DS #: 5367

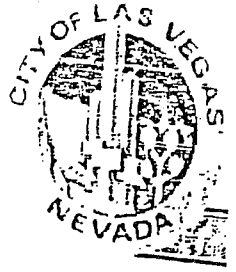
APN: 137-23-210-001

PROJECT: Summerlin West Village 22. Fleet Wing Avenue (Street A)

SUBMITTAL: 2nd

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: November 19, 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 22 - Fleet Wing Avenue (Street G)** **(Kettle Ridge Drive to Scurry Bend Drive)**			**COPIES TO:** Atkins Global
Cross Streets:	Kettle Bend Road and Sunset Run Drive		Howard Hughes Company, LLC.
File Number:	F:\Depot\DSMemos\DS5367B.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-23-210-001		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	9/22/2020 & 10/7/2020	10/13/2020	Not Approved	$400.00	3999164: $400
2nd Submittal Paid on 11/18/2020	10/29/2020 & 11/18/2020	11/19/2020	See Comments Below	$400.00	4072796: $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.

1. The subject project is based on the premise that the downstream *Kettle Ridge Drive* and *Kindle Rise Way* and the associated storm drain facilities are in place for flood flow perpetuation. The subject drainage study will not be finally approved prior to the posting of the construction bonds of the *Summerlin West Village 22 – Kettle Ridge Drive (Fleet Wing to Kindle Rise) and Kindle Rise Way (Kettle Ridge to Desert Foothill)* street improvements project.
2. The project proposed to construct temporary drainage facilities including drainage berms/ditches along both sides of the proposed roadway. Prior to the final plans 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 Flood Control* for approval. Once the drainage study is conditionally approved, the engineer/developer should contact the *City's Land Development Section* (702-229-6371) to begin the agreement process.

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

3. **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

4. Specify clearly all 2"-sacrificial concrete to have minimum strength of 6,000 psi on all pertinent plans & profiles.

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/23
AREA K-23

SNC·LAVALIN

ATKINS
Member of the SNC-Lavalin Group

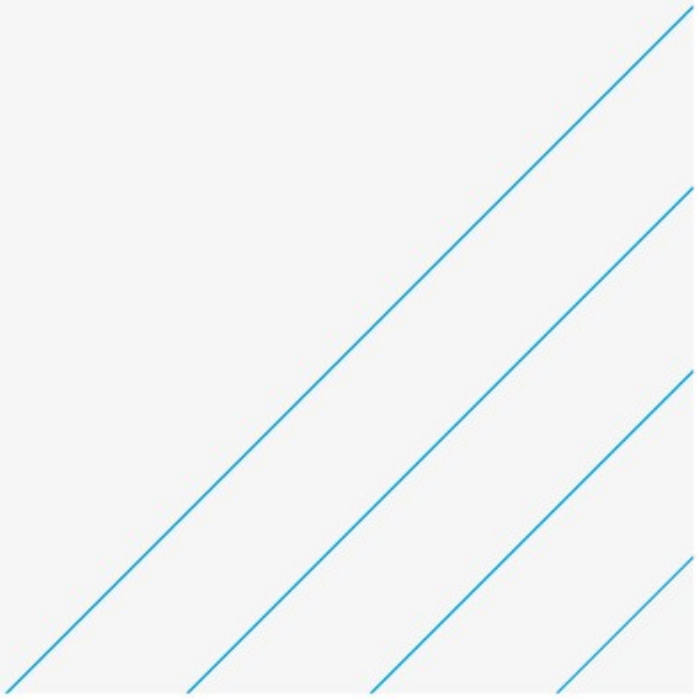
SUMMERLIN®

Summerlin West Village 22

Fleet Wing Avenue (Street G): Kettle Ridge Drive to Scurry Bend Drive

Prepared for Howard Hughes Company, LLC

October 2020



HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Fleet Wing Avenue (Street G): Kettle Bend Drive to Scurry Bend Drive Date: October 29, 2020

Location of Development: a) Descriptive (Cross Streets) North/South: Kettle Bend Road

East/West: Lake Mead Boulevard

b) Section: 23 Township: 20S Range: 59E

c) APN : 137-23-210-001

Name of Owner: Howard Hughes Company, LLC

Telephone No.: (702) 791-4000 Fax No.: (702) 791-4450 E-Mail Address: april.chapman@howardhughes.com

Address: 10845 Griffith Peak Drive, Suite 160, Las Vegas, NV 89135

Contact Person-Name: Janelle Klein, PE **Telephone No.:** (702) 551-0365

* **E-Mail Address:** janelle.klein@atkinsglobal.com **Fax No.:** (702) 263-7200

Firm: Atkins

Address: 2270 Corporate Circle, Ste 200, Henderson, NV 89074

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	X	Roadway Improvements

1. Total Owned Land Area: At Site: +/- 446 acres Being Developed/Disturbed: 3.56 acres
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ **Yes**** ✔ **No**
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? **Yes**** ✔ **No**
4. Proposed type of development (Residential, Commercial, Etc.): Public - Roadway Improvements
5. Approximate upstream land area which drains to the subject site:
6. Has the site drainage been evaluated in the past? ✔ **YES** **NO** If yes, please identify documentation: Update #2 to the Master Conceptual Drainage Study for Summerlin West Village 22
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Existing CC-215 Western Beltway Channel
8. Briefly describe your proposed schedule for the subject project: ASAP



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.**

CLV DS5367

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

Contents

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Appendix A.	**Comment Letter**	
Appendix B.	**Revised Hydrology**	
B.1	Interim Condition Hydrology Parameters	
B.2	Interim Conditions HEC-1 Model	
B.3	Updated Hydrology Workmap	
Appendix C.	**Revised Hydraulics**	
C.1.	Revised Hydraulics Workmap	
C.2.	Revised WSPG-W Models	
Appendix D.	**Referenced Report**	
Appendix E.	**CD-ROM**	

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 **Addendum #1 to the Technical Drainage Study for Fleet Wing Avenue (Street G): Kettle Ridge Drive to Scurry Bend Drive** electronic submittal matches the paper version bound into the study.

_____

Janelle L. Klein, PE (NV #17313)

Senior Engineer

Comment Response Letter

Your reference: DS #5367

Albert Sung
City of Las Vegas Public Works
333 N. Rancho Dr, 7th Floor
Las Vegas, NV 89106

October 29, 2020

RE: ADDENDUM #1 TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 22 FLEET WING AVENUE (STREET G): KETTLE RIDGE DRIVE TO SCURRY BEND DRIVE

Dear Albert,

This letter and the attached documents have been prepared as an Addendum #1 to the *Technical Drainage Study (TDS) for Summerlin West Village 22 Fleet Wing Avenue (Street G): Kettle Ridge Drive to Scurry Bend Drive.*

Comment #1: The subject project is based on the premise that the downstream *Kettle Ridge Drive and Kindle Rise Way* and the associated storm drain facilities are in place for downstream flood perpetuation. The subject drainage study will not be approved prior to the posting of the construction bonds of Summerlin West Village 22 - *Kettle Ridge Drive (Fleet Wing to Kindle Rise) and Kindle Rise Way (Kettle Ridge to Desert Foothills)* street improvements project.

Comment response: Understood.

Comment #2: The project proposes to build temporary drainage facilities including berms/ditches along both sides of *the proposed roadway*. 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 facility and an exhibit that adequately shows the location and limits of the drainage facility 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* (702-229-6371) to begin the agreement process.

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

Comment response: Once this drainage study is conditionally approved, the report will be submitted to the Land Development Section to begin the agreement process.

Comment #3: The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.

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

Comment response: This report will be submitted to CCRFCD for concurrence.

Comment #4: Figure 3: Interim Hydrology Workmap: The basins listed in the tables are not shown on the Exhibit. For example, there is a basin STN1 shown on the exhibit, but StN1-a and StN1-b are shown in the table

Comment response: The exhibit has been updated with the interim basins and basin labels. The Interim Condition basins (STN1 & STN2) are referenced from the Scurry Bend Drive Rough Grade, the Ultimate Condition basins (STN1a, STN1b, STN2a, STN2b, & STN2c) are calculated in this report based on the Scurry Bend Drive Improvement plans provided in Appendix D.

Comment #5: Figure 3: Interim Hydrology Workmap: The Interim and Ultimate Conditions appear to have different basins however there is no differentiation shown on the exhibit. Create separate exhibits or show different line type for interim and ultimate conditions.

Comment response: The exhibit has been updated with the interim basins.

Comment #6: Figure 3: Interim Hydrology Workmap: Basins F and L-M are not shown on the Exhibit.

Comment response: Parcels F and LM do not drain to this section of the proposed Fleet Wing Avenue improvements. The parcels are labeled on the Workmap provided with this submittal.

Comment #7: Figure 4: Hydraulics Workmap: Section 3 for the 100-year Ultimate Condition states that it collects from StG-2 + StG-3 + bypass from SDDI#1 & SDDI#2, this flow totals to 7.51 cfs, not 7.40 cfs.

Comment response: The FlowMaster calculations and summary tables have been updated in this submittal.

Comment #8: Table 6 of Chapter 2.3 (Storm Drain System Modeling) showed that downstream of SDMH#4, the flow velocities are more than 25 ft/s in both the 100-year Interim and Ultimate Conditions. Besides using higher strength concrete pipes and sacrificial concrete, address what other means have been explored, such as using a larger pipe diameter pipe or drop structure manholes to reduce pipe slope, ie, resulting in lower velocity.

Comment response: The design of the proposed storm drain was constrained by the existing downstream and upstream connections as well as the proposed street grade and other proposed utilities. The system was evaluated using larger sized pipes to reduce velocities and with alternating shallow and steep slopes; however, the larger size and alternate slopes did not decrease the velocity sufficiently to eliminate the need for higher strength and sacrificial material. It has been our understanding that drop structure manholes are the less preferred alternative within the City of Las Vegas.

Comment #9: The new villages in Summerlin have 0 cfs enter into intersections, therefore any bypass flow entering into intersections should be collected by the proposed inlets. None of the flow from FWA-2 or FWA-3 or bypass from SDDI#2 and SDDI#1 is collected before the intersection of Fleet Wing Avenue and Kettle Ridge Drive.

Comment response: The bypass flow from SDDI#1 and SDDI#2 are each less than 1 cfs. The flows from FWA-2 and FWA-3 are collected in the drop inlets shown on the Kettle Ridge Drive plans (CLV L19-02315, DS5349). A copy of the Hydraulic Workmap from the Technical Drainage Study for Kettle Ridge Drive is provided with this submittal.

Comment #10: The only proposed inlet on the south side of the road is SDDI#2. The next inlet in the intersection exceeds the maximum distance of 600'. Additional inlets are required on the south side of the road to address this.

Comment response: An additional inlet has been added to the south side of the road and the hydrology and hydraulic calculations have been revised accordingly.

Comment #11: The HGLs shown in Storm Drain Lateral 2 do not match the WSPG and the lines shown do not meet the minimum requirement of 1' below the proposed surface. Review and revised accordingly.

Comment response: The WSPG and HGLs shown in Storm Drain Lateral 2 have been revised.

The revised Hydrology and Hydraulics are included with this submittal, the revised summary tables follow this response letter.

