DS #: 05221

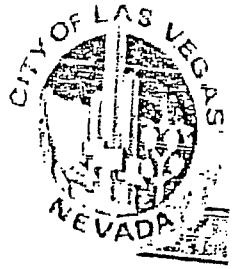
APN: 137-21-801-001, 137-22-301-001

PROJECT: Summerlin West Village 25. Standstone Rise Dr

SUBMITTAL: 2nd

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: February 20, 2020
TO: **Land Development Services** Department of Building & Safety			FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT: Drainage Study for: **Summerlin West Village 25 - Sandstone Rise Dr. (Street M)** **(from Park Drift Trail <Street K> to Sky Vista Drive)**			**COPIES TO:** Atkins
Cross Streets:	NWQ of Sky Vista Drive & Far Hills Avenue		Howard Hughes Company LLC
File Number:	F:\Depot\DSMemos\DS5221B.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-21-801-001, 137-22-301-001		CCRFCD
Zoning Action:	N/A		
FEMA Flood Zone	YES	NO **X**	
Proposed Storm Drain	YES **X**	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	11/20/2019	12/26/2019	Not Approved	$400.00	3652617: $400
2nd Submittal	1/22/2020	2/20/2020	See Comments Below	$400.00	3713777: $400
			TOTAL FEES (LDDRS):	**$800.00**	----

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:
	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.

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

***** Do not submit the Drainage Study to Clark County Regional Flood Control District (CCRFCD) prior to the Structural Design and Calculations being approved by the City Building & Safety Department**

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 (CCRFCD)* has issued a letter of concurrence. The engineer should contact the CCRFCD to confirm that they have begun their review.

   Please note that effective March 15, 2019, the CCRFCD adopted new requirements for drainage study concurrence submittal. Follow the link below for specific guidance.

   http://gustfront.ccrfcd.org/LandDev/LandDev.aspx

2. The subject drainage study for *Sandstone Rise Drive (Street M) from Park Drift Trail to Sky Vista Drive* will not be approved prior to the final approval of the *Update Study to the Conceptual Master Drainage Study for Summerlin West Village 25.*

3. The project proposes to build temporary drainage facilities including drainage berms/swales for the flood protection of the proposed ***Sandstone Rise Drive***. Prior to final plan approval the developer must complete a ***Maintenance & Liability Agreement*** for the interim drainage improvements and post a minimum maintenance bond of $50,000 or 50-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for constructing the facilities and an exhibit that adequately shows the location and limits of the drainage facilities to *City of Las Vegas Flood Control* for approval. Once the drainage study is conditionally approved, the engineer should contact the *City's Land Development Section* (229-6371) to begin the agreement process.

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

4. All storm drain inlets that are more than 10'-deep require a special structural detail and calculations. Submit structural design and calculations to *City Building & Safety Department* for review and approval prior to the final approval of the drainage study.

5. ***Second Request***: *Figure 3 Hydrology Workmap* also did not state what drainage condition it is trying to present. Is it an *Interim Condition* or *Ultimate Condition*? Label clearly in the next submittal.

   The revised workmap still did not state whether it is *Interim* or *Ultimate* condition. Provide a corrected workmap as a supplement to *City Flood Control*.

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/AYS

T/R/S: T20S/R59E/21
AREA K-21



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SUMMERLIN®

Summerlin West Village 22

Sandstone Rise Drive (Street M)
Park Drift Trail (Street K) to Sky Vista Drive

November 20, 2019

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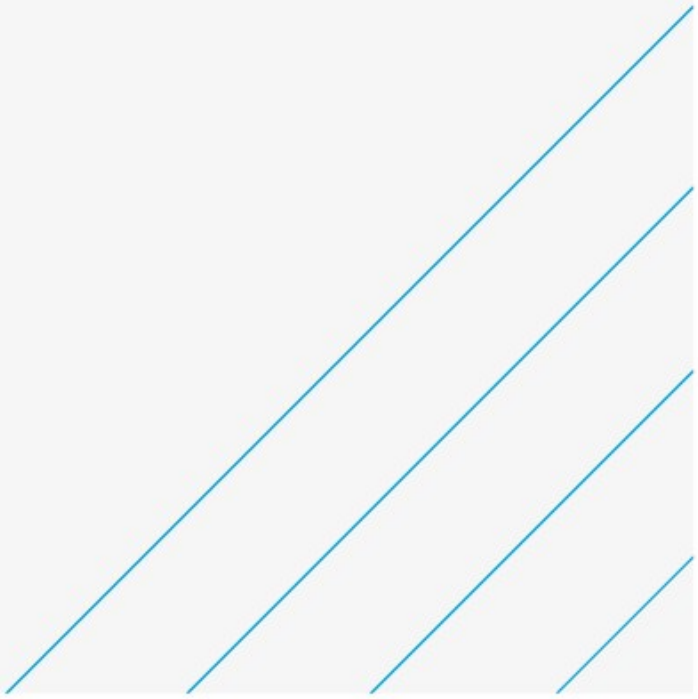
SUMMERLIN®

Summerlin West Village 25

Sandstone Rise Drive (Street M): Park Drift Trail (Street K) to Sky Vista Drive

Prepared for Howard Hughes Company, LLC

November 2019



Engineer's Certification

Atkins certifies that the information contained herein has been prepared in accordance with generally accepted engineering principles and practices, and to the best of our knowledge, is true and correct.

This letter certifies that all items in the **Technical Drainage study for Sandstone Rise Drive (Street M): Park Drift Trail (Street K) to Sky Vista Drive** electronic submittal matches the paper version bound into the study.

_____

Janelle L. Klein, PE (NV #17313)

Senior Engineer

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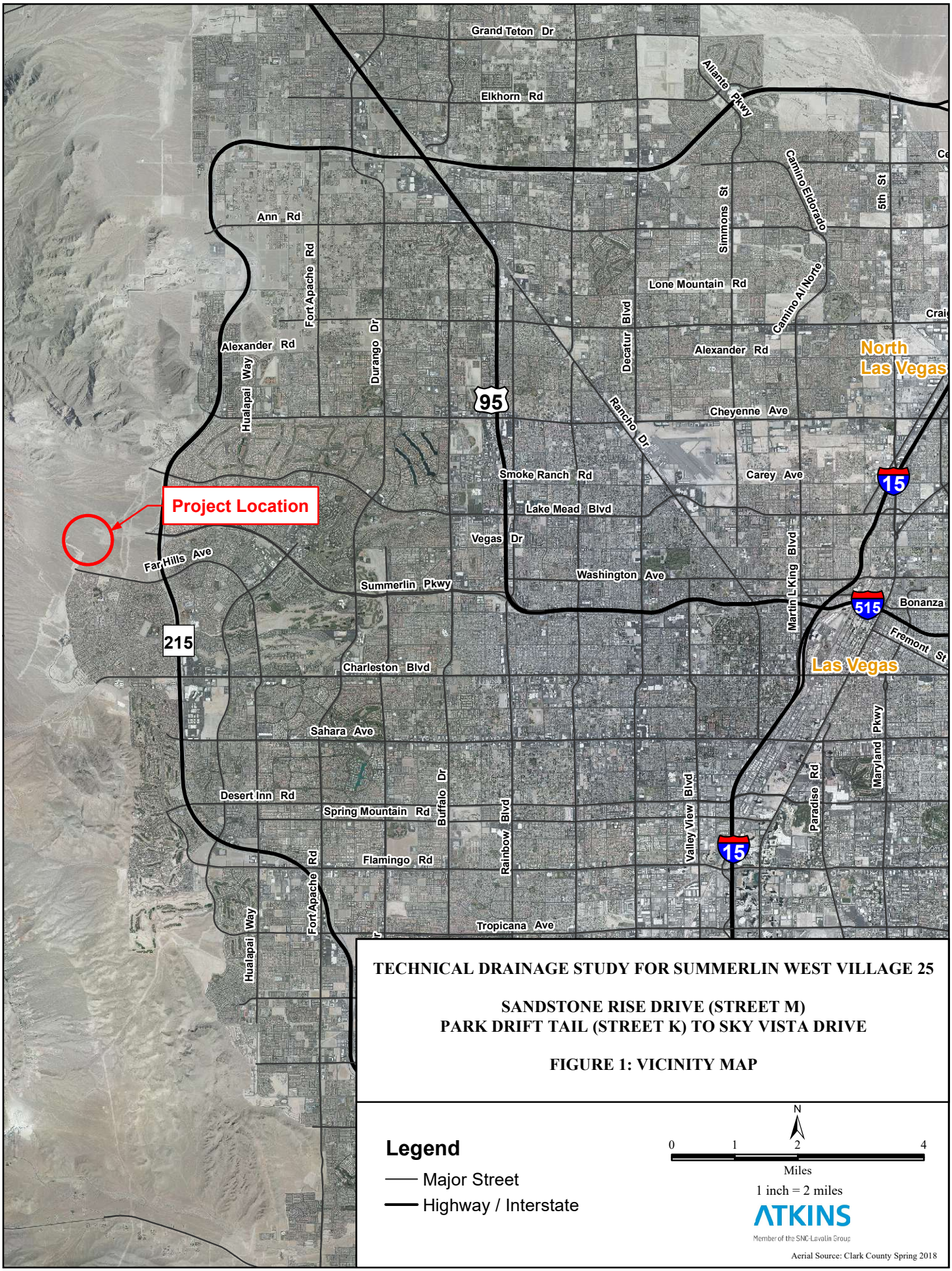
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Executive Summary

This Technical Drainage Study (TDS), prepared on behalf of Howard Hughes Company, LLC represents the hydrologic and hydraulic analysis for the Sandstone Rise Drive (Street M) roadway improvements of the Summerlin West Village 25 development. Summerlin West Village 25 is located in the northwest Las Vegas Valley west of the CC-215 beltway and is bounded by Summerlin Parkway Westbound and Far Hills Avenue. A vicinity map is provided in Figure 1. Sandstone Rise Drive is located between Fox Hill Drive and Far Hills Avenue and is shown on the location map on Figure 2.

A Master Conceptual Drainage Study (MCDS) for Summerlin West Village 25 (W.O. 7919-A) was approved June 18, 2019. Portions of the TDS, such as parcel names, rainfall depths, and facility locations are directly referenced from the MCDS and the relevant information is included in Appendix A.



TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M)
PARK DRIFT TAIL (STREET K) TO SKY VISTA DRIVE

FIGURE 1: VICINITY MAP

Legend

- Major Street
- Highway / Interstate

N

0 1 2 4

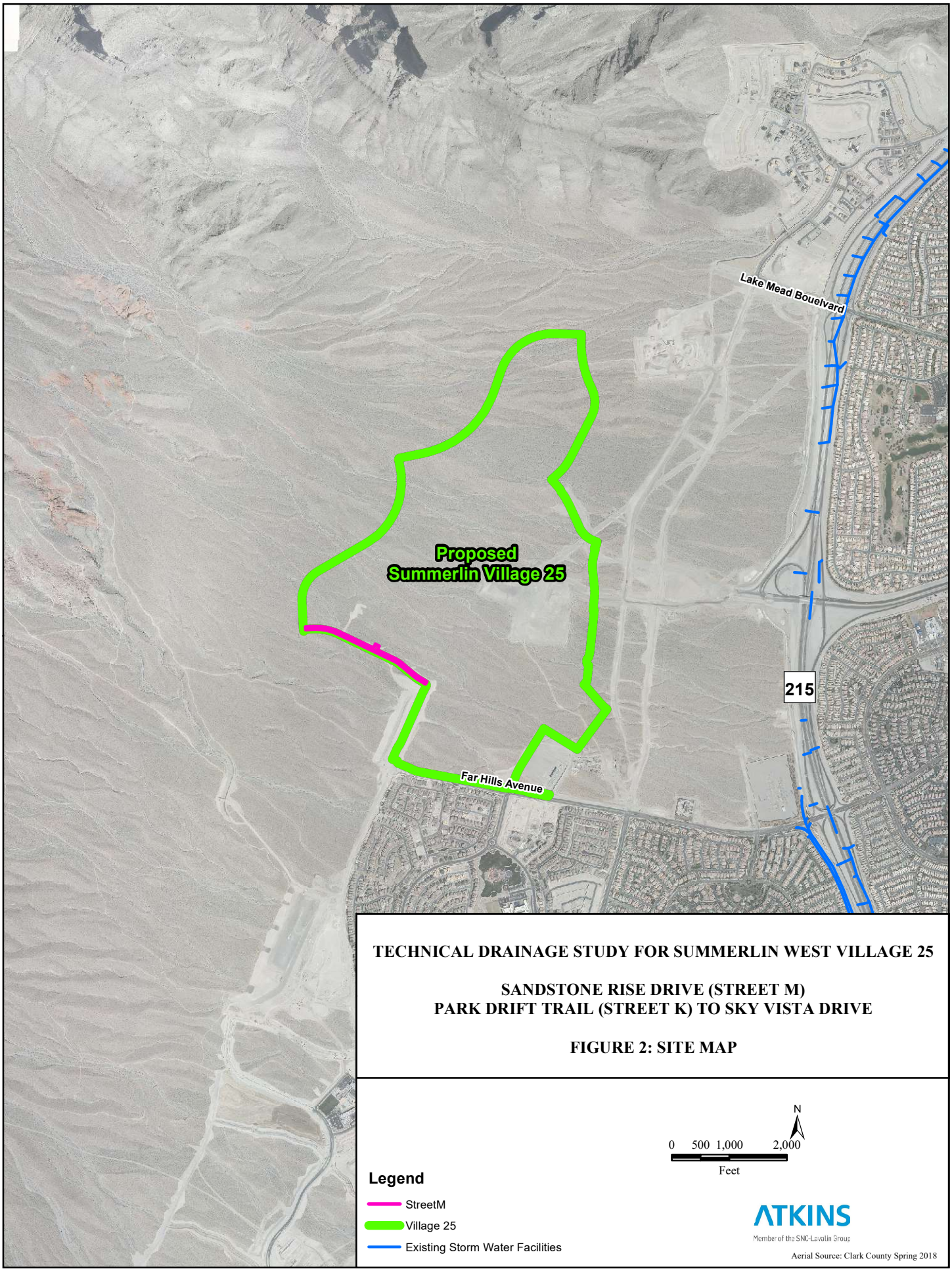
Miles

1 inch = 2 miles

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Aerial Source: Clark County Spring 2018



TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M)
PARK DRIFT TRAIL (STREET K) TO SKY VISTA DRIVE

FIGURE 2: SITE MAP

N

0 500 1,000 2,000

Feet

Legend

- StreetM
- Village 25
- Existing Storm Water Facilities

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Aerial Source: Clark County Spring 2018

1. Hydrologic Analysis

1.1. Existing Condition

The existing site condition is undeveloped desert land. As established in the Master Conceptual Drainage Study (MCDS), there is one existing downstream storm drain facility that collects runoff from the proposed Street M improvements and adjacent development. The Western Beltway Channel to the east of the project is fully developed and includes a 20-foot wide concrete channel that conveys flow north to the Village 26 Detention Basin.

In the existing condition, runoff generated by the project and the undeveloped areas west of the project drains east as sheet flow to the Western Beltway Channel. According to the 2002 Conceptual Drainage Study and Western Beltway Study, the existing channel has been designed to accept both the existing and ultimate condition flows from Village 25. The Village 25 site was included in the area previously analyzed in the Western Beltway Study. In addition, the allowable discharge flow rates for the project have been established in the 2017 Summerlin West Planning Area (SWPA) MPU study. Therefore, an additional existing condition hydrologic model was not required as part of this study.

1.2. Interim Condition

The proposed roadway is referred to as “Sandstone Rise Drive” in this study and on the plans. The MCDS refers to the proposed roadway by a letter name, “Street M”. Now that the roadways have been named, the plans and report refer to the roadways by name. Table 1 compares the roadway names to their letter name in the MCDS.

The proposed Sandstone Rise Drive improvements will be constructed prior to the development of adjacent onsite parcels (H, I, J, DC-1, V30-P, V30-Q, V30-R and V30-S). As a result, an interim condition exists for the proposed improvements. Refer to Figure 3 to see the interim conditions in the hydrology workmap.

The proposed Street M improvements and interim grading have been designed to ensure that the existing drainage patterns are maintained in the interim condition and that none of the existing downstream facilities are adversely affected by the proposed improvements.

Rough grading of Park Drift Trail (Street K) is to be completed prior to the construction of Sandstone Rise Drive. Drainage basins to the northwest of Park Drift Trail (Street K) will be intercepted before entering Sandstone Rise Drive in the interim and ultimate conditions. There are no offsite flows tributary to Sandstone Rise Drive in the interim or ultimate conditions. There are several drainage basins on the north and south side of Sandstone Rise Drive that collect flows in the interim condition which are either intercepted by interim swales or drop inlets; flows from these adjacent interim subbasins do not drain onto Sandstone Rise Drive. Interim subbasin INT-PQ (Figure 3) collect flows in the interim swale to the south of Sandstone Rise Drive, which drains into the proposed Sandstone Rise Drive storm drain.

The hydrologic conditions for 10-year and 100-year storm events in the interim subbasins were modeled using HEC-1. The results are summarized in Table 2 and Figure 3.

The proposed Sandstone Rise Drive storm drain discharges east to the storm drain facility in Sky Vista Drive. The tailwater elevation for the hydraulic model was taken from the upstream hydraulic grade line (HGL) in the approved plans. The plan sheets that reference the HGL information is included in the reference information in Appendix A.

Table 1 – Village 25 MCDS and TDS Roadway Names

MCDS Street Name	TDS Street Name
Street J	Kettle Ridge Drive
Street K	Park Drift Trail
Street L	Grand Park Boulevard
Street M	Sandstone Rise Drive
Summerlin Parkway WB/Street Q	Sunset Run Drive

Table 2 – Interim Condition HEC-1 Model Results

Basin ID	Tributary Area (sq mi)	Tributary Area (ac)	100-year Flow (cfs)	10-year Flow (cfs)
INT-J	0.02640	16.90	60	30
STM-1N	0.00046	0.29	1	1
MH1			61	31
STM-1S	0.00047	0.30	1	1
DI2			63	32
STM-2N	0.00044	0.28	1	1
MH3			64	32
INT-PQ	0.03109	19.90	54	22
STM-2S	0.00047	0.30	1	1
DI4			119	55
INT-DC	0.02347	15.02	39	16
MH5			158	70
STM-3N	0.00112	0.71	3	2
STM-3S	0.00090	0.58	2	1
MH10			163	73

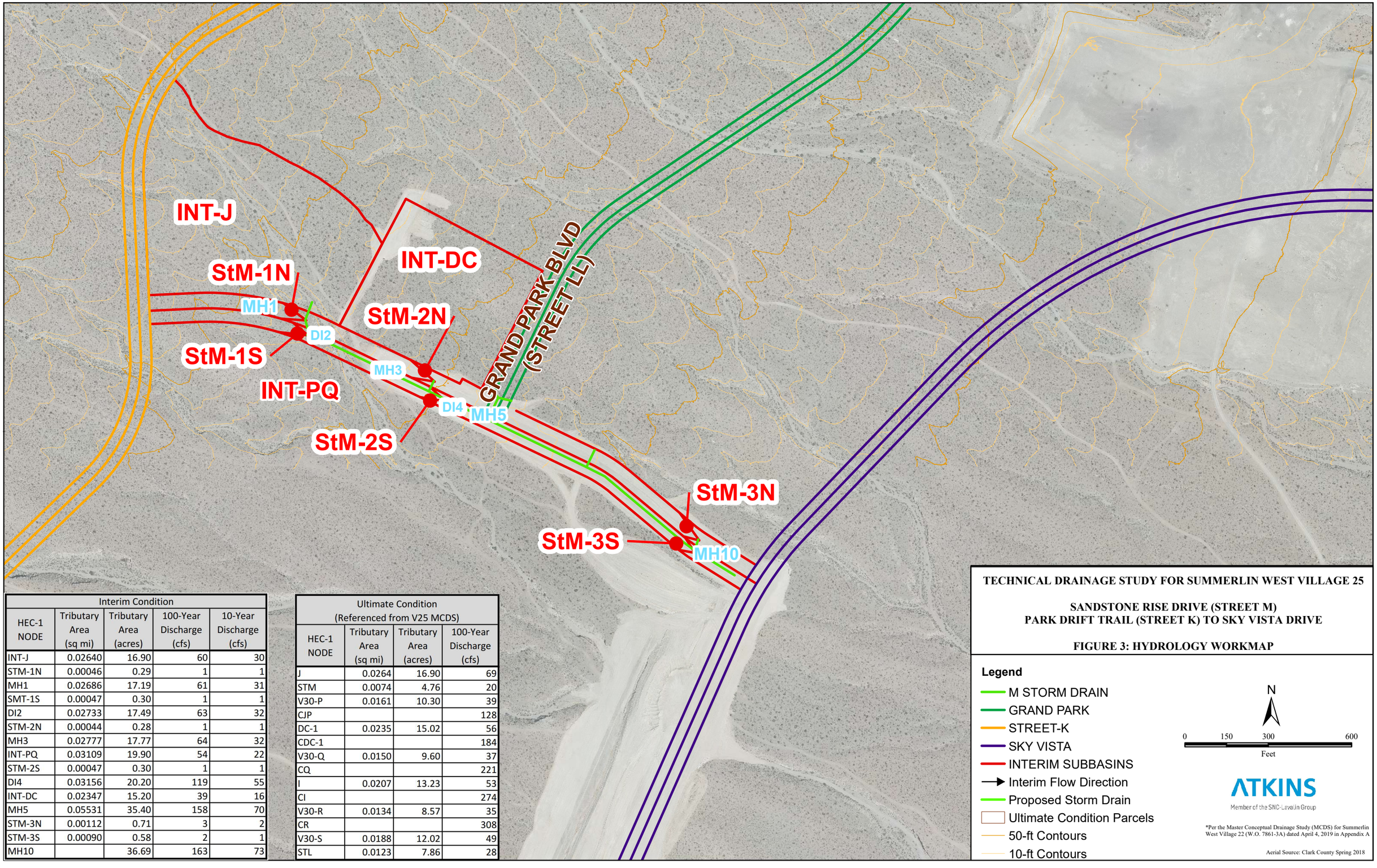
1.3. Ultimate Condition

The ultimate condition flows were directly referenced from the approved MCDS as shown in the HEC-1 output and in the Ultimate Condition Basin Map, Figure 6, of Appendix A. Table 3, below, summarizes the ultimate conditions results from the MCDS for the Sandstone Rise Drive study. Ultimate conditions are also displayed on Figure 3.

Table 3 – Ultimate Condition MCDS Reference Information

Parcel ID	Tributary Area (sq mi)	Tributary Area (ac)	100-year Flow (cfs)
J	0.0264	16.90	69
STM	0.0074	4.76	20
V30-P	0.0161	10.30	39
CJP			*128*
DC-1	0.0235	15.02	56
CDC-1			*184*
V30-Q	0.0150	9.60	37
CQ			*221*
I	0.0207	13.23	53
CI			*274*
V30-R	0.0134	8.57	35
CR			*308*
V30-S	0.0188	12.02	49
STL		7.86	28

Parcels V30-P and V-30Q have been combined
Parcels H & I have been combined and drain to Sky Vista Drive
Parcels V30R and V30-S have been combined and drain to Sky Vista Drive
The southwest portion of STL now drains to STM



Interim Condition				
HEC-1 NODE	Tributary Area (sq mi)	Tributary Area (acres)	100-Year Discharge (cfs)	10-Year Discharge (cfs)
INT-J	0.02640	16.90	60	30
STM-1N	0.00046	0.29	1	1
MH1	0.02686	17.19	61	31
SMT-1S	0.00047	0.30	1	1
DI2	0.02733	17.49	63	32
STM-2N	0.00044	0.28	1	1
MH3	0.02777	17.77	64	32
INT-PQ	0.03109	19.90	54	22
STM-2S	0.00047	0.30	1	1
DI4	0.03156	20.20	119	55
INT-DC	0.02347	15.20	39	16
MH5	0.05531	35.40	158	70
STM-3N	0.00112	0.71	3	2
STM-3S	0.00090	0.58	2	1
MH10		36.69	163	73

Ultimate Condition (Referenced from V25 MCDS)			
HEC-1 NODE	Tributary Area (sq mi)	Tributary Area (acres)	100-Year Discharge (cfs)
J	0.0264	16.90	69
STM	0.0074	4.76	20
V30-P	0.0161	10.30	39
CJP			128
DC-1	0.0235	15.02	56
CDC-1			184
V30-Q	0.0150	9.60	37
CQ			221
I	0.0207	13.23	53
CI			274
V30-R	0.0134	8.57	35
CR			308
V30-S	0.0188	12.02	49
STL	0.0123	7.86	28

TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M)
PARK DRIFT TRAIL (STREET K) TO SKY VISTA DRIVE

FIGURE 3: HYDROLOGY WORKMAP

Legend

- M STORM DRAIN
- GRAND PARK
- STREET-K
- SKY VISTA
- INTERIM SUBBASINS
- Interim Flow Direction
- Proposed Storm Drain
- Ultimate Condition Parcels
- 50-ft Contours
- 10-ft Contours

N

0 150 300 600
Feet

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*Per the Master Conceptual Drainage Study (MCDS) for Summerlin West Village 22 (W.O. 7861-3A) dated April 4, 2019 in Appendix A

Aerial Source: Clark County Spring 2018

2. Hydraulic Analysis

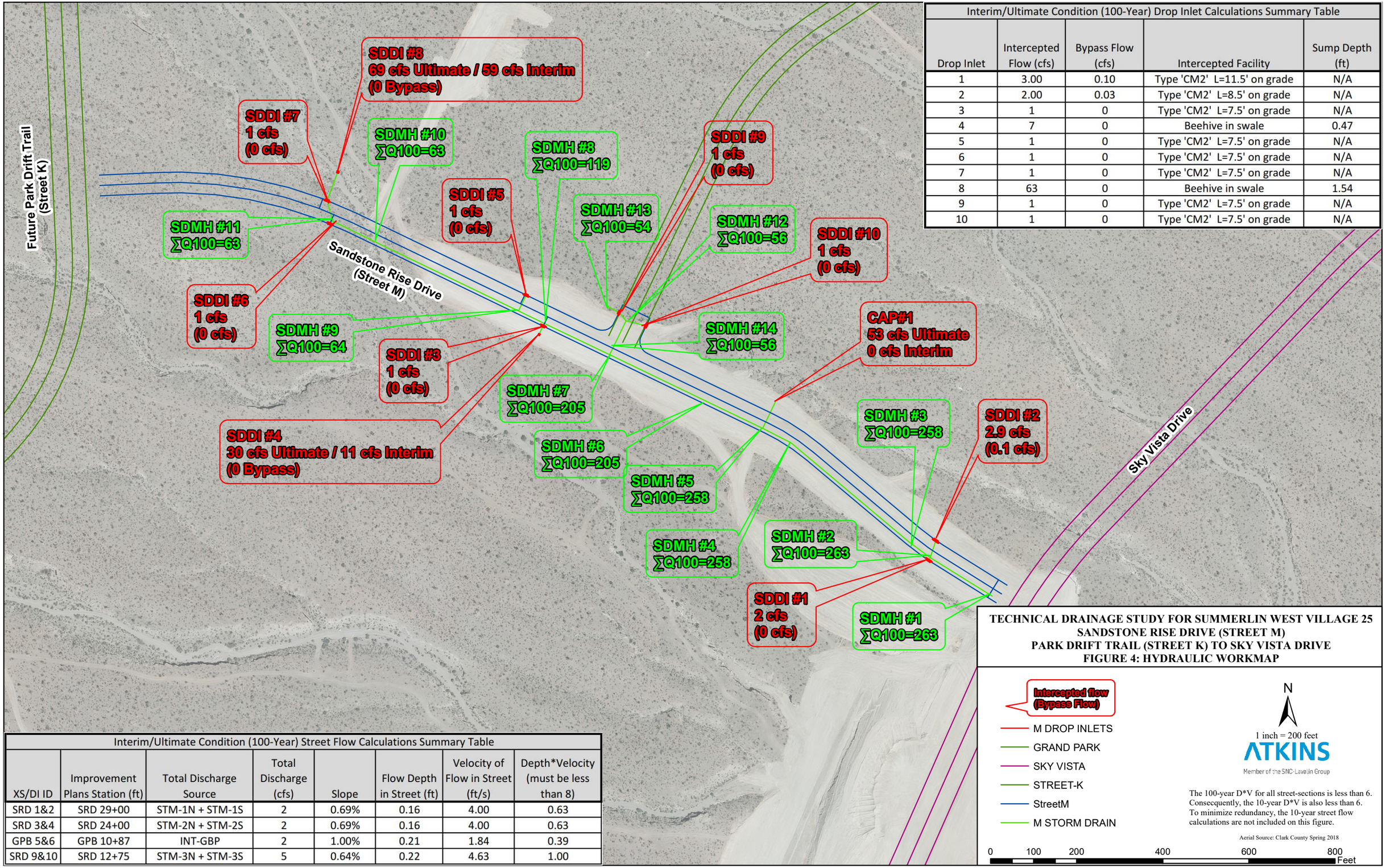
2.1. Drop Inlet Calculations

The computer program Bentley FlowMaster V10.2 was utilized to perform calculations for the six proposed drop inlets along Sandstone Rise Drive. The storm drain inlets SDDI #4 and SDDI #8, are in the proposed swales to the south and north of Sandstone Rise Drive respectively. The laterals for SDDI #4 and SDDI #8 were sized for the ultimate condition 100-event.

For SDDI's located on the proposed Sandstone Rise Drive roadway (SDDI #1, #2, #3, #5, #6, #7) the ultimate conditions are equal to or a slightly lower than the interim conditions. The one exception to this is the SDDI Cap #1 that has no flow in the interim condition and 53 cfs in the ultimate condition. Drop inlet calculations are provided in Appendix C. Table 4 provides a summary of the drop inlet calculation results. Drop inlet locations and calculation results are also shown on Figure 4.

Table 4 – Drop Inlet Calculations

ID	Improvement Plans Station (ft)	Total Flow (cfs)	Discharge Source	Intercepted Flow (cfs)	Bypass Flow (cfs)
100-Year Interim Conditions					
SDDI#8	28+85.56	61	INT-J	61	0
SDDI#7	28+84.95	1	M1N	1	0
SDDI#6	28+58.56	1	M1S	1	0
SDDI#5	23+75.00	1	M2N	1	0
SDDI#3	23+08.38	1	M2S	1	0
SDDI#4	23+08.38	54	INT-PQ	54	0
SDDI#9	GPB 10+73	1	Int-G1	1	Nuisance
SDDI#10	GPB 10+73	1	Int-G2	1	Nuisance
SDDI#2	12+61.07	3	M3N	2.90	Nuisance
SDDI#1	12+62.99	2	M3S	1.97	Nuisance
100-Year Ultimate Conditions					
SDDI#7	28+84.95	1	M1N	1	0
SDDI#6	28+58.56	1	M1S	1	0
SDDI#5	23+75.00	1	M2N	1	0
SDDI#3	23+08.38	1	M2S	1	0
SDDI#9	GPB 10+73	1	G1	1	Nuisance
SDDI#10	GPB 10+73	1	G2	1	Nuisance
SDDI#2	12+62 L	3	M3N	2.90	Nuisance
SDDI#1	12+62 R	2	M3S	1.97	Nuisance



Interim/Ultimate Condition (100-Year) Drop Inlet Calculations Summary Table				
Drop Inlet	Intercepted Flow (cfs)	Bypass Flow (cfs)	Intercepted Facility	Sump Depth (ft)
1	3.00	0.10	Type 'CM2' L=11.5' on grade	N/A
2	2.00	0.03	Type 'CM2' L=8.5' on grade	N/A
3	1	0	Type 'CM2' L=7.5' on grade	N/A
4	7	0	Beehive in swale	0.47
5	1	0	Type 'CM2' L=7.5' on grade	N/A
6	1	0	Type 'CM2' L=7.5' on grade	N/A
7	1	0	Type 'CM2' L=7.5' on grade	N/A
8	63	0	Beehive in swale	1.54
9	1	0	Type 'CM2' L=7.5' on grade	N/A
10	1	0	Type 'CM2' L=7.5' on grade	N/A

Interim/Ultimate Condition (100-Year) Street Flow Calculations Summary Table							
XS/DI ID	Improvement Plans Station (ft)	Total Discharge Source	Total Discharge (cfs)	Slope	Flow Depth in Street (ft)	Velocity of Flow in Street (ft/s)	Depth*Velocity (must be less than 8)
SRD 1&2	SRD 29+00	STM-1N + STM-1S	2	0.69%	0.16	4.00	0.63
SRD 3&4	SRD 24+00	STM-2N + STM-2S	2	0.69%	0.16	4.00	0.63
GPB 5&6	GPB 10+87	INT-GBP	2	1.00%	0.21	1.84	0.39
SRD 9&10	SRD 12+75	STM-3N + STM-3S	5	0.64%	0.22	4.63	1.00

TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
PARK DRIFT TRAIL (STREET K) TO SKY VISTA DRIVE
FIGURE 4: HYDRAULIC WORKMAP

Intercepted flow (Bypass Flow)

M DROP INLETS
GRAND PARK
SKY VISTA
STREET-K
StreetM
M STORM DRAIN

N

1 inch = 200 feet

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The 100-year D*V for all street-sections is less than 6. Consecquently, the 10-year D*V is also less than 6. To minimize redundancy, the 10-year street flow calculations are not included on this figure.

Aerial Source: Clark County Spring 2018

0 100 200 400 600 800 Feet

2.2. Normal Depth Calculations

The computer program Bentley FlowMaster V10.2 was utilized to perform normal depth calculations for the proposed roadway. These normal depth calculations were utilized to ensure that the proposed storm drain facility is adequately designed and that all local street flow criteria are met.

Two full street cross-sections were analyzed as roadway flow and storm drain capture were equal on north and south sides of the street. The cross-section locations were specified based on the flow patterns and utilized the worst-case slope or roadway width when applicable for the calculations. Street roadway flows for the western portion of the roadway (STM-2) are equal in both the interim and ultimate conditions. In the ultimate conditions for the eastern part of the roadway (STM-1) the total roadway flow is 1 cfs less than in the interim condition (0.5 cfs less for each N/S half section)

Table 5 summarizes the normal depth calculations for 100-year interim and ultimate storm events. Depth*Velocity must be less than 8 for the 100-year event and less than 6 for the 10-year event. Since the street conditions in the interim and ultimate 100-yr events meet the roadway criteria for the 10-year event as well, the computations for the 10-yr events are not shown in tables and figures.

Print-outs of all normal depth calculations for the ultimate condition are provided in Appendix C. Cross section locations and calculation summaries are shown on Figure 4.

Table 5 – Normal Depth Calculations

ID	Total Flow (cfs)	Discharge Source	Slope (%)	Flow Depth (ft)	Velocity (ft/s)	D* V
STM-1	2	M1+M2	6.9	0.16	4.00	0.64
STM-2	2	M3+M4	6.9	0.16	4.00	0.64
STM-3	5	M5+M6+Bypass	6.4	0.22	4.63	1.02

2.3. Storm Drain System Modeling

The proposed storm drain systems were modeled using Water Surface Pressure Gradient for Windows (WSPG-W). A print-out of the WSPG-W models for interim and ultimate conditions are provided in Appendix C. The Q100 and hydraulic grade lines are shown on the improvement plans in Appendix D. Table 6 summarizes the WSPG-W model at the mainline manholes for interim and ultimate conditions.

The downstream end of the proposed storm drain is 48” RCP. The maximum velocity modeled is 33.05 ft/s and is observed in the ultimate condition between SDMH#5 and SDMH#5. Hydraulic jumps are modeled in the Sandstone Rise Drive storm drain on the mainline between SDMH#8 and SDMH#9 in the interim condition, and between SDMH#7 and SDMH#8 in both the interim and the ultimate conditions. All HGLs modeled, including the hydraulic jumps, are greater than 1 foot below the existing and or proposed surfaces.

Table 6 – WSPG-W Mainline Summary Table

SDMH#	WSPG-W Station	Q_{100}	$\sum Q_{100}$	HGL (Ft)
100-Interim Condition				
#1	0	0	163	3559.66
#2	171.98	5	158	3566.52
#3	234.44	0	158	3569.68
#4	590.71	0	158	3586.96
#5	664.87	0	158	3590.57
#6	789.84	0	158	3602.15
#7	1058.97	39	119	3629.20
#8	1227.06	55	64	3636.92
#9	1293.68	1	63	3634.84
#10	1637.77	0	63	3655.42
#11	1763.42	63	63	3665.12
100-Ultimate Condition				
#1	0	0	263	3560.46
#2	171.98	5	258	3567.28
#3	234.44	0	258	3570.46
#4	590.71	0	258	3588.08
#5	664.87	53	205	3590.86
#6	789.84	0	205	3602.46
#7	1058.97	56	149	3631.09
#8	1227.06	77	72	3638.41
#9	1293.68	1	71	3634.92
#10	1637.77	0	71	3655.51
#11	1763.42	71	71	3665.14

2.4. Riprap Calculations

Normal depth calculations for the north-south oriented earthen swale separating parcels J and DC-1 shows that average velocities are less than 5 ft/s and riprap is not needed for the temporary interim condition. The normal depth calculations for the earthen swale adjacent to street M within future V30 Parcel A also has average velocities are less than 5 ft/s and riprap is not needed for the temporary interim condition. Results of the swale calculations are shown in Appendix C.

3. Differences between Village 25 MCDS and Proposed TDS

The MCDS shows the flow from V30-P and V30-Q discharging into the proposed storm drain in Street M separately. However, the flow from the two parcels flow was combined in this design. Likewise, the MCDS shows the flow from Parcel V30-R discharging into the proposed storm drain in Street M, however in this study it was combined with Parcel V30-S discharging into the Sky Vista Drive storm drain. Table 1 compares the proposed names in the TDS to the MCDS letter.

Appendices

Appendix A. Summerlin West Village 25 Master Conceptual Drainage Study Reference

Master Conceptual Drainage Study for

Summerlin West Village 25

Las Vegas, Nevada

W.O. # 7919-A

Prepared for:

Howard Hughes Company, LLC

Submitted to:

City of Las Vegas
Public Works

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Summerlin West Village 25 Date: February 20, 2019

Location of Development: a) Descriptive (Cross Streets) North/South: Sky Vista Drive

East/West: Far Hills Avenue

b) Section: 21 and 22 Township: 20S Range: 59E

c) APN : 137-22-101-001; 137-21-000-002

Name of Owner: The Howard Hughes Company, LLC

Telephone No.: (702) 791-4336 Fax No.: (702) 791-4453 E-Mail Address: chris.anderson@howardhughes.com

Address: 10801 W. Charleston Blvd. LV, NV, 89135

Contact Person-Name: Joanna Ayson **Telephone No.:** (702)-873-7550

* **E-Mail Address:** jayson@vtnnv.com **Fax No.:** (702)-362-2597

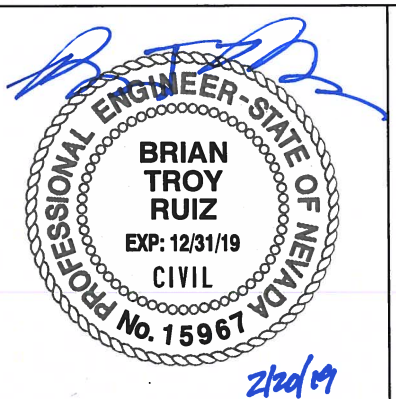
Firm: VTN Nevada

Address: 2727 S. Rainbow Blvd, LV, NV, 89146

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		

1. Total Owned Land Area: At Site: +/-548 Acres Being Developed/Disturbed: +/-548 Acres
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ **Yes**** ☒ **No**
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☒ **Yes**** ☐ **No**
4. Proposed type of development (Residential, Commercial, Etc.): Mixed-use master plan
5. Approximate upstream land area which drains to the subject site: +/- 819 acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: SWPA MPU (DS4926), TDS for Summerlin West Desert Foothills Drive (Far Hills to Street A) (DS5013
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: 10'X10' RCB storm drain in Desert Foothills Drive (CCRFCD Master Planned Facility)
8. Briefly describe your proposed schedule for the subject project: As soon as possible



Engineer's Seal

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

*New Required Field

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

Revision	Date

Local Entity File No.

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

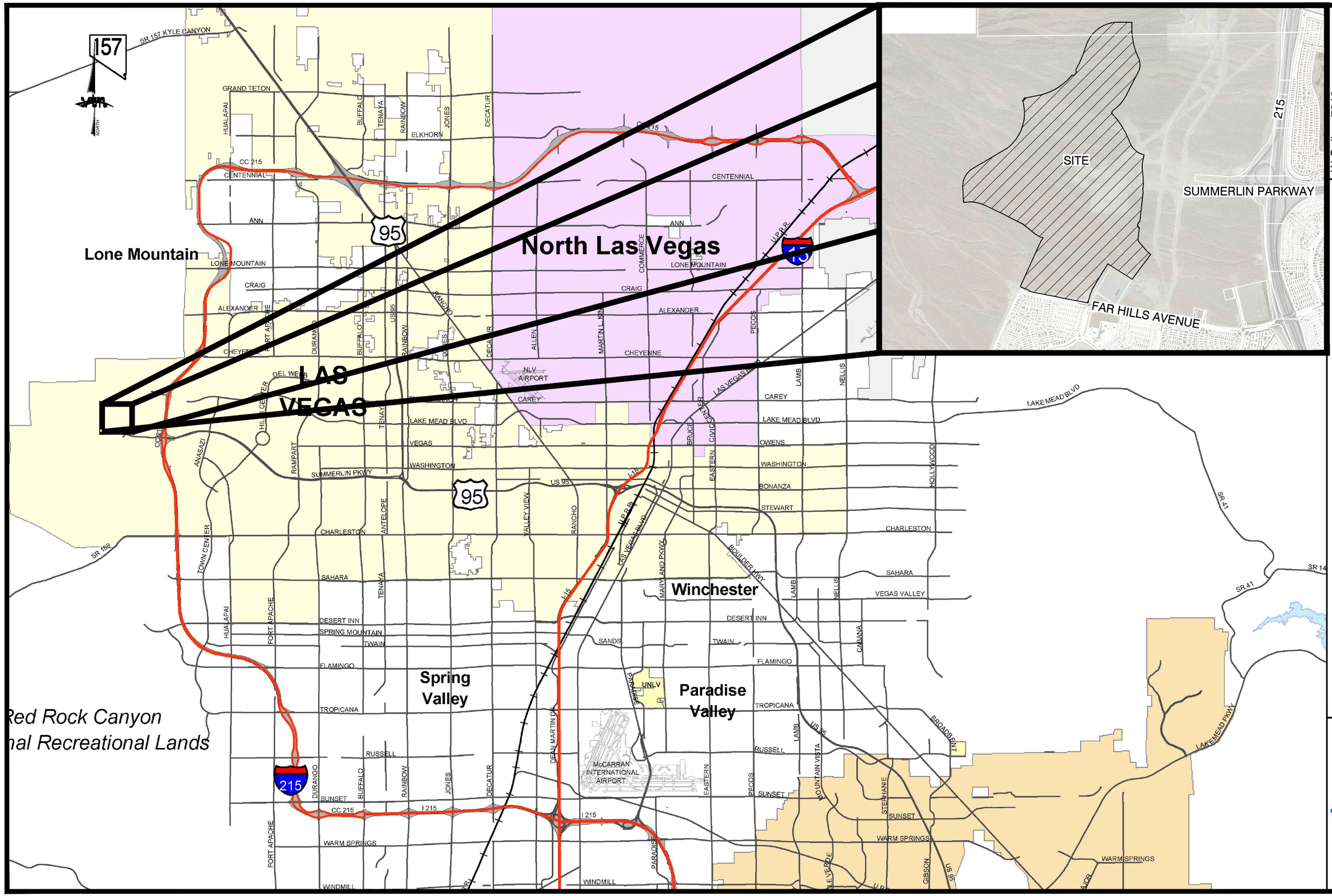
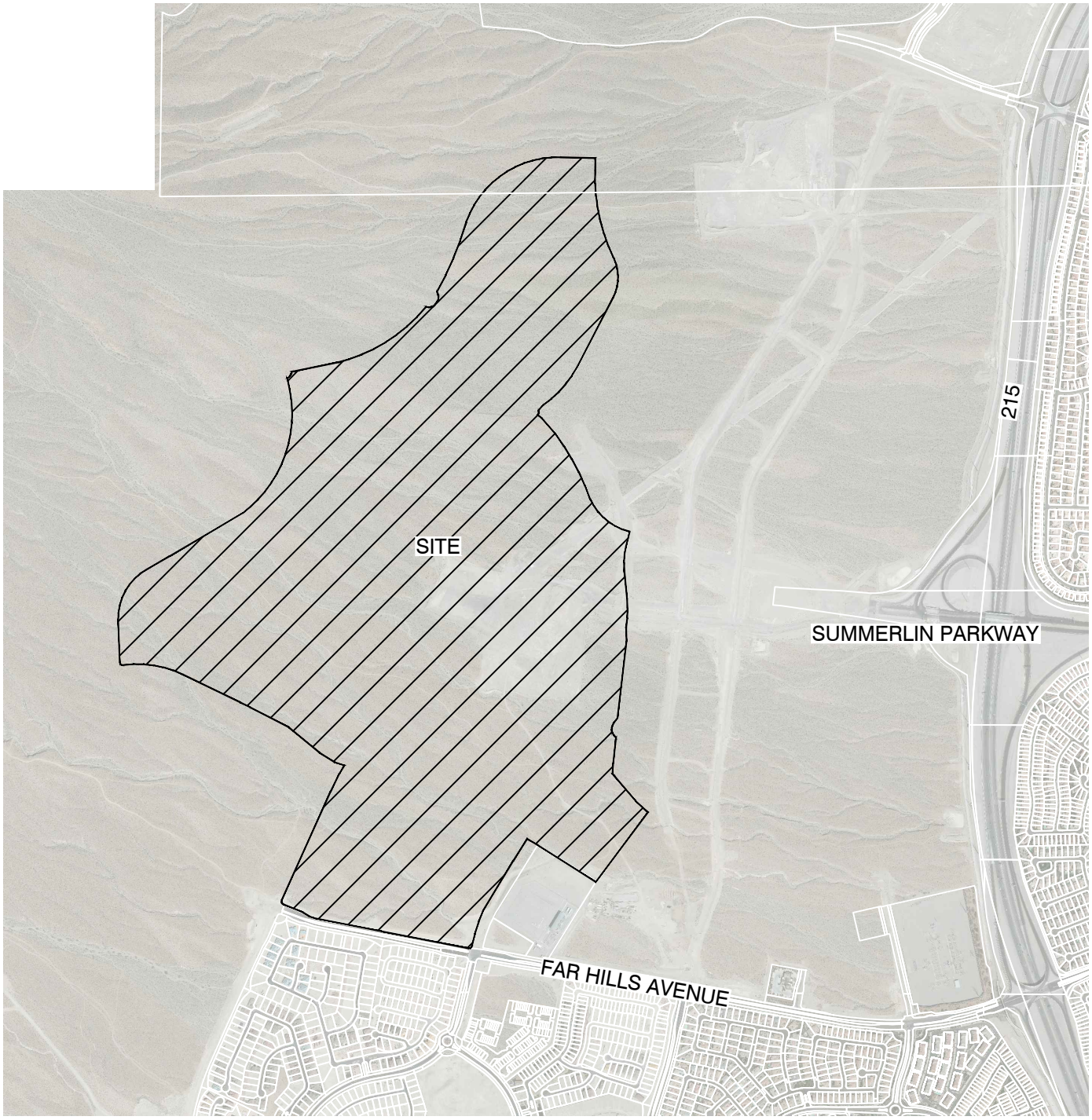


FIGURE 1
VICINITY MAP
SUMMERLIN WEST VILLAGE 25

W.O.#:	7919
DATE:	JUNE 2018
BY:	AH
SCALE:	N.T.S
SHEET	1 OF 1

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NV 89146-5148

H:\7919\Drainage\A Figures\Figure 1 & 2.dwg;alanh; Jun 05, 2018 - 11:24am



GRAPHIC SCALE

1500 0 750 1500 3000

1" = 1500'

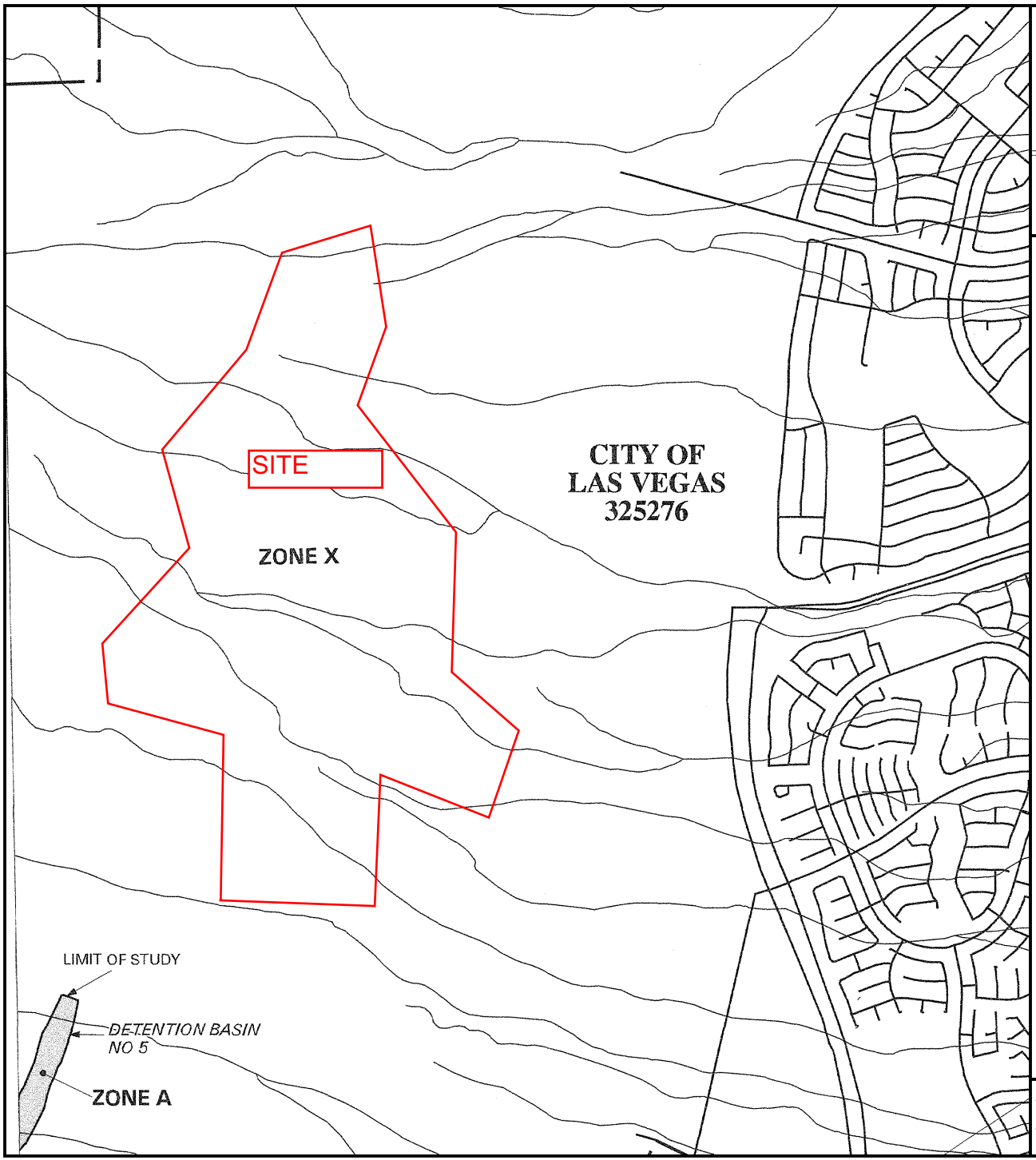
NORTH

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NV 89146-5148

SUMMERLIN WEST
VILLAGE 25

SITE DESCRIPTION MAP
FIGURE 2

SCALE	HORZ. 1"=1500'
	VERT. N/A
W.O. NO.	7919
DRAWN BY:	AH
DATE:	JUNE 2018
SHEET	1 OF 1



MAP SCALE 1" = 2000'

1000 0 2000 4000 FEET

PANEL 2150 E

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY,
NEVADA AND
INCORPORATED AREAS

PANEL 2150 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LAS VEGAS, CITY OF	325276	2150	E
CLARK COUNTY, UNINCORPORATED AREAS	320003	2150	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
32003C2150 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

FIGURE 3

REGIONAL FLOOD CONTROL DISTRICT

2013
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F- 24
FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin

- Stormdrain
- Lined Channel
- Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain

N

0 500 1,000 2,000 3,000
Feet

Scale: 1 inch = 2,000 feet

Refer to Figure G-2 for Aerial Source(s)

US95 I-15 I-215

1	2	3			A1	A2
4	5	6			A3	A4
	7	8	9	10	A5	A6
11	12	13	14	15	16	17
	18	19	20	21	22	23
	24	25	26	27	28	
	29	30	31	32	33	34
	35	36	37	38	39	40
	41	42	43	44	45	46
	47	48	49	50	51	52
	53	54	55	56		
	57	58	59			

SITE

GOWAN RD
CHEYENNE AV
BUTTON WILLOW DR
LAKE MEAD BLVD
THOMAS W RYAN BLVD
SNOW TRL
MISSUIN LAKES AV
SUMMERLIN PKWY
LAURELGLEN DR
FAR HILLS AV
ANASAZI DR
VISTA RUN DR
ALTA DR
215

GOLM 0260
GOLM 0252
GOLM 0230
GOL3 0010
GOL3 0000
GOL4 0026
GOL4 0025
GOL4 0000
GOL4 0010
GOL3 0068
GOL3 0077
GOL3 0070
GOL3 0123
GOL3 0116
GOL3 0100
GOBE 0000
GOBE 0001
GOL3 0137
GOL3 0290
GOL3 0870
GOL3 0299
GOL3 0216
GOB3 0035
GOB3 0000
GOBE 0065
GOBE 0066
GOBE 0108
GOBE 0068
GOB2 0098
GOB2 0033
GOB2 0020
GOB2 0000
GOB2 0001
GOBE 0127
GOBE 0139
APDF 0123
APD3 0000
APD3 0013
APDF 0073
APDF 0026
APDF 0000
APD6 0000
APM5 0039
APM5 0057
APM5 0213
APM5 0212
APM5 0009
APM5 0056
APM5 0047
APM5 0008
APM5 0000
APF2 0000
APFH 0144
APFH 0089
APFH 0061
APFH 0024
APFH 0019
APFH 0000
APCH 0000
APCH 0037
APCH 0003
APBE 0122
APBE 0094
APBE 0081
APBE 0061
APBE 0022
APBE 0013
APBE 0000
APSP 0177
APSP 0135
APSP 0183
APAD 0225
APAD 0203
APAD 0000
APD2 0000
APD2 0002
APMD 0233

FIGURE 4A - MPU Facilities

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
APAD		**ANGEL PARK - ALTA DRIVE BRANCH**						
0044	E	11' X 8' RCAP	1565	3140	CSWAA-3	ALLGOW4	8.26	4.24
0073	E	11' X 8' RCAP	2220	2917	CSWAA-2	ALLGOW3	7.68	3.50
0146	E	10' X 8' RCB	3010	2220	CSWAA-1	ALLGOW3	6.98	4.40
0203	E	2: 7' X 5.5' RCB	1136	2220	CSWAA-1	ALLGOW3	6.98	5.28
0225	E	2: 7' X 5.5' RCB Outlet	360	2149	SUM5DB	ALLGOW3	6.74	3.40
APBE		**ANGEL PARK - BELTWAY BRANCH**						
0013	E	3: 12' X 8' RCB	489	4060	CSWFH-9	ALLGOW3	2.65	6.50
0022	E	Conc Chnl 20'W 7'D 2:1 SS	1556	4060	CSWFH-9	ALLGOW3	2.65	1.81
0051	E	Conc Chnl 20'W 7'D 2:1 SS	1583	4060	CSWFH-9	ALLGOW3	2.65	2.77
0081	E	8' X 8' RCBC @ Far Hills	777	423	SWFH-9	ALLGOW3	0.17	2.32
0094	E	Conc Chnl 10'W 5'D 2:1 SS	1465	423	SWFH-9	ALLGOW3	0.17	1.88
0122	E	Conc Chnl 10'W 4'D 2:1 SS	1409	423	SWFH-9	ALLGOW3	0.17	0.80
APCH		**ANGEL PARK - CARRIAGE HILL BRANCH**						
0000	E	8' X 6' RCB	152	585	SWFH-8	ALLGOW3	0.29	0.87
0003	P0	8' X 7' RCB	1461	585	SWFH-8	ALLGOW3	0.29	2.39
0031	P0	8' X 5' RCB	896	585	SWFH-8	ALLGOW3	0.29	0.60
APD2		**ANGEL PARK - DESERT FOOTHILLS 2 BRANCH**						
0002	P0	7' X 7' RCB	964	948	SWAA-2	ALLGOW3	0.70	2.00
APD5		**ANGEL PARK - DESERT FOOTHILLS 5 BRANCH**						
0000	P0	8' X 6' RCB	685	1701	CSWFH-2	ALLGOW3	1.09	1.89
0013	P0	72" RCP	1436	1701	CSWFH-2	ALLGOW3	1.09	4.18
APD6		**ANGEL PARK - DESERT FOOTHILLS 6 BRANCH**						
0000	P0	6' X 6' RCB	2604	1076	CSWFH-6	ALLGOW3	0.56	6.15
APDF		**ANGEL PARK - DESERT FOOTHILLS BRANCH**						
0000	P0	12' X 10' RCB	1356	2897	CSWFH-7	ALLGOW3	1.81	2.20
0026	P0	12' X 10' RCB	2463	1962	CSWFH-3	ALLGOW3	1.25	1.62
0073	P0	10' X 8' RCB	2679	1962	CSWFH-3	ALLGOW3	1.25	4.10
0123	P0	6' X 5' RCB	5355	1701	CSWFH-2	ALLGOW3	1.09	6.53
APF2		**ANGEL PARK - FAR HILLS 2 BRANCH**						
0000	P0	8' X 6' RCB	1046	669	CSWFH-5	ALLGOW3	0.38	1.00
APFH		**ANGEL PARK - FAR HILLS BRANCH**						
0000	E	2: 8' X 8' RCB	995	3862	CSWFH-8	ALLGOW3	2.48	3.50
0019	E	2: 8' X 8' RCB	250	3392	CCSWFH-7	ALLGOW3	2.18	4.19
0024	E	16' X 8' RCAP	1943	3392	CCSWFH-7	ALLGOW3	2.18	5.10
0061	P0	8' X 6' RCB	1492	669	CSWFH-5	ALLGOW3	0.38	2.00
0089	P0	8' X 6' RCB	2902	669	CSWFH-5	ALLGOW3	0.38	2.00
0144	P0	7' X 6' RCB	1556	669	CSWFH-5	ALLGOW3	0.38	5.50
APM5		**ANGEL PARK - MIDDLE 5 BRANCH**						
0000	E	384 ac-ft Detention Basin #5		7001	SUM5IN	ALLGOW3	6.74	
0001	E	12,153 cfs PMF Spillway		12153	SUM5IN	ALLGOW3	6.74	
0008	P0	Conc Chnl 50'W 4.5'D 2:1 SS	2102	3725	CDB54-6R	ALLGOW3	4.30	5.20
0009	P0	Conc Chnl 50'W 4.5'D 2:1 SS	4180	3624	CDB55-8	ALLGOW3	2.45	5.80
0047	E	Diversion Berm with Gabion Bank Protection	1000	3725	CDB54-6R	ALLGOW3	4.30	1.30
0056	P0	Conc Chnl 80'W 4'D 2:1 SS	264	3725	CDB54-6R	ALLGOW3	4.30	1.30
0057	P0	Conc Chnl 50'W 3'D 2:1 SS	9922	1821	CDB54-4	ALLGOW3	1.01	6.80
0059	P0	Conc Chnl 100'W 3'D 2:1 SS	8923	2358	CDB54-5	ALLGOW3	2.45	7.00
0212	P0	Conc Chnl 30'W 3.5'D 2:1 SS	6695	1238	CDB55-2	ALLGOW3	0.74	7.50
0213	P0	Conc Chnl 50'W 2.5'D 2:1 SS	6522	1125	CDB55-5	ALLGOW3	0.62	7.30
APSP		**ANGEL PARK - SUMMERLIN PARKWAY**						
0135	E	Conc Chnl 10'W 6'D 2:1 SS	2030	1173	C8B-1	ALLGOW3	1.14	2.40
0177	E	9' X 8' RCBC @ Anasazi	330	867	C11B-1	ALLGOW3	0.84	1.70
0183	E	Conc Chnl 10'W 6'D 2:1 SS	1680	867	C11B-1	ALLGOW3	0.84	1.70
GO02		**GOWAN SOUTH FACILITIES (CHEYENNE CHANNEL)**						
0257	E	Conc Chnl 10'W 6.75'D 1.5:1 SS	4293	2577	CCJ-C	ALLGOW3	2.97	4.10
GOB2		**GOWAN LONE MOUNTAIN SYST. 2 BELTWAY**						
0000	P0	36" RCP Outlet	118	75	DET22	ALLGOW3	0.76	6.76
0001	P0	123 ac-ft Village 22 Detention Basin		1344	CSV22-DB	ALLGOW3	0.76	
0020	P0	8' X 7' RCB	657	1247	SV22-2	ALLGOW3	0.70	8.30
0033	P0	8' X 6' RCB	3359	1247	SV22-2	ALLGOW3	0.70	6.90
0096	P0	6' X 5' RCB	1332	1247	SV22-2	ALLGOW3	0.70	6.00

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
GOB3		**GOWAN LONE MOUNTAIN SYST. 3 BELTWAY**						
0000	P0	66" RCP	1877	530	SV22-3	ALLGOW3	0.28	6.60
0035	P0	54" RCP	965	530	SV22-3	ALLGOW3	0.28	6.40
GOBE		**GOWAN LONE MOUNTAIN SYST. BELTWAY**						
0000	E	20' X 10' RCBC @ Access Rd	30	958	CSV22-3	GW3SC	0.28	5.67
0001	E	Conc Chnl 20'W 5'D 2:1 SS	3355	958	CSV22-3	GW3SC	0.28	6.50
0065	E	Conc Chnl 20'W 6'D 2:1 SS	1220	958	CSV22-3	GW3SC	0.28	1.90
0088	E	2: 10'X9' RCBC @ Lake Mead	400	471	CDET22	ALLGOW3	0.96	0.50
0096	E	Conc Chnl 20'W 9'D 2:1 SS	627	471	CDET22	ALLGOW3	0.96	0.50
0108	E	Conc Chnl 20'W 6'D 2:1 SS	1021	471	CDET22	ALLGOW3	0.96	0.50
0127	E	Conc Chnl 20'W 6'D 2:1 SS	638	442	SV22-1	ALLGOW3	0.20	0.50
0139	E	Conc Chnl 10'W 5.5'D 2:1 SS	1500	442	SV22-1	ALLGOW3	0.20	1.02
GOL3		**GOWAN LONE MOUNTAIN SYSTEM-BRANCH 3**						
0010	E	Conc Chnl 20'W 10'D 0:1 SS	3037	2946	CRCLMT1R	GW3SC	2.61	2.78
0068	E	Transition Structure	100	2946	CRCLMT1R	GW3SC	2.61	3.50
0070	E	20' X 6' RCBC @ Cliff Shadows	350	1162	CRCSV223	ALLGOW3	5.68	2.44
0077	E	Conc Chnl 20'W 6'D 0:1 SS	1229	1162	CRCSV223	ALLGOW3	5.68	6.11
0100	E	Conc Chnl 20'W 10'D 0:1 SS	200	1162	CRCSV223	ALLGOW3	5.68	5.67
0115	E	66" RCP Outlet	670	679	DET26	ALLGOW3	4.43	
0128	E	333 ac-ft Village 26 Detention Basin		3767	VIL26IN	ALLGOW3	4.43	
0137	P0	14' X 14' RCB	4335	3767	VIL26IN	ALLGOW3	4.43	0.50
0216	P0	Conc Chnl 50'W 4.5'D 2:1 SS	3761	3693	CSV26-1	ALLGOW3	4.15	6.08
0289	P0	Conc Chnl 50'W 3.5'D 2:1 SS	6215	2396	30	ALLGOW3	2.51	7.95
0290	E	Natural Wash 363'W	4850	1465	SV26-1	ALLGOW3	1.64	22.50
0370	E	Natural Wash 450'W	7000	2396	30	ALLGOW3	2.51	8.50
GOL4		**GOWAN LONE MOUNTAIN SYSTEM-BRANCH 4**						
0000	E	14' X 8' RCB	554	2257	CLMT1R	ALLGOW3	2.33	2.50
0010	E	2: 9' X 8' RCB	820	2257	CLMT1R	ALLGOW3	2.33	4.74
0025	E	Soil Cement Chnl 60'W 8'D 3-4:1 SS	320	2257	CLMT1R	ALLGOW3	2.33	2.00
0026	E	Soil Cement Chnl 42'W 6'D 3-4:1 SS	700	2257	CLMT1R	ALLGOW3	2.33	1.00

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

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

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

REGIONAL FLOOD CONTROL DISTRICT

2013 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

FACILITY INVENTORY FIGURE F - 24

LEGEND

ID (Facility Identifier) AABB
- Parent Stream Name
- Stream Name

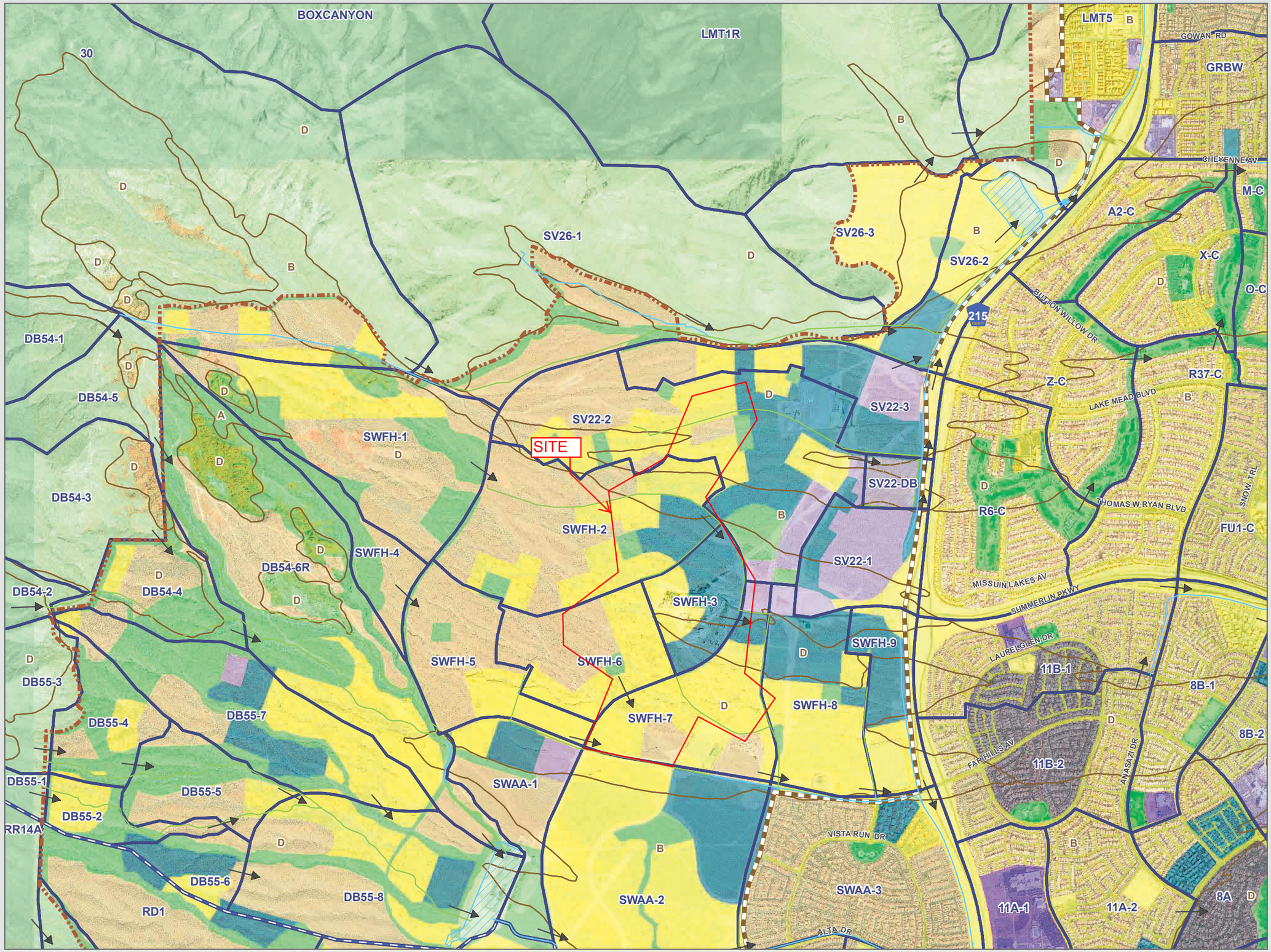
River Mile 0000
- Distance Above Confluence with Parent Stream (Miles)
- Miles in Hundredths

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

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

Construction Features

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



REGIONAL FLOOD CONTROL DISTRICT

2008
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE H- 24
HYDROLOGIC SUMMARY

LEGEND

- Ultimate Development Boundary
- Watershed Boundary
- Subbasin Boundary
- Drought Ordinance Boundary
- Flow Arrows

Flood Control Facilities

- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Category A Remove & Replace/ Parallel Facilities
- Category B Remove & Replace/ Parallel Facilities

Type Hydrologic Soil Groups

- A Low Runoff Potential
- B Moderately Low Runoff Potential
- C Moderately High Runoff Potential
- D High Runoff Potential/Rock Outcrops

Typical Land Use

1		Undeveloped Land, Open Desert
2		Parks, Golf Courses
3		Rural
4 / 14*		Low Density Residential
5 / 15*		Medium Density Residential
6 / 16*		High Density Residential
7 / 17*		Public Facility, Residential
8 / 18*		Very High Density Residential
9 / 19*		Commerical, Retail, Casino, High Rise Condominiums
10 / 20*		Light Industrial
11 / 21*		Heavy Industrial
12 / 22*		Schools
13		Lakes

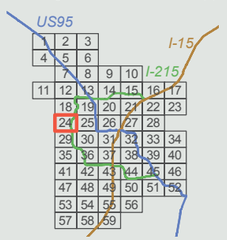
* Drought Ordinance Applied

N

0 500 1,000 2,000 3,000
Feet

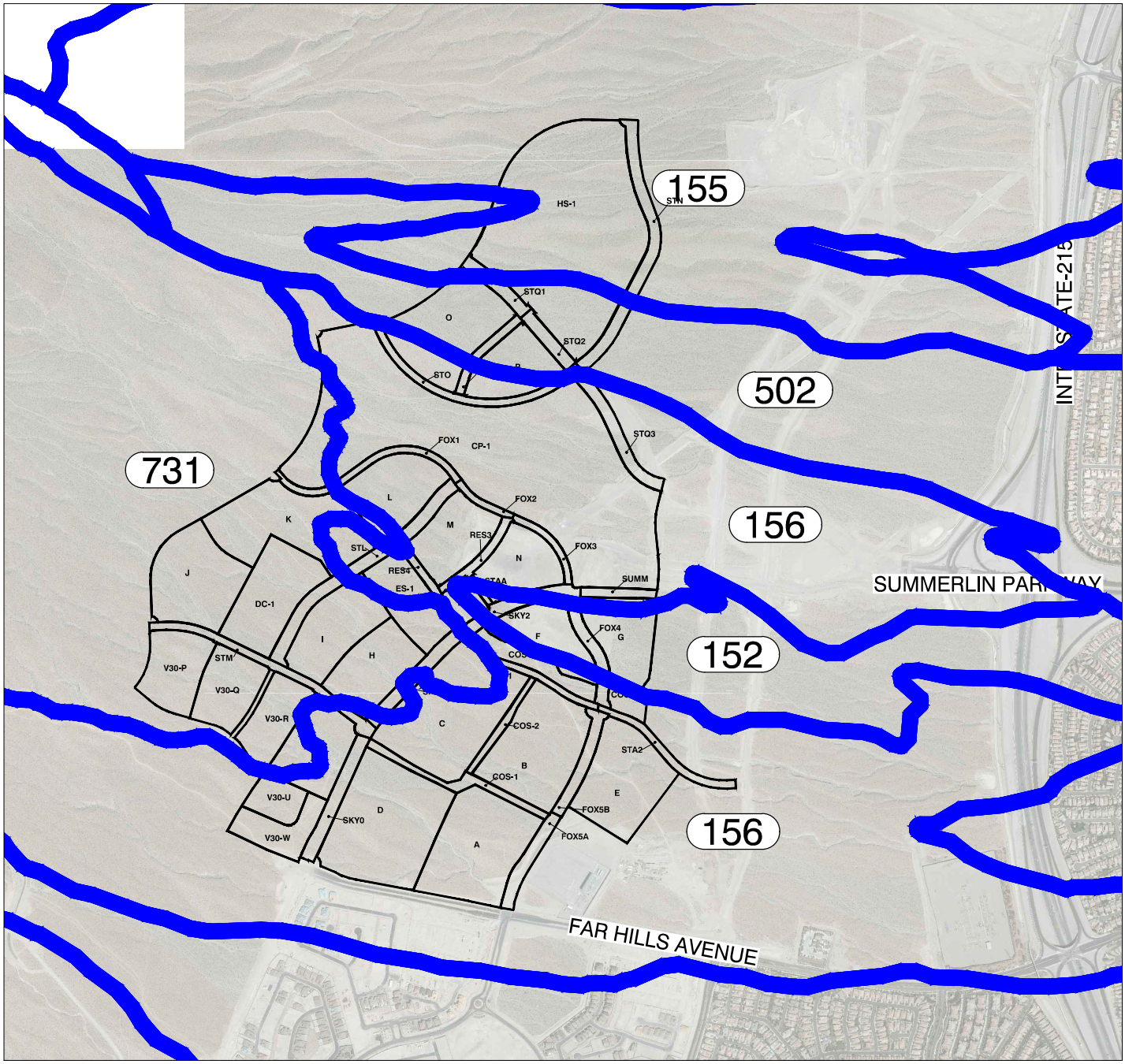
Scale: 1 inch = 2,000 feet

Refer to Figure G-2 for Aerial Source(s)



PBS&J PB

FIGURE 4B - MPU HYDROLOGIC SUMMARY



LEGEND

SITE BOUNDARY

300 SOIL NUMBER

SOIL BOUNDARY

NOTE:
1. This data was taken from the following website: http://soildatamart.nrcs.usda.gov
2. This data is in state plane coordinates

NORTH

GRAPHIC SCALE

1500 0 750 1500 3000

1" = 1500'

H:\7919\Drainage\1_TDS\A Figures\Figure 5 - Soils Map.dwg

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NV 89146-5148

FIGURE 5A
SOILS MAP

SUMMERLIN WEST
VILLAGE 25

SCALE	HORZ. 1"=1500'
	VERT. n/a
W.O. NO.	7919
DRAWN BY:	AH
DATE:	JUNE 2018
SHEET	OF

SOIL INFORMATION

Las Vegas Valley Area, Nevada, Part of Clark County

152—Cave gravelly fine sandy loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: hr9v
Elevation: 2,000 to 4,800 feet
Mean annual precipitation: 4 to 12 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 280 days
Farmland classification: Not prime farmland

Map Unit Composition

Cave and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cave

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 12 inches: gravelly fine sandy loam
H2 - 12 to 36 inches: indurated
H3 - 36 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: 4 to 20 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Other vegetative classification: LIMY 3-5" P.Z. (030XB019NV_3)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 12, Sep 15, 2017

Las Vegas Valley Area, Nevada, Part of Clark County

155—Cave gravelly fine sandy loam, 4 to 15 percent slopes

Map Unit Setting

National map unit symbol: hr9w
Elevation: 2,000 to 4,800 feet
Mean annual precipitation: 4 to 12 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 280 days
Farmland classification: Not prime farmland

Map Unit Composition

Cave and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cave

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 15 inches: gravelly fine sandy loam
H2 - 15 to 60 inches: indurated

Properties and qualities

Slope: 4 to 15 percent
Depth to restrictive feature: 4 to 20 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Other vegetative classification: LIMY 3-5" P.Z. (030XB019NV_3)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 12, Sep 15, 2017

Las Vegas Valley Area, Nevada, Part of Clark County

156—Vace-Wechech association

Map Unit Setting

National map unit symbol: 1tf5w
Elevation: 2,720 to 4,030 feet
Mean annual precipitation: 5 to 7 inches
Mean annual air temperature: 57 to 69 degrees F
Frost-free period: 180 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Vace and similar soils: 45 percent
Wechech and similar soils: 25 percent
Wechech, steep, and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vace

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Calcareous loess and mixed alluvium

Typical profile

H1 - 0 to 2 inches: gravelly fine sandy loam
H2 - 2 to 8 inches: loam
H3 - 8 to 60 inches: cemented material

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 4 to 14 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D
Ecological site: Desert Fans 4-6 P.Z. (R030XB005NV)
Other vegetative classification: Limy 5-7 p.z. (030XB005NV_3)
Hydric soil rating: No

Description of Wechech

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from limestone and dolomite

Typical profile

H1 - 0 to 2 inches: very gravelly sandy loam
- 2 to 7 inches: very gravelly sandy loam
H2 - 7 to 13 inches: very gravelly sandy loam
H3 - 13 to 60 inches: cemented material

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 8 to 14 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 50 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Desert Fans 4-6 P.Z. (R030XB005NV)
Hydric soil rating: No

Description of Wechech, Steep

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from limestone and dolomite

Typical profile

H1 - 0 to 2 inches: very gravelly sandy loam

- 2 to 7 inches: very gravelly sandy loam
H2 - 7 to 13 inches: very gravelly sandy loam
H3 - 13 to 60 inches: cemented material

Properties and qualities

Slope: 8 to 30 percent
Depth to restrictive feature: 8 to 14 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 50 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: LIMY HILL 5-7 P.Z. (R030XB001NV)
Hydric soil rating: No

Minor Components

Weiser

Percent of map unit: 8 percent
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: GRAVELLY FAN 5-7 P.Z. (R030XB075NV)
Other vegetative classification: Gravelly Fan 5-7 p.z. (030XB075NV_1)
Hydric soil rating: No

Irongold

Percent of map unit: 4 percent
Landform: Fan remnants
Landform position (two-dimensional): Shoulder
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: SHALLOW GRAVELLY LOAM 5-7 P.Z. cool thermic fan portions corr cool hills to R030XB029NV (R030XB029NV)
Other vegetative classification: Shallow Gravelly Loam 5-7 p.z. (030XB029NV_2)
Hydric soil rating: No

Commski

Percent of map unit: 2 percent

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: CALCAREOUS LOAM 5-7 P.Z. (R030XA066NV)
Other vegetative classification: Calcareous Loam 5-7 p.z. (030XA066NV_1)
Hydric soil rating: No

Threelakes

Percent of map unit: 1 percent
Landform: Drainageways
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: VALLEY WASH (R030XB028NV)
Hydric soil rating: No

Data Source Information

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 12, Sep 15, 2017

Las Vegas Valley Area, Nevada, Part of Clark County

502—Canutio-Cave gravelly fine sandy loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: hrcf
Elevation: 1,700 to 4,800 feet
Mean annual precipitation: 4 to 12 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Canutio and similar soils: 55 percent
Cave and similar soils: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canutio

Setting

Landform: Inset fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 9 inches: gravelly fine sandy loam
H2 - 9 to 60 inches: stratified extremely gravelly loamy coarse sand to gravelly loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: A

Other vegetative classification: LIMY 3-5" P.Z. (030XB019NV_3)
Hydric soil rating: No

Description of Cave

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 16 inches: gravelly fine sandy loam
H2 - 16 to 30 inches: indurated
H3 - 30 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 4 to 20 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: Very low (about 1.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Other vegetative classification: LIMY 3-5" P.Z. (030XB019NV_3)
Hydric soil rating: No

Minor Components

Arizo

Percent of map unit: 5 percent
Landform: Channels
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: VALLEY WASH (R030XB028NV)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 12, Sep 15, 2017

Las Vegas Valley Area, Nevada, Part of Clark County

731—Purob-Irongold association

Map Unit Setting

National map unit symbol: 1tf74
Elevation: 3,410 to 6,660 feet
Mean annual precipitation: 5 to 10 inches
Mean annual air temperature: 51 to 63 degrees F
Frost-free period: 130 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Purob and similar soils: 60 percent
Irongold and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Purob

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from limestone

Typical profile

H1 - 0 to 3 inches: extremely gravelly loam
H2 - 3 to 8 inches: very gravelly loam
H3 - 8 to 19 inches: very gravelly loam
H4 - 19 to 60 inches: cemented material

Properties and qualities

Slope: 2 to 8 percent
Percent of area covered with surface fragments: 1.0 percent
Depth to restrictive feature: 14 to 20 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 80 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Very low (about 1.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: SHALLOW GRAVELLY LOAM 7-9 P.Z. Mountain portions correlated t (R030XC007NV)
Hydric soil rating: No

Description of Irongold

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: And/or alluvium derived from limestone

Typical profile

H1 - 0 to 1 inches: extremely gravelly loam
H2 - 1 to 7 inches: gravelly loam
H3 - 7 to 11 inches: very gravelly loam
H4 - 11 to 34 inches: cemented material
H5 - 34 to 60 inches: extremely gravelly loamy coarse sand

Properties and qualities

Slope: 2 to 8 percent
Percent of area covered with surface fragments: 1.0 percent
Depth to restrictive feature: 10 to 14 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 70 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: SHALLOW GRAVELLY LOAM 5-7 P.Z. cool thermic fan portions corr cool hills to R030XB029NV (R030XB029NV)
Hydric soil rating: No

Minor Components

Typic torriorthents

Percent of map unit: 5 percent
Landform: Inset fans
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: SHALLOW GRAVELLY LOAM 7-9 P.Z. Mountain portions correlated t (R030XC007NV)
Hydric soil rating: No

Purob

Percent of map unit: 3 percent
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: SHALLOW GRAVELLY LOAM 7-9 P.Z. Mountain portions correlated t (R030XC007NV)
Hydric soil rating: No

Arizo

Percent of map unit: 3 percent
Landform: Drainageways
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: UPLAND WASH (R030XB051NV)
Hydric soil rating: No

Typic haplocalcids

Percent of map unit: 2 percent
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: SHALLOW LIMESTONE SLOPE 5-7 P.Z. (R030XA006NV)
Hydric soil rating: No

Aridic calcixerolls

Percent of map unit: 1 percent
Landform: Inset fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: GRAVELLY INSET FAN 7-9 P.Z. (R030XC011NV)
Hydric soil rating: No

Xeric haplocambids

Percent of map unit: 1 percent
Landform: Inset fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: GRAVELLY CALCAREOUS INSET FAN 9-11 P.Z. (R030XC012NV)
Hydric soil rating: No

Data Source Information

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 12, Sep 15, 2017

RUNOFF CURVE NUMBERS
(URBAN AREAS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved: curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved: open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					

See Table 602A

Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system. Impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using Figure 603.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using Figure 603 based on the impervious area percentage (CN #98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using Figure 603 based on the degree of development impervious area percentage) and the CN's for the newly graded pervious areas.

Revision	Date

RUNOFF CURVE NUMBERS - RESIDENTIAL DISTRICTS

Average Lot Size or Usage[1]	Percent Impervious[2]	Curve Number for Hydrologic Soil Groups			
		A	B	C	D
Apartments/Condos	72	81	88	91	93
Townhouses/6,000 sq ft lots or less[3]	69	80	87	90	92
7,000 sq ft lots	63	76	84	89	91
8,000 sq ft lots	58	73	82	88	90
10,000 sq ft lots	38	61	75	83	87
14,000 sq ft lots	30	57	72	81	86
20,000 sq ft lots	25	54	70	80	85
40,000 sq ft lots	20	51	68	79	84
80,000 sq ft lots	12	46	65	77	82

1 Lot size should represent the size of the average lot and not the gross acreage divided by the number of lots.

2 Actual percent impervious value should be compared to selected land use type.

3 In cases where average residential lots are smaller than 6,000 sq ft, commercial/business/industrial land use should be used.

Revision	Date

REFERENCE:

TABLE 602A

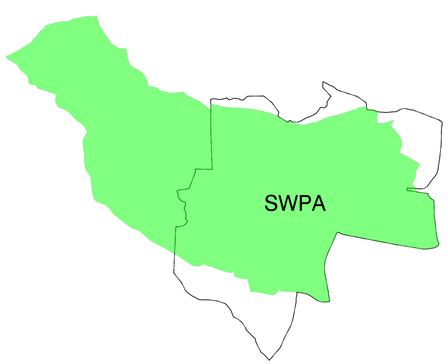
HEC-1 SUMMARY TABLE
DB5/ALTA TRIBUTARY
ULTIMATE CONDITION

Basin / Concentration Point	Area (Acre)			Q_{100} (cfs)			SDN	Basin / Concentration Point	Area (Acre)			Q_{100} (cfs)			SDN
	Update	Previous	Difference	Update	Previous	Difference			Update	Previous	Difference	Update	Previous	Difference	
3-1	1422.67	1422.67	0	2117	2117	0	SDN3	3-G2	119.24	82.23	37.01	432	286	146	SDN3
3-2	144.58	144.58	0	429	429	0	SDN3	3-L2	57.71	59.53	-1.82	186	178	8	SDN3
CP3.1	-	-	-	2172	2172	0	SDN3	CP3.8	-	-	-	602	896	-294	SDN3
3-D	213.04	213.07	-0.03	614	488	126	SDN3	3-A	616.53	233.21	383.32	1255	458	797	SDN3
CP3.3	-	-	-	2332	2319	13	SDN3	3-B	100.29	446.26	-345.97	332	853	-521	SDN3
3-3	111.16	111.16	0	392	392	0	SDN3	3-C	141.55	184.83	-43.28	389	363	26	SDN3
3-4	221.26	221.26	0	757	757	0	SDN3	CPDBA-B	858.37	864.3	-5.93	1785	1561	224	SDN3
3-5	187.91	187.91	0	625	625	0	SDN3	GPDB	858.37	864.3	-5.93	184	142	42	SDN3
CP3.2	520.33	520.33	0	1666	1666	0	SDN3	3-G1	117.56	110.4	7.16	407	476	-69	SDN3
3-E	362.34	348.31	14.03	855	792	63	SDN3	CP3-G1	-	-	-	529	529	0	SDN3
3-F	138.17	180.16	-41.99	476	472	4	SDN3	3-Q2	95.51	95.5	0.01	204	341	-137	SDN3
CP3.4	-	-	-	4139	3596	543	SDN3	CP3-Q2	-	-	-	713	796	-83	SDN3
3-6	56.74	56.74	0	203	203	0	SDN3	3-H1	77.17	80.61	-3.44	257	295	-38	SDN3
3-7	109.69	109.69	0	423	423	0	SDN3	CP3-H1	-	-	-	958	1053	-95	SDN3
3-J	157.02	97.87	59.15	414	200	214	SDN3	3-I1	192.91	187.75	5.16	538	501	37	SDN3
CP3.5	-	-	-	872	689	183	SDN3	CP3.9	-	-	-	1950	2269	-319	SDN3
3-8	408.73	408.73	0	1113	1113	0	SDN3	3-H2	64.21	64.21	0	197	209	-12	SDN3
3-K	537.27	568.98	-31.71	1378	1226	152	SDN3	3-I2	74.15	75.83	-1.68	211	201	10	SDN3
CP3.6	-	-	-	3168	2804	364	SDN3	CP3.10A	-	-	-	398	406	-8	SDN3
3-N	290.9	290.04	0.86	747	681	66	SDN3	CP3.10	-	-	-	2301	2626	-325	SDN3
3-M	149.46	123.16	26.3	485	362	123	SDN3	3-O	51.51	55.79	-4.28	187	182	5	SDN3
CPDB5	-	-	-	7787	6857	930	SDN3	3-P2	0	55.73	-55.73	0	155	-155	SDN3
DB5	4510.94	4484.33	26.61	2148	2137	11	SDN3	3-P1	119.43	85.52	33.91	419	283	136	SDN3
3-L	150.92	152.22	-1.3	486	396	90	SDN3	CP3-P	-	-	-	596	612	-16	SDN3
CP3-L	-	-	-	2221	2206	15	SDN3	3-Q	65.66	65.66	0	202	197	5	SDN3
RCSWAA-1	4661.86	4636.55	25.31	2220	2205	15	SDN3	CP3-Q	-	-	-	779	804	-25	SDN3
SWAA-2	448	449	-1	948	948	0	SDN3	3-H3	89.8	89.8	0	252	256	-4	SDN3
CSWAA-2	5109.86	5085.55	24.31	2884	2838	46	SDN3	CP3.11	-	-	-	3191	3515	-324	SDN3
SWAA-3	371.2	372.2	-1	668	668	0	SDN3	ANGLPKIN	14553.6	14451.2	102.4	8949	8875	74	SDN5
CSWAA-3	5481.06	5457.75	23.31	3121	3074	47	SDN4	ANGLPKDB	14553.6	14451.2	102.4	877	405	472	SDN5

LEGEND

- CONCENTRATION POINT
- BASIN BOUNDARY
- LOT BOUNDARY
- 3-A ONSITE BASIN ID
- 3-3 OFFSITE BASIN ID
- LM3 LOT ID
- FLOW ARROW

KEY MAP



EX 12X8' RCAP (RFCD FACILITY APFH 0024)
EX (2) 6'X8' RCB (RFCD FACILITY APFH 0019)
EX 6'X8' RCB (RFCD FACILITY APCH 0000)
EX BELTWAY CHANNEL (RFCD FACILITY APBE 0051)
EX BELTWAY CHANNEL (RFCD FACILITY ES 0122, 0094)
EX DB5 DETENTION BASIN

GRAPHIC SCALE
1000 0 500 1000 2000
1" = 1000'

NORTH

THE HOWARD HUGHES CORPORATION
10801 WEST CHARLESTON BLVD. 3RD FLOOR
LAS VEGAS, NV 89135

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7500 FAX (702) 362-2597 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

REVISION	DATE	BY
ADDENDUM #1	10/17	JVA

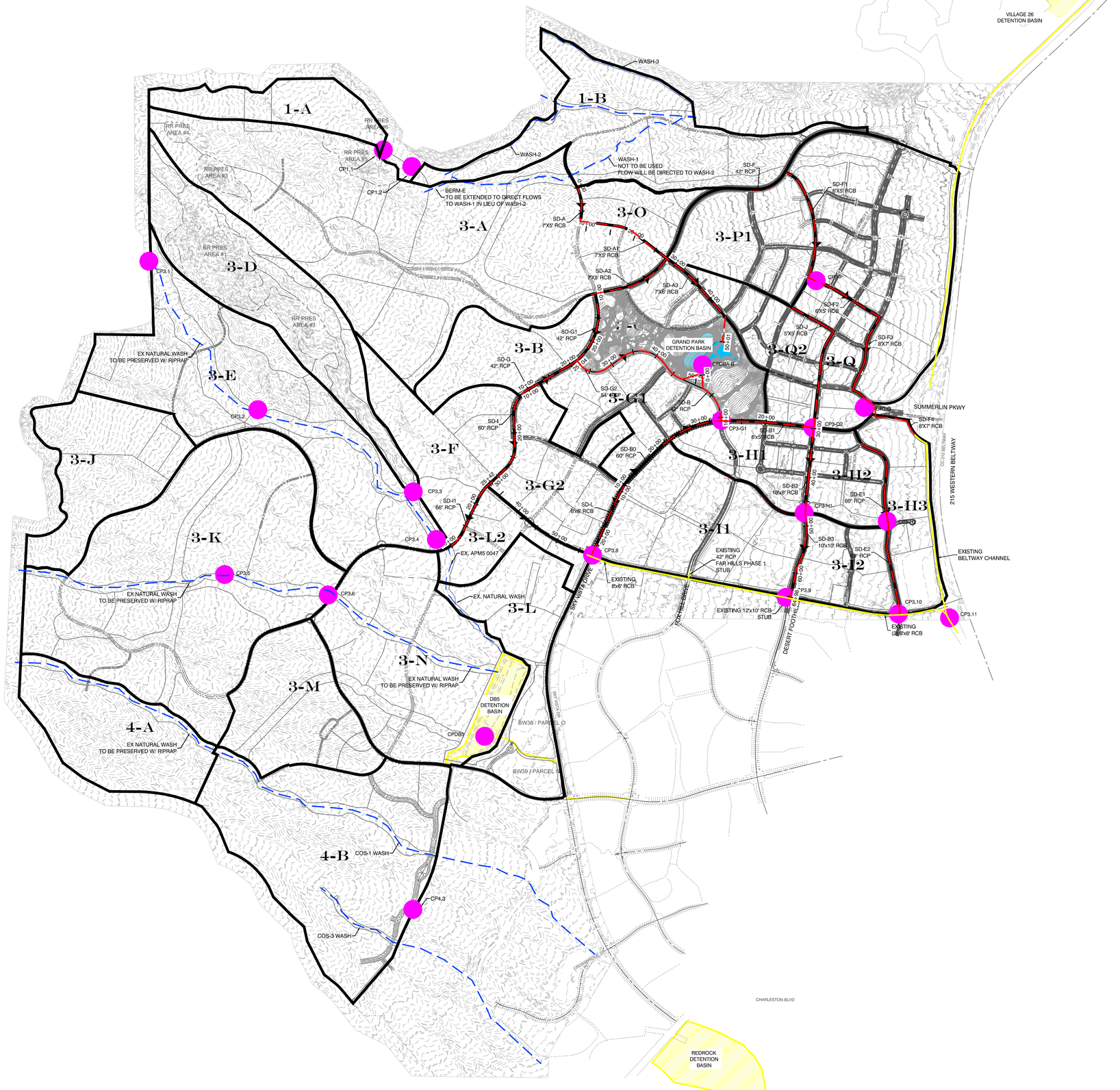
2018 UPDATE TO SUMMERLIN WEST PLANNING AREA

A.6.3
DB5/Alta Tributary

DRAWN BY: PLM
DESIGNED BY:
CHECKED BY:
PROJECT NO: 7809
SCALE: 1"=1000' HORIZ. VERT.
DATE: 11/2018

SHEET
A.6.3
OF SHEETS
DRAWING NO.

H:\7809\Drainage\7_UP1_ADD1\A Figures\A.6.3_DB5-Alta Tributary.dwg





GRAPHIC SCALE

1000 0 500 1000 2000

1" = 1000'

REGIONAL FLOOD CONTROL FACILITY SUMMARY TABLE

Designation	Q (cfs)	Basin/CP	Size	Type	Velocity	Remarks
SD-A	627.5	1/2 3-A	7'x5'	RCB	19.93	
SD-A1	627.5	1/2 3-A	7'x5'	RCB	29.18	
SD-A2	627.5	1/2 3-A	7'x5'	RCB	29.18	
SD-A3	1255	3-A	7'x6'	RCB	37.73	
SD-B	184	GPDB	42"	RCP	24.97	
SD-B0	407	3-G1	60"	RCP	29.34	
SD-B1	529	CP3-G1	6'x5'	RCB	27.31	
SD-B2	958	CP3-H1	10'x8'	RCB	23.88	Reference 2
SD-B3	1496	CP3-H1, 3-I1	10'x10'	RCB	23.97	Reference 1
SD-J	204	3-Q2	5'x5'	RCB	9.50	
SD-E1	197	3-H2	60"	RCP	16.31	Reference 4
SD-E2	408	3-H2, 3-I2	60"	RCP	22.47	Reference 3
SD-F	187	3-O	42"	RCP	26.25	
SD-F1	596	CP3-P	6'x5'	RCB	24.63	
SD-F2	779	CP3-Q	6'x5'	RCB	30.60	
SD-F3	779	CP3-Q	8'x7'	RCB	17.42	
SD-F4	779	CP3-Q	8'x7'	RCB	19.74	
SD-G	166	1/2 3-B	42"	RCP	23.36	
SD-G1	166	1/2 3-B	42"	RCP	20.45	
SD-G2	332	3-B	54"	RCP	27.13	
SD-I	238	1/2 3-F	60"	RCP	21.05	
SD-I1	238	1/2 3-F	66"	RCP	15.33	
SD-L	432	3-G2	7'x6'	RCB	11.54	

References:

1- TDS for Desert Foothills Drive (Far Hills to Street A)

2- TDS for Desert Foothills Drive (Redpoint to Summerlin Pkwy)

3- TDS for Carriage Hill Drive (Far Hills to Street A)

4- TDS for Carriage Hill Drive (Redpoint to Summerlin Pkwy)

LEGEND

- STORM DRAIN FACILITY ALIGNMENT
- EXISTING FACILITY ALIGNMENT
- EXISTING WASHES TO BE DESIGNATED AS CCRFCD MPU FACILITIES
- CONCENTRATION POINT
- BASIN BOUNDARY
- 3-A ONSITE BASIN
- 3-1 OFFSITE BASIN

REV	DATE	BY	REVISION

THE HOWARD HUGHES CORPORATION
1980 FESTIVAL PLAZA DRIVE, SUITE 300
LAS VEGAS, NEVADA 89135

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7550 FAX (702) 362-2597 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

2018 UPDATE TO SUMMERLIN WEST PLANNING AREA

A.6.5 REGIONAL FLOOD CONTROL FACILITIES MAP

DRAWN BY: JYA 11/2018

DESIGNED BY: JAN 201

CHECKED BY: WJ

PROJECT NO: 7809

SCALE: HORZ. VERT.

SHEET A.6.5 OF SHEETS

DRAWING NO.

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Addendum #1 to the Master Conceptual Drainage Study for

Summerlin West Village 25

Las Vegas, Nevada

W.O. # 7919-A

Prepared for:

Howard Hughes Company, LLC

Submitted to:

City of Las Vegas
Public Works

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Summerlin West Village 25 Date: April 4, 2019

Location of Development: a) Descriptive (Cross Streets) North/South: Sky Vista Drive

East/West: Far Hills Avenue

b) Section: 21 and 22 Township: 20S Range: 59E

c) APN : 137-22-101-001; 137-21-000-002

Name of Owner: The Howard Hughes Company, LLC

Telephone No.: (702) 791-4336 Fax No.: (702) 791-4453 E-Mail Address: chris.anderson@howardhughes.com

Address: 10801 W. Charleston Blvd. LV, NV, 89135

Contact Person-Name: Joanna Ayson **Telephone No.:** (702)-873-7550

* **E-Mail Address:** jayson@vtnnv.com **Fax No.:** (702)-362-2597

Firm: VTN Nevada

Address: 2727 S. Rainbow Blvd, LV, NV, 89146

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		

1. Total Owned Land Area: At Site: +/-548 Acres Being Developed/Disturbed: +/-548 Acres
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ **Yes**** ☒ **No**
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☒ **Yes**** ☐ **No**
4. Proposed type of development (Residential, Commercial, Etc.): Mixed-use master plan
5. Approximate upstream land area which drains to the subject site: +/- 819 acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: SWPA MPU (DS4926), TDS for Summerlin West Desert Foothills Drive (Far Hills to Street A) (DS5013
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: 10'X10' RCB storm drain in Desert Foothills Drive (CCRFCD Master Planned Facility)
8. Briefly describe your proposed schedule for the subject project: As soon as possible

PROFESSIONAL ENGINEER-STATE OF NEVADA
BRIAN TROY RUIZ
EXP: 12/31/19
CIVIL
No. 15967
4/4/19

Engineer's Seal

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

*New Required Field

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

Revision	Date

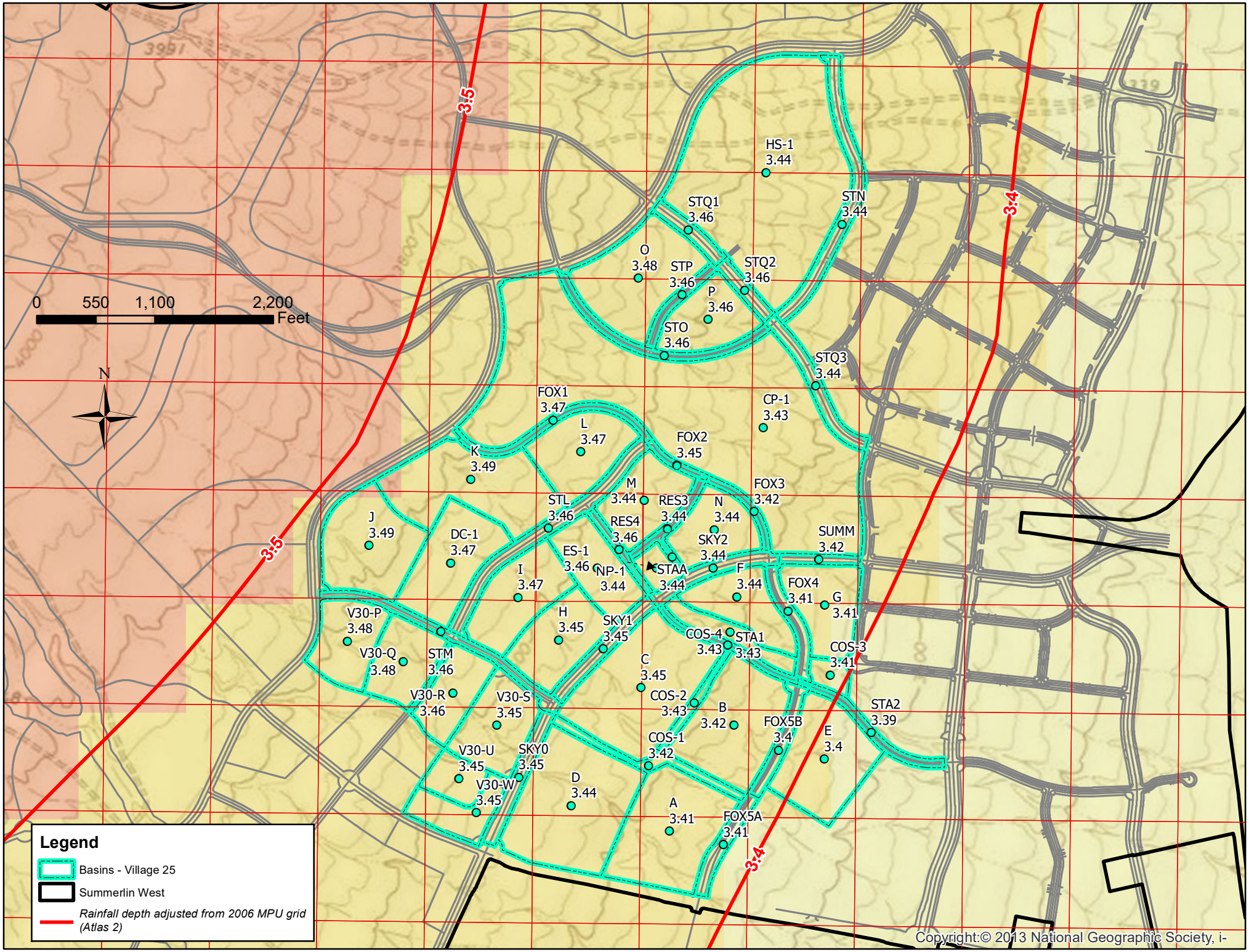
Local Entity File No.

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

RAINFALL CALCULATIONS



H:\7919\GIS\Rainfall\mxd\Village25-2006MPU-Precipitation.mxd Date: 2/20/2019

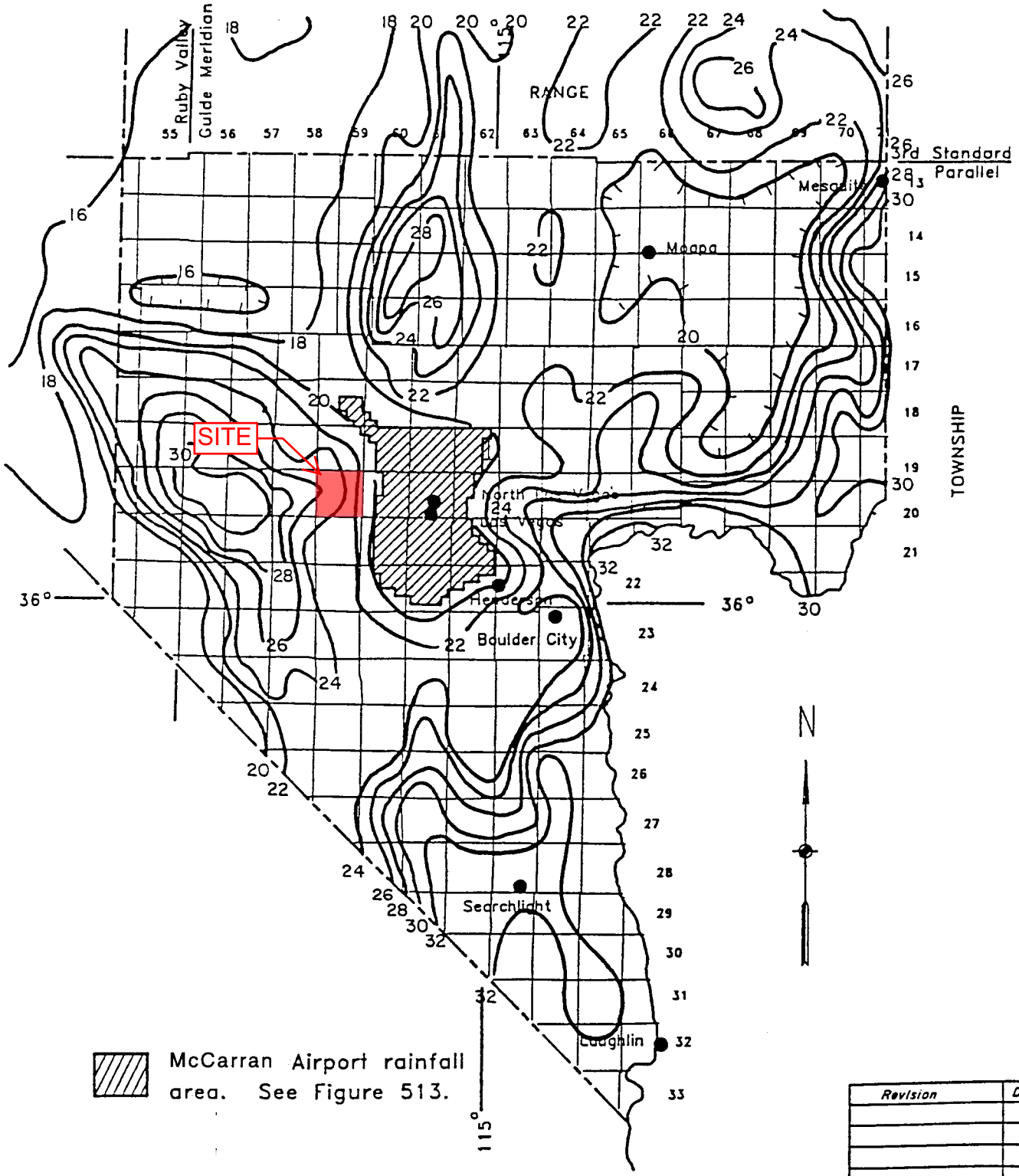
PRECIPITATION ADJUSTMENT RATIOS

Recurrence Interval	Ratio to NOAA Atlas 2
2-year	1.00
5-year	1.16
10-year	1.24
25-year	1.33
50-year	1.39
100-year	1.43

NOTE:
1. Multiply the values obtained from the NOAA Atlas 2 by the above ratios to obtain the adjusted precipitation values.
2. NOAA Atlas 2 values for use with TR-55 shall not be adjusted by the above ratios.
3. Tables 505 and 506 require no adjustments.

Revision	Date

RAINFALL DEPTH-DURATION-FREQUENCY
100-YEAR, 6-HOUR
(DEPTHS IN TENTHS OF INCHES)



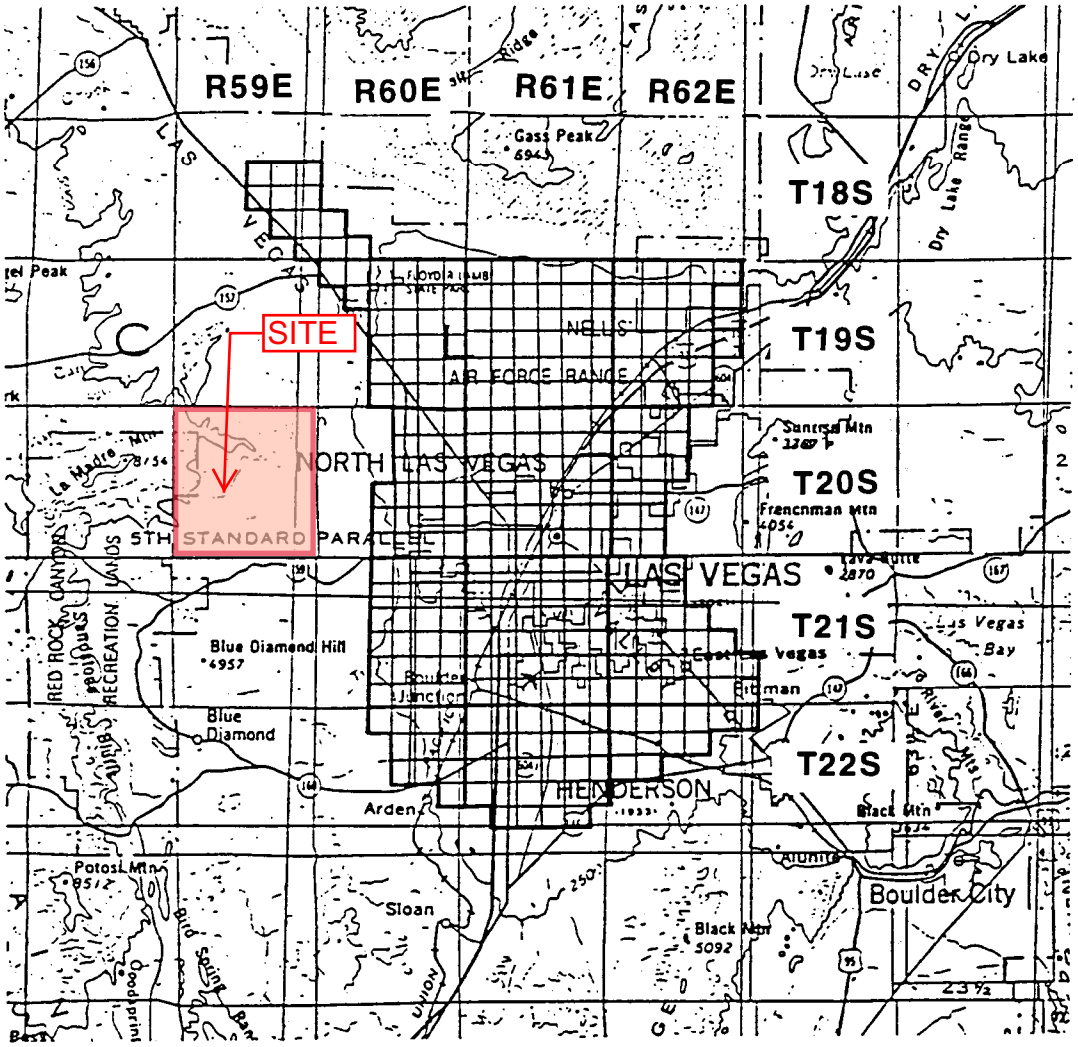
Revision	Date

WRC ENGINEERING

REFERENCE:
NOAA ATLAS 2, VOLUME VII NEVADA, 1973

FIGURE 506

McCARRAN AIRPORT RAINFALL AREA



TOWNSHIP	RANGE	SECTIONS	TOWNSHIP	RANGE	SECTIONS
18 South	59 East	13-15,22-26,36	20 South	62 East	4-9,16-20,29-32
18 South	60 East	30-32	21 South	60 East	1-4,9-16,21-28,33-36
19 South	60 East	1-6,8-16,21-28,33-36	21 South	61 East	ALL SECTIONS
19 South	61 East	ALL SECTIONS	21 South	62 East	4-9,15-23, 25-36
19 South	62 East	2-11,14-23,27-34	22 South	60 East	1-4,10-15,24
20 South	60 East	1-3,10-15,21-28,33-36	22 South	61 East	1-24,26-29
20 South	61 East	ALL SECTIONS	22 South	62 East	1-10,17-18

Notes:
1. Refer to Table 505 and Figure 516 Depth-Duration- Frequency values in the McCarran Airport Rainfall Area.
2. Refer to Table 506 and Figure 517 for Time-Intensity-Frequency values on the McCarran Airport Rainfall Area.

Revision	Date

WRC ENGINEERING

REFERENCE:
USACE, Los Angeles District, 1988

FIGURE 513

LAG TIME CALCULATIONS

STANDARD FORM 4

DEVELOPMENT: Summerlin West Village 25

W.O. # 7919 **CALCULATED BY:** JYA/ RBR

V1 applies to the first 500 feet of travel distance applies to the remaining travel distance		V2	
Existing:		**Developed**	
$V1 = 148 * S^{1/2}$	$V2 = 294 * S^{1/2}$	$V1 = 202 * S^{1/2}$	$V2 = 306 * S^{1/2}$

$$T_i = \frac{1.8(1.1-k)L^{1/2}}{S^{1/3}} \qquad T_t = \frac{L}{60V}$$

$$k = 0.0132C_n - 0.39 \qquad T_c = T_i + T_t$$

SUB-BASIN					INITIAL/OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK (URBANIZED BASINS)		FINAL Tc	LAG TIME	REMARKS
DESIG. (1)	Cn	K (2)	AREA Ac. (3)	AREA Mi^2	LENGTH Ft (4)	SLOPE % (5)	Ti Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	V1 fps (9a)	V2 fps (9b)	Tt Min. (10)	TOTAL LENGTH (11)	Tc Min. (12)	Min.	TLAG Hr.	
DEVELOPED CONDITION																	
A	95.0	0.864	21.35	0.0334	100	1.0	4.25	1409	3.6	3.8	5.8	4.81	1509	18.38	9.06	0.091	
B	95.0	0.864	19.86	0.0310	100	1.0	4.25	1311	3.6	3.8	5.8	4.51	1411	17.84	8.76	0.088	
C	95.0	0.864	26.54	0.0415	100	1.0	4.25	1465	2.7	3.3	5.1	5.68	1565	18.69	9.93	0.099	
COS-1	88.0	0.772	3.48	0.0054	100	1.0	5.91	1898	0.8	1.8	2.7	13.49	1998	21.10	19.40	0.194	
COS-2	88.0	0.772	1.72	0.0027	100	1.0	5.91	1036	1.0	2.1	3.1	6.94	1136	16.31	12.85	0.128	
COS-3	88.1	0.773	2.40	0.0038	100	1.0	5.89	390	7.9	5.7	8.6	1.14	490	12.72	7.03	0.070	
COS-4	88.0	0.772	5.04	0.0079	100	1.0	5.91	1205	7.2	5.4	8.2	2.96	1305	17.25	8.88	0.089	
CP-1	87.9	0.770	94.28	0.1473	100	1.0	5.93	2646	11.2	6.8	10.3	4.72	2746	25.26	10.65	0.107	
D	95.0	0.864	27.15	0.0424	100	1.0	4.25	1417	4.5	4.3	6.5	4.28	1517	18.43	8.53	0.085	
DC-1	92.0	0.824	15.02	0.0235	100	1.0	4.96	917	4.5	4.3	6.5	3.00	1017	15.65	7.96	0.080	
E	95.0	0.864	17.14	0.0268	100	1.0	4.25	1250	3.3	3.7	5.5	4.53	1350	17.50	8.78	0.088	
ES-1	95.0	0.864	10.20	0.0159	100	1.0	4.25	1032	7.5	5.5	8.4	2.57	1132	16.29	6.81	0.068	
F	95.0	0.864	10.44	0.0163	100	1.0	4.25	1030	8.1	5.7	8.7	2.47	1130	16.28	6.72	0.067	
G	93.0	0.838	11.44	0.0179	100	1.0	4.72	879	7.8	5.7	8.6	2.21	979	15.44	6.93	0.069	
H	95.0	0.864	12.11	0.0189	100	1.0	4.25	999	3.8	3.9	6.0	3.51	1099	16.11	7.76	0.078	
HS-1A	95.0	0.864	11.70	0.0183	100	1.0	4.25	1494	7.5	5.8	8.7	3.35	1594	18.86	7.60	0.076	
HS-1B	94.3	0.855	49.79	0.0778	100	1.0	4.41	1541	8.1	5.8	8.7	3.44	1641	19.12	7.85	0.078	
I	95.0	0.864	13.23	0.0207	100	1.0	4.25	1122	3.9	4.0	6.0	3.82	1222	16.79	8.07	0.081	
J	95.0	0.864	16.90	0.0264	100	1.0	4.25	1097	5.5	4.7	7.2	3.15	1197	16.65	7.40	0.074	
K	95.0	0.864	21.91	0.0342	100	1.0	4.25	1721	6.4	5.1	7.7	4.26	1821	20.12	8.51	0.085	
L	95.0	0.864	12.79	0.0200	100	1.0	4.25	846	6.7	5.2	7.9	2.33	946	15.25	6.58	0.066	
M	95.0	0.864	10.88	0.0170	100	1.0	4.25	743	9.5	6.2	9.4	1.77	843	14.69	6.01	0.060	
N	95.0	0.864	9.91	0.0155	100	1.0	4.25	877	5.2	4.6	7.0	2.72	977	15.43	6.97	0.070	
NP-1	88.4	0.776	2.70	0.0042	100	1.0	5.82	442	6.6	5.2	7.9	1.42	542	13.01	7.24	0.072	
O	81.3	0.683	19.18	0.0300	100	1.0	7.50	1301	6.6	5.2	7.8	3.31	1401	17.79	10.81	0.108	
P	93.2	0.840	10.31	0.0161	100	1.0	4.67	656	8.3	5.8	8.8	1.73	756	14.20	6.40	0.064	
FOX1	98.0	0.904	3.39	0.0053	26	2.0	1.44	2115	5.3	4.6	7.0	5.62	2141	21.90	7.06	0.071	

STANDARD FORM 4

DEVELOPMENT: Summerlin West Village 25

W.O. # 7919 **CALCULATED BY:** JYA/ RBR

V1 applies to the first 500 feet of travel distance applies to the remaining travel distance		V2
Existing:		**Developed**
$V1 = 148 * S^{1/2}$	$V2 = 294 * S^{1/2}$	$V1 = 202 * S^{1/2}$ $V2 = 306 * S^{1/2}$

$$T_i = \frac{1.8(1.1-k)L^{1/2}}{S^{1/3}} \qquad T_t = \frac{L}{60V}$$

$$k = 0.0132C_n - 0.39 \qquad T_c = T_i + T_t$$

SUB-BASIN					INITIAL/OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK (URBANIZED BASINS)		FINAL Tc	LAG TIME	REMARKS
DESIG. (1)	Cn	K (2)	AREA Ac. (3)	AREA Mi^2	LENGTH Ft (4)	SLOPE % (5)	Ti Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	V1 fps (9a)	V2 fps (9b)	Tt Min. (10)	TOTAL LENGTH (11)	Tc Min. (12)	Min.	TLAG Hr.	
FOX2	98.0	0.904	1.06	0.0017	27	2.0	1.45	641	6.7	5.2	7.9	1.89	667	13.71	3.35	0.033	Use Min TLAG = 0.050 per HCDDM
FOX3	98.0	0.904	1.51	0.0024	36	2.0	1.69	907	4.4	4.2	6.4	3.03	943	15.24	4.72	0.047	Use Min TLAG = 0.050 per HCDDM
FOX4	98.0	0.904	3.20	0.0050	60	2.0	2.17	1230	4.1	4.1	6.2	4.02	1290	17.17	6.19	0.062	
FOX5A	98.0	0.904	3.15	0.0049	60	2.0	2.17	1182	0.5	1.4	2.2	11.09	1242	16.90	13.26	0.133	
FOX5B	98.0	0.904	3.19	0.0050	60	2.0	2.17	1004	0.7	1.7	2.6	8.22	1064	15.91	10.39	0.104	
RES3	98.0	0.904	1.97	0.0031	44	2.0	1.87	978	4.5	4.3	6.5	3.19	1022	15.68	5.05	0.051	Use Min TLAG = 0.050 per HCDDM
RES4	98.0	0.904	1.60	0.0025	33	2.0	1.62	909	6.0	5.0	7.5	2.59	942	15.23	4.20	0.042	
SKY0	98.0	0.904	4.15	0.0065	60	2.0	2.17	1325	0.5	1.4	2.1	12.81	1385	17.69	14.98	0.150	
SKY1	98.0	0.904	3.91	0.0061	61	2.0	2.18	1241	1.7	2.6	4.0	6.32	1301	17.23	8.50	0.085	
SKY2	98.0	0.904	3.78	0.0059	65	2.0	2.27	1114	3.8	4.0	6.0	3.81	1179	16.55	6.07	0.061	Use Min TLAG = 0.050 per HCDDM
STAA	98.0	0.904	0.44	0.0007	32	2.0	1.59	314	5.2	4.6	7.0	1.13	347	11.93	2.73	0.027	
STA1	98.0	0.904	2.29	0.0036	32	2.0	1.59	1455	5.6	4.8	7.2	3.95	1487	18.26	5.54	0.055	
STA2	98.0	0.904	2.84	0.0044	35	2.0	1.67	1555	5.8	4.9	7.4	4.10	1590	18.84	5.77	0.058	
STL	98.0	0.904	7.86	0.0123	62	2.0	2.22	2588	1.7	2.6	4.0	11.88	2650	24.72	14.09	0.141	
STM	98.0	0.904	4.76	0.0074	38	2.0	1.74	2493	5.7	4.8	7.3	6.26	2531	24.06	7.99	0.080	
STN	98.0	0.904	7.67	0.0120	57	2.0	2.13	2716	1.4	2.4	3.6	13.83	2773	25.41	15.95	0.160	
STO	98.0	0.904	4.10	0.0064	36	2.0	1.67	2302	6.2	5.0	7.6	5.58	2338	22.99	7.26	0.073	
STP	98.0	0.904	2.05	0.0032	37	2.0	1.72	995	3.2	3.6	5.5	3.81	1033	15.74	5.52	0.055	Use Min TLAG = 0.050 per HCDDM
STQ1	98.0	0.904	2.49	0.0039	61	2.0	2.19	804	5.6	4.8	7.3	2.44	865	14.81	4.63	0.046	Use Min TLAG = 0.050 per HCDDM
STQ2	98.0	0.904	2.11	0.0033	65	2.0	2.27	691	5.2	4.6	7.0	2.26	757	14.20	4.53	0.045	
STQ3	98.0	0.904	4.22	0.0066	60	2.0	2.18	1530	5.9	4.9	7.4	4.02	1590	18.83	6.19	0.062	Use Min TLAG = 0.050 per HCDDM
SUMM	98.0	0.904	1.65	0.0026	41	1.0	2.26	753	5.8	4.9	7.4	2.28	793	14.41	4.54	0.045	
V30-P	92.0	0.824	10.30	0.0161	100	1.0	4.96	834	6.0	5.0	7.5	2.42	934	15.19	7.38	0.074	
V30-Q	92.0	0.824	9.60	0.0150	100	1.0	4.96	829	5.3	4.6	7.0	2.57	929	15.16	7.53	0.075	
V30-R	95.0	0.864	8.57	0.0134	100	1.0	4.25	876	4.0	4.1	6.1	3.07	976	15.42	7.32	0.073	
V30-S	95.0	0.864	12.02	0.0188	100	1.0	4.25	836	3.8	3.9	6.0	3.06	936	15.20	7.31	0.073	
V30-U	95.0	0.864	4.74	0.0074	100	1.0	4.25	472	6.1	5.0	7.6	1.57	572	13.18	5.82	0.058	
V30-W	92.0	0.824	6.84	0.0107	100	1.0	4.96	1266	2.5	3.2	4.9	5.22	1366	17.59	10.18	0.102	
																	Tc Min (Urban)= 5 min
																	Tc Min (Non Urb)= 10 min

TRAVEL TIME CALCULATIONS

DEVELOPMENT: Summerlin West Village 25

W.O. # 7919 **CALCULATED BY:** AH

$$Velocity = CS^{1/2}$$

C1 applies to the first 500 feet of travel distance
C2 applies to the remaining travel distance

Existing:		Urbanized	
C1=14.8	C2=29.4	C1=20.2	C2=30.6

					First 500 feet		Remaining Travel Distance	
Basin	**Length** (ft)	**High Elev** (ft)	**Low Elev** (ft)	**Slope** (ft/ft)	**C1**	**V1** (fps)	**C2**	**V2** (fps)
DEVELOPED CONDITION								
A	1409	3502	3452	0.036	20.2	3.8	30.6	5.8
B	1311	3499	3452	0.036	20.2	3.8	30.6	5.8
C	1465	3537	3497	0.027	20.2	3.3	30.6	5.1
COS-1	1898	3564	3550	0.008	20.2	1.8	30.6	2.7
COS-2	1036	3507	3496	0.010	20.2	2.1	30.6	3.1
COS-3	390	3453	3422	0.079	20.2	5.7	30.6	8.6
COS-4	1205	3538	3451	0.072	20.2	5.4	30.6	8.2
CP-1	2646	3737	3440	0.112	20.2	6.8	30.6	10.3
D	1417	3562	3497	0.045	20.2	4.3	30.6	6.5
DC-1	917	3680	3638	0.045	20.2	4.3	30.6	6.5
E	1250	3447	3406	0.033	20.2	3.7	30.6	5.5
ES-1	1032	3623	3545	0.075	20.2	5.5	30.6	8.4
F	1030	3538	3455	0.081	20.2	5.7	30.6	8.7
G	879	3491	3422	0.078	20.2	5.7	30.6	8.6
H	999	3602	3564	0.038	20.2	3.9	30.6	6.0
HS-1A	1494	3643	3531	0.075	20.2	5.5	30.6	8.4
HS-1B	1541	3648	3523	0.081	20.2	5.8	30.6	8.7
I	1122	3637	3593	0.039	20.2	4.0	30.6	6.0
J	1097	3740	3680	0.055	20.2	4.7	30.6	7.2
K	1721	3729	3618	0.064	20.2	5.1	30.6	7.7
L	846	3661	3604	0.067	20.2	5.2	30.6	7.9
M	743	3601	3530	0.095	20.2	6.2	30.6	9.4
N	877	3550	3505	0.052	20.2	4.6	30.6	7.0
NP-1	442	3569	3540	0.066	20.2	5.2	30.6	7.9
O	1301	3696	3610	0.066	20.2	5.2	30.6	7.8
P	656	3616	3562	0.083	20.2	5.8	30.6	8.8
FOX1	2115	3711	3599	0.053	20.2	4.6	30.6	7.0
FOX2	641	3589	3546	0.067	20.2	5.2	30.6	7.9
FOX3	907	3544	3504	0.044	20.2	4.2	30.6	6.4
FOX4	1230	3502	3452	0.041	20.2	4.1	30.6	6.2
FOX5A	1182	n/a	n/a	0.005	20.2	1.4	30.6	2.2
FOX5B	1004	3451	3444	0.007	20.2	1.7	30.6	2.6
RES3	978	3571	3528	0.045	20.2	4.3	30.6	6.5
RES4	909	3603	3548	0.060	20.2	5.0	30.6	7.5
SKY0	1325	3565	3559	0.005	20.2	1.4	30.6	2.1
SKY1	1241	3565	3544	0.017	20.2	2.6	30.6	4.0
SKY2	1114	3543	3500	0.038	20.2	4.0	30.6	6.0
STAA	314	3555	3538	0.052	20.2	4.6	30.6	7.0
STA1	1455	3537	3456	0.056	20.2	4.8	30.6	7.2
STA2	1555	3450	3360	0.058	20.2	4.9	30.6	7.4
STL	2588	3640	3596	0.017	20.2	2.6	30.6	4.0
STM	2493	3711	3568	0.057	20.2	4.8	30.6	7.3
STN	2716	3551	3514	0.014	20.2	2.4	30.6	3.6
STO	2302	3701	3557	0.062	20.2	5.0	30.6	7.6
STP	995	3635	3603	0.032	20.2	3.6	30.6	5.5
STQ1	804	3648	3603	0.056	20.2	4.8	30.6	7.3
STQ2	691	3599	3563	0.052	20.2	4.6	30.6	7.0
STQ3	1530	3555	3465	0.059	20.2	4.9	30.6	7.4
SUMM	753	3492	3448	0.058	20.2	4.9	30.6	7.4
V30-P	834	3715	3665	0.060	20.2	5.0	30.6	7.5
V30-Q	829	3668	3624	0.053	20.2	4.6	30.6	7.0
V30-R	876	3629	3594	0.040	20.2	4.1	30.6	6.1
V30-S	836	3601	3569	0.038	20.2	3.9	30.6	6.0
V30-U	472	3594	3565	0.061	20.2	5.0	30.6	7.6
V30-W	1266	3600	3568	0.025	20.2	3.2	30.6	4.9

CURVE NUMBERS FOR SOILS - W.O. #7919

Soil # 152 Cave gravelly fine sandy loam, 0 to 4 percent slopes									
Soil	Percent	Group	Residential$_{1}$ (Apartment/Condo)	Residential$_{2}$ (7,000 ft^2)	Open Space $_{3}$(Poor Condition)	Urban Districts $_{4}$(Commercial)	Impervious $_{5}$(Streets and roads(Paved)	Urban Districts $_{6}$(Industrial)	Residential$_{7}$ (Townhomes)
Cave	100%	D	93	91	89	95	98	93	92
Total	**100%**		**93**	**91**	**89**	**95**	**98**	**93**	**92**

Soil # 155 Cave gravelly fine sandy loam, 4 to 15 percent slopes									
Soil	Percent	Group	Residential$_{1}$ (Apartment/Condo)	Residential$_{2}$ (7,000 ft^2)	Open Space $_{3}$(Poor Condition)	Urban Districts $_{4}$(Commercial)	Impervious $_{5}$(Streets and roads(Paved)	Urban Districts $_{6}$(Industrial)	Residential$_{7}$ (Townhomes)
Cave	100%	D	93	91	89	95	98	93	92
Total	**100%**		**93**	**91**	**89**	**95**	**98**	**93**	**92**

Soil # 156 Vace - Wechech association									
Soil	Percent	Group	Residential$_{1}$ (Apartment/Condo)	Residential$_{2}$ (7,000 ft^2)	Open Space $_{3}$(Poor Condition)	Urban Districts $_{4}$(Commercial)	Impervious $_{5}$(Streets and roads(Paved)	Urban Districts $_{6}$(Industrial)	Residential$_{7}$ (Townhomes)
Vace and Similar	45%	D	93	91	89	95	98	93	92
Wechech and Similar	25%	D	93	91	89	95	98	93	92
Wechech, steep, and similar	15%	D	93	91	89	95	98	93	92
Weiser	8%	B	88	84	79	92	98	88	87
Irongold	4%	D	93	91	89	95	98	93	92
Commski	2%	B	88	84	79	92	98	88	87
Threelakes	1%	A	81	76	68	89	98	81	80
Total	**100%**		**93**	**91**	**88**	**95**	**98**	**93**	**92**

Soil # 502 Canutio-Cave gravelly fine sandy loams, 2 to 8 percent slopes									
Soil	Percent	Group	Residential$_{1}$ (Apartment/Condo)	Residential$_{2}$ (7,000 ft^2)	Open Space $_{3}$(Poor Condition)	Urban Districts $_{4}$(Commercial)	Impervious $_{5}$(Streets and roads(Paved)	Urban Districts $_{6}$(Industrial)	Residential$_{7}$ (Townhomes)
Canutio	55%	A	81	76	68	89	98	81	80
Cave	40%	D	93	91	89	95	98	93	92
Arizo	5%	D	93	91	89	95	98	93	92
Total	**100%**		**87**	**83**	**78**	**92**	**98**	**87**	**86**

Soil # 731 Purob-Irongold association									
Soil	Percent	Group	Residential$_{1}$ (Apartment/Condo)	Residential$_{2}$ (7,000 ft^2)	Open Space $_{3}$(Poor Condition)	Urban Districts $_{4}$(Commercial)	Impervious $_{5}$(Streets and roads(Paved)	Urban Districts $_{6}$(Industrial)	Residential$_{7}$ (Townhomes)
Purob	60%	D	93	91	89	95	98	93	92
Irongold	25%	D	93	91	89	95	98	93	92
Typic torriorthents	5%	A	81	76	68	89	98	81	80
Arizo	3%	A	81	76	68	89	98	81	80
Purob	3%	D	93	91	89	95	98	93	92
Typic haplocalcids	2%	B	88	84	79	92	98	88	87
Xeric haplocambids	1%	A	81	76	68	89	98	81	80
Aridic calcixerolls	1%	A	81	76	68	89	98	81	80
Total	**100%**		**92**	**90**	**87**	**95**	**98**	**92**	**91**

1-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602A
* Residential (Apartments / Condos)
2-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602A
* Residential (7,000 sq ft lots)
3-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602 page 1 of 4
* Open spaces in poor condition (grass cover < 50%)
4-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602 page 1 of 4
* Urban Districts (Commercial / Business & Residential with average lot size <6000 sqft)
5-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602 page 1 of 4
*Impervious (Paved Streets)
6-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602 page 1 of 4
*Urban Districts (Industrial)
7-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602 page 1 of 4
*Residential (Townhomes)

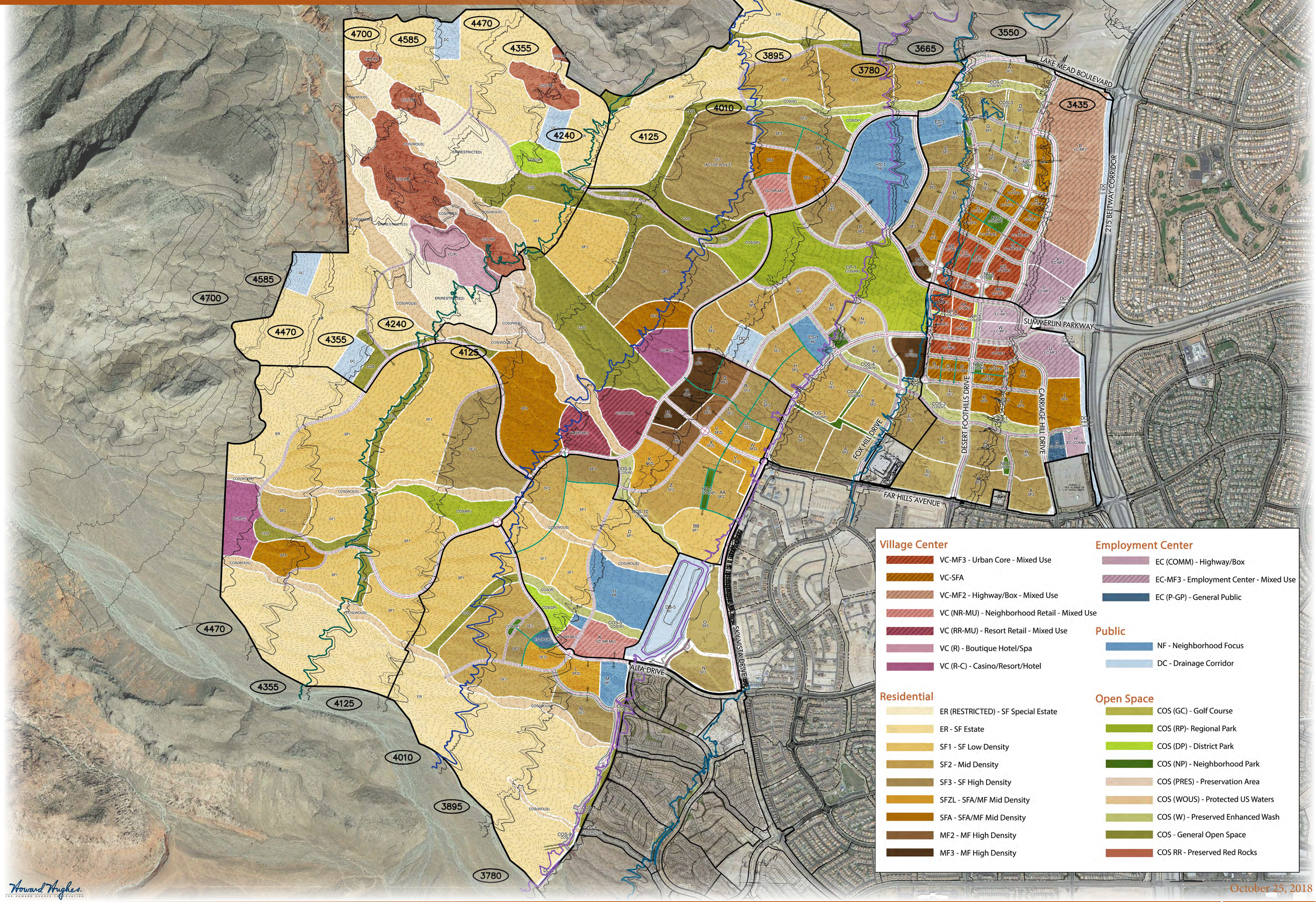
Curve Number calculations for basins										
Basin Name	Type	Soil Percentage	1	2	3	4	5	6	7	CN Value
A	156	100%				100%				95.0
B	156	100%				100%				95.0
C	156	74%				100%				95.0
	731	26%				100%				
D	156	100%				100%				95.0
DC-1	731	100%						100%		92.0
E	156	100%				100%				95.0
ES-1	156	48%				100%				95.0
	731	52%				100%				
F	152	79%				100%				95.0
	156	21%				100%				
G	152	84%	100%							93.0
	156	16%	100%							
H	156	5%				100%				95.0
	731	95%				100%				
HS-1A	155	78%				100%				95.0
	502	22%				100%				
HS-1B	155	78%				100%				94.3
	502	22%				100%				
I	156	2%				100%				95.0
	731	98%				100%				
J	731	100%				100%				95.0
K	156	19%				100%				95.0
	731	81%				100%				
L	156	87%				100%				95.0
	731	13%				100%				
M	156	100%				100%				95.0
N	152	5%				100%				95.0
	156	95%				100%				
O	155	1%				100%				81.3
	156	32%				100%				
	502	67%				100%				
P	156	40%				100%				93.2
	502	60%				100%				
COS-1	156	100%			100%					88.0
COS-2	156	100%			100%					88.0
COS-3	152	9%			100%					88.1
	156	91%			100%					
COS-4	156	100%			100%					88.0
	731	0%			100%					
CP-1	156	91%			100%					87.9
	731	9%			100%					
NP-1	152	37%			100%					88.4
	156	63%			100%					
FOX1	156	69%					100%			98.0
	731	31%					100%			
FOX2	156	100%					100%			98.0
FOX3	156	100%					100%			98.0
FOX4	152	62%					100%			98.0
	156	38%					100%			
FOX5A	156	100%					100%			98.0
FOX5B	156	100%					100%			98.0
RES3	156	100%					100%			98.0
RES4	156	90%					100%			98.0
	731	10%					100%			
SKY0	156	100%					100%			98.0
SKY1	156	22%					100%			98.0
	731	78%					100%			
SKY2	152	48%					100%			98.0
	156	50%					100%			
	731	2%					100%			
STAA	152	71%					100%			98.0
	156	29%					100%			
STA1	156	82%					100%			98.0
	731	18%					100%			
STA2	156	100%					100%			98.0
STL	156	50%					100%			98.0
	731	50%					100%			
STM	731	22%					100%			98.0
	156	78%					100%			

STN	155	68%					100%			**98.0**
	502	32%					100%			
STO	156	97%					100%			**98.0**
	502	3%					100%			
STP	156	35%					100%			**98.0**
	502	65%					100%			
STQ1	155	33%					100%			**98.0**
	502	67%					100%			
STQ2	502	100%					100%			**98.0**
STQ3	156	93%					100%			**98.0**
	502	7%					100%			
SUMM	156	100%					100%			**98.0**
V30-P	731	100%	100%							**92.0**
V30-Q	731	100%	100%							**92.0**
V30-R	731	100%				100%				**95.0**
	156	0%				100%				
V30-S	731	34%				100%				**95.0**
	156	66%				100%				
V30-U	156	100%				100%				**95.0**
V30-W	156	100%							100%	**92.0**

2019 FLOOD CONTROL MASTER PLAN UPDATE FOR SUMMERLIN WEST ARE

(DS4926)

Non-Golf Master Plan



Village Center

- VC-MF3 - Urban Core - Mixed Use
- VC-SFA
- VC-MF2 - Highway/Box - Mixed Use
- VC (NR-MU) - Neighborhood Retail - Mixed Use
- VC (RR-MU) - Resort Retail - Mixed Use
- VC (R) - Boutique Hotel/Spa
- VC (R-C) - Casino/Resort/Hotel

Residential

- ER (RESTRICTED) - SF Special Estate
- ER - SF Estate
- SF1 - SF Low Density
- SF2 - Mid Density
- SF3 - SF High Density
- SFZL - SFA/MF Mid Density
- SFA - SFA/MF Mid Density
- MF2 - MF High Density
- MF3 - MF High Density

Employment Center

- EC (COMM) - Highway/Box
- EC-MF3 - Employment Center - Mixed Use
- EC (P-GP) - General Public

Public

- NF - Neighborhood Focus
- DC - Drainage Corridor

Open Space

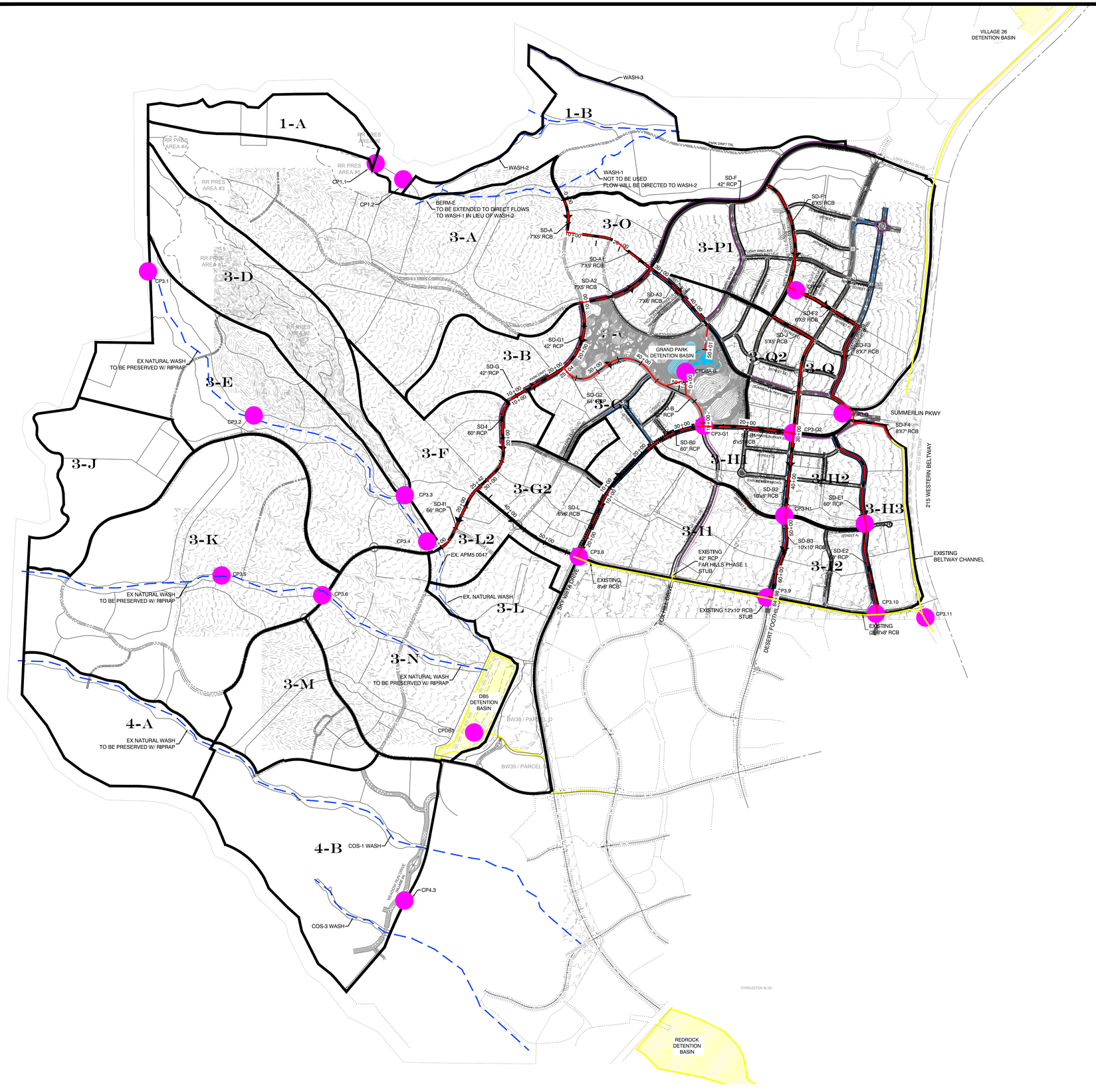
- COS (GC) - Golf Course
- COS (RP)- Regional Park
- COS (DP) - District Park
- COS (NP) - Neighborhood Park
- COS (PRES) - Preservation Area
- COS (WOUS) - Protected US Waters
- COS (W) - Preserved Enhanced Wash
- COS - General Open Space
- COS RR - Preserved Red Rocks

Howard Hughes
THE HOWARD HUGHES CORPORATION

3101 Iris Avenue, Suite 130
Boulder, Colorado 80301
T: 303.443.7533

0' 300' 600' 1,200'
SCALE 1"=600'-0"

October 25, 2018



GRAPHIC SCALE

1000 0 500 1000 2000

1" = 1000'

REGIONAL FLOOD CONTROL FACILITY SUMMARY TABLE

Designation	Q (cfs)	Basin/CP	Size	Type	Velocity	Remarks
SD-A	627.5	1/2 3-A	7'x5'	RCB	19.93	
SD-A1	627.5	1/2 3-A	7'x5'	RCB	29.18	
SD-A2	627.5	1/2 3-A	7'x5'	RCB	29.18	
SD-A3	1255	3-A	7'x6'	RCB	37.73	
SD-B	184	GPDB	42"	RCP	24.97	
SD-B0	407	3-G1	60"	RCP	29.34	
SD-B1	529	CP3-G1	6'x5'	RCB	27.31	
SD-B2	958	CP3-H1	10'x8'	RCB	23.88	Reference 2
SD-B3	1496	CP3-H1, 3-I1	10'x10'	RCB	23.97	Reference 1
SD-J	204	3-Q2	5'x5'	RCB	9.50	
SD-E1	197	3-H2	60"	RCP	16.31	Reference 4
SD-E2	408	3-H2, 3-I2	60"	RCP	22.47	Reference 3
SD-F	187	3-O	42"	RCP	26.25	
SD-F1	596	CP3-P	6'x5'	RCB	24.63	
SD-F2	779	CP3-Q	6'x5'	RCB	30.60	
SD-F3	779	CP3-Q	8'x7'	RCB	17.42	
SD-F4	779	CP3-Q	8'x7'	RCB	19.74	
SD-G	166	1/2 3-B	42"	RCP	23.36	
SD-G1	166	1/2 3-B	42"	RCP	20.45	
SD-G2	332	3-B	54"	RCP	27.13	
SD-I	238	1/2 3-F	60"	RCP	21.05	
SD-I1	238	1/2 3-F	66"	RCP	15.33	
SD-L	432	3-G2	7'x6'	RCB	11.54	

References:

1- TDS for Desert Foothills Drive (Far Hills to Street A)

2- TDS for Desert Foothills Drive (Redpoint to Summerlin Pkwy)

3- TDS for Carriage Hill Drive (Far Hills to Street A)

4- TDS for Carriage Hill Drive (Redpoint to Summerlin Pkwy)

LEGEND

- STORM DRAIN FACILITY ALIGNMENT
- EXISTING FACILITY ALIGNMENT
- EXISTING WASHES TO BE DESIGNATED AS CCRFCD MPU FACILITIES
- CONCENTRATION POINT
- BASIN BOUNDARY
- 3-A ONSITE BASIN
- 3-1 OFFSITE BASIN

REV	DATE	BY	REVISION

THE HOWARD HUGHES CORPORATION
10801 WEST CHARLESTON BLVD, 3RD FLOOR
LAS VEGAS, NEVADA 89135

vtn
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7500 FAX (702) 362-2597 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

2018 UPDATE TO SUMMERLIN WEST PLANNING AREA

A.6.5 REGIONAL FLOOD CONTROL FACILITIES MAP

DRAWN BY: JYA 11/2018

DESIGNED BY: JAN 201

CHECKED BY: WJ

SCALE: HORIZ VERT

PROJECT NO: 7909

SHEET A.6.5 OF SHEETS

DRAWING NO.

H:\7909\Drainage\7_UP1 ADD1\A Figures\A.6.5 Regional Flood Control Facility Map\A.6.5_Regional Flood Control Facility Map.dwg

Addendum #2 to the Master Conceptual Drainage Study for

Summerlin West Village 25

Las Vegas, Nevada

W.O. # 7919-A

Prepared for:
Howard Hughes Company, LLC

Submitted to:
City of Las Vegas
Public Works

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Summerlin West Village 25 Date: April 25, 2019

Location of Development: a) Descriptive (Cross Streets) North/South: Sky Vista Drive

East/West: Far Hills Avenue

b) Section: 21 and 22 Township: 20S Range: 59E

c) APN : 137-22-101-001; 137-21-000-002

Name of Owner: The Howard Hughes Company, LLC

Telephone No.: (702) 791-4336 Fax No.: (702) 791-4453 E-Mail Address: chris.anderson@howardhughes.com

Address: 10801 W. Charleston Blvd. LV, NV, 89135

Contact Person-Name: Joanna Ayson **Telephone No.:** (702)-873-7550

* **E-Mail Address:** jayson@vtnnv.com **Fax No.:** (702)-362-2597

Firm: VTN Nevada

Address: 2727 S. Rainbow Blvd, LV, NV, 89146

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		

1. Total Owned Land Area: At Site: +/-548 Acres Being Developed/Disturbed: +/-548 Acres
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ **Yes**** ☒ **No**
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☒ **Yes**** ☐ **No**
4. Proposed type of development (Residential, Commercial, Etc.): Mixed-use master plan
5. Approximate upstream land area which drains to the subject site: +/- 819 acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: SWPA MPU (DS4926), TDS for Summerlin West Desert Foothills Drive (Far Hills to Street A) (DS5013
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: 10'X10' RCB storm drain in Desert Foothills Drive (CCRFCD Master Planned Facility)
8. Briefly describe your proposed schedule for the subject project: As soon as possible

PROFESSIONAL ENGINEER - STATE OF NEVADA
BRIAN TROY RUIZ
EXP: 12/31/19
CIVIL
No. 15967
4/25/19

Engineer's Seal

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

*New Required Field

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

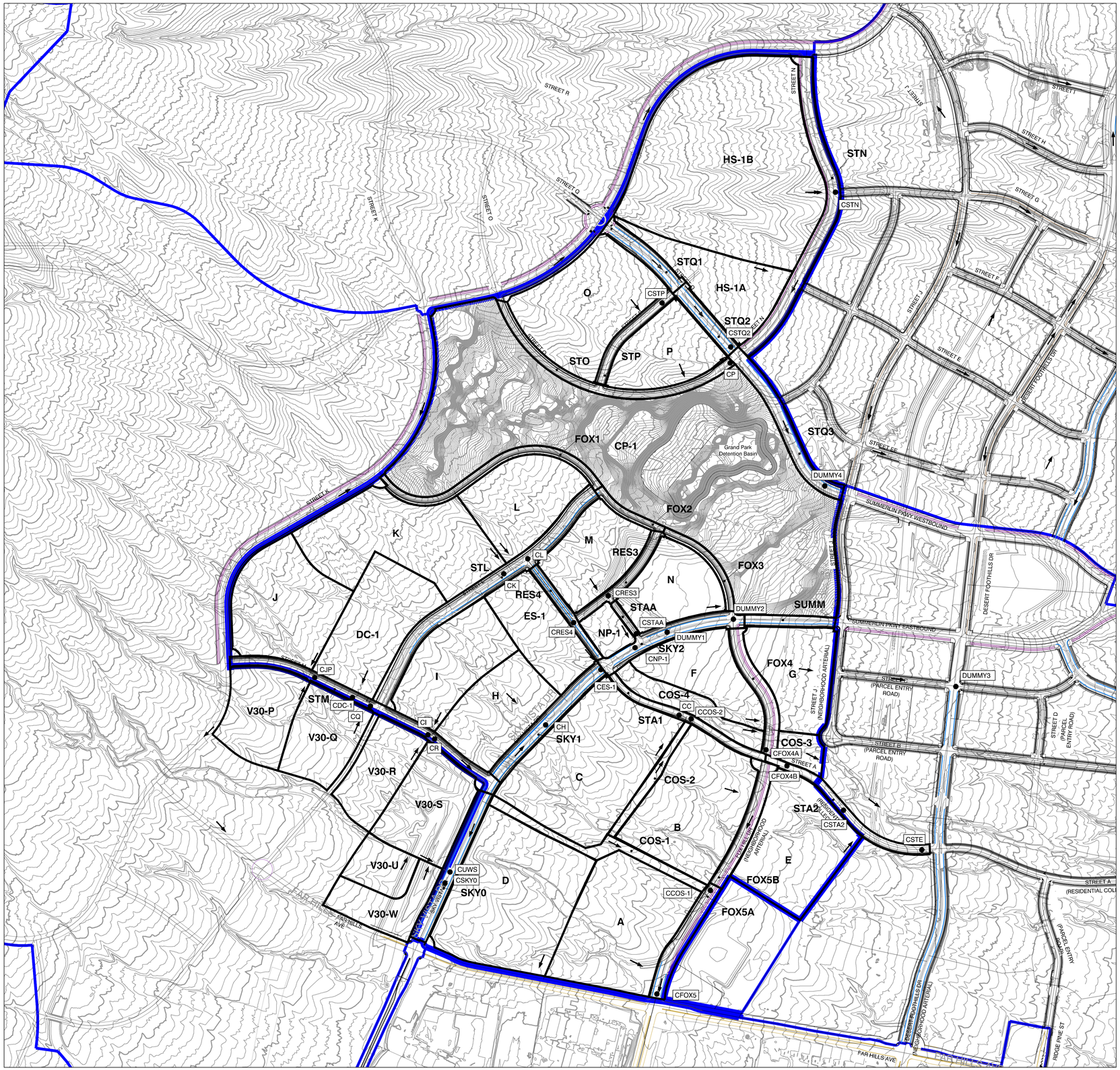
Revision	Date

Local Entity File No.