_____
Janelle L. Klein, PE (NV #17313)
Senior Engineer

Table 1 – Interim Condition HEC-1 Model Results

Basin ID	Tributary Area (sq mi)	Tributary Area (ac)	100-year Flow (cfs)	10-year Flow (cfs)
OFF-1*	0.06690	42.82	122	-
25-HS1*	0.07542	48.27	144	63
StN-1*	0.00571	3.66	11	-
StN-2*	0.00687	4.39	10	-
CFWA-W	StN-2 + SBD-N		287	-
FWA-1	0.00066	0.42	2	1
FWA-2	0.00052	0.34	1	1
CFWA-C	FWA-1 + FWA-2 + CFWA-W		290	-
FWA-3	0.00116	0.74	3	2
FWA-4	0.00143	0.91	4	2
CFWA-E	FWA-3 + FWA-4 + CFWA-C		297	-

**Referenced from Scurry Bend Drive Rough Grade Drainage Study*

- No flow given in referenced study

Table 2 – Ultimate Condition HEC-1 Model Results

Basin ID	Tributary Area (sq mi)	Tributary Area (ac)	100-year Flow (cfs)	10-year Flow (cfs)
OFF-1*	0.06690	42.82	122	-
25-HS1*	0.07542	48.27	144	63
StN-1a	0.00269	1.72	8	4
SBD-N	StN-1a + 25-HS1*		274	
StN-1b	0.00271	1.74	8	4
StN-2b	0.00252	1.62	7	4
StN-2c	0.00146	0.94	4	2
CFWA-W	StN-1b + StN-2b + StN-2c + SBD-N		293	
FWA-1	0.00066	0.42	2	1
FWA-2	0.00052	0.34	1	1
CFWA-C	FWA-1 + FWA-2 + CFWA-W		296	
FWA-3	0.00116	0.74	3	2
FWA-4	0.00143	0.91	4	2
CFWA-E	FWA-3 + FWA-4 + CFWA-C		303	

**Referenced from Scurry Bend Drive Rough Grade Drainage Study*

- No flow given in referenced study

Table 2 – Drop Inlet Calculations

ID	Station (ft)	Total Flow (cfs)	Discharge Source (Controlling Flow Condition)	Intercepted Flow (cfs)	Bypass Flow (cfs)
Interim 100-year					
SDDI #1	34+90	4.51	FWA-1 + Bypass SDDI#4	3.65	0.86
SDDI #2	34+90	3.07	FWA-2 + Bypass SDDI#3	2.75	0.32
SDDI #3	38+00	10	StN-2	7.93	2.07
SDDI #4	38+00	11	StN-1	8.49	2.51
Ultimate 100-year					
SDDI #1	34+90	3.25	FWA-1 + Bypass SDDI#4	2.87	0.38
SDDI #2	34+90	1.13	FWA-2 + Bypass SDDI#3	1.13	0
SDDI #3	38+00	4	StN-2c	3.87	0.13
SDDI #4	38+00	8	StN-1b	6.75	1.25

Table 3 – Normal Depth Calculations

ID	Total Flow (cfs)	Discharge Source	Slope (%)	Flow Depth (ft)	Velocity (ft/s)	D* V
Interim 100-year						
STG-1	21	StN-1 + StN-2	~4.0	0.39	5.43	2.12
STG-2	7.58	FWA-1 & FWA-2 + bypass from SDDI#3 & SDDI#4	7.86	0.23	5.52	1.27
STG-3	8.18	FWA-3 + FWA-4 + bypass from SDDI#1 & SDDI#2	~4.0	0.30	4.37	1.31
100-year Ultimate Condition						
STG-1	12	StN-1b + StN-2c	~4.0	0.33	4.76	1.57
STG-2	4.38	FWA-1 & FWA-2 + bypass from SDDI#3 & SDDI#4	7.86	0.20	4.90	0.98
STG-3	7.38	FWA-3 + FWA-4 + bypass from SDDI#1 & SDDI#2	~4.0	0.29	4.27	1.24

~Approximate slope calculated in the vertical curve

Table 4 – WSPG-W Mainline Summary Table

SDMH#	WSPG-W Station	Q_{100}	$\sum Q_{100}$	HGL (Ft)	Velocity (ft/sec)
100-Interim Condition					
#1	154.19	0	166.82	3418.570	30.49
#2	516.52	0	166.82	3446.740	29.78
#3	658.64	6.40	160.42	3458.517	28.89
#4	774.19	0	160.42	3467.682	26.70
#5	1000.98	16.47	144.00	3485.993	11.46
100-Ultimate Condition					
#1	154.19	0	239.62	3419.185	33.37
#2	516.52	0	239.62	3447.373	32.68
#3	658.64	4.00	235.62	3459.013	31.29
#4	774.19	0	235.62	3468.217	28.96
#5	1000.98	10.62	225.00	3486.229	17.90

Appendices

Appendix A. Comment Letter

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: October 13, 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 22 - Fleet Wing Avenue (Street G) (Kettle Ridge Drive to Scurry Bend Drive)**			**COPIES TO:** Atkins Global
Cross Streets:	Kettle Bend Road and Sunset Run Drive			Howard Hughes Company, LLC.
File Number:	F:\Depot\DSMemos\DS5367A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	137-23-210-001			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	9/22/2020 & 10/7/2020	10/13/2020	See Comments Below	$400.00	3999164: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

REMARKS:

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

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

1. The subject project is based on the premise that the downstream *Kettle Ridge Drive* and *Kindle Rise Way* and the associated storm drain facilities are in place for flood flow perpetuation. The subject drainage study will not be finally approved prior to the posting of the construction bonds of the *Summerlin West Village 22 – Kettle Ridge Drive (Fleet Wing to Kindle Rise) and Kindle Rise Way (Kettle Ridge to Desert Foothill)* street improvements project.
2. The project proposed to construct temporary drainage facilities including drainage berms/ditches along both sides of the proposed roadway. Prior to the final plans 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 Flood Control* for approval. Once the drainage study is conditionally approved, the engineer/developer should contact the *City's Land Development Section* (702-229-6371) to begin the agreement process.

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

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

   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

4. **Figure 3: Interim Hydrology Workmap:** The basins listed in the tables are not shown on the Exhibit. For example, there is a basin STN1 shown on the exhibit, but StN-1a and StN-1b are shown in the table.
5. **Figure 3: Interim Hydrology Workmap:** The Interim and Ultimate Conditions appear to have different basins however there is no differentiation shown on the exhibit. Create separate exhibits or show different line type for interim and ultimate conditions.
6. **Figure 3: Interim Hydrology Workmap:** Basins F and L-M are not shown on the Exhibit.
7. **Figure 4: Hydraulics Work Map:** Section 3 for the 100-YR Ultimate Condition states that it collects from StG-2 + StG-3+bypass from SDDI#1 & SDDI#2, this flow totals to 7.51 cfs, not 7.40 cfs.
8. **Table 6 of Chapter 2.3 (Storm Drain System Modeling)** showed that downstream of SDMH #4, the flow velocities are more than 25 ft/s in both 100-year Interim and Ultimate Conditions. Besides using higher strength concrete pipe and sacrificial concrete, address what other means have been explored, such as using larger diameter pipe or drop structure manholes to reduce the pipe slope, ie, resulting in lower velocity.
9. The new villages in Summerlin have 0 cfs enter into intersections, therefore there any bypass flow entering into intersections should be collected by the proposed inlets. None of the flow from FWA-2 or FWA-3 or bypass from SDDI#2 and SDDI#1 is collected before the intersection of Fleet Wing Avenue and Kettle Ridge Drive.
10. The only proposed inlet on the south side of the road is SDDI#2. The next inlet in the intersection exceeds the maximum distance of 600'. Additional inlets are required on the south side of the road to address this.
11. The HGLs shown on *Storm Drain Lateral 2* do not match the WSPG and the lines shown do not meet the minimum requirement of 1' below the proposed surface. Review and revise accordingly.

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/23
AREA K-23

Appendix B. Revised Hydrology

B.1 Interim Condition Hydrology Parameters

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL
TIME OF CONCENTRATION
TDS for Summerlin Village 22 West

ATKINS
Member of the SNC-Lavalin Group

Fleet Wing Avenue (Street G)
Kettle Ridge Drive (Street J) to Scurry Bend Drive (Street N)

BY: JLK
DATE: 10/23/2020

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
StN-1a	D	98.0	0.904	1.72	0.00269	30	2.0	1.5	584	2.3	3.0	4.6	3.0	4.6	13.4	**0.05***
StN-1b	D	98.0	0.904	1.74	0.00271	30	2.0	1.5	595	2.3	3.0	4.6	3.1	4.6	13.5	**0.05***
StN-2b	D	98.0	0.904	1.62	0.00252	30	2.0	1.5	555	3.2	3.6	5.5	2.5	4.0	13.3	**0.05***
StN-2c	D	98.0	0.904	0.94	0.00146	30	2.0	1.5	315	3.2	3.6	5.5	1.5	3.0	11.9	**0.05***
FWA-1	D	98.0	0.904	0.42	0.00066	19	2.0	1.2	365	7.8	5.6	8.5	1.1	2.3	12.1	**0.05***
FWA-2	D	98.0	0.904	0.34	0.00052	19	2.0	1.2	361	7.8	5.6	8.5	1.1	2.3	12.1	**0.05***
FWA-3	D	98.0	0.904	0.74	0.00116	19	2.0	1.2	621	7.8	5.6	8.5	1.7	2.9	13.6	**0.05***
FWA-4	D	98.0	0.904	0.91	0.00143	19	2.0	1.2	625	7.8	5.6	8.5	1.7	2.9	13.6	**0.05***

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.

V1 = 14.8*(S/100)^1/2 Developed V1 = 20.2*(S/100)^1/2
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 Interim Conditions HEC-1 Model

```
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *             JUN  1998                *
 *           VERSION 4.1                *
 *                                      *
 *  RUN DATE   26OCT20  TIME  11:18:50  *
 *                                      *
 ****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (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  TECHNICAL DRAINAGE STUDY
             2          ID  SUMMERLIN VILLAGE 22 NORTH
             3          ID  FLEET WING AVENUE (STREET G): KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRI
             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-year       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   STN2B
            18          KO       1
            19          BA 0.00252
            20          PB    3.44
            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    98.0
            30          UD   0.050
                        *

            31          KK   STN2C
            32          BA 0.00146
            33          PB    3.44
            34          LS       0    98.0
            35          UD   0.050
                        *

            36          KK  25-HS1
            37          BA 0.07542
            38          PB    3.44
            39          LS       0    87.5
            40          UD   0.100
                        *
```



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

            41          KK   STN1A
            42          BA 0.00269
            43          PB    3.44
            44          LS       0    98.0
            45          UD   0.050
                        *

            46          KK   SBD-N
            47          KO       1
            48          HC       2
                        *

            49          KK   STN1B
            50          BA 0.00271
            51          PB    3.44
            52          LS       0    98.0
            53          UD   0.050
                        *

            54          KK  CFWA-W
            55          KO       1
            56          HC       4
                        *

            57          KK   FWA-1
            58          BA 0.00066
            59          PB    3.43
            60          LS       0    98.0
```

```
             61           UD   0.050
                          *

             62           KK   FWA-2
             63           BA 0.00052
             64           PB    3.43
             65           LS       0    98.0
             66           UD   0.050
                          *

             67           KK  CFWA-C
             68           KO       1
             69           HC       3
                          *

             70           KK   FWA-3
             71           BA 0.00116
             72           PB    3.43
             73           LS       0    98.0
             74           UD   0.050
                          *
1                                          HEC-1 INPUT                                                PAGE  3

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

             75           KK   FWA-4
             76           BA 0.00143
             77           PB    3.43
             78           LS       0    98.0
             79           UD   0.050
                          *

             80           KK  CFWA-E
             81           KO       1
             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       STN2B
                  .
                  .
    31            .       STN2C
                  .           .
                  .           .
    36            .           .      25-HS1
                  .           .           .
                  .           .           .
    41            .           .           .       STN1A
                  .           .           .           .
                  .           .           .           .
    46            .           .       SBD-N............
                  .           .           .
                  .           .           .
    49            .           .           .       STN1B
                  .           .           .           .
                  .           .           .           .
    54      CFWA-W.....................................
                  .
                  .
    57            .       FWA-1
                  .           .
                  .           .
    62            .           .       FWA-2
                  .           .           .
                  .           .           .
    67      CFWA-C.......................
                  .
                  .
    70            .       FWA-3
                  .           .
                  .           .
    75            .           .       FWA-4
                  .           .           .
                  .           .           .
    80      CFWA-E.......................