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008



GRAPHIC SCALE

400 0 200 400 800

1" = 400'

NORTH

LEGEND

- BASIN BOUNDARY
- W51 BASIN DESIGNATION
- CONCENTRATION POINT
- FLOW ARROW

ULTIMATE CONDITION HEC-1 SUMMARY TABLE

BASIN ID	Area (a.c.)	Q100 (cfs)	BASIN ID	Area (a.c.)	Q100 (cfs)
J	16.90	69	FOX3	1.51	7
STM	4.76	20	N	9.91	40
V30-P	10.30	39	SUMM	1.65	7
CJP	-	128	G	11.44	45
DC-1	15.02	56	D	27.15	105
CDC-1	-	184	FOX5B	3.19	12
V30-Q	9.60	37	COS-1	3.48	9
CQ	-	221	CCOS-1	-	20
I	13.23	53	FOX5A	3.15	11
CI	-	274	A	21.35	81
V30-R	8.57	35	CFOX5	-	111
CR	-	308	C	26.54	99
V30-S	11.91	49	STA1	2.29	10
V30-U	4.74	20	CC	-	109
V30-W	6.85	25	COS-2	1.72	5
CUWS	-	403	CCOS-2	-	114
SKY0	4.16	14	FOX4	3.20	14
CSKY0	-	416	F	10.44	43
SKY1	3.91	16	COS-4	5.04	16
H	12.11	48	CFOX4A	-	73
CH	-	64	B	19.86	76
ES-1	10.20	42	CFOX4B	-	263
CES-1	-	106	STA2	2.84	12
SKY2	3.78	17	CSTA2	-	275
NP-1	2.70	9	COS-3	2.40	8
CNP-1	-	132	E	17.14	65
STL	7.86	28	CSTE	-	348
K	21.91	86	STP	2.05	9
CK	-	113	O	19.18	46
L	12.79	53	CSTP	-	55
CL	-	167	STQ1	2.49	11
RES4	1.60	7	STQ2	2.11	10
CRES4	-	174	CSTQ2	-	76
RES3	1.97	9	STO	4.10	17
M	10.88	46	P	10.31	42
CRES3	-	229	CP	-	59
STAA	0.44	2	STQ3	4.22	18
CSTAA	-	231	STN	7.67	27
FOX1	3.39	14	HS-1A	11.70	47
FOX2	1.06	5	HS-1B	49.79	195
CP-1	94.28	282	CSTN	-	266

REVISION | BY | DATE | REV

THE HOWARD HUGHES CORPORATION
10801 WEST CHARLESTON BLVD, 3RD FLOOR
LAS VEGAS, NEVADA 89135

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5146
PH: (702) 873-7550 FAX (702) 362-2597 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

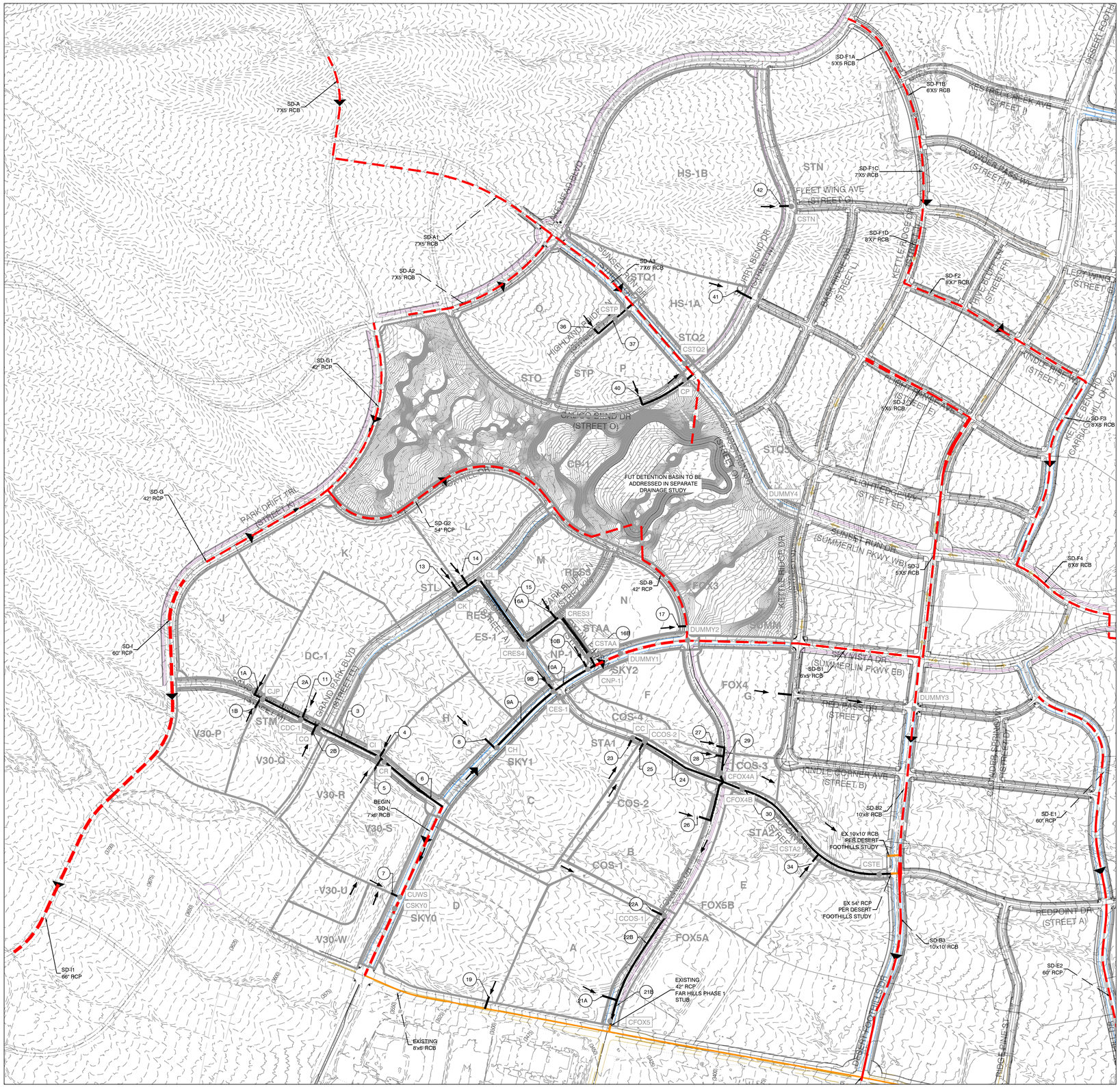
FIGURE 6
ULTIMATE CONDITION BASIN MAP

SUMMERLIN WEST VILLAGE 25

DRAWN BY: ATM/AH — JULY 2018
DESIGNED BY: JYA — JULY 2018
CHECKED BY: JYA — JULY 2018
PROJECT NO: 2919
SCALE: 1" = 400' HORIZ. N/A VERT.

SHEET
OF SHEETS
DRAWING NO.

H:\2919\Drainage\3_Arch\2A_Figures\Figure 6 - Village 25 Drainage Basin Map.dwg



VILLAGE 25 LOCAL FLOOD PROTECTION FACILITIES

Facility #	Design Slope %	Q100 cfs	Tributary Basin/CP	Facility	Velocity fps
1A	6.00%	69	J	42" RCP	21.97
1B	3.78%	39	V30-P	30" RCP	16.15
2A	0.50%	128	CJP	54" RCP	9.92
2B	0.50%	37	V30-Q	36" RCP	7.39
3	6.00%	221	CQ	54" RCP	29.63
4	0.50%	53	I	42" RCP	8.10
5	2.84%	35	V30-R	30" RCP	14.12
6	5.18%	308	CR	66" RCP	30.44
7	1.00%	403	CUWS	72" RCP	17.05
8	6.00%	48	H	36" RCP	20.09
9A	0.50%	64	CH	42" RCP	8.37
9B	0.99%	42	ES-1	36" RCP	9.93
10A	6.00%	106	CES-1	42" RCP	24.65
10B	5.78%	9	NP-1	24" RCP	12.81
11	1.62%	56	DC-1	36" RCP	12.83
13	0.50%	86	K	48" RCP	9.07
14	6.00%	53	L	36" RCP	20.64
15	5.98%	167	CL	48" RCP	27.60
16A	6.00%	46	M	36" RCP	19.85
16B	4.05%	231	CSTAA	48" RCP	25.55
17	2.55%	40	N	30" RCP	14.00
19	0.50%	105	D	36" RCP	24.04
21A	1.00%	81	A	42" RCP	11.63
21B	2.02%	111	CFOX5	42" RCP	16.42
22A	4.00%	9	COS-1	24" RCP	11.23
22B	1.00%	20	CCOS-1	24" RCP	8.13
23	0.50%	99	C	48" RCP	9.21
24	5.13%	114	CCOS-2	48" RCP	23.60
25	0.50%	5	COS-2	24" RCP	4.50
26	1.00%	76	B	48" RCP	11.59
27	1.33%	43	F	30" RCP	10.92
29	1.50%	73	CFOX4A	36" RCP	13.07
30	5.50%	263	CFOX4B	54" RCP	29.95
31	4.27%	8	COS-3	24" RCP	11.12
34	0.50%	65	E	42" RCP	8.38
36	6.00%	46	O	36" RCP	19.85
37	6.00%	55	CSTP	36" RCP	20.85
40	6.00%	42	P	36" RCP	19.36
41	1.00%	47	HS-1A	36" RCP	10.22
42	1.00%	195	HS-1B	54" RCP	14.09

REVISION | BY | DATE | REV

THE HOWARD HUGHES CORPORATION
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FIGURE 7
LOCAL STORM DRAIN FACILITIES MAP

SUMMERLIN WEST VILLAGE 25

DRAWN BY: ATM/AH — JULY 2018
DESIGNED BY: SVB/JYA — JULY 2018
CHECKED BY: J/A — JULY 2018
SCALE: 1"=400' HORIZ. NA VERT.
PROJECT NO: 7881

SHEET
OF SHEETS
DRAWING NO.

H:\7919\Drainage\3_Arc\2A_Figures\Figure 7 - Local Flood Control Facilities Map V25-REV.dwg

APPENDIX B
HYDROLOGIC CALCULATIONS

```
1****************************************                                  ****************************************
 *                                      *                                  *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                  *   U.S. ARMY CORPS OF ENGINEERS       *
 *              JUN   1998              *                                  *   HYDROLOGIC ENGINEERING CENTER      *
 *           VERSION 4.1                *                                  *         609 SECOND STREET            *
 *                                      *                                  *      DAVIS, CALIFORNIA 95616         *
 *  RUN DATE   23APR19  TIME  16:32:39  *                                  *          (916) 756-1104              *
 *                                      *                                  *                                      *
 ****************************************                                  ****************************************

                                        X     X  XXXXXXX   XXXXX          X
                                        X     X  X       X     X        XX
                                        X     X  X       X              X
                                        XXXXXXX  XXXX    X       XXXXX  X
                                        X     X  X       X              X
                                        X     X  X       X     X        X
                                        X     X  XXXXXXX   XXXXX        XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
          LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

                        *DIAGRAM
 *** FREE ***
             1          ID    ULTIMATE CONDITION HYDROLOGIC MODEL
             2          ID    OFFSITE BASINS DRAINING TO STUB AT STREET A
             3          ID    INPUT FILE DATE = JUNE 27, 2018
             4          ID    DESIGN STORM = 100-YEAR 6-HR STORM
             5          ID    STORM DISTRIBUTION = SDN #3
             6          ID    MODELED BY VTN (AH)
             7          ID
             8          ID    ********************************************************
             9          ID    * SUMMERLIN WEST VILLAGE 25                           *
            10          ID    ********************************************************
            11          ID
            12          ID
            13          ID  JR CARD RATIOS REPRESENT DEPTH-AREA REDUCTION FACTORS (DARF'S)
            14          ID
            15          ID  100-YEAR,  6-HOUR STORM,  SDN3
            16          ID
            17          IT       5       0       0     300
            18          IO       5       0       0
            19          IN       5       0       0
            20          JR    PREC    1.00
                        *

            21          KK       J
            22          KM   ONSITE BASIN
            23          BA  0.0264
            24          PB    3.49
            25          PC       0    0.02   0.057    0.07   0.087   0.108   0.124    0.13    0.13   0.130
            26          PC    0.13    0.13    0.13   0.133    0.14   0.142   0.148   0.158   0.172   0.181
            27          PC    0.19   0.197   0.199     0.2   0.201   0.204   0.214   0.229   0.241   0.249
            28          PC   0.251   0.256    0.27   0.278   0.281   0.283   0.295   0.322   0.352   0.409
            29          PC   0.499    0.59    0.71   0.744   0.781   0.812   0.819   0.835   0.851   0.856
            30          PC    0.86   0.868   0.876   0.888    0.91   0.926   0.937    0.95    0.97   0.976
            31          PC   0.982   0.985   0.987   0.989    0.99   0.993   0.993   0.994   0.995   0.998
            32          PC   0.998   0.999       1
            33          LS       0    95.0
            34          UD   0.074
                        *

            35          KK     STM
            36          KM   ONSITE BASIN
            37          BA  0.0074
            38          PB    3.46
            39          LS       0    98.0
            40          UD   0.080
                        *

            41          KK   V30-P
            42          KM   ONSITE BASIN
            43          BA  0.0161
```

```
              44          PB    3.48
              45          LS       0    92.0
              46          UD   0.074
                          *
1                                        HEC-1 INPUT                                        PAGE  2

            LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


              47          KK     CJP
              48          KM   COMBINE J,STM AND V30-P
              49          HC       3
                          *

              50          KK    DC-1
              51          KM   ONSITE BASIN
              52          BA  0.0235
              53          PB    3.47
              54          LS       0    92.0
              55          UD   0.080
                          *

              56          KK   CDC-1
              57          KM   COMBINE DC-1 AND CPJ
              58          HC       2
                          *

              59          KK   V30-Q
              60          KM   ONSITE BASIN
              61          BA  0.0150
              62          PB    3.48
              63          LS       0    92.0
              64          UD   0.075
                          *

              65          KK      CQ
              66          KM   COMBINE V30-Q AND CDC-1
              67          HC       2
                          *

              68          KK       I
              69          KM   ONSITE BASIN
              70          BA  0.0207
              71          PB    3.47
              72          LS       0    95.0
              73          UD   0.081
                          *

              74          KK      CI
              75          KM   COMBINE I AND CSTM
              76          HC       2
                          *

              77          KK   V30-R
              78          KM   ONSITE BASIN
              79          BA  0.0134
              80          PB    3.46
              81          LS       0    95.0
              82          UD   0.073
                          *
1                                        HEC-1 INPUT                                        PAGE  3

            LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


              83          KK      CR
              84          KM   COMBINE V30-R, AND CI
              85          HC       2
                          *

              86          KK   V30-S
              87          KM   ONSITE BASIN
              88          BA  0.0188
              89          PB    3.45
              90          LS       0    95.0
              91          UD   0.073
                          *

              92          KK   V30-U
              93          KM   ONSITE BASIN
              94          BA  0.0074
              95          PB    3.45
              96          LS       0    95.0
              97          UD   0.058
                          *

              98          KK   V30-W
              99          KM   ONSITE BASIN
             100          BA  0.0107
```

```
 101          PB    3.45
 102          LS       0    95.0
 103          UD   0.102
              *

 104          KK    CUWS
 105          KM   COMBINE CR AND V30-S
 106          HC       4
              *

 107          KK    SKY0
 108          KM   ONSITE BASIN
 109          BA  0.0065
 110          PB    3.45
 111          LS       0    95.0
 112          UD   0.150
              *

 113          KK   CSKY0
 114          KM   COMBINE CUWS AND CSKY0
 115          HC       2
              *

 116          KK    SKY1
 117          KM   STREET BASIN
 118          BA  0.0061
 119          PB    3.45
 120          LS       0    98.0
 121          UD   0.085
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 122          KK       H
 123          KM   ONSITE BASIN
 124          BA  0.0189
 125          PB    3.45
 126          LS       0    95.0
 127          UD   0.078
              *

 128          KK      CH
 129          KM   COMBINE SKY1 AND H
 130          HC       2
              *

 131          KK    ES-1
 132          KM   ONSITE BASIN
 133          BA  0.0159
 134          PB    3.46
 135          LS       0    95.0
 136          UD   0.068
              *

 137          KK   CES-1
 138          KM   COMBINE CH AND ES-1
 139          HC       2
              *

 140          KK    SKY2
 141          KM   STREET BASIN
 142          BA  0.0059
 143          PB    3.44
 144          LS       0    98.0
 145          UD   0.061
              *

 146          KK    NP-1
 147          KM   ONSITE BASIN
 148          BA  0.0042
 149          PB    3.44
 150          LS       0    88.4
 151          UD   0.072
              *

 152          KK   CNP-1
 153          KM   COMBINE CES-1, SKY2, AND NP-1
 154          HC       3
              *

 155          KK     STL
 156          KM   STREET BASIN
 157          BA  0.0123
 158          PB    3.46
 159          LS       0    98.0
 160          UD   0.141
              *
```

```
          LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

           161      KK       K
           162      KM   ONSITE BASIN
           163      BA  0.0342
           164      PB    3.49
           165      LS       0    95.0
           166      UD   0.085
                    *

           167      KK      CK
           168      KM   COMBINE K AND STL
           169      HC       2
                    *

           170      KK       L
           171      KM   ONSITE BASIN
           172      BA  0.0200
           173      PB    3.47
           174      LS       0    95.0
           175      UD   0.066
                    *

           176      KK      CL
           177      KM   COMBINE CK, AND L
           178      HC       2
                    *

           179      KK    RES4
           180      KM   STREET BASIN
           181      BA  0.0025
           182      PB    3.46
           183      LS       0    98.0
           184      UD   0.050
                    *

           185      KK   CRES4
           186      KM   COMBINE CL AND RES4
           187      HC       2
                    *

           188      KK    RES3
           189      KM   STREET BASIN
           190      BA  0.0031
           191      PB    3.44
           192      LS       0    98.0
           193      UD   0.051
                    *

           194      KK       M
           195      KM   ONSITE BASIN
           196      BA  0.0170
           197      PB    3.44
           198      LS       0    95.0
           199      UD   0.060
                    *
```



```
          LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

           200      KK   CRES3
           201      KM   COMBINE CRES4, RES3, AND M
           202      HC       3
                    *

           203      KK    STAA
           204      KM   ONSITE BASIN
           205      BA  0.0007
           206      PB    3.44
           207      LS       0    98.0
           208      UD   0.050
                    *

           209      KK   CSTAA
           210      KM   COMBINE CRES3 AND STAA
           211      HC       2
                    *

           212      KK  DUMMY1
           213      KM   COMBINE CNP-1 AND CSTAA
           214      HC       2
                    *

           215      KK    FOX1
           216      KM   STREET BASIN
```

```
 217          BA  0.0053
 218          PB    3.47
 219          LS       0    98.0
 220          UD   0.071
              *

 221          KK    FOX2
 222          KM   STREET BASIN
 223          BA  0.0017
 224          PB    3.45
 225          LS       0    98.0
 226          UD   0.050
              *

 227          KK    CP-1
 228          KM   ONSITE BASIN
 229          BA  0.1473
 230          PB    3.45
 231          LS       0    87.9
 232          UD   0.107
              *

 233          KK    FOX3
 234          KM   STREET BASIN
 235          BA  0.0024
 236          PB    3.42
 237          LS       0    98.0
 238          UD   0.050
              *
```



```
            LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 239          KK       N
 240          KM   ONSITE BASIN
 241          BA  0.0155
 242          PB    3.44
 243          LS       0    95.0
 244          UD   0.070
              *

 245          KK  DUMMY2
 246          KM   COMBINE DUMMY1, N, FOX1, FOX2, FOX3, AND CP-1
 247          HC       6
              *

 248          KK    SUMM
 249          KM   SUMMERLIN PARKWAY STREET BASIN
 250          BA  0.0026
 251          PB    3.42
 252          LS       0    98.0
 253          UD   0.050
              *

 254          KK       G
 255          KM   ONSITE BASIN
 256          BA  0.0179
 257          PB    3.41
 258          LS       0    93.0
 259          UD   0.069
              *

 260          KK  DUMMY3
 261          KM   COMBINE DUMMY2, SUMM, AND G
 262          HC       3
              *

 263          KK       D
 264          KM   ONSITE BASIN
 265          BA  0.0424
 266          PB    3.44
 267          LS       0    95.0
 268          UD   0.085
              *

 269          KK   FOX5B
 270          KM   1/2 FOX5 STREET BASIN
 271          BA  0.0050
 272          PB    3.40
 273          LS       0    98.0
 274          UD   0.104
              *
```



```
            LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 275          KK   COS-1
```

```
 276          KM   ONSITE BASIN
 277          BA  0.0054
 278          PB    3.42
 279          LS       0    88.0
 280          UD   0.194
              *

 281          KK  CCOS-1
 282          KM   COMBINE FOX5B AND COS-1
 283          HC       2
              *

 284          KK   FOX5A
 285          KM   1/2 FOX5 STREET BASIN
 286          BA  0.0049
 287          PB    3.40
 288          LS       0    98.0
 289          UD   0.133
              *

 290          KK       A
 291          KM   ONSITE BASIN
 292          BA  0.0334
 293          PB    3.41
 294          LS       0    95.0
 295          UD   0.091
              *

 296          KK   CFOX5
 297          KM   COMBINE FOX5A,CCOS-1, AND A
 298          HC       3
              *

 299          KK       C
 300          KM   ONSITE BASIN
 301          BA  0.0415
 302          PB    3.45
 303          LS       0    95.0
 304          UD   0.099
              *

 305          KK    STA1
 306          KM   STREET BASIN
 307          BA  0.0036
 308          PB    3.43
 309          LS       0    98.0
 310          UD   0.055
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 311          KK      CC
 312          KM   COMBINE STA1, AND C
 313          HC       2
              *

 314          KK   COS-2
 315          KM   ONSITE BASIN
 316          BA  0.0027
 317          PB    3.43
 318          LS       0    88.0
 319          UD   0.128
              *

 320          KK  CCOS-2
 321          KM   COMBINE CC AND COS-2
 322          HC       2
              *

 323          KK    FOX4
 324          KM   STREET BASIN
 325          BA  0.0050
 326          PB    3.41
 327          LS       0    98.0
 328          UD   0.062
              *

 329          KK       F
 330          KM   ONSITE BASIN
 331          BA  0.0163
 332          PB    3.44
 333          LS       0    95.0
 334          UD   0.067
              *

 335          KK   COS-4
 336          KM   ONSITE BASIN
```

```
 337          BA  0.0079
 338          PB    3.43
 339          LS       0    88.0
 340          UD   0.089
              *

 341          KK  CFOX4A
 342          KM   COMBINE F, COS-4, AND FOX4
 343          HC       3
              *

 344          KK       B
 345          KM   ONSITE BASIN
 346          BA  0.0310
 347          PB    3.42
 348          LS       0    95.0
 349          UD   0.088
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 350          KK  CFOX4B
 351          KM   COMBINE CCOS-2, B AND CFOX4A
 352          HC       3
              *

 353          KK    STA2
 354          KM   STREET BASIN
 355          BA  0.0044
 356          PB    3.39
 357          LS       0    98.0
 358          UD   0.058
              *

 359          KK   CSTA2
 360          KM   COMBINE CFOX4B AND STA2
 361          HC       2
              *

 362          KK   COS-3
 363          KM   STREET  BASIN
 364          BA  0.0038
 365          PB    3.41
 366          LS       0    88.1
 367          UD   0.070
              *

 368          KK       E
 369          KM   ONSITE BASIN
 370          BA  0.0268
 371          PB    3.40
 372          LS       0    95.0
 373          UD   0.088
              *

 374          KK    CSTE
 375          KM   COMBINE CSTA2, COS-3 AND E
 376          HC       3
              *

 377          KK     STP
 378          KM   STREET BASIN
 379          BA  0.0032
 380          PB    3.46
 381          LS       0    98.0
 382          UD   0.055
              *

 383          KK       O
 384          KM   ONSITE BASIN
 385          BA  0.0300
 386          PB    3.48
 387          LS       0    81.3
 388          UD   0.108
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 389          KK    CSTP
 390          KM   COMBINE O AND STP
 391          HC       2
              *

 392          KK    STQ1
 393          KM   STREET BASIN
```

```
             394          BA  0.0039
             395          PB    3.46
             396          LS       0    98.0
             397          UD   0.050
                          *

             398          KK    STQ2
             399          KM   STREET BASIN
             400          BA  0.0033
             401          PB    3.46
             402          LS       0    98.0
             403          UD   0.050
                          *

             404          KK   CSTQ2
             405          KM   COMBINE CSTP, STQ1, AND STQ2
             406          HC       3
                          *

             407          KK     STO
             408          KM   STREET BASIN
             409          BA  0.0064
             410          PB    3.46
             411          LS       0    98.0
             412          UD   0.073
                          *

             413          KK       P
             414          KM   ONSITE BASIN
             415          BA  0.0161
             416          PB    3.46
             417          LS       0    93.2
             418          UD   0.064
                          *

             419          KK      CP
             420          KM   COMBINE P AND STO
             421          HC       2
                          *

             422          KK    STQ3
             423          KM   STREET BASIN
             424          BA  0.0066
             425          PB    3.44
             426          LS       0    98.0
             427          UD   0.062
                          *
1                                                HEC-1 INPUT                                                PAGE 12

            LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


             428          KK  DUMMY4
             429          KM   COMBINE CP, CSTQ2, AND STQ3
             430          HC       3
                          *

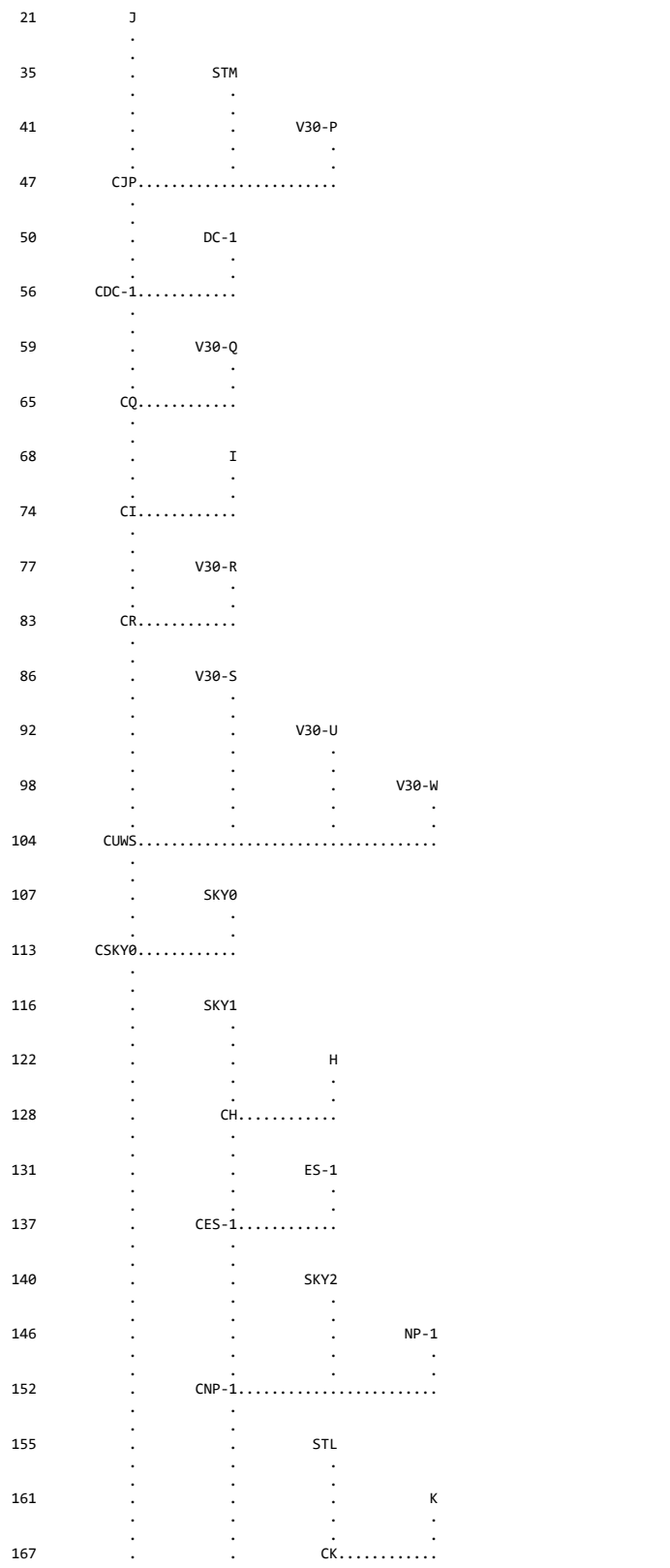
             431          KK     STN
             432          KM   ONSITE BASIN
             433          BA  0.0120
             434          PB    3.44
             435          LS       0    98.0
             436          UD   0.160
                          *

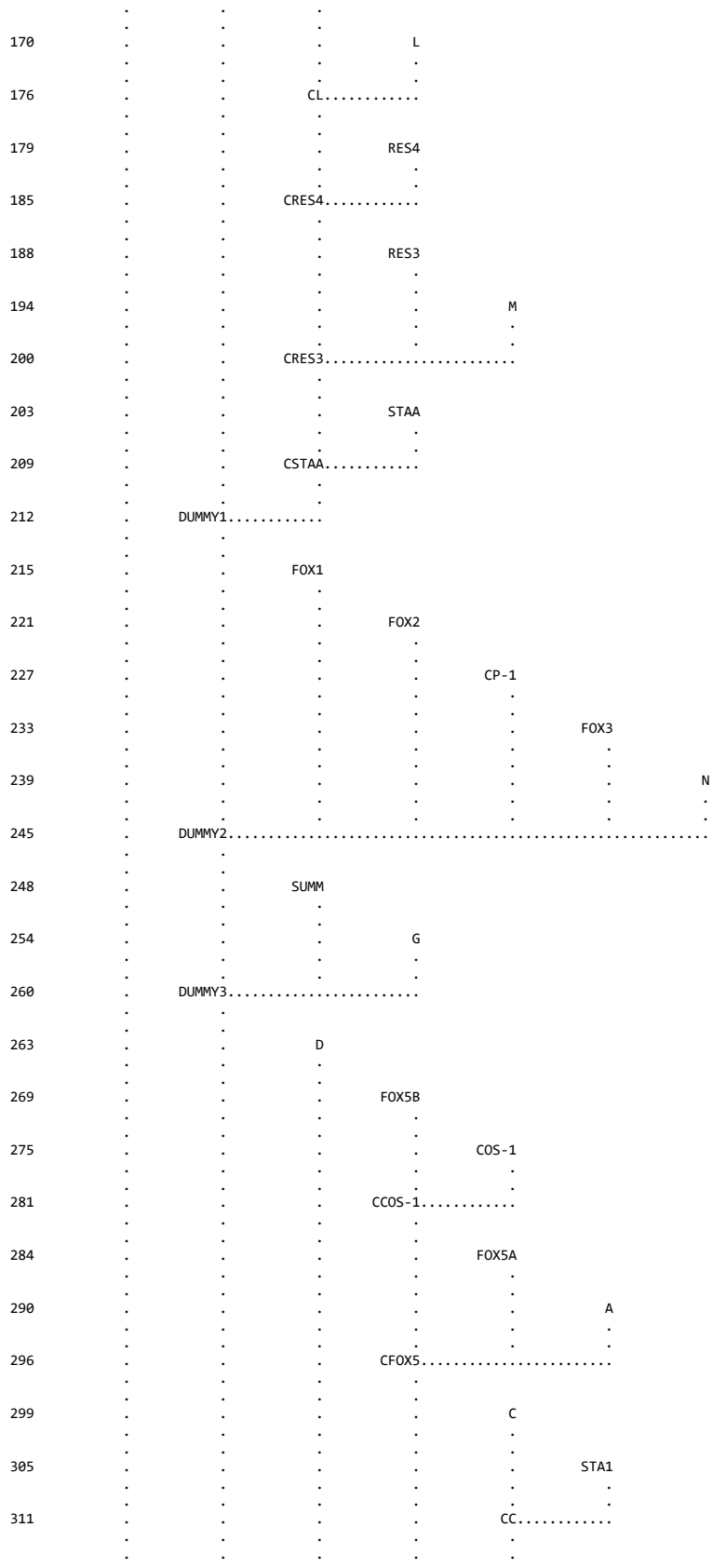
             437          KK   HS-1A
             438          KM   ONSITE BASIN
             439          BA  0.0183
             440          PB    3.44
             441          LS       0    95.0
             442          UD   0.076
                          *

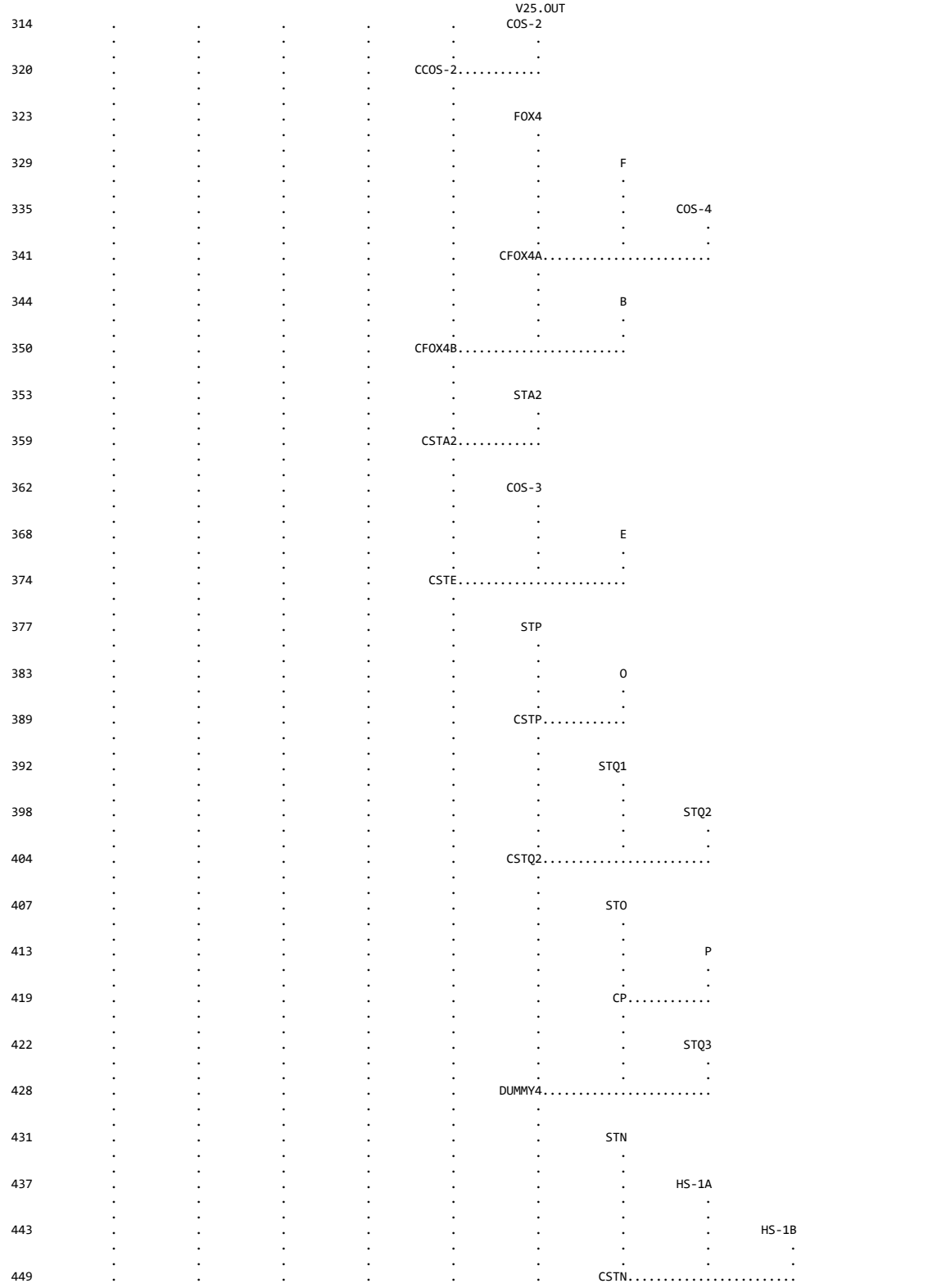
             443          KK   HS-1B
             444          KM   ONSITE BASIN
             445          BA  0.0778
             446          PB    3.44
             447          LS       0    94.3
             448          UD   0.078
                          *

             449          KK    CSTN
             450          KM   COMBINE STN AND HS-1A AND HS-1B
             451          HC       3
                          *
             452          ZZ
1
                  SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
```

LINE (V) ROUTING (---->) DIVERSION OR PUMP FLOW
NO. (.) CONNECTOR (<----) RETURN OF DIVERTED OR PUMPED FLOW




L
CL
RES4
CRES4
RES3
M
CRES3
STAA
CSTAA
DUMMY1
FOX1
FOX2
CP-1
FOX3
N
DUMMY2
SUMM
G
DUMMY3
D
FOX5B
COS-1
CCOS-1
FOX5A
A
CFOX5
C
STA1
CC



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1****************************************                    ****************************************
 *                                      *                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998              *                    *    HYDROLOGIC ENGINEERING CENTER     *
 *           VERSION 4.1                *                    *          609 SECOND STREET           *
```

* RUN DATE   23APR19 TIME 16:32:39 *
*   DAVIS, CALIFORNIA 95616   *
*   (916) 756-1104   *

ULTIMATE CONDITION HYDROLOGIC MODEL
OFFSITE BASINS DRAINING TO STUB AT STREET A
INPUT FILE DATE = JUNE 27, 2018
DESIGN STORM = 100-YEAR 6-HR STORM
STORM DISTRIBUTION = SDN #3
MODELED BY VTN (AH)

****
* SUMMERLIN WEST VILLAGE 25 *
****

JR CARD RATIOS REPRESENT DEPTH-AREA REDUCTION FACTORS (DARF'S)

100-YEAR, 6-HOUR STORM, SDN3

```
   18 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                        NMIN           5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1    0  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2    0  ENDING DATE
                      NDTIME        0055  ENDING TIME
                       ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL     .08 HOURS
                       TOTAL TIME BASE   24.92 HOURS

          ENGLISH UNITS
               DRAINAGE AREA         SQUARE MILES
               PRECIPITATION DEPTH   INCHES
               LENGTH, ELEVATION     FEET
               FLOW                  CUBIC FEET PER SECOND
               STORAGE VOLUME        ACRE-FEET
               SURFACE AREA          ACRES
               TEMPERATURE           DEGREES FAHRENHEIT

      JP          MULTI-PLAN OPTION
                        NPLAN           1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                     1.00
1

               PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                                   FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                                TIME TO PEAK IN HOURS


                                                                        RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION     AREA    PLAN            RATIO 1
                                                        1.00

 HYDROGRAPH AT
+                     J       .03     1   FLOW          69.
                                           TIME         3.50

 HYDROGRAPH AT
+                    STM       .01     1   FLOW          20.
                                           TIME         3.50

 HYDROGRAPH AT
+                   V30-P       .02     1   FLOW          39.
                                           TIME         3.50

   3 COMBINED AT
+                    CJP       .05     1   FLOW         128.
                                           TIME         3.50

 HYDROGRAPH AT
+                    DC-1       .02     1   FLOW          56.
                                           TIME         3.50
```

```
  2 COMBINED AT
+                  CDC-1       .07     1   FLOW         184.
                                             TIME         3.50

 HYDROGRAPH AT
+                  V30-Q       .01     1   FLOW          37.
                                             TIME         3.50

  2 COMBINED AT
+                     CQ       .09     1   FLOW         221.
                                             TIME         3.50

 HYDROGRAPH AT
+                      I       .02     1   FLOW          53.
                                             TIME         3.50

  2 COMBINED AT
+                     CI       .11     1   FLOW         274.
                                             TIME         3.50

 HYDROGRAPH AT
+                  V30-R       .01     1   FLOW          35.
                                             TIME         3.50

  2 COMBINED AT
+                     CR       .12     1   FLOW         308.
                                             TIME         3.50

 HYDROGRAPH AT
+                  V30-S       .02     1   FLOW          49.
                                             TIME         3.50

 HYDROGRAPH AT
+                  V30-U       .01     1   FLOW          20.
                                             TIME         3.50

 HYDROGRAPH AT
+                  V30-W       .01     1   FLOW          25.
                                             TIME         3.50

  4 COMBINED AT
+                   CUWS       .16     1   FLOW         403.
                                             TIME         3.50

 HYDROGRAPH AT
+                   SKY0       .01     1   FLOW          14.
                                             TIME         3.58

  2 COMBINED AT
+                  CSKY0       .17     1   FLOW         416.
                                             TIME         3.50

 HYDROGRAPH AT
+                   SKY1       .01     1   FLOW          16.
                                             TIME         3.50

 HYDROGRAPH AT
+                      H       .02     1   FLOW          48.
                                             TIME         3.50

  2 COMBINED AT
+                     CH       .02     1   FLOW          64.
                                             TIME         3.50

 HYDROGRAPH AT
+                   ES-1       .02     1   FLOW          42.
                                             TIME         3.50

  2 COMBINED AT
+                  CES-1       .04     1   FLOW         106.
                                             TIME         3.50

 HYDROGRAPH AT
+                   SKY2       .01     1   FLOW          17.
                                             TIME         3.50

 HYDROGRAPH AT
+                   NP-1       .00     1   FLOW           9.
                                             TIME         3.50

  3 COMBINED AT
+                  CNP-1       .05     1   FLOW         132.
                                             TIME         3.50

 HYDROGRAPH AT
+                    STL       .01     1   FLOW          28.
                                             TIME         3.58

 HYDROGRAPH AT
```

```
+                     K       .03     1   FLOW          86.
                                          TIME         3.50

  2 COMBINED AT
+                    CK       .05     1   FLOW         113.
                                          TIME         3.50

 HYDROGRAPH AT
+                     L       .02     1   FLOW          53.
                                          TIME         3.50

  2 COMBINED AT
+                    CL       .07     1   FLOW         167.
                                          TIME         3.50

 HYDROGRAPH AT
+                   RES4       .00     1   FLOW           7.
                                          TIME         3.50

  2 COMBINED AT
+                  CRES4       .07     1   FLOW         174.
                                          TIME         3.50

 HYDROGRAPH AT
+                   RES3       .00     1   FLOW           9.
                                          TIME         3.50

 HYDROGRAPH AT
+                     M       .02     1   FLOW          46.
                                          TIME         3.50

  3 COMBINED AT
+                  CRES3       .09     1   FLOW         229.
                                          TIME         3.50

 HYDROGRAPH AT
+                   STAA       .00     1   FLOW           2.
                                          TIME         3.50

  2 COMBINED AT
+                  CSTAA       .09     1   FLOW         231.
                                          TIME         3.50

  2 COMBINED AT
+                 DUMMY1       .14     1   FLOW         363.
                                          TIME         3.50

 HYDROGRAPH AT
+                   FOX1       .01     1   FLOW          14.
                                          TIME         3.50

 HYDROGRAPH AT
+                   FOX2       .00     1   FLOW           5.
                                          TIME         3.50

 HYDROGRAPH AT
+                   CP-1       .15     1   FLOW         282.
                                          TIME         3.50

 HYDROGRAPH AT
+                   FOX3       .00     1   FLOW           7.
                                          TIME         3.50

 HYDROGRAPH AT
+                     N       .02     1   FLOW          40.
                                          TIME         3.50

  6 COMBINED AT
+                 DUMMY2       .31     1   FLOW         712.
                                          TIME         3.50

 HYDROGRAPH AT
+                   SUMM       .00     1   FLOW           7.
                                          TIME         3.50

 HYDROGRAPH AT
+                     G       .02     1   FLOW          45.
                                          TIME         3.50

  3 COMBINED AT
+                 DUMMY3       .33     1   FLOW         764.
                                          TIME         3.50

 HYDROGRAPH AT
+                     D       .04     1   FLOW         105.
                                          TIME         3.50

 HYDROGRAPH AT
+                  FOX5B       .00     1   FLOW          12.
```

```
                                        TIME         3.50

 HYDROGRAPH AT
+                 COS-1       .01     1   FLOW          9.
                                           TIME         3.58

  2 COMBINED AT
+                CCOS-1       .01     1   FLOW         20.
                                           TIME         3.58

 HYDROGRAPH AT
+                 FOX5A       .00     1   FLOW         11.
                                           TIME         3.58

 HYDROGRAPH AT
+                     A       .03     1   FLOW         81.
                                           TIME         3.50

  3 COMBINED AT
+                 CFOX5       .05     1   FLOW        111.
                                           TIME         3.50

 HYDROGRAPH AT
+                     C       .04     1   FLOW         99.
                                           TIME         3.50

 HYDROGRAPH AT
+                  STA1       .00     1   FLOW         10.
                                           TIME         3.50

  2 COMBINED AT
+                    CC       .05     1   FLOW        109.
                                           TIME         3.50

 HYDROGRAPH AT
+                 COS-2       .00     1   FLOW          5.
                                           TIME         3.58

  2 COMBINED AT
+                CCOS-2       .05     1   FLOW        114.
                                           TIME         3.50

 HYDROGRAPH AT
+                  FOX4       .00     1   FLOW         14.
                                           TIME         3.50

 HYDROGRAPH AT
+                     F       .02     1   FLOW         43.
                                           TIME         3.50

 HYDROGRAPH AT
+                 COS-4       .01     1   FLOW         16.
                                           TIME         3.50

  3 COMBINED AT
+                CFOX4A       .03     1   FLOW         73.
                                           TIME         3.50

 HYDROGRAPH AT
+                     B       .03     1   FLOW         76.
                                           TIME         3.50

  3 COMBINED AT
+                CFOX4B       .11     1   FLOW        263.
                                           TIME         3.50

 HYDROGRAPH AT
+                  STA2       .00     1   FLOW         12.
                                           TIME         3.50

  2 COMBINED AT
+                 CSTA2       .11     1   FLOW        275.
                                           TIME         3.50

 HYDROGRAPH AT
+                 COS-3       .00     1   FLOW          8.
                                           TIME         3.50

 HYDROGRAPH AT
+                     E       .03     1   FLOW         65.
                                           TIME         3.50

  3 COMBINED AT
+                  CSTE       .14     1   FLOW        348.
                                           TIME         3.50

 HYDROGRAPH AT
+                   STP       .00     1   FLOW          9.
                                           TIME         3.50
```

```
 HYDROGRAPH AT
+                     O       .03     1   FLOW          46.
                                           TIME         3.58

  2 COMBINED AT
+                  CSTP       .03     1   FLOW          55.
                                           TIME         3.50

 HYDROGRAPH AT
+                  STQ1       .00     1   FLOW          11.
                                           TIME         3.50

 HYDROGRAPH AT
+                  STQ2       .00     1   FLOW          10.
                                           TIME         3.50

  3 COMBINED AT
+                 CSTQ2       .04     1   FLOW          76.
                                           TIME         3.50

 HYDROGRAPH AT
+                   STO       .01     1   FLOW          17.
                                           TIME         3.50

 HYDROGRAPH AT
+                     P       .02     1   FLOW          42.
                                           TIME         3.50

  2 COMBINED AT
+                    CP       .02     1   FLOW          59.
                                           TIME         3.50

 HYDROGRAPH AT
+                  STQ3       .01     1   FLOW          18.
                                           TIME         3.50

  3 COMBINED AT
+                DUMMY4       .07     1   FLOW         153.
                                           TIME         3.50

 HYDROGRAPH AT
+                   STN       .01     1   FLOW          27.
                                           TIME         3.58

 HYDROGRAPH AT
+                 HS-1A       .02     1   FLOW          47.
                                           TIME         3.50

 HYDROGRAPH AT
+                 HS-1B       .08     1   FLOW         195.
                                           TIME         3.50

  3 COMBINED AT
+                  CSTN       .11     1   FLOW         266.
                                           TIME         3.50


 *** NORMAL END OF HEC-1 ***
```

CITY OF LAS VEGAS
INTER-OFFICE MEMORANDUM

DATE: June 18, 2019

TO:
Land Development Services
Department of Building & Safety

FROM:
Albert Sung, P.E.
Flood Control Project Engineer
Department of Public Works

SUBJECT: Drainage Study for:
Master Conceptual Drainage Study
For Summerlin West Village 25

COPIES TO:
VTN Nevada
Howard Hughes Company, LLC
Bart Anderson, P.E., DevCo
CCRFCD

Cross Streets:	Sky Vista Drive and Far Hills Avenue		
File Number:	F:\Depot\DSMemos\DS5104D.doc		
Parcel Number:	137-22-101-001, 137-21-000-002		
Zoning Action:	MDR-75107 & PMP-74780		
FEMA Flood Zone	YES	NO **X**	
Proposed Storm Drain	YES **X**	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	2/20/2019	2/27/2019 & 3/20/2019	Not Approved	$400.00	503292: $400
2nd Submittal	4/4/2019	4/17/2019	Not Approved	$400.00	3081574: $400
3rd Submittal	4/25/2019	5/9/2019	Conditional Approval	$400.00	3105175: $400
CCRFCD	6/10/2019	6/18/2019	Concurrence Recv'd	N/C	N/C
			TOTAL FEES (LDDRS):	**$1,200.00**	----

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.

1. The *Grand Park Detention Basin* is proposed to regulate and meter outflow to match the previously approved downstream flow conditions at the junction of *Far Hills* storm drain and the *Beltway Channel*. Without the *Grand Park Detention Basin*, there will be a net increase in flows at the *Beltway Channel* downstream of *Far Hills* intersection exceeding the previously approved flow.

   A technical drainage study for the analysis, design and construction plans for the *Grand Park Detention Basin* must be submitted and approved by the City prior to the individual onsite parcel developments.

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
WSP/AYS

T/R/S: T20S/R59E/22
AREA K-22

REGIONAL FLOOD CONTROL DISTRICT

Steven C. Parrish, P.E.
General Manager/Chief Engineer

BOARD OF DIRECTORS

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Clark County

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Dr. Lois Tarkanian
City of Las Vegas

Mayor Rodney Woodbury
City of Boulder City

June 6, 2019

Mr. Oh Sang Kwon, P.E.
City of Las Vegas Department of Public Works
333 North Rancho Drive
Las Vegas, NV 89106

DISTRICT CONCURRENCE: **MASTER CONCEPTUAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 25 (DS5104C) (RFCD No. 19-11268)**

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Conceptual Drainage Study dated February 20, 2019, Addendum No. 1 dated April 4, 2019, Addendum No. 2 dated April 25, 2019 for above-mentioned project as submitted by VTN NEVADA. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Department of Public Works dated May 9, 2019.

District concurs with acceptance of this Technical Drainage Study by City of Las Vegas Department of Public Works.

District's review of this project was limited to issues of Regional Flood Control Significance as defined in *Uniform Regulations for the Control of Drainage*.

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, information submitted by VTN NEVADA may be superseded. Compliance with regulatory elements and design standards specified in *Uniform Regulations for the Control of Drainage* does not imply a guarantee that properties will be free from flooding or flood damage. The District, its officials, or employees assume no liability for information, data, or conclusions presented by consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review.

STEVEN C. PARRISH, P.E.
General Manager/Chief Engineer

BY:
Ching C. Wang, P.E.
Senior Civil Engineer

CCW:cr

c: Brian Troy Ruiz, P.E., VTN Nevada

P:\Letters and Memos\Local Drainage\Land Development & Drainage\2019\L-19-11268.doc

600 S. Grand Central Parkway, Suite 300 • Las Vegas, Nevada 89106-4511
(702) 685-0000 • FAX: (702) 685-0001
Website: http://www.regionalflood.org

Appendix B. Hydrology Appendix

B.1. Parameters

B.2. HEC-1 Model

B.1 Parameters

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (Street M)
Park Drift Trail (Sttreet K) to Sky Vista Drive

BASIN ID	LAND USE INDEX NUMBER	LAND USE DESCRIPTION	SOIL MAP UNIT #	SUBREGION CN	SUBREGION AREA (SQ FT)	SUBBASIN AREA (SQ FT)	PERCENT OF SUBBASIN	CUMULATIVE PERCENT	AREAL WEIGHTED CN	CUMULATIVE CN	COMPOSITE CN
INT-J	1	Undeveloped Land, Open Desert	1731	85	736164	736164	100.0%	100.0%	85.00	85.00	**85.0**
INT-DC	1	Undeveloped Land, Open Desert	1731	85	654271	654271	100.0%	100.0%	85.00	85.00	**85.0**
INT-PQ	1	Undeveloped Land, Open Desert	1731	85	866844	866844	100.0%	100.0%	85.00	85.00	**85.0**
StrM-1N	7	Public Facility and Residential, 8-12 units/acre	1731	93	12771	12771	100.0%	100.0%	93.00	93.00	**93.0**
StrM-1S	7	Public Facility and Residential, 8-12 units/acre	1731	93	13157	13157	100.0%	100.0%	93.00	93.00	**93.0**
StrM-2N	7	Public Facility and Residential, 8-12 units/acre	1731	93	12261	12261	100.0%	100.0%	93.00	93.00	**93.0**
StrM-2S	7	Public Facility and Residential, 8-12 units/acre	1731	93	13186	13186	100.0%	100.0%	93.00	93.00	**93.0**
StrM-3N	7	Public Facility and Residential, 8-12 units/acre	1731	93	15045	31097	48.4%	48.4%	44.99	44.99	
StrM-3S	7	Public Facility and Residential, 8-12 units/acre	1731	93	12549	25097	50.0%	50.0%	46.50	46.50	
StrM-3N	7	Public Facility and Residential, 8-12 units/acre	1156	93	16052	31097	51.6%	51.6%	48.01	93.00	**93.0**
StrM-3S	7	Public Facility and Residential, 8-12 units/acre	1156	93	12548	25097	50.0%	50.0%	46.50	93.00	**93.0**

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL
TIME OF CONCENTRATION

ATKINS
Member of the SNC-Lavalin Group

TDS for Summerlin West Village 25
Sandstone Rise Drive (Street M)
Park Drift Trail (Street K) to Sky Vista Drive

BY: JLK
DATE: 9/17/19

INTERIM CONDITION

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc	Tc Check	Tlag
DESIG: (1)	DEV./EX. (D or E)	CN	K (2)	AREA Ac (3)	AREA Mi^2	INITIAL LENGTH Feet (4)	SLOPE % (5)	Ti Min (6)	TRAVEL LENGTH Feet (7)	SLOPE % (8)	V1 VELOCITY FPS (9a)	V2 VELOCITY FPS (9b)	Tt Min (10)	Min (13)	Min (14)	Tlag= 0.6Tc/60 Hours
INT-J	E	85.0	0.732	16.90	0.02641	100	9.8	3.1	895	8.1	4.2	8.3	2.8	5.9	N/A	**0.100****
INT-DC	E	85.0	0.732	15.02	0.02347	200	1.0	9.4	490	6.6	3.8	7.5	2.2	11.5	N/A	**0.115**
INT-PQ	E	85.0	0.732	19.90	0.03109	100	12.9	2.8	1050	6.8	3.8	7.6	3.4	6.2	N/A	**0.100****
StrM-1N	D	93.0	0.838	0.29	0.00046	24	2.0	1.8	537	6.2	5.0	7.6	1.7	3.6	13.1	**0.050***
StrM-1S	D	93.0	0.838	0.30	0.00047	24	2.0	1.8	543	6.4	5.1	7.8	1.7	3.6	13.1	**0.050***
StrM-2N	D	93.0	0.838	0.28	0.00044	24	2.0	1.8	512	7.0	5.3	8.1	1.6	3.4	13.0	**0.050***
StrM-2S	D	93.0	0.838	0.30	0.00047	24	2.0	1.8	549	7.0	5.3	8.1	1.7	3.5	13.2	**0.050***
StrM-3N	D	93.0	0.838	0.71	0.00112	24	2.0	1.8	1115	6.1	5.0	7.6	3.0	4.9	16.3	**0.050***
StrM-3S	D	93.0	0.838	0.58	0.00090	24	2.0	1.8	1044	6.4	5.1	7.7	2.8	4.6	15.9	**0.050***

Tc = Ti + Tt Tlag = 0.6 Tc
Ti = 1.8 (1.1 - K) L^1/2 / S^1/3
K = 0.0132 (CN) - 0.39
Tc Check = L/180+10

For the travel time (Tt) calculations,
V1 applies to the first 500 feet of travel distance;
V2 applies to the remaining travel distance.

Existing: V1 = 14.8*(S/100)^1/2 Developed: V1 = 20.2*(S/100)^1/2
Existing: V2 = 29.4*(S/100)^1/2 Developed: V2 = 30.6*(S/100)^1/2

REFERENCE : **STANDARD FORM 4**

*Minimum recommended Tc for developed subbasins is 5 mins. A value of 0.05 was use for the Tlag where the calculated Tc was less than 5 mins.

**Minimum recommended Tc for undeveloped subbasins is 10 mins. A value of 0.10 was use for the Tlag where the calculated Tc was less than 10 mins.

B.2 HEC-1 Model

```
1****************************************                 ****************************************
 *                                      *                 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                 *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998              *                 *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                 *          609 SECOND STREET           *
 *                                      *                 *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   17SEP19  TIME  17:47:06  *                 *           (916) 756-1104             *
 *                                      *                 *                                      *
 ****************************************                 ****************************************

                                        X     X  XXXXXXX   XXXXX          X
                                        X     X  X       X     X        XX
                                        X     X  X       X               X
                                        XXXXXXX  XXXX    X        XXXXX  X
                                        X     X  X       X               X
                                        X     X  X       X     X         X
                                        X     X  XXXXXXX   XXXXX        XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
          LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

                    *DIAGRAM
 *** FREE ***
             1      ID  TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 25
             2      ID  SANDSTONE RISE DRIVE (STREEET M)
             3      ID  PARK DRIFT TRAIL (STREET K) TO SKY VISTA DRIVE
             4      ID  DESIGN STORM 100-YEAR 6 HOUR
             5      ID
             6      ID  JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES
             7      ID
             8      ID    AREA (SQUARE MILES)           DARF
             9      ID
            10      ID          0 - 0.5                 0.99
            11      ID          ESTIMATED 10-YR         0.57
            12      ID
            13      IT       5       0       0     300
            14      IO       5       0       0
            15      IN       5       0       0
            16      JR    PREC    0.99    0.57
                    *

            17      KK   INT-J
            18      KM  REFERENCED FROM ADDENDUM #2 TO THE MCDS FOR SUMMERLIN WEST VILLAGE 25 (W.O. 79
            19      BA 0.02640
            20      PB    3.49
            21      PC   0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
            22      PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
            23      PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
            24      PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
            25      PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
            26      PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
            27      PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
            28      PC   0.998   0.999   1.000
            29      LS       0    93.0
            30      UD   0.100
                    *

            31      KK  STM-1N
            32      BA 0.00046
            33      PB    3.55
            34      LS       0    93.0
            35      UD   0.050
                    *

            36      KK     MH1
            37      HC       2
                    *

            38      KK  STM-1S
            39      BA 0.00047
            40      PB    3.43
            41      LS       0    93.0
            42      UD   0.050
                    *
```

1 HEC-1 INPUT PAGE 2

```
          LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

            43      KK     DI2
            44      HC       2
                    *

            45      KK  STM-2N
            46      BA 0.00044
            47      PB    3.43
```

```
             48           LS       0    93.0
             49           UD   0.050
                          *

             50           KK     MH3
             51           HC       2
                          *

             52           KK  INT-PQ
             53           BA 0.03109
             54           PB    3.43
             55           LS       0    85.0
             56           UD   0.100
                          *

             57           KK  STM-2S
             58           BA 0.00047
             59           PB    3.43
             60           LS       0    93.0
             61           UD   0.050
                          *

             62           KK     DI4
             63           HC       3
                          *

             64           KK  INT-DC
             65           BA 0.02347
             66           PB    3.43
             67           LS       0    85.0
             68           UD   0.115
                          *

             69           KK     MH5
             70           HC       2
                          *

             71           KK  STM-3N
             72           BA 0.00112
             73           PB    3.43
             74           LS       0    93.0
             75           UD   0.050
                          *
```



```
          LINE           ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

             76           KK  STM-3S
             77           BA 0.00090
             78           PB    3.43
             79           LS       0    93.0
             80           UD   0.050
                          *

             81           KK    MH10
             82           HC       3
                          *
             83           ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

```
 INPUT
  LINE      (V) ROUTING          (---->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<----) RETURN OF DIVERTED OR PUMPED FLOW

    17       INT-J
                 .
                 .
    31           .      STM-1N
                 .           .
                 .           .
    36         MH1............
                 .
                 .
    38           .      STM-1S
                 .           .
                 .           .
    43         DI2............
                 .
                 .
    45           .      STM-2N
                 .           .
                 .           .
    50         MH3............
                 .
                 .
    52           .      INT-PQ
                 .           .
                 .           .
    57           .           .      STM-2S
                 .           .           .
                 .           .           .
    62         DI4.........................
                 .
                 .
    64           .      INT-DC
                 .           .
                 .           .
    69         MH5............
                 .
```

```
                .
   71           .      STM-3N
                .           .
                .           .
   76           .           .      STM-3S
                .           .           .
                .           .           .
   81        MH10.......................

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
```

```
1****************************************                ****************************************
 *                                      *                *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                *    HYDROLOGIC ENGINEERING CENTER     *
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 *                                      *                *                                      *
 ****************************************                ****************************************
```

TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREEET M)
PARK DRIFT TRAIL (STREET K) TO SKY VISTA DRIVE
DESIGN STORM 100-YEAR 6 HOUR

JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES

AREA (SQUARE MILES)	DARF
0 - 0.5	0.99
ESTIMATED 10-YR	0.57

```
   14 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                        NMIN           5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1    0  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2    0  ENDING DATE
                      NDTIME        0055  ENDING TIME
                       ICENT          19  CENTURY MARK

                    COMPUTATION INTERVAL     .08 HOURS
                         TOTAL TIME BASE   24.92 HOURS

           ENGLISH UNITS
                DRAINAGE AREA         SQUARE MILES
                PRECIPITATION DEPTH   INCHES
                LENGTH, ELEVATION     FEET
                FLOW                  CUBIC FEET PER SECOND
                STORAGE VOLUME        ACRE-FEET
                SURFACE AREA          ACRES
                TEMPERATURE           DEGREES FAHRENHEIT

      JP          MULTI-PLAN OPTION
                       NPLAN           1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                      .99       .57
1
```

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .99	RATIO 2 .57
HYDROGRAPH AT						
+	INT-J	.03	1	FLOW	60.	30.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	STM-1N	.00	1	FLOW	1.	1.
				TIME	3.50	3.50
2 COMBINED AT						
+	MH1	.03	1	FLOW	61.	31.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	STM-1S	.00	1	FLOW	1.	1.
				TIME	3.50	3.50
2 COMBINED AT						
+	DI2	.03	1	FLOW	63.	32.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	STM-2N	.00	1	FLOW	1.	1.

				TIME	3.50	3.50
2 COMBINED AT						
+	MH3	.03	1	FLOW	64.	32.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	INT-PQ	.03	1	FLOW	54.	22.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	STM-2S	.00	1	FLOW	1.	1.
				TIME	3.50	3.50
3 COMBINED AT						
+	DI4	.06	1	FLOW	119.	55.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	INT-DC	.02	1	FLOW	39.	16.
				TIME	3.58	3.58
2 COMBINED AT						
+	MH5	.08	1	FLOW	158.	70.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	STM-3N	.00	1	FLOW	3.	2.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	STM-3S	.00	1	FLOW	2.	1.
				TIME	3.50	3.50
3 COMBINED AT						
+	MH10	.08	1	FLOW	163.	73.
				TIME	3.50	3.50

*** NORMAL END OF HEC-1 ***

Appendix C. Hydraulics Appendix

C.1. Drop Inlet Calculations

C.2. Normal Depth Calculations

C.3. Interim Condition WSPG-W Model

C.4. Ultimate Condition WSPG-W Model

C.5. Rip-rap Calculations

C.1 Drop Inlet Calculations

Worksheet for 1N Combination Inlet On Grade - 6.9%

Project Description	
Solve For	Efficiency

Input Data		
Discharge	1.00	cfs
Slope	0.069	ft/ft
Gutter Width	1.50	ft
Gutter Cross Slope	0.080	ft/ft
Road Cross Slope	0.020	ft/ft
Roughness Coefficient	0.016	
Local Depression	4.0	in
Local Depression Width	24.0	in
Grate Width	1.50	ft
Grate Length	3.0	ft
Grate Type	Curved Vaned	
Clogging	50.0	%
Curb Opening Length	5.5	ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	100.00	%
Intercepted Flow	1.00	cfs
Bypass Flow	0.00	cfs
Spread	3.7	ft
Depth	2.0	in
Flow Area	0.2	ft^2
Gutter Depression	1.1	in
Total Depression	5.1	in
Velocity	4.91	ft/s
Splash Over Velocity	5.14	ft/s
Frontal Flow Factor	1.000	
Side Flow Factor	0.019	
Grate Flow Ratio	0.891	
Equivalent Cross Slope	0.209	ft/ft
Active Grate Length	1.5	ft
Length Factor	0.486	
Total Interception Length	8.2	ft

Messages

Worksheet for 1N Combination Inlet On Grade - 6.9%

Messages		
Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).	

Worksheet for 1S Combination Inlet On Grade - 6.9%

Project Description	
Solve For	Efficiency

Input Data		
Discharge	1.00	cfs
Slope	0.069	ft/ft
Gutter Width	1.50	ft
Gutter Cross Slope	0.080	ft/ft
Road Cross Slope	0.020	ft/ft
Roughness Coefficient	0.016	
Local Depression	4.0	in
Local Depression Width	24.0	in
Grate Width	1.50	ft
Grate Length	3.0	ft
Grate Type	Curved Vaned	
Clogging	50.0	%
Curb Opening Length	5.5	ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	100.00	%
Intercepted Flow	1.00	cfs
Bypass Flow	0.00	cfs
Spread	3.7	ft
Depth	2.0	in
Flow Area	0.2	ft^2
Gutter Depression	1.1	in
Total Depression	5.1	in
Velocity	4.91	ft/s
Splash Over Velocity	5.14	ft/s
Frontal Flow Factor	1.000	
Side Flow Factor	0.019	
Grate Flow Ratio	0.891	
Equivalent Cross Slope	0.209	ft/ft
Active Grate Length	1.5	ft
Length Factor	0.486	
Total Interception Length	8.2	ft

Messages

Worksheet for 1S Combination Inlet On Grade - 6.9%

Messages		
Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).	

Worksheet for 2N Combination Inlet On Grade - 6.9%

Project Description	
Solve For	Efficiency

Input Data		
Discharge	1.00	cfs
Slope	0.069	ft/ft
Gutter Width	1.50	ft
Gutter Cross Slope	0.080	ft/ft
Road Cross Slope	0.020	ft/ft
Roughness Coefficient	0.016	
Local Depression	4.0	in
Local Depression Width	24.0	in
Grate Width	1.50	ft
Grate Length	3.0	ft
Grate Type	Curved Vaned	
Clogging	50.0	%
Curb Opening Length	5.5	ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	100.00	%
Intercepted Flow	1.00	cfs
Bypass Flow	0.00	cfs
Spread	3.7	ft
Depth	2.0	in
Flow Area	0.2	ft^2
Gutter Depression	1.1	in
Total Depression	5.1	in
Velocity	4.91	ft/s
Splash Over Velocity	5.14	ft/s
Frontal Flow Factor	1.000	
Side Flow Factor	0.019	
Grate Flow Ratio	0.891	
Equivalent Cross Slope	0.209	ft/ft
Active Grate Length	1.5	ft
Length Factor	0.486	
Total Interception Length	8.2	ft

Messages

Worksheet for 2N Combination Inlet On Grade - 6.9%

Messages		
Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).	

Worksheet for 2S Combination Inlet On Grade - 6.9%

Project Description	
Solve For	Efficiency

Input Data		
Discharge	1.00	cfs
Slope	0.069	ft/ft
Gutter Width	1.50	ft
Gutter Cross Slope	0.080	ft/ft
Road Cross Slope	0.020	ft/ft
Roughness Coefficient	0.016	
Local Depression	4.0	in
Local Depression Width	24.0	in
Grate Width	1.50	ft
Grate Length	3.0	ft
Grate Type	Curved Vaned	
Clogging	50.0	%
Curb Opening Length	5.5	ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	100.00	%
Intercepted Flow	1.00	cfs
Bypass Flow	0.00	cfs
Spread	3.7	ft
Depth	2.0	in
Flow Area	0.2	ft^2
Gutter Depression	1.1	in
Total Depression	5.1	in
Velocity	4.91	ft/s
Splash Over Velocity	5.14	ft/s
Frontal Flow Factor	1.000	
Side Flow Factor	0.019	
Grate Flow Ratio	0.891	
Equivalent Cross Slope	0.209	ft/ft
Active Grate Length	1.5	ft
Length Factor	0.486	
Total Interception Length	8.2	ft

Messages

Worksheet for 2S Combination Inlet On Grade - 6.9%

Messages		
Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).	

Worksheet for 1 Grand Park Combination Inlet On Grade - 1%

Project Description	
Solve For	Efficiency

Input Data		
Discharge	1.00	cfs
Slope	0.010	ft/ft
Gutter Width	1.50	ft
Gutter Cross Slope	0.080	ft/ft
Road Cross Slope	0.020	ft/ft
Roughness Coefficient	0.016	
Local Depression	4.0	in
Local Depression Width	24.0	in
Grate Width	1.50	ft
Grate Length	3.0	ft
Grate Type	Curved Vaned	
Clogging	50.0	%
Curb Opening Length	5.5	ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	100.00	%
Intercepted Flow	1.00	cfs
Bypass Flow	0.00	cfs
Spread	6.4	ft
Depth	2.6	in
Flow Area	0.5	ft^2
Gutter Depression	1.1	in
Total Depression	5.1	in
Velocity	2.12	ft/s
Splash Over Velocity	5.14	ft/s
Frontal Flow Factor	1.000	
Side Flow Factor	0.080	
Grate Flow Ratio	0.654	
Equivalent Cross Slope	0.158	ft/ft
Active Grate Length	1.5	ft
Length Factor	0.735	
Total Interception Length	5.4	ft

Messages

Worksheet for 1 Grand Park Combination Inlet On Grade - 1%

Messages		
Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).	

Worksheet for 2 Grand Park Combination Inlet On Grade - 1%

Project Description	
Solve For	Efficiency

Input Data	
Discharge	1.00 cfs
Slope	0.010 ft/ft
Gutter Width	1.50 ft
Gutter Cross Slope	0.080 ft/ft
Road Cross Slope	0.020 ft/ft
Roughness Coefficient	0.016
Local Depression	4.0 in
Local Depression Width	24.0 in
Grate Width	1.50 ft
Grate Length	3.0 ft
Grate Type	Curved Vaned
Clogging	50.0 %
Curb Opening Length	5.5 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	100.00 %
Intercepted Flow	1.00 cfs
Bypass Flow	0.00 cfs
Spread	6.4 ft
Depth	2.6 in
Flow Area	0.5 ft²
Gutter Depression	1.1 in
Total Depression	5.1 in
Velocity	2.12 ft/s
Splash Over Velocity	5.14 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.080
Grate Flow Ratio	0.654
Equivalent Cross Slope	0.158 ft/ft
Active Grate Length	1.5 ft
Length Factor	0.735
Total Interception Length	5.4 ft

Messages

Worksheet for 2 Grand Park Combination Inlet On Grade - 1%

Messages		
Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).	

Worksheet for 3N Combination Inlet On Grade - 5.11%

Project Description	
Solve For	Efficiency

Input Data		
Discharge	3.00	cfs
Slope	0.051	ft/ft
Gutter Width	1.50	ft
Gutter Cross Slope	0.080	ft/ft
Road Cross Slope	0.020	ft/ft
Roughness Coefficient	0.016	
Local Depression	4.0	in
Local Depression Width	24.0	in
Grate Width	1.50	ft
Grate Length	9.0	ft
Grate Type	Curved Vaned	
Clogging	50.0	%
Curb Opening Length	11.5	ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	96.76	%
Intercepted Flow	2.90	cfs
Bypass Flow	0.10	cfs
Spread	7.3	ft
Depth	2.8	in
Flow Area	0.6	ft^2
Gutter Depression	1.1	in
Total Depression	5.1	in
Velocity	5.05	ft/s
Splash Over Velocity	9.41	ft/s
Frontal Flow Factor	1.000	
Side Flow Factor	0.187	
Grate Flow Ratio	0.588	
Equivalent Cross Slope	0.144	ft/ft
Active Grate Length	4.5	ft
Length Factor	0.470	
Total Interception Length	14.9	ft

Messages

Worksheet for 3N Combination Inlet On Grade - 5.11%

Messages		
Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).	

Worksheet for 3S Combination Inlet On Grade - 5.11%

Project Description	
Solve For	Efficiency

Input Data	
Discharge	2.00 cfs
Slope	0.051 ft/ft
Gutter Width	1.50 ft
Gutter Cross Slope	0.080 ft/ft
Road Cross Slope	0.020 ft/ft
Roughness Coefficient	0.016
Local Depression	4.0 in
Local Depression Width	24.0 in
Grate Width	1.50 ft
Grate Length	6.0 ft
Grate Type	Curved Vaned
Clogging	50.0 %
Curb Opening Length	8.5 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	98.69 %
Intercepted Flow	1.97 cfs
Bypass Flow	0.03 cfs
Spread	6.0 ft
Depth	2.5 in
Flow Area	0.4 ft²
Gutter Depression	1.1 in
Total Depression	5.1 in
Velocity	4.70 ft/s
Splash Over Velocity	7.15 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.093
Grate Flow Ratio	0.683
Equivalent Cross Slope	0.165 ft/ft
Active Grate Length	3.0 ft
Length Factor	0.474
Total Interception Length	11.6 ft

Messages

Worksheet for 3S Combination Inlet On Grade - 5.11%

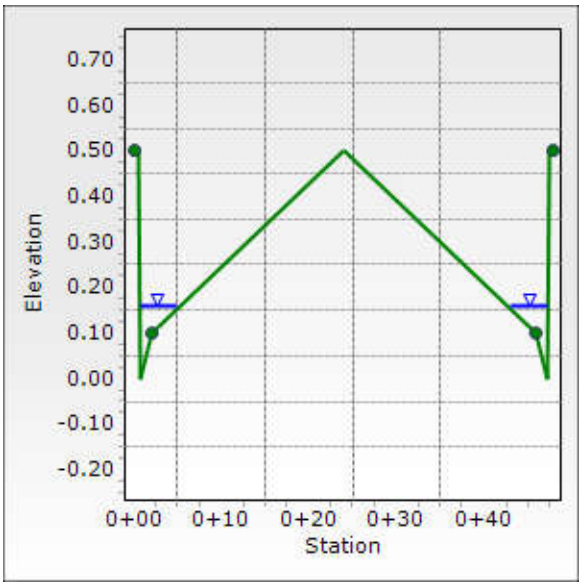
Messages		
Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).	

C.2 Normal Depth Calculations

Cross Section for Sandstone Rise Drive - DI 1&2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.069 ft/ft
Normal Depth	1.9 in
Discharge	2.00 cfs



Worksheet for Sandstone Rise Drive - DI 1&2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.069 ft/ft
Discharge	2.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	0.50
0+01	0.50
0+01	0.00
0+02	0.08
0+02	0.10
0+24	0.54
0+46	0.10
0+46	0.08
0+47	0.00
0+48	0.50
0+48	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 0.50)	(0+02, 0.08)	0.013
(0+02, 0.08)	(0+46, 0.08)	0.015
(0+46, 0.08)	(0+48, 0.50)	0.013

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	1.9 in
Elevation Range	0.0 to 0.5 ft
Flow Area	0.5 ft²
Wetted Perimeter	8.8 ft
Hydraulic Radius	0.7 in
Top Width	8.53 ft
Normal Depth	1.9 in
Critical Depth	2.7 in
Critical Slope	0.007 ft/ft

Worksheet for Sandstone Rise Drive - DI 1&2

Results	
Velocity	4.00 ft/s
Velocity Head	0.25 ft
Specific Energy	0.41 ft
Froude Number	2.911
Flow Type	Supercritical

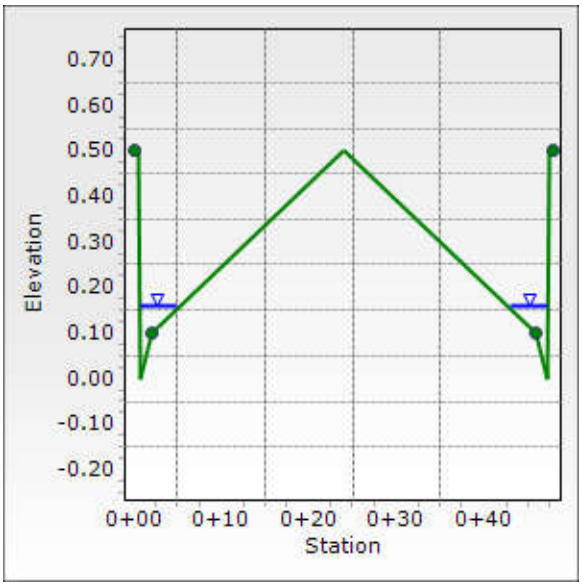
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.9 in
Critical Depth	2.7 in
Channel Slope	0.069 ft/ft
Critical Slope	0.007 ft/ft

Cross Section for Sandstone Rise Drive - DI 3&4

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.069 ft/ft
Normal Depth	1.9 in
Discharge	2.00 cfs



Worksheet for Sandstone Rise Drive - DI 3&4

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.069 ft/ft
Discharge	2.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	0.50
0+01	0.50
0+01	0.00
0+02	0.08
0+02	0.10
0+24	0.54
0+46	0.10
0+46	0.08
0+47	0.00
0+48	0.50
0+48	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 0.50)	(0+02, 0.08)	0.013
(0+02, 0.08)	(0+46, 0.08)	0.015
(0+46, 0.08)	(0+48, 0.50)	0.013

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	1.9 in
Elevation Range	0.0000 to 0.5442 ft
Flow Area	0.5 ft²
Wetted Perimeter	8.8 ft
Hydraulic Radius	0.7 in
Top Width	8.53 ft
Normal Depth	1.9 in
Critical Depth	2.7 in

Worksheet for Sandstone Rise Drive - DI 3&4

Results	
Critical Slope	0.007 ft/ft
Velocity	4.00 ft/s
Velocity Head	0.25 ft
Specific Energy	0.41 ft
Froude Number	2.911
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.9 in
Critical Depth	2.7 in
Channel Slope	0.069 ft/ft
Critical Slope	0.007 ft/ft

Cross Section for Grand Park Bouelvard

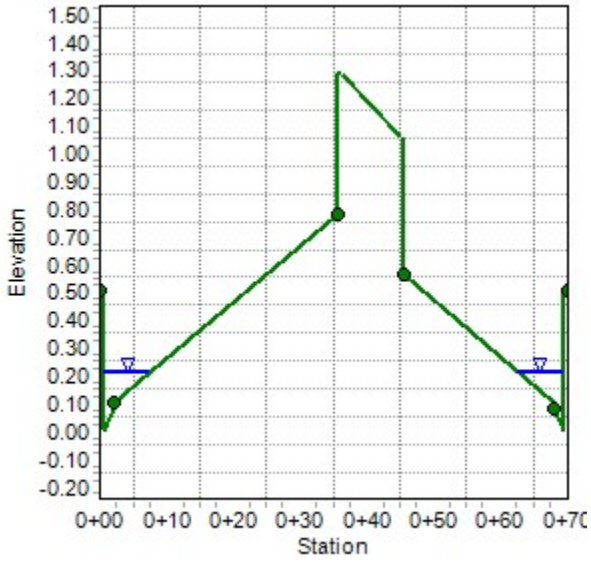
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01000	ft/ft
Normal Depth	0.21	ft
Discharge	2.00	ft³/s

Cross Section Image



Worksheet for Grand Park Bouelvard

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01000	ft/ft
Discharge	2.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.58	0.00
0+02.00	0.08
0+02.00	0.10
0+35.59	0.78
0+35.67	1.28
0+36.17	1.28
0+44.83	1.06
0+45.33	1.06
0+45.41	0.56
0+68.00	0.10
0+68.00	0.08
0+69.42	0.00
0+69.50	0.50
0+70.00	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.50)	(0+02.00, 0.10)	0.013
(0+02.00, 0.10)	(0+35.59, 0.78)	0.015
(0+35.59, 0.78)	(0+45.41, 0.56)	0.013
(0+45.41, 0.56)	(0+68.00, 0.08)	0.015
(0+68.00, 0.08)	(0+70.00, 0.50)	0.013

Worksheet for Grand Park Bouelvard

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		0.21	ft
Elevation Range	0.00 to 1.28 ft		
Flow Area		1.09	ft²
Wetted Perimeter		14.21	ft
Hydraulic Radius		0.08	ft
Top Width		13.80	ft
Normal Depth		0.21	ft
Critical Depth		0.22	ft
Critical Slope		0.00736	ft/ft
Velocity		1.84	ft/s
Velocity Head		0.05	ft
Specific Energy		0.27	ft
Froude Number		1.16	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

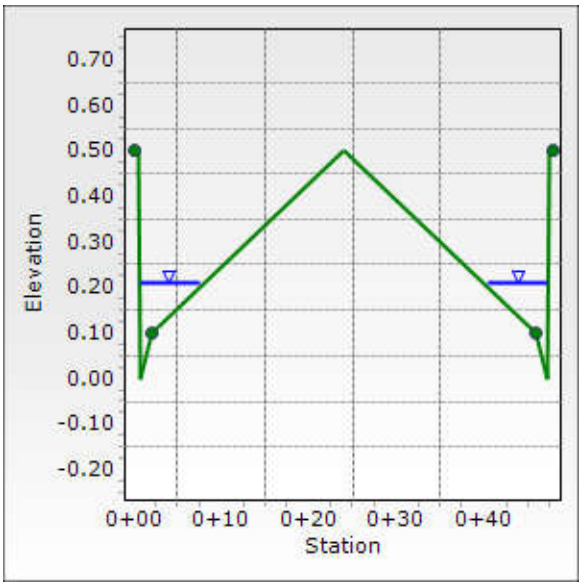
GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.21	ft
Critical Depth	0.22	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.00736	ft/ft

Cross Section for Sandstone Rise Drive - DI 9&10

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.064 ft/ft
Normal Depth	2.6 in
Discharge	5.00 cfs



Worksheet for Sandstone Rise Drive - DI 9&10

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.064 ft/ft
Discharge	5.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	0.50
0+01	0.50
0+01	0.00
0+02	0.08
0+02	0.10
0+24	0.54
0+46	0.10
0+46	0.08
0+47	0.00
0+48	0.50
0+48	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 0.50)	(0+02, 0.08)	0.013
(0+02, 0.08)	(0+46, 0.08)	0.015
(0+46, 0.08)	(0+48, 0.50)	0.013

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	2.6 in
Elevation Range	0.0000 to 0.5442 ft
Flow Area	1.1 ft²
Wetted Perimeter	14.2 ft
Hydraulic Radius	0.9 in
Top Width	13.76 ft
Normal Depth	2.6 in
Critical Depth	3.6 in

Worksheet for Sandstone Rise Drive - DI 9&10

Results	
Critical Slope	0.007 ft/ft
Velocity	4.63 ft/s
Velocity Head	0.33 ft
Specific Energy	0.55 ft
Froude Number	2.909
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	2.6 in
Critical Depth	3.6 in
Channel Slope	0.064 ft/ft
Critical Slope	0.007 ft/ft

C.3 Interim Condition WSPG-W Model

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)
T3 ATKINS / INTERIM CONDITIONS
SO      0.0003557.530  1                         3560.390
R     166.9803564.340  1      .013                                .000    .000 0
JX    168.9803564.440  1  2  2.013    2.000    3.0003565.94 3566.54  76.1-36.7    .000
R     171.9803564.540  1      .013                                .000  -4.601 1
R     229.4403567.500  1      .013                                .000    .000 0
R     234.4403567.700  1      .013                                .000  -3.551 1
R     585.7103584.960  1      .013                                .000    .000 0
R     590.7103585.160  1      .013                                .000  13.070 1
R     659.8703588.680  1      .013                                .000    .000 0
R     664.8703588.880  1      .013                                .000  -1.237 1
R     784.8403600.190  1      .013                                .000    .000 0
R     789.8403600.390  1      .013                                .000    .000 0
R    1053.9703623.050  1      .013                                .000    .000 0
JX   1055.9703623.150  1  4   .013   39.000         3625.25          90.0         .000
R    1058.9703623.250  1      .013                                .000    .188 1
R    1222.0603631.090  1      .013                                .000    .000 0
JX   1224.0603631.190  1  4   .013   55.000         3631.29         -89.8      .000
R    1227.0603631.290  1      .013                                .000   -.188 1
R    1288.6803633.430  1      .013                                .000    .000
JX   1290.6803633.530  3  2   .013    1.000         3640.48          90.0         .000
R    1293.6803633.630  3      .013                                .000    .000 1
R    1632.7703653.970  3      .013                                .000    .000 0
R    1637.7703654.170  3      .013                                .000    .241 1
R    1763.4203662.630  3      .013                                .000    .000 0
SH   1763.4203662.630  3                         3662.63
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q            63.000   .0
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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-14-2019 Time: 1:40:23

SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
.000	3557.530	2.129	3559.659	163.00	23.98	8.93	3568.59	.00	3.69	3.99	4.000	.000	.00	1 .0
166.980	.0408				.0432	7.21	2.13	3.24	2.14	.013	.00	.00	PIPE	
166.980	3564.340	2.088	3566.428	163.00	24.57	9.38	3575.80	.00	3.69	4.00	4.000	.000	.00	1 .0
JUNCT STR	.0499				.0473	.09	2.09	3.36		.013	.00	.00	PIPE	
168.980	3564.440	1.980	3566.420	158.00	25.47	10.07	3576.49	.00	3.65	4.00	4.000	.000	.00	1 .0
3.000	.0334				.0503	.15	1.98	3.60	2.24	.013	.00	.00	PIPE	
171.980	3564.540	1.976	3566.516	158.00	25.54	10.13	3576.65	.00	3.65	4.00	4.000	.000	.00	1 .0
57.460	.0515				.0502	2.88	1.98	3.62	1.96	.013	.00	.00	PIPE	
229.440	3567.500	1.982	3569.482	158.00	25.44	10.05	3579.53	.00	3.65	4.00	4.000	.000	.00	1 .0
5.000	.0400				.0501	.25	1.98	3.60	2.12	.013	.00	.00	PIPE	
234.440	3567.700	1.977	3569.677	158.00	25.51	10.11	3579.78	.00	3.65	4.00	4.000	.000	.00	1 .0
158.361	.0491				.0519	8.22	1.98	3.61	1.99	.013	.00	.00	PIPE	
392.801	3575.481	1.942	3577.424	158.00	26.10	10.58	3588.00	.00	3.65	4.00	4.000	.000	.00	1 .0
123.567	.0491				.0571	7.06	1.94	3.74	1.99	.013	.00	.00	PIPE	
516.369	3581.553	1.872	3583.425	158.00	27.38	11.64	3595.06	.00	3.65	3.99	4.000	.000	.00	1 .0
69.341	.0491				.0650	4.50	1.87	4.01	1.99	.013	.00	.00	PIPE	
585.710	3584.960	1.805	3586.764	158.00	28.71	12.80	3599.57	.00	3.65	3.98	4.000	.000	.00	1 .0
5.000	.0400				.0697	.35	1.80	4.30	2.12	.013	.00	.00	PIPE	

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-14-2019 Time: 1:40:23

SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
590.710	3585.160	1.796	3586.956	158.00	28.90	12.97	3599.92	.00	3.65	3.98	4.000	.000	.00	1 .0
24.105	.0509					.0723	1.74	1.80	4.34	1.97	.013	.00	.00	PIPE
614.815	3586.387	1.768	3588.154	158.00	29.50	13.51	3601.67	.00	3.65	3.97	4.000	.000	.00	1 .0
45.055	.0509					.0795	3.58	1.77	4.48	1.97	.013	.00	.00	PIPE
659.870	3588.680	1.705	3590.385	158.00	30.94	14.86	3605.25	.00	3.65	3.96	4.000	.000	.00	1 .0
5.000	.0400					.0856	.43	1.70	4.80	2.12	.013	.00	.00	PIPE
664.870	3588.880	1.694	3590.574	158.00	31.19	15.11	3605.68	.00	3.65	3.95	4.000	.000	.00	1 .0
37.237	.0943					.0852	3.17	1.69	4.86	1.65	.013	.00	.00	PIPE
702.107	3592.390	1.709	3594.099	158.00	30.84	14.77	3608.87	.00	3.65	3.96	4.000	.000	.00	1 .0
82.733	.0943					.0788	6.52	1.71	4.78	1.65	.013	.00	.00	PIPE
784.840	3600.190	1.772	3601.962	158.00	29.41	13.43	3615.39	.00	3.65	3.97	4.000	.000	.00	1 .0
5.000	.0400					.0744	.37	1.77	4.46	2.12	.013	.00	.00	PIPE
789.840	3600.390	1.763	3602.153	158.00	29.61	13.61	3615.76	.00	3.65	3.97	4.000	.000	.00	1 .0
7.160	.0858					.0748	.54	1.76	4.50	1.70	.013	.00	.00	PIPE
797.000	3601.004	1.767	3602.771	158.00	29.52	13.53	3616.30	.00	3.65	3.97	4.000	.000	.00	1 .0
73.585	.0858					.0700	5.15	1.77	4.48	1.70	.013	.00	.00	PIPE
870.585	3607.317	1.833	3609.150	158.00	28.14	12.30	3621.45	.00	3.65	3.99	4.000	.000	.00	1 .0
43.237	.0858					.0615	2.66	1.83	4.18	1.70	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-14-2019 Time: 1:40:23

SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
913.822	3611.027	1.901	3612.928	158.00	26.83	11.18	3624.11	.00	3.65	4.00	4.000	.000	.00	1 .0
29.830	.0858					.0541	1.61	1.90	3.90	1.70	.013	.00	.00	PIPE
943.652	3613.586	1.973	3615.559	158.00	25.58	10.16	3625.72	.00	3.65	4.00	4.000	.000	.00	1 .0
22.255	.0858					.0477	1.06	1.97	3.63	1.70	.013	.00	.00	PIPE
965.907	3615.495	2.048	3617.543	158.00	24.39	9.24	3626.78	.00	3.65	4.00	4.000	.000	.00	1 .0
17.371	.0858					.0420	.73	2.05	3.38	1.70	.013	.00	.00	PIPE
983.277	3616.985	2.128	3619.113	158.00	23.26	8.40	3627.51	.00	3.65	3.99	4.000	.000	.00	1 .0
13.954	.0858					.0370	.52	2.13	3.14	1.70	.013	.00	.00	PIPE
997.231	3618.182	2.211	3620.393	158.00	22.18	7.64	3628.03	.00	3.65	3.98	4.000	.000	.00	1 .0
11.421	.0858					.0327	.37	2.21	2.92	1.70	.013	.00	.00	PIPE
1008.652	3619.162	2.298	3621.460	158.00	21.14	6.94	3628.40	.00	3.65	3.96	4.000	.000	.00	1 .0
9.463	.0858					.0289	.27	2.30	2.71	1.70	.013	.00	.00	PIPE
1018.115	3619.974	2.391	3622.365	158.00	20.16	6.31	3628.68	.00	3.65	3.92	4.000	.000	.00	1 .0
7.899	.0858					.0256	.20	2.39	2.51	1.70	.013	.00	.00	PIPE
1026.014	3620.652	2.489	3623.141	158.00	19.22	5.74	3628.88	.00	3.65	3.88	4.000	.000	.00	1 .0
6.611	.0858					.0227	.15	2.49	2.33	1.70	.013	.00	.00	PIPE
1032.625	3621.219	2.593	3623.812	158.00	18.33	5.22	3629.03	.00	3.65	3.82	4.000	.000	.00	1 .0
5.527	.0858					.0201	.11	2.59	2.15	1.70	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date:10-14-2019 Time: 1:40:23

SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1038.152	3621.693	2.704	3624.397	158.00	17.47	4.74	3629.14	.00	3.65	3.74	4.000	.000	.00	1 .0
4.590	.0858					.0179	.08	2.70	1.98	1.70	.013	.00	.00	PIPE
1042.742	3622.087	2.824	3624.911	158.00	16.66	4.31	3629.22	.00	3.65	3.64	4.000	.000	.00	1 .0
3.763	.0858					.0160	.06	2.82	1.82	1.70	.013	.00	.00	PIPE
1046.505	3622.409	2.953	3625.363	158.00	15.89	3.92	3629.28	.00	3.65	3.52	4.000	.000	.00	1 .0
3.008	.0858					.0143	.04	2.95	1.66	1.70	.013	.00	.00	PIPE
1049.513	3622.667	3.094	3625.762	158.00	15.15	3.56	3629.32	.00	3.65	3.35	4.000	.000	.00	1 .0
2.287	.0858					.0129	.03	3.09	1.51	1.70	.013	.00	.00	PIPE
1051.800	3622.864	3.252	3626.115	158.00	14.44	3.24	3629.35	.00	3.65	3.12	4.000	.000	.00	1 .0
1.542	.0858					.0118	.02	3.25	1.36	1.70	.013	.00	.00	PIPE
1053.342	3622.996	3.432	3626.428	158.00	13.77	2.94	3629.37	.00	3.65	2.79	4.000	.000	.00	1 .0
.628	.0858					.0109	.01	3.43	1.20	1.70	.013	.00	.00	PIPE
1053.970	3623.050	3.654	3626.704	158.00	13.13	2.68	3629.38	.00	3.65	2.25	4.000	.000	.00	1 .0
JUNCT STR	.0499					.0087	.02	3.65	1.00		.013	.00	.00	PIPE
1055.970	3623.150	5.962	3629.112	119.00	9.47	1.39	3630.50	.00	3.29	.00	4.000	.000	.00	1 .0
3.000	.0334					.0069	.02	5.96	.00	1.89	.013	.00	.00	PIPE
1058.970	3623.250	5.953	3629.203	119.00	9.47	1.39	3630.60	.00	3.29	.00	4.000	.000	.00	1 .0
4.797	.0481					.0069	.03	5.95	.00	1.70	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-14-2019 Time: 1:40:23

SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1063.767	3623.481	5.754	3629.235	119.00	9.47	1.39	3630.63	.00	3.29	.00	4.000	.000	.00	1 .0
HYDRAULIC JUMP														
1063.767	3623.481	1.842	3625.323	119.00	21.06	6.89	3632.21	.00	3.29	3.99	4.000	.000	.00	1 .0
2.402	.0481					.0364	.09	1.84	3.12	1.70	.013	.00	.00	PIPE
1066.169	3623.596	1.846	3625.442	119.00	21.00	6.85	3632.29	.00	3.29	3.99	4.000	.000	.00	1 .0
39.456	.0481					.0340	1.34	1.85	3.11	1.70	.013	.00	.00	PIPE
1105.625	3625.493	1.915	3627.408	119.00	20.03	6.23	3633.63	.00	3.29	4.00	4.000	.000	.00	1 .0
27.249	.0481					.0300	.82	1.91	2.89	1.70	.013	.00	.00	PIPE
1132.874	3626.803	1.987	3628.790	119.00	19.09	5.66	3634.45	.00	3.29	4.00	4.000	.000	.00	1 .0
20.215	.0481					.0264	.53	1.99	2.70	1.70	.013	.00	.00	PIPE
1153.089	3627.775	2.063	3629.838	119.00	18.20	5.15	3634.98	.00	3.29	4.00	4.000	.000	.00	1 .0
15.630	.0481					.0232	.36	2.06	2.51	1.70	.013	.00	.00	PIPE
1168.720	3628.526	2.143	3630.669	119.00	17.36	4.68	3635.35	.00	3.29	3.99	4.000	.000	.00	1 .0
12.377	.0481					.0205	.25	2.14	2.33	1.70	.013	.00	.00	PIPE
1181.096	3629.121	2.227	3631.348	119.00	16.55	4.25	3635.60	.00	3.29	3.97	4.000	.000	.00	1 .0
9.948	.0481					.0181	.18	2.23	2.17	1.70	.013	.00	.00	PIPE
1191.045	3629.599	2.316	3631.915	119.00	15.78	3.87	3635.78	.00	3.29	3.95	4.000	.000	.00	1 .0
8.042	.0481					.0160	.13	2.32	2.01	1.70	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1199.086	3629.986	2.409	3632.395	119.00	15.05	3.51	3635.91	.00	3.29	3.92	4.000	.000	.00	1 .0
6.498	.0481					.0142	.09	2.41	1.87	1.70	.013	.00	.00	PIPE
1205.584	3630.298	2.509	3632.807	119.00	14.34	3.20	3636.00	.00	3.29	3.87	4.000	.000	.00	1 .0
5.209	.0481					.0126	.07	2.51	1.73	1.70	.013	.00	.00	PIPE
1210.793	3630.549	2.614	3633.163	119.00	13.68	2.90	3636.07	.00	3.29	3.81	4.000	.000	.00	1 .0
4.101	.0481					.0112	.05	2.61	1.59	1.70	.013	.00	.00	PIPE
1214.894	3630.746	2.727	3633.473	119.00	13.04	2.64	3636.11	.00	3.29	3.73	4.000	.000	.00	1 .0
3.120	.0481					.0099	.03	2.73	1.47	1.70	.013	.00	.00	PIPE
1218.014	3630.896	2.848	3633.744	119.00	12.43	2.40	3636.14	.00	3.29	3.62	4.000	.000	.00	1 .0
2.216	.0481					.0089	.02	2.85	1.35	1.70	.013	.00	.00	PIPE
1220.230	3631.002	2.979	3633.981	119.00	11.86	2.18	3636.16	.00	3.29	3.49	4.000	.000	.00	1 .0
1.357	.0481					.0080	.01	2.98	1.23	1.70	.013	.00	.00	PIPE
1221.586	3631.067	3.123	3634.191	119.00	11.30	1.98	3636.17	.00	3.29	3.31	4.000	.000	.00	1 .0
.474	.0481					.0072	.00	3.12	1.12	1.70	.013	.00	.00	PIPE
1222.060	3631.090	3.285	3634.375	119.00	10.77	1.80	3636.18	.00	3.29	3.06	4.000	.000	.00	1 .0
JUNCT STR	.0499					.0044	.01	3.29	1.00		.013	.00	.00	PIPE
1224.060	3631.190	5.706	3636.896	64.00	5.09	.40	3637.30	.00	2.41	.00	4.000	.000	.00	1 .0
3.000	.0334					.0020	.01	5.71	.00	1.35	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date:10-14-2019 Time: 1:40:23

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)
ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1227.060	3631.290	5.632	3636.922	64.00	5.09	.40	3637.32	.00	2.41	.00	4.000	.000	.00	1 .0
34.503	.0347					.0020	.07	5.63	.00	1.33	.013	.00	.00	PIPE
1261.563	3632.488	4.501	3636.990	64.00	5.09	.40	3637.39	.00	2.41	.00	4.000	.000	.00	1 .0
HYDRAULIC JUMP														
1261.563	3632.488	1.203	3633.691	64.00	20.12	6.28	3639.97	.00	2.41	3.67	4.000	.000	.00	1 .0
27.117	.0347					.0546	1.48	1.20	3.81	1.33	.013	.00	.00	PIPE
1288.680	3633.430	1.166	3634.596	64.00	21.01	6.85	3641.45	.00	2.41	3.64	4.000	.000	.00	1 .0
JUNCT STR	.0500					.0584	.12	1.17	4.04		.013	.00	.00	PIPE
1290.680	3633.530	1.212	3634.742	63.00	21.29	7.04	3641.78	.00	2.49	3.33	3.500	.000	.00	1 .0
3.000	.0333					.0595	.18	1.21	3.98	1.41	.013	.00	.00	PIPE
1293.680	3633.630	1.207	3634.837	63.00	21.42	7.13	3641.96	.00	2.49	3.33	3.500	.000	.00	1 .0
38.866	.0600					.0600	2.33	1.21	4.02	1.21	.013	.00	.00	PIPE
1332.546	3635.961	1.207	3637.168	63.00	21.42	7.13	3644.29	.00	2.49	3.33	3.500	.000	.00	1 .0
160.886	.0600					.0597	9.60	1.21	4.02	1.21	.013	.00	.00	PIPE
1493.432	3645.612	1.210	3646.822	63.00	21.34	7.07	3653.89	.00	2.49	3.33	3.500	.000	.00	1 .0
139.338	.0600					.0557	7.76	1.21	3.99	1.21	.013	.00	.00	PIPE
1632.770	3653.970	1.253	3655.223	63.00	20.35	6.43	3661.65	.00	2.49	3.36	3.500	.000	.00	1 .0
5.000	.0400					.0524	.26	1.25	3.73	1.35	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date:10-14-2019 Time: 1:40:23

SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1637.770	3654.170	1.249	3655.419	63.00	20.45	6.50	3661.92	.00	2.49	3.35	3.500	.000	.00	1 .0
5.439	.0673					.0523	.28	1.25	3.76	1.17	.013	.00	.00	PIPE
1643.209	3654.537	1.255	3655.791	63.00	20.32	6.41	3662.20	.00	2.49	3.36	3.500	.000	.00	1 .0
28.802	.0673					.0486	1.40	1.25	3.73	1.17	.013	.00	.00	PIPE
1672.011	3656.476	1.299	3657.775	63.00	19.38	5.83	3663.60	.00	2.49	3.38	3.500	.000	.00	1 .0
19.588	.0673					.0427	.84	1.30	3.48	1.17	.013	.00	.00	PIPE
1691.599	3657.795	1.346	3659.141	63.00	18.47	5.30	3664.44	.00	2.49	3.41	3.500	.000	.00	1 .0
14.484	.0673					.0374	.54	1.35	3.25	1.17	.013	.00	.00	PIPE
1706.083	3658.770	1.395	3660.165	63.00	17.61	4.82	3664.98	.00	2.49	3.43	3.500	.000	.00	1 .0
11.229	.0673					.0328	.37	1.39	3.04	1.17	.013	.00	.00	PIPE
1717.312	3659.526	1.446	3660.972	63.00	16.80	4.38	3665.35	.00	2.49	3.45	3.500	.000	.00	1 .0
8.968	.0673					.0288	.26	1.45	2.84	1.17	.013	.00	.00	PIPE
1726.281	3660.130	1.499	3661.628	63.00	16.01	3.98	3665.61	.00	2.49	3.46	3.500	.000	.00	1 .0
7.303	.0673					.0253	.18	1.50	2.65	1.17	.013	.00	.00	PIPE
1733.583	3660.621	1.554	3662.175	63.00	15.27	3.62	3665.80	.00	2.49	3.48	3.500	.000	.00	1 .0
6.020	.0673					.0223	.13	1.55	2.47	1.17	.013	.00	.00	PIPE
1739.603	3661.027	1.612	3662.638	63.00	14.56	3.29	3665.93	.00	2.49	3.49	3.500	.000	.00	1 .0
4.998	.0673					.0196	.10	1.61	2.30	1.17	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1744.601	3661.363	1.672	3663.035	63.00	13.88	2.99	3666.03	.00	2.49	3.50	3.500	.000	.00	1 .0
4.165	.0673				.0172	.07	1.67	2.15	1.17	.013	.00	.00	PIPE	
1748.765	3661.644	1.736	3663.379	63.00	13.23	2.72	3666.10	.00	2.49	3.50	3.500	.000	.00	1 .0
3.467	.0673				.0152	.05	1.74	2.00	1.17	.013	.00	.00	PIPE	
1752.232	3661.877	1.802	3663.679	63.00	12.62	2.47	3666.15	.00	2.49	3.50	3.500	.000	.00	1 .0
2.874	.0673				.0134	.04	1.80	1.86	1.17	.013	.00	.00	PIPE	
1755.106	3662.070	1.872	3663.942	63.00	12.03	2.25	3666.19	.00	2.49	3.49	3.500	.000	.00	1 .0
2.357	.0673				.0118	.03	1.87	1.73	1.17	.013	.00	.00	PIPE	
1757.463	3662.229	1.945	3664.174	63.00	11.47	2.04	3666.22	.00	2.49	3.48	3.500	.000	.00	1 .0
1.907	.0673				.0104	.02	1.95	1.61	1.17	.013	.00	.00	PIPE	
1759.370	3662.357	2.022	3664.380	63.00	10.94	1.86	3666.24	.00	2.49	3.46	3.500	.000	.00	1 .0
1.500	.0673				.0092	.01	2.02	1.49	1.17	.013	.00	.00	PIPE	
1760.870	3662.458	2.104	3664.563	63.00	10.43	1.69	3666.25	.00	2.49	3.43	3.500	.000	.00	1 .0
1.132	.0673				.0081	.01	2.10	1.38	1.17	.013	.00	.00	PIPE	
1762.002	3662.535	2.191	3664.725	63.00	9.94	1.54	3666.26	.00	2.49	3.39	3.500	.000	.00	1 .0
.791	.0673				.0072	.01	2.19	1.28	1.17	.013	.00	.00	PIPE	
1762.793	3662.588	2.283	3664.870	63.00	9.48	1.40	3666.27	.00	2.49	3.33	3.500	.000	.00	1 .0
.469	.0673				.0064	.00	2.28	1.18	1.17	.013	.00	.00	PIPE	

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SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1763.262	3662.619	2.381	3665.000	63.00	9.04	1.27	3666.27	.00	2.49	3.26	3.500	.000	.00	1 .0
.158	.0673				.0057	.00	2.38	1.09	1.17	.013	.00	.00	PIPE	
1763.420	3662.630	2.487	3665.117	63.00	8.61	1.15	3666.27	.00	2.49	3.17	3.500	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 NORTH TO SDDI#2
T3 ATKINS / INTERIM CONDITIONS
SO    171.9803566.540  1                        3566.516
R     184.6103569.420  2      .013                              .000   0.000 1
SH    184.6103569.420  2                        3569.42
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q            2.000   .0
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SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 NORTH TO SDDI#2

ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
171.980	3566.540	.205	3566.745	2.00	11.78	2.16	3568.90	.00	.49	1.21	2.000	.000	.00	1 .0
1.039	.2280					.1572	.16	.21	5.55	.19	.013	.00	.00	PIPE
173.019	3566.777	.208	3566.984	2.00	11.58	2.08	3569.07	.00	.49	1.22	2.000	.000	.00	1 .0
2.159	.2280					.1435	.31	.21	5.42	.19	.013	.00	.00	PIPE
175.177	3567.269	.214	3567.483	2.00	11.04	1.89	3569.38	.00	.49	1.24	2.000	.000	.00	1 .0
1.604	.2280					.1252	.20	.21	5.09	.19	.013	.00	.00	PIPE
176.782	3567.635	.222	3567.856	2.00	10.53	1.72	3569.58	.00	.49	1.26	2.000	.000	.00	1 .0
1.256	.2280					.1092	.14	.22	4.77	.19	.013	.00	.00	PIPE
178.038	3567.921	.229	3568.150	2.00	10.04	1.56	3569.71	.00	.49	1.27	2.000	.000	.00	1 .0
1.014	.2280					.0953	.10	.23	4.47	.19	.013	.00	.00	PIPE
179.052	3568.152	.236	3568.389	2.00	9.57	1.42	3569.81	.00	.49	1.29	2.000	.000	.00	1 .0
.838	.2280					.0832	.07	.24	4.19	.19	.013	.00	.00	PIPE
179.890	3568.344	.244	3568.588	2.00	9.12	1.29	3569.88	.00	.49	1.31	2.000	.000	.00	1 .0
.704	.2280					.0726	.05	.24	3.93	.19	.013	.00	.00	PIPE
180.594	3568.504	.252	3568.757	2.00	8.70	1.18	3569.93	.00	.49	1.33	2.000	.000	.00	1 .0
.598	.2280					.0634	.04	.25	3.69	.19	.013	.00	.00	PIPE
181.192	3568.640	.261	3568.901	2.00	8.30	1.07	3569.97	.00	.49	1.35	2.000	.000	.00	1 .0
.513	.2280					.0553	.03	.26	3.46	.19	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 2:52:32

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 NORTH TO SDDI#2
ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
181.705	3568.757	.269	3569.027	2.00	7.91	.97	3570.00	.00	.49	1.37	2.000	.000	.00	1 .0
.441	.2280					.0483	.02	.27	3.24	.19	.013	.00	.00	PIPE
182.146	3568.858	.278	3569.136	2.00	7.54	.88	3570.02	.00	.49	1.38	2.000	.000	.00	1 .0
.382	.2280					.0422	.02	.28	3.04	.19	.013	.00	.00	PIPE
182.528	3568.945	.288	3569.233	2.00	7.19	.80	3570.04	.00	.49	1.40	2.000	.000	.00	1 .0
.331	.2280					.0368	.01	.29	2.85	.19	.013	.00	.00	PIPE
182.860	3569.021	.297	3569.318	2.00	6.86	.73	3570.05	.00	.49	1.42	2.000	.000	.00	1 .0
.288	.2280					.0321	.01	.30	2.67	.19	.013	.00	.00	PIPE
183.148	3569.086	.307	3569.394	2.00	6.54	.66	3570.06	.00	.49	1.44	2.000	.000	.00	1 .0
.250	.2280					.0281	.01	.31	2.50	.19	.013	.00	.00	PIPE
183.398	3569.144	.318	3569.461	2.00	6.23	.60	3570.06	.00	.49	1.46	2.000	.000	.00	1 .0
.217	.2280					.0245	.01	.32	2.34	.19	.013	.00	.00	PIPE
183.615	3569.193	.328	3569.521	2.00	5.94	.55	3570.07	.00	.49	1.48	2.000	.000	.00	1 .0
.188	.2280					.0214	.00	.33	2.20	.19	.013	.00	.00	PIPE
183.803	3569.236	.339	3569.575	2.00	5.67	.50	3570.07	.00	.49	1.50	2.000	.000	.00	1 .0
.162	.2280					.0187	.00	.34	2.06	.19	.013	.00	.00	PIPE
183.965	3569.273	.351	3569.624	2.00	5.40	.45	3570.08	.00	.49	1.52	2.000	.000	.00	1 .0
.139	.2280					.0163	.00	.35	1.93	.19	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 2:52:32

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 NORTH TO SDDI#2
ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
184.103	3569.305	.362	3569.667	2.00	5.15	.41	3570.08	.00	.49	1.54	2.000	.000	.00	1 .0
.118	.2280					.0143	.00	.36	1.81	.19	.013	.00	.00	PIPE
184.222	3569.332	.375	3569.706	2.00	4.91	.37	3570.08	.00	.49	1.56	2.000	.000	.00	1 .0
.099	.2280					.0125	.00	.37	1.69	.19	.013	.00	.00	PIPE
184.321	3569.354	.387	3569.741	2.00	4.68	.34	3570.08	.00	.49	1.58	2.000	.000	.00	1 .0
.082	.2280					.0109	.00	.39	1.59	.19	.013	.00	.00	PIPE
184.403	3569.373	.400	3569.773	2.00	4.46	.31	3570.08	.00	.49	1.60	2.000	.000	.00	1 .0
.067	.2280					.0095	.00	.40	1.49	.19	.013	.00	.00	PIPE
184.469	3569.388	.414	3569.802	2.00	4.26	.28	3570.08	.00	.49	1.62	2.000	.000	.00	1 .0
.053	.2280					.0083	.00	.41	1.39	.19	.013	.00	.00	PIPE
184.522	3569.400	.428	3569.828	2.00	4.06	.26	3570.08	.00	.49	1.64	2.000	.000	.00	1 .0
.039	.2280					.0073	.00	.43	1.31	.19	.013	.00	.00	PIPE
184.561	3569.409	.443	3569.852	2.00	3.87	.23	3570.08	.00	.49	1.66	2.000	.000	.00	1 .0
.027	.2280					.0063	.00	.44	1.22	.19	.013	.00	.00	PIPE
184.589	3569.415	.458	3569.873	2.00	3.69	.21	3570.08	.00	.49	1.68	2.000	.000	.00	1 .0
.016	.2280					.0055	.00	.46	1.14	.19	.013	.00	.00	PIPE
184.605	3569.419	.473	3569.892	2.00	3.52	.19	3570.08	.00	.49	1.70	2.000	.000	.00	1 .0
.005	.2280					.0048	.00	.47	1.07	.19	.013	.00	.00	PIPE

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                          Program Package Serial Number: 7271
                                          WATER SURFACE PROFILE LISTING                  Date:10-15-2019  Time: 2:52:32
                      SUMMERLIN WEST VILLAGE 25
                        SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 NORTH TO SDDI#2
                          ATKINS / INTERIM CONDITIONS
*************************************************************************************************************************** ********
         | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
         |         |        |         |         |               |         |       |        |        |
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T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 SOUTH TO SDDI#1
T3 ATKINS / INTERIM CONDITIONS
SO    171.9803566.540  1                        3566.516
R     213.6503567.950  2      .013                              .000   0.000 1
SH    213.6503567.950  2                        3567.95
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q             3.000   .0
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WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 2:59: 8

SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 SOUTH TO SDDI#1

ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
171.980	3566.540	.370	3566.910	3.00	7.51	.88	3567.79	.00	.60	1.55	2.000	.000	.00	1 .0
11.356	.0338				.0305	.35	.37	2.61	.36	.013	.00	.00	PIPE	
183.336	3566.924	.376	3567.301	3.00	7.32	.83	3568.13	.00	.60	1.56	2.000	.000	.00	1 .0
9.952	.0338				.0275	.27	.38	2.52	.36	.013	.00	.00	PIPE	
193.288	3567.261	.389	3567.650	3.00	6.98	.76	3568.41	.00	.60	1.58	2.000	.000	.00	1 .0
5.670	.0338				.0240	.14	.39	2.36	.36	.013	.00	.00	PIPE	
198.958	3567.453	.402	3567.855	3.00	6.65	.69	3568.54	.00	.60	1.60	2.000	.000	.00	1 .0
3.811	.0338				.0210	.08	.40	2.21	.36	.013	.00	.00	PIPE	
202.769	3567.582	.416	3567.998	3.00	6.34	.62	3568.62	.00	.60	1.62	2.000	.000	.00	1 .0
2.753	.0338				.0184	.05	.42	2.07	.36	.013	.00	.00	PIPE	
205.523	3567.675	.430	3568.105	3.00	6.05	.57	3568.67	.00	.60	1.64	2.000	.000	.00	1 .0
2.083	.0338				.0160	.03	.43	1.94	.36	.013	.00	.00	PIPE	
207.605	3567.746	.445	3568.190	3.00	5.77	.52	3568.71	.00	.60	1.66	2.000	.000	.00	1 .0
1.603	.0338				.0140	.02	.44	1.82	.36	.013	.00	.00	PIPE	
209.208	3567.800	.460	3568.260	3.00	5.50	.47	3568.73	.00	.60	1.68	2.000	.000	.00	1 .0
1.251	.0338				.0123	.02	.46	1.70	.36	.013	.00	.00	PIPE	
210.459	3567.842	.476	3568.318	3.00	5.24	.43	3568.74	.00	.60	1.70	2.000	.000	.00	1 .0
.974	.0338				.0107	.01	.48	1.59	.36	.013	.00	.00	PIPE	

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 2:59: 8

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 SOUTH TO SDDI#1
ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
211.433	3567.875	.492	3568.367	3.00	5.00	.39	3568.75	.00	.60	1.72	2.000	.000	.00	1 .0
.751	.0338					.0094	.01	.49	1.49	.36	.013	.00	.00	PIPE
212.184	3567.900	.509	3568.409	3.00	4.77	.35	3568.76	.00	.60	1.74	2.000	.000	.00	1 .0
.568	.0338					.0082	.00	.51	1.40	.36	.013	.00	.00	PIPE
212.753	3567.920	.526	3568.446	3.00	4.54	.32	3568.77	.00	.60	1.76	2.000	.000	.00	1 .0
.411	.0338					.0072	.00	.53	1.31	.36	.013	.00	.00	PIPE
213.164	3567.934	.544	3568.478	3.00	4.33	.29	3568.77	.00	.60	1.78	2.000	.000	.00	1 .0
.276	.0338					.0063	.00	.54	1.22	.36	.013	.00	.00	PIPE
213.440	3567.943	.563	3568.506	3.00	4.13	.27	3568.77	.00	.60	1.80	2.000	.000	.00	1 .0
.159	.0338					.0055	.00	.56	1.15	.36	.013	.00	.00	PIPE
213.598	3567.948	.583	3568.531	3.00	3.94	.24	3568.77	.00	.60	1.82	2.000	.000	.00	1 .0
.052	.0338					.0048	.00	.58	1.07	.36	.013	.00	.00	PIPE
213.650	3567.950	.604	3568.554	3.00	3.75	.22	3568.77	.00	.60	1.84	2.000	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#7 NORTH TO SDMH#12
T3 ATKINS / INTERIM CONDITIONS
SO   1058.9703623.250  1                         3629.203
R    1092.5403625.820  4      .013                                .000   0.000 1
R    1097.5403626.020  4      .013                                .000   0.000 0
R    1141.0303626.990  4      .013                                .000   0.000 1
SH   1141.0303626.990  4                         3627.990
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q           39.000   .0
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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 3: 4:47

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#7 NORTH TO SDMH#12
ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1058.970	3623.250	5.953	3629.203	39.00	5.52	.47	3629.68	.00	2.03	.00	3.000	.000	.00	1 .0
33.188	.0766				.0034	.11	5.95	.00	.94	.013	.00	.00	PIPE	
1092.158	3625.791	3.548	3629.339	39.00	5.52	.47	3629.81	.00	2.03	.00	3.000	.000	.00	1 .0
HYDRAULIC JUMP														
1092.158	3625.791	1.102	3626.893	39.00	16.56	4.26	3631.15	.00	2.03	2.89	3.000	.000	.00	1 .0
.382	.0766				.0412	.02	1.10	3.23	.94	.013	.00	.00	PIPE	
1092.540	3625.820	1.102	3626.922	39.00	16.56	4.26	3631.18	.00	2.03	2.89	3.000	.000	.00	1 .0
5.000	.0400				.0413	.21	1.10	3.23	1.11	.013	.00	.00	PIPE	
1097.540	3626.020	1.101	3627.121	39.00	16.58	4.27	3631.39	.00	2.03	2.89	3.000	.000	.00	1 .0
13.626	.0223				.0435	.59	1.10	3.24	1.30	.013	.00	.00	PIPE	
1111.166	3626.324	1.072	3627.396	39.00	17.19	4.59	3631.98	.00	2.03	2.88	3.000	.000	.00	1 .0
15.858	.0223				.0489	.78	1.07	3.41	1.30	.013	.00	.00	PIPE	
1127.024	3626.677	1.035	3627.713	39.00	18.03	5.05	3632.76	.00	2.03	2.85	3.000	.000	.00	1 .0
14.006	.0223				.0558	.78	1.04	3.65	1.30	.013	.00	.00	PIPE	
1141.030	3626.990	1.000	3627.990	39.00	18.91	5.55	3633.54	.00	2.03	2.83	3.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#8 SOUTH TO SDDI#3
T3 ATKINS / INTERIM CONDITIONS
SO   1227.0593631.290  1                         3636.922
R    1231.4093631.390  4      .013                                .000   0.000 1
JX   1236.4093631.590  4  4   .013    1.000         3631.29       -89.8      .000
R    1257.9093633.580  4      .013                                .000   0.000 1
SH   1334.8253640.910  4                         3641.910
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q           55.000   .0
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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-23-2019 Time:10:54:18

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#8 SOUTH TO SDDI#3
ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1227.059	3631.290	5.632	3636.922	56.00	4.46	.31	3637.23	.00	2.25	3.54	4.000	.000	.00	1 .0
1227.059	3631.290	1.072	3632.362	56.00	24.68	9.46	3641.82	.00	2.43	2.88	3.000	.000	.00	1 .0
4.350	.0230				.0966	.42	1.07	4.90	1.60	.013	.00	.00	PIPE	
1231.409	3631.390	1.058	3632.448	56.00	25.13	9.80	3642.25	.00	2.43	2.87	3.000	.000	.00	1 .0
JUNCT STR	.0400				.1049	.52	1.06	5.02		.013	.00	.00	PIPE	
1236.409	3631.590	1.017	3632.607	55.00	26.04	10.53	3643.14	.00	2.41	2.84	3.000	.000	.00	1 .0
21.500	.0926				.1146	2.46	1.02	5.32	1.07	.013	.00	.00	PIPE	
1257.909	3633.580	1.000	3634.580	55.00	26.67	11.04	3645.62	.00	2.41	2.83	3.000	.000	.00	1 .0
1334.825	3640.910	1.000	3641.910	55.00	26.67	11.04	3652.95	.00	2.41	2.83	3.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#9 NORTH TO SDDI#5
T3 ATKINS / INTERIM CONDITIONS
SO   1293.6753640.480  1                        3634.837
R    1334.8253640.910  2      .013                              .000   0.000 1
SH   1334.8253640.910  2                        3640.910
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q            1.000   .0
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FILE: SM-LATERAL-MH9N-INT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 2:54:52

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#9 NORTH TO SDDI#5
ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1293.675	3640.480	.284	3640.763	1.00	3.67	.21	3640.97	.00	.34	1.40	2.000	.000	.00	1 .0
17.851	.0104				.0104	.19	.28	1.47	.28	.013	.00	.00	PIPE	
1311.526	3640.667	.284	3640.950	1.00	3.67	.21	3641.16	.00	.34	1.40	2.000	.000	.00	1 .0
14.718	.0104				.0099	.15	.28	1.47	.28	.013	.00	.00	PIPE	
1326.244	3640.820	.291	3641.111	1.00	3.53	.19	3641.31	.00	.34	1.41	2.000	.000	.00	1 .0
4.637	.0104				.0088	.04	.29	1.39	.28	.013	.00	.00	PIPE	
1330.881	3640.869	.301	3641.170	1.00	3.37	.18	3641.35	.00	.34	1.43	2.000	.000	.00	1 .0
2.152	.0104				.0076	.02	.30	1.30	.28	.013	.00	.00	PIPE	
1333.033	3640.891	.311	3641.202	1.00	3.21	.16	3641.36	.00	.34	1.45	2.000	.000	.00	1 .0
1.106	.0104				.0067	.01	.31	1.22	.28	.013	.00	.00	PIPE	
1334.139	3640.903	.321	3641.224	1.00	3.06	.15	3641.37	.00	.34	1.47	2.000	.000	.00	1 .0
.529	.0104				.0058	.00	.32	1.14	.28	.013	.00	.00	PIPE	
1334.668	3640.908	.332	3641.240	1.00	2.92	.13	3641.37	.00	.34	1.49	2.000	.000	.00	1 .0
.157	.0104													

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#11 NORTH TO SDDI#7
T3 ATKINS / INTERIM CONDITIONS
SO   1763.4203662.840  3      .013               3665.117
R    1807.8903663.370  4      .013                                .000   0.000 1
JX   1812.8903663.870  2  2   .013    1.000         3663.87          90.0         .000
R    1883.3903664.670  2      .013                                .000   0.000 1
SH   1883.3903664.670  2                          3667.170
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.500     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q           61.000   .0
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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-23-2019 Time:12:42:31

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#11 NORTH TO SDDI#7
ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1763.420	3662.840	1.818	3664.658	62.00	13.83	2.97	3667.63	.00	2.54	2.93	3.000	.000	.00	1 .0
18.222	.0119				.0193	.35	1.82	1.97	2.13	.013	.00	.00	PIPE	
1781.642	3663.057	1.774	3664.832	62.00	14.24	3.15	3667.98	.00	2.54	2.95	3.000	.000	.00	1 .0
26.248	.0119				.0213	.56	1.77	2.07	2.13	.013	.00	.00	PIPE	
1807.890	3663.370	1.706	3665.076	62.00	14.94	3.46	3668.54	.00	2.54	2.97	3.000	.000	.00	1 .0
JUNCT STR	.1000				.0209	.10	1.71	2.23		.013	.00	.00	PIPE	
1812.890	3663.870	2.400	3666.270	61.00	12.60	2.46	3668.73	.00	2.40	.98	2.500	.000	.00	1 .0
3.921	.0113				.0201	.08	2.40	1.00	2.50	.013	.00	.00	PIPE	
1816.811	3663.915	2.500	3666.415	61.00	12.43	2.40	3668.81	.00	2.40	.00	2.500	.000	.00	1 .0
66.579	.0113				.0215	1.43	2.50	.00	2.50	.013	.00	.00	PIPE	
1883.390	3664.670	3.330	3668.000	61.00	12.43	2.40	3670.40	.00	2.40	.00	2.500	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#11 SOUTH TO SDDI#6
T3 ATKINS / INTERIM CONDITIONS
SO   1763.4203662.840  3                        3664.660
R    1772.2203663.140  2      .013                              .000   0.000 1
SH   1772.2203663.140  2                        3665.440
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q            1.000   .0
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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-23-2019 Time: 1: 1:14

SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#11 SOUTH TO SDDI#6

ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1763.420	3662.840	1.820	3664.660	1.00	.33	.00	3664.66	.00	.34	1.15	2.000	.000	.00	1 .0
3.193	.0341				.0000	.00	1.82	.04	.21	.013		.00	.00	PIPE
1766.614	3662.949	1.711	3664.660	1.00	.35	.00	3664.66	.00	.34	1.41	2.000	.000	.00	1 .0
2.620	.0341				.0000	.00	1.71	.04	.21	.013		.00	.00	PIPE
1769.234	3663.038	1.622	3664.660	1.00	.37	.00	3664.66	.00	.34	1.57	2.000	.000	.00	1 .0
2.288	.0341				.0000	.00	1.62	.05	.21	.013		.00	.00	PIPE
1771.521	3663.116	1.543	3664.660	1.00	.38	.00	3664.66	.00	.34	1.68	2.000	.000	.00	1 .0
.699	.0341				.0000	.00	1.54	.05	.21	.013		.00	.00	PIPE
1772.220	3663.140	1.520	3664.660	1.00	.39	.00	3664.66	.00	.34	1.71	2.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#12 EAST TO SDDI#9
T3 ATKINS / INTERIM CONDITIONS
SO   1146.0303627.190  4                         3627.990
R    1163.7703627.690  4      .013                                .000   0.000 1
JX   1168.7703627.890  2  2   .013    1.000         3628.09          90.0         .000
R    1196.2903631.090  2      .013                                .000   0.000 1
SH   1196.2903631.090  2                         3632.090
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q            39.000   .0
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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 3:21:35

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#12 EAST TO SDDI#9
ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1146.030	3627.190	.913	3628.103	40.00	21.98	7.50	3635.60	.00	2.06	2.76	3.000	.000	.00	1 .0
7.581	.0282				.0929	.70	.91	4.77	1.24	.013	.00	.00	PIPE	
1153.611	3627.404	.892	3628.295	40.00	22.72	8.01	3636.31	.00	2.06	2.74	3.000	.000	.00	1 .0
10.159	.0282				.1041	1.06	.89	5.00	1.24	.013	.00	.00	PIPE	
1163.770	3627.690	.862	3628.552	40.00	23.82	8.81	3637.37	.00	2.06	2.71	3.000	.000	.00	1 .0
JUNCT STR	.0400				.1144	.57	.86	5.34		.013	.00	.00	PIPE	
1168.770	3627.890	1.003	3628.893	39.00	24.75	9.51	3638.40	.00	1.95	2.00	2.000	.000	.00	1 .0
27.520	.1163				.1184	3.26	1.00	4.91	1.01	.013	.00	.00	PIPE	
1196.290	3631.090	1.000	3632.090	39.00	24.83	9.57	3641.66	.00	1.95	2.00	2.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#12 WEST TO SDDI#10
T3 ATKINS / INTERIM CONDITIONS
SO   1146.0303627.190  4                        3627.990
R    1189.1203627.430  2      .013                              .000   0.000 1
SH   1189.1203627.430  2                        3627.530
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q            1.000   .0
```

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 3:22: 3

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#12 WEST TO SDDI#10
ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1146.030	3627.190	.800	3627.990	1.00	.85	.01	3628.00	.00	.34	1.96	2.000	.000	.00	1 .0
4.997	.0056					.0002	.00	.80	.19	.33	.013	.00	.00	PIPE
1151.027	3627.218	.772	3627.990	1.00	.89	.01	3628.00	.00	.34	1.95	2.000	.000	.00	1 .0
4.769	.0056					.0002	.00	.77	.21	.33	.013	.00	.00	PIPE
1155.796	3627.244	.745	3627.990	1.00	.94	.01	3628.00	.00	.34	1.93	2.000	.000	.00	1 .0
4.584	.0056					.0002	.00	.75	.22	.33	.013	.00	.00	PIPE
1160.380	3627.270	.719	3627.990	1.00	.98	.02	3628.00	.00	.34	1.92	2.000	.000	.00	1 .0
4.380	.0056					.0003	.00	.72	.24	.33	.013	.00	.00	PIPE
1164.760	3627.294	.695	3627.989	1.00	1.03	.02	3628.01	.00	.34	1.90	2.000	.000	.00	1 .0
4.212	.0056					.0003	.00	.69	.25	.33	.013	.00	.00	PIPE
1168.973	3627.318	.671	3627.989	1.00	1.08	.02	3628.01	.00	.34	1.89	2.000	.000	.00	1 .0
4.044	.0056					.0004	.00	.67	.27	.33	.013	.00	.00	PIPE
1173.016	3627.340	.648	3627.988	1.00	1.13	.02	3628.01	.00	.34	1.87	2.000	.000	.00	1 .0
3.874	.0056					.0004	.00	.65	.29	.33	.013	.00	.00	PIPE
1176.890	3627.362	.626	3627.988	1.00	1.19	.02	3628.01	.00	.34	1.85	2.000	.000	.00	1 .0
.482	.0056					.0005	.00	.63	.31	.33	.013	.00	.00	PIPE
1177.372	3627.365	.605	3627.969	1.00	1.25	.02	3627.99	.00	.34	1.84	2.000	.000	.00	1 .0

HYDRAULIC JUMP

FILE: SM-Lateral-MH12W-INT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 3:22: 3

SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#12 WEST TO SDDI#10

ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1177.372	3627.365	.168	3627.532	1.00	7.94	.98	3628.51	.00	.34	1.11	2.000	.000	.00	1 .0
.247	.0056					.0945	.02	.17	4.15	.33	.013	.00	.00	PIPE
1177.619	3627.366	.168	3627.533	1.00	7.93	.98	3628.51	.00	.34	1.11	2.000	.000	.00	1 .0
.965	.0056					.1013	.10	.17	4.14	.33	.013	.00	.00	PIPE
1178.584	3627.371	.162	3627.533	1.00	8.32	1.07	3628.61	.00	.34	1.09	2.000	.000	.00	1 .0
.925	.0056					.1161	.11	.16	4.42	.33	.013	.00	.00	PIPE
1179.509	3627.376	.157	3627.533	1.00	8.73	1.18	3628.72	.00	.34	1.08	2.000	.000	.00	1 .0
.888	.0056					.1332	.12	.16	4.71	.33	.013	.00	.00	PIPE
1180.397	3627.381	.152	3627.533	1.00	9.15	1.30	3628.83	.00	.34	1.06	2.000	.000	.00	1 .0
.851	.0056					.1527	.13	.15	5.02	.33	.013	.00	.00	PIPE
1181.247	3627.386	.147	3627.533	1.00	9.60	1.43	3628.96	.00	.34	1.04	2.000	.000	.00	1 .0
.817	.0056					.1751	.14	.15	5.36	.33	.013	.00	.00	PIPE
1182.064	3627.391	.143	3627.533	1.00	10.07	1.57	3629.11	.00	.34	1.03	2.000	.000	.00	1 .0
.783	.0056					.2008	.16	.14	5.71	.33	.013	.00	.00	PIPE
1182.847	3627.395	.138	3627.533	1.00	10.56	1.73	3629.26	.00	.34	1.01	2.000	.000	.00	1 .0
.751	.0056					.2301	.17	.14	6.09	.33	.013	.00	.00	PIPE
1183.598	3627.399	.134	3627.533	1.00	11.07	1.90	3629.44	.00	.34	1.00	2.000	.000	.00	1 .0
.721	.0056					.2639	.19	.13	6.49	.33	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 3:22: 3

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#12 WEST TO SDDI#10
ATKINS / INTERIM CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1184.319	3627.403	.129	3627.532	1.00	11.61	2.09	3629.63	.00	.34	.98	2.000	.000	.00	1 .0
.691	.0056					.3026	.21	.13	6.92	.33	.013	.00	.00	PIPE
1185.010	3627.407	.125	3627.532	1.00	12.18	2.30	3629.84	.00	.34	.97	2.000	.000	.00	1 .0
.663	.0056					.3470	.23	.13	7.38	.33	.013	.00	.00	PIPE
1185.673	3627.411	.121	3627.532	1.00	12.78	2.53	3630.07	.00	.34	.95	2.000	.000	.00	1 .0
.636	.0056					.3980	.25	.12	7.86	.33	.013	.00	.00	PIPE
1186.309	3627.414	.118	3627.532	1.00	13.40	2.79	3630.32	.00	.34	.94	2.000	.000	.00	1 .0
.610	.0056					.4565	.28	.12	8.38	.33	.013	.00	.00	PIPE
1186.919	3627.418	.114	3627.531	1.00	14.05	3.07	3630.60	.00	.34	.93	2.000	.000	.00	1 .0
.585	.0056					.5235	.31	.11	8.94	.33	.013	.00	.00	PIPE
1187.504	3627.421	.110	3627.531	1.00	14.74	3.37	3630.90	.00	.34	.91	2.000	.000	.00	1 .0
.561	.0056					.6004	.34	.11	9.53	.33	.013	.00	.00	PIPE
1188.065	3627.424	.107	3627.531	1.00	15.46	3.71	3631.24	.00	.34	.90	2.000	.000	.00	1 .0
.538	.0056					.6884	.37	.11	10.15	.33	.013	.00	.00	PIPE
1188.604	3627.427	.103	3627.530	1.00	16.21	4.08	3631.61	.00	.34	.89	2.000	.000	.00	1 .0
.516	.0056					.7896	.41	.10	10.82	.33	.013	.00	.00	PIPE
1189.120	3627.430	.100	3627.530	1.00	17.00	4.49	3632.02	.00	.34	.87	2.000	.000	.00	1 .0

C.4 Ultimate Condition WSPG-W Model

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)
T3 ATKINS / ULTIMATE CONDITIONS
SO      0.0003557.530  1                          3560.390
R     166.9803564.340  1      .013                                .000    .000 0
JX    168.9803564.440  1  2  2.013    2.000    3.0003565.94 3566.54  76.1-36.7    .000
R     171.9803564.540  1      .013                                .000  -4.601 1
R     229.4403567.500  1      .013                                .000    .000 0
R     234.4403567.700  1      .013                                .000  -3.551 1
R     585.7103584.960  1      .013                                .000    .000 0
R     590.7103585.160  1      .013                                .000  13.070 1
R     659.8703588.680  1      .013                                .000    .000 0
JX    662.3703588.780  1  4   .013   53.000         3598.99          88.8      .000
R     664.8703588.880  1      .013                                .000  -1.237 1
R     784.8403600.190  1      .013                                .000    .000 0
R     789.8403600.390  1      .013                                .000    .000 0
R    1053.9703623.050  1      .013                                .000    .000 0
JX   1055.9703623.150  1  4   .013   56.000         3623.25          90.0         .000
R    1058.9703623.250  1      .013                                .000    .188 1
R    1222.0603631.090  1      .013                                .000    .000 0
JX   1224.0603631.190  1  4   .013   77.000         3631.29         -89.8      .000
R    1227.0603631.290  1      .013                                .000   -.188 1
R    1288.6803633.430  1      .013                                .000    .000
JX   1290.6803633.530  3  2   .013    1.000         3640.48          90.0         .000
R    1293.6803633.630  3      .013                                .000    .000 1
R    1632.7703653.970  3      .013                                .000    .000 0
R    1637.7703654.170  3      .013                                .000    .241 1
R    1763.4203662.630  3      .013                                .000    .000 0
SH   1763.4203662.630  3                          3662.63
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q           71.000   .0
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SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
.000	3557.530	2.928	3560.458	263.00	26.68	11.06	3571.51	.00	3.95	3.54	4.000	.000	.00	1 .0
166.980	.0408				.0442	7.38	2.93	2.82	2.99	.013	.00	.00	PIPE	
166.980	3564.340	2.850	3567.190	263.00	27.46	11.70	3578.90	.00	3.95	3.62	4.000	.000	.00	1 .0
JUNCT STR	.0499				.0471	.09	2.85	2.97		.013	.00	.00	PIPE	
168.980	3564.440	2.745	3567.185	258.00	28.07	12.23	3579.42	.00	3.94	3.71	4.000	.000	.00	1 .0
3.000	.0334				.0486	.15	2.74	3.14	3.22	.013	.00	.00	PIPE	
171.980	3564.540	2.739	3567.280	258.00	28.13	12.29	3579.57	.00	3.94	3.72	4.000	.000	.00	1 .0
57.460	.0515				.0483	2.78	2.74	3.16	2.69	.013	.00	.00	PIPE	
229.440	3567.500	2.760	3570.260	258.00	27.90	12.09	3582.35	.00	3.94	3.70	4.000	.000	.00	1 .0
5.000	.0400				.0479	.24	2.76	3.11	2.96	.013	.00	.00	PIPE	
234.440	3567.700	2.755	3570.455	258.00	27.95	12.13	3582.59	.00	3.94	3.70	4.000	.000	.00	1 .0
181.745	.0491				.0470	8.55	2.75	3.12	2.73	.013	.00	.00	PIPE	
416.185	3576.630	2.799	3579.429	258.00	27.47	11.71	3591.14	.00	3.94	3.67	4.000	.000	.00	1 .0
169.526	.0491				.0436	7.39	2.80	3.02	2.73	.013	.00	.00	PIPE	
585.710	3584.960	2.926	3587.886	258.00	26.19	10.65	3598.54	.00	3.94	3.54	4.000	.000	.00	1 .0
5.000	.0400				.0412	.21	2.93	2.77	2.96	.013	.00	.00	PIPE	
590.710	3585.160	2.925	3588.085	258.00	26.20	10.66	3598.74	.00	3.94	3.55	4.000	.000	.00	1 .0
69.160	.0509				.0391	2.71	2.93	2.77	2.70	.013	.00	.00	PIPE	

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SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
659.870	3588.680	3.061	3591.741	258.00	25.01	9.71	3601.45	.00	3.94	3.39	4.000	.000	.00	1 .0
JUNCT STR	.0400					.0603	.15	3.06	2.53		.013	.00	.00	PIPE
662.370	3588.780	1.985	3590.765	205.00	32.93	16.84	3607.61	.00	3.86	4.00	4.000	.000	.00	1 .0
2.500	.0399					.0839	.21	1.99	4.65	2.50	.013	.00	.00	PIPE
664.870	3588.880	1.980	3590.860	205.00	33.05	16.96	3607.82	.00	3.86	4.00	4.000	.000	.00	1 .0
40.536	.0943					.0828	3.36	1.98	4.68	1.92	.013	.00	.00	PIPE
705.406	3592.701	2.002	3594.703	205.00	32.59	16.49	3611.19	.00	3.86	4.00	4.000	.000	.00	1 .0
79.434	.0943					.0764	6.07	2.00	4.58	1.92	.013	.00	.00	PIPE
784.840	3600.190	2.079	3602.269	205.00	31.07	14.99	3617.26	.00	3.86	4.00	4.000	.000	.00	1 .0
5.000	.0400					.0721	.36	2.08	4.26	2.50	.013	.00	.00	PIPE
789.840	3600.390	2.069	3602.459	205.00	31.25	15.16	3617.62	.00	3.86	4.00	4.000	.000	.00	1 .0
36.322	.0858					.0708	2.57	2.07	4.30	1.97	.013	.00	.00	PIPE
826.162	3603.506	2.101	3605.608	205.00	30.65	14.59	3620.20	.00	3.86	3.99	4.000	.000	.00	1 .0
59.695	.0858					.0649	3.88	2.10	4.17	1.97	.013	.00	.00	PIPE
885.858	3608.628	2.183	3610.811	205.00	29.22	13.26	3624.07	.00	3.86	3.98	4.000	.000	.00	1 .0
39.306	.0858					.0573	2.25	2.18	3.88	1.97	.013	.00	.00	PIPE
925.164	3612.000	2.269	3614.269	205.00	27.86	12.06	3626.33	.00	3.86	3.96	4.000	.000	.00	1 .0
28.586	.0858					.0506	1.45	2.27	3.60	1.97	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
953.750	3614.452	2.360	3616.812	205.00	26.57	10.96	3627.77	.00	3.86	3.93	4.000	.000	.00	1 .0
21.952	.0858					.0448	.98	2.36	3.34	1.97	.013	.00	.00	PIPE
975.702	3616.335	2.456	3618.792	205.00	25.33	9.96	3628.76	.00	3.86	3.89	4.000	.000	.00	1 .0
17.427	.0858					.0397	.69	2.46	3.10	1.97	.013	.00	.00	PIPE
993.128	3617.831	2.558	3620.389	205.00	24.15	9.06	3629.45	.00	3.86	3.84	4.000	.000	.00	1 .0
14.128	.0858					.0352	.50	2.56	2.86	1.97	.013	.00	.00	PIPE
1007.257	3619.043	2.667	3621.710	205.00	23.03	8.23	3629.94	.00	3.86	3.77	4.000	.000	.00	1 .0
11.601	.0858					.0313	.36	2.67	2.64	1.97	.013	.00	.00	PIPE
1018.858	3620.038	2.784	3622.822	205.00	21.96	7.49	3630.31	.00	3.86	3.68	4.000	.000	.00	1 .0
9.588	.0858					.0279	.27	2.78	2.43	1.97	.013	.00	.00	PIPE
1028.446	3620.861	2.910	3623.770	205.00	20.94	6.81	3630.58	.00	3.86	3.56	4.000	.000	.00	1 .0
7.924	.0858					.0250	.20	2.91	2.23	1.97	.013	.00	.00	PIPE
1036.369	3621.540	3.047	3624.587	205.00	19.96	6.19	3630.77	.00	3.86	3.41	4.000	.000	.00	1 .0
6.492	.0858					.0225	.15	3.05	2.03	1.97	.013	.00	.00	PIPE
1042.862	3622.097	3.198	3625.295	205.00	19.03	5.62	3630.92	.00	3.86	3.20	4.000	.000	.00	1 .0
5.195	.0858					.0204	.11	3.20	1.83	1.97	.013	.00	.00	PIPE
1048.056	3622.543	3.370	3625.912	205.00	18.15	5.11	3631.03	.00	3.86	2.91	4.000	.000	.00	1 .0
3.891	.0858					.0187	.07	3.37	1.62	1.97	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1051.947	3622.876	3.574	3626.450	205.00	17.30	4.65	3631.10	.00	3.86	2.47	4.000	.000	.00	1 .0
2.023	.0858					.0179	.04	3.57	1.39	1.97	.013	.00	.00	PIPE
1053.970	3623.050	3.860	3626.910	205.00	16.49	4.22	3631.13	.00	3.86	1.47	4.000	.000	.00	1 .0
JUNCT STR	.0499					.0143	.03	3.86	1.00		.013	.00	.00	PIPE
1055.970	3623.150	7.801	3630.951	149.00	11.86	2.18	3633.13	.00	3.59	.00	4.000	.000	.00	1 .0
3.000	.0334					.0108	.03	7.80	.00	2.16	.013	.00	.00	PIPE
1058.970	3623.250	7.844	3631.094	149.00	11.86	2.18	3633.28	.00	3.59	.00	4.000	.000	.00	1 .0
54.681	.0481					.0108	.59	7.84	.00	1.94	.013	.00	.00	PIPE
1113.651	3625.879	5.803	3631.682	149.00	11.86	2.18	3633.86	.00	3.59	.00	4.000	.000	.00	1 .0
HYDRAULIC JUMP														
1113.651	3625.879	2.223	3628.102	149.00	20.77	6.70	3634.80	.00	3.59	3.98	4.000	.000	.00	1 .0
15.296	.0481					.0293	.45	2.22	2.72	1.94	.013	.00	.00	PIPE
1128.947	3626.614	2.274	3628.888	149.00	20.20	6.34	3635.22	.00	3.59	3.96	4.000	.000	.00	1 .0
22.547	.0481					.0266	.60	2.27	2.61	1.94	.013	.00	.00	PIPE
1151.494	3627.698	2.365	3630.063	149.00	19.26	5.76	3635.82	.00	3.59	3.93	4.000	.000	.00	1 .0
17.386	.0481					.0235	.41	2.37	2.42	1.94	.013	.00	.00	PIPE
1168.881	3628.534	2.462	3630.995	149.00	18.36	5.24	3636.23	.00	3.59	3.89	4.000	.000	.00	1 .0
13.712	.0481					.0208	.29	2.46	2.24	1.94	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1182.593	3629.193	2.564	3631.757	149.00	17.51	4.76	3636.52	.00	3.59	3.84	4.000	.000	.00	1 .0
10.935	.0481					.0185	.20	2.56	2.07	1.94	.013	.00	.00	PIPE
1193.528	3629.719	2.673	3632.392	149.00	16.69	4.33	3636.72	.00	3.59	3.77	4.000	.000	.00	1 .0
8.736	.0481					.0164	.14	2.67	1.91	1.94	.013	.00	.00	PIPE
1202.264	3630.138	2.790	3632.929	149.00	15.92	3.93	3636.86	.00	3.59	3.67	4.000	.000	.00	1 .0
6.926	.0481					.0147	.10	2.79	1.76	1.94	.013	.00	.00	PIPE
1209.190	3630.471	2.917	3633.388	149.00	15.18	3.58	3636.96	.00	3.59	3.56	4.000	.000	.00	1 .0
5.365	.0481					.0131	.07	2.92	1.61	1.94	.013	.00	.00	PIPE
1214.555	3630.729	3.054	3633.784	149.00	14.47	3.25	3637.04	.00	3.59	3.40	4.000	.000	.00	1 .0
3.950	.0481					.0118	.05	3.05	1.47	1.94	.013	.00	.00	PIPE
1218.505	3630.919	3.207	3634.126	149.00	13.80	2.96	3637.08	.00	3.59	3.19	4.000	.000	.00	1 .0
2.566	.0481					.0107	.03	3.21	1.32	1.94	.013	.00	.00	PIPE
1221.071	3631.042	3.380	3634.422	149.00	13.16	2.69	3637.11	.00	3.59	2.90	4.000	.000	.00	1 .0
.989	.0481					.0099	.01	3.38	1.17	1.94	.013	.00	.00	PIPE
1222.060	3631.090	3.587	3634.677	149.00	12.54	2.44	3637.12	.00	3.59	2.43	4.000	.000	.00	1 .0
JUNCT STR	.0499					.0060	.01	3.59	1.00		.013	.00	.00	PIPE
1224.060	3631.190	7.191	3638.381	72.00	5.73	.51	3638.89	.00	2.57	.00	4.000	.000	.00	1 .0
3.000	.0334					.0025	.01	7.19	.00	1.43	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1227.060	3631.290	7.124	3638.415	72.00	5.73	.51	3638.92	.00	2.57	.00	4.000	.000	.00	1 .0
61.620	.0347				.0025	.15	7.12	.00	1.42	.013	.00	.00	PIPE	
1288.680	3633.430	5.139	3638.569	72.00	5.73	.51	3639.08	.00	2.57	.00	4.000	.000	.00	1 .0
JUNCT STR	.0500						5.14	.00		.013	.00	.00	PIPE	
1290.680	3633.530	1.292	3634.822	71.00	22.02	7.53	3642.35	.00	2.64	3.38	3.500	.000	.00	1 .0
3.000	.0333				.0595	.18	1.29	3.97	1.51	.013	.00	.00	PIPE	
1293.680	3633.630	1.286	3634.916	71.00	22.14	7.61	3642.53	.00	2.64	3.37	3.500	.000	.00	1 .0
54.807	.0600				.0600	3.29	1.29	4.00	1.29	.013	.00	.00	PIPE	
1348.487	3636.917	1.286	3638.203	71.00	22.14	7.61	3645.82	.00	2.64	3.37	3.500	.000	.00	1 .0
173.302	.0600				.0589	10.21	1.29	4.00	1.29	.013	.00	.00	PIPE	
1521.789	3647.313	1.299	3648.611	71.00	21.86	7.42	3656.03	.00	2.64	3.38	3.500	.000	.00	1 .0
110.981	.0600				.0543	6.03	1.30	3.93	1.29	.013	.00	.00	PIPE	
1632.770	3653.970	1.345	3655.315	71.00	20.84	6.74	3662.06	.00	2.64	3.41	3.500	.000	.00	1 .0
5.000	.0400				.0511	.26	1.35	3.67	1.44	.013	.00	.00	PIPE	
1637.770	3654.170	1.341	3655.511	71.00	20.94	6.81	3662.32	.00	2.64	3.40	3.500	.000	.00	1 .0
14.791	.0673				.0500	.74	1.34	3.70	1.25	.013	.00	.00	PIPE	
1652.561	3655.166	1.361	3656.527	71.00	20.51	6.53	3663.06	.00	2.64	3.41	3.500	.000	.00	1 .0
25.079	.0673				.0456	1.14	1.36	3.59	1.25	.013	.00	.00	PIPE	

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SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1677.641	3656.854	1.411	3658.265	71.00	19.56	5.94	3664.20	.00	2.64	3.43	3.500	.000	.00	1 .0
17.901	.0673					.0400	.72	1.41	3.35	1.25	.013	.00	.00	PIPE
1695.542	3658.060	1.462	3659.522	71.00	18.65	5.40	3664.92	.00	2.64	3.45	3.500	.000	.00	1 .0
13.585	.0673					.0352	.48	1.46	3.13	1.25	.013	.00	.00	PIPE
1709.126	3658.974	1.516	3660.490	71.00	17.78	4.91	3665.40	.00	2.64	3.47	3.500	.000	.00	1 .0
10.708	.0673					.0309	.33	1.52	2.92	1.25	.013	.00	.00	PIPE
1719.834	3659.695	1.572	3661.267	71.00	16.95	4.46	3665.73	.00	2.64	3.48	3.500	.000	.00	1 .0
8.635	.0673					.0272	.23	1.57	2.72	1.25	.013	.00	.00	PIPE
1728.469	3660.277	1.631	3661.907	71.00	16.16	4.06	3665.96	.00	2.64	3.49	3.500	.000	.00	1 .0
7.076	.0673					.0239	.17	1.63	2.54	1.25	.013	.00	.00	PIPE
1735.545	3660.753	1.692	3662.445	71.00	15.41	3.69	3666.13	.00	2.64	3.50	3.500	.000	.00	1 .0
5.850	.0673					.0210	.12	1.69	2.37	1.25	.013	.00	.00	PIPE
1741.394	3661.147	1.756	3662.903	71.00	14.69	3.35	3666.26	.00	2.64	3.50	3.500	.000	.00	1 .0
4.862	.0673					.0185	.09	1.76	2.20	1.25	.013	.00	.00	PIPE
1746.256	3661.474	1.824	3663.298	71.00	14.01	3.05	3666.34	.00	2.64	3.50	3.500	.000	.00	1 .0
4.043	.0673					.0163	.07	1.82	2.05	1.25	.013	.00	.00	PIPE
1750.299	3661.746	1.894	3663.641	71.00	13.36	2.77	3666.41	.00	2.64	3.49	3.500	.000	.00	1 .0
3.350	.0673					.0144	.05	1.89	1.91	1.25	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-10-2019 Time: 3: 3:18

SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) SKY VISTA DRIVE TO PARK DRIFT TRAIL (K)

ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1753.649	3661.972	1.969	3663.941	71.00	12.74	2.52	3666.46	.00	2.64	3.47	3.500	.000	.00	1 .0
2.751	.0673					.0127	.03	1.97	1.77	1.25	.013	.00	.00	PIPE
1756.400	3662.157	2.048	3664.205	71.00	12.14	2.29	3666.49	.00	2.64	3.45	3.500	.000	.00	1 .0
2.229	.0673					.0112	.03	2.05	1.64	1.25	.013	.00	.00	PIPE
1758.629	3662.307	2.131	3664.438	71.00	11.58	2.08	3666.52	.00	2.64	3.42	3.500	.000	.00	1 .0
1.762	.0673					.0100	.02	2.13	1.52	1.25	.013	.00	.00	PIPE
1760.392	3662.426	2.219	3664.645	71.00	11.04	1.89	3666.54	.00	2.64	3.37	3.500	.000	.00	1 .0
1.335	.0673					.0088	.01	2.22	1.41	1.25	.013	.00	.00	PIPE
1761.727	3662.516	2.313	3664.829	71.00	10.53	1.72	3666.55	.00	2.64	3.31	3.500	.000	.00	1 .0
.939	.0673					.0079	.01	2.31	1.30	1.25	.013	.00	.00	PIPE
1762.667	3662.579	2.413	3664.992	71.00	10.04	1.56	3666.56	.00	2.64	3.24	3.500	.000	.00	1 .0
.563	.0673					.0070	.00	2.41	1.20	1.25	.013	.00	.00	PIPE
1763.229	3662.617	2.521	3665.138	71.00	9.57	1.42	3666.56	.00	2.64	3.14	3.500	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 NORTH TO SDDI#2
T3 ATKINS / ULTIMATE CONDITIONS
SO    171.9803566.540  1                        3567.277
R     184.6103569.420  2      .013                              .000   0.000 1
SH    184.6103569.420  2                        3569.42
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q            2.000   .0
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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10- 9-2019 Time: 7:33: 5

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 NORTH TO SDDI#2
ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
171.980	3566.540	.737	3567.277	2.00	1.26	.02	3567.30	.00	.41	1.76	4.000	.000	.00	1 .0
171.980	3566.540	.205	3566.745	2.00	11.78	2.16	3568.90	.00	.49	1.21	2.000	.000	.00	1 .0
1.039	.2280					.1572	.16	.21	5.55	.19	.013	.00	.00	PIPE
173.019	3566.777	.208	3566.984	2.00	11.58	2.08	3569.07	.00	.49	1.22	2.000	.000	.00	1 .0
2.159	.2280					.1435	.31	.21	5.42	.19	.013	.00	.00	PIPE
175.177	3567.269	.214	3567.483	2.00	11.04	1.89	3569.38	.00	.49	1.24	2.000	.000	.00	1 .0
1.604	.2280					.1252	.20	.21	5.09	.19	.013	.00	.00	PIPE
176.782	3567.635	.222	3567.856	2.00	10.53	1.72	3569.58	.00	.49	1.26	2.000	.000	.00	1 .0
1.256	.2280					.1092	.14	.22	4.77	.19	.013	.00	.00	PIPE
178.038	3567.921	.229	3568.150	2.00	10.04	1.56	3569.71	.00	.49	1.27	2.000	.000	.00	1 .0
1.014	.2280					.0953	.10	.23	4.47	.19	.013	.00	.00	PIPE
179.052	3568.152	.236	3568.389	2.00	9.57	1.42	3569.81	.00	.49	1.29	2.000	.000	.00	1 .0
.838	.2280					.0832	.07	.24	4.19	.19	.013	.00	.00	PIPE
179.890	3568.344	.244	3568.588	2.00	9.12	1.29	3569.88	.00	.49	1.31	2.000	.000	.00	1 .0
.704	.2280					.0726	.05	.24	3.93	.19	.013	.00	.00	PIPE
180.594	3568.504	.252	3568.757	2.00	8.70	1.18	3569.93	.00	.49	1.33	2.000	.000	.00	1 .0
.598	.2280					.0634	.04	.25	3.69	.19	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10- 9-2019 Time: 7:33: 5

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 NORTH TO SDDI#2
ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
181.192	3568.640	.261	3568.901	2.00	8.30	1.07	3569.97	.00	.49	1.35	2.000	.000	.00	1 .0
.513	.2280					.0553	.03	.26	3.46	.19	.013	.00	.00	PIPE
181.705	3568.757	.269	3569.027	2.00	7.91	.97	3570.00	.00	.49	1.37	2.000	.000	.00	1 .0
.441	.2280					.0483	.02	.27	3.24	.19	.013	.00	.00	PIPE
182.146	3568.858	.278	3569.136	2.00	7.54	.88	3570.02	.00	.49	1.38	2.000	.000	.00	1 .0
.382	.2280					.0422	.02	.28	3.04	.19	.013	.00	.00	PIPE
182.528	3568.945	.288	3569.233	2.00	7.19	.80	3570.04	.00	.49	1.40	2.000	.000	.00	1 .0
.331	.2280					.0368	.01	.29	2.85	.19	.013	.00	.00	PIPE
182.860	3569.021	.297	3569.318	2.00	6.86	.73	3570.05	.00	.49	1.42	2.000	.000	.00	1 .0
.288	.2280					.0321	.01	.30	2.67	.19	.013	.00	.00	PIPE
183.148	3569.086	.307	3569.394	2.00	6.54	.66	3570.06	.00	.49	1.44	2.000	.000	.00	1 .0
.250	.2280					.0281	.01	.31	2.50	.19	.013	.00	.00	PIPE
183.398	3569.144	.318	3569.461	2.00	6.23	.60	3570.06	.00	.49	1.46	2.000	.000	.00	1 .0
.217	.2280					.0245	.01	.32	2.34	.19	.013	.00	.00	PIPE
183.615	3569.193	.328	3569.521	2.00	5.94	.55	3570.07	.00	.49	1.48	2.000	.000	.00	1 .0
.188	.2280					.0214	.00	.33	2.20	.19	.013	.00	.00	PIPE
183.803	3569.236	.339	3569.575	2.00	5.67	.50	3570.07	.00	.49	1.50	2.000	.000	.00	1 .0
.162	.2280					.0187	.00	.34	2.06	.19	.013	.00	.00	PIPE

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10- 9-2019 Time: 7:33: 5

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 NORTH TO SDDI#2
ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
183.965	3569.273	.351	3569.624	2.00	5.40	.45	3570.08	.00	.49	1.52	2.000	.000	.00	1 .0
.139	.2280					.0163	.00	.35	1.93	.19	.013	.00	.00	PIPE
184.103	3569.305	.362	3569.667	2.00	5.15	.41	3570.08	.00	.49	1.54	2.000	.000	.00	1 .0
.118	.2280					.0143	.00	.36	1.81	.19	.013	.00	.00	PIPE
184.222	3569.332	.375	3569.706	2.00	4.91	.37	3570.08	.00	.49	1.56	2.000	.000	.00	1 .0
.099	.2280					.0125	.00	.37	1.69	.19	.013	.00	.00	PIPE
184.321	3569.354	.387	3569.741	2.00	4.68	.34	3570.08	.00	.49	1.58	2.000	.000	.00	1 .0
.082	.2280					.0109	.00	.39	1.59	.19	.013	.00	.00	PIPE
184.403	3569.373	.400	3569.773	2.00	4.46	.31	3570.08	.00	.49	1.60	2.000	.000	.00	1 .0
.067	.2280					.0095	.00	.40	1.49	.19	.013	.00	.00	PIPE
184.469	3569.388	.414	3569.802	2.00	4.26	.28	3570.08	.00	.49	1.62	2.000	.000	.00	1 .0
.053	.2280					.0083	.00	.41	1.39	.19	.013	.00	.00	PIPE
184.522	3569.400	.428	3569.828	2.00	4.06	.26	3570.08	.00	.49	1.64	2.000	.000	.00	1 .0
.039	.2280					.0073	.00	.43	1.31	.19	.013	.00	.00	PIPE
184.561	3569.409	.443	3569.852	2.00	3.87	.23	3570.08	.00	.49	1.66	2.000	.000	.00	1 .0
.027	.2280					.0063	.00	.44	1.22	.19	.013	.00	.00	PIPE
184.589	3569.415	.458	3569.873	2.00	3.69	.21	3570.08	.00	.49	1.68	2.000	.000	.00	1 .0
.016	.2280					.0055	.00	.46	1.14	.19	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10- 9-2019 Time: 7:33: 5

SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 NORTH TO SDDI#2

ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
184.605	3569.419	.473	3569.892	2.00	3.52	.19	3570.08	.00	.49	1.70	2			

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T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 SOUTH TO SDDI#1
T3 ATKINS / ULTIMATE CONDITIONS
SO    171.9803566.540  1                        3567.277
R     213.6503567.950  2      .013                              .000   0.000 1
SH    213.6503567.950  2                        3567.95
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q             3.000   .0
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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10- 9-2019 Time: 7:32:16

SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 SOUTH TO SDDI#1

ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
171.980	3566.540	.737	3567.277	3.00	1.89	.06	3567.33	.00	.50	2.32	4.000	.000	.00	1 .0
171.980	3566.540	.370	3566.910	3.00	7.51	.88	3567.79	.00	.60	1.55	2.000	.000	.00	1 .0
11.356	.0338					.0305	.35	.37	2.61	.36	.013	.00	.00	PIPE
183.336	3566.924	.376	3567.301	3.00	7.32	.83	3568.13	.00	.60	1.56	2.000	.000	.00	1 .0
9.952	.0338					.0275	.27	.38	2.52	.36	.013	.00	.00	PIPE
193.288	3567.261	.389	3567.650	3.00	6.98	.76	3568.41	.00	.60	1.58	2.000	.000	.00	1 .0
5.670	.0338					.0240	.14	.39	2.36	.36	.013	.00	.00	PIPE
198.958	3567.453	.402	3567.855	3.00	6.65	.69	3568.54	.00	.60	1.60	2.000	.000	.00	1 .0
3.811	.0338					.0210	.08	.40	2.21	.36	.013	.00	.00	PIPE
202.769	3567.582	.416	3567.998	3.00	6.34	.62	3568.62	.00	.60	1.62	2.000	.000	.00	1 .0
2.753	.0338					.0184	.05	.42	2.07	.36	.013	.00	.00	PIPE
205.523	3567.675	.430	3568.105	3.00	6.05	.57	3568.67	.00	.60	1.64	2.000	.000	.00	1 .0
2.083	.0338					.0160	.03	.43	1.94	.36	.013	.00	.00	PIPE
207.605	3567.746	.445	3568.190	3.00	5.77	.52	3568.71	.00	.60	1.66	2.000	.000	.00	1 .0
1.603	.0338					.0140	.02	.44	1.82	.36	.013	.00	.00	PIPE
209.208	3567.800	.460	3568.260	3.00	5.50	.47	3568.73	.00	.60	1.68	2.000	.000	.00	1 .0
1.251	.0338					.0123	.02	.46	1.70	.36	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10- 9-2019 Time: 7:32:16

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH2 SOUTH TO SDDI#1
ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
210.459	3567.842	.476	3568.318	3.00	5.24	.43	3568.74	.00	.60	1.70	2.000	.000	.00	1 .0
.974	.0338					.0107	.01	.48	1.59	.36	.013	.00	.00	PIPE
211.433	3567.875	.492	3568.367	3.00	5.00	.39	3568.75	.00	.60	1.72	2.000	.000	.00	1 .0
.751	.0338					.0094	.01	.49	1.49	.36	.013	.00	.00	PIPE
212.184	3567.900	.509	3568.409	3.00	4.77	.35	3568.76	.00	.60	1.74	2.000	.000	.00	1 .0
.568	.0338					.0082	.00	.51	1.40	.36	.013	.00	.00	PIPE
212.753	3567.920	.526	3568.446	3.00	4.54	.32	3568.77	.00	.60	1.76	2.000	.000	.00	1 .0
.411	.0338					.0072	.00	.53	1.31	.36	.013	.00	.00	PIPE
213.164	3567.934	.544	3568.478	3.00	4.33	.29	3568.77	.00	.60	1.78	2.000	.000	.00	1 .0
.276	.0338					.0063	.00	.54	1.22	.36	.013	.00	.00	PIPE
213.440	3567.943	.563	3568.506	3.00	4.13	.27	3568.77	.00	.60	1.80	2.000	.000	.00	1 .0
.159	.0338					.0055	.00	.56	1.15	.36	.013	.00	.00	PIPE
213.598	3567.948	.583	3568.531	3.00	3.94	.24	3568.77	.00	.60	1.82	2.000	.000	.00	1 .0
.052	.0338					.0048	.00	.58	1.07	.36	.013	.00	.00	PIPE
213.650	3567.950	.604	3568.554	3.00	3.75	.22	3568.77	.00	.60	1.84	2.000	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH5 NORTH TO PARCEL I
T3 ATKINS / ULTIMATE CONDITIONS
SO    664.8703588.880  1                        3590.839
R     732.4703589.320  4      .013                              .000   0.000 1
SH    732.4703589.320  4                        3590.84
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q            53.000   .0
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FILE: SM-Lateral-MH5N-ULT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-23-2019 Time:10:43:18

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH5 NORTH TO PARCEL I
ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
664.870	3588.880	1.779	3590.659	53.00	12.14	2.29	3592.95	.00	2.37	2.95	3.000	.000	.00	1 .0
1.418	.0065					.0146	.02	1.78	1.76	2.42	.013	.00	.00	PIPE
666.288	3588.889	1.773	3590.662	53.00	12.19	2.31	3592.97	.00	2.37	2.95	3.000	.000	.00	1 .0
17.822	.0065					.0156	.28	1.77	1.77	2.42	.013	.00	.00	PIPE
684.111	3589.005	1.705	3590.710	53.00	12.78	2.54	3593.25	.00	2.37	2.97	3.000	.000	.00	1 .0
16.931	.0065					.0177	.30	1.70	1.91	2.42	.013	.00	.00	PIPE
701.042	3589.115	1.640	3590.755	53.00	13.40	2.79	3593.55	.00	2.37	2.99	3.000	.000	.00	1 .0
16.096	.0065					.0200	.32	1.64	2.05	2.42	.013	.00	.00	PIPE
717.137	3589.220	1.579	3590.799	53.00	14.06	3.07	3593.87	.00	2.37	3.00	3.000	.000	.00	1 .0
15.333	.0065					.0227	.35	1.58	2.21	2.42	.013	.00	.00	PIPE
732.470	3589.320	1.520	3590.840	53.00	14.75	3.38	3594.22	.00	2.37	3.00	3.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#7 NORTH TO SDMH#12
T3 ATKINS / ULTIMATE CONDITIONS
SO   1058.9703623.250  1                         3631.094
R    1092.5403625.820  4      .013                                .000   0.000 1
R    1097.5403626.020  4      .013                                .000   0.000 0
R    1141.0303626.990  4      .013                                .000   0.000 1
SH   1141.0303626.990  4                         3627.990
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q           56.000   .0
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FILE: SM-Lateral-MH7N-ULT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 8:13: 0

SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#7 NORTH TO SDMH#12

ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1058.970	3623.250	7.844	3631.094	56.00	7.92	.97	3632.07	.00	2.43	.00	3.000	.000	.00	1 .0
33.570	.0766					.0070	.24	7.84	.00	1.13	.013	.00	.00	PIPE
1092.540	3625.820	5.559	3631.379	56.00	7.92	.97	3632.35	.00	2.43	.00	3.000	.000	.00	1 .0
5.000	.0400					.0070	.04	5.56	.00	1.36	.013	.00	.00	PIPE
1097.540	3626.020	5.395	3631.415	56.00	7.92	.97	3632.39	.00	2.43	.00	3.000	.000	.00	1 .0
1.970	.0223					.0070	.01	5.39	.00	1.61	.013	.00	.00	PIPE
1099.510	3626.064	5.364	3631.428	56.00	7.92	.97	3632.40	.00	2.43	.00	3.000	.000	.00	1 .0
HYDRAULIC JUMP														
1099.510	3626.064	1.129	3627.193	56.00	23.02	8.23	3635.42	.00	2.43	2.91	3.000	.000	.00	1 .0
6.677	.0223					.0802	.54	1.13	4.43	1.61	.013	.00	.00	PIPE
1106.188	3626.213	1.111	3627.323	56.00	23.53	8.60	3635.92	.00	2.43	2.90	3.000	.000	.00	1 .0
12.431	.0223					.0884	1.10	1.11	4.58	1.61	.013	.00	.00	PIPE
1118.619	3626.490	1.072	3627.563	56.00	24.68	9.46	3637.02	.00	2.43	2.88	3.000	.000	.00	1 .0
11.575	.0223					.1008	1.17	1.07	4.90	1.61	.013	.00	.00	PIPE
1130.194	3626.748	1.035	3627.784	56.00	25.89	10.41	3638.19	.00	2.43	2.85	3.000	.000	.00	1 .0
10.836	.0223					.1151	1.25	1.04	5.24	1.61	.013	.00	.00	PIPE
1141.030	3626.990	1.000	3627.990	56.00	27.15	11.45	3639.44	.00	2.43	2.83	3.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#8 SOUTH TO SDDI#3
T3 ATKINS / ULTIMATE CONDITIONS
SO   1227.0593631.290  1                         3638.415
R    1231.4093631.390  4      .013                                .000   0.000 1
JX   1236.4093631.590  4  4   .013    1.000         3631.29       -89.8      .000
R    1257.9093633.580  4      .013                                .000   0.000 1
SH   1334.8253640.910  4                         3641.990
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q           76.000   .0
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FILE: SM-Lateral-MH8S-ULT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-23-2019 Time:10:58:32

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#8 SOUTH TO SDDI#3
ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1227.059	3631.290	7.125	3638.415	77.00	6.13	.58	3639.00	.00	2.66	3.64	4.000	.000	.00	1 .0
1227.059	3631.290	1.169	3632.459	77.00	30.20	14.16	3646.62	.00	2.74	2.93	3.000	.000	.00	1 .0
4.350	.0230					.1324	.58	1.17	5.70	1.96	.013	.00	.00	PIPE
1231.409	3631.390	1.154	3632.544	77.00	30.74	14.68	3647.22	.00	2.74	2.92	3.000	.000	.00	1 .0
JUNCT STR	.0400					.1424	.71	1.15	5.85		.013	.00	.00	PIPE
1236.409	3631.590	1.117	3632.707	76.00	31.71	15.62	3648.32	.00	2.73	2.90	3.000	.000	.00	1 .0
21.500	.0926					.1590	3.42	1.12	6.15	1.27	.013	.00	.00	PIPE
1257.909	3633.580	1.080	3634.660	76.00	33.17	17.09	3651.75	.00	2.73	2.88	3.000	.000	.00	1 .0
1334.825	3640.910	1.080	3641.990	76.00	33.17	17.09	3659.08	.00	2.73	2.88	3.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#9 NORTH TO SDDI#5
T3 ATKINS / ULTIMATE CONDITIONS
SO   1293.6753640.480  1                        3634.916
R    1334.8253640.910  2      .013                              .000   0.000 1
SH   1334.8253640.910  2                        3640.910
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q            1.000   .0
```