 (***) 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            *
*                                       *                                  *       DAVIS, CALIFORNIA 95616         *
*  RUN DATE   26OCT20  TIME  11:18:50   *                                  *           (916) 756-1104              *
*                                       *                                  *                                       *
*****************************************                                  *****************************************



                          TECHNICAL DRAINAGE STUDY
                          SUMMERLIN VILLAGE 22 NORTH
                          FLEET WING AVENUE (STREET G): KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRI
                          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-year       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

					RATIOS APPLIED TO PRECIPITATION	
OPERATION	STATION	AREA	PLAN		RATIO 1 .99	RATIO 2 .57
HYDROGRAPH AT						
+	STN2B	.00	1	FLOW	7.	4.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	STN2C	.00	1	FLOW	4.	2.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	25-HS1	.08	1	FLOW	144.	63.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	STN1A	.00	1	FLOW	8.	4.
				TIME	3.50	3.50
2 COMBINED AT						
+	SBD-N	.08	1	FLOW	152.	67.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	STN1B	.00	1	FLOW	8.	4.
				TIME	3.50	3.50
4 COMBINED AT						
+	CFWA-W	.08	1	FLOW	171.	78.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	FWA-1	.00	1	FLOW	2.	1.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	FWA-2	.00	1	FLOW	1.	1.
				TIME	3.50	3.50
3 COMBINED AT						
+	CFWA-C	.09	1	FLOW	174.	80.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	FWA-3	.00	1	FLOW	3.	2.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	FWA-4	.00	1	FLOW	4.	2.
				TIME	3.50	3.50
3 COMBINED AT						
+	CFWA-E	.09	1	FLOW	182.	84.
				TIME	3.50	3.50

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

B.3 Updated Hydrology Workmap

Ultimate Condition			
HEC-1 Node	Tributary Area (sq mi)	Tributary Area (acres)	100-Year Discharge (cfs)
OFF-1*	0.06690	42.82	122
25-HS1*	0.07542	48.27	144
STN-1a	0.00269	1.72	8
SBD-N	StN-1a + 25-HS1*		274
StN-1b	0.00271	1.74	8
StN-2b	0.00252	1.62	7
StN-2c	0.00146	0.94	4
CFWA-W	StN-1b + StN-2b + StN-2c + SBD-N		293
FWA-1	0.00066	0.42	2
FWA-2	0.00052	0.34	1
CFWA-C	FWA-1 + FWA-2 + CFWA-W		296
FWA-3	0.00116	0.74	3
FWA-4	0.00143	0.91	4
CFWA-E	FWA-3 + FWA-4 + CFWA-C		303

*Referenced from Scurry Bend Rough Grade Drainage Study

Interim Condition			
HEC-1 Node	Tributary Area (sq mi)	Tributary Area (acres)	100-Year Discharge (cfs)
OFF-1*	0.06690	42.82	122
25-HS1*	0.07542	48.27	144
STN-1*	0.00571	3.66	11
StN-2*	0.00687	4.39	10
CFWA-W	OFFSITE		287
FWA-1	0.00066	0.42	2
FWA-2	0.00052	0.34	1
CFWA-C	FWA-1 + FWA-2 + CFWA-W		290
FWA-3	0.00116	0.74	3
FWA-4	0.00143	0.91	4
CFWA-E	FWA-3 + FWA-4 + CFWA-C		297

*Referenced from Scurry Bend Rough Grade Drainage Study

OFF-1
Lake Mead Blvd (Future)
STN1
25-HS1
Fleet Wing Avenue
FWA-1
FWA-2
FWA-4
FWA-3
Kettle Ridge Drive
Scurry Bend Drive
25-HS1B
STN2
Flight Range Avenue
Sunset Run Drive
3600
3500
3550
3450

TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 22
FLEET WING AVE. (STREET G)
SCURRY BEND DRIVE TO KETTLE RIDGE DRIVE (STREET J)
FIGURE 3: INTERIM HYDROLOGY WORKMAP

0 200 400
Feet
1 inch = 200 feet

Legend

- Existing KRD Storm Drain
- Proposed FWA Storm Drain
- FleetWingBasins
- Proposed Fleet Wing Avenue
- Interim Flow Direction
- Interim Condition Subbasin
- Ultimate Condition Parcels
- 10-ft Contours
- 50-ft Contours

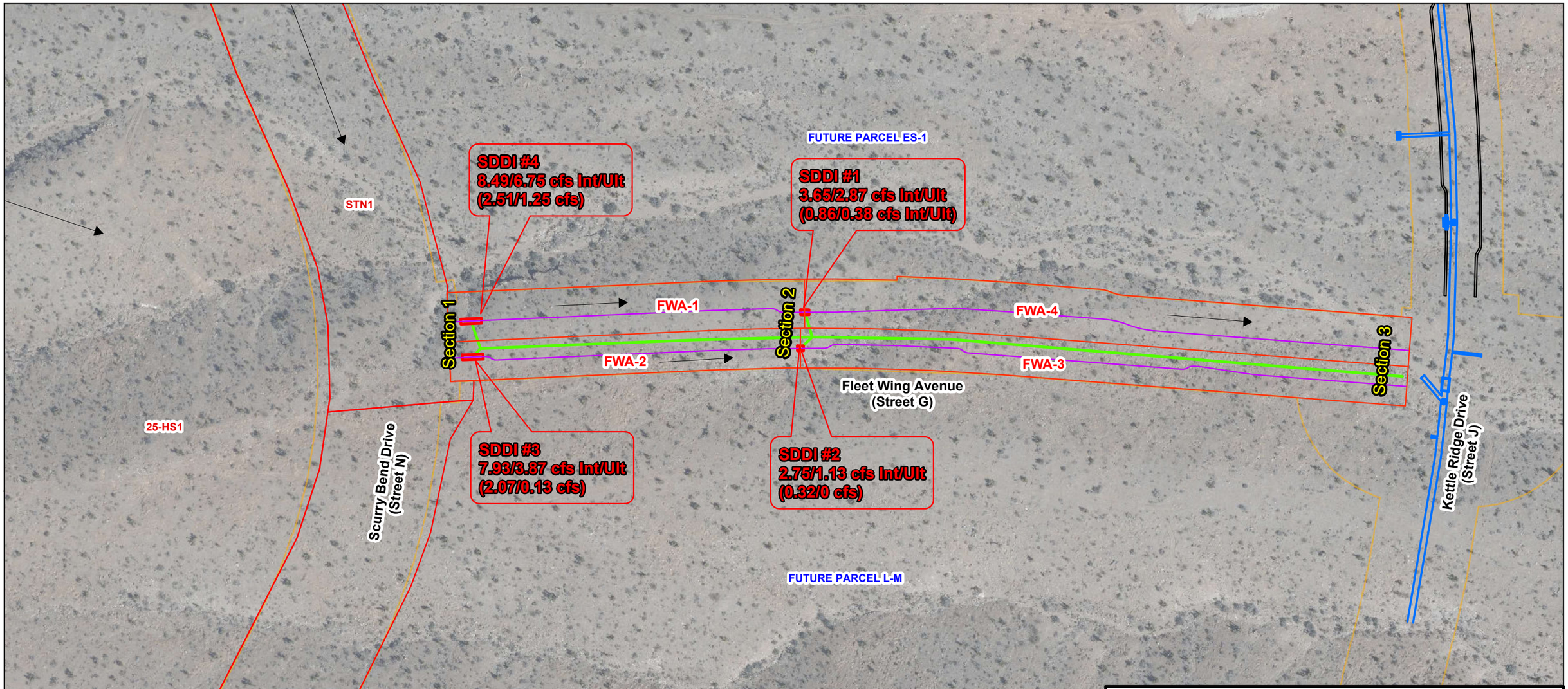
N

ATKINS
Member of the SNC-Lavalin Group

Aerial Source: Clark County Spring 2018

Appendix C. Revised Hydraulics

C.1. Revised Hydraulics Workmap



Drop Inlet Calculations (100-YEAR)

Drop Inlet	Plan Station	Total Discharge (CFS)	Discharge Source	Drop Inlet Type	Intercepted Flow (CFS)	Bypass Flow (CFS)
Interim 100-yer						
SDDI#1	34+90	4.51	FWA-1 + Bypass SDDI#4	CM2, L=7.5'	3.65	0.86
SDDI#2	34+90	3.07	FWA-2 + Bypass SDDI#3	CM2, L=5'	2.75	0.32
SDDI#3	38+00	10	StN-2	CM2, L=15'	7.93	2.07
SDDI#4	38+00	11	StN-1	CM2, L=15'	8.49	2.51
Ultimate 100-year						
SDDI#1	34+90	3.25	FWA-1 + Bypass SDDI#4	CM2, L=7.5'	2.87	0.38
SDDI#2	34+90	1.13	FWA-2 + Bypass SDDI#3	CM2, L=5'	1.13	0
SDDI#3	38+00	4	StN-2c	CM2, L=15'	3.87	0.13
SDDI#4	38+00	8	StN-1b	CM2, L=15'	6.75	1.25

Normal Depth Calculation Summary Table

Section ID	Plan Station	Total Discharge (CFS)	Discharge Source	Flow Depth (FT)	Flow Velocity (FPS)	Depth * Velocity
Interim 100-yer						
STG-1	38+50	21	STN1+STN2	0.39	5.43	2.12
STG-2	35+00	7.58	FWA1+FWA2+bypass SDDI#3 & SDDI#4	0.23	5.52	1.27
STG-3	28+70	8.18	FWA3+FWA4+bypass SDDI#1 & SDDI#2	0.30	4.37	1.31
Ultimate 100-year						
STG-1	38+50	12	STN1b+STN2c	0.33	4.76	1.57
STG-2	35+00	4.38	FWA1+FWA2+bypass SDDI#3 & SDDI#4	0.20	4.90	0.98
STG-3	28+70	7.38	FWA3+FWA4+bypass SDDI#1 & SDDI#2	0.29	4.27	1.24

TECHNICAL DRAINAGE STUDY FOR SUMMERLIN VILLAGE 22
FLEET WING AVE. (STREET G)
SCURRY BEND DRIVE TO KETTLE RIDGE DRIVE (STREET J)
FIGURE 4: HYDRAULICS WORKMAP

Fleet Wing Ave (FWA) Basins
Proposed FWA Roadway
FWA Drop Inlets
FWA Storm Drain
Existing Storm Drain
Flow Paths
Existing Roadways
Ultimate Condition Parcels
Intercepted Flow (Bypass Flow)