FILE: SM-LATERAL-MH9N-ULT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 2:53:33

SUMMERLIN WEST VILLAGE 25

SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#9 NORTH TO SDDI#5

ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1293.675	3640.480	.284	3640.763	1.00	3.67	.21	3640.97	.00	.34	1.40	2.000	.000	.00	1 .0
17.851	.0104				.0104	.19	.28	1.47	.28	.013	.00	.00	PIPE	
1311.526	3640.667	.284	3640.950	1.00	3.67	.21	3641.16	.00	.34	1.40	2.000	.000	.00	1 .0
14.718	.0104				.0099	.15	.28	1.47	.28	.013	.00	.00	PIPE	
1326.244	3640.820	.291	3641.111	1.00	3.53	.19	3641.31	.00	.34	1.41	2.000	.000	.00	1 .0
4.637	.0104				.0088	.04	.29	1.39	.28	.013	.00	.00	PIPE	
1330.881	3640.869	.301	3641.170	1.00	3.37	.18	3641.35	.00	.34	1.43	2.000	.000	.00	1 .0
2.152	.0104				.0076	.02	.30	1.30	.28	.013	.00	.00	PIPE	
1333.033	3640.891	.311	3641.202	1.00	3.21	.16	3641.36	.00	.34	1.45	2.000	.000	.00	1 .0
1.106	.0104				.0067	.01	.31	1.22	.28	.013	.00	.00	PIPE	
1334.139	3640.903	.321	3641.224	1.00	3.06	.15	3641.37	.00	.34	1.47	2.000	.000	.00	1 .0
.529	.0104				.0058	.00	.32	1.14	.28	.013	.00	.00	PIPE	
1334.668	3640.908	.332	3641.240	1.00	2.92	.13	3641.37	.00	.34	1.49	2.000	.000	.00	1 .0
.157	.0104													

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#11 NORTH TO SDDI#7
T3 ATKINS / ULTIMATE CONDITIONS
SO   1763.4203662.840  3      .013               3665.138
R    1807.8903663.370  4      .013                                .000   0.000 1
JX   1812.8903663.870  2  2   .013    1.000         3663.87          90.0         .000
R    1883.3903664.670  2      .013                                .000   0.000 1
SH   1883.3903664.670  2                          3667.170
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.500     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q            69.000   .0
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FILE: SM-Lateral-MH11N-ULT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-23-2019 Time:12:41:56

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#11 NORTH TO SDDI#7
ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1763.420	3662.840	1.898	3664.738	70.00	14.85	3.42	3668.16	.00	2.66	2.89	3.000	.000	.00	1 .0
20.576	.0119					.0218	.45	1.90	2.05	2.36	.013	.00	.00	PIPE
1783.996	3663.085	1.839	3664.925	70.00	15.41	3.69	3668.61	.00	2.66	2.92	3.000	.000	.00	1 .0
23.894	.0119					.0243	.58	1.84	2.18	2.36	.013	.00	.00	PIPE
1807.890	3663.370	1.767	3665.137	70.00	16.16	4.05	3669.19	.00	2.66	2.95	3.000	.000	.00	1 .0
JUNCT STR	.1000					.0255	.13	1.77	2.35		.013	.00	.00	PIPE
1812.890	3663.870	2.437	3666.307	69.00	14.15	3.11	3669.42	.00	2.44	.78	2.500	.000	.00	1 .0
1.454	.0113					.0259	.04	2.44	1.00	2.50	.013	.00	.00	PIPE
1814.344	3663.887	2.500	3666.387	69.00	14.06	3.07	3669.45	.00	2.44	.00	2.500	.000	.00	1 .0
69.046	.0113					.0275	1.90	2.50	.00	2.50	.013	.00	.00	PIPE
1883.390	3664.670	3.821	3668.491	69.00	14.06	3.07	3671.56	.00	2.44	.00	2.500	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#11 SOUTH TO SDDI#6
T3 ATKINS / ULTIMATE CONDITIONS
SO   1763.4203662.840  3                        3665.140
R    1772.2203663.140  2      .013                              .000   0.000 1
SH   1772.2203663.140  2                        3665.440
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q            1.000   .0
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FILE: SM-Lateral-MH11S-ULT.WSW              W S P G W - CIVILDESIGN Version 14.08                                    PAGE    1
                              Program Package Serial Number: 7271
                                              WATER SURFACE PROFILE LISTING                    Date:10-23-2019  Time:12: 3: 8
                          SUMMERLIN WEST VILLAGE 25
                            SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#11 SOUTH TO SDDI#6
                              ATKINS / ULTIMATE CONDITIONS
********************************************************************************************************************************** ********
         | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1763.420  3662.840    2.300  3665.140      1.00     .32     .00  3665.14     .00     .34      .00    2.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-
    8.800    .0341                                    .0000      .00     2.30     .00     .21     .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1772.220  3663.140    2.000  3665.140      1.00     .32     .00  3665.14     .00     .34      .00    2.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-
```

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#12 EAST TO SDDI#9
T3 ATKINS / ULTIMATE CONDITIONS
SO   1146.0303627.190  4                          3627.990
R    1163.7703627.690  4      .013                                .000   0.000 1
JX   1168.7703627.890  2  2   .013    1.000         3628.09          90.0         .000
R    1196.2903631.090  2      .013                                .000   0.000 1
SH   1196.2903631.090  2                          3631.990
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q            56.000   .0
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FILE: SM-Lateral-MH12E-ULT.WSW              W S P G W - CIVILDESIGN Version 14.08                                  PAGE    1
                          Program Package Serial Number: 7271
                                                WATER SURFACE PROFILE LISTING                    Date:10-15-2019  Time: 3: 1:24
                       SUMMERLIN WEST VILLAGE 25
                         SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#12 EAST TO SDDI#9
                           ATKINS / ULTIMATE CONDITIONS
```

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1146.030	3627.190	.964	3628.154	57.00	29.08	13.13	3641.28	.00	2.45	2.80	3.000	.000	.00	1 .0
8.278	.0282					.1549	1.28	.96	6.13	1.52	.013	.00	.00	PIPE
1154.308	3627.423	.936	3628.360	57.00	30.25	14.21	3642.57	.00	2.45	2.78	3.000	.000	.00	1 .0
9.462	.0282					.1750	1.66	.94	6.48	1.52	.013	.00	.00	PIPE
1163.770	3627.690	.905	3628.595	57.00	31.73	15.63	3644.23	.00	2.45	2.75	3.000	.000	.00	1 .0
JUNCT STR	.0400					.1923	.96	.90	6.92		.013	.00	.00	PIPE
1168.770	3627.890	1.066	3628.956	56.00	32.90	16.80	3645.76	.00	1.99	2.00	2.000	.000	.00	1 .0
12.150	.1163					.2070	2.51	1.07	6.28	1.26	.013	.00	.00	PIPE
1180.920	3629.303	1.038	3630.341	56.00	33.99	17.94	3648.28	.00	1.99	2.00	2.000	.000	.00	1 .0
15.370	.1163					.2305	3.54							

```
T1 SUMMERLIN WEST VILLAGE 25                                                0
T2 SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#12 WEST TO SDDI#10
T3 ATKINS / ULTIMATE CONDITIONS
SO   1146.0303627.190  4                        3627.990
R    1189.1203627.430  2      .013                              .000   0.000 1
SH   1189.1203627.430  2                        3627.530
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   3.500     .000  .000  .000   .00
CD   4  4   1    .000   3.000     .000  .000  .000   .00
Q            1.000   .0
```

FILE: SM-Lateral-MH12W-ULT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 3: 0:15

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#12 WEST TO SDDI#10
ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1146.030	3627.190	.800	3627.990	1.00	.85	.01	3628.00	.00	.34	1.96	2.000	.000	.00	1 .0
4.997	.0056					.0002	.00	.80	.19	.33	.013	.00	.00	PIPE
1151.027	3627.218	.772	3627.990	1.00	.89	.01	3628.00	.00	.34	1.95	2.000	.000	.00	1 .0
4.769	.0056					.0002	.00	.77	.21	.33	.013	.00	.00	PIPE
1155.796	3627.244	.745	3627.990	1.00	.94	.01	3628.00	.00	.34	1.93	2.000	.000	.00	1 .0
4.584	.0056					.0002	.00	.75	.22	.33	.013	.00	.00	PIPE
1160.380	3627.270	.719	3627.990	1.00	.98	.02	3628.00	.00	.34	1.92	2.000	.000	.00	1 .0
4.380	.0056					.0003	.00	.72	.24	.33	.013	.00	.00	PIPE
1164.760	3627.294	.695	3627.989	1.00	1.03	.02	3628.01	.00	.34	1.90	2.000	.000	.00	1 .0
4.212	.0056					.0003	.00	.69	.25	.33	.013	.00	.00	PIPE
1168.973	3627.318	.671	3627.989	1.00	1.08	.02	3628.01	.00	.34	1.89	2.000	.000	.00	1 .0
4.044	.0056					.0004	.00	.67	.27	.33	.013	.00	.00	PIPE
1173.016	3627.340	.648	3627.988	1.00	1.13	.02	3628.01	.00	.34	1.87	2.000	.000	.00	1 .0
3.874	.0056					.0004	.00	.65	.29	.33	.013	.00	.00	PIPE
1176.890	3627.362	.626	3627.988	1.00	1.19	.02	3628.01	.00	.34	1.85	2.000	.000	.00	1 .0
.482	.0056					.0005	.00	.63	.31	.33	.013	.00	.00	PIPE
1177.372	3627.365	.605	3627.969	1.00	1.25	.02	3627.99	.00	.34	1.84	2.000	.000	.00	1 .0

HYDRAULIC JUMP

FILE: SM-Lateral-MH12W-ULT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 3: 0:15

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#12 WEST TO SDDI#10
ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1177.372	3627.365	.168	3627.532	1.00	7.94	.98	3628.51	.00	.34	1.11	2.000	.000	.00	1 .0
.247	.0056					.0945	.02	.17	4.15	.33	.013	.00	.00	PIPE
1177.619	3627.366	.168	3627.533	1.00	7.93	.98	3628.51	.00	.34	1.11	2.000	.000	.00	1 .0
.965	.0056					.1013	.10	.17	4.14	.33	.013	.00	.00	PIPE
1178.584	3627.371	.162	3627.533	1.00	8.32	1.07	3628.61	.00	.34	1.09	2.000	.000	.00	1 .0
.925	.0056					.1161	.11	.16	4.42	.33	.013	.00	.00	PIPE
1179.509	3627.376	.157	3627.533	1.00	8.73	1.18	3628.72	.00	.34	1.08	2.000	.000	.00	1 .0
.888	.0056					.1332	.12	.16	4.71	.33	.013	.00	.00	PIPE
1180.397	3627.381	.152	3627.533	1.00	9.15	1.30	3628.83	.00	.34	1.06	2.000	.000	.00	1 .0
.851	.0056					.1527	.13	.15	5.02	.33	.013	.00	.00	PIPE
1181.247	3627.386	.147	3627.533	1.00	9.60	1.43	3628.96	.00	.34	1.04	2.000	.000	.00	1 .0
.817	.0056					.1751	.14	.15	5.36	.33	.013	.00	.00	PIPE
1182.064	3627.391	.143	3627.533	1.00	10.07	1.57	3629.11	.00	.34	1.03	2.000	.000	.00	1 .0
.783	.0056					.2008	.16	.14	5.71	.33	.013	.00	.00	PIPE
1182.847	3627.395	.138	3627.533	1.00	10.56	1.73	3629.26	.00	.34	1.01	2.000	.000	.00	1 .0
.751	.0056					.2301	.17	.14	6.09	.33	.013	.00	.00	PIPE
1183.598	3627.399	.134	3627.533	1.00	11.07	1.90	3629.44	.00	.34	1.00	2.000	.000	.00	1 .0
.721	.0056					.2639	.19	.13	6.49	.33	.013	.00	.00	PIPE

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-15-2019 Time: 3: 0:15

SUMMERLIN WEST VILLAGE 25
SANDSTONE RISE DRIVE (STREET M) LATERAL FROM SDMH#12 WEST TO SDDI#10
ATKINS / ULTIMATE CONDITIONS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1184.319	3627.403	.129	3627.532	1.00	11.61	2.09	3629.63	.00	.34	.98	2.000	.000	.00	1 .0
.691	.0056					.3026	.21	.13	6.92	.33	.013	.00	.00	PIPE
1185.010	3627.407	.125	3627.532	1.00	12.18	2.30	3629.84	.00	.34	.97	2.000	.000	.00	1 .0
.663	.0056					.3470	.23	.13	7.38	.33	.013	.00	.00	PIPE
1185.673	3627.411	.121	3627.532	1.00	12.78	2.53	3630.07	.00	.34	.95	2.000	.000	.00	1 .0
.636	.0056					.3980	.25	.12	7.86	.33	.013	.00	.00	PIPE
1186.309	3627.414	.118	3627.532	1.00	13.40	2.79	3630.32	.00	.34	.94	2.000	.000	.00	1 .0
.610	.0056					.4565	.28	.12	8.38	.33	.013	.00	.00	PIPE
1186.919	3627.418	.114	3627.531	1.00	14.05	3.07	3630.60	.00	.34	.93	2.000	.000	.00	1 .0
.585	.0056					.5235	.31	.11	8.94	.33	.013	.00	.00	PIPE
1187.504	3627.421	.110	3627.531	1.00	14.74	3.37	3630.90	.00	.34	.91	2.000	.000	.00	1 .0
.561	.0056					.6004	.34	.11	9.53	.33	.013	.00	.00	PIPE
1188.065	3627.424	.107	3627.531	1.00	15.46	3.71	3631.24	.00	.34	.90	2.000	.000	.00	1 .0
.538	.0056					.6884	.37	.11	10.15	.33	.013	.00	.00	PIPE
1188.604	3627.427	.103	3627.530	1.00	16.21	4.08	3631.61	.00	.34	.89	2.000	.000	.00	1 .0
.516	.0056					.7896	.41	.10	10.82	.33	.013	.00	.00	PIPE

C.5. Rip-Rap Calculations

Cross Section for Roadside Channel - M1

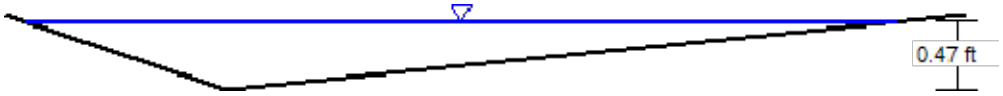
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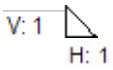
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.06900	ft/ft
Normal Depth	0.47	ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	10.00	ft/ft (H:V)
Discharge	7.00	ft³/s

Cross Section Image





Worksheet for Roadside Channel - M1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.06900	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	10.00	ft/ft (H:V)
Discharge	7.00	ft^3/s

Results

Normal Depth	0.47	ft
Flow Area	1.43	ft^2
Wetted Perimeter	6.20	ft
Hydraulic Radius	0.23	ft
Top Width	6.10	ft
Critical Depth	0.59	ft
Critical Slope	0.02012	ft/ft
Velocity	4.89	ft/s
Velocity Head	0.37	ft
Specific Energy	0.84	ft
Froude Number	1.78	
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	0.47	ft
Critical Depth	0.59	ft
Channel Slope	0.06900	ft/ft
Critical Slope	0.02012	ft/ft

Cross Section for Parcel J Interim Swale

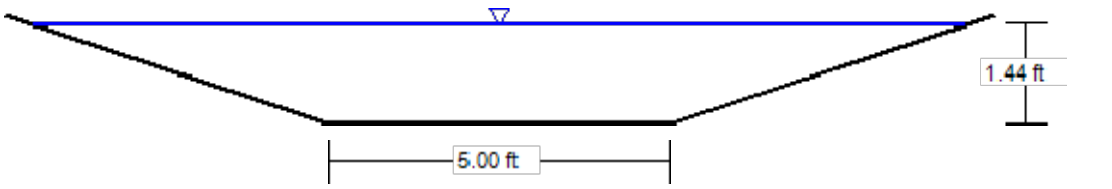
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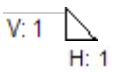
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.035	
Channel Slope	0.01200	ft/ft
Normal Depth	1.44	ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	5.00	ft
Discharge	60.00	ft³/s

Cross Section Image





Worksheet for Parcel J Interim Swale

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.035	
Channel Slope	0.01200	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	5.00	ft
Discharge	60.00	ft³/s

Results

Normal Depth	1.44	ft
Flow Area	13.36	ft²
Wetted Perimeter	14.08	ft
Hydraulic Radius	0.95	ft
Top Width	13.61	ft
Critical Depth	1.27	ft
Critical Slope	0.01938	ft/ft
Velocity	4.49	ft/s
Velocity Head	0.31	ft
Specific Energy	1.75	ft
Froude Number	0.80	
Flow Type	Subcritical	

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	1.44	ft
Critical Depth	1.27	ft
Channel Slope	0.01200	ft/ft

Worksheet for Parcel J Interim Swale

GVF Output Data

Critical Slope	0.01938	ft/ft

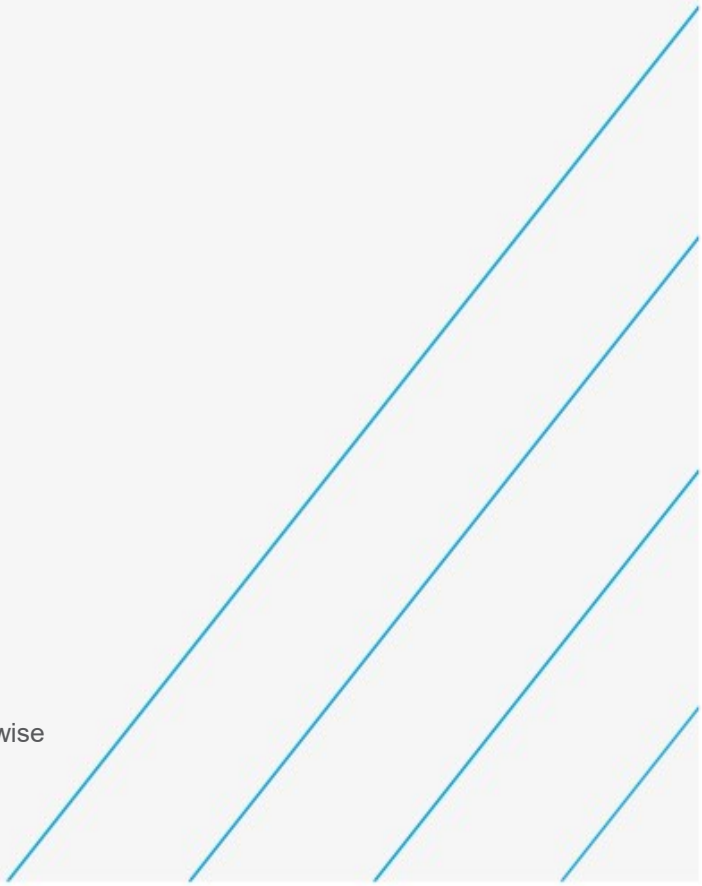
Appendix D. Proposed Improvement Plans

Appendix E. CD-ROM

Atkins

2270 Corporate Circle
Suite 200
Henderson, NV 89074-7755

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Fax: +1 702 263 7200
Direct: 702 551 0330
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www.atkinsglobal.com/northamerica

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14	SANDSTONE RISE DRIVE GRADING PLAN	STA 20+00 TO STA 24+00
15	SANDSTONE RISE DRIVE PLAN AND PROFILE	STA 20+00 TO STA 24+00
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UTILITY NOTE

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

CALL BEFORE YOU DIG: 1-800-642-2444

THIS PROPERTY MAY HAVE STATIC WATER PRESSURE IN EXCESS OF 80 PSI. THE UNIFORM PLUMBING CODE REQUIRES THAT INDIVIDUAL, ON-SITE (PRIVATE) PRESSURE REDUCING VALVES BE INSTALLED WHENEVER THE PRESSURE EXCEEDS 80 PSI. PRV'S ARE THE DEVELOPER'S RESPONSIBILITY AND WILL NOTE BE INSPECTED OR INCLUDED IN THE ACCEPTANCE OF THE LAS VEGAS VALLEY WATER DISTRICT FACILITIES.

NOTICE OF INTENT NOTE

NOTE: ALL LAND SURFACE AREA DISTURBANCES OVER 1 ACRE REQUIRE A STORMWATER DISCHARGE PERMIT ISSUED BY THE NEVADA DIVISION OF ENVIRONMENTAL PROTECTION (NDEP). A PHASED CONSTRUCTION UNIT IN A CONTIGUOUS SUBDIVISION IS CONSIDERED UNDER CONSTRUCTION UNTIL ALL STRIPPED SURFACE AREAS HAVE BEEN COVERED BY PAVING, BUILDING CONSTRUCTION OR PLANTING. A STORMWATER DISCHARGE PERMIT APPLICATION AND ASSOCIATED INFORMATION MAY BE DOWNLOADED FROM THE WEB SITE: HTTP://WWW.STATE.NV.US/BWPC/STORM01.HTM PROJECTS THAT DISTURB MORE THAN ONE ACRE OF LAND MUST SUBMIT TO NDEP A "NOTICE OF INTENT" FOR INCLUSION UNDER STORMWATER PERMIT NO. NVR100000 ALONG WITH APPROPRIATE FILLING FEE.

NPDES PERMIT NOTE

THE ENGINEER SHOULD CONTACT THE NEVADA DIVISION OF ENVIRONMENTAL PROTECTION (NDEP) TO OBTAIN A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT PRIOR TO CONSTRUCTION. ALL CONSTRUCTION PROJECTS ONE ACRE OR LARGER MUST APPLY FOR THE PERMIT THROUGH NDEP. ALL QUESTIONS REGARDING THE NPDES PERMIT REQUIREMENTS SHOULD BE DIRECTED TO THE NDEP AT (775) 687-9429.

FEMA FLOOD ZONE INFORMATION

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE X (UNSHADED) AS DEPICTED ON FLOOD INSURANCE RATE MAP (FIRM) PANEL 32003C2150E, DATED 9/27/2002. A ZONE X (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.

PROPOSED RIGHT-OF-WAY ACREAGE
2.72 AC.

GEOTECHNICAL ENGINEER
PREPARED BY: NOVA GEOTECHNICAL & INSPECTION SERVICES
4480 W. HACIENDA AVENUE, SUITE 104, LAS VEGAS, NV 89118
PHONE: 702-873-3478
PROJECT NO.: G-19-026
DATED: MAY 9,2019

SUMMERLIN VILLAGE 25 IMPROVEMENT PLANS FOR:

SANDSTONE RISE DRIVE (STREET M)

SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

FUTURE SID PROJECT

SUMMERLIN®

OWNER /DEVELOPER

OWNER

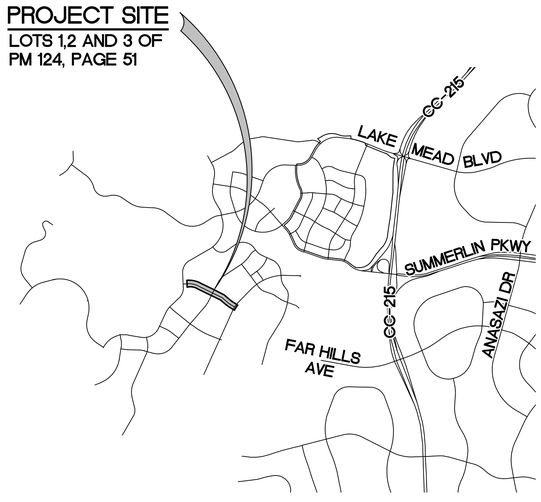
CONTACT: KEVIN ORROCK
HOWARD HUGHES COMPANY LLC
10845 GRIFFITH PEAK DRIVE, SUITE 160
LAS VEGAS, NEVADA 89135
702-791-4000

ENGINEER / CONSULTANT

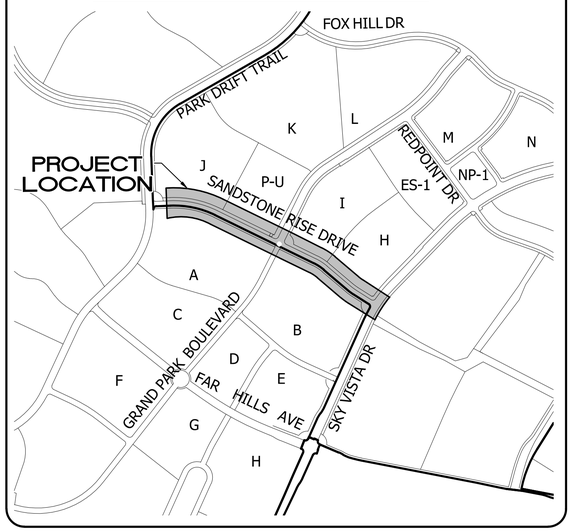
CIVIL

CONTACT: DAVID WILSON P.E.
ATKINS
2270 CORPORATE CIRCLE SUITE 200
HENDERSON, NEVADA 89074
(702) 263-7275

LOCATION MAP



VICINITY MAP



APPROVALS

HOWARD HUGHES COMPANY LLC, A DELAWARE LIMITED LIABILITY COMPANY

KEVIN T. ORROCK, VICE PRESIDENT — DATE

ACTING CITY ENGINEER – ROSA CORTEZ, P.E. #17505 — DATE

APPROVAL OF THESE PLANS IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHT-OF-WAY AND OR/ DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE THE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND/OR SPECIFICATIONS, EXCEPT THOSE SPECIFICALLY LISTED UNDER DEVIATIONS FROM STANDARD. THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN DEVIATIONS FROM STANDARDS IN FAVOR OF THE UNIFORM STANDARDS DRAWING AND SPECIFICATIONS CLARK COUNTY AREA, NEVADA.

CITY OF LAS VEGAS PLANNING DEPARTMENT — DATE

NOTE:
THIS PLAN CONFORMS TO THE APPLICABLE STANDARDS OF THE PLANNING DEPARTMENT.

LAS VEGAS FIRE AND RESCUE — DATE

CENTRAL TELEPHONE COMPANY d/b/a CENTURYLINK — DATE

THE AFFIXED CENTRAL TELEPHONE COMPANY d/b/a CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES, AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES
PROJECT NO. XXXXX FIRST APPROVED DATE: _____
LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL
SHEETS 2,3,6,9,11,13,15,17,19,21,22,24,25,26,27,29

NV ENERGY — DATE

NV ENERGY HAS ACKNOWLEDGED WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NV ENERGY RESERVES THE RIGHT TO ADDRESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO THE NEVADA UTILITY COMMISSION'S RULES AND REGULATIONS.

SOUTHWEST GAS CORPORATION — DATE

COX COMMUNICATIONS OF LAS VEGAS, INC — DATE

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983. SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

LINEAR UNIT: US SURVEY FOOT (FTUS)
DATUM (REFERENCE FRAME): NAD 83 (2011) EPOCH 2010.00
SYSTEM: NEVADA COORDINATE REFERENCE SYSTEM (NCRS)
ZONE: LAS VEGAS HIGH ELEVATION ZONE
PROJECTION: TRANSVERSE MERCATOR STANDARD PARALLEL (AND LATITUDE OF GRID ORIGIN): 36°15'00"N
LONGITUDE OF CENTRAL MERIDIAN: 114°58'00"W
NORTHING AT GRID OF ORIGIN: 400,000.00 M (1,312,333.3333 FTUS)
EASTING AT CENTRAL MERIDIAN: 300,000 M (984,250.0000 FTUS)
SCALE FACTOR ON CENTRAL MERIDIAN: 1.000135 (EXACT)

NOTES:
1. ALL DISTANCES AND BEARINGS SHOWN HEREON ARE PROJECTED (GRID) VALUES BASED ON THE PRECEDING PROJECTION DEFINITION. THE PROJECTION WAS DEFINED SUCH THAT PROJECTED (GRID) DISTANCES ARE EQUIVALENT TO "GROUND" DISTANCES IN THE PROJECTED AREA
2. GRID BEARINGS SHOWN HEREON (OR IMPLIED BY GRID COORDINATES) DO NOT EQUAL GEODETIC BEARINGS DUE TO MERIDIAN CONVERGENCE.

BENCHMARK

PROJECT DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
CITY OF LAS VEGAS BENCHMARK: D368 (REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET)
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
T21S,R59E,S03

LEGAL DESCRIPTION

BEING A PORTION OF LOT 2 AS SHOWN ON THE MAP THEREOF IN BOOK 124 OF PLATS, PAGE 51, OFFICIAL RECORDS, CITY OF LAS VEGAS CLARK COUNTY, NEVADA.

FAST Call before you UnderGround 1-702-432-5300 — BLUESTAKES AND ARIZONA BLUE STAKE, INC. SYSTEM OF TRANSPORTATION
Call before you Dig — ARIZONA BLUE STAKE, INC. — Call 811 or 1-800-642-2444
ARIZONA, NEVADA OVERHEAD POWER LINES, IT'S COMMON SENSE — CALL BEFORE YOU DIG OVERHEAD — 1-702-227-2929

PROFESSIONAL ENGINEER-STATE OF NEVADA — ANTHONY J ORTIZ — EXP. 12-31-21 — CIVIL — NO. 19949
11/18/2019

REVISIONS			
REV.	DESCRIPTION	BY	DATE APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

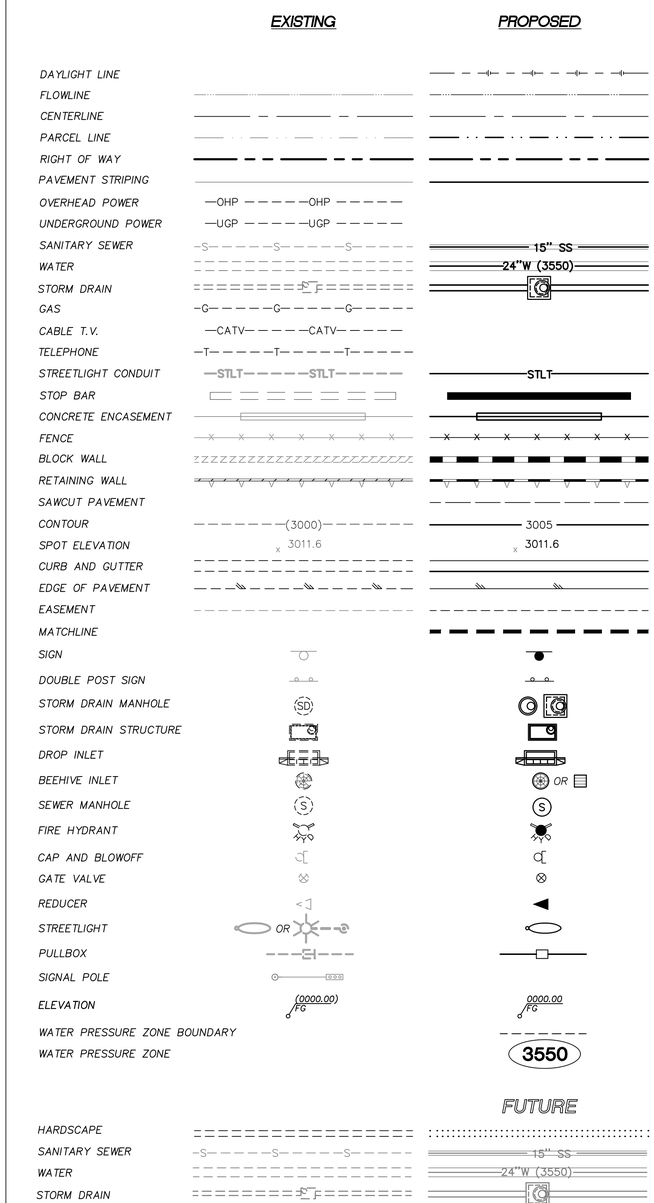
COVER SHEET

JOB NO. 10006366	DESIGNED BY: C. BLAKE	DRAWN BY: G. BLAKE	CHECKED BY: T. ORTIZ
DATE: NOVEMBER, 2019			HORIZ.: NONE
DRAWING NO. 1/32			VERT.: NONE

CLV

X:\Projects\SummWest\Village 25\10006366 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-01-TITL-C1.dwg LAYOUT: 1 Nov 18, 2019 - 8:13AM

@	AT
#	NUMBER
AB	ABANDONED
AC	ASPHALTIC CONCRETE
ACP	ASBESTOS CEMENT PIPE
AGG	AGGREGATE
AIP	ABANDON IN PLACE
ALT	ALTERNATE
AP	ANGLE POINT
APPROX	APPROXIMATE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS INTERNATIONAL
AV/AR	AIR VACUUM AIR RELIEF VALVE
BC	BACK OF CURB
BCR	BACK OF CURB RETURN
BLK	BLOCK
BLVD	BOULEVARD
BM	BENCHMARK
BO	BLOW OFF
BP	BOTTOM OF PIPE
BSW	BACK OF SIDEWALK
BVC	BEGIN VERTICAL CURVE
BVCE	BEGINNING OF VERTICAL CURVE ELEVATION
BVCS	BEGINNING OF VERTICAL CURVE STATION
BW	BOTTOM WIDTH
C&G	CURB AND GUTTER
C–C	CENTER TO CENTER
CATV	CABLE TELEVISION
CCAUSD	CLARK COUNTY AREA UNIFORM STANDARD DRAWING
CCRFCD	CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
CCWRD	CLARK COUNTY WATER RECLAMATION DISTRICT
CF	CUBIC FOOT
CIP	CAST IRON PIPE OR CAST IN PLACE
CL	CENTERLINE
CLR	CLEAR
CLV	CITY OF LAS VEGAS
CM	CONSTRUCTION MANAGER
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CNDT	CONDUIT
CNLV	CITY OF NORTH LAS VEGAS
CO	CLEANOUT
COH	CITY OF HENDERSON
COL	COLUMN
CON'T	CONTINUATION
CONC	CONCRETE
CONST	CONSTRUCT OR CONSTRUCTION
COR	CORNER
COS	COMMUNITY OPEN SPACE
CPP	CORRUGATED PLASTIC PIPE
CSP	CORRUGATED STEEL PIPE
CU	CUBIC
CULV	CULVERT
CY	CUBIC YARD
D	DEPTH
DCSWCS	DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS
DET, DTL	DETAIL
DEPT	DEPARTMENT
DG	DESIGN GRADE
DI	DROP INLET
DIA	DIAMETER
DIAG	DIAGONAL
DIP	DUCTILE IRON PIPE
DOC	DOCUMENT
DW	DRIVEWAY
DWG	DRAWING
E	EAST
EA	EACH
EB	EASTBOUND
EC	END OF CURVE
ECR	END CURB RETURN
EF	EACH FACE
EG	EXISTING GROUND
ELEC	ELECTRICAL
ELEV	ELEVATION
EMBK	EMBANKMENT
EOP	EDGE OF PAVEMENT
EP	EDGE OF PAVEMENT ALIGNMENT END
EQ	EQUAL
ESMT	EASEMENT
EVC	END VERTICAL CURVE
EVCS	END VERTICAL CURVE STATION
EW	EACH WAY
EX, EXST	EXISTING
EXP, JT	EXPANSION JOINT
FA	FIRE ALARM
FC	FACE OF CURB
FF	FINISHED FLOOR ELEVATION
FH	FIRE HYDRANT
FL	FLOW LINE
FO	FIBER OPTIC
FT	FOOT OR FEET
G	GAS LINE
GALV	GALVANIZED
GB	GRADE BREAK
GL	GRATE LENGTH
GM	GAS METER
GUT	GUTTER
GV	GATE VALVE
H	HEIGHT
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HDWL	HEADWALL
HE	HORIZONTAL ELLIPTICAL
HGL	HYDRAULIC GRADE LINE
HOA	HOMEOWNER'S ASSOCIATION
HOR	HORIZONTAL
HP	HIGH POINT
ID	INSIDE DIAMETER
IN	INCH(ES)
INT	INTERSECTION
INV	INVERT
IQAC	INTERAGENCY QUALITY ASSURANCE COMMITTEE
IRR	IRRIGATION
ISL	ISLAND
JB	JUNCTION BOX
JCT	JUNCTION
JT	JOINT
K	VERTICAL CURVE K VALUE
L	LENGTH
LB	POUND(S)
LF	LINEAR FEET
LIN	LINEAR
LIN #	CCWRD MANHOLE NUMBER
LOC	LENGTH OF CURVE
LOL	LAYOUT LINE
LP	LOW POINT
LS	LANDSCAPE
LT	LEFT
LVC	LENGTH OF VERTICAL CURVE
LVVWD	LAS VEGAS VALLEY WATER DISTRICT
MAS	MASONRY
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MON	MONOLITHIC, MONUMENT
MTL	MATERIAL
ME	MATCH EXISTING
MUE	MUNICIPAL UTILITY EASEMENT
N	NORTH
NAP	NOT A PART
NDOT	NEVADA DEPARTMENT OF TRANSPORTATION
NF	NEAR FACE
NG	NUMBER OF GRATES, NATURAL GRADE
NIC	NOT IN CONTRACT
No.	NUMBER
NTS	NOT TO SCALE
NVE	NV ENERGY
OC	ON CENTER
OD	OUTSIDE DIAMETER
OG	OPEN GRADE
OH	OVERHEAD
OHP	OVERHEAD POWER
OS	OFFSET
P	POWER
PB	PULL BOX
PBS	PLANTMIX BITUMINOUS SURFACE
PC	POINT OF CURVATURE
PCC	PORTLAND CEMENT CONCRETE OR POINT OF COMPOUND CURVATURE
PE	POLYETHYLENE
PG	PROPOSED GRADE
PGL	PROFILE GRADE LINE
PH	POT HOLE
PI	POINT OF INTERSECTION
PIP	PROTECT IN PLACE
PL	PROPERTY LINE
PLCS	PLACES
PMF	PAVEMENT MARKING FILM
POC	POINT OF CONNECTION
PP	POWER POLE
PRC	POINT OF REVERSE CURVATURE
PROP	PROPOSED
PSI	POUNDS PER SQUARE INCH
PT	POINT, POINT OF TANGENCY
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
QTY	QUANTITY
(R)	RADIAL
R/W,ROW	RIGHT OF WAY
R	RADIUS
RC	REINFORCED CONCRETE
RCB	REINFORCED CONCRETE BOX
RCC	ROLLER COMPACTED CONCRETE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
REINF	REINFORCED OR REINFORCEMENT
RELOC	RELOCATE
REV	REVISION
RG	ROUGH GRADE
RP	RADIUS POINT
RPM	RAISED PAVEMENT MARKER
RR	RAILROAD
RT	RIGHT
SCHED	SCHEDULE
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SF	SQUARE FOOT/SQUARE FEET
SHLD	SHOULDER
SHT	SHEET
SHP	STEEL HIGH PRESSURE PIPE
SMFO	SINGLE MODE FIBER OPTIC
SNWA	SOUTHERN NEVADA WATER AUTHORITY
SQ	SQUARE
SS	SANITARY SEWER OR SIDE SLOPE
SSD	SUMMERLIN STANDARD DRAWING
SST	STAINLESS STEEL
ST	STREET
STA	STATION
STD	STANDARD
STL	STEEL
STLT	STREETLIGHT
SDHW	STORM DRAIN HEADWALL
STRUCT	STRUCTURAL OR STRUCTURE
SUM #	CCWRD MANHOLE NUMBER
SURV	SURVEY
SVZ	SIGHT VISIBILITY ZONE
SW	SIDEWALK
SY	SQUARE YARD
T	TELEPHONE LINE
TAN	TANGENT
TB	TOP OF BOX
TBA	TO BE ADJUSTED
TBC	TOP OF BACK OF CURB
TBR	TO BE REMOVED
TC	TOP OF CURB
TCD	TRAFFIC CONTROL DEVICE
TDS	TECHNICAL DRAINAGE STUDY
TEL	TELEPHONE
TEMP	TEMPORARY
TF	TOP OF FOOTING
THK	THICK
THR	THRUST
THW	TOP OF HEADWALL
TOF	TOP OF FACE
TW/TOW	TOP OF WALL
TP	TOP OF PIPE
TRANS	TRANSITION
TS	TRAFFIC SIGNAL
TSI	TRAFFIC SIGNAL INTERCONNECT
TW	TOP OF WALL
TYP	TYPICAL
UDACS	UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR WATER DISTRIBUTION SYSTEMS
UG	UNDERGROUND
UGP	UNDERGROUND POWER
UIE	UPPER INVERT ELEVATION
UNO	UNLESS NOTED OTHERWISE
UPRR	UNION PACIFIC RAILROAD
USD	UNIFORM STANDARD DRAWING
UTACS	ULTRA THIN ASPHALT CONCRETE SURFACE
USTCDE	UTILITY, STREETLIGHT, TRAFFIC CONTROL DEVICE EASEMENT
V	VOLT
VAR	VARIABLE
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VG	VALLEY GUTTER
W	WEST, WATER
W/	WITH
WB	WEST BOUND
WL	WATER LINE
WM	WATER METER
W/O	WITHOUT
WPJ	WEAKENED PLANE JOINT
WV	WATER VALVE
WW	WING WALL
YD	YARD(S)



SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY	UNIT
WATER		
12" DIP WATER MAIN	1,123	LF
6" DIP WATER MAIN	106	LF
12" GATE VALVE	3	EA
IRRIGATION SLEEVES	373	LF
WATER SERVICE TO LOTS	1	EA
FIRE HYDRANT	5	EA
1.5" METER AND RPPA	1	EA
SEWER		
12" C900 SEWER	1,807	LF
8" C900 SEWER	162	LF
6" SEWER	69	LF
SEWER MANHOLE (12'–18')	9	EA
STORM DRAIN		
24" RCP SD	111	LF
24" PVC C900 SD	131	LF
30" RCP SD	71	LF
36" RCP SD	121	LF
36" PVC C900 SD	87	LF
42" RCP SD	475	LF
48" RCP SD	1,294	LF
STORM DRAIN PLUG	1	EA
7.5' CM2 SDDI	6	EA
10' CM2 SDDI	2	EA
48"x48" NDOT TYPE 2 SDDI	2	EA
48" TYPE II SD MANHOLE	8	EA
60" TYPE I SD MANHOLE	1	EA
60" TYPE III SD MANHOLE	5	EA

NOTE TO CONTRACTOR

- QUANTITIES SHOWN ARE ESTIMATES ONLY AND ARE INTENDED TO ILLUSTRATE SCOPE OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXACT QUANTITIES INVOLVED.

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

LEGEND AND ABBREVIATIONS

ROADWAY ALIGNMENT DESIGNATIONS

"SRD" = SANDSTONE RISE DRIVE
"PDT" = PARK DRIFT TRAIL
"GPB" = GRAND PARK BOULEVARD
"SVD" = SKY VISTA DRIVE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. XXXXX FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK:
D368 (REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET)
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 REGIONAL AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you D g AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY. Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J. ORTIZ
EXP. 12-31-21
CIVIL
No. 18949
11/18/2019

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: NONE
VERT.: NONE

JOB NO. 100063656
DATE: NOVEMBER, 2019
DRAWING NO. 2/32
CLV

X:\Projects\SummWest\Village 25\100063656 – V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-02-LGND-02.dwg LAYOUT: 2 Nov 18, 2019 – 8:16AM

CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE THE CONTRACTOR SHALL, AT HIS EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE S WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
5. TYPE V CEMENT SHALL BE USED IN ALL OFF–SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.
6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT–OF–WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300´ IN EXTRUDED–TYPE CURB.
8. AC PAVEMENT TO BE ONE–HALF INCH (½") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS.
9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 216.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE AS SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY THE (COMPANY, REPORT #, DATE) APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOWLINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.

WALL NOTES:

16. ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.
17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC, THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.
21. SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE CITY AND APPROVED PRIOR TO ACCEPTANCE OF FACILITY VIDEO INSPECTION. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES AND TRANSITION STRUCTURES, STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXIT THE PUBLIC RIGHT–OF–WAY, SEWER AND STORM DRAIN MAIN ALIGNMENT, INCLUDING DEFLECTION POINTS. THE LOCATION SHALL BE DESCRIBED BY COORDINATES WHICH SHALL BE BASED ON THE OFFICIAL HORIZONTAL AND VERTICAL CONTROL NETWORKS OF THE CITY OF LAS VEGAS. FINAL LOCATION MAPS MUST BE SEALED AND CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINTIES OF ± 0.09 METERS (± 0.3 FEET) HORIZONTALLY AND VERTICALLY. A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S).
22. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST EDITION.
23. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

REVISED 06/04/2018

CITY OF LAS VEGAS GRADING NOTES

1. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATIONS, THE OWNER/ENGINEER SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL NECESSARY CUTS AND FILLS WITHIN THE LIMITS OF THIS PROJECT AND THE RELATED OFF–SITE WORK, SO AS TO GENERATE THE DESIRED SUBGRADE, FINISH GRADES AND SLOPES SHOWN.
3. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ALL EXCAVATION. ADEQUATE SHORING SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR TO PREVENT UNDERMINING OF ANY ADJACENT FEATURES OR FACILITIES AND/OR CAVING OF THE EXCAVATION.
4. THE CONTRACTOR IS WARNED THAT AN EARTHWORK BALANCE WAS NOT NECESSARILY THE INTENT OF THIS PROJECT. ANY ADDITIONAL MATERIAL REQUIRED OR LEFTOVER MATERIAL FOLLOWING EARTHWORK OPERATIONS BECOMES THE RESPONSIBILITY OF THE CONTRACTOR.
5. THE GRADING CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE OWNER TO PROVIDE FOR THE REQUIREMENTS OF THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND ASSOCIATED PERMIT.
6. CONTRACTOR SHALL GRADE TO THE LINES AND ELEVATIONS SHOWN ON THE PLANS WITHIN THE FOLLOWING HORIZONTAL AND VERTICAL TOLERANCES AND DEGREES OF COMPACTION, IN THE AREAS INDICATED:

		HORIZONTAL	VERTICAL	COMPACTION
A.	PAVEMENT AREA SUBGRADE	0.1'+	+0.0' TO –0.1'	SEE SOILS REPORT
B.	ENGINEERED FILL	0.5'+	+0.1' TO –0.1'	SEE SOILS REPORT

COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE.

7. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.
8. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.
9. THE CONTRACTOR SHALL MAINTAIN THE STREETS, SIDEWALKS AND ALL OTHER PUBLIC RIGHT–OF–WAY IN A CLEAN, SAFE AND USABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE PUBLICLY OWNED PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. ALL ADJACENT PROPERTY, PRIVATE OR PUBLIC SHALL BE MAINTAINED IN A CLEAN, SAFE AND USABLE CONDITION.
10. IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED THAT IS NOT SHOWN ON THESE DRAWINGS, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIS OWN EXPENSE AND AT THE DIRECTION OF THE CITY ENGINEER. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

REVISED 04/15/10

CONSTRUCTION CONCURRENCY NOTES

THE FOLLOWING SEPARATE VILLAGE 25 ROADWAY IMPROVEMENT PLANS ARE TO BE CONSTRUCTED CONCURRENTLY AND ARE SHOWN AS FUTURE (BY OTHERS):

1. SKY VISTA DRIVE (FAR HILLS AVENUE TO REDPOINT DRIVE)
2. SUMMERLIN 4125 ZONE NORTH PIPELINES PHASE 1
3. PARK DRIFT TRAIL (SANDSTONE RISE DRIVE TO LAKE MEAD BLVD)
4. GRAND PARK BOULEVARD (SANDSTONE RISE DRIVE TO FOX HILL DRIVE)

CITY OF LAS VEGAS FIRE DEPARTMENT NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE #6325 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS.
2. ONLY FIRE HYDRANTS THAT ARE ON THE LAS VEGAS VALLEY WATER DISTRICT'S APPROVED PRODUCTS LIST ARE ALLOWED TO BE INSTALLED.
3. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON–SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK. IFC § 105.7.12
4. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. IFC § 3310, § 3312
5. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. IFC § 507.5.7.3
6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL. IFC § 106.3
7. ALL ON–SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. IFC § 507.2.1, NFPA 24
8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. IFC § 507
9. PRIVATE HYDRANTS SHALL BE PAINTED RED. IFC § 507.5.7.1
10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. IFC § 507
11. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: IFC § C102
    - RESIDENTIAL – 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
    - COMMERCIAL – 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
12. WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. IFC § C102.8
13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL–DE–SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL–DE–SAC.
14. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. IFC § C102.12
15. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE–TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. IFC § 102.4
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. IFC § C102.7
17. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD–END STREET SHALL NOT EXCEED 200 FT. IFC § C102.6
18. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD–INS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN. IFC § C104
19. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL–WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. IFC § 503.2.3
20. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12% ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FT PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. IFC § 503.2.7; 503.2.8
21. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. IFC § 503.2.4
22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13FT 6 INS. IFC § 503.2.1
23. FIRE DEPARTMENT ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 40 FT FLOW LINE TO FLOW LINE WITH PARALLEL PARKING PERMITTED ON BOTH SIDES. NOT LESS THAN 32 FT WIDE, FLOW LINE TO FLOW LINE, WHERE PARKING IS PERMITTED ONLY ON ONE SIDE OF THE FIRE APPARATUS ACCESS ROAD. NOT LESS THAN 24FT WIDE, FLOW LINE TO FLOW LINE, WHERE NO PARKING IS PERMITTED ON EITHER SIDE. FIRE LANES THROUGH PARKING LOTS SHALL BE NOT LESS THAN 24 FT. IFC § 503.2.1.1
24. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. THIS DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED. IFC § 503.1.1
25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD–ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT. COMMERCIAL AND INDUSTRIAL DEVELOPMENTS WHERE BUILDINGS EXCEED 2 STORIES OR 30 FEET IN HEIGHT, OR EXCEEDING 62,000 SQUARE FEET IN AREA. IFC § 503.1.2
26. ALL DEAD–END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. IFC § 503.2.5
27. ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS OF 100 FT ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM THE ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. IFC § 503.3
28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM. SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE IFC § 503.6 AND IFC APPENDIX M.

REVISED MARCH 1, 2016

CITY OF LAS VEGAS TRAFFIC NOTES

1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.
2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.
3. BEFORE ANY WORK IS STARTED IN THE RIGHT–OF–WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
4. WHEN A DESIGNATED "SUGGESTED ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD". THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.
5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW TRAFFIC SIGNS SHALL UTILIZE TYPE XI RETROREFLECTIVE SHEETING IN ACCORDANCE WITH CGAUSS 627 AND 716 AND SHALL HAVE AN ANTI–GRAFFITI PROTECTIVE OVERLAY FILM THAT IS A MATCHING COMPONENT TO, AND OF THE SAME MANUFACTURER AS THE RETROREFLECTIVE SHEETING TO WHICH IT IS APPLIED. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.
7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5') FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.
8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF–SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.
9. STREET SIGNS AND STOP SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.
10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR IMSA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT OF WAY.
11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA (RTC). IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.
13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828–3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.
14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.
15. THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPICTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

REVISED JUNE 4, 2018

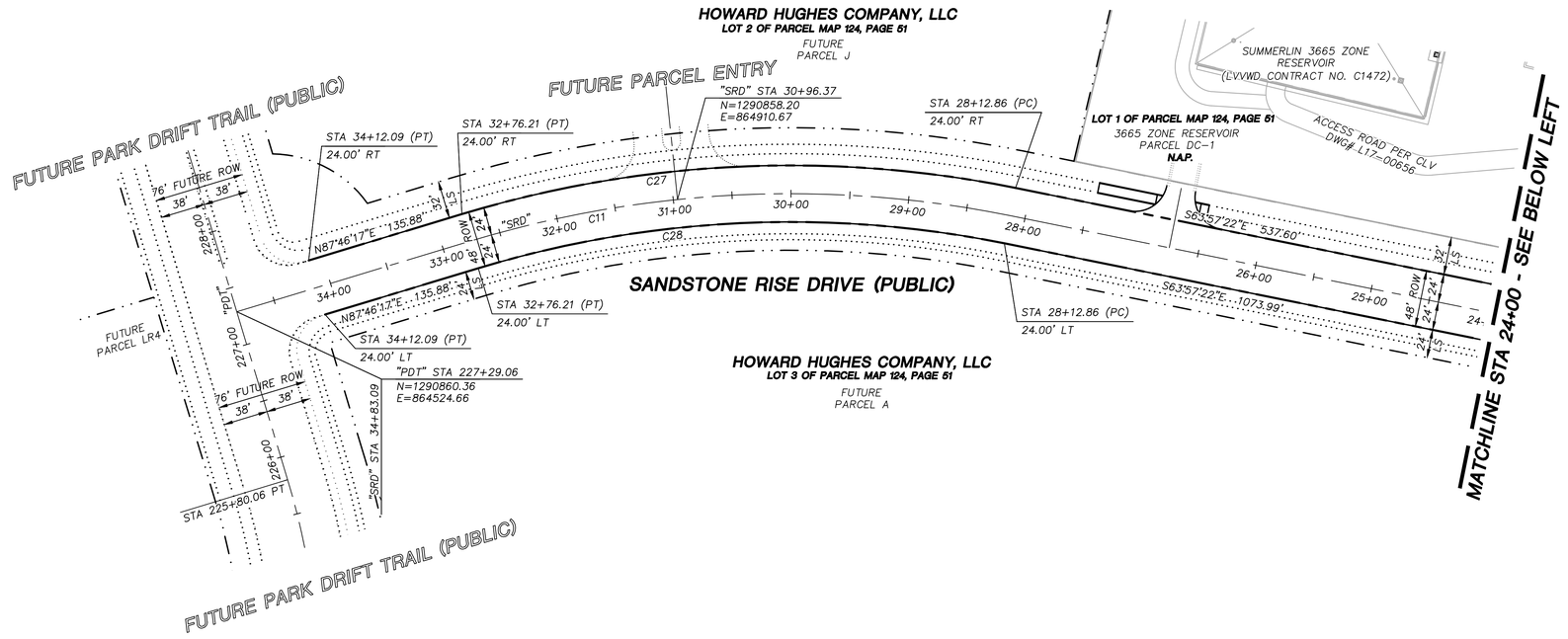
CITY OF LAS VEGAS SEWER NOTES

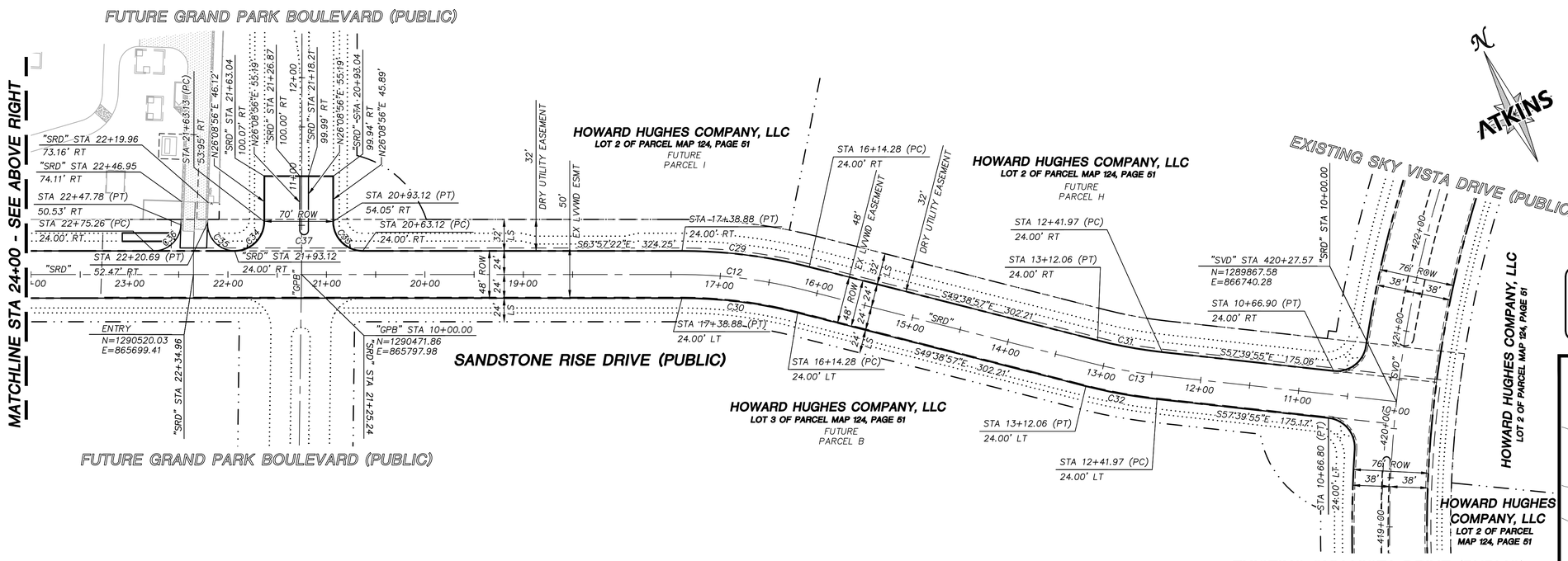
1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS. ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEER.
3. CHISEL "S" OR "G" IN CURBS WHERE SEWER OR GAS LATERALS PASS UNDER THE CURB.
4. POLYVINYL (PVC) SEWER PIPE SHALL MEET ASTM D–3034 SDR 35 SPECIFICATIONS, INSTALLED WITH SAND BEDDING AND BACKFILL OF TYPE II AGGREGATE BASE.
5. ALL MANHOLES PAVED IN STREETS EIGHTY (80') FOOT R/W AND LARGER SHALL HAVE CONCRETE COLLARS. STREETS LESS THAN EIGHTY (80') FOOT R/W WILL REQUIRE RETROFIT IF PAVING DOES NOT CONFORM TO CITY STANDARDS AT THE MANHOLE.
6. TEE SADDLES SHALL BE USED TO CONNECT SEWER LATERALS TO EXISTING MAIN LINES UP TO TWELVE INCH (12") DIAMETER. CONNECTIONS TO FIFTEEN INCH (15") OR LARGER MAINS SHALL REQUIRE SPECIAL PROCEDURES. IN LINE "Y"'S SHALL BE USED ON LINES TWELVE INCHES (12") OR ABOVE.
7. WATER MAINS SHALL BE PROTECTED IN ACCORDANCE WITH LVWD STANDARDS WHENEVER A SEWER MAIN CROSSES OVER A WATER MAIN OR THE SEWER IS LESS THAN EIGHTEEN INCH (18") UNDER A WATER MAIN.
8. ALL CONTRACTORS INSTALLING SEWER MAINS THAT WILL BE UNDER THE JURISDICTION OF THE CITY OF LAS VEGAS MUST BE STATE OF NEVADA CLASS "A" CONTRACTORS.
9. THE CITY OF LAS VEGAS WILL NOT ACCEPT ANY SEWER MAINS WHICH HAVE A VERTICAL DEFLECTION OF MORE THAN ONE TENTH (0.1) OF A FOOT FROM THE APPROVED CONSTRUCTION PLANS AT ANY LOCATION. SEWER MAINS FOUND TO EXCEED THIS TOLERANCE WILL HAVE TO BE REPAIRED OR REMOVED OR REPLACED TO THE SATISFACTION OF THE CITY ENGINEER PRIOR TO ACCEPTANCE BY THE CITY OF LAS VEGAS.
10. INSTALLATION OF CURVED SEWER REQUIRES THE USE OF C–900 PIPE WHICH ALLOWS FOR PIPE DEFLECTION AT THE JOINTS.

REVISED 04/15/10

CITY OF LAS VEGAS STREET LIGHT NOTES

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION (USS), AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" (USD), LATEST REVISION.
2. DESIGN PROFESSIONAL AND CONTRACTOR SHALL VERIFY CITY'S LATEST LED FIXTURE SPECIFICATIONS AND APPROVED FIXTURES PER CLV WEBSITE, UNDER BUILDING SAFETY FORMS, PRIOR TO ORDERING MATERIALS.
3. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS, ETC., LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE TRAFFIC AND CITY ENGINEER. ANY DEVIATION FROM THE PLAN LOCATION WILL REQUIRE COMPLIANCE WITH SECTION 623 OF THE USS.
4. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION IN ACCORDANCE WITH SECTION 623 G.03.01 OF THE USS.
5. ALL EMPTY CONDUIT SHALL HAVE AT LEAST ONE GREEN NO. #8 AWG WIRE INSTALLED AS TRACER WIRE IN ACCORDANCE WITH SECTION 623 G.02.01 OF THE USS PRIOR TO BACKFILLING AND FINAL INSPECTION.
6. ANY STRUCTURE SUCH AS BLOCK WALLS, CHA





SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY	UNIT
ROADWAY		
CURB & GUTTER (TYPE "L")	4518	LF
CURB & GUTTER (TYPE "A")	124	LF
TYPE II GRAVEL BASE	1335	CY
4" ASPHALTIC CONCRETE PAVING	12019	SY
CURB RAMP	6	EA

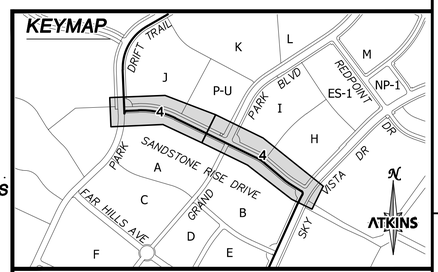
ROADWAY NOTES

1. SEE SHEET 24 FOR TYPICAL SECTIONS, DETAILS
2. SEE SHEET 2 FOR ROADWAY ALIGNMENT ABBREVIATIONS

CENTERLINE CURVE TABLE				
NO.	RADIUS	DELTA	LENGTH	TANGENT
C11	939.00'	28°16'21"	463.35'	236.49'
C12	499.00'	14°18'25"	124.60'	62.63'
C13	501.00'	8°00'59"	70.10'	35.11'

BACK OF CURB CURVE TABLE				
NO.	RADIUS	DELTA	LENGTH	TANGENT
C27	963.00'	28°16'21"	475.19'	242.54'
C28	915.00'	28°16'21"	451.51'	230.45'
C29	523.00'	14°18'25"	130.60'	65.64'
C30	475.00'	14°18'25"	118.61'	59.61'
C31	477.00'	8°00'59"	66.74'	33.42'
C32	525.00'	8°00'59"	73.45'	36.79'
C33	30.00'	90°06'17"	47.18'	30.05'
C34	30.00'	89°53'43"	47.07'	29.95'
C35	27.50'	92°01'13"	44.17'	28.49'
C36	27.50'	87°58'47"	42.23'	26.55'
C37	4.33'	180°00'00"	13.60'	INFINITY

EX SKY VISTA DRIVE:
PER VILLAGE 25 SKY VISTA DRIVE IMPROVEMENTS BY GCW, INC CLV# 107V7884



GRAPHIC SCALE
60 0 30 60 120
HORIZONTAL: 1"= 60'

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK: D368 (REVISED 2008) NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET) FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN. T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you D g AVOID BURIED INTERFERENCE UTILITY LINES. ITS SIMPLY... Call 811 OR 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES. IT'S SIMPLY... CALL BEFORE YOU DIG OVERHEAD 1-702-227-2929

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
No. 18949
11/18/2019

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

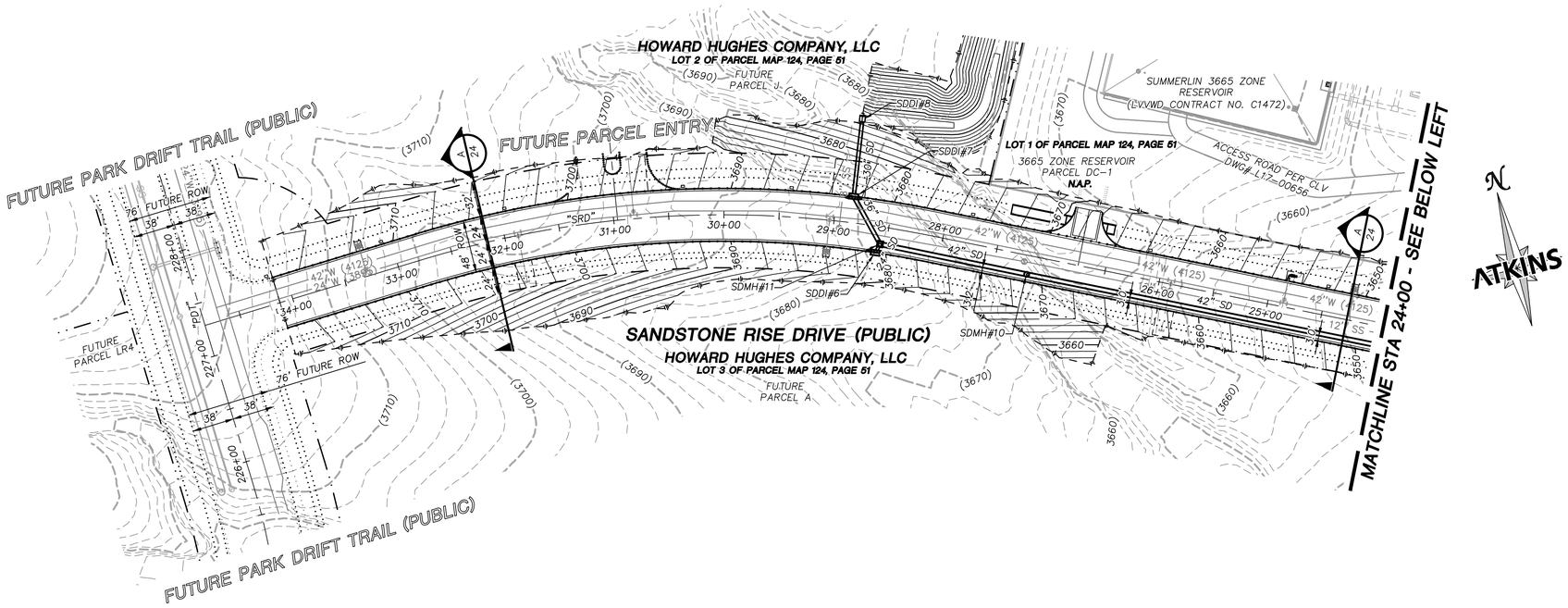
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

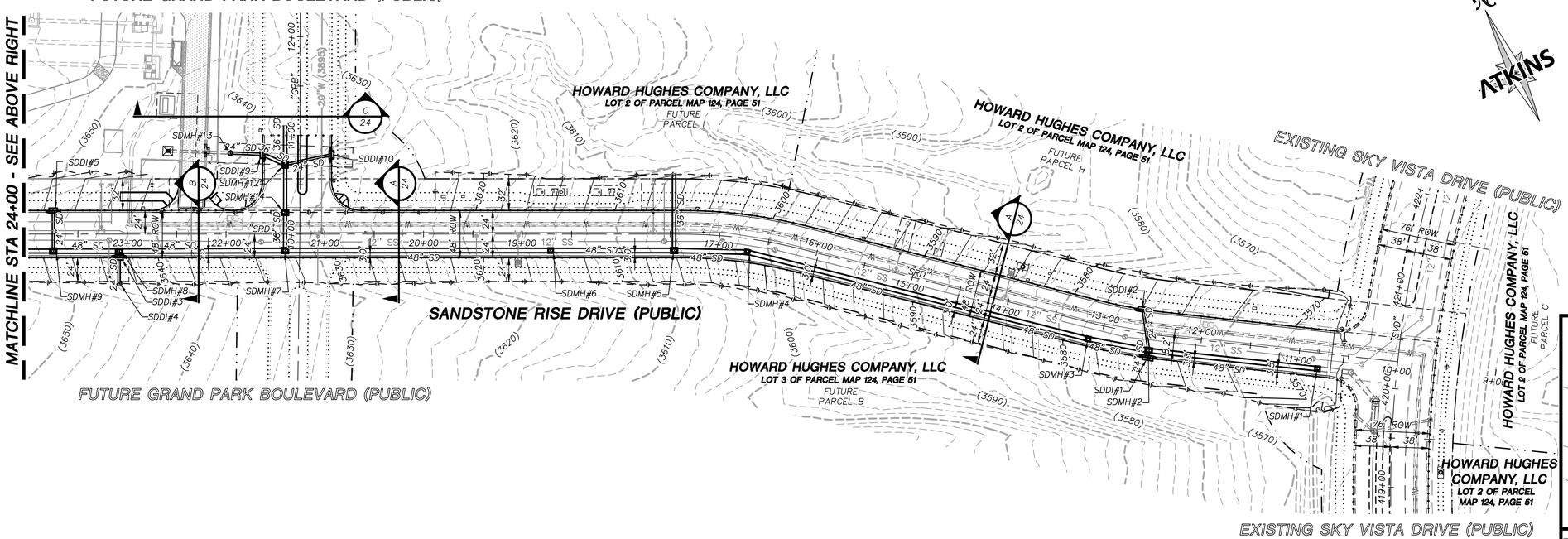
HORIZONTAL CONTROL PLAN

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: 1"=60'
VERT.: NONE

JOB NO. 100063656
DATE: NOVEMBER, 2019
DRAWING NO. 4/32
CLV

X:\Projects\SummWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-04-HORIZ-H1.dwg LAYOUT: 4 Nov 18, 2019 - 8:17AM





MASTER PLAN NOTE

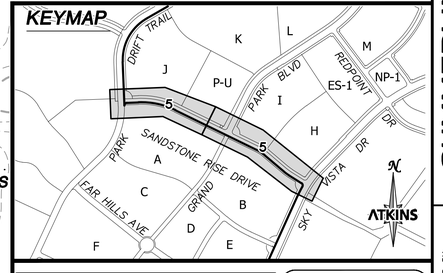
THIS SHEET IS FOR INFORMATIONAL PURPOSES ONLY. IT IS AN OVERALL REPRESENTATION OF THE UTILITY FOR REVIEW AND COORDINATION WITH OTHER PROJECT DETAILS WITHIN THIS PLAN SET.

STORM DRAIN NOTES

1. SEE ROADWAY GRADING PLAN AND ROADWAY PLAN AND PROFILE SHEETS FOR CONSTRUCTION NOTES AND INFORMATION RELATED TO PIPE SIZE (INNER DIAMETER), MANHOLE BASE SIZE (INSIDE DIMENSIONS), AND DROP INLET LENGTHS (CURB OPENING).
2. ALL STORM DRAIN MATERIAL TO BE CLASS III REINFORCED CONCRETE PIPE, UNLESS OTHERWISE NOTED IN PROFILES.
3. CONTRACTOR TO PROVIDE 6" MINIMUM OF CLEARANCE BETWEEN OUTSIDE OF PIPE TO INSIDE WALL OF STORM DRAIN STRUCTURES.

EX SKY VISTA DRIVE:

PER
VILLAGE 25 SKY VISTA DRIVE IMPROVEMENTS
BY GCW, INC
CLV# 107V7884



GRAPHIC SCALE
60 0 30 60 120
HORIZONTAL: 1"= 60'

SOILS REPORT

BY NOVA GEOTECHNICAL
PROJECT NO. G-19-026
DATED MAY 9,2019
EARTHWORK QUANTITIES (RAW):
CUT= 5,910 CU YDS
FILL= 15,946 CU YDS

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE#18849 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

DSI#XXX-0000

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

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AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY. CALL BEFORE YOU DIG OVERHEAD 1-702-227-2929

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J. ORTIZ
EXP. 12-31-21
CIVIL
No. 18949
11/18/2019

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

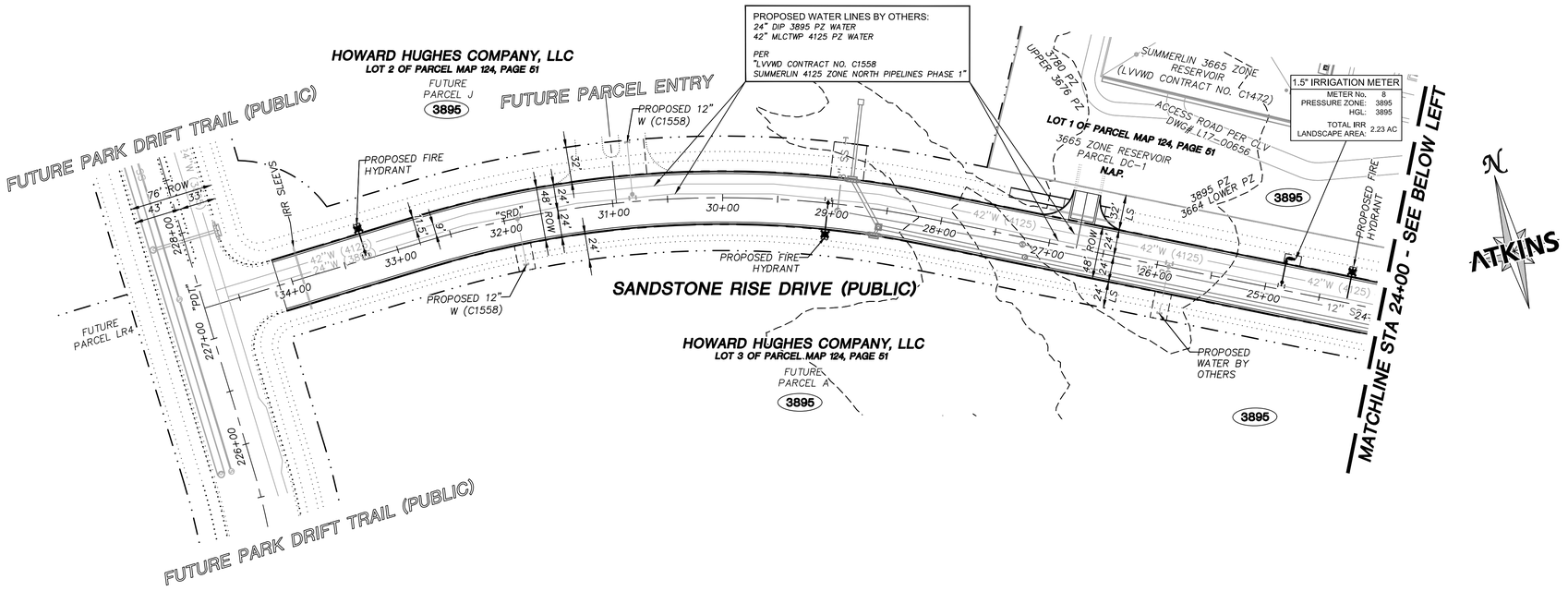
SUMMERLIN

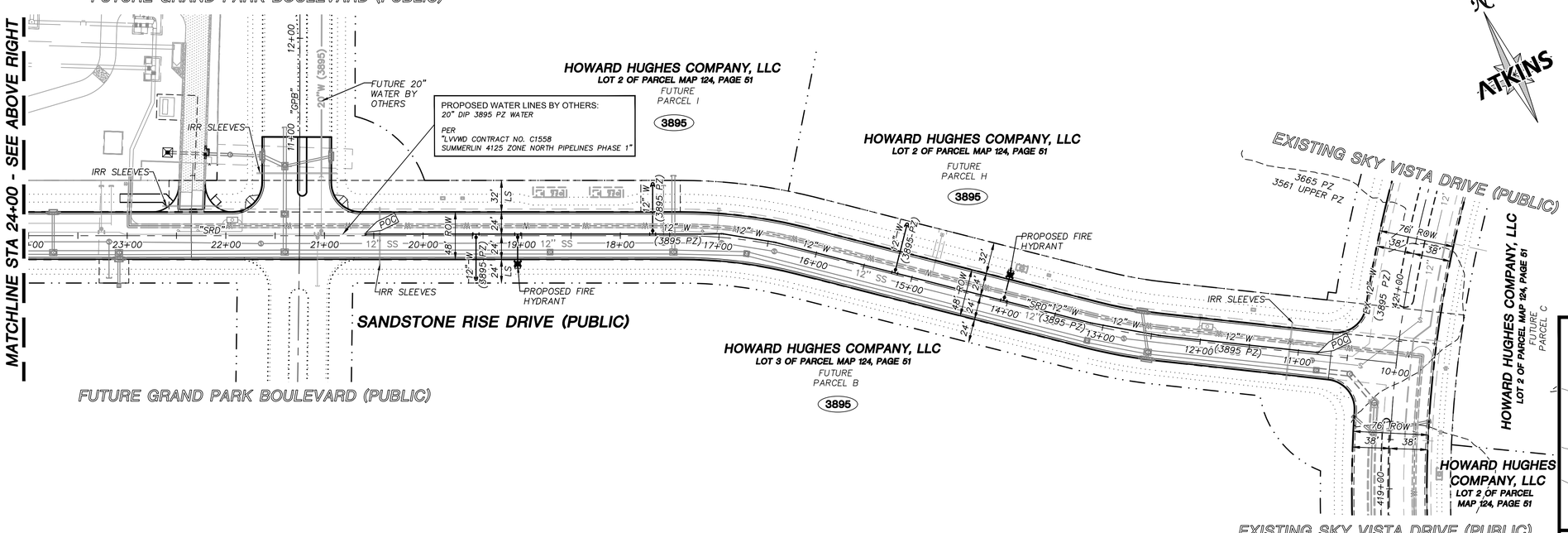
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)
MASTER DRAINAGE PLAN

JOB NO.	100063656
DATE:	NOVEMBER, 2019
DRAWING NO.	5/32
DESIGNED BY:	C. BLAKE
DRAWN BY:	G. BLAKE
CHECKED BY:	T. ORTIZ
HORIZ:	1"=##
VERT.:	NONE

CLV

X:\Projects\SummWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-05-STRM-SD1.dwg LAYOUT: 5 Nov 18, 2019 - 8:18AM





MASTER PLAN NOTE

THIS SHEET IS FOR INFORMATIONAL PURPOSES ONLY. IT IS AN OVERALL REPRESENTATION OF THE UTILITY FOR REVIEW AND COORDINATION WITH OTHER PROJECT DETAILS WITHIN THIS PLAN SET.

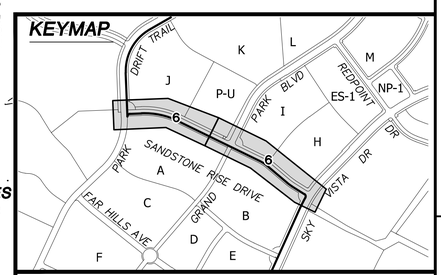
WATER NOTES

1. SEE ROADWAY PLAN AND PROFILE SHEETS FOR CONSTRUCTION NOTES AND INFORMATION RELATED TO PIPE SIZE, LENGTH, AND SIZE OF FITTINGS.
2. ALL WATER PIPE MATERIAL TO BE WATER QUALITY RATED AWWA C-900, UNLESS OTHERWISE NOTED IN PROFILES.
3. INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING PER UDACS PLATE #15.
4. PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.
5. THRUST BLOCKS WILL BE PROVIDED AT EVERY CHANGE IN DIRECTION PER UDACS PLATES #30 & #31
6. IRRIGATION METER NUMBERING PER SUMMERLIN VILLAGE 25 IRRIGATION MASTER PLAN BY SMP ENVIRONMENTAL DESIGN DATED 5/1/19
7. ALL SEWER/STORM DRAIN CROSSING WATER LINES MUST COMPLY WITH UDACS SECTION 2.22.
8. THE WATER PLANS SHOW ONE OR MORE VALVED OUTLETS EXTENDING OUT OF PAVED AREAS. INSTALLATION OF THESE OUTLETS IS ACCEPTABLE, HOWEVER, IF THE OUTLETS ARE INCORRECTLY LOCATED OR NOT USED FOR ANY REASON WHEN THE PROPERTY IS ACTUALLY DEVELOPED, THE DEVELOPER SHALL ABANDON THE OUTLETS AT THE CONNECTION TO THE ACTIVE MAIN IN ACCORDANCE TO LVVWD STANDARDS AND AT THE DEVELOPER'S EXPENSE. APPROVAL OF THE VALVED OUTLET DOES NOT PROVIDE OR IMPLY A WATER COMMITMENT.
9. ALL ABOVE GROUND OBSTRUCTIONS INCLUDING BUT NOT LIMITED TO LANDSCAPE BOULDERS, FENCES / WALLS (TO INCLUDE NO FOOTINGS), AND SIGNS ARE STRICTLY PROHIBITED WITHIN EASEMENT.
10. MAINTAIN MINIMUM TWENTY-FOUR (24) INCH COVER PER UDACS SECTION 2.08.04. GRADING MUST BE COMPLETED PRIOR TO WATERLINE INSTALLATION
11. PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

EX SKY VISTA DRIVE:

PER
VILLAGE 25 SKY VISTA DRIVE IMPROVEMENTS
BY GCW, INC
CLV# 107V7884

KEYMAP



GRAPHIC SCALE
60 0 30 60 120
HORIZONTAL: 1"= 60'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. XXXXX FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK: D368 (REVISED 2008) NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET) FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN. T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you D g AVOID SYSTEMS UNDERGROUND UTILITY LINES. IT'S COURTLY. Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES. IT'S COURTLY. CALL BEFORE YOU DO OVERHEAD. 1-702-227-2929

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PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
No. 18949
11/18/2019

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

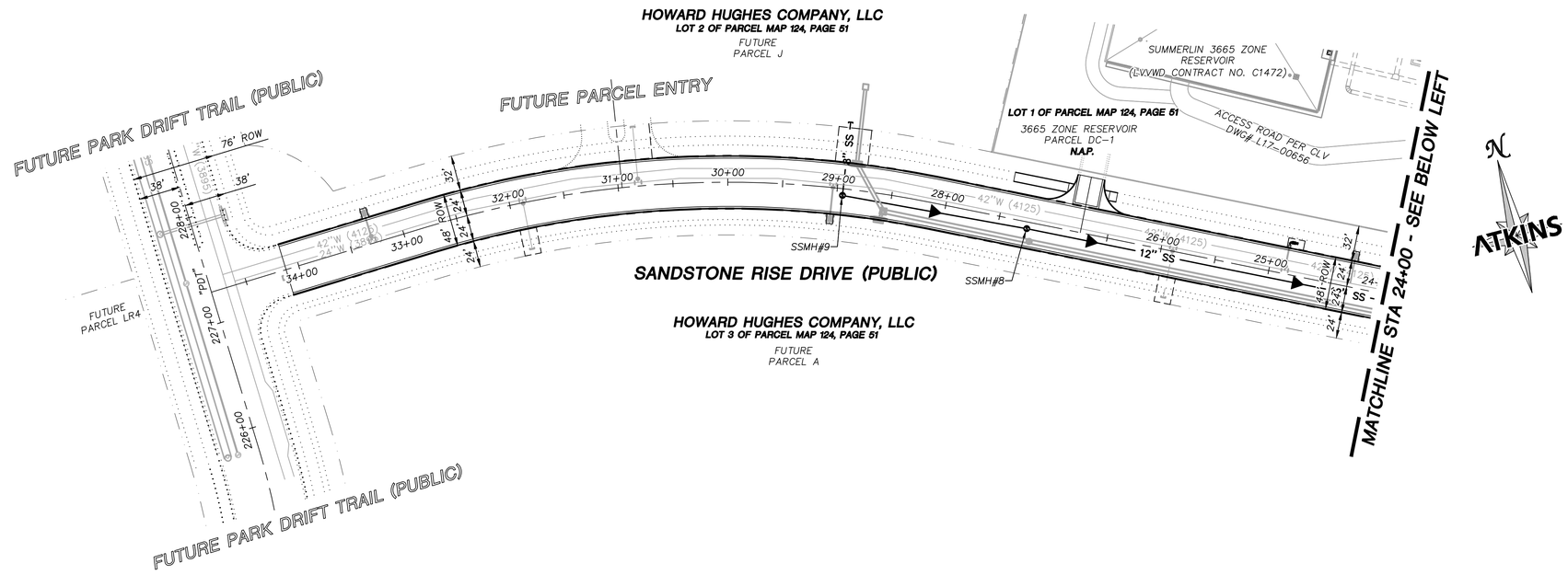
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

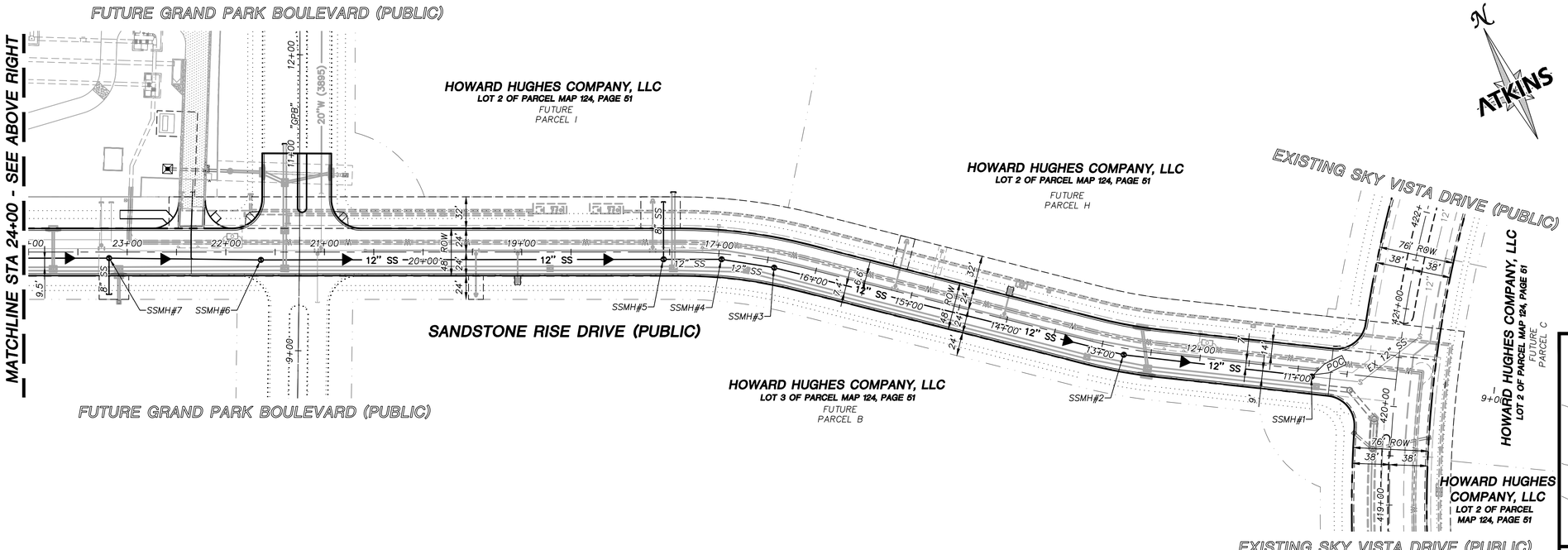
MASTER WATER PLAN

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.:1"=#'
VERT.: NONE

JOB NO. 100063656
DATE: NOVEMBER, 2019
DRAWING NO. 6/32
CLV

X:\Projects\SummWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-06-WATR-W1.dwg LAYOUT: 6 Nov 18, 2019 - 8:19AM





MASTER PLAN NOTE

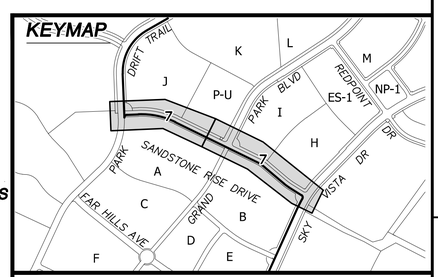
THIS SHEET IS FOR INFORMATIONAL PURPOSES ONLY. IT IS AN OVERALL REPRESENTATION OF THE UTILITY FOR REVIEW AND COORDINATION WITH OTHER PROJECT DETAILS WITHIN THIS PLAN SET.

SEWER NOTES

1. SEE ROADWAY PLAN AND PROFILE SHEETS FOR CONSTRUCTION NOTES AND INFORMATION RELATED TO PIPE SIZE, SLOPE, INVERT, RIM INFORMATION, AND MANHOLE BASE SIZE.
2. ALL SEWER PIPE MATERIAL TO BE WATER QUALITY RATED AWWA C-900, UNLESS OTHERWISE NOTED IN PROFILES.
3. ALL SEWER MANHOLES TO BE POLYMER LINED AND ALL JOINTS TO HAVE SIKAFLEX 2C NS SEALANT BETWEEN COMPONENTS.
4. ALL SEWER MANHOLES GREATER THAN 20' DEEP TO BE LINED WITH CORROSION PROTECTION PER DCSCWS STANDARD PLATE SD-1.

EX SKY VISTA DRIVE:
PER
VILLAGE 25 SKY VISTA DRIVE
IMPROVEMENTS
BY GCW, INC
CLV# 107V7884

KEYMAP



GRAPHIC SCALE
60 0 30 60 120
HORIZONTAL: 1"= 60'

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK: D368 (REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET)
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN. T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 — HIGHWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you D g — AVOID OUTSIDE UNDERGROUND UTILITY LINES. IT'S COURTLY. Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES. IT'S COURTLY. CALL BEFORE YOU DO OVERHEAD. 1-702-227-2929

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PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
No. 18949
11/18/2019

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7375
Fax: +1.702.263.7200

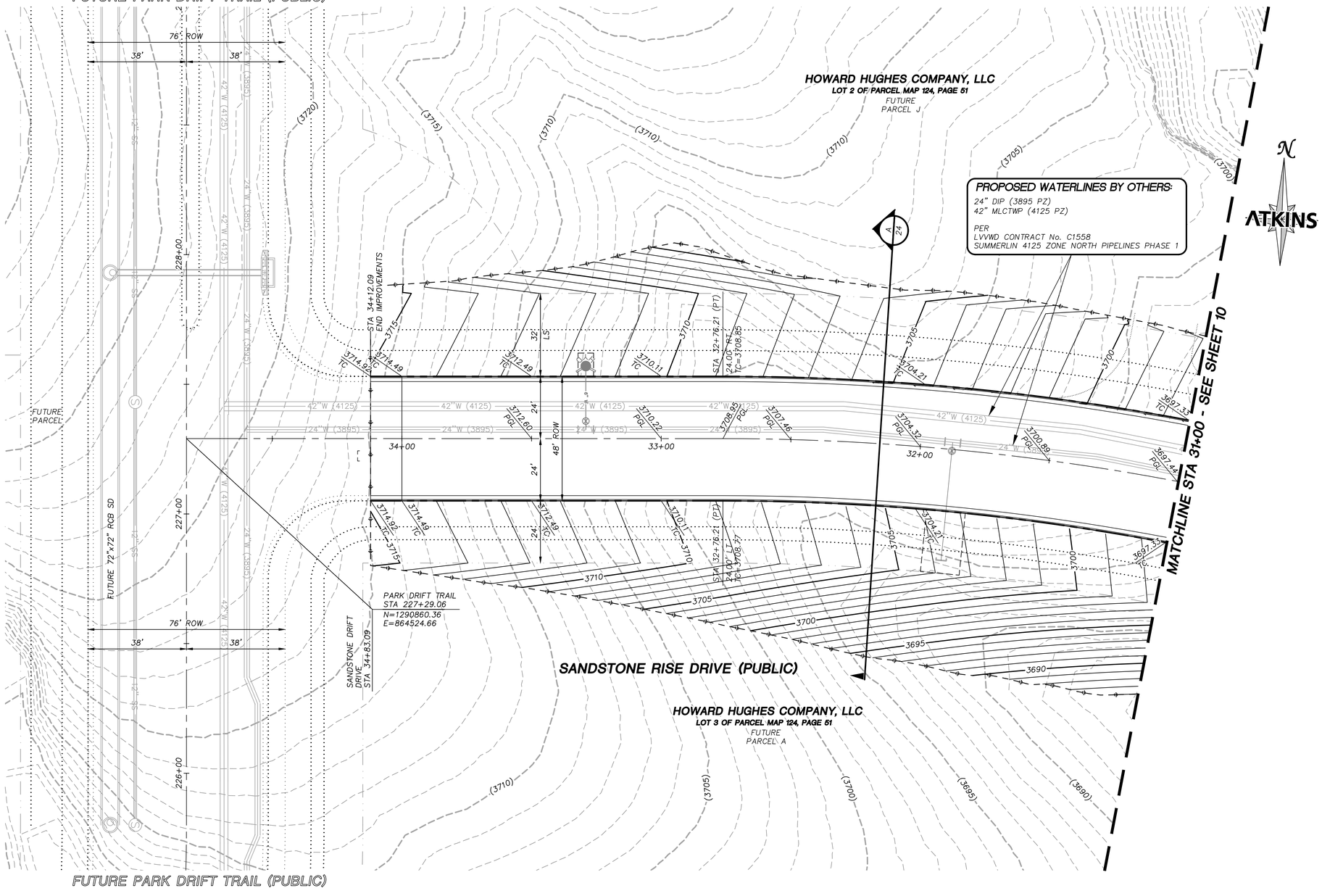
SUMMERLIN

SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)
MASTER SEWER PLAN

JOB NO.	100063656
DATE	NOVEMBER, 2019
DRAWING NO.	7/32

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: 1"=60'
VERT.: NONE
CLV

X:\Projects\SummWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-07-SSWR-S1.dwg LAYOUT: 7 Nov 18, 2019 - 8:20AM



STORM DRAIN CONSTRUCTION NOTES

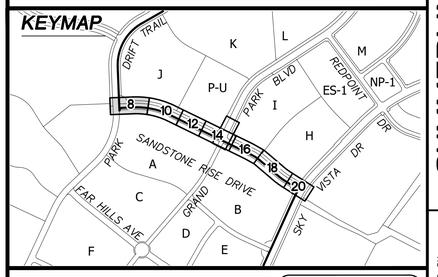
1. INSTALL STORM DRAIN. SEE SHEET 5 FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1, #422 & #421. L=7.5'
3. INSTALL BEEHIVE DROP INLET PER CCAUSD DWG #416
4. INSTALL 60" TYPE I SD MANHOLE PER CCAUSD #403
5. INSTALL 48" TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL 60" TYPE III SD MANHOLE PER CCAUSD #406
7. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
8. DEEP DROP INLET PER DETAIL "C" SHEET 29.

DEPTH OF COVER DURING CONSTRUCTION

MAINTAIN MINIMUM TWENTY-FOUR (24) INCH COVER PER UDACS SECTION 2.08.04. GRADING MUST BE COMPLETED PRIOR TO WATERLINE INSTALLATION.

EXISTING LVVWD FACILITIES

PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.



GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"= 20'

SOILS REPORT

BY NOVA GEOTECHNICAL
PROJECT NO. G-19-026
DATED MAY 9,2019
EARTHWORK QUANTITIES (RAW):
CUT= 5,910 CU YDS
FILL= 15,946 CU YDS

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

XXX-0000

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK:
D368 (REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS
(3,246.63 FEET)
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you D g AVOID CUTTING INTERRUPTION OF UTILITY LINES. ITS SCARCITY. Call 811 OR 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES. ITS COSTLY. CALL BEFORE YOU DIG OVERHEAD 1-702-227-2929

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PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
No. 18849
11/18/2019

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

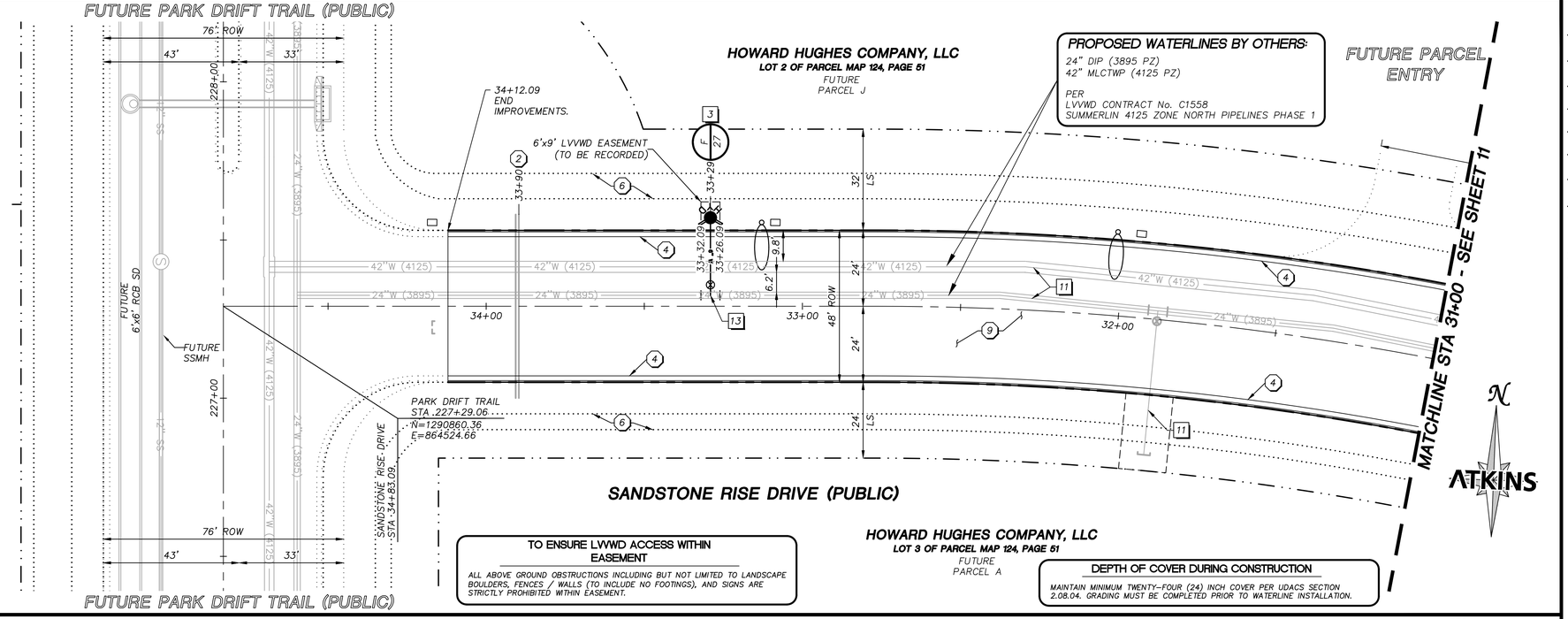
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

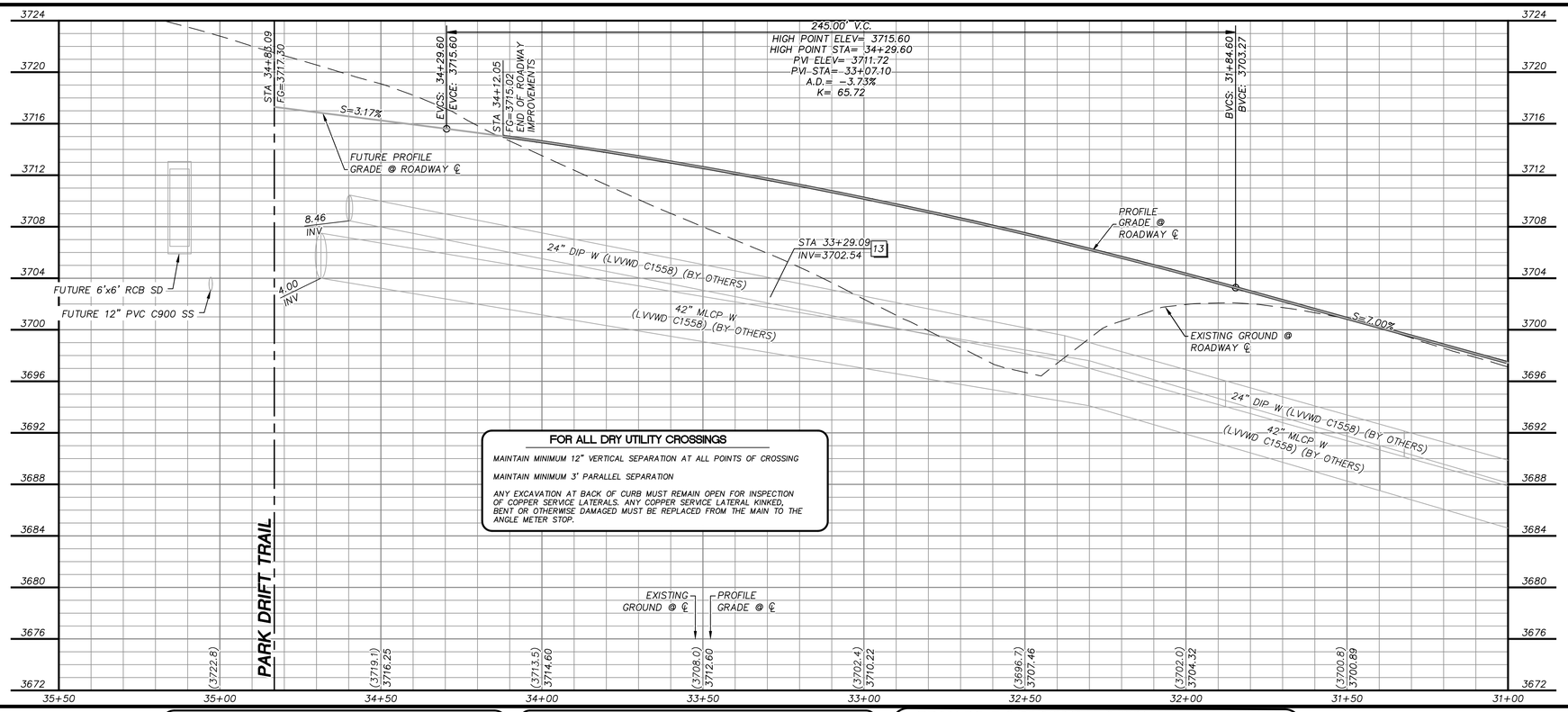
SANDSTONE RISE DRIVE GRADING PLAN
STA 31+00 TO END

JOB NO.	100063656
DATE:	NOVEMBER, 2019
DRAWING NO.	8/32

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: 1"=20'
VERT.: NONE
CLV

K:\Projects\SummitWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-08-GRAD-C1.dwg LAYOUT: 8 Nov 18, 2019 - 8:23AM





FOR ALL DRY UTILITY CROSSINGS

MAINTAIN MINIMUM 12" VERTICAL SEPARATION AT ALL POINTS OF CROSSING

MAINTAIN MINIMUM 3' PARALLEL SEPARATION

ANY EXCAVATION AT BACK OF CURB MUST REMAIN OPEN FOR INSPECTION OF COPPER SERVICE LATERALS. ANY COPPER SERVICE LATERAL KINKED, BENT OR OTHERWISE DAMAGED MUST BE REPLACED FROM THE MAIN TO THE ANGLE METER STOP.

GRAPHIC SCALE

HORIZONTAL: 1"= 20'
20 0 10 20 40

VERTICAL: 1"= 5'
5 0 2.5 5 10

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. XXXXX FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

XXX-0000

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

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FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
T21S,R59E,S03

FAST — Call before you UnderGround 1-702-432-5300 FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you D ☎ AVOID CUTTING UNDERGROUND UTILITY LINES IT'S COURTLY. Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES. IT'S COURTLY. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 5 FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1, #422 & #421. L=7.5'
3. INSTALL BEEHIVE DROP INLET PER CCAUSD DWG #416
4. INSTALL 60" TYPE I SD MANHOLE PER CCAUSD #403
5. INSTALL 48" TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL 60" TYPE III SD MANHOLE PER CCAUSD #406
7. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
8. DEEP DROP INLET PER DETAIL "C" SHEET 29.

SEWER CONSTRUCTION NOTES

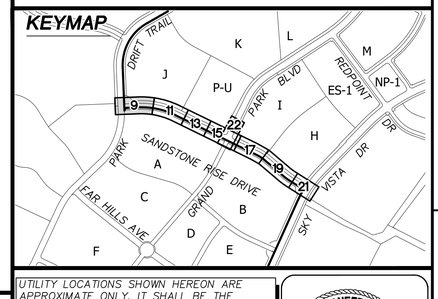
1. INSTALL 60" DIA SEWER MANHOLE PER DCSWCS SD-1, AND SD-4
2. INSTALL PVC C-900 SEWER MAIN PER DCSWCS SD-17
3. STUB AND CAP SEWER PIPE. PLACE MARKER BALL AND 4"X4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).
4. INSTALL 6" LATERAL PER DCSWCS SD-22, SD-23 AND SD-25

WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN WITH MARKER BALLS PER UDACS PLATES #15, #17 AND #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL FIRE HYDRANT PER UDACS PLATE #40 AND DETAIL "C" ON SHEET 28
4. INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
5. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
6. INSTALL 5° BEND PER UDACS PLATE #31
7. INSTALL 11.25° BEND PER UDACS PLATE #31
8. INSTALL 1.5" WATER METER AND RPPA PER UDACS PLATES #4 AND #8 AND DETAIL ON SHEET 30
9. INSTALL IN-LINE REDUCER PER UDACS PLATE #30
10. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE
11. WATER LINE BY OTHERS
12. WATER MAIN JOINT DEFLECTION PER UDACS 2.07.01 AND 2.07.03
13. INSTALL 24"x6" TAPPING SLEEVE W/ TAPPING VALVE PER UDACS PLATES #30, #34, #39 AND SECTION 2.24.01B

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. INSTALL IRRIGATION SLEEVES PER DETAIL "E" SHEET 28
4. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
5. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
6. FUTURE SIDEWALK BY OTHERS
7. CONSTRUCT COMMERCIAL DRIVEWAY PER CCASUD #222.1
8. CONSTRUCT SIDEWALK RAMP, PER DETAIL "A", SHEET 28
9. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 24 FOR TYPICAL PAVEMENT SECTION.
10. CONSTRUCT SIDEWALK RAMP CASE II PER CCAUSD #235



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PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
No. 18949
11/18/2019

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

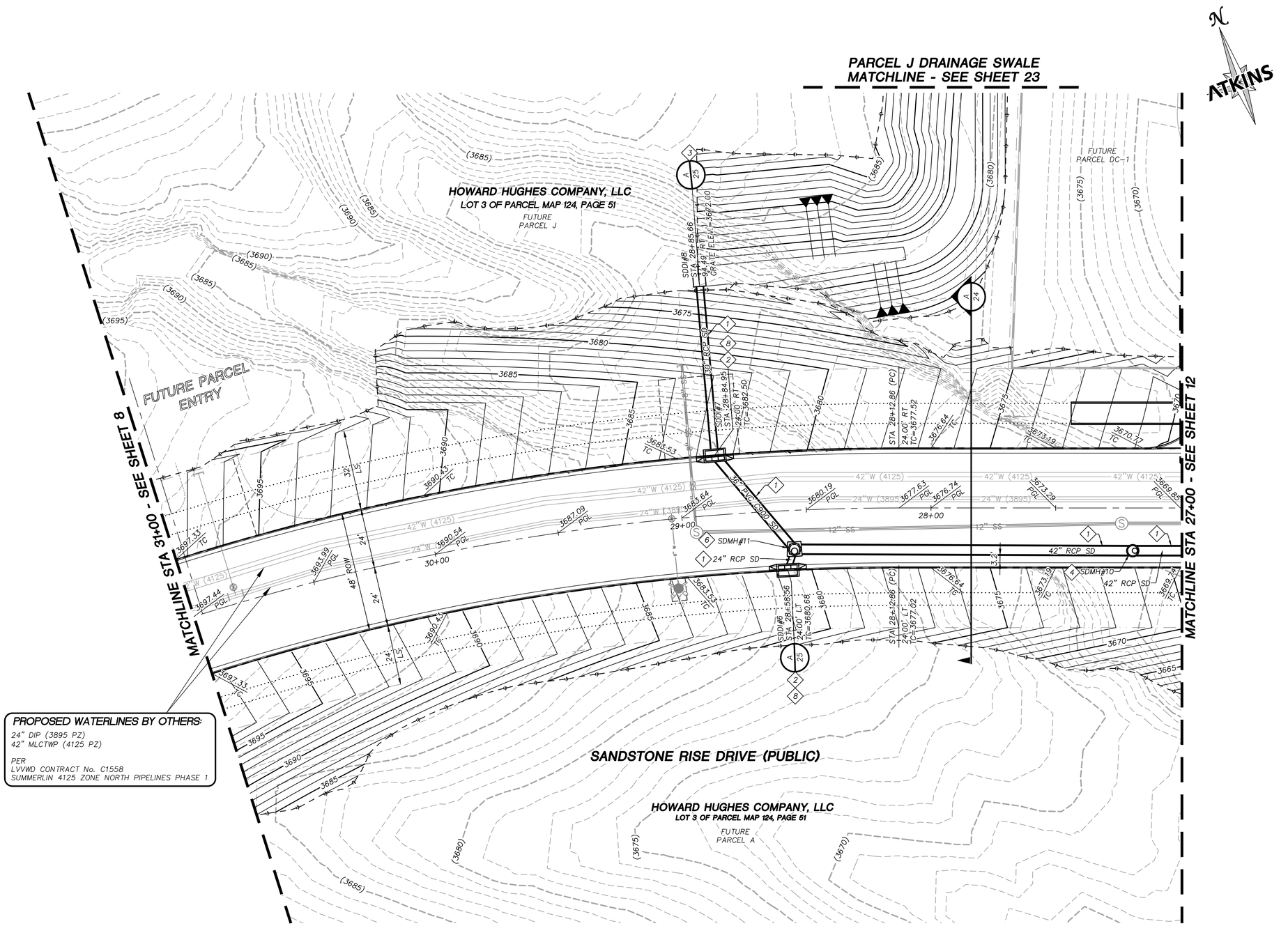
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

SANDSTONE RISE DRIVE PLAN AND PROFILE STA 31+00 TO END

JOB NO.	100063656
DATE:	NOVEMBER, 2019
DRAWING NO.	9/32

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: 1"=20'
VERT.: 1"=5'
CLV

X:\Projects\SummitWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-10-PLAN-P1.dwg LAYOUT: 9 Nov 18, 2019 - 8:32AM



PROPOSED WATERLINES BY OTHERS:

24" DIP (3895 PZ)
42" MLCTWP (4125 PZ)

PER
LVVWD CONTRACT No. C1558
SUMMERLIN 4125 ZONE NORTH PIPELINES PHASE 1

GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"= 20'

SOILS REPORT

BY NOVA GEOTECHNICAL
PROJECT NO. G-19-026
DATED MAY 9,2019
EARTHWORK QUANTITIES (RAW):
CUT= 5,910 CU YDS
FILL= 15,946 CU YDS

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

XXX-0000

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK:
D368 (REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS
(3,246.63 FEET)
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you D g AVOID CUTTING UNDERGROUND UTILITY LINES & CONFLICT Call 811 OR 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES WITH EQUIP. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 5 FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1, #422 & #421. L=7.5'
3. INSTALL BEEHIVE DROP INLET PER CCAUSD DWG #416
4. INSTALL 60" TYPE I SD MANHOLE PER CCAUSD #403
5. INSTALL 48" TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL 60" TYPE III SD MANHOLE PER CCAUSD #406
7. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
8. DEEP DROP INLET PER DETAIL "C" SHEET 29.

DEPTH OF COVER DURING CONSTRUCTION

MAINTAIN MINIMUM TWENTY-FOUR (24) INCH COVER PER UDACS SECTION 2.08.04. GRADING MUST BE COMPLETED PRIOR TO WATERLINE INSTALLATION.

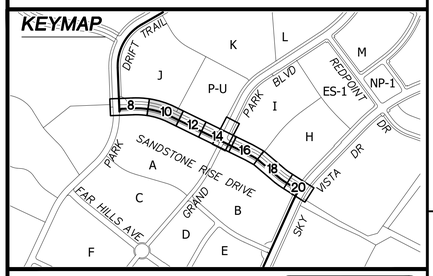
EXISTING LVVWD FACILITIES

PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

KEYMAP



UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

PROFESSIONAL ENGINEER - STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
No. 18949
11/18/2019

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

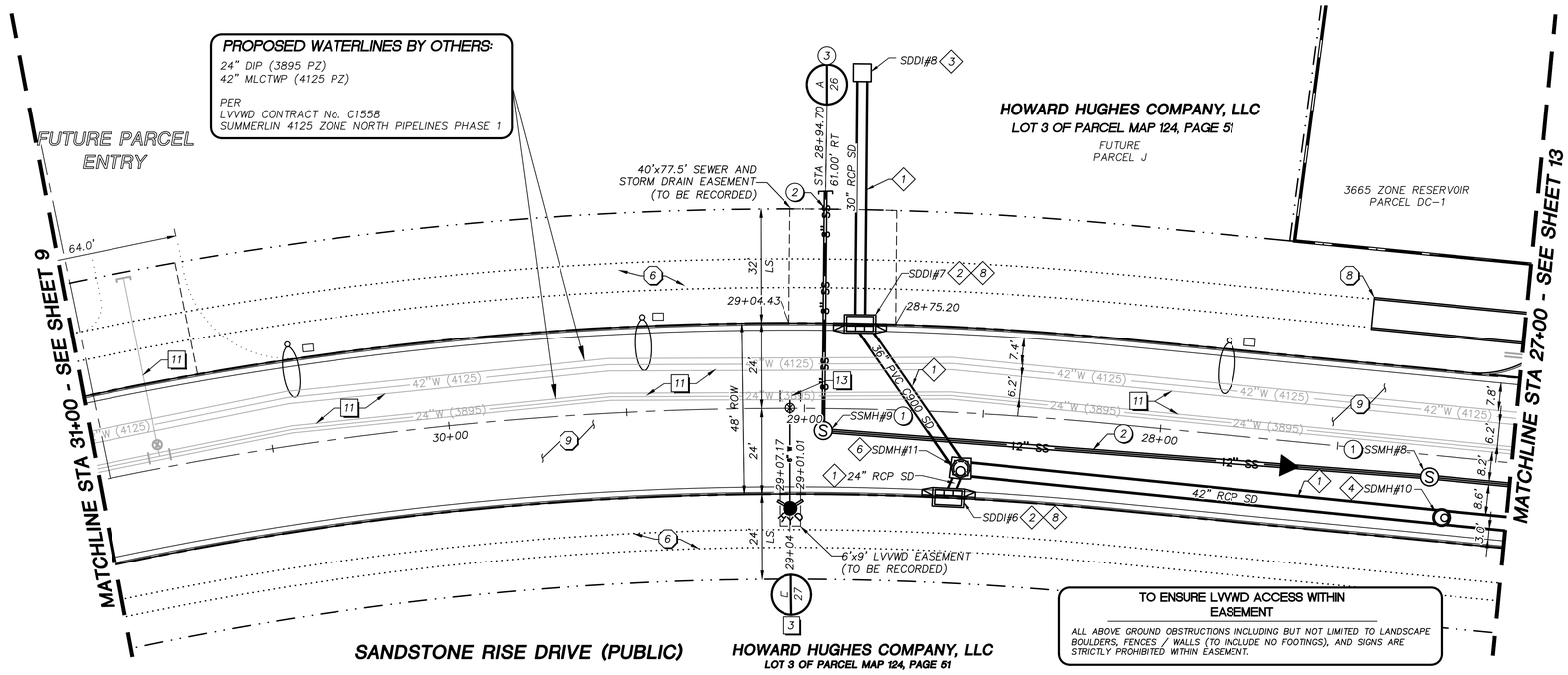
SUMMERLIN VILLAGE 25

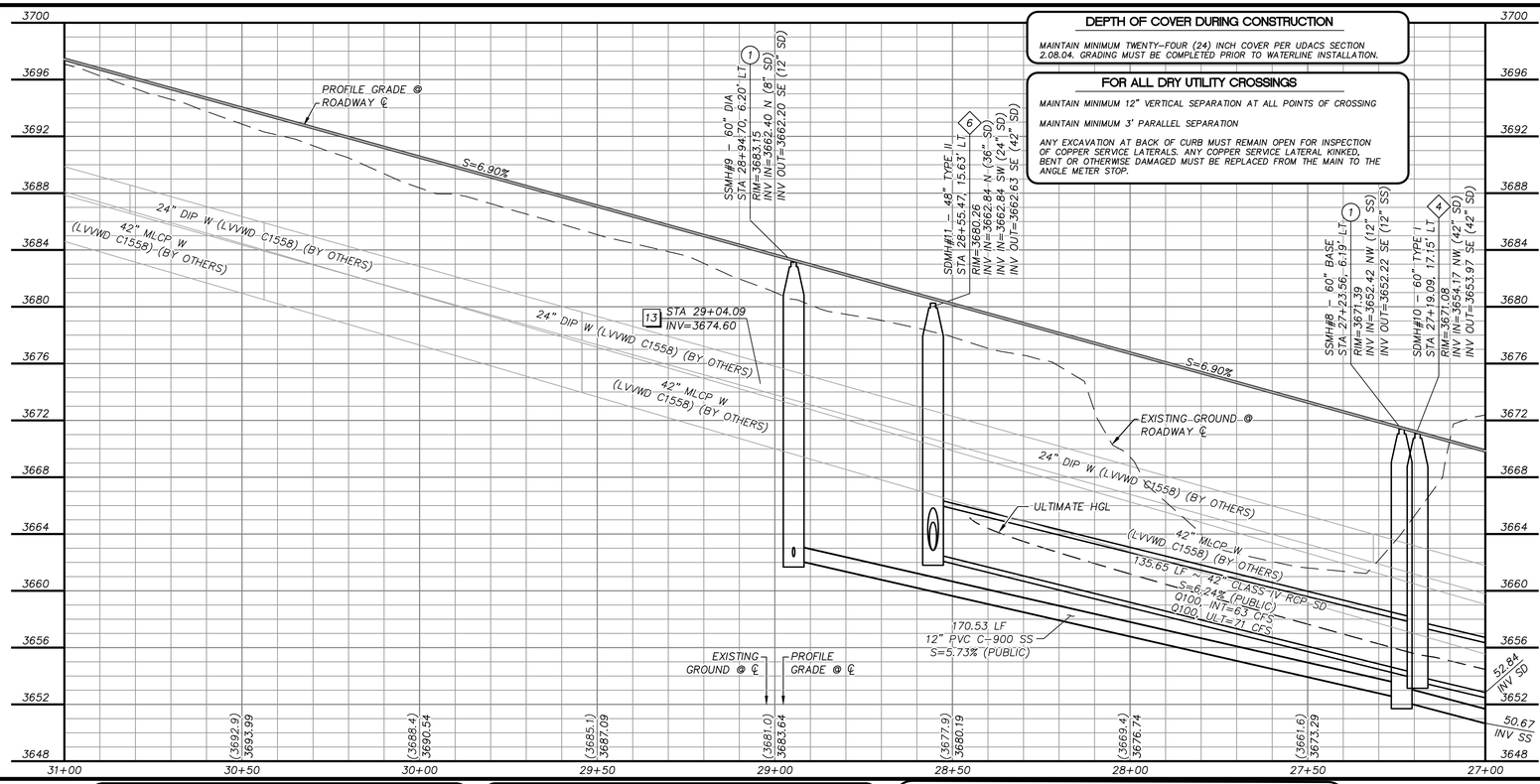
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

SANDSTONE RISE DRIVE GRADING PLAN STA 27+00 TO STA 31+00

JOB NO.	DESIGNED BY: G. BLAKE	HORIZ.: 1"=20'
100063656	DRAWN BY: G. BLAKE	VERT.: NONE
DATE: NOVEMBER, 2019	CHECKED BY: T. ORTIZ	
DRAWING NO. 10/32		
CLV		

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DEPTH OF COVER DURING CONSTRUCTION

MAINTAIN MINIMUM TWENTY-FOUR (24) INCH COVER PER UDACS SECTION 2.08.04. GRADING MUST BE COMPLETED PRIOR TO WATERLINE INSTALLATION.

FOR ALL DRY UTILITY CROSSINGS

MAINTAIN MINIMUM 12" VERTICAL SEPARATION AT ALL POINTS OF CROSSING

MAINTAIN MINIMUM 3' PARALLEL SEPARATION

ANY EXCAVATION AT BACK OF CURB MUST REMAIN OPEN FOR INSPECTION OF COPPER SERVICE LATERALS. ANY COPPER SERVICE LATERAL KINKED, BENT OR OTHERWISE DAMAGED MUST BE REPLACED FROM THE MAIN TO THE ANGLE METER STOP.

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 5 FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1, #422 & #421. L=7.5'
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4. INSTALL 60" TYPE I SD MANHOLE PER CCAUSD #403
5. INSTALL 48" TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL 60" TYPE III SD MANHOLE PER CCAUSD #406
7. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
8. DEEP DROP INLET PER DETAIL "C" SHEET 29.

SEWER CONSTRUCTION NOTES

1. INSTALL 60" DIA SEWER MANHOLE PER DCSWCS SD-1, AND SD-4
2. INSTALL PVC C-900 SEWER MAIN PER DCSWCS SD-17
3. STUB AND CAP SEWER PIPE. PLACE MARKER BALL AND 4"X4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).
4. INSTALL 6" LATERAL PER DCSWCS SD-22, SD-23 AND SD-25

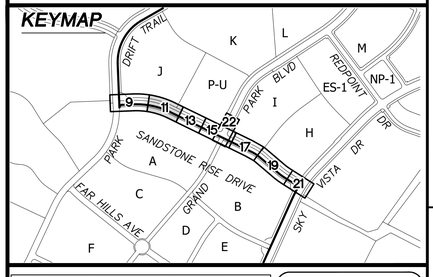
WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN WITH MARKER BALLS PER UDACS PLATES #15, #17 AND #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL FIRE HYDRANT PER UDACS PLATE #40 AND DETAIL "C" ON SHEET 28
4. INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
5. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
6. INSTALL 5° BEND PER UDACS PLATE #31
7. INSTALL 11.25° BEND PER UDACS PLATE #31
8. INSTALL 1.5" WATER METER AND RPPA PER UDACS PLATES #4 AND #8 AND DETAIL ON SHEET 30
9. INSTALL IN-LINE REDUCER PER UDACS PLATE #30
10. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE
11. WATER LINE BY OTHERS
12. WATER MAIN JOINT DEFLECTION PER UDACS 2.07.01 AND 2.07.03
13. INSTALL 24"x6" TAPPING SLEEVE W/ TAPPING VALVE PER UDACS PLATES #30, #34, #39 AND SECTION 2.24.01B

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. INSTALL IRRIGATION SLEEVES PER DETAIL "E" SHEET 28
4. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
5. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
6. FUTURE SIDEWALK BY OTHERS
7. CONSTRUCT COMMERCIAL DRIVEWAY PER CCASUD #222.1
8. CONSTRUCT SIDEWALK RAMP, PER DETAIL "A", SHEET 28
9. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 24 FOR TYPICAL PAVEMENT SECTION.
10. CONSTRUCT SIDEWALK RAMP CASE II PER CCAUSD #235

KEYMAP



GRAPHIC SCALE

20 0 10 20 40
HORIZONTAL: 1"= 20'
5 0 2.5 5 10
VERTICAL: 1"= 5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. XXXXX FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

XXX-0000

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

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FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 (NEVADA ONE CALL)

Call before you D g AVOID OUTSIDE UNDERGROUND UTILITY LINES. IT'S COURTLY. Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES. IT'S COURTLY. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

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PROFESSIONAL ENGINEER - STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
No. 18949
11/18/2019

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

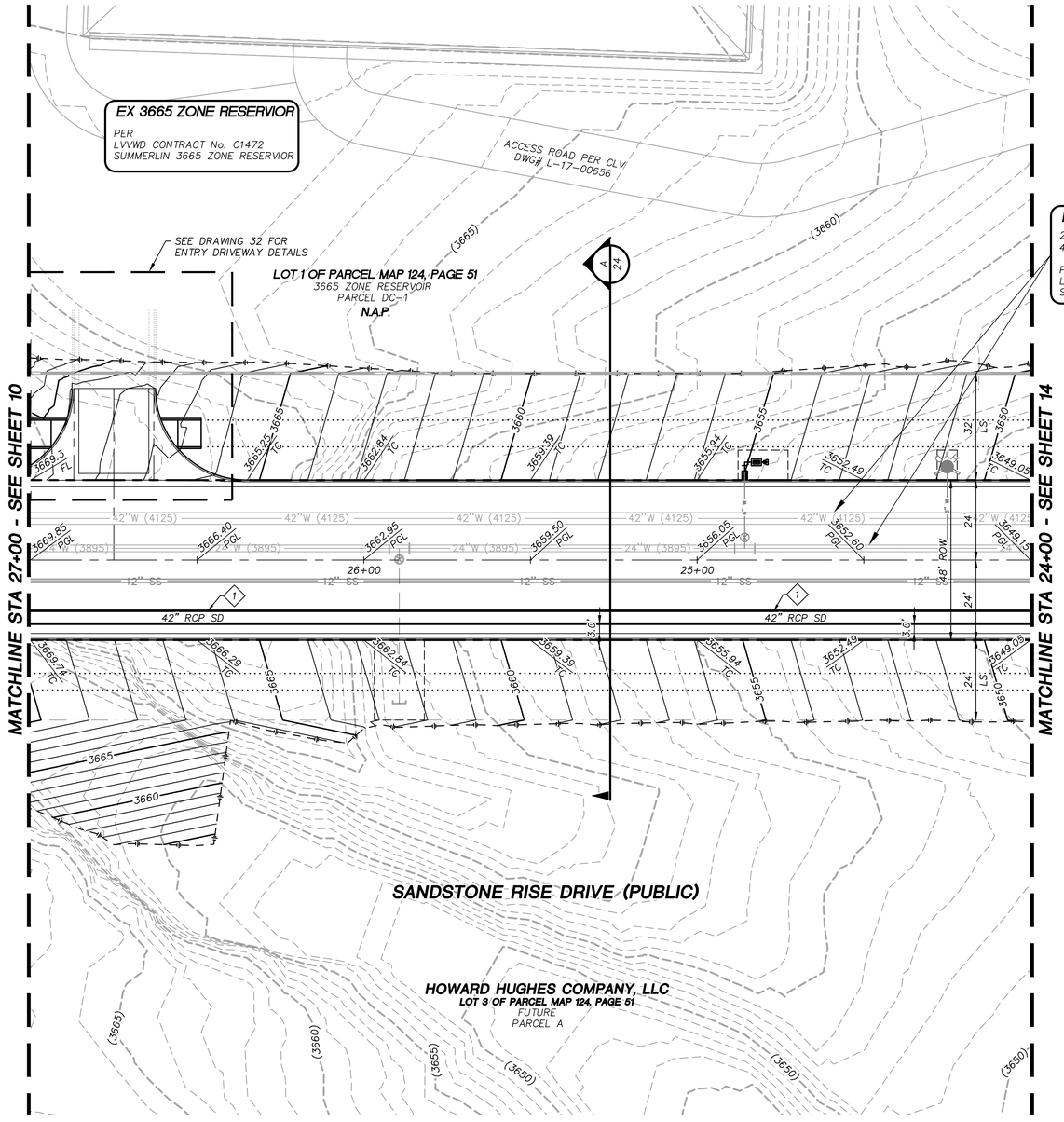
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

SANDSTONE RISE DRIVE PLAN AND PROFILE
STA 27+00 TO STA 31+00

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: 1"=20'
VERT.: 1"=5'

JOB NO. 100063656
DATE: NOVEMBER, 2019
DRAWING NO. 11/32
CLV

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STORM DRAIN CONSTRUCTION NOTES

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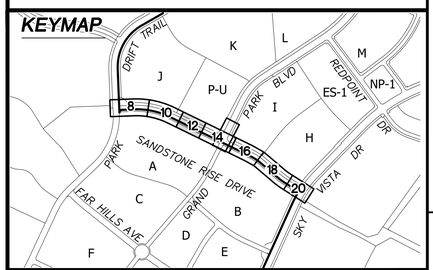
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REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

KEYMAP



GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"= 20'

SOILS REPORT

BY NOVA GEOTECHNICAL
PROJECT NO. G-19-026
DATED MAY 9,2019
EARTHWORK QUANTITIES (RAW):
CUT= 5,910 CU YDS
FILL= 15,946 CU YDS

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

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BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

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FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you D g AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S CORTLY. Call 811 or 1-800-642-2444

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11/18/2019

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SUMMERLIN

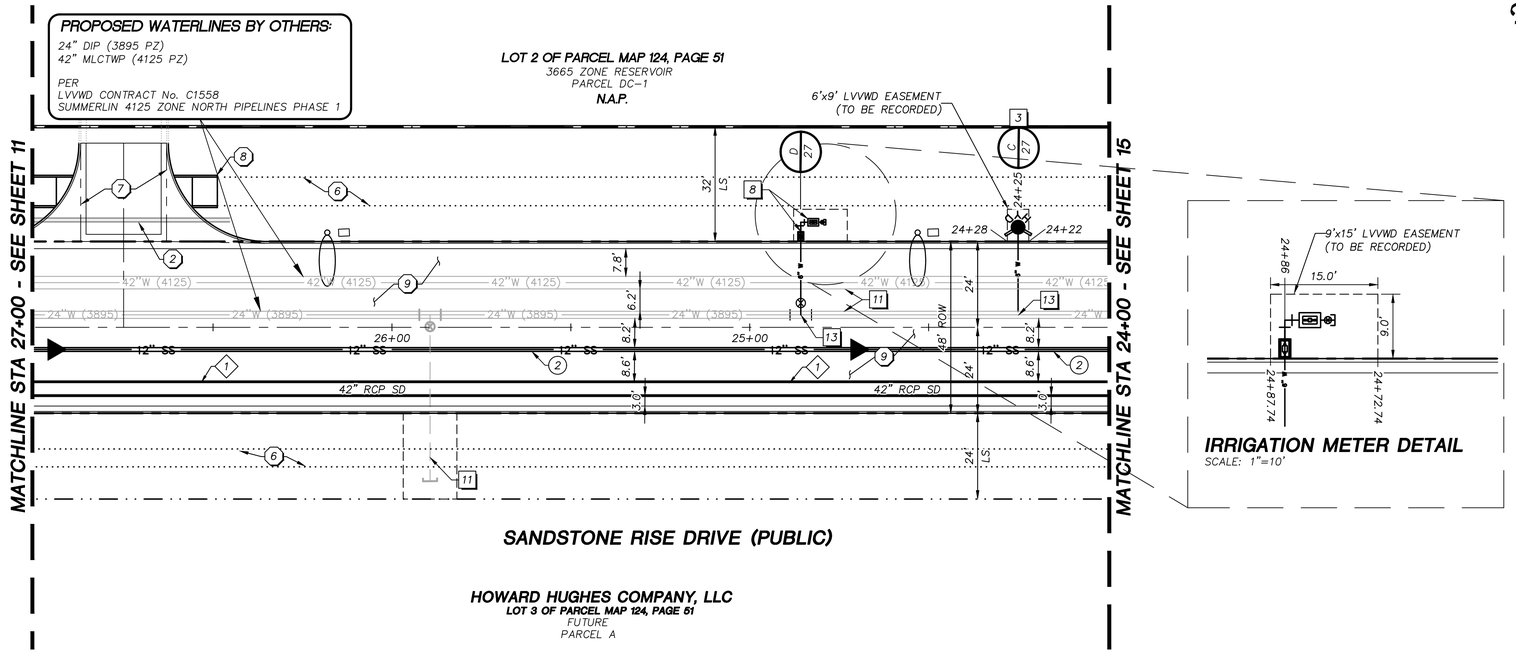
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

SANDSTONE RISE DRIVE GRADING PLAN
STA 24+00 TO STA 27+00

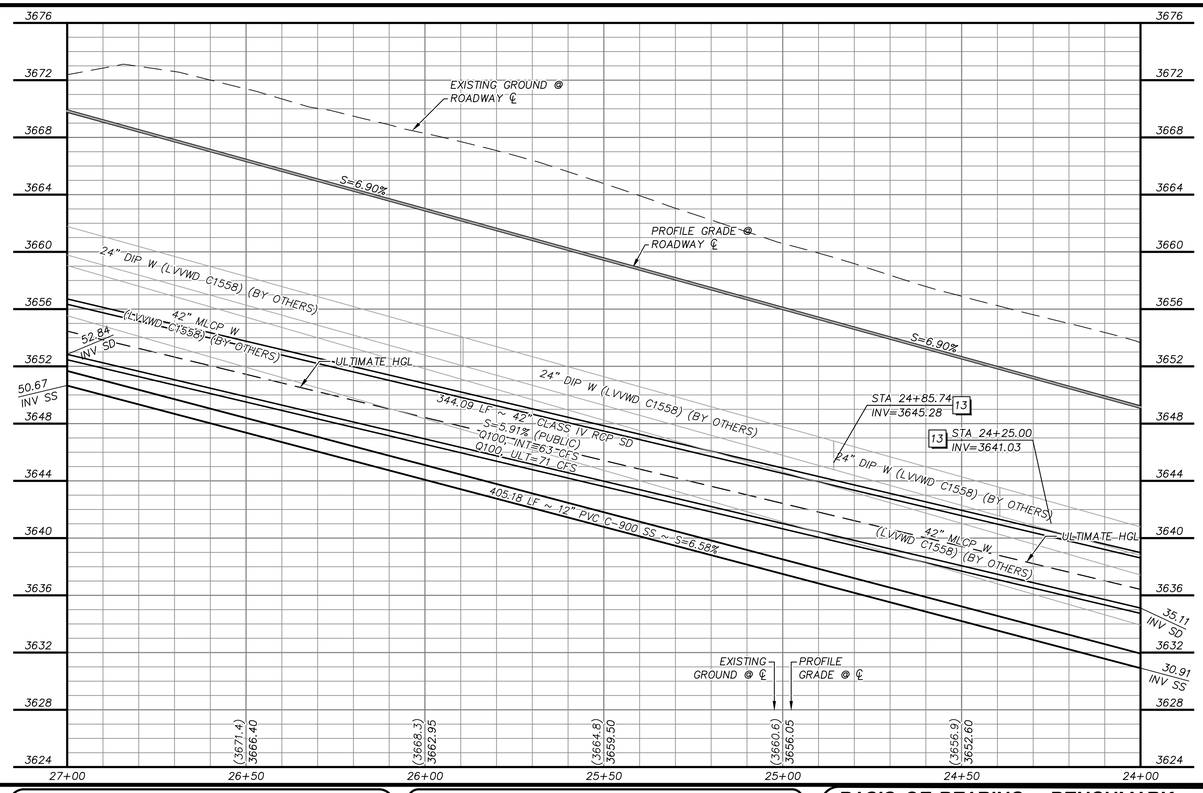
JOB NO.	100063656
DATE:	NOVEMBER, 2019
DRAWING NO.	12/32
DESIGNED BY:	G. BLAKE
DRAWN BY:	G. BLAKE
CHECKED BY:	T. ORTIZ
HORIZ.:	1"=20'
VERT.:	NONE

CLV

X:\Projects\SummWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-08-GRAD-G1.dwg LAYOUT: 12 Nov 18, 2019 - 8:24AM



IRRIGATION METER DETAIL
SCALE: 1"=10'



GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"= 20'
5 0 2.5 5 10
VERTICAL: 1"= 5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. XXXXX FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

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AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY. CALL BEFORE YOU DIG OVERHEAD 1-702-227-2929

CONDITIONAL APPROVAL OF VALVED OUTLET (6-INCH AND LARGER)

THE WATER PLANS SHOW ONE OR MORE VALVED OUTLETS EXTENDING OUT OF PAVED AREAS. INSTALLATION OF THESE OUTLETS IS ACCEPTABLE, HOWEVER, IF THE OUTLETS ARE INCORRECTLY LOCATED OR NOT USED FOR ANY REASON WHEN THE PROPERTY IS ACTUALLY DEVELOPED, THE DEVELOPER SHALL ABANDON THE OUTLETS AT THE CONNECTION TO THE ACTIVE MAIN IN ACCORDANCE TO LVVWD STANDARDS AND AT THE DEVELOPER'S EXPENSE. APPROVAL OF THE VALVED OUTLET DOES NOT PROVIDE OR IMPLY A WATER COMMITMENT.