N

1 inch = 100 feet

ATKINS
Member of the SNC-Lavalin Group

Aerial Source: Clark County Spring 2018

0 50 100 200 300 400 Feet

C.2. Revised WSPG-W Models

```
T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 FLEET WING AVENUE (KETTLE RIDGE DRIVE TO SCURRY BEND DRIVE)
T3 100-YEAR INTERIM CONTDITION
SO       .0003405.720  1                          3406.715
REM*****CONNECTON TO KETTLE RIDGE DRIVE MAINLINE 6'X10' RCB
R      26.9003410.630  1      .013                                  .000 -13.655 0
R      27.9003410.746  1      .013                                  .000 -13.500 0
R      29.9003410.862  1      .013                                  .000 -13.500 0
R      31.9003410.920  1      .013                                  .000    .000 1
REM*****FLEET WING DRIVE (DFD-KRD) SDMH#8
R      48.5003411.840  1      .013                                  .000    .000 0
REM*****POINT OF CONNECTION TO STUB
R     148.1903416.760  1      .013                                  .000    .000 0
R     154.1903416.960  1      .013                                  .000    .000 1
REM*****FLEET WING AVENUE SDMH#1
R     511.5203444.910  1      .013                                  .000  -3.709 0
R     516.5203445.110  1      .013                                  .000    .000 1
REM*****FLEET WING AVENUE SDMH#2
R     653.6403456.500  1      .013                                  .000    .000 0
JX    656.1403456.600  1  2  2.013    3.65     2.75 3456.70 3456.70  72.7-45.2    .000
REM*****FLEET WING AVENUE SDDI#1 & SDDI#2
R     658.6403456.700  1      .013                                  .000  -2.413 1
REM*****FLEET WING AVENUE SDMH#3
R     769.1903465.550  1      .013                                  .000    .000 0
R     774.1903465.750  1      .013                                  .000    .843 1
REM*****FLEET WING AVENUE SDMH#4
R     995.9803480.950  1      .013                                  .000    .000 0
JX    998.4803481.050  1  2  2.013    8.49     7.93 3481.15 3481.15  72.1-45.2    .000
REM*****FLEET WING AVENUE SDDI#3 & SDDI#4
R    1000.9803481.150  1      .013                                  .000    .000 1
REM*****FLEET WING AVENUE SDMH#5
SH   1000.9803481.150  1                          3481.150
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
Q           144.000   .0
```

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

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-27-2020 Time:10:26:35

SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (KETTLE RIDGE DRIVE TO SCURRY BEND DRIVE)
100-YEAR INTERIM CONTDITION

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	3405.720	1.765	3407.485	166.82	31.21	15.13	3422.61	.00	3.71	3.97	4.000	.000	.00	1 .0
5.694	.1825					.0811	.46	1.76	4.74	1.42	.013	.00	.00	PIPE
5.694	3406.759	1.792	3408.552	166.82	30.59	14.53	3423.08	.00	3.71	3.98	4.000	.000	.00	1 .0
11.569	.1825					.0741	.86	1.79	4.60	1.42	.013	.00	.00	PIPE
17.263	3408.871	1.859	3410.730	166.82	29.16	13.21	3423.94	.00	3.71	3.99	4.000	.000	.00	1 .0
9.637	.1825					.0652	.63	1.86	4.29	1.42	.013	.00	.00	PIPE
26.900	3410.630	1.929	3412.559	166.82	27.81	12.01	3424.56	.00	3.71	4.00	4.000	.000	.00	1 .0
1.000	.1162					.0608	.06	1.93	4.00	1.61	.013	.00	.00	PIPE
27.900	3410.746	1.933	3412.679	166.82	27.74	11.95	3424.63	.00	3.71	4.00	4.000	.000	.00	1 .0
2.000	.0580					.0607	.12	1.93	3.99	1.96	.013	.00	.00	PIPE
29.900	3410.862	1.932	3412.794	166.82	27.75	11.96	3424.75	.00	3.71	4.00	4.000	.000	.00	1 .0
2.000	.0289					.0610	.12	1.93	3.99	2.43	.013	.00	.00	PIPE
31.900	3410.920	1.928	3412.848	166.82	27.83	12.03	3424.88	.00	3.71	4.00	4.000	.000	.00	1 .0
16.600	.0554					.0616	1.02	1.93	4.01	1.98	.013	.00	.00	PIPE
48.500	3411.840	1.921	3413.761	166.82	27.96	12.14	3425.90	.00	3.71	4.00	4.000	.000	.00	1 .0
44.854	.0494					.0645	2.89	1.92	4.03	2.05	.013	.00	.00	PIPE
93.354	3414.054	1.878	3415.932	166.82	28.78	12.87	3428.80	.00	3.71	3.99	4.000	.000	.00	1 .0
54.836	.0494					.0716	3.93	1.88	4.21	2.05	.013	.00	.00	PIPE

FILE: FWW-INT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-27-2020 Time:10:26:35

SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (KETTLE RIDGE DRIVE TO SCURRY BEND DRIVE)
100-YEAR INTERIM CONTDITION

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	
148.190	3416.760	1.810	3418.570	166.82	30.19	14.15	3432.72	.00	3.71	3.98	4.000	.000	.00	1 .0
6.000	.0333					.0772	.46	1.81	4.52	2.32	.013	.00	.00	PIPE
154.190	3416.960	1.797	3418.757	166.82	30.49	14.43	3433.19	.00	3.71	3.98	4.000	.000	.00	1 .0
95.624	.0782					.0782	7.48	1.80	4.58	1.80	.013	.00	.00	PIPE
249.814	3424.439	1.797	3426.236	166.82	30.49	14.43	3440.67	.00	3.71	3.98	4.000	.000	.00	1 .0
261.706	.0782					.0758	19.84	1.80	4.58	1.80	.013	.00	.00	PIPE
511.520	3444.910	1.830	3446.740	166.82	29.78	13.77	3460.51	.00	3.71	3.99	4.000	.000	.00	1 .0
5.000	.0400					.0741	.37	1.83	4.43	2.19	.013	.00	.00	PIPE
516.520	3445.110	1.820	3446.930	166.82	29.97	13.95	3460.88	.00	3.71	3.98	4.000	.000	.00	1 .0
81.156	.0831					.0710	5.77	1.82	4.47	1.77	.013	.00	.00	PIPE
597.676	3451.851	1.875	3453.726	166.82	28.85	12.92	3466.65	.00	3.71	3.99	4.000	.000	.00	1 .0
55.964	.0831					.0633	3.54	1.87	4.22	1.77	.013	.00	.00	PIPE
653.640	3456.500	1.945	3458.446	166.82	27.50	11.75	3470.19	.00	3.71	4.00	4.000	.000	.00	1 .0
JUNCT STR	.0400					.0641	.16	1.95	3.94		.013	.00	.00	PIPE
656.140	3456.600	1.822	3458.422	160.42	28.79	12.87	3471.30	.00	3.67	3.98	4.000	.000	.00	1 .0
2.500	.0399					.0692	.17	1.82	4.29	2.14	.013	.00	.00	PIPE
658.640	3456.700	1.817	3458.517	160.42	28.89	12.96	3471.48	.00	3.67	3.98	4.000	.000	.00	1 .0
60.782	.0801					.0664	4.03	1.82	4.31	1.75	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (KETTLE RIDGE DRIVE TO SCURRY BEND DRIVE)
100-YEAR INTERIM CONTDITION

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	
719.422	3461.566	1.867	3463.433	160.42	27.89	12.08	3475.51	.00	3.67	3.99	4.000	.000	.00	1 .0
49.768	.0801					.0594	2.96	1.87	4.09	1.75	.013	.00	.00	PIPE
769.190	3465.550	1.937	3467.488	160.42	26.59	10.98	3478.47	.00	3.67	4.00	4.000	.000	.00	1 .0
5.000	.0400					.0559	.28	1.94	3.81	2.14	.013	.00	.00	PIPE
774.190	3465.750	1.932	3467.682	160.42	26.70	11.07	3478.75	.00	3.67	4.00	4.000	.000	.00	1 .0
41.831	.0685					.0540	2.26	1.93	3.84	1.82	.013	.00	.00	PIPE
816.021	3468.617	1.978	3470.595	160.42	25.90	10.41	3481.01	.00	3.67	4.00	4.000	.000	.00	1 .0
43.988	.0685					.0487	2.14	1.98	3.67	1.82	.013	.00	.00	PIPE
860.008	3471.632	2.053	3473.685	160.42	24.69	9.47	3483.15	.00	3.67	4.00	4.000	.000	.00	1 .0
30.526	.0685					.0429	1.31	2.05	3.41	1.82	.013	.00	.00	PIPE
890.535	3473.724	2.133	3475.856	160.42	23.54	8.61	3484.46	.00	3.67	3.99	4.000	.000	.00	1 .0
22.791	.0685					.0379	.86	2.13	3.18	1.82	.013	.00	.00	PIPE
913.326	3475.286	2.216	3477.502	160.42	22.45	7.82	3485.33	.00	3.67	3.98	4.000	.000	.00	1 .0
17.755	.0685					.0334	.59	2.22	2.95	1.82	.013	.00	.00	PIPE
931.081	3476.502	2.304	3478.807	160.42	21.40	7.11	3485.92	.00	3.67	3.95	4.000	.000	.00	1 .0
14.203	.0685					.0295	.42	2.30	2.74	1.82	.013	.00	.00	PIPE
945.284	3477.476	2.397	3479.873	160.42	20.41	6.47	3486.34	.00	3.67	3.92	4.000	.000	.00	1 .0
11.548	.0685					.0261	.30	2.40	2.54	1.82	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (KETTLE RIDGE DRIVE TO SCURRY BEND DRIVE)
100-YEAR INTERIM CONTDITION

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	
956.831	3478.267	2.496	3480.763	160.42	19.46	5.88	3486.64	.00	3.67	3.88	4.000	.000	.00	1 .0
9.477	.0685					.0232	.22	2.50	2.35	1.82	.013	.00	.00	PIPE
966.308	3478.917	2.600	3481.517	160.42	18.55	5.34	3486.86	.00	3.67	3.82	4.000	.000	.00	1 .0
7.803	.0685					.0206	.16	2.60	2.17	1.82	.013	.00	.00	PIPE
974.111	3479.451	2.712	3482.163	160.42	17.69	4.86	3487.02	.00	3.67	3.74	4.000	.000	.00	1 .0
6.407	.0685					.0183	.12	2.71	2.00	1.82	.013	.00	.00	PIPE
980.517	3479.890	2.832	3482.722	160.42	16.86	4.42	3487.14	.00	3.67	3.64	4.000	.000	.00	1 .0
5.207	.0685					.0164	.09	2.83	1.84	1.82	.013	.00	.00	PIPE
985.724	3480.247	2.962	3483.209	160.42	16.08	4.02	3487.22	.00	3.67	3.51	4.000	.000	.00	1 .0
4.137	.0685					.0147	.06	2.96	1.68	1.82	.013	.00	.00	PIPE
989.861	3480.531	3.104	3483.635	160.42	15.33	3.65	3487.28	.00	3.67	3.34	4.000	.000	.00	1 .0
3.135	.0685					.0132	.04	3.10	1.53	1.82	.013	.00	.00	PIPE
992.996	3480.746	3.262	3484.008	160.42	14.62	3.32	3487.33	.00	3.67	3.10	4.000	.000	.00	1 .0
2.117	.0685					.0121	.03	3.26	1.37	1.82	.013	.00	.00	PIPE
995.113	3480.891	3.445	3484.335	160.42	13.94	3.02	3487.35	.00	3.67	2.77	4.000	.000	.00	1 .0
.867	.0685					.0112	.01	3.44	1.20	1.82	.013	.00	.00	PIPE
995.980	3480.950	3.670	3484.620	160.42	13.29	2.74	3487.36	.00	3.67	2.20	4.000	.000	.00	1 .0
JUNCT STR	.0400					.0104	.03	3.67	1.00		.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (KETTLE RIDGE DRIVE TO SCURRY BEND DRIVE)
100-YEAR INTERIM CONTDITION

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	
998.480	3481.050	4.756	3485.806	144.00	11.46	2.04	3487.85	.00	3.55	.00	4.000	.000	.00	1 .0
2.500	.0399				.0100	.03	4.76	.00	2.00	.013	.00	.00	PIPE	
1000.980	3481.150	4.783	3485.933	144.00	11.46	2.04	3487.97	.00	3.55	.00	4.000	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE
T3 100-YEAR INTERIM CONDITION - LATERAL 2
SO    658.6403456.700  1                          3458.517
REM*****FLEET WING AVENUE WEST LATERAL 2 - SDDI#1
R     685.1703458.950  1      .013                                .000    .000 0
SH    685.1703458.950  1                          3458.950
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             3.650   .0
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SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR INTERIM CONDITION - LATERAL 2

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
658.640	3456.700	1.817	3458.517	3.65	1.22	.02	3458.54	.00	.67	1.15	2.000	.000	.00	1 .0
1.254	.0848					.0002	.00	1.82	.13	.32	.013	.00	.00	PIPE
659.894	3456.806	1.709	3458.515	3.65	1.28	.03	3458.54	.00	.67	1.41	2.000	.000	.00	1 .0
1.023	.0848					.0003	.00	1.71	.16	.32	.013	.00	.00	PIPE
660.916	3456.893	1.620	3458.513	3.65	1.34	.03	3458.54	.00	.67	1.57	2.000	.000	.00	1 .0
.890	.0848					.0003	.00	1.62	.18	.32	.013	.00	.00	PIPE
661.806	3456.968	1.542	3458.510	3.65	1.40	.03	3458.54	.00	.67	1.68	2.000	.000	.00	1 .0
.795	.0848					.0003	.00	1.54	.20	.32	.013	.00	.00	PIPE
662.601	3457.036	1.472	3458.507	3.65	1.47	.03	3458.54	.00	.67	1.76	2.000	.000	.00	1 .0
.720	.0848					.0003	.00	1.47	.22	.32	.013	.00	.00	PIPE
663.321	3457.097	1.407	3458.504	3.65	1.54	.04	3458.54	.00	.67	1.83	2.000	.000	.00	1 .0
.660	.0848					.0004	.00	1.41	.24	.32	.013	.00	.00	PIPE
663.981	3457.153	1.348	3458.500	3.65	1.62	.04	3458.54	.00	.67	1.87	2.000	.000	.00	1 .0
.607	.0848					.0004	.00	1.35	.26	.32	.013	.00	.00	PIPE
664.588	3457.204	1.293	3458.497	3.65	1.70	.04	3458.54	.00	.67	1.91	2.000	.000	.00	1 .0
.562	.0848					.0005	.00	1.29	.28	.32	.013	.00	.00	PIPE
665.150	3457.252	1.241	3458.492	3.65	1.78	.05	3458.54	.00	.67	1.94	2.000	.000	.00	1 .0
.521	.0848					.0006	.00	1.24	.31	.32	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR INTERIM CONDITION - LATERAL 2

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	
665.671	3457.296	1.192	3458.488	3.65	1.87	.05	3458.54	.00	.67	1.96	2.000	.000	.00	1 .0
.308	.0848					.0006	.00	1.19	.33	.32	.013	.00	.00	PIPE
665.978	3457.322	1.146	3458.468	3.65	1.96	.06	3458.53	.00	.67	1.98	2.000	.000	.00	1 .0
HYDRAULIC JUMP														
665.978	3457.322	.340	3457.662	3.65	10.31	1.65	3459.31	.00	.67	1.50	2.000	.000	.00	1 .0
.104	.0848					.0616	.01	.34	3.74	.32	.013	.00	.00	PIPE
666.082	3457.331	.352	3457.683	3.65	9.82	1.50	3459.18	.00	.67	1.52	2.000	.000	.00	1 .0
4.013	.0848					.0538	.22	.35	3.50	.32	.013	.00	.00	PIPE
670.096	3457.671	.363	3458.035	3.65	9.37	1.36	3459.40	.00	.67	1.54	2.000	.000	.00	1 .0
2.953	.0848					.0470	.14	.36	3.28	.32	.013	.00	.00	PIPE
673.048	3457.922	.376	3458.297	3.65	8.93	1.24	3459.54	.00	.67	1.56	2.000	.000	.00	1 .0
2.283	.0848					.0411	.09	.38	3.08	.32	.013	.00	.00	PIPE
675.331	3458.115	.388	3458.504	3.65	8.51	1.13	3459.63	.00	.67	1.58	2.000	.000	.00	1 .0
1.822	.0848					.0359	.07	.39	2.88	.32	.013	.00	.00	PIPE
677.153	3458.270	.401	3458.671	3.65	8.12	1.02	3459.69	.00	.67	1.60	2.000	.000	.00	1 .0
1.486	.0848					.0313	.05	.40	2.70	.32	.013	.00	.00	PIPE
678.639	3458.396	.415	3458.811	3.65	7.74	.93	3459.74	.00	.67	1.62	2.000	.000	.00	1 .0
1.228	.0848					.0274	.03	.42	2.53	.32	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR INTERIM CONDITION - LATERAL 2

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	
679.867	3458.500	.429	3458.929	3.65	7.38	.85	3459.77	.00	.67	1.64	2.000	.000	.00	1 .0
1.023	.0848					.0239	.02	.43	2.37	.32	.013	.00	.00	PIPE
680.890	3458.587	.444	3459.031	3.65	7.04	.77	3459.80	.00	.67	1.66	2.000	.000	.00	1 .0
.858	.0848					.0209	.02	.44	2.22	.32	.013	.00	.00	PIPE
681.748	3458.660	.459	3459.118	3.65	6.71	.70	3459.82	.00	.67	1.68	2.000	.000	.00	1 .0
.719	.0848					.0183	.01	.46	2.08	.32	.013	.00	.00	PIPE
682.468	3458.721	.475	3459.195	3.65	6.40	.64	3459.83	.00	.67	1.70	2.000	.000	.00	1 .0
.603	.0848					.0160	.01	.47	1.95	.32	.013	.00	.00	PIPE
683.070	3458.772	.491	3459.262	3.65	6.10	.58	3459.84	.00	.67	1.72	2.000	.000	.00	1 .0
.503	.0848					.0140	.01	.49	1.82	.32	.013	.00	.00	PIPE
683.573	3458.814	.508	3459.322	3.65	5.82	.53	3459.85	.00	.67	1.74	2.000	.000	.00	1 .0
.417	.0848					.0122	.01	.51	1.71	.32	.013	.00	.00	PIPE
683.990	3458.850	.525	3459.375	3.65	5.55	.48	3459.85	.00	.67	1.76	2.000	.000	.00	1 .0
.341	.0848					.0107	.00	.53	1.60	.32	.013	.00	.00	PIPE
684.332	3458.879	.543	3459.422	3.65	5.29	.43	3459.86	.00	.67	1.78	2.000	.000	.00	1 .0
.273	.0848					.0094	.00	.54	1.50	.32	.013	.00	.00	PIPE
684.604	3458.902	.562	3459.464	3.65	5.04	.39	3459.86	.00	.67	1.80	2.000	.000	.00	1 .0
.214	.0848					.0082	.00	.56	1.40	.32	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR INTERIM CONDITION - LATERAL 2

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	
684.818	3458.920	.582	3459.502	3.65	4.81	.36	3459.86	.00	.67	1.82	2.000	.000	.00	1 .0
.159	.0848					.0072	.00	.58	1.31	.32	.013	.00	.00	PIPE
684.976	3458.934	.602	3459.536	3.65	4.58	.33	3459.86	.00	.67	1.83	2.000	.000	.00	1 .0
.109	.0848					.0063	.00	.60	1.23	.32	.013	.00	.00	PIPE
685.085	3458.943	.623	3459.566	3.65	4.37	.30	3459.86	.00	.67	1.85	2.000	.000	.00	1 .0
.064	.0848					.0055	.00	.62	1.15	.32	.013	.00	.00	PIPE
685.149	3458.948	.645	3459.593	3.65	4.17	.27	3459.86	.00	.67	1.87	2.000	.000	.00	1 .0
.021	.0848					.0048	.00	.65	1.07	.32	.013	.00	.00	PIPE
685.170	3458.950	.669	3459.619	3.65	3.96	.24	3459.86	.00	.67	1.89	2.000	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE
T3 100-YEAR INTERIM CONDITION - LATERAL 2
SO    658.6403456.700  1                          3458.517
REM*****FLEET WING AVENUE WEST LATERAL 2 - SDDI#2
R     675.2703458.700  1      .013                                .000    .000 0
SH    675.2703458.700  1                          3458.700
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             2.750   .0
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WATER SURFACE PROFILE LISTING Date:10-27-2020 Time:11: 4: 1

SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR INTERIM CONDITION - LATERAL 2

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
658.640	3456.700	1.817	3458.517	2.75	.92	.01	3458.53	.00	.58	1.15	2.000	.000	.00	1 .0
.891	.1203					.0001	.00	1.82	.10	.26	.013	.00	.00	PIPE
659.531	3456.807	1.709	3458.516	2.75	.96	.01	3458.53	.00	.58	1.41	2.000	.000	.00	1 .0
.729	.1203					.0001	.00	1.71	.12	.26	.013	.00	.00	PIPE
660.260	3456.895	1.620	3458.515	2.75	1.01	.02	3458.53	.00	.58	1.57	2.000	.000	.00	1 .0
.636	.1203					.0002	.00	1.62	.13	.26	.013	.00	.00	PIPE
660.896	3456.971	1.542	3458.513	2.75	1.06	.02	3458.53	.00	.58	1.68	2.000	.000	.00	1 .0
.570	.1203					.0002	.00	1.54	.15	.26	.013	.00	.00	PIPE
661.466	3457.040	1.472	3458.511	2.75	1.11	.02	3458.53	.00	.58	1.76	2.000	.000	.00	1 .0
.519	.1203					.0002	.00	1.47	.16	.26	.013	.00	.00	PIPE
661.985	3457.102	1.407	3458.510	2.75	1.16	.02	3458.53	.00	.58	1.83	2.000	.000	.00	1 .0
.477	.1203					.0002	.00	1.41	.18	.26	.013	.00	.00	PIPE
662.462	3457.160	1.348	3458.508	2.75	1.22	.02	3458.53	.00	.58	1.87	2.000	.000	.00	1 .0
.441	.1203					.0002	.00	1.35	.20	.26	.013	.00	.00	PIPE
662.904	3457.213	1.293	3458.505	2.75	1.28	.03	3458.53	.00	.58	1.91	2.000	.000	.00	1 .0
.411	.1203					.0003	.00	1.29	.21	.26	.013	.00	.00	PIPE
663.315	3457.262	1.241	3458.503	2.75	1.34	.03	3458.53	.00	.58	1.94	2.000	.000	.00	1 .0
.383	.1203					.0003	.00	1.24	.23	.26	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date:10-27-2020 Time:11: 4: 1

SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR INTERIM CONDITION - LATERAL 2

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
663.698	3457.308	1.192	3458.500	2.75	1.41	.03	3458.53	.00	.58	1.96	2.000	.000	.00	1 .0
.359	.1203					.0004	.00	1.19	.25	.26	.013	.00	.00	PIPE
664.057	3457.352	1.146	3458.498	2.75	1.48	.03	3458.53	.00	.58	1.98	2.000	.000	.00	1 .0
.336	.1203					.0004	.00	1.15	.27	.26	.013	.00	.00	PIPE
664.393	3457.392	1.102	3458.494	2.75	1.55	.04	3458.53	.00	.58	1.99	2.000	.000	.00	1 .0
.315	.1203					.0005	.00	1.10	.29	.26	.013	.00	.00	PIPE
664.708	3457.430	1.061	3458.490	2.75	1.62	.04	3458.53	.00	.58	2.00	2.000	.000	.00	1 .0
.295	.1203					.0005	.00	1.06	.31	.26	.013	.00	.00	PIPE
665.003	3457.465	1.021	3458.487	2.75	1.70	.05	3458.53	.00	.58	2.00	2.000	.000	.00	1 .0
.099	.1203					.0006	.00	1.02	.33	.26	.013	.00	.00	PIPE
665.102	3457.477	.984	3458.461	2.75	1.79	.05	3458.51	.00	.58	2.00	2.000	.000	.00	1 .0
HYDRAULIC JUMP														
665.102	3457.477	.296	3457.773	2.75	9.51	1.40	3459.18	.00	.58	1.42	2.000	.000	.00	1 .0
.923	.1203					.0622	.06	.30	3.71	.26	.013	.00	.00	PIPE
666.025	3457.588	.306	3457.894	2.75	9.06	1.28	3459.17	.00	.58	1.44	2.000	.000	.00	1 .0
1.603	.1203					.0543	.09	.31	3.48	.26	.013	.00	.00	PIPE
667.628	3457.781	.316	3458.097	2.75	8.64	1.16	3459.26	.00	.58	1.46	2.000	.000	.00	1 .0
1.301	.1203					.0474	.06	.32	3.26	.26	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR INTERIM CONDITION - LATERAL 2