TO ENSURE LVVWD ACCESS WITHIN EASEMENT

ALL ABOVE GROUND OBSTRUCTIONS INCLUDING BUT NOT LIMITED TO LANDSCAPE BOULDERS, FENCES / WALLS (TO INCLUDE NO FOOTINGS), AND SIGNS ARE STRICTLY PROHIBITED WITHIN EASEMENT.

DEPTH OF COVER DURING CONSTRUCTION

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FOR ALL DRY UTILITY CROSSINGS

MAINTAIN MINIMUM 12" VERTICAL SEPARATION AT ALL POINTS OF CROSSING

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ANY EXCAVATION AT BACK OF CURB MUST REMAIN OPEN FOR INSPECTION OF COPPER SERVICE LATERALS. ANY COPPER SERVICE LATERAL KINKED, BENT OR OTHERWISE DAMAGED MUST BE REPLACED FROM THE MAIN TO THE ANGLE METER STOP.

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7. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
8. DEEP DROP INLET PER DETAIL "C" SHEET 29.

SEWER CONSTRUCTION NOTES

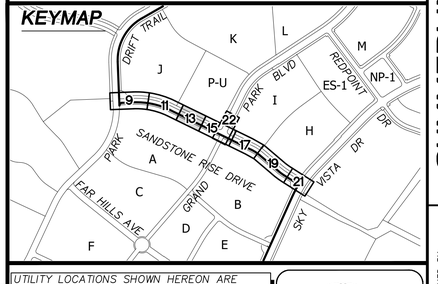
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2. INSTALL PVC C-900 SEWER MAIN PER DCSWCS SD-17
3. STUB AND CAP SEWER PIPE. PLACE MARKER BALL AND 4"X4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).
4. INSTALL 6" LATERAL PER DCSWCS SD-22, SD-23 AND SD-25

WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN WITH MARKER BALLS PER UDACS PLATES #15, #17 AND #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL FIRE HYDRANT PER UDACS PLATE #40 AND DETAIL "C" ON SHEET 28
4. INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
5. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
6. INSTALL 5° BEND PER UDACS PLATE #31
7. INSTALL 11.25° BEND PER UDACS PLATE #31
8. INSTALL 1.5" WATER METER AND RPPA PER UDACS PLATES #4 AND #8 AND DETAIL ON SHEET 30
9. INSTALL IN-LINE REDUCER PER UDACS PLATE #30
10. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE
11. WATER LINE BY OTHERS
12. WATER MAIN JOINT DEFLECTION PER UDACS 2.07.01 AND 2.07.03
13. INSTALL 24"x6" TAPPING SLEEVE W/ TAPPING VALVE PER UDACS PLATES #30, #34, #39 AND SECTION 2.24.01B

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
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4. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
5. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
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7. CONSTRUCT COMMERCIAL DRIVEWAY PER CCASUD #222.1
8. CONSTRUCT SIDEWALK RAMP, PER DETAIL "A", SHEET 28
9. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 24 FOR TYPICAL PAVEMENT SECTION.
10. CONSTRUCT SIDEWALK RAMP CASE II PER CCAUSD #235



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PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
No. 18949
11/18/2019

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

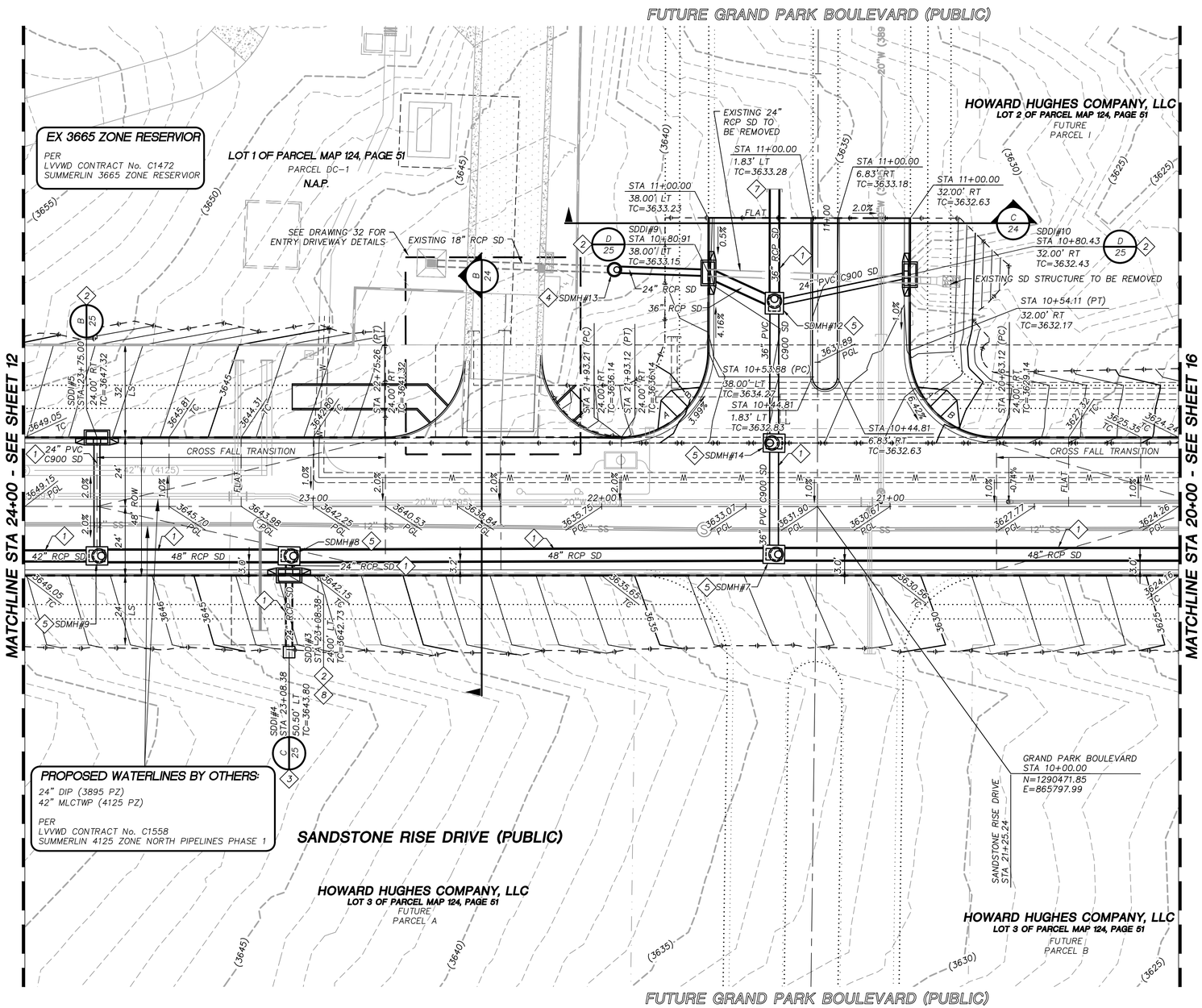
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

SANDSTONE RISE DRIVE PLAN AND PROFILE
STA 24+00 TO STA 27+00

DESIGNED BY: C. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: 1"=20'
VERT.: 1"=5'

JOB NO. 100063656
DATE: NOVEMBER, 2019
DRAWING NO. 13/32
CLV

X:\Projects\SummWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-10-PLAN-P1.dwg LAYOUT: 13 Nov 18, 2019 - 8:32AM



GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"= 20'

SOILS REPORT

BY NOVA GEOTECHNICAL
PROJECT NO. G-19-026
DATED MAY 9,2019
EARTHWORK QUANTITIES (RAW):
CUT= 5,910 CU YDS
FILL= 15,946 CU YDS

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

XXX-0000

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

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CITY OF LAS VEGAS BENCHMARK:
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NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET)
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 (THROUGHOUT AND NATIONAL SYSTEM OF TRANSPORTATION)
Call before you D g. AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S CONTU. Call 811 OR 1-800-842-2444
AVOID HITTING OVERHEAD POWER LINES. IT'S CONTU. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 5 FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1, #422 & #421. L=7.5'
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8. DEEP DROP INLET PER DETAIL "C" SHEET 29.

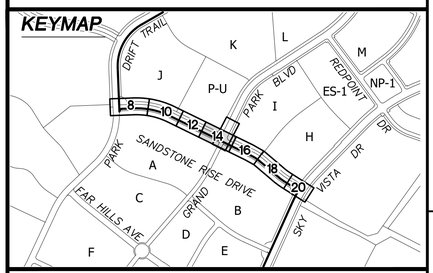
DEPTH OF COVER DURING CONSTRUCTION

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EXISTING LVVWD FACILITIES

PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

KEYMAP



UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
NO. 18849
11/18/2019

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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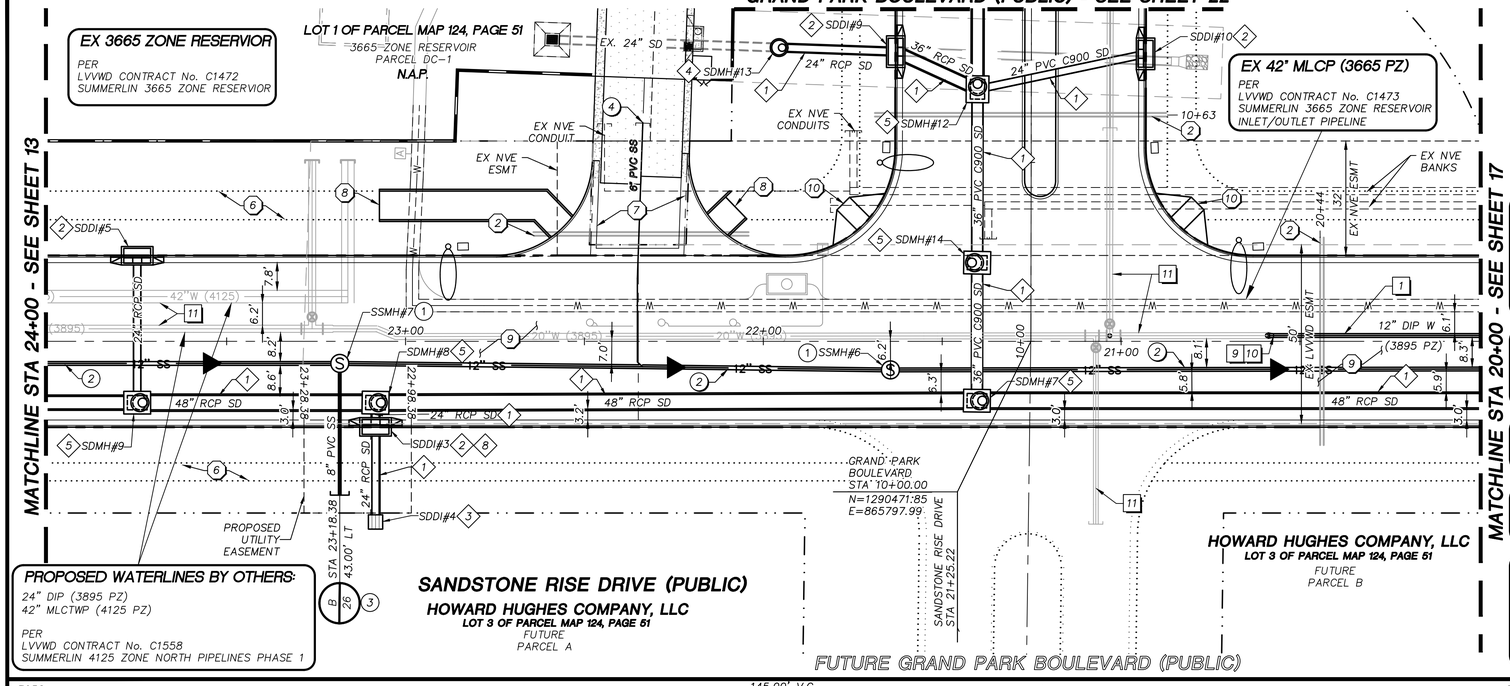
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
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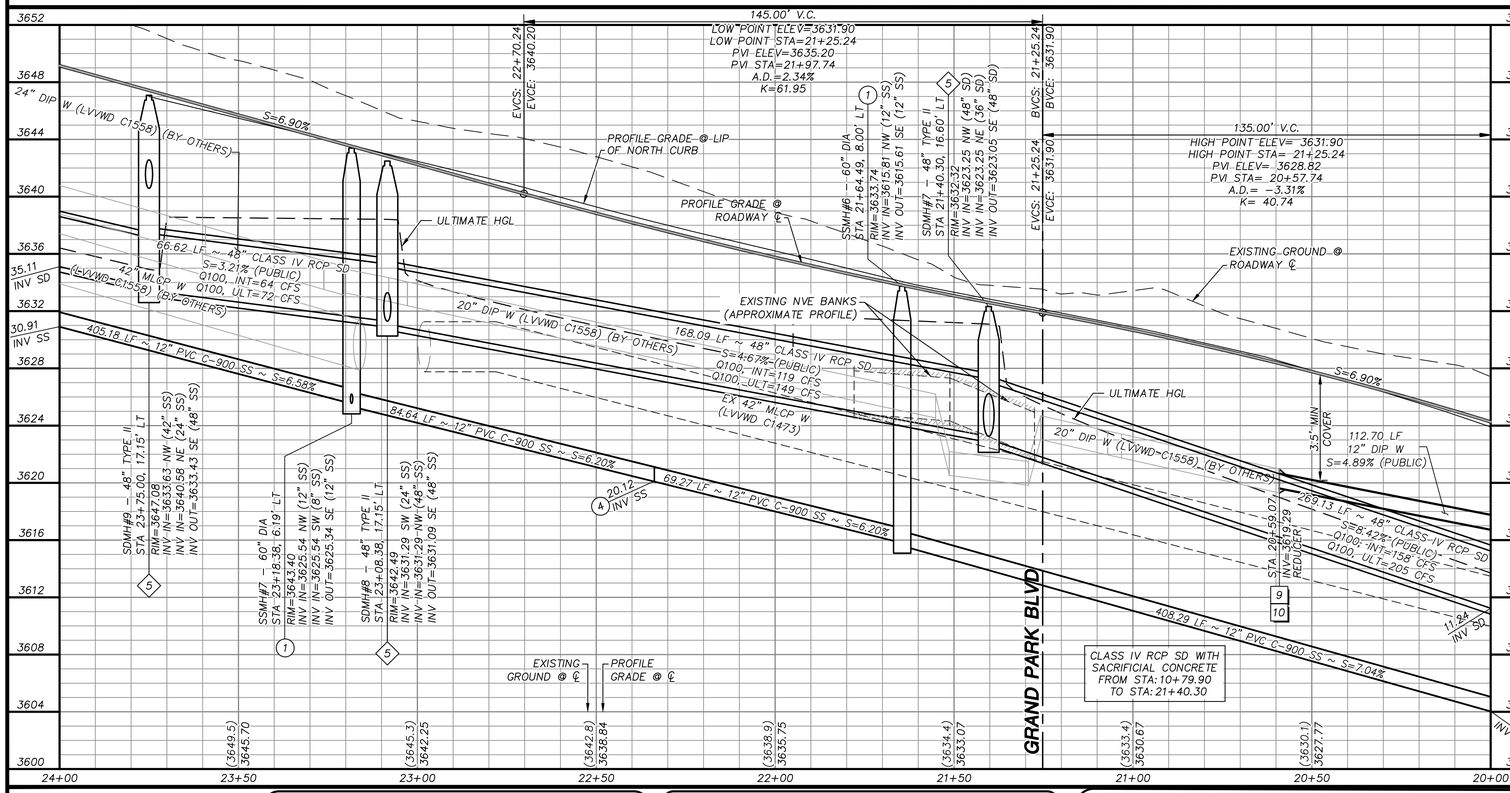
SANDSTONE RISE DRIVE GRADING PLAN
STA 20+00 TO STA 24+00

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.:1"=20'
VERT.: NONE

JOB NO. 100063656
DATE: NOVEMBER, 2019
DRAWING NO. 14/32
CLV

X:\Projects\SummWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-08-GRAD-G1.dwg LAYOUT: 14 Nov 18, 2019 - 8:24AM





CONDITIONAL APPROVAL OF VALVED OUTLET (6-INCH AND LARGER)

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TO ENSURE LVVWD ACCESS WITHIN EASEMENT

ALL ABOVE GROUND OBSTRUCTIONS INCLUDING BUT NOT LIMITED TO LANDSCAPE BOULDERS, FENCES / WALLS (TO INCLUDE NO FOOTINGS), AND SIGNS ARE STRICTLY PROHIBITED WITHIN EASEMENT.

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PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

FOR ALL DRY UTILITY CROSSINGS

MAINTAIN MINIMUM 12" VERTICAL SEPARATION AT ALL POINTS OF CROSSING

MAINTAIN MINIMUM 3' PARALLEL SEPARATION

ANY EXCAVATION AT BACK OF CURB MUST REMAIN OPEN FOR INSPECTION OF COPPER SERVICE LATERALS. ANY COPPER SERVICE LATERAL KINKED, BENT OR OTHERWISE DAMAGED MUST BE REPLACED FROM THE MAIN TO THE ANGLE METER STOP.

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SEWER CONSTRUCTION NOTES

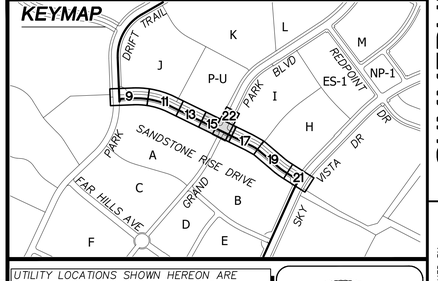
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3. STUB AND CAP SEWER PIPE. PLACE MARKER BALL AND 4"X4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).
4. INSTALL 6" LATERAL PER DCSWCS SD-22, SD-23 AND SD-25

WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN WITH MARKER BALLS PER UDACS PLATES #15, #17 AND #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL FIRE HYDRANT PER UDACS PLATE #40 AND DETAIL "C" ON SHEET 28
4. INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
5. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
6. INSTALL 5° BEND PER UDACS PLATE #31
7. INSTALL 11.25° BEND PER UDACS PLATE #31
8. INSTALL 1.5" WATER METER AND RPPA PER UDACS PLATES #4 AND #8 AND DETAIL ON SHEET 30
9. INSTALL IN-LINE REDUCER PER UDACS PLATE #30
10. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE
11. WATER LINE BY OTHERS
12. WATER MAIN JOINT DEFLECTION PER UDACS 2.07.01 AND 2.07.03
13. INSTALL 24"x6" TAPPING SLEEVE W/ TAPPING VALVE PER UDACS PLATES #30, #34, #39 AND SECTION 2.24.01B

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. INSTALL IRRIGATION SLEEVES PER DETAIL "E" SHEET 28
4. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
5. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
6. FUTURE SIDEWALK BY OTHERS
7. CONSTRUCT COMMERCIAL DRIVEWAY PER CCASUD #222.1
8. CONSTRUCT SIDEWALK RAMP, PER DETAIL "A", SHEET 28
9. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 24 FOR TYPICAL PAVEMENT SECTION.
10. CONSTRUCT SIDEWALK RAMP CASE II PER CCAUSD #235



REV.	DESCRIPTION	BY	DATE	APPROVAL

REVISIONS

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

SANDSTONE RISE DRIVE PLAN AND PROFILE
STA 20+00 TO STA 24+00

GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"= 20'
5 0 2.5 5 10
VERTICAL: 1"= 5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. XXXXX FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

XXX-0000

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

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CITY OF LAS VEGAS BENCHMARK: D368 (REVISED 2008) NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET) FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN. T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 TRENCHES AND ARTERIAL SYSTEMS OF TRANSPORTATION

Call before you D g. AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY. Call 811 or 1-800-642-2444

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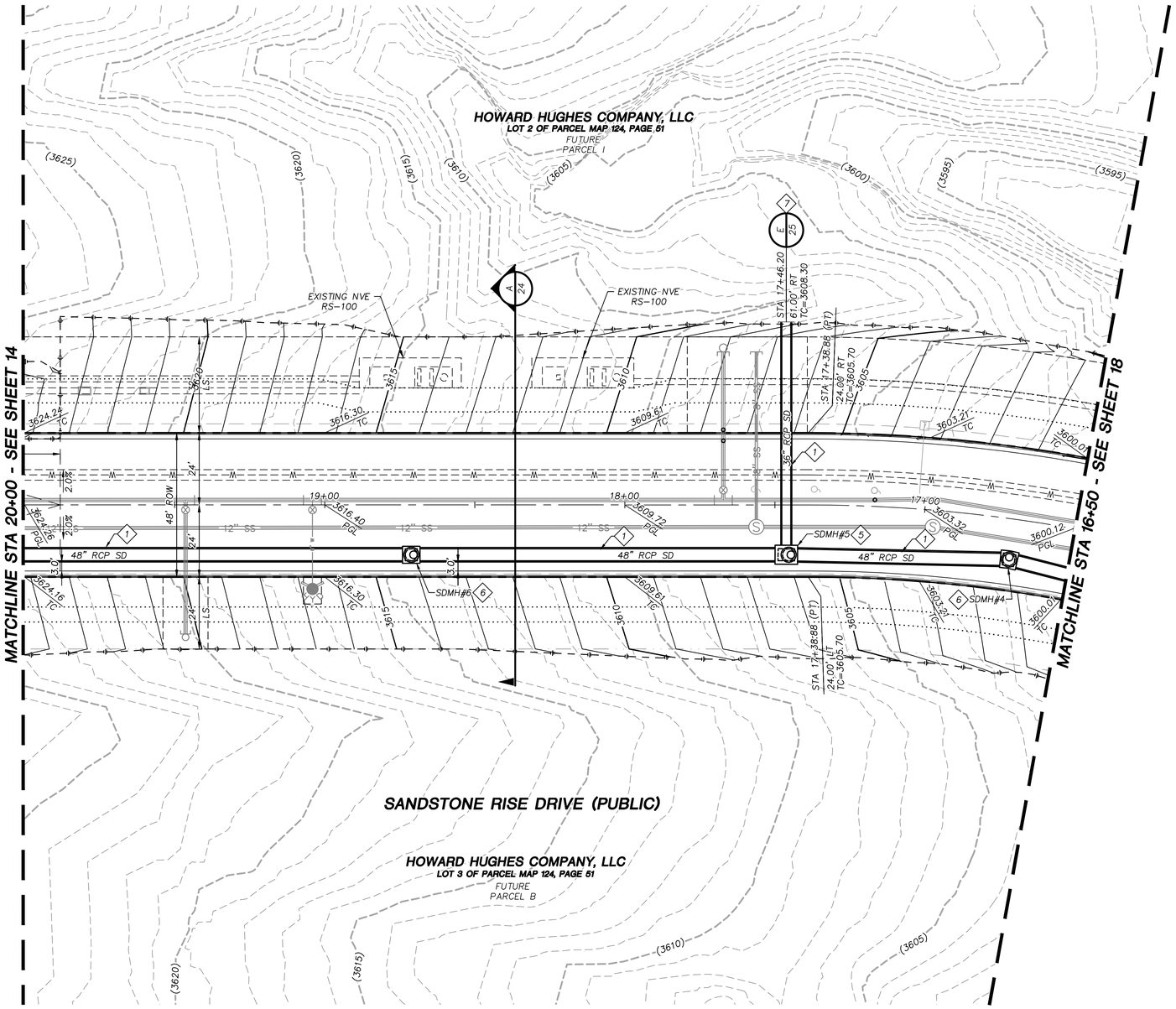
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PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J. ORTIZ
EXP. 12-31-21
CIVIL
NO. 18949
11/18/2019

JOB NO.	DESIGNED BY:
100063656	C. BLAKE
DATE:	DRAWN BY:
NOVEMBER, 2019	C. BLAKE
DRAWING NO.	CHECKED BY:
15/32	T. ORTIZ
	HORIZ.: 1"=20'
	VERT.: 1"=5'

CLV

X:\Projects\SummWest Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-10-PLAN-P1.dwg LAYOUT: 15 Nov 18, 2019 - 8:32AM





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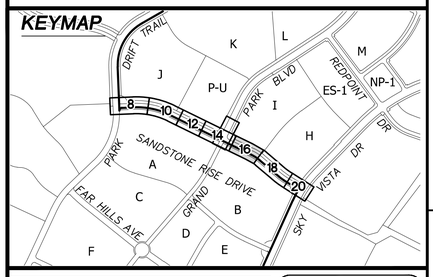
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REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL



GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"= 20'

SOILS REPORT

BY NOVA GEOTECHNICAL
PROJECT NO. G-19-026
DATED MAY 9,2019
EARTHWORK QUANTITIES (RAW):
CUT= 5,910 CU YDS
FILL= 15,946 CU YDS

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

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SUMMERLIN

SUMMERLIN VILLAGE 25

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SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

SANDSTONE RISE DRIVE GRADING PLAN STA 16+50 TO STA 20+00

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: 1"=20'
VERT.: NONE

JOB NO. 100063656
DATE: NOVEMBER, 2019
DRAWING NO. 16/32
CLV

X:\Projects\SummitWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-08-GRAD-01.dwg LAYOUT: 16 Nov 18, 2019 - 8:52AM

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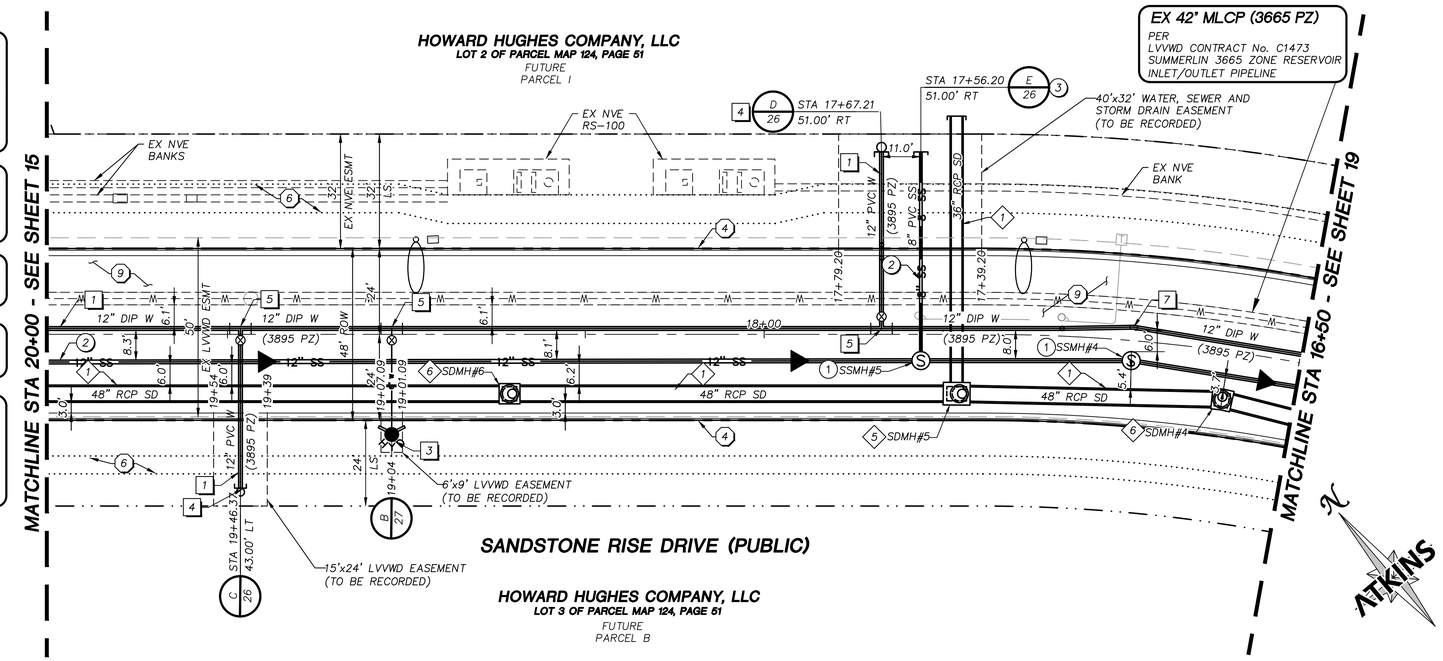
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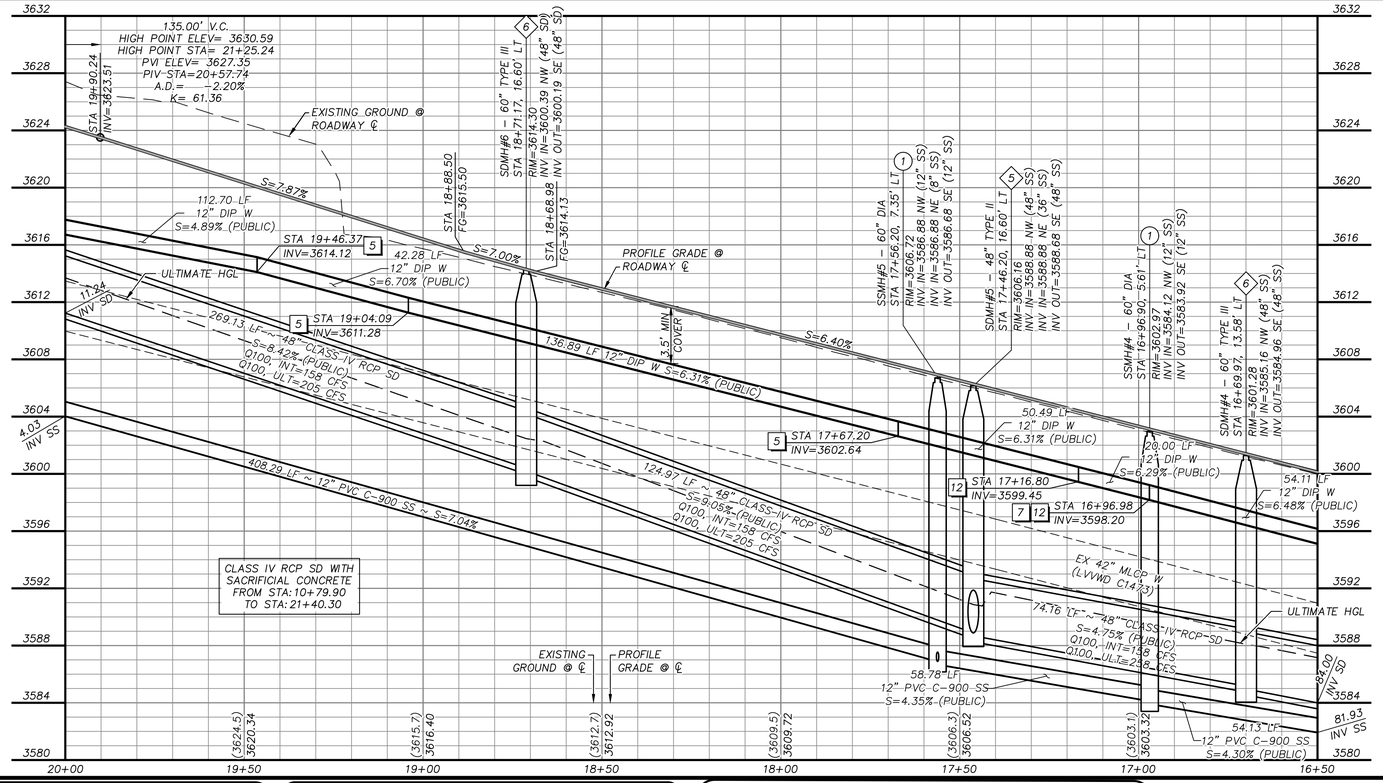
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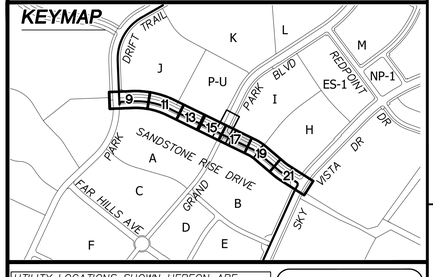
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11. WATER LINE BY OTHERS
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ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. INSTALL IRRIGATION SLEEVES PER DETAIL "E" SHEET 28
4. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
5. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
6. FUTURE SIDEWALK BY OTHERS
7. CONSTRUCT COMMERCIAL DRIVEWAY PER CCASUD #222.1
8. CONSTRUCT SIDEWALK RAMP, PER DETAIL "A", SHEET 28
9. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 24 FOR TYPICAL PAVEMENT SECTION.
10. CONSTRUCT SIDEWALK RAMP CASE II PER CCAUSD #235



REV.	DESCRIPTION	BY	DATE	APPROVAL
	REVISIONS			

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

SANDSTONE RISE DRIVE PLAN AND PROFILE STA 16+50 TO STA 20+00

GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"= 20'
5 0 2.5 5 10
VERTICAL: 1"= 5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. XXXXX FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

XXX-0000

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK: D368 (REVISED 2008) NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET) FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN. T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you D ig AVOID OUTSIDE ENTANGLEMENT UTILITY LINES (1TE COUNTY). Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES. (1TE COUNTY). CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

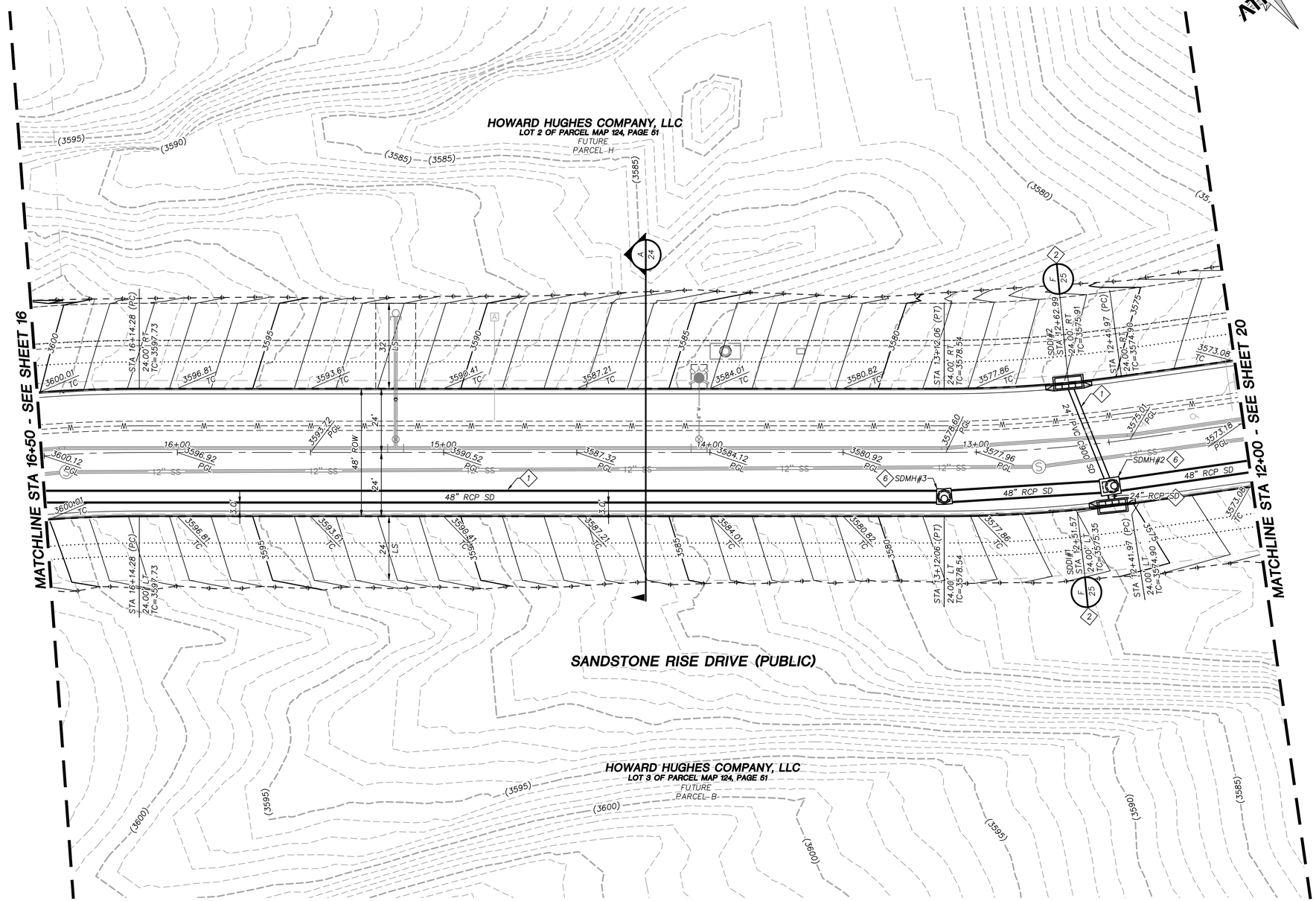
UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

PROFESSIONAL ENGINEER - STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
NO. 18849
11/18/2019

JOB NO.	100063656
DATE:	NOVEMBER, 2019
DRAWING NO.	17/32

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: 1"=20'
VERT.: 1"=5'
CLV

X:\Projects\SummitWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-10-PLAN-P1.dwg LAYOUT: 17 Nov 18, 2019 - 8:33AM



STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 5 FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1, #422 & #421. L=7.5'
3. INSTALL BEEHIVE DROP INLET PER CCAUSD DWG #416
4. INSTALL 60" TYPE I SD MANHOLE PER CCAUSD #403
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6. INSTALL 60" TYPE III SD MANHOLE PER CCAUSD #406
7. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
8. DEEP DROP INLET PER DETAIL "C" SHEET 29.

DEPTH OF COVER DURING CONSTRUCTION

MAINTAIN MINIMUM TWENTY-FOUR (24) INCH COVER PER UDACS SECTION 2.08.04. GRADING MUST BE COMPLETED PRIOR TO WATERLINE INSTALLATION.

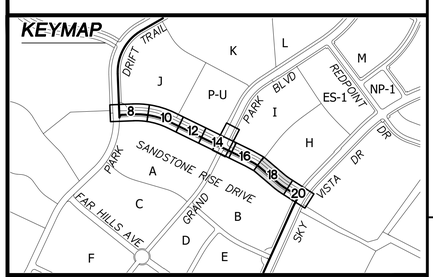
EXISTING LVVWD FACILITIES

PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

KEYMAP



GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"= 20'

SOILS REPORT

BY NOVA GEOTECHNICAL
PROJECT NO. G-19-026
DATED MAY 9,2019
EARTHWORK QUANTITIES (RAW):
CUT= 5,910 CU YDS
FILL= 15,946 CU YDS

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

XXX-0000

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

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Call before you D g AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY. Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY. CALL BEFORE YOU DO OVERHEAD. 1-702-227-2929

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PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J. ORTIZ
EXP. 12-31-21
CIVIL
No. 18949
11/18/2019

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

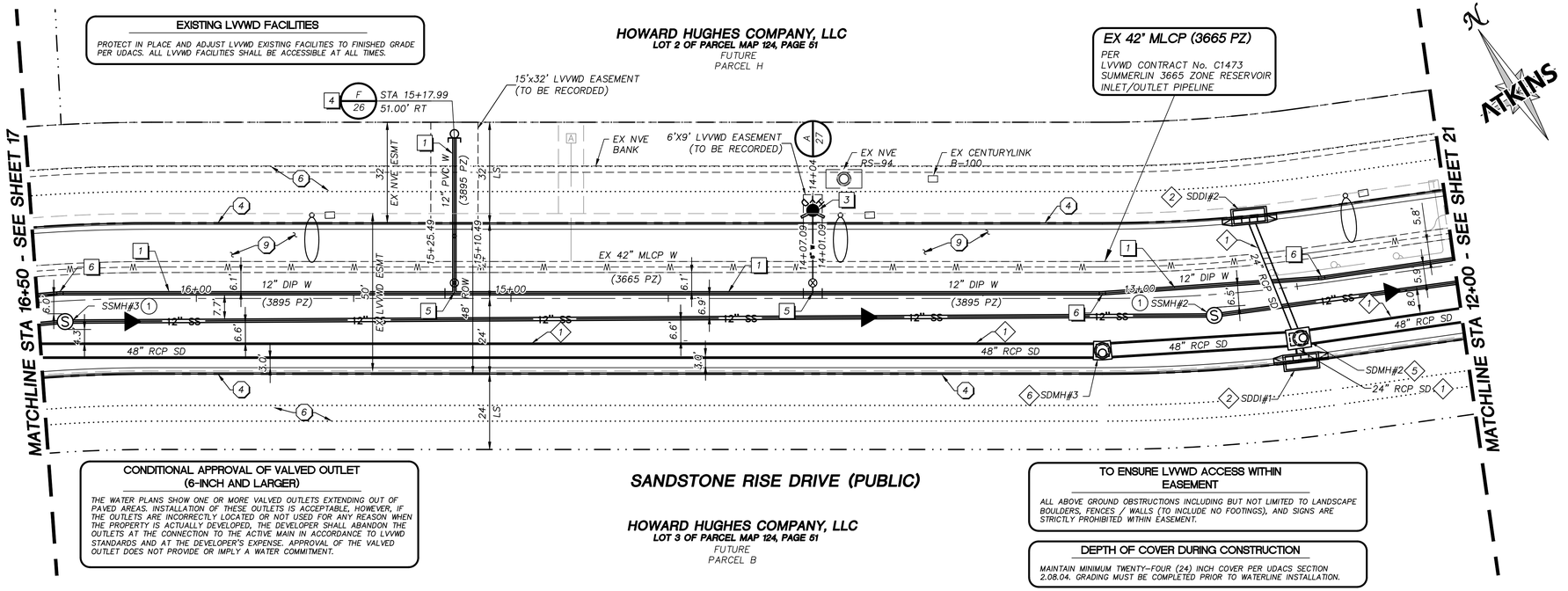
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

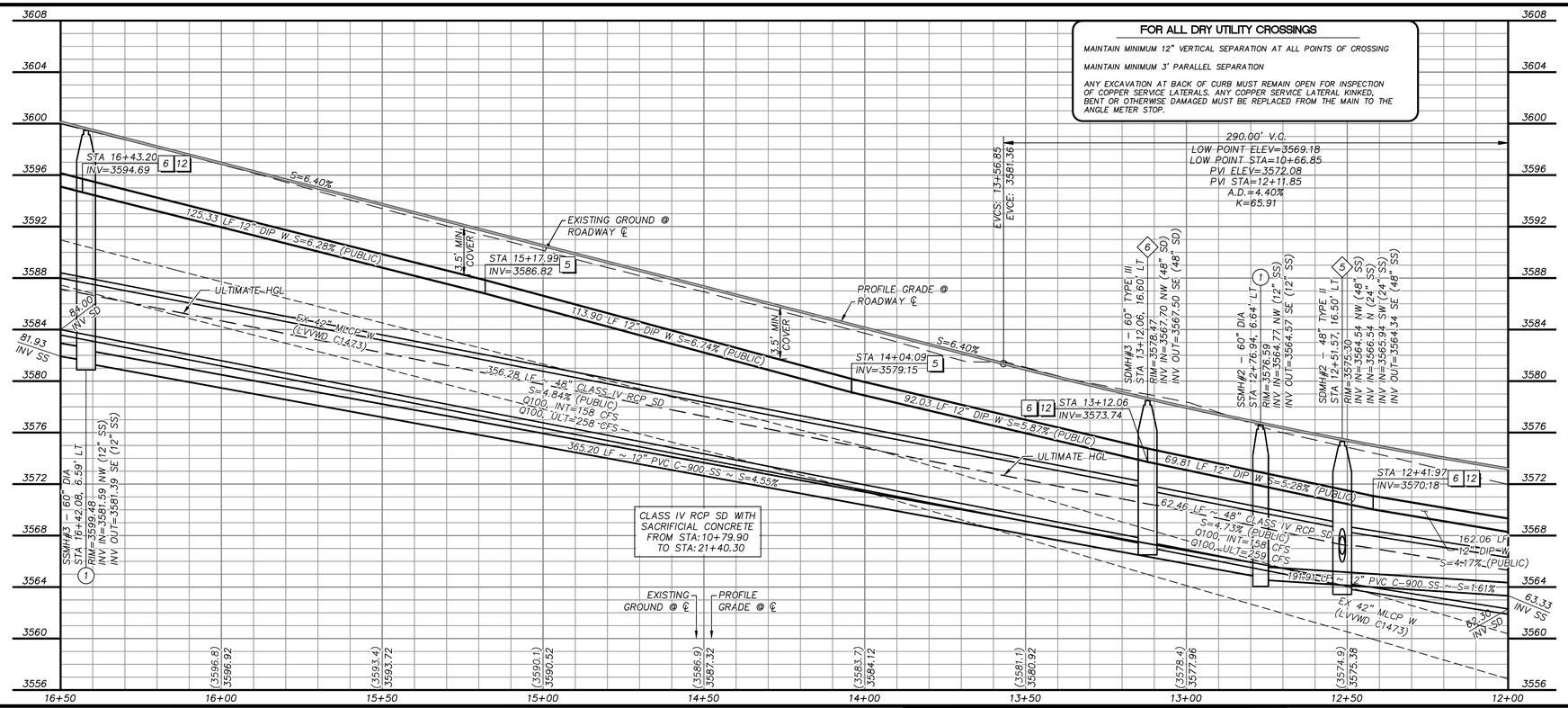
SANDSTONE RISE DRIVE GRADING PLAN
STA 12+00 TO STA 16+50

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: 1"=20'
VERT.: NONE

JOB NO. 100063656
DATE NOVEMBER, 2019
DRAWING NO. 18/32
CLV

X:\Projects\SummWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-08-GRAD-01.dwg LAYOUT: 18 Nov 18, 2019 - 8:24AM





GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"= 20'
5 0 2.5 5 10
VERTICAL: 1"= 5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. XXXXX FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

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STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 5 FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1, #422 & #421. L=7.5'
3. INSTALL BEEHIVE DROP INLET PER CCAUSD DWG #416
4. INSTALL 60" TYPE I SD MANHOLE PER CCAUSD #403
5. INSTALL 48" TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL 60" TYPE III SD MANHOLE PER CCAUSD #406
7. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
8. DEEP DROP INLET PER DETAIL "C" SHEET 29.

SEWER CONSTRUCTION NOTES

1. INSTALL 60" DIA SEWER MANHOLE PER DCSWCS SD-1, AND SD-4
2. INSTALL PVC C-900 SEWER MAIN PER DCSWCS SD-17
3. STUB AND CAP SEWER PIPE. PLACE MARKER BALL AND 4"X4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).
4. INSTALL 6" LATERAL PER DCSWCS SD-22, SD-23 AND SD-25

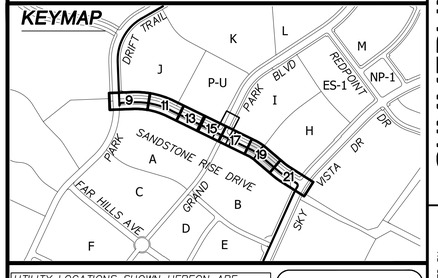
WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN WITH MARKER BALLS PER UDACS PLATES #15, #17 AND #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL FIRE HYDRANT PER UDACS PLATE #40 AND DETAIL "C" ON SHEET 28
4. INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
5. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
6. INSTALL 5° BEND PER UDACS PLATE #31
7. INSTALL 11.25° BEND PER UDACS PLATE #31
8. INSTALL 1.5" WATER METER AND RPPA PER UDACS PLATES #4 AND #8 AND DETAIL ON SHEET 30
9. INSTALL IN-LINE REDUCER PER UDACS PLATE #30
10. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE
11. WATER LINE BY OTHERS
12. WATER MAIN JOINT DEFLECTION PER UDACS 2.07.01 AND 2.07.03
13. INSTALL 24"x6" TAPPING SLEEVE W/ TAPPING VALVE PER UDACS PLATES #30, #34, #39 AND SECTION 2.24.01B

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. INSTALL IRRIGATION SLEEVES PER DETAIL "E" SHEET 28
4. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
5. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
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8. CONSTRUCT SIDEWALK RAMP, PER DETAIL "A", SHEET 28
9. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 24 FOR TYPICAL PAVEMENT SECTION.
10. CONSTRUCT SIDEWALK RAMP CASE II PER CCAUSD #235

KEYMAP



REV.	DESCRIPTION	BY	DATE	APPROVAL
	REVISIONS			

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

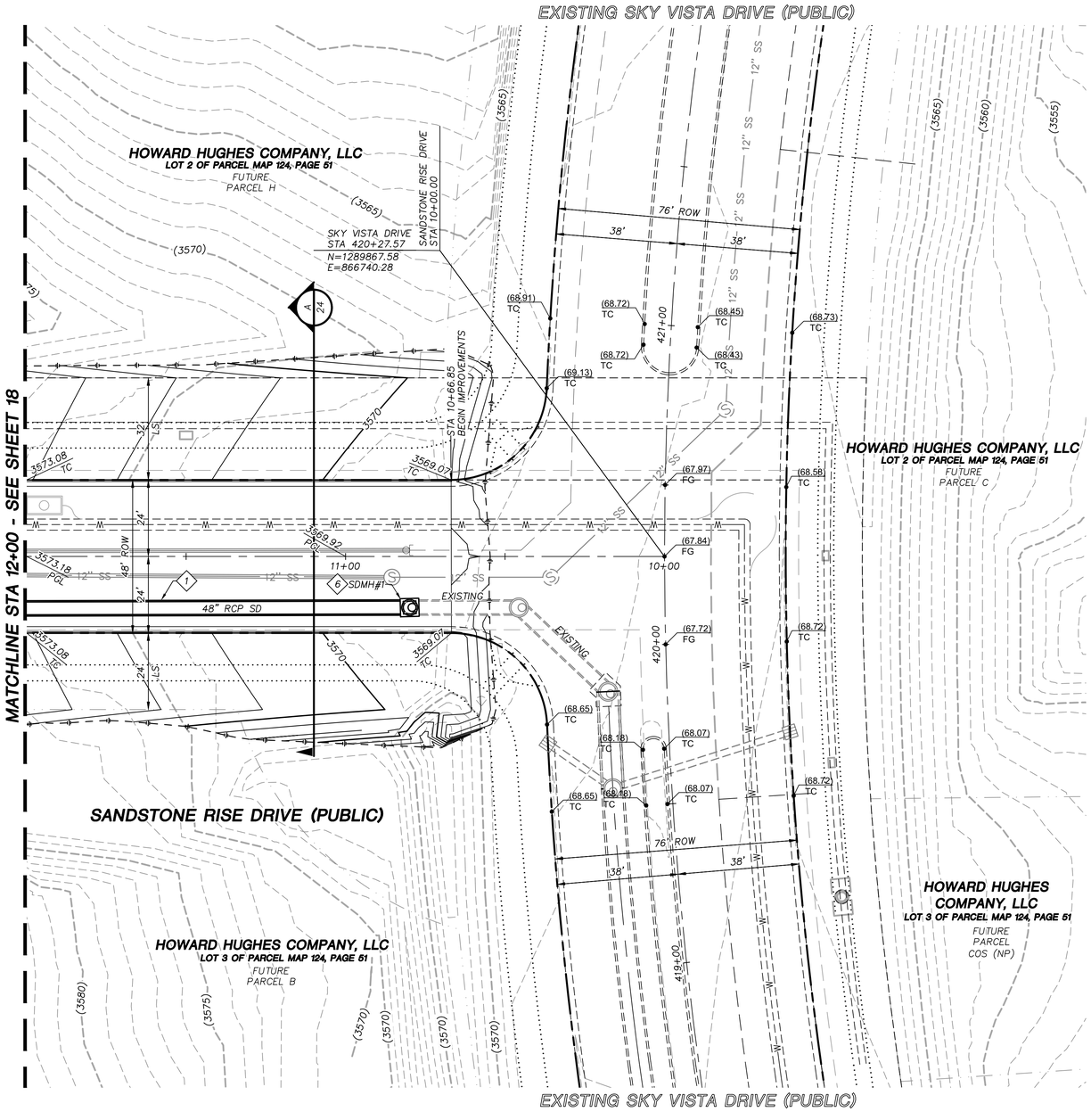
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)
SANDSTONE RISE DRIVE PLAN AND PROFILE STA 12+00 TO STA 16+50

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PROFESSIONAL ENGINEER - STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 10-31-21
CIVIL
No. 18849
11/18/2019

JOB NO.	100063656
DATE:	NOVEMBER, 2019
DRAWING NO.	19/32
DESIGNED BY:	G. BLAKE
DRAWN BY:	G. BLAKE
CHECKED BY:	T. ORTIZ
HORIZ.:	1"=20'
VERT.:	1"=5'
CLV	

X:\Projects\SummitWest Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-10-PLAN-P1.dwg LAYOUT: 19 Nov 18, 2019 - 8:33AM



EX SKY VISTA DRIVE:
PER
VILLAGE 25 SKY VISTA DRIVE
IMPROVEMENTS
BY GCW, INC
CLV# 107V7884

STORM DRAIN CONSTRUCTION NOTES

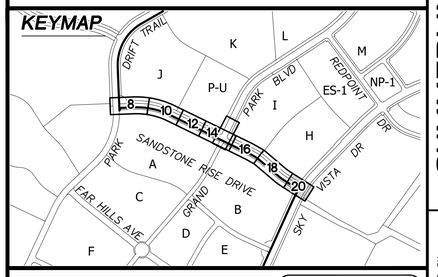
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DEPTH OF COVER DURING CONSTRUCTION

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EXISTING LVVWD FACILITIES

PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.



GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"= 20'

SOILS REPORT

BY NOVA GEOTECHNICAL
PROJECT NO. G-19-026
DATED MAY 9,2019
EARTHWORK QUANTITIES (RAW):
CUT= 5,910 CU YDS
FILL= 15,946 CU YDS

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

XXX-0000

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

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PROFESSIONAL ENGINEER - STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
No. 18949
11/18/2019

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

SANDSTONE RISE DRIVE GRADING PLAN
BEGIN TO STA 12+00

JOB NO.	100063656
DATE:	NOVEMBER, 2019
DRAWING NO.	20/32

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: 1"=20'
VERT.: NONE
CLV

K:\Projects\SummitWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-08-GRAD-C1.dwg LAYOUT: 20 Nov 18, 2019 - 8:24AM

DEPTH OF COVER DURING CONSTRUCTION

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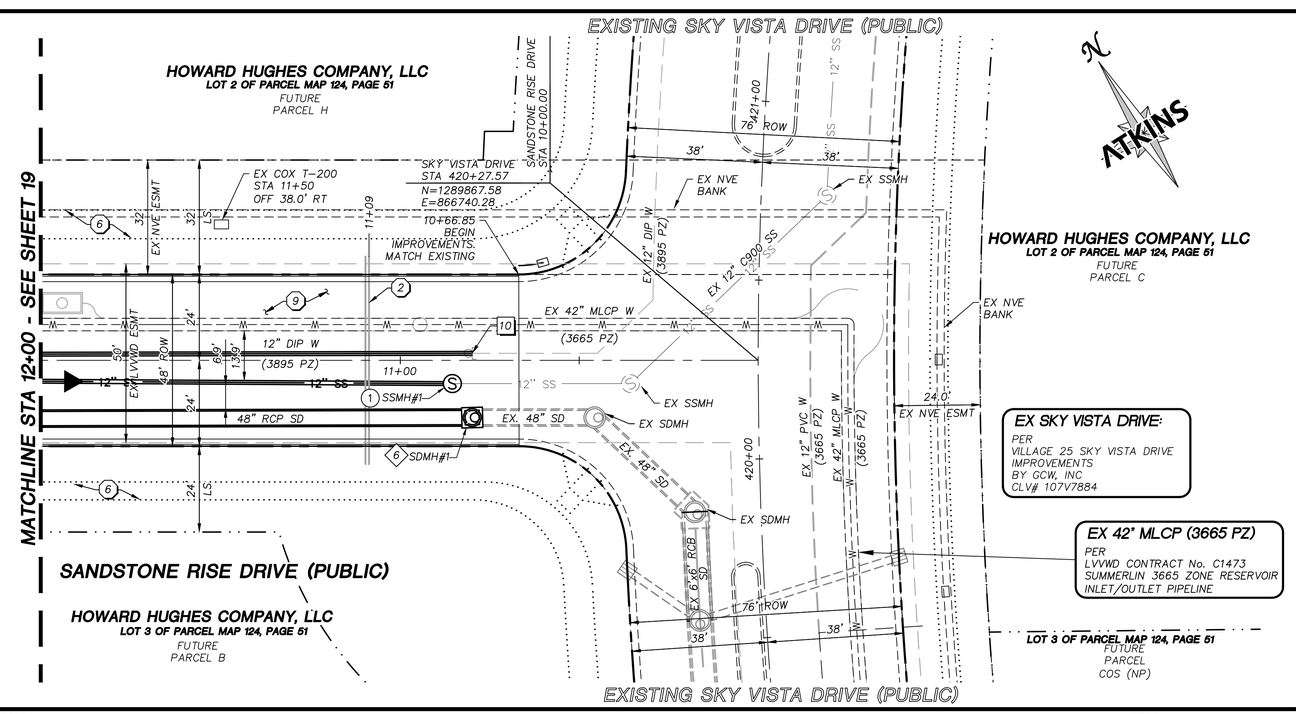
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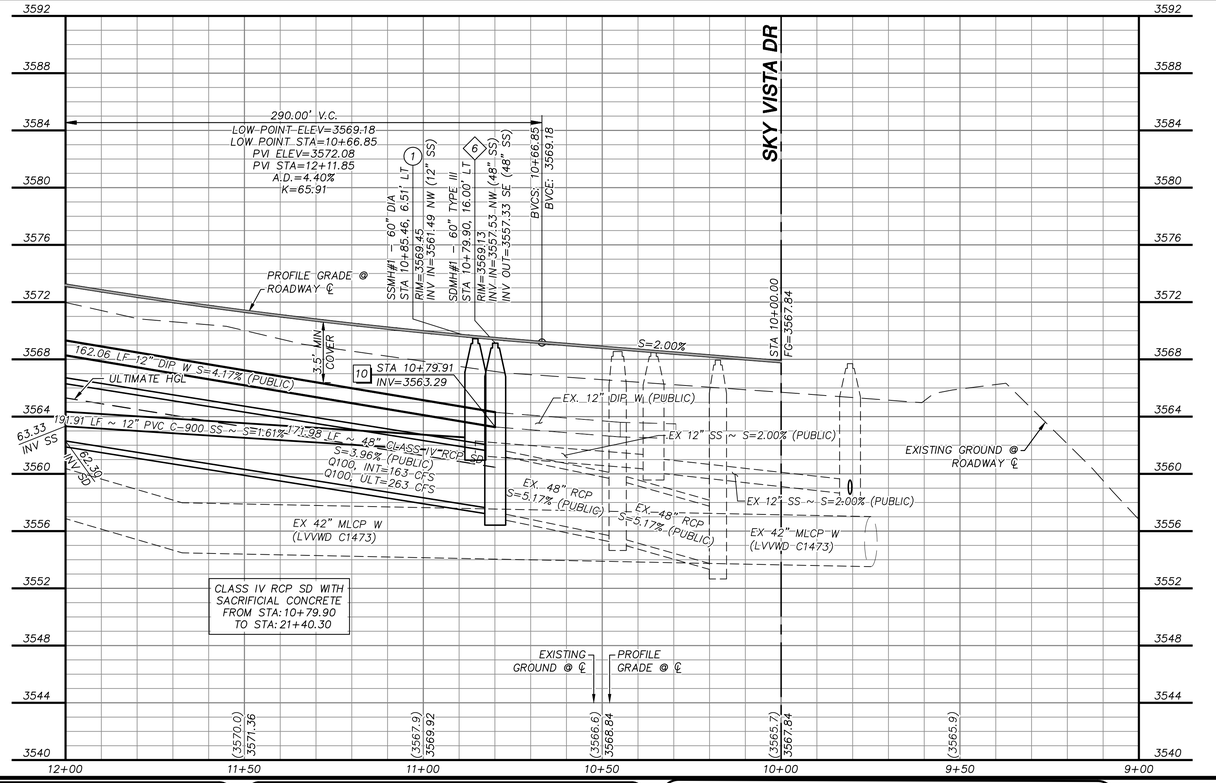
FOR ALL DRY UTILITY CROSSINGS

MAINTAIN MINIMUM 12" VERTICAL SEPARATION AT ALL POINTS OF CROSSING

MAINTAIN MINIMUM 3' PARALLEL SEPARATION

ANY EXCAVATION AT BACK OF CURB MUST REMAIN OPEN FOR INSPECTION OF COPPER SERVICE LATERALS. ANY COPPER SERVICE LATERAL KINKED, BENT OR OTHERWISE DAMAGED MUST BE REPLACED FROM THE MAIN TO THE ANGLE METER STOP.





GRAPHIC SCALE

20 0 10 20 40

HORIZONTAL: 1"= 20'

5 0 2.5 5 10

VERTICAL: 1"= 5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. XXXXX FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

XXX-0000

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SEWER CONSTRUCTION NOTES

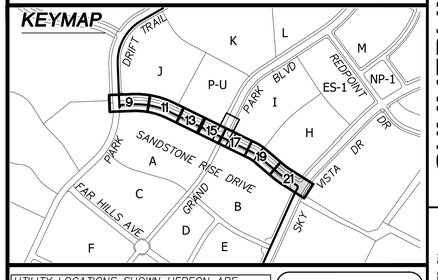
1. INSTALL 60" DIA SEWER MANHOLE PER DCSWCS SD-1, AND SD-4
2. INSTALL PVC C-900 SEWER MAIN PER DCSWCS SD-17
3. STUB AND CAP SEWER PIPE. PLACE MARKER BALL AND 4"X4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).
4. INSTALL 6" LATERAL PER DCSWCS SD-22, SD-23 AND SD-25

WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN WITH MARKER BALLS PER UDACS PLATES #15, #17 AND #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL FIRE HYDRANT PER UDACS PLATE #40 AND DETAIL "C" ON SHEET 28
4. INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
5. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
6. INSTALL 5° BEND PER UDACS PLATE #31
7. INSTALL 11.25° BEND PER UDACS PLATE #31
8. INSTALL 1.5" WATER METER AND RPPA PER UDACS PLATES #4 AND #8 AND DETAIL ON SHEET 30
9. INSTALL IN-LINE REDUCER PER UDACS PLATE #30
10. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE
11. WATER LINE BY OTHERS
12. WATER MAIN JOINT DEFLECTION PER UDACS 2.07.01 AND 2.07.03
13. INSTALL 24"x6" TAPPING SLEEVE W/ TAPPING VALVE PER UDACS PLATES #30, #34, #39 AND SECTION 2.24.01B

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. INSTALL IRRIGATION SLEEVES PER DETAIL "E" SHEET 28
4. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
5. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
6. FUTURE SIDEWALK BY OTHERS
7. CONSTRUCT COMMERCIAL DRIVEWAY PER CCASUD #222.1
8. CONSTRUCT SIDEWALK RAMP, PER DETAIL "A", SHEET 28
9. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 24 FOR TYPICAL PAVEMENT SECTION.
10. CONSTRUCT SIDEWALK RAMP CASE II PER CCAUSD #235



UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

PROFESSIONAL ENGINEER - STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
NO. 18849
11/18/2019

REVISIONS				
REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

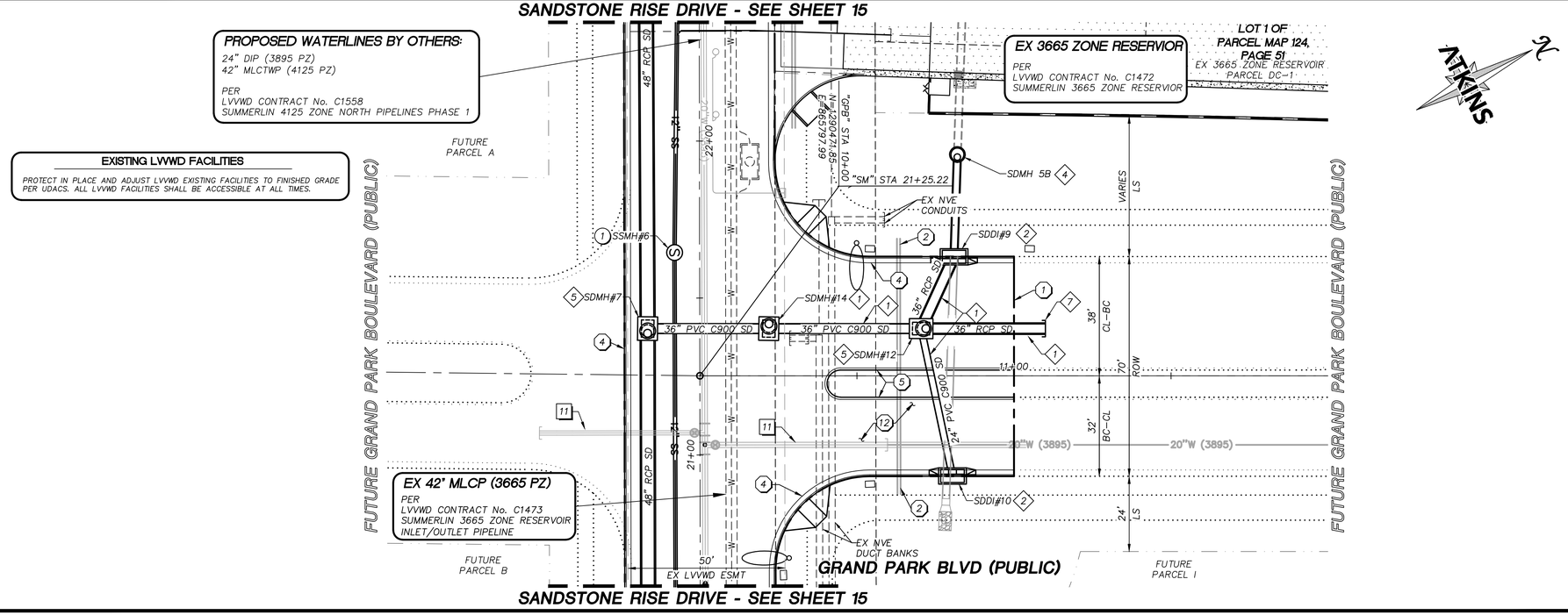
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

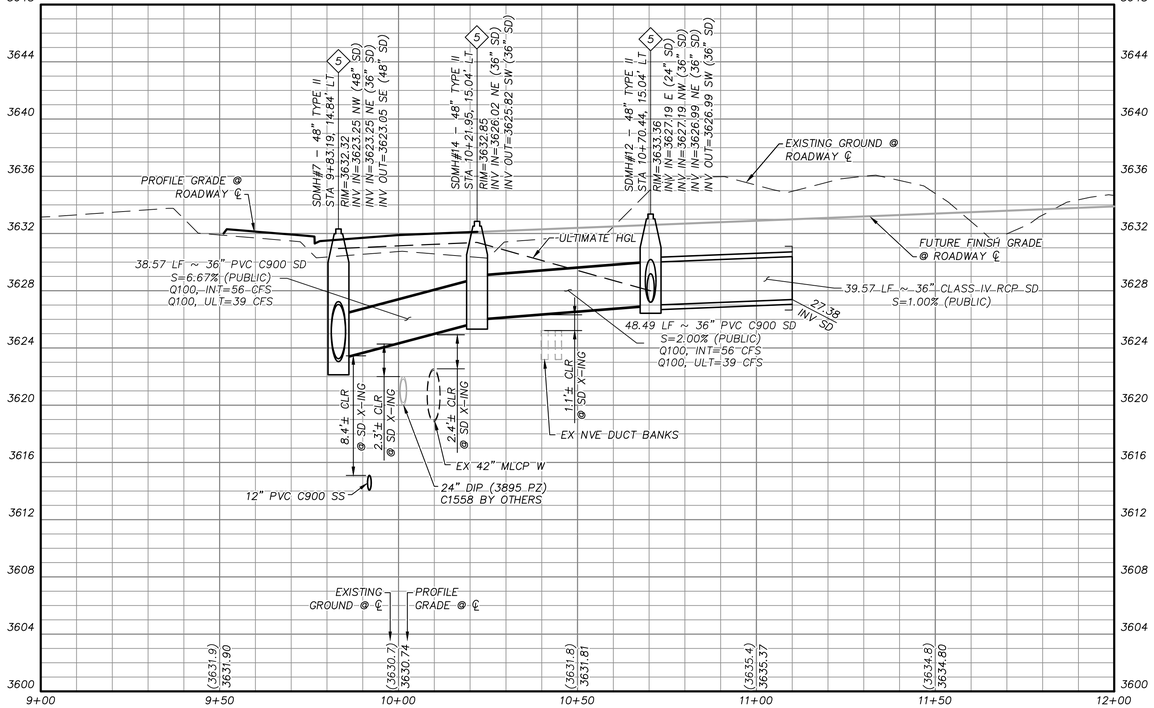
SANDSTONE RISE DRIVE PLAN AND PROFILE BEGIN TO STA 12+00

JOB NO.	100063656
DATE:	NOVEMBER, 2019
DRAWING NO.	21/32

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: 1"=20'
VERT.: 1"=5'
CLV

X:\Projects\SummitWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-10-PLAN-P1.dwg LAYOUT: 21 Nov 18, 2019 - 8:33AM





STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 5 FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1, #422 & #421. L=7.5'
3. INSTALL BEEHIVE DROP INLET PER CCAUSD DWG #416
4. INSTALL 60" TYPE I SD MANHOLE PER CCAUSD #403
5. INSTALL 48" TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL 60" TYPE III SD MANHOLE PER CCAUSD #406
7. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
8. DEEP DROP INLET PER DETAIL "C" SHEET 29.

SEWER CONSTRUCTION NOTES

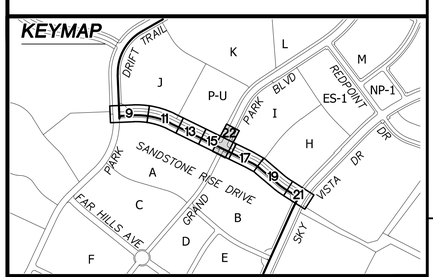
1. INSTALL 60" DIA SEWER MANHOLE PER DCSWCS SD-1, AND SD-4
2. INSTALL PVC C-900 SEWER MAIN PER DCSWCS SD-17
3. STUB AND CAP SEWER PIPE. PLACE MARKER BALL AND 4"X4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).
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5. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
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9. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 24 FOR TYPICAL PAVEMENT SECTION.
10. CONSTRUCT SIDEWALK RAMP CASE II PER CCAUSD #235



REVISIONS				
REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)
GRAND PARK BOULEVARD PLAN AND PROFILE
STA 10+00 TO STA 12+00

GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"= 20'
5 0 2.5 5 10
VERTICAL: 1"= 5'

APPROVED FOR CONSTRUCTION
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES
PROJECT NO. XXXXX FIRST APPROVED DATE: _____
LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION
ANTHONY ORTIZ PE# 18849 DATE
CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.
XXX-0000

BASIS OF BEARING
GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK
CITY OF LAS VEGAS BENCHMARK: D368 (REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET)
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN. T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 EMERGENCY AND NATIONAL SYSTEM OF TRANSPORTATION
Call before you D g AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY. Call 811 or 1-800-642-2444
AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

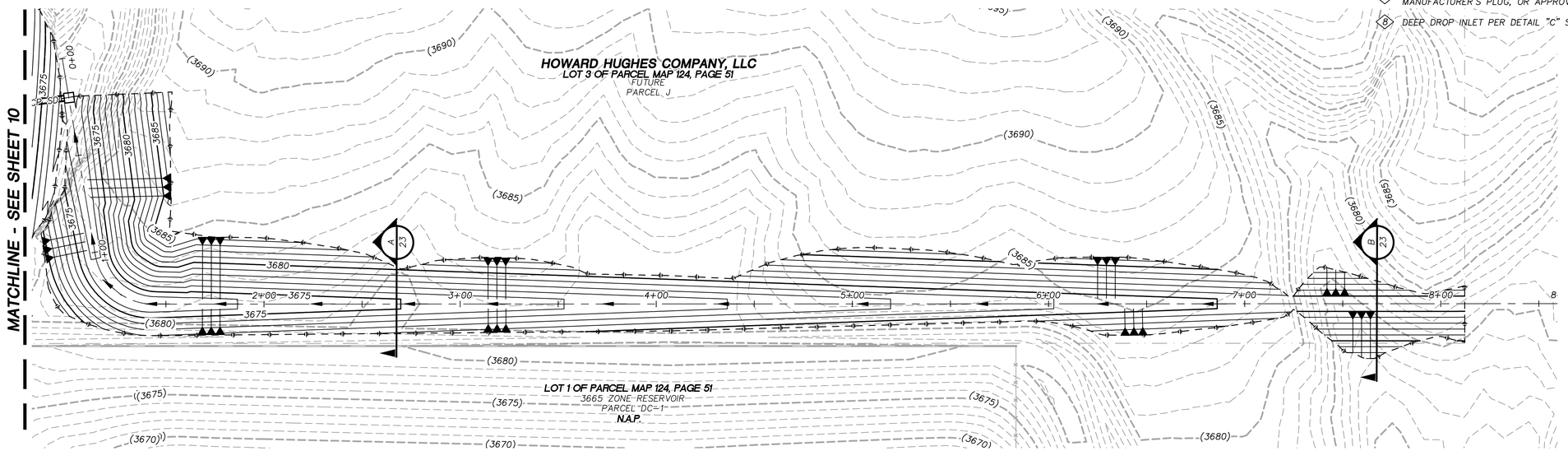
PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
No. 18849
11/18/2019

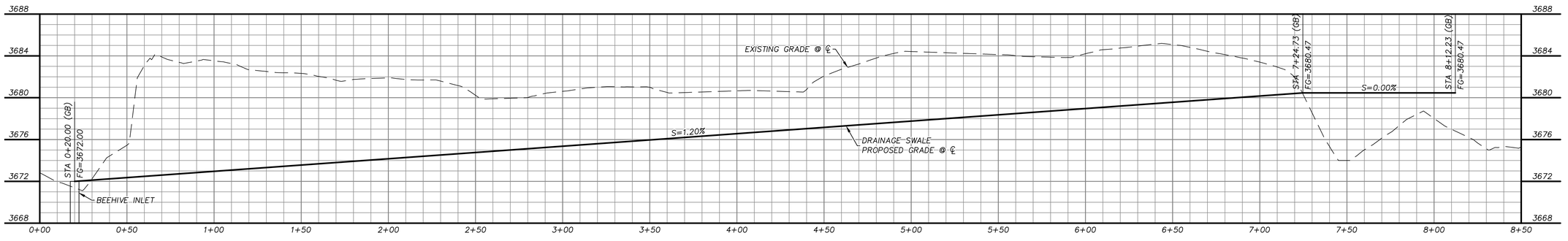
JOB NO.	100063656
DATE:	NOVEMBER, 2019
DRAWING NO.	22/32
DESIGNED BY:	C. BLAKE
DRAWN BY:	G. BLAKE
CHECKED BY:	T. ORTIZ
HORIZ.:	1"=20'
VERT.:	1"=5'
CLV	

X:\Projects\SummWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-11-PLAN-P2.dwg LAYOUT: 22 Nov 18, 2019 - 8:35AM

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 5 FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1, #422 & #421. L=7.5'
3. INSTALL BEEHIVE DROP INLET PER CCAUSD DWG #416
4. INSTALL 60" TYPE I SD MANHOLE PER CCAUSD #403
5. INSTALL 48" TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL 60" TYPE III SD MANHOLE PER CCAUSD #406
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8. DEEP DROP INLET PER DETAIL "C" SHEET 29.