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	
668.929	3457.938	.326	3458.264	2.75	8.24	1.05	3459.32	.00	.58	1.48	2.000	.000	.00	1 .0
1.077	.1203					.0414	.04	.33	3.06	.26	.013	.00	.00	PIPE
670.006	3458.067	.337	3458.404	2.75	7.86	.96	3459.36	.00	.58	1.50	2.000	.000	.00	1 .0
.900	.1203					.0362	.03	.34	2.86	.26	.013	.00	.00	PIPE
670.906	3458.175	.349	3458.524	2.75	7.49	.87	3459.39	.00	.58	1.52	2.000	.000	.00	1 .0
.761	.1203					.0316	.02	.35	2.68	.26	.013	.00	.00	PIPE
671.667	3458.267	.360	3458.627	2.75	7.14	.79	3459.42	.00	.58	1.54	2.000	.000	.00	1 .0
.645	.1203					.0276	.02	.36	2.51	.26	.013	.00	.00	PIPE
672.312	3458.344	.373	3458.717	2.75	6.81	.72	3459.44	.00	.58	1.56	2.000	.000	.00	1 .0
.551	.1203					.0241	.01	.37	2.36	.26	.013	.00	.00	PIPE
672.863	3458.410	.385	3458.795	2.75	6.49	.65	3459.45	.00	.58	1.58	2.000	.000	.00	1 .0
.468	.1203					.0211	.01	.39	2.21	.26	.013	.00	.00	PIPE
673.330	3458.467	.398	3458.865	2.75	6.19	.59	3459.46	.00	.58	1.60	2.000	.000	.00	1 .0
.398	.1203					.0184	.01	.40	2.07	.26	.013	.00	.00	PIPE
673.729	3458.514	.412	3458.926	2.75	5.90	.54	3459.47	.00	.58	1.62	2.000	.000	.00	1 .0
.339	.1203					.0161	.01	.41	1.94	.26	.013	.00	.00	PIPE
674.067	3458.555	.426	3458.981	2.75	5.63	.49	3459.47	.00	.58	1.64	2.000	.000	.00	1 .0
.284	.1203					.0141	.00	.43	1.81	.26	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR INTERIM CONDITION - LATERAL 2

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	
674.352	3458.589	.440	3459.029	2.75	5.37	.45	3459.48	.00	.58	1.66	2.000	.000	.00	1 .0
.237	.1203					.0123	.00	.44	1.70	.26	.013	.00	.00	PIPE
674.589	3458.618	.455	3459.073	2.75	5.12	.41	3459.48	.00	.58	1.68	2.000	.000	.00	1 .0
.195	.1203					.0107	.00	.46	1.59	.26	.013	.00	.00	PIPE
674.784	3458.641	.471	3459.112	2.75	4.88	.37	3459.48	.00	.58	1.70	2.000	.000	.00	1 .0
.158	.1203					.0094	.00	.47	1.49	.26	.013	.00	.00	PIPE
674.941	3458.660	.487	3459.147	2.75	4.65	.34	3459.48	.00	.58	1.72	2.000	.000	.00	1 .0
.123	.1203					.0082	.00	.49	1.40	.26	.013	.00	.00	PIPE
675.065	3458.675	.503	3459.179	2.75	4.43	.31	3459.48	.00	.58	1.74	2.000	.000	.00	1 .0
.092	.1203					.0072	.00	.50	1.31	.26	.013	.00	.00	PIPE
675.156	3458.686	.521	3459.207	2.75	4.23	.28	3459.48	.00	.58	1.76	2.000	.000	.00	1 .0
.064	.1203					.0063	.00	.52	1.22	.26	.013	.00	.00	PIPE
675.221	3458.694	.539	3459.233	2.75	4.03	.25	3459.49	.00	.58	1.77	2.000	.000	.00	1 .0
.037	.1203					.0055	.00	.54	1.15	.26	.013	.00	.00	PIPE
675.258	3458.698	.557	3459.256	2.75	3.84	.23	3459.49	.00	.58	1.79	2.000	.000	.00	1 .0
.012	.1203					.0048	.00	.56	1.07	.26	.013	.00	.00	PIPE
675.270	3458.700	.578	3459.278	2.75	3.66	.21	3459.49	.00	.58	1.81	2.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE
T3 100-YEAR INTERIM CONDITION - LATERAL 1
SO   1000.9803481.150  1                          3485.933
REM*****FLEET WING AVENUE WEST LATERAL 1 - SDDI#4
R    1030.8003483.390  1      .013                                 .000    .000 0
SH   1030.8003483.390  1                          3483.390
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             8.490   .0
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SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR INTERIM CONDITION - LATERAL 1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1000.980	3481.150	4.783	3485.933	8.49	2.70	.11	3486.05	.00	1.04	.00	2.000	.000	.00	1 .0
29.820	.0751				.0014	.04	4.78	.00	.50	.013	.00	.00	PIPE	
1030.800	3483.390	2.585	3485.975	8.49	2.70	.11	3486.09	.00	1.04	.00	2.000	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE
T3 100-YEAR INTERIM CONDITION - LATERAL 1
SO   1000.9803481.150  1                          3485.933
REM*****FLEET WING AVENUE WEST LATERAL 1 - SDDI#3
R    1012.8403483.230  1      .013                                 .000    .000 0
SH   1012.8403483.230  1                          3483.230
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             7.930   .0
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SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR INTERIM CONDITION - LATERAL 1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1000.980	3481.150	4.783	3485.933	7.93	2.52	.10	3486.03	.00	1.00	.00	2.000	.000	.00	1 .0
11.860	.1754				.0012	.01	4.78	.00	.39	.013	.00	.00	PIPE	
1012.840	3483.230	2.718	3485.948	7.93	2.52	.10	3486.05	.00	1.00	.00	2.000	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 22                                                    0
T2 FLEET WING AVENUE (KETTLE RIDGE DRIVE TO SCURRY BEND DRIVE)
T3 100-YEAR ULTIMATE CONTDITION
SO       .0003405.720  1                          3406.715
REM*****CONNECTON TO KETTLE RIDGE DRIVE MAINLINE 6'X10' RCB
R      26.9003410.630  1      .013                                  .000 -13.655 0
R      27.9003410.746  1      .013                                  .000 -13.500 0
R      29.9003410.862  1      .013                                  .000 -13.500 0
R      31.9003410.920  1      .013                                  .000    .000 1
REM*****FLEET WING DRIVE (DFD-KRD) SDMH#8
R      48.5003411.840  1      .013                                  .000    .000 0
REM*****POINT OF CONNECTION TO STUB
R     148.1903416.760  1      .013                                  .000    .000 0
R     154.1903416.960  1      .013                                  .000    .000 1
REM*****FLEET WING AVENUE SDMH#1
R     511.5203444.910  1      .013                                  .000  -3.709 0
R     516.5203445.110  1      .013                                  .000    .000 1
REM*****FLEET WING AVENUE SDMH#2
R     653.6403456.500  1      .013                                  .000    .000 0
JX    656.1403456.600  1  2  2.013    2.870    1.13 3456.70 3456.70  72.7-45.2    .000
REM*****FLEET WING AVENUE SDDI#1 & SDDI#2
R     658.6403456.700  1      .013                                  .000  -2.413 1
REM*****FLEET WING AVENUE SDMH#3
R     769.1903465.550  1      .013                                  .000    .000 0
R     774.1903465.750  1      .013                                  .000    .843 1
REM*****FLEET WING AVENUE SDMH#4
R     995.9803480.950  1      .013                                  .000    .000 0
JX    998.4803481.050  1  2  2.013    3.870    6.75 3481.15 3481.15  72.1-45.2    .000
REM*****FLEET WING AVENUE SDDI#3 & SDDI#4
R    1000.9803481.150  1      .013                                  .000    .000 1
REM*****FLEET WING AVENUE SDMH#5
SH   1000.9803481.380  1                          3481.380
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
Q           225.000   .0
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SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (KETTLE RIDGE DRIVE TO SCURRY BEND DRIVE)
100-YEAR ULTIMATE CONTDITION

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	3405.720	2.200	3407.919	239.62	33.84	17.79	3425.71	.00	3.92	3.98	4.000	.000	.00	1 .0
.689	.1825					.0810	.06	2.20	4.47	1.74	.013	.00	.00	PIPE
.689	3405.846	2.203	3408.049	239.62	33.78	17.72	3425.77	.00	3.92	3.98	4.000	.000	.00	1 .0
14.311	.1825					.0761	1.09	2.20	4.46	1.74	.013	.00	.00	PIPE
15.000	3408.458	2.290	3410.748	239.62	32.21	16.11	3426.86	.00	3.92	3.96	4.000	.000	.00	1 .0
11.900	.1825					.0672	.80	2.29	4.14	1.74	.013	.00	.00	PIPE
26.900	3410.630	2.382	3413.012	239.62	30.71	14.64	3427.66	.00	3.92	3.93	4.000	.000	.00	1 .0
1.000	.1162					.0629	.06	2.38	3.84	1.97	.013	.00	.00	PIPE
27.900	3410.746	2.386	3413.132	239.62	30.65	14.59	3427.72	.00	3.92	3.92	4.000	.000	.00	1 .0
2.000	.0580					.0628	.13	2.39	3.83	2.45	.013	.00	.00	PIPE
29.900	3410.862	2.385	3413.247	239.62	30.67	14.61	3427.86	.00	3.92	3.93	4.000	.000	.00	1 .0
2.000	.0289					.0631	.13	2.38	3.83	3.21	.013	.00	.00	PIPE
31.900	3410.920	2.380	3413.300	239.62	30.75	14.68	3427.98	.00	3.92	3.93	4.000	.000	.00	1 .0
16.600	.0554					.0637	1.06	2.38	3.85	2.49	.013	.00	.00	PIPE
48.500	3411.840	2.370	3414.210	239.62	30.90	14.83	3429.04	.00	3.92	3.93	4.000	.000	.00	1 .0
35.668	.0494					.0659	2.35	2.37	3.88	2.59	.013	.00	.00	PIPE
84.168	3413.600	2.329	3415.929	239.62	31.56	15.46	3431.39	.00	3.92	3.95	4.000	.000	.00	1 .0
64.022	.0494					.0721	4.62	2.33	4.01	2.59	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (KETTLE RIDGE DRIVE TO SCURRY BEND DRIVE)
100-YEAR ULTIMATE CONTDITION

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	
148.190	3416.760	2.240	3419.000	239.62	33.10	17.01	3436.01	.00	3.92	3.97	4.000	.000	.00	1 .0
6.000	.0333					.0774	.46	2.24	4.32	3.01	.013	.00	.00	PIPE
154.190	3416.960	2.225	3419.185	239.62	33.37	17.29	3436.47	.00	3.92	3.97	4.000	.000	.00	1 .0
34.022	.0782					.0782	2.66	2.22	4.37	2.22	.013	.00	.00	PIPE
188.212	3419.621	2.225	3421.846	239.62	33.37	17.29	3439.14	.00	3.92	3.97	4.000	.000	.00	1 .0
323.308	.0782					.0756	24.46	2.22	4.37	2.22	.013	.00	.00	PIPE
511.520	3444.910	2.273	3447.183	239.62	32.51	16.41	3463.59	.00	3.92	3.96	4.000	.000	.00	1 .0
5.000	.0400					.0736	.37	2.27	4.20	2.79	.013	.00	.00	PIPE
516.520	3445.110	2.263	3447.373	239.62	32.68	16.59	3463.96	.00	3.92	3.97	4.000	.000	.00	1 .0
56.059	.0831					.0723	4.05	2.26	4.24	2.18	.013	.00	.00	PIPE
572.579	3449.767	2.300	3452.066	239.62	32.05	15.95	3468.01	.00	3.92	3.95	4.000	.000	.00	1 .0
81.061	.0831					.0663	5.38	2.30	4.11	2.18	.013	.00	.00	PIPE
653.640	3456.500	2.392	3458.892	239.62	30.55	14.50	3473.39	.00	3.92	3.92	4.000	.000	.00	1 .0
JUNCT STR	.0400					.0643	.16	2.39	3.81		.013	.00	.00	PIPE
656.140	3456.600	2.318	3458.918	235.62	31.21	15.12	3474.04	.00	3.92	3.95	4.000	.000	.00	1 .0
2.500	.0399					.0666	.17	2.32	3.98	2.76	.013	.00	.00	PIPE
658.640	3456.700	2.313	3459.013	235.62	31.29	15.20	3474.21	.00	3.92	3.95	4.000	.000	.00	1 .0
56.535	.0801					.0641	3.62	2.31	3.99	2.19	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (KETTLE RIDGE DRIVE TO SCURRY BEND DRIVE)
100-YEAR ULTIMATE CONTDITION

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	
715.175	3461.226	2.377	3463.603	235.62	30.28	14.24	3477.84	.00	3.92	3.93	4.000	.000	.00	1 .0
54.015	.0801					.0579	3.13	2.38	3.79	2.19	.013	.00	.00	PIPE
769.190	3465.550	2.474	3468.024	235.62	28.87	12.94	3480.97	.00	3.92	3.89	4.000	.000	.00	1 .0
5.000	.0400					.0546	.27	2.47	3.51	2.76	.013	.00	.00	PIPE
774.190	3465.750	2.467	3468.217	235.62	28.96	13.02	3481.24	.00	3.92	3.89	4.000	.000	.00	1 .0
1.553	.0685					.0548	.09	2.47	3.53	2.29	.013	.00	.00	PIPE
775.744	3465.856	2.469	3468.325	235.62	28.94	13.00	3481.33	.00	3.92	3.89	4.000	.000	.00	1 .0
63.727	.0685					.0516	3.29	2.47	3.52	2.29	.013	.00	.00	PIPE
839.471	3470.224	2.572	3472.796	235.62	27.59	11.82	3484.62	.00	3.92	3.83	4.000	.000	.00	1 .0
42.447	.0685					.0458	1.94	2.57	3.26	2.29	.013	.00	.00	PIPE
881.918	3473.133	2.682	3475.815	235.62	26.31	10.75	3486.56	.00	3.92	3.76	4.000	.000	.00	1 .0
30.927	.0685					.0408	1.26	2.68	3.00	2.29	.013	.00	.00	PIPE
912.845	3475.252	2.800	3478.052	235.62	25.08	9.77	3487.82	.00	3.92	3.67	4.000	.000	.00	1 .0
23.654	.0685					.0364	.86	2.80	2.76	2.29	.013	.00	.00	PIPE
936.499	3476.874	2.927	3479.800	235.62	23.91	8.88	3488.68	.00	3.92	3.54	4.000	.000	.00	1 .0
18.591	.0685					.0326	.61	2.93	2.53	2.29	.013	.00	.00	PIPE
955.090	3478.148	3.065	3481.213	235.62	22.80	8.07	3489.29	.00	3.92	3.39	4.000	.000	.00	1 .0
14.802	.0685					.0293	.43	3.07	2.30	2.29	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (KETTLE RIDGE DRIVE TO SCURRY BEND DRIVE)
100-YEAR ULTIMATE CONTDITION

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	
969.892	3479.162	3.219	3482.381	235.62	21.74	7.34	3489.72	.00	3.92	3.17	4.000	.000	.00	1 .0
11.747	.0685				.0266	.31	3.22	2.07	2.29	.013	.00	.00	PIPE	
981.640	3479.967	3.394	3483.361	235.62	20.73	6.67	3490.03	.00	3.92	2.87	4.000	.000	.00	1 .0
9.014	.0685				.0245	.22	3.39	1.84	2.29	.013	.00	.00	PIPE	
990.654	3480.585	3.604	3484.189	235.62	19.76	6.07	3490.25	.00	3.92	2.39	4.000	.000	.00	1 .0
5.326	.0685				.0239	.13	3.60	1.56	2.29	.013	.00	.00	PIPE	
995.980	3480.950	3.918	3484.868	235.62	18.84	5.51	3490.38	.00	3.92	1.13	4.000	.000	.00	1 .0
JUNCT STR	.0400				.0243	.06	3.92	1.00		.013	.00	.00	PIPE	
998.480	3481.050	4.869	3485.919	225.00	17.90	4.98	3490.90	.00	3.90	.00	4.000	.000	.00	1 .0
2.500	.0399				.0245	.06	4.87	.00	2.67	.013	.00	.00	PIPE	
1000.980	3481.150	5.079	3486.229	225.00	17.90	4.98	3491.21	.00	3.90	.00	4.000	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE
T3 100-YEAR ULTIMATE CONDITION - LATERAL 2
SO    658.6403456.700  1                          3459.013
REM*****FLEET WING AVENUE WEST LATERAL 2 - SDDI#2
R     675.2703458.700  1      .013                                .000    .000 0
SH    675.2703458.700  1                          3458.700
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             1.130   .0
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SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR ULTIMATE CONDITION - LATERAL 2

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
658.640	3456.700	2.313	3459.013	1.13	.36	.00	3459.01	.00	.37	.00	2.000	.000	.00	1 .0
2.603	.1203					.0000	.00	2.31	.00	.17	.013	.00	.00	PIPE
661.243	3457.013	2.000	3459.013	1.13	.36	.00	3459.01	.00	.37	.00	2.000	.000	.00	1 .0
1.532	.1203					.0000	.00	2.00	.00	.17	.013	.00	.00	PIPE
662.775	3457.197	1.815	3459.012	1.13	.38	.00	3459.01	.00	.37	1.16	2.000	.000	.00	1 .0
.894	.1203					.0000	.00	1.81	.04	.17	.013	.00	.00	PIPE
663.669	3457.305	1.707	3459.012	1.13	.40	.00	3459.01	.00	.37	1.41	2.000	.000	.00	1 .0
.737	.1203					.0000	.00	1.71	.05	.17	.013	.00	.00	PIPE
664.405	3457.393	1.618	3459.011	1.13	.41	.00	3459.01	.00	.37	1.57	2.000	.000	.00	1 .0
.645	.1203					.0000	.00	1.62	.06	.17	.013	.00	.00	PIPE
665.050	3457.471	1.540	3459.011	1.13	.44	.00	3459.01	.00	.37	1.68	2.000	.000	.00	1 .0
.580	.1203					.0000	.00	1.54	.06	.17	.013	.00	.00	PIPE
665.630	3457.541	1.470	3459.011	1.13	.46	.00	3459.01	.00	.37	1.77	2.000	.000	.00	1 .0
.530	.1203					.0000	.00	1.47	.07	.17	.013	.00	.00	PIPE
666.160	3457.604	1.406	3459.011	1.13	.48	.00	3459.01	.00	.37	1.83	2.000	.000	.00	1 .0
.490	.1203					.0000	.00	1.41	.07	.17	.013	.00	.00	PIPE
666.651	3457.664	1.347	3459.010	1.13	.50	.00	3459.01	.00	.37	1.88	2.000	.000	.00	1 .0
.457	.1203					.0000	.00	1.35	.08	.17	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR ULTIMATE CONDITION - LATERAL 2

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
667.107	3457.719	1.292	3459.010	1.13	.53	.00	3459.01	.00	.37	1.91	2.000	.000	.00	1 .0
.427	.1203					.0000	.00	1.29	.09	.17	.013	.00	.00	PIPE
667.535	3457.770	1.240	3459.010	1.13	.55	.00	3459.01	.00	.37	1.94	2.000	.000	.00	1 .0
.402	.1203					.0001	.00	1.24	.09	.17	.013	.00	.00	PIPE
667.937	3457.818	1.191	3459.009	1.13	.58	.01	3459.01	.00	.37	1.96	2.000	.000	.00	1 .0
.378	.1203					.0001	.00	1.19	.10	.17	.013	.00	.00	PIPE
668.315	3457.864	1.145	3459.009	1.13	.61	.01	3459.01	.00	.37	1.98	2.000	.000	.00	1 .0
.358	.1203					.0001	.00	1.15	.11	.17	.013	.00	.00	PIPE
668.673	3457.906	1.101	3459.008	1.13	.64	.01	3459.01	.00	.37	1.99	2.000	.000	.00	1 .0
.339	.1203					.0001	.00	1.10	.12	.17	.013	.00	.00	PIPE
669.012	3457.947	1.060	3459.007	1.13	.67	.01	3459.01	.00	.37	2.00	2.000	.000	.00	1 .0
.322	.1203					.0001	.00	1.06	.13	.17	.013	.00	.00	PIPE
669.334	3457.986	1.021	3459.007	1.13	.70	.01	3459.01	.00	.37	2.00	2.000	.000	.00	1 .0
.306	.1203					.0001	.00	1.02	.14	.17	.013	.00	.00	PIPE
669.640	3458.023	.983	3459.006	1.13	.74	.01	3459.01	.00	.37	2.00	2.000	.000	.00	1 .0
.291	.1203					.0001	.00	.98	.15	.17	.013	.00	.00	PIPE
669.931	3458.058	.947	3459.005	1.13	.77	.01	3459.01	.00	.37	2.00	2.000	.000	.00	1 .0
.277	.1203					.0001	.00	.95	.16	.17	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR ULTIMATE CONDITION - LATERAL 2

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
670.208	3458.091	.913	3459.004	1.13	.81	.01	3459.01	.00	.37	1.99	2.000	.000	.00	1 .0
.264	.1203					.0001	.00	.91	.17	.17	.013	.00	.00	PIPE
670.472	3458.123	.880	3459.003	1.13	.85	.01	3459.01	.00	.37	1.99	2.000	.000	.00	1 .0
.251	.1203					.0002	.00	.88	.18	.17	.013	.00	.00	PIPE
670.723	3458.153	.849	3459.002	1.13	.89	.01	3459.01	.00	.37	1.98	2.000	.000	.00	1 .0
.239	.1203					.0002	.00	.85	.20	.17	.013	.00	.00	PIPE
670.962	3458.182	.819	3459.001	1.13	.93	.01	3459.01	.00	.37	1.97	2.000	.000	.00	1 .0
.229	.1203					.0002	.00	.82	.21	.17	.013	.00	.00	PIPE
671.190	3458.209	.790	3459.000	1.13	.98	.01	3459.01	.00	.37	1.96	2.000	.000	.00	1 .0
.217	.1203					.0002	.00	.79	.22	.17	.013	.00	.00	PIPE
671.407	3458.236	.763	3458.999	1.13	1.03	.02	3459.01	.00	.37	1.94	2.000	.000	.00	1 .0
.207	.1203					.0003	.00	.76	.24	.17	.013	.00	.00	PIPE
671.614	3458.260	.736	3458.997	1.13	1.08	.02	3459.01	.00	.37	1.93	2.000	.000	.00	1 .0
.197	.1203					.0003	.00	.74	.26	.17	.013	.00	.00	PIPE
671.811	3458.284	.711	3458.995	1.13	1.13	.02	3459.01	.00	.37	1.91	2.000	.000	.00	1 .0
.188	.1203					.0004	.00	.71	.28	.17	.013	.00	.00	PIPE
671.999	3458.307	.687	3458.993	1.13	1.18	.02	3459.02	.00	.37	1.90	2.000	.000	.00	1 .0
.177	.1203					.0004	.00	.69	.29	.17	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE
100-YEAR ULTIMATE CONDITION - LATERAL 2