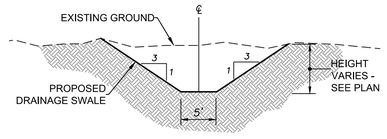


DEPTH OF COVER DURING CONSTRUCTION

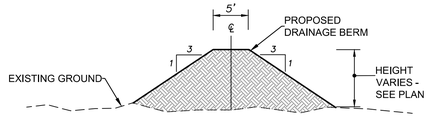
MAINTAIN MINIMUM TWENTY-FOUR (24) INCH COVER PER UDACS SECTION 2.08.04. GRADING MUST BE COMPLETED PRIOR TO WATERLINE INSTALLATION.

EXISTING LVVWD FACILITIES

PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.



DRAINAGE SWALE SECTION (A 23)
N.T.S.



DRAINAGE BERM SECTION (B 23)
N.T.S.

GRAPHIC SCALE
30 0 15 30 60
HORIZONTAL: 1"= 30'
5 0 2.5 5 10
VERTICAL: 1"= 5'

SOILS REPORT

BY NOVA GEOTECHNICAL
PROJECT NO. G-19-026
DATED MAY 9,2019
EARTHWORK QUANTITIES (RAW):
CUT= 5,910 CU YDS
FILL= 15,946 CU YDS

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

XXX-0000

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

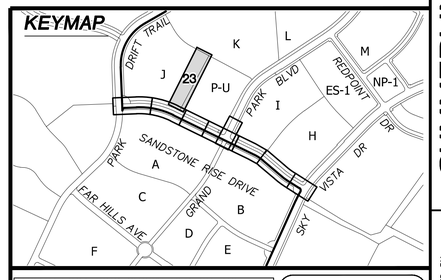
BENCHMARK

CITY OF LAS VEGAS BENCHMARK:
D368 (REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET)
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you D ig AVOID BURYING INTERSTATE UTILITY LINES. IT'S COSTLY. Call 811 OR 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929



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PROFESSIONAL ENGINEER - STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
No. 18849
11/18/2019

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

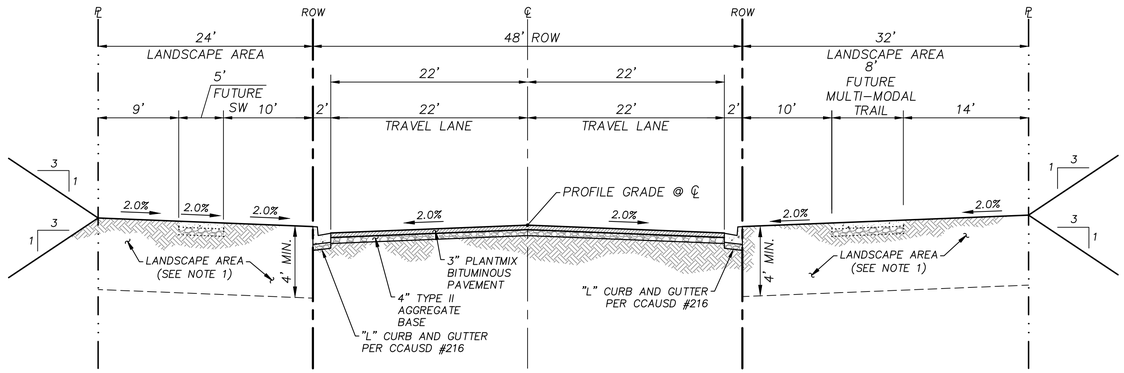
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

PARCEL J DRAINAGE SWALE PLAN AND PROFILE

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: 1"=30"
VERT.: NONE

JOB NO. 100063656
DATE: NOVEMBER, 2019
DRAWING NO. 23/32
CLV

X:\Projects\SummWest\Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-09-GRAD-02.dwg LAYOUT: 23 Nov 18, 2019 - 8:27AM



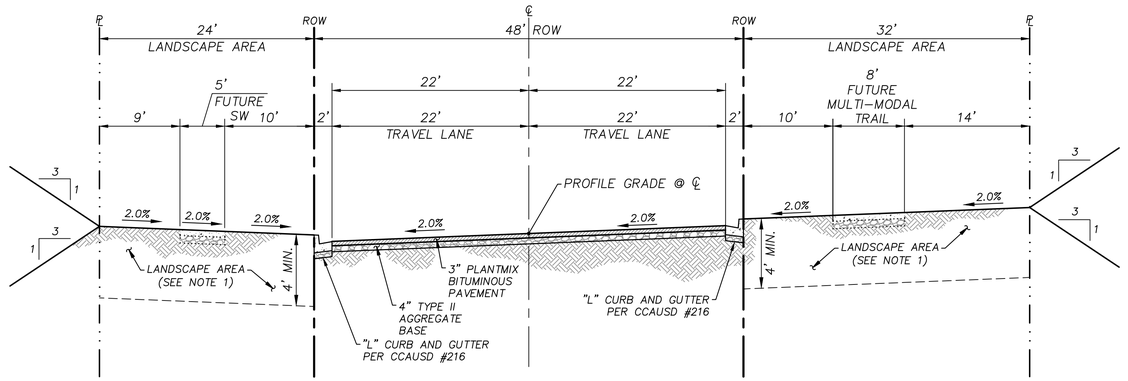
NOTES:

1. EXCAVATE BOTH SIDES TO DEPTH INDICATED PRIOR TO STREET IMPROVEMENTS. SIFT/SCREEN OUT ROCK AND DEBRIS GREATER THAN 6" FROM EXCAVATED MATERIAL, THEN BACKFILL TO 85% COMPACTION. FILL AS NECESSARY TO 2" BELOW THE FINISHED GRADE.

SANDSTONE RISE DRIVE - TYPICAL SECTION

N.T.S.

A / 24



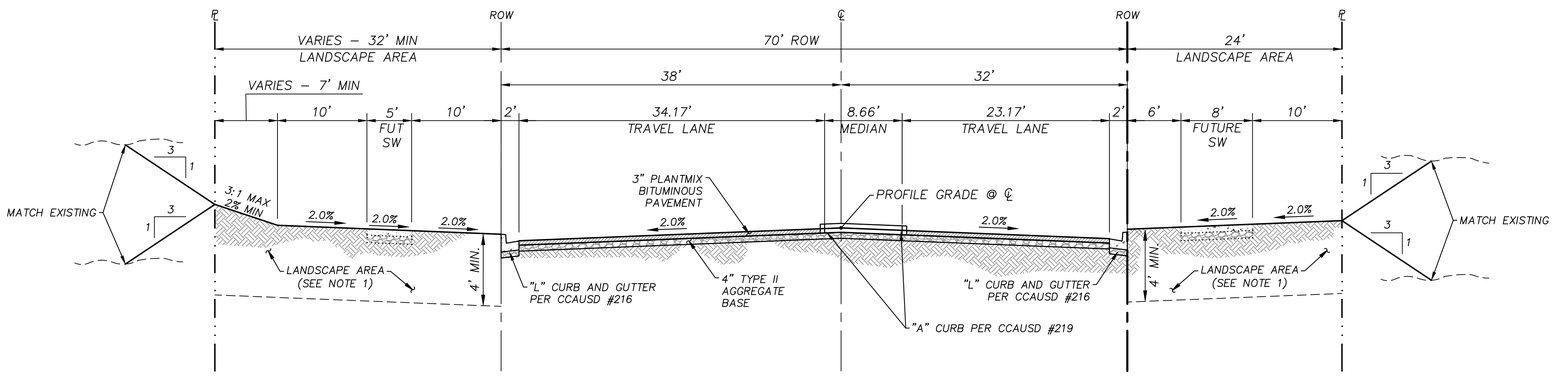
NOTES:

1. EXCAVATE BOTH SIDES TO DEPTH INDICATED PRIOR TO STREET IMPROVEMENTS. SIFT/SCREEN OUT ROCK AND DEBRIS GREATER THAN 6" FROM EXCAVATED MATERIAL, THEN BACKFILL TO 85% COMPACTION. FILL AS NECESSARY TO 2" BELOW THE FINISHED GRADE.

SANDSTONE RISE DRIVE - SUPER-ELEVATED SECTION

N.T.S.

B / 24



NOTES:

1. EXCAVATE BOTH SIDES TO DEPTH INDICATED PRIOR TO STREET IMPROVEMENTS. SIFT/SCREEN OUT ROCK AND DEBRIS GREATER THAN 6" FROM EXCAVATED MATERIAL, THEN BACKFILL TO 85% COMPACTION. FILL AS NECESSARY TO 2" BELOW THE FINISHED GRADE.

GRAND PARK BOULEVARD - TYPICAL SECTION

N.T.S.

C / 24

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

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Call before you D g AVOID CUTTING THE UNDERGROUND UTILITY LINES. IT'S COSTLY. Call 811 OR 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

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PROFESSIONAL ENGINEER - STATE OF NEVADA
ANTHONY J ORTIZ
EXP. 12-31-21
CIVIL
No. 18949
11/18/2019

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

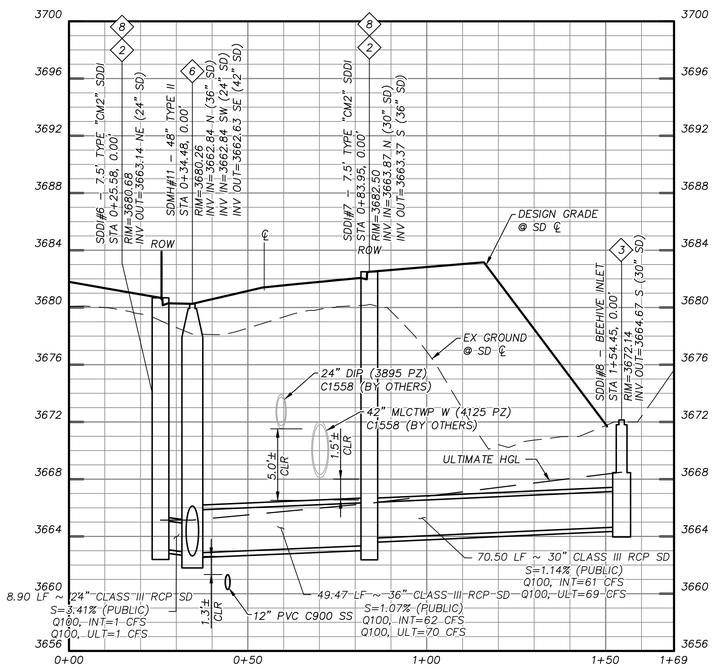
SUMMERLIN

SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

STREET SECTIONS

JOB NO.	100063656
DATE:	NOVEMBER, 2019
DRAWING NO.	24/32
DESIGNED BY:	G. BLAKE
DRAWN BY:	G. BLAKE
CHECKED BY:	T. ORTIZ
HORIZ.:	N.T.S.
VERT.:	N.T.S.
CLV	

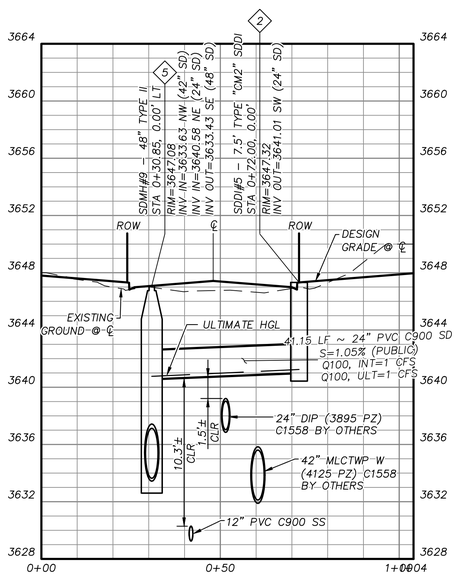
X:\Projects\SummWest\Village 25\100063656 – V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-12-DETL-D1.dwg LAYOUT: 24 Nov 18, 2019 – 8:35AM



STORM DRAIN LATERAL DETAIL

"SRD" STA: 28+64 SEE SHEETS 10 AND 11

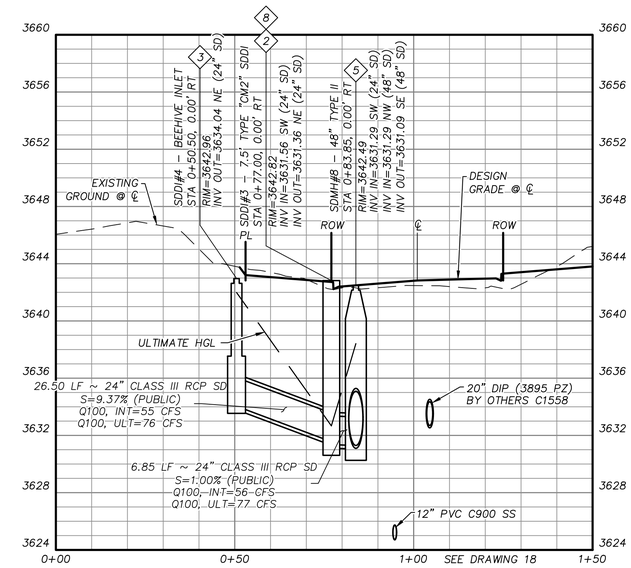
A 25



STORM DRAIN LATERAL DETAIL

"SRD" STA: 23+75 SEE SHEET 14

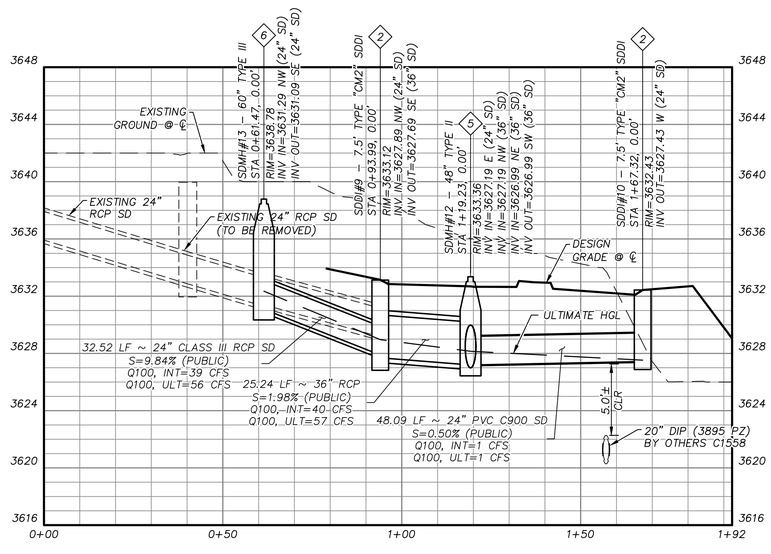
B 25



STORM DRAIN LATERAL DETAIL

"SRD" STA: 23+08 SEE SHEET 14

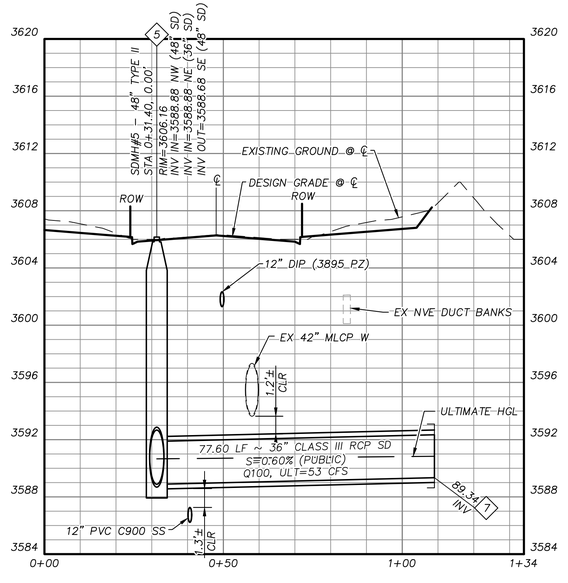
C 25



STORM DRAIN LATERAL DETAIL

"GPB" STA: 10+73 SEE SHEET 14 & 22

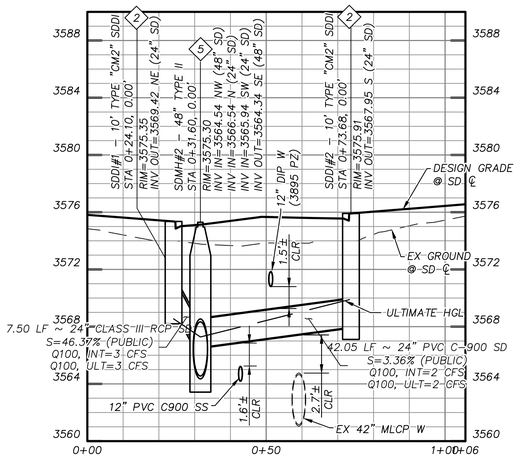
D 25



STORM DRAIN LATERAL DETAIL

"SRD" STA: 17+46 SEE SHEET 16

E 25



STORM DRAIN LATERAL DETAIL

"SRD" STA: 12+62 SEE SHEET 18

F 25

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 5 FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1, #422 & #421. L=7.5'
3. INSTALL BEEHIVE DROP INLET PER CCAUSD DWG #416
4. INSTALL 60" TYPE I SD MANHOLE PER CCAUSD #403
5. INSTALL 48" TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL 60" TYPE III SD MANHOLE PER CCAUSD #406
7. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
8. DEEP DROP INLET PER DETAIL "C" SHEET 29.

SEWER CONSTRUCTION NOTES

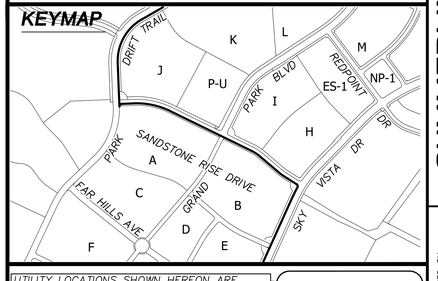
1. INSTALL 60" DIA SEWER MANHOLE PER DCSWCS SD–1, AND SD–4
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4. INSTALL 6" LATERAL PER DCSWCS SD–22, SD–23 AND SD–25

WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN WITH MARKER BALLS PER UDACS PLATES #15, #17 AND #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL FIRE HYDRANT PER UDACS PLATE #40 AND DETAIL "C" ON SHEET 28
4. INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
5. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
6. INSTALL 5° BEND PER UDACS PLATE #31
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8. INSTALL 1.5" WATER METER AND RPPA PER UDACS PLATES #4 AND #8 AND DETAIL ON SHEET 30
9. INSTALL IN–LINE REDUCER PER UDACS PLATE #30
10. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE
11. WATER LINE BY OTHERS
12. WATER MAIN JOINT DEFLECTION PER UDACS 2.07.01 AND 2.07.03
13. INSTALL 24"x6" TAPPING SLEEVE W/ TAPPING VALVE PER UDACS PLATES #30, #34, #39 AND SECTION 2.24.01B

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. INSTALL IRRIGATION SLEEVES PER DETAIL "E" SHEET 28
4. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
5. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
6. FUTURE SIDEWALK BY OTHERS
7. CONSTRUCT COMMERCIAL DRIVEWAY PER CCASUD #222.1
8. CONSTRUCT SIDEWALK RAMP, PER DETAIL "A", SHEET 28
9. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 24 FOR TYPICAL PAVEMENT SECTION.
10. CONSTRUCT SIDEWALK RAMP CASE II PER CCAUSD #235



APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. XXXXX FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

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T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 EFFICIENT AND OPTIMAL SYSTEM OF TRANSPORTATION

Call before you Dig AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY. Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY. CALL BEFORE YOU DIG OVERHEAD 1-702-227-2929

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PROFESSIONAL ENGINEER-STATE OF NEVADA ANTHONY J. ORTIZ EXP. 12-31-21 CIVIL No. 19949 11/18/2019

REVISIONS			
REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

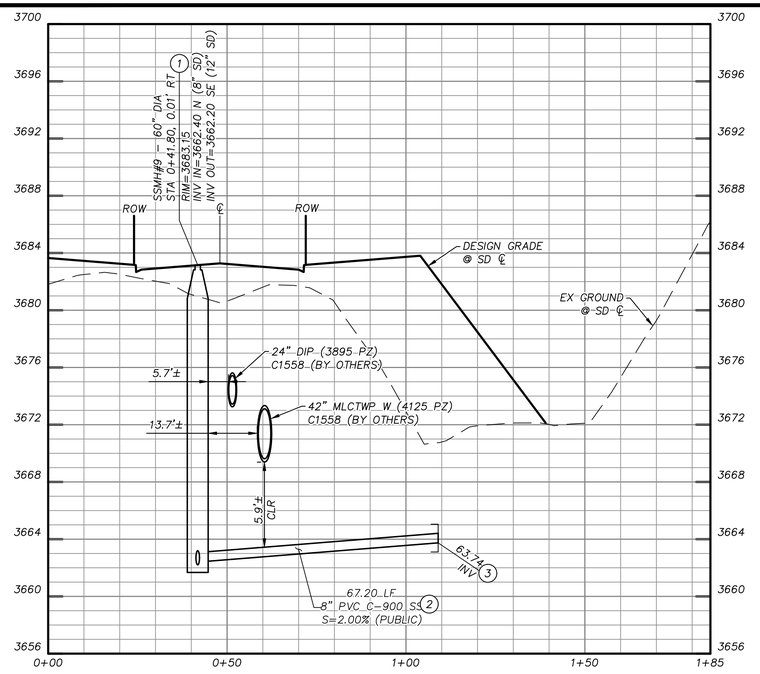
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

LATERAL DETAILS 1

DESIGNED BY: C. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: N.T.S.
VERT.: N.T.S.

JOB NO. 100063656
DATE: NOVEMBER, 2019
DRAWING NO. 25/32
CLV

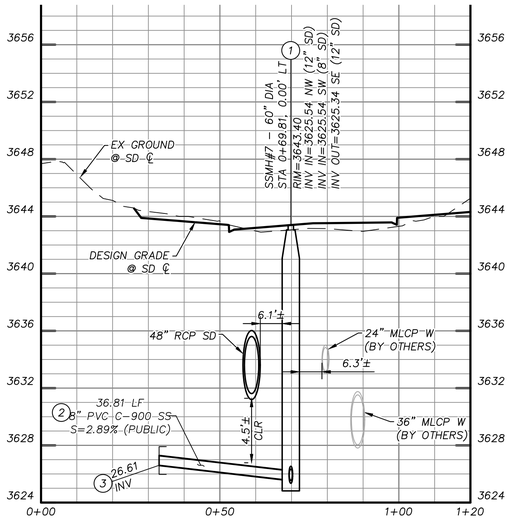
X:\Projects\SummWest\Village 25\100063656 – V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-13-DETL-02.dwg LAYOUT: 25 Nov 18, 2019 – 8:38AM



SEWER LATERAL DETAIL

"SRD" STA: 28+94 SEE SHEET 11

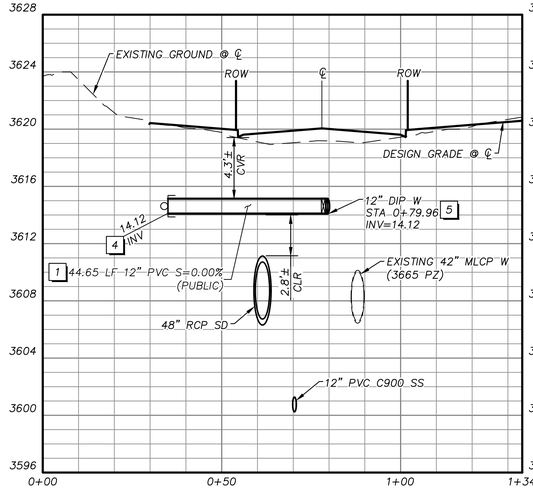
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SEWER LATERAL DETAIL

"SRD" STA: 23+18 SEE SHEET 15

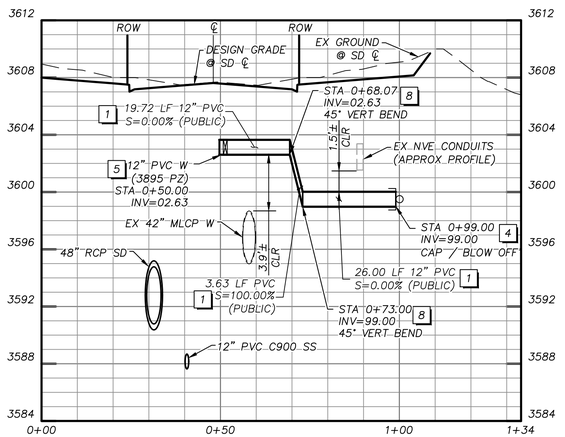
B 26



WATER LATERAL DETAIL

"SRD" STA: 19+46 SEE SHEET 17

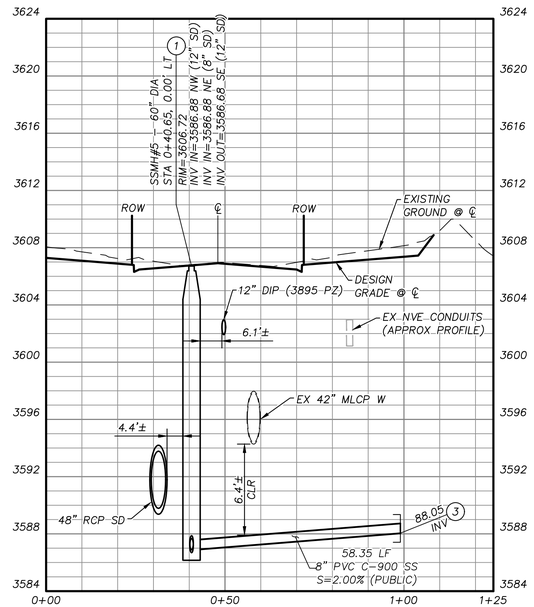
C 26



WATER LATERAL DETAIL

"SRD" STA: 17+67 SEE SHEET 17

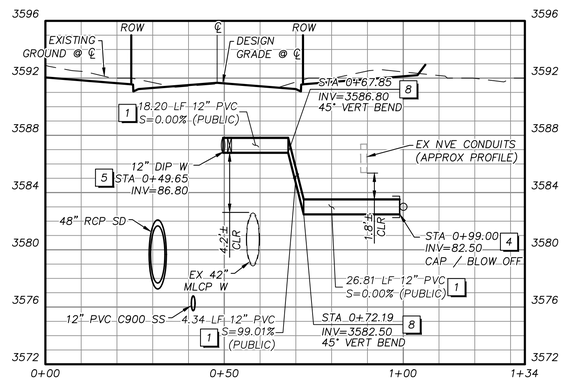
D 26



SEWER LATERAL DETAIL

"SRD" STA: 17+56 SEE SHEET 17

E 26



WATER LATERAL DETAIL

"SRD" STA: 15+17 SEE SHEET 19

F 26

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APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. XXXXX FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL

BASIS OF BEARING

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REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

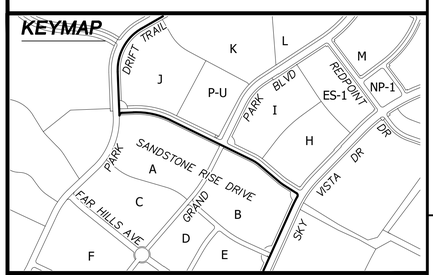
ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

LATERAL DETAILS 2

KEYMAP



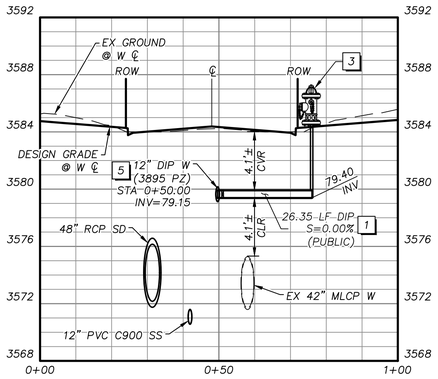
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PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J. ORTIZ
EXP. 12-31-21
CIVIL
No. 18949
11/18/2019

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: N.T.S.
VERT.: N.T.S.

JOB NO. 100063656
DATE: NOVEMBER, 2019
DRAWING NO. 26/32
CLV

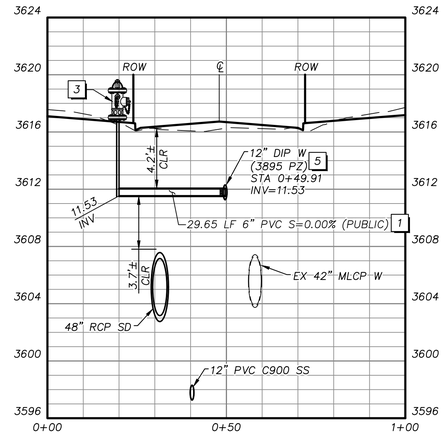
X:\Projects\SummWest\Village 25\100063656 – V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-13-DETL-02.dwg LAYOUT: 26 Nov 18, 2019 – 8:39AM



FIRE HYDRANT LATERAL DETAIL

"SRD" STA: 14+04 SEE SHEET 19

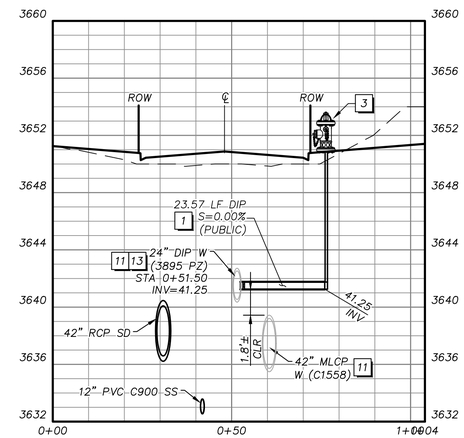
A / 27



FIRE HYDRANT LATERAL DETAIL

"SRD" STA: 19+04 SEE SHEET 17

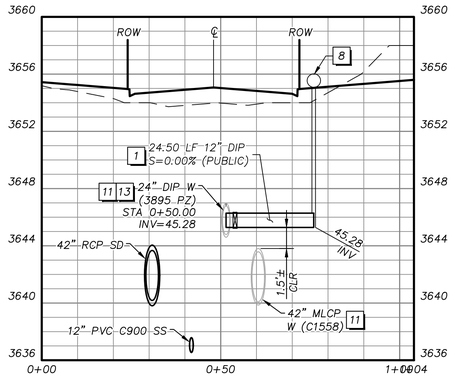
B / 27



FIRE HYDRANT LATERAL DETAIL

"SRD" STA: 24+25 SEE SHEET 13

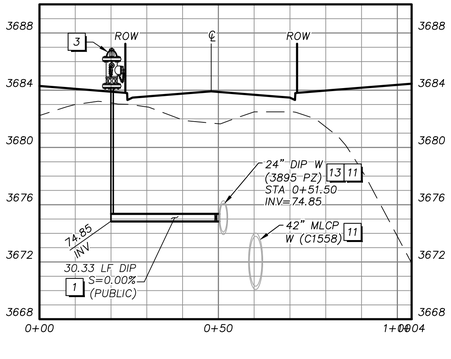
C / 27



IRRIGATION METER LATERAL DETAIL

"SRD" STA: 24+85 SEE SHEET 13

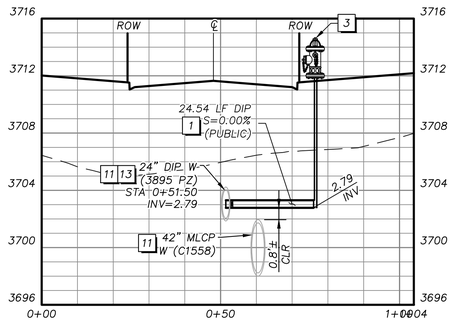
D / 27



FIRE HYDRANT LATERAL DETAIL

"SRD" STA: 29+04 SEE SHEET 11

E / 27



FIRE HYDRANT LATERAL DETAIL

"SRD" STA: 33+29 SEE SHEET 9

F / 27

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. XXXXX FIRST APPROVED DATE: _____

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PROFESSIONAL ENGINEER · STATE OF NEVADA · ANTHONY J ORTIZ · EXP. 12-31-21 · CIVIL · No. 18949

11/18/2019

STORM DRAIN CONSTRUCTION NOTES

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SEWER CONSTRUCTION NOTES

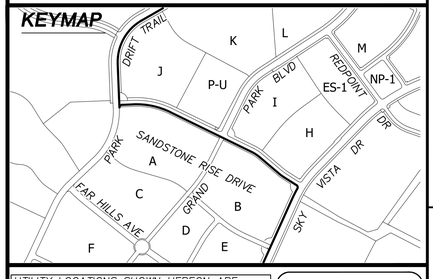
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REV.	DESCRIPTION	BY	DATE	APPROVAL

REVISIONS

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

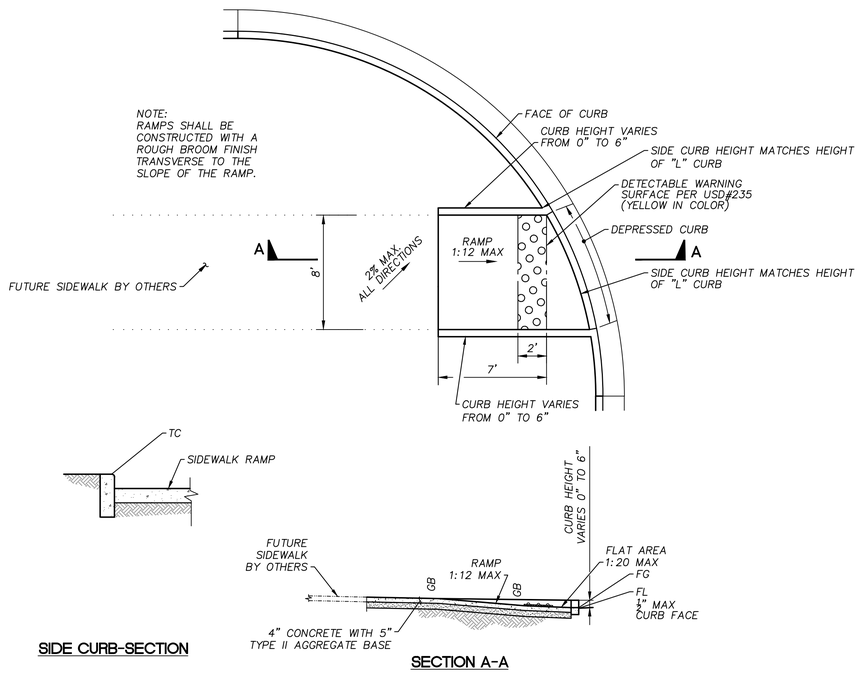
LATERAL DETAILS 3

JOB NO.	100063656
DATE:	NOVEMBER, 2019
DRAWING NO.	27/32

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: T. ORTIZ
HORIZ.: N.T.S.
VERT.: N.T.S.

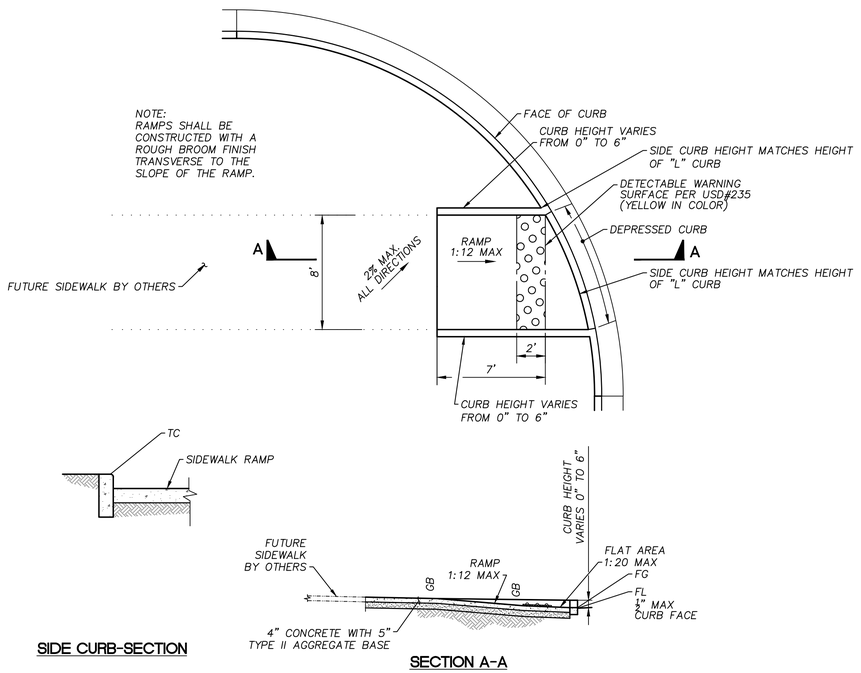
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X:\Projects\SummWest Village 25\100063656 - V25 Street M (Lake Mead to Sky Vista)_Sheets\63656-13-DETL-02.dwg LAYOUT: 27 Nov 18, 2019 - 8:39AM



SIDE CURB-SECTION

SECTION A-A



SIDE CURB-SECTION

SECTION A-A

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 5 FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1, #422 & #421. L=7.5'
3. INSTALL BEEHIVE DROP INLET PER CCAUSD DWG #416
4. INSTALL 60" TYPE I SD MANHOLE PER CCAUSD #403
5. INSTALL 48" TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL 60" TYPE III SD MANHOLE PER CCAUSD #406
7. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
8. DEEP DROP INLET PER DETAIL "C" SHEET 29.

SEWER CONSTRUCTION NOTES

1. INSTALL 60" DIA SEWER MANHOLE PER DCSWCS SD-1, AND SD-4
2. INSTALL PVC C-900 SEWER MAIN PER DCSWCS SD-17
3. STUB AND CAP SEWER PIPE. PLACE MARKER BALL AND 4"X4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).
4. INSTALL 6" LATERAL PER DCSWCS SD-22, SD-23 AND SD-25

WATERLINE CONSTRUCTION NOTES

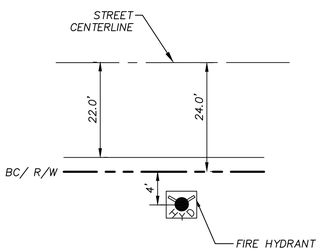
1. INSTALL WATER MAIN WITH MARKER BALLS PER UDACS PLATES #15, #17 AND #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL FIRE HYDRANT PER UDACS PLATE #40 AND DETAIL "C" ON SHEET 28
4. INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
5. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
6. INSTALL 5° BEND PER UDACS PLATE #31
7. INSTALL 11.25° BEND PER UDACS PLATE #31
8. INSTALL 1.5" WATER METER AND RPPA PER UDACS PLATES #4 AND #8 AND DETAIL ON SHEET 30
9. INSTALL IN-LINE REDUCER PER UDACS PLATE #30
10. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE
11. WATER LINE BY OTHERS
12. WATER MAIN JOINT DEFLECTION PER UDACS 2.07.01 AND 2.07.03
13. INSTALL 24"x6" TAPPING SLEEVE W/ TAPPING VALVE PER UDACS PLATES #30, #34, #39 AND SECTION 2.24.01B

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. INSTALL IRRIGATION SLEEVES PER DETAIL "E" SHEET 28
4. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
5. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
6. FUTURE SIDEWALK BY OTHERS
7. CONSTRUCT COMMERCIAL DRIVEWAY PER CCASUD #222.1
8. CONSTRUCT SIDEWALK RAMP, PER DETAIL "A", SHEET 28
9. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 24 FOR TYPICAL PAVEMENT SECTION.
10. CONSTRUCT SIDEWALK RAMP CASE II PER CCAUSD #235

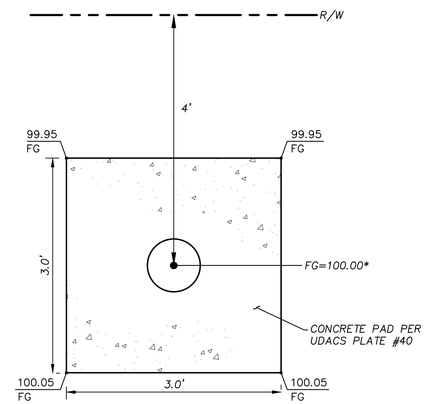
SIDEWALK RAMP DETAIL

N.T.S. (A / 28)



FIRE HYDRANT LOCATION DETAIL

N.T.S. (C / 28)



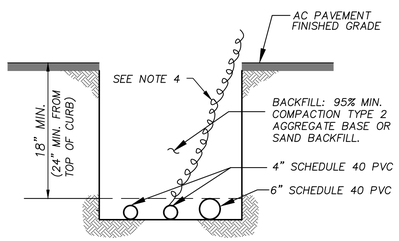
*NOTE: THE GRADES SHOWN IN THIS DETAIL ARE RELATIVE NOT ACTUAL, 100.00 IS THE REFERENCE GRADE FOR THE CENTER OF PAD ELEVATION. SEE P-SHEETS FOR ACTUAL FINISHED GRADE FOR CENTER OF PAD.

FIRE HYDRANT PAD GRADING DETAIL

N.T.S. (D / 28)

NOTES:

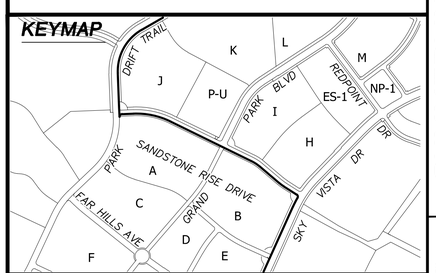
1. SLEEVES AND CONDUITS SHALL BE INSTALLED 18" BELOW FINISHED GRADE AND SHALL EXTEND 5' BEYOND BACK OF CURBS, WALLS AND PAVING.
2. CONTRACTOR SHALL RECORD LOCATIONS OF INSTALLED SLEEVES: A COPY OF THE FILED NOTES SHALL BE GIVEN TO SUMMERLIN'S ENGINEER FOLLOWING CONSTRUCTION.
3. HORIZONTAL LOCATION OF SLEEVES SHOWN ON P-SHEETS.
4. THE CONTRACTOR TO PROVIDE A WIRE THROUGH THE SLEEVE TO GRADE LEVEL (FOR FUTURE SLEEVE LOCATION).
5. CONTRACTOR TO IDENTIFY SLEEVE LOCATION ON TOP OF CURB.



IRRIGATION SLEEVES DETAIL

N.T.S. (E / 28)

KEYMAP



APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. XXXXX FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK: D368 (REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET)
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN. T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 (FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION)

Call before you D g. AVOID CUTTING UNDERGROUND UTILITY LINES, IT'S COSTLY. Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES, IT'S COSTLY. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

PROFESSIONAL ENGINEER - STATE OF NEVADA — ANTHONY J. ORTIZ — EXP. 12-31-21 — CIVIL — No. 18949 — 11/18/2019

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

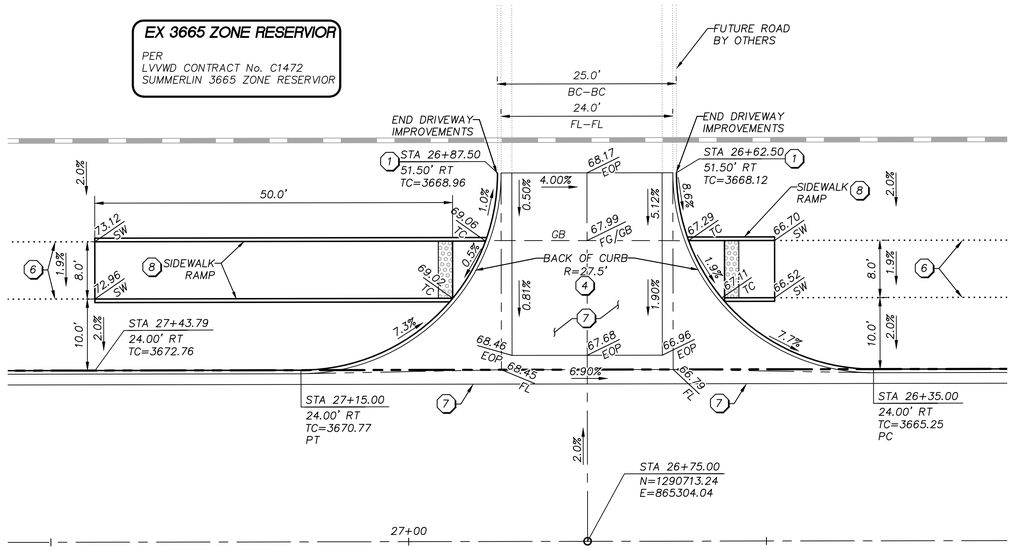
ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)
MISCELANEOUS DETAILS

DESIGNED BY:	G. BLAKE
DRAWN BY:	G. BLAKE
CHECKED BY:	CLV
HORIZ.:	N.T.S.
VERT.:	N.T.S.
JOB NO.	100063656
DATE:	NOVEMBER, 2019
DRAWING NO.	28/32

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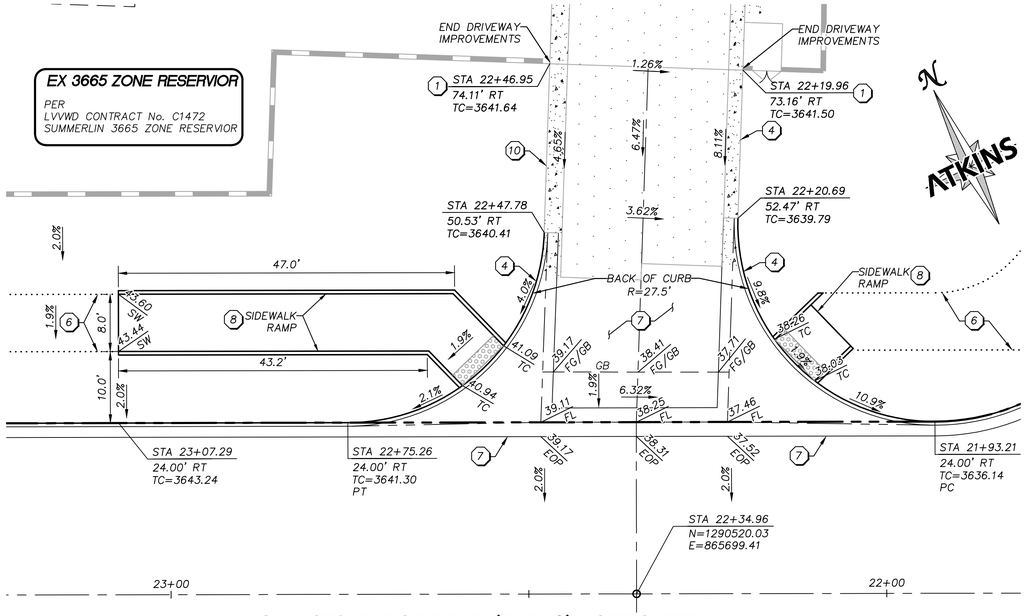


SANDSTONE RISE DRIVE (PUBLIC) - SEE SHEET 12

RESERVOIR SECONDARY ENTRY DRIVEWAY

SCALE: 1"=10'

SEE DRAWING 12 (A 29)



SANDSTONE RISE DRIVE (PUBLIC) - SEE SHEET 14

RESERVOIR ENTRY DRIVEWAY

SCALE: 1"=10'

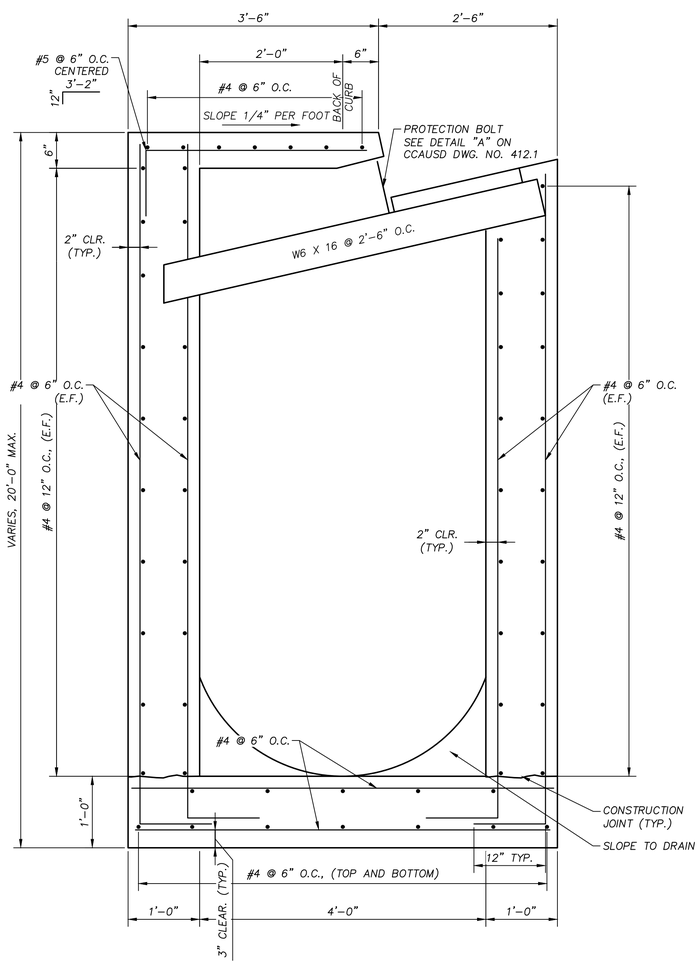
SEE DRAWING 14 (B 29)

GRADING PLAN CERTIFICATION

ANTHONY ORTIZ PE# 18849 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

XXX-0000



CONCRETE:

CONCRETE SHALL BE MODIFIED CLASS DA 4500 PSI, SEE SPECIAL PROVISIONS SECTION 501.

NOTE:

THIS DETAIL IS MEANT TO MODIFY THE TYPE "CM2" DROP INLET SECTION PER CCAUSD DWG. NO. 412.1 FOR STRUCTURES WITH DEPTHS GREATER THAN 10'. ALL OTHER INFORMATION OF THE STANDARD DRAWING STILL APPLY UNLESS OVERWRITTEN BY THIS DETAIL.

SUPPLEMENT TO "CM2" DROP INLET (D>10')

N.T.S.

(C 29)

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 5 FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1, #422 & #421. L=7.5'
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5. INSTALL 48" TYPE II SD MANHOLE PER CCAUSD #405.2
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SEWER CONSTRUCTION NOTES

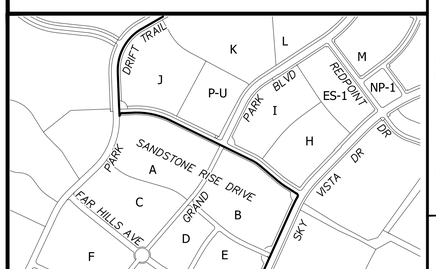
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WATERLINE CONSTRUCTION NOTES

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7. INSTALL 11.25° BEND PER UDACS PLATE #31
8. INSTALL 1.5" WATER METER AND RPPA PER UDACS PLATES #4 AND #8 AND DETAIL ON SHEET 30
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10. CONSTRUCT SIDEWALK RAMP CASE II PER CCAUSD #235



ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

SUMMERLIN

SUMMERLIN VILLAGE 25

SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

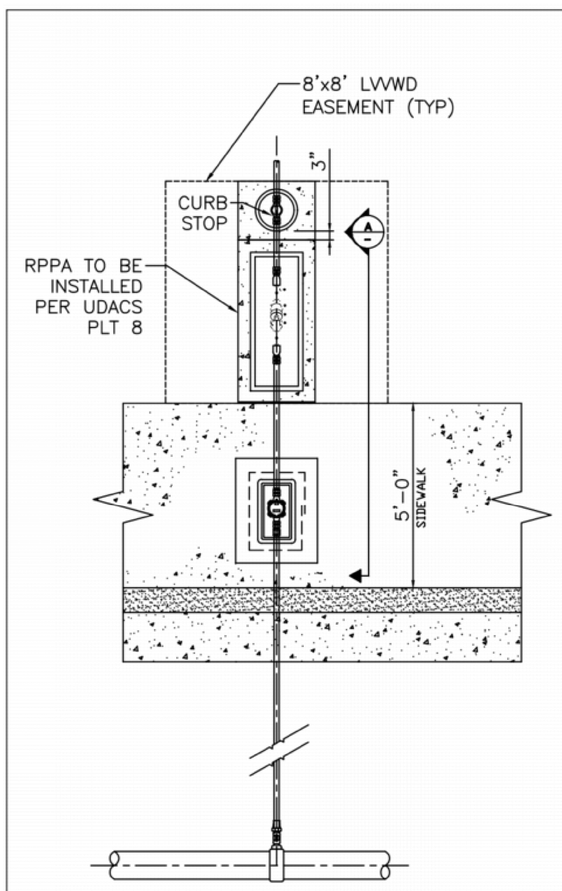
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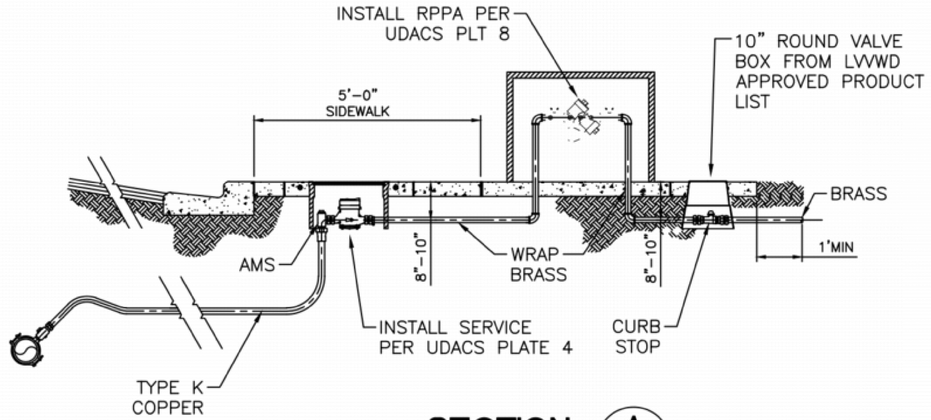
DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: A. ORTIZ
HORIZ.: N.T.S.
VERT.: N.T.S.

JOB NO. 100063656
DATE: NOVEMBER, 2019
DRAWING NO. 29/32
CLV

PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J. ORTIZ
EXP. 12-31-21
CIVIL
No. 18849
11/18/2019

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SECTION A

WATER METER DETAIL

N.T.S.

A / 30

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. XXXXX FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 2,000 GPM AT 20 PSI RESIDUAL

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK:
D368 (REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET)
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 FEDERAL AND NATIONAL SYSTEM OF TRANSPORTATION

Call before you Dig AVOID CUTTING UNDERGROUND UTILITY LINES IN THE COUNTY. Call 811 or 1-800-642-2444

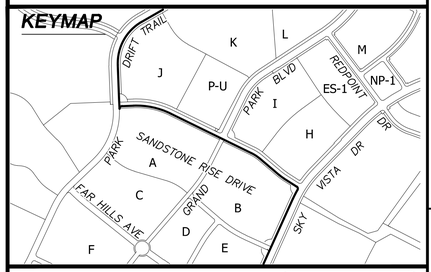
AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

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PROFESSIONAL ENGINEER-STATE OF NEVADA — ANTHONY J. ORTIZ — EXP. 12-31-21 — CIVIL — No. 19949

11/18/2019

KEYMAP



REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

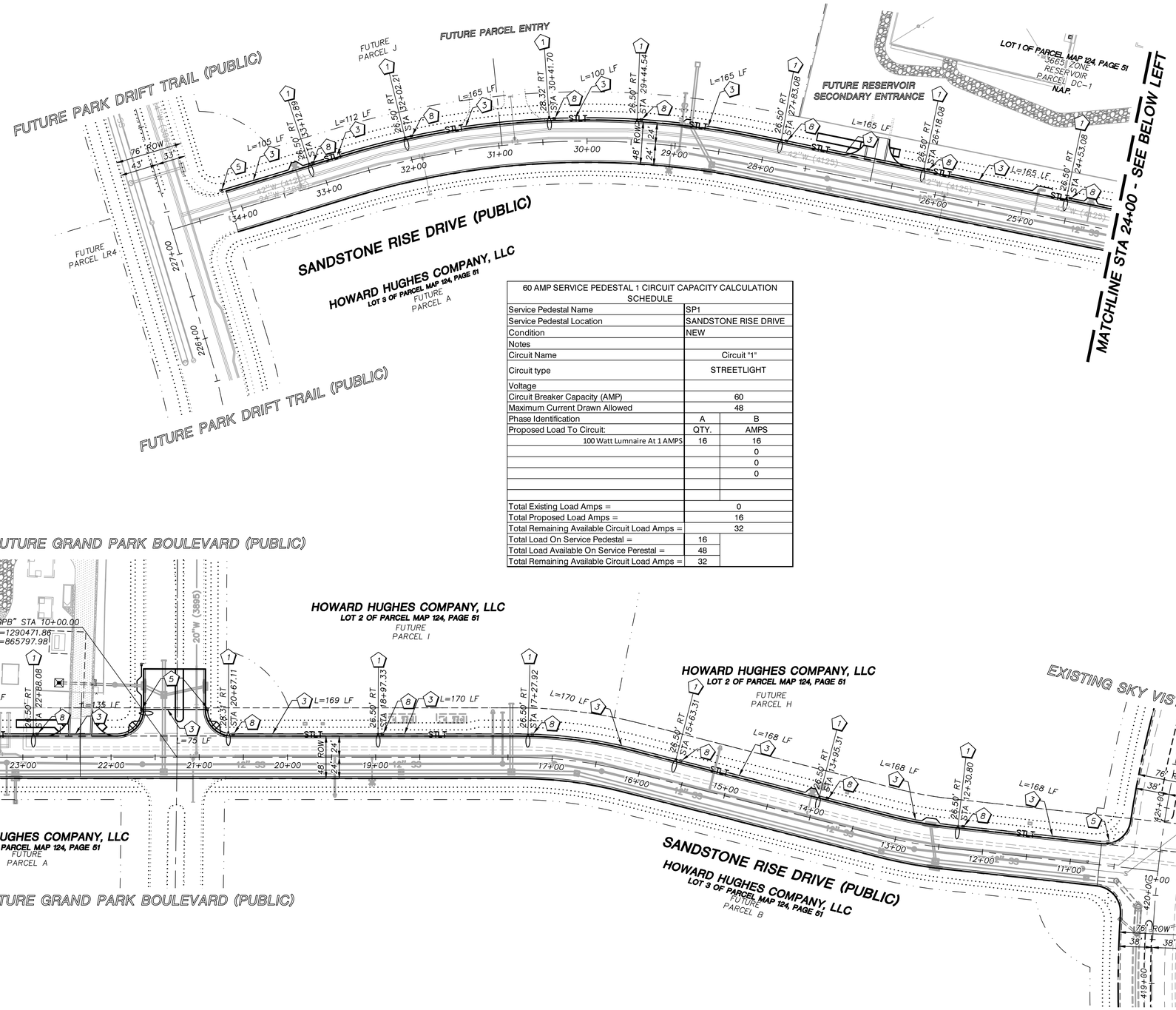
SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

WATER METER DETAILS

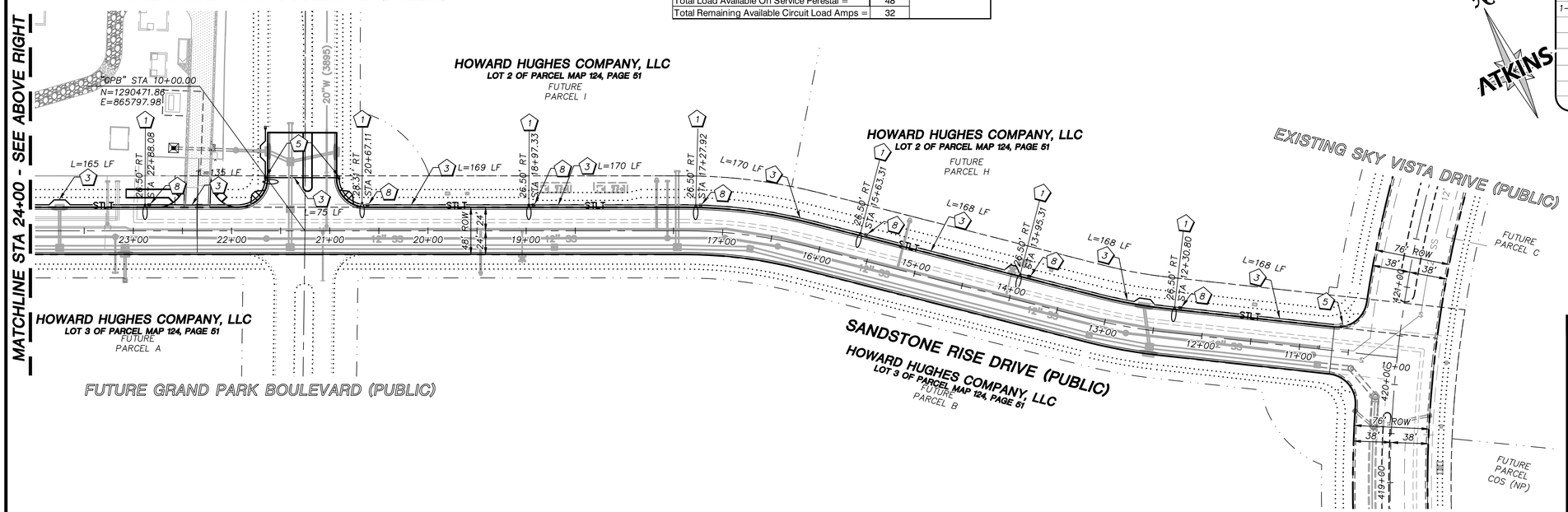
JOB NO. 100063656
DATE: NOVEMBER, 2019
DRAWING NO. 30/32

DESIGNED BY: G. BLAKE
DRAWN BY: G. BLAKE
CHECKED BY: CLV
HORIZ.: N.T.S.
VERT.: N.T.S.

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60 AMP SERVICE PEDESTAL 1 CIRCUIT CAPACITY CALCULATION SCHEDULE		
Service Pedestal Name	SP1	
Service Pedestal Location	SANDSTONE RISE DRIVE	
Condition	NEW	
Notes		
Circuit Name	Circuit "1"	
Circuit type	STREETLIGHT	
Voltage		
Circuit Breaker Capacity (AMP)	60	
Maximum Current Drawn Allowed	48	
Phase Identification	A	B
Proposed Load To Circuit:	QTY.	AMPS
100 Watt Lumnaire At 1 AMPS	16	16
		0
		0
		0
Total Existing Load Amps =	0	
Total Proposed Load Amps =	16	
Total Remaining Available Circuit Load Amps =	32	
Total Load On Service Pedestal =	16	
Total Load Available On Service Perestal =	48	
Total Remaining Available Circuit Load Amps =	32	



STREET LIGHTING CONSTRUCTION NOTES

1. INSTALL 100W SINGLE ARM TYPE 2 STREETLIGHT WITH METAL HALIDE LUMINAIRE PER SUMMERLIN STANDARD DRAWINGS ON SHEET (XX) AND PER NOTE, THIS SHEET. SEE DETAIL A, SHEET (XX) FOR TYPICAL LOCATION
2. INSTALL 100W DUAL ARM TYPE 2 STREETLIGHT WITH METAL HALIDE LUMINAIRE PER SUMMERLIN STANDARD DRAWINGS ON SHEET (XX) AND PER NOTE BELOW.
3. INSTALL 1–1/4" STREETLIGHT CONDUIT W/ 2–#4 AND 1–#8 PER CCAUSD #501
4. INSTALL NEW 200 AMP SERVICE PEDESTAL PER CCAUSD #332.S2, 331, 335.S2, 336, AND 730.
5. INSTALL NO. 3–1/2" PULL BOX PER CCAUSD #705
6. EXISTING STREETLIGHT TO BE REMOVED AND RELOCATED. REMOVE EXISTING FOUNDATION AND INSTALL STREETLIGHT ON NEW FOUNDATION PER CCAUSD #321. INSTALL NEW 2" OR 1–1/4" (TO MATCH EXISTING) CONDUIT AS NEEDED. REPULL WIRE AND CONNECT TO EXISTING CONDUIT WITHOUT SPLICING.
7. INSTALL TWO (2) 3" CONDUIT W/2–#4 AND 1–#8 PER CCAUSD #501
8. INSTALL NO. 7 PULL BOX PER CCAUSD #707
9. INSTALL 2–2" PVC CONDUIT, 2–3" PVC CONDUIT AND 1–3" LVACTS COMM. CONDUIT FOR TRAFFIC SIGNAL PER CCAUSD #889
10. INSTALL 2–2" PVC CONDUIT, 2–3" PVC CONDUIT AND 1–4" LVACTS COMM. CONDUIT FOR TRAFFIC SIGNAL PER CCAUSD #889
11. INSTALL NO. 7 PULLBOX FOR TRAFFIC SIGNAL PER CCAUSD #889
12. INSTALL 2–1/4" STREETLIGHT CONDUIT W/ 4–#4 AND 2–#8 PER CCAUSD #501
13. INSTALL 2–3" PVC CONDUIT FOR TRAFFIC SIGNAL PER CCAUSD #889

NOTE:

PER ZC–1020–07, A LIGHTING STUDY OF THE METAL HALIDE LUMINAIRES IS TO BE PROVIDED FOR REVIEW AND APPROVAL BY PUBLIC WORKS.

IF LED LUMINAIRES ARE DESIRED, A SIMILAR LIGHTING STUDY WILL BE REQUIRED.

THE DESIGN AND EQUIPMENT USED FOR THE STREET LIGHT SYSTEM WILL NEED TO BE MODIFIED UPON APPROVAL OF LIGHTING STUDY AND ITS RESULTS. PLAN REVISION WILL BE REQUIRED AT THAT TIME.

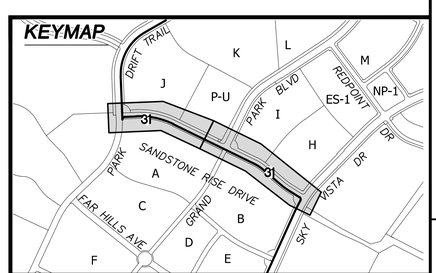
SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY	UNIT
STREETLIGHTING		
100W SINGLE ARM TYPE 2 STREETLIGHT	16	EA
1–1/4" STREETLIGHT CONDUIT	2772	LF

EX SKY VISTA DRIVE:

PER VILLAGE 25 SKY VISTA DRIVE IMPROVEMENTS BY GCW, INC CLV# 107V7884

KEYMAP



STREET LIGHTING NOTES

1. SEE SHEET D–8 FOR DETAILS & CCAUSD'S FOR STREETLIGHTING

GRAPHIC SCALE
60 0 30 60 120
HORIZONTAL: 1"= 60'

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

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FAST Call before you UnderGround 1-702-432-5300 NEVADA ONE-CALL SYSTEM OF UNDERGROUND FACILITIES

Call before you D g AVOID CUTTING UNDERGROUND UTILITY LINES & AVOID INJURY. Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

PROFESSIONAL ENGINEER – STATE OF NEVADA
ANTHONY J. ORTIZ
EXP. 12-31-21
CIVIL
No. 19949
11/18/2019

REVISIONS				
REV.	DESCRIPTION	BY	DATE	APPROVAL

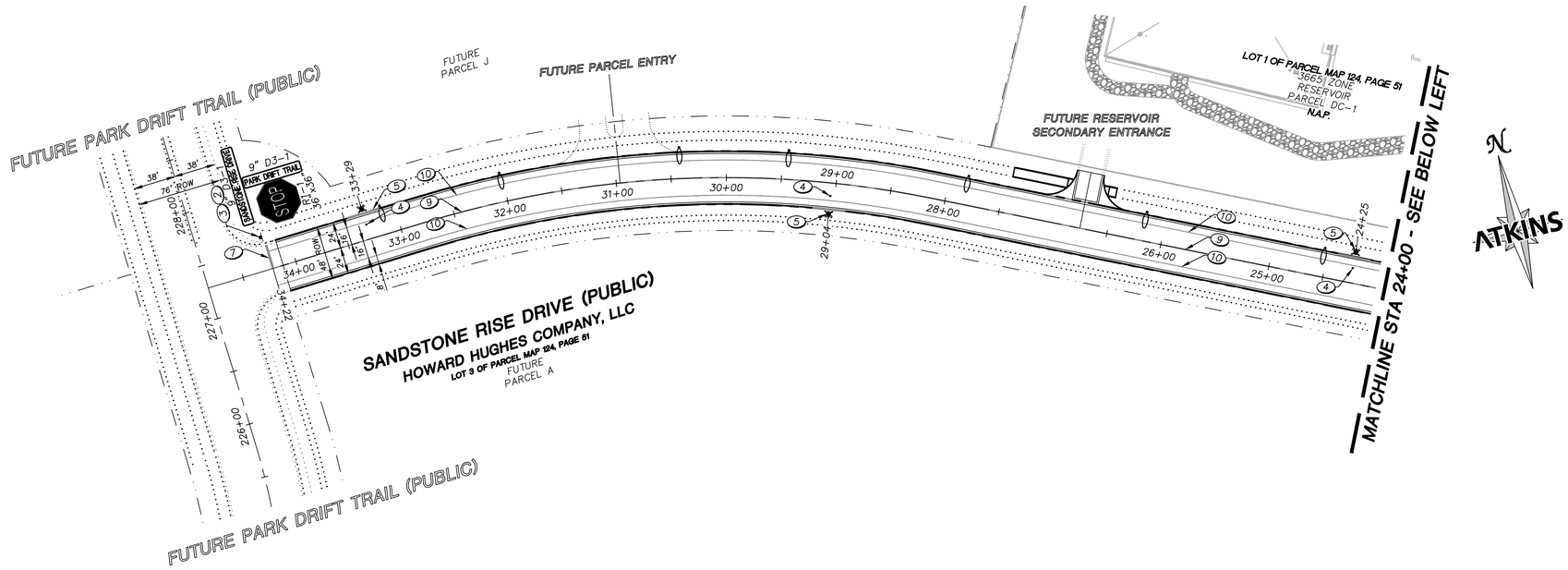
ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7375
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 25
SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)
STREETLIGHT PLAN

JOB NO. 100063656	DESIGNED BY: G. BLAKE	DRAWN BY: G. BLAKE	CHECKED BY: T. ORTIZ	HORIZ.: 1"=60' VERT.: NONE
DATE: NOVEMBER, 2019				
DRAWING NO.	31/32			
CLV				

X:\Projects\SummitWest\Village 25\100063656 – V25 Street M (Lake Mead to Sky Vista)_Sheets\63656–17–STLT–SLT.dwg LAYOUT: 31 Nov 18, 2019 – 8:42AM



STRIPING AND SIGNAGE CONSTRUCTION NOTES

1. INSTALL SIGN(S) ON STREETLIGHT POLE
2. INSTALL SIGN(S) ON POST PER CCAUSD #249.1
3. INSTALL STREET NAME SIGN (D3-1) PER CCAUSD #250 ON TOP OF STOP SIGN
4. INSTALL BLUE REFLECTIVE MARKER 8' FROM BACK OF CURB
5. PAINT CURB 15' EITHER DIRECTION OF FIRE HYDRANT (30' MINIMUM)
6. INSTALL MEDIAN NOSE MARKER PER CCAUSD #248 WITH R-71 AND TYPE C MARKING ALONG THE MEDIAN ISLAND PER DETAIL (XX).
7. INSTALL 24" SOLID WHITE LINE PER CCAUSD #254 (TYPE 2 PMF)
8. INSTALL STORAGE LANE LINE (RPM) PER CCAUSD #246
9. INSTALL TYPE I CENTERLINE (RPM) PER CCAUSD #244
10. INSTALL 6" SOLID WHITE LINE PER CCAUSD #244.9 (POLUREA LPM)
11. INSTALL 6"X2' SKIP LINE 8' ON CENTER PER CCAUSD #244.9 (POLUREA LPM)

SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY	UNIT
STREETLIGHTING		

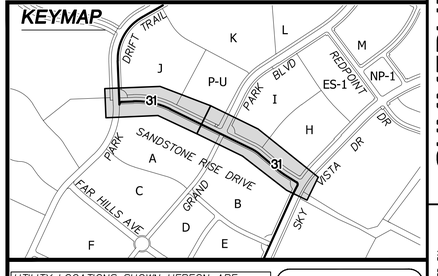
NOTE:
CONTRACTOR SHALL EXERCISE CARE WITH ALL SALVAGED ITEMS AND SHALL ASSUME THAT ITEMS SHALL BE RE-USED AGAIN BY CLARK COUNTY. ALL SALVAGED EQUIPMENT SHALL HAVE ALL COMPONENTS INCLUDED AND DISASSEMBLED FROM THEIR MAIN COMPONENTS. ANY ITEMS TO BE RETURNED TO CLARK COUNTY TRAFFIC OPERATIONS SHALL INCLUDE A TRANSMITTAL FORM WITH THE CONTRACTORS COMPANY LETTERHEAD. THE TRANSMITTAL FORM SHALL INCLUDE THE ASSOCIATED PROJECT NAME AND NUMBER AND A LIST OF ITEMS AND THE QUANTITIES OF ITEMS BEING RETURNED. CONTRACTOR SHALL CALL (702) 455-6000 TO MAKE AN APPOINTMENTS FOR DROPPING OFF SALVAGED ITEMS.

LEGEND

SIGHT VISIBILITY ZONES (SVZ) PER APPROVED TRAFFIC STUDY UPDATE HTE #TIA76065

EX SKY VISTA DRIVE:

PER
VILLAGE 25 SKY VISTA DRIVE IMPROVEMENTS
BY GCW, INC
CLV# 107V7884



GRAPHIC SCALE
60 0 30 60 120
HORIZONTAL: 1"= 60'

STREET LIGHTING NOTES

1. SEE SHEET D-8 FOR DETAILS & CCAUSD'S FOR STREETLIGHTING

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK:
D368 (REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS
(3,246.63 FEET)
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 (TWENTY-FOUR HOUR NATIONAL SYSTEM OF TRANSMISSION)

Call before you Dig AVOID CUTTING UNDERGROUND UTILITY LINES, ITS COSTLY! Call 811 or 1-800-642-2444

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SANDSTONE RISE DRIVE (STREET M)
SKY VISTA DRIVE TO PARK DRIFT TRAIL (STREET K)

TRAFFIC PLAN

JOB NO.	100063656
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DESIGNED BY: C. BLAKE
DRAWN BY: G. BLAKE
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HORIZ.: 1"=60'
VERT.: NONE
CLV

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