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	
672.176	3458.328	.663	3458.991	1.13	1.24	.02	3459.02	.00	.37	1.88	2.000	.000	.00	1 .0
.169	.1203					.0005	.00	.66	.31	.17	.013	.00	.00	PIPE
672.345	3458.348	.641	3458.989	1.13	1.30	.03	3459.02	.00	.37	1.87	2.000	.000	.00	1 .0
.160	.1203					.0005	.00	.64	.34	.17	.013	.00	.00	PIPE
672.505	3458.368	.619	3458.986	1.13	1.37	.03	3459.02	.00	.37	1.85	2.000	.000	.00	1 .0
.150	.1203					.0006	.00	.62	.36	.17	.013	.00	.00	PIPE
672.655	3458.386	.598	3458.984	1.13	1.43	.03	3459.02	.00	.37	1.83	2.000	.000	.00	1 .0
.141	.1203					.0007	.00	.60	.38	.17	.013	.00	.00	PIPE
672.797	3458.403	.578	3458.980	1.13	1.50	.04	3459.02	.00	.37	1.81	2.000	.000	.00	1 .0
.133	.1203					.0008	.00	.58	.41	.17	.013	.00	.00	PIPE
672.930	3458.419	.558	3458.977	1.13	1.58	.04	3459.02	.00	.37	1.79	2.000	.000	.00	1 .0
.040	.1203					.0009	.00	.56	.44	.17	.013	.00	.00	PIPE
672.970	3458.424	.540	3458.963	1.13	1.65	.04	3459.01	.00	.37	1.78	2.000	.000	.00	1 .0
HYDRAULIC JUMP														
672.970	3458.424	.223	3458.647	1.13	5.88	.54	3459.18	.00	.37	1.26	2.000	.000	.00	1 .0
.065	.1203					.0337	.00	.22	2.65	.17	.013	.00	.00	PIPE
673.035	3458.432	.231	3458.662	1.13	5.61	.49	3459.15	.00	.37	1.28	2.000	.000	.00	1 .0
.405	.1203					.0294	.01	.23	2.49	.17	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR ULTIMATE CONDITION - LATERAL 2

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
673.440	3458.480	.238	3458.719	1.13	5.34	.44	3459.16	.00	.37	1.30	2.000	.000	.00	1 .0
.343	.1203					.0257	.01	.24	2.33	.17	.013	.00	.00	PIPE
673.783	3458.521	.246	3458.768	1.13	5.10	.40	3459.17	.00	.37	1.31	2.000	.000	.00	1 .0
.291	.1203					.0224	.01	.25	2.19	.17	.013	.00	.00	PIPE
674.074	3458.556	.254	3458.811	1.13	4.86	.37	3459.18	.00	.37	1.33	2.000	.000	.00	1 .0
.247	.1203					.0196	.00	.25	2.05	.17	.013	.00	.00	PIPE
674.320	3458.586	.263	3458.849	1.13	4.63	.33	3459.18	.00	.37	1.35	2.000	.000	.00	1 .0
.209	.1203					.0171	.00	.26	1.92	.17	.013	.00	.00	PIPE
674.529	3458.611	.272	3458.883	1.13	4.42	.30	3459.19	.00	.37	1.37	2.000	.000	.00	1 .0
.175	.1203					.0149	.00	.27	1.80	.17	.013	.00	.00	PIPE
674.704	3458.632	.281	3458.913	1.13	4.21	.28	3459.19	.00	.37	1.39	2.000	.000	.00	1 .0
.147	.1203					.0130	.00	.28	1.69	.17	.013	.00	.00	PIPE
674.851	3458.650	.290	3458.940	1.13	4.02	.25	3459.19	.00	.37	1.41	2.000	.000	.00	1 .0
.120	.1203					.0114	.00	.29	1.58	.17	.013	.00	.00	PIPE
674.971	3458.664	.300	3458.964	1.13	3.83	.23	3459.19	.00	.37	1.43	2.000	.000	.00	1 .0
.097	.1203					.0099	.00	.30	1.48	.17	.013	.00	.00	PIPE
675.068	3458.676	.310	3458.986	1.13	3.65	.21	3459.19	.00	.37	1.45	2.000	.000	.00	1 .0
.075	.1203					.0087	.00	.31	1.39	.17	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE
100-YEAR ULTIMATE CONDITION - LATERAL 2

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	
675.143	3458.685	.320	3459.005	1.13	3.48	.19	3459.19	.00	.37	1.47	2.000	.000	.00	1 .0
.057	.1203					.0076	.00	.32	1.30	.17	.013	.00	.00	PIPE
675.200	3458.692	.331	3459.022	1.13	3.32	.17	3459.19	.00	.37	1.49	2.000	.000	.00	1 .0
.039	.1203					.0066	.00	.33	1.22	.17	.013	.00	.00	PIPE
675.239	3458.696	.342	3459.038	1.13	3.16	.16	3459.19	.00	.37	1.51	2.000	.000	.00	1 .0
.023	.1203					.0058	.00	.34	1.15	.17	.013	.00	.00	PIPE
675.262	3458.699	.353	3459.052	1.13	3.02	.14	3459.19	.00	.37	1.53	2.000	.000	.00	1 .0
.008	.1203					.0050	.00	.35	1.07	.17	.013	.00	.00	PIPE
675.270	3458.700	.366	3459.066	1.13	2.87	.13	3459.19	.00	.37	1.55	2.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE
T3 100-YEAR ULTIMATE CONDITION - LATERAL 2
SO    658.6403456.700  1                          3459.013
REM*****FLEET WING AVENUE WEST LATERAL 2 - SDDI#3
R     685.1703458.950  1      .013                                .000    .000 0
SH    685.1703458.950  1                          3458.950
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             2.870   .0
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FILE: FWW-ULT-MH3-S.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-27-2020 Time:11: 5:42

SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE
100-YEAR ULTIMATE CONDITION - LATERAL 2

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
658.640	3456.700	2.313	3459.013	2.87	.91	.01	3459.03	.00	.59	.00	2.000	.000	.00	1 .0
3.698	.0848					.0002	.00	2.31	.00	.28	.013	.00	.00	PIPE
662.338	3457.013	2.000	3459.013	2.87	.91	.01	3459.03	.00	.59	.00	2.000	.000	.00	1 .0
2.163	.0848					.0001	.00	2.00	.00	.28	.013	.00	.00	PIPE
664.500	3457.197	1.815	3459.011	2.87	.96	.01	3459.03	.00	.59	1.16	2.000	.000	.00	1 .0
1.255	.0848					.0001	.00	1.81	.11	.28	.013	.00	.00	PIPE
665.755	3457.303	1.707	3459.010	2.87	1.00	.02	3459.03	.00	.59	1.41	2.000	.000	.00	1 .0
1.030	.0848					.0002	.00	1.71	.12	.28	.013	.00	.00	PIPE
666.786	3457.391	1.618	3459.009	2.87	1.05	.02	3459.03	.00	.59	1.57	2.000	.000	.00	1 .0
.899	.0848					.0002	.00	1.62	.14	.28	.013	.00	.00	PIPE
667.685	3457.467	1.540	3459.007	2.87	1.11	.02	3459.03	.00	.59	1.68	2.000	.000	.00	1 .0
.805	.0848					.0002	.00	1.54	.16	.28	.013	.00	.00	PIPE
668.490	3457.535	1.470	3459.005	2.87	1.16	.02	3459.03	.00	.59	1.77	2.000	.000	.00	1 .0
.733	.0848					.0002	.00	1.47	.17	.28	.013	.00	.00	PIPE
669.223	3457.597	1.406	3459.004	2.87	1.22	.02	3459.03	.00	.59	1.83	2.000	.000	.00	1 .0
.674	.0848					.0002	.00	1.41	.19	.28	.013	.00	.00	PIPE
669.897	3457.655	1.347	3459.001	2.87	1.28	.03	3459.03	.00	.59	1.88	2.000	.000	.00	1 .0
.624	.0848					.0003	.00	1.35	.21	.28	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date:10-27-2020 Time:11: 5:42

SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR ULTIMATE CONDITION - LATERAL 2

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
670.521	3457.708	1.292	3458.999	2.87	1.34	.03	3459.03	.00	.59	1.91	2.000	.000	.00	1 .0
.580	.0848					.0003	.00	1.29	.22	.28	.013	.00	.00	PIPE
671.101	3457.757	1.240	3458.997	2.87	1.40	.03	3459.03	.00	.59	1.94	2.000	.000	.00	1 .0
.542	.0848					.0003	.00	1.24	.24	.28	.013	.00	.00	PIPE
671.643	3457.803	1.191	3458.994	2.87	1.47	.03	3459.03	.00	.59	1.96	2.000	.000	.00	1 .0
.505	.0848					.0004	.00	1.19	.26	.28	.013	.00	.00	PIPE
672.148	3457.845	1.145	3458.990	2.87	1.54	.04	3459.03	.00	.59	1.98	2.000	.000	.00	1 .0
.473	.0848					.0004	.00	1.15	.28	.28	.013	.00	.00	PIPE
672.621	3457.885	1.101	3458.987	2.87	1.62	.04	3459.03	.00	.59	1.99	2.000	.000	.00	1 .0
.443	.0848					.0005	.00	1.10	.30	.28	.013	.00	.00	PIPE
673.063	3457.923	1.060	3458.983	2.87	1.70	.04	3459.03	.00	.59	2.00	2.000	.000	.00	1 .0
.415	.0848					.0006	.00	1.06	.33	.28	.013	.00	.00	PIPE
673.478	3457.958	1.021	3458.979	2.87	1.78	.05	3459.03	.00	.59	2.00	2.000	.000	.00	1 .0
.387	.0848					.0006	.00	1.02	.35	.28	.013	.00	.00	PIPE
673.865	3457.991	.983	3458.974	2.87	1.87	.05	3459.03	.00	.59	2.00	2.000	.000	.00	1 .0
.067	.0848					.0007	.00	.98	.38	.28	.013	.00	.00	PIPE
673.932	3457.997	.947	3458.944	2.87	1.96	.06	3459.00	.00	.59	2.00	2.000	.000	.00	1 .0

HYDRAULIC JUMP

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SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR ULTIMATE CONDITION - LATERAL 2

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
673.932	3457.997	.323	3458.319	2.87	8.75	1.19	3459.51	.00	.59	1.47	2.000	.000	.00	1 .0
.670	.0848					.0473	.03	.32	3.26	.28	.013	.00	.00	PIPE
674.603	3458.054	.333	3458.387	2.87	8.34	1.08	3459.47	.00	.59	1.49	2.000	.000	.00	1 .0
1.998	.0848					.0413	.08	.33	3.06	.28	.013	.00	.00	PIPE
676.601	3458.223	.345	3458.568	2.87	7.95	.98	3459.55	.00	.59	1.51	2.000	.000	.00	1 .0
1.593	.0848					.0361	.06	.34	2.87	.28	.013	.00	.00	PIPE
678.194	3458.358	.356	3458.715	2.87	7.58	.89	3459.61	.00	.59	1.53	2.000	.000	.00	1 .0
1.297	.0848					.0315	.04	.36	2.69	.28	.013	.00	.00	PIPE
679.490	3458.468	.368	3458.836	2.87	7.23	.81	3459.65	.00	.59	1.55	2.000	.000	.00	1 .0
1.071	.0848					.0275	.03	.37	2.52	.28	.013	.00	.00	PIPE
680.561	3458.559	.381	3458.940	2.87	6.89	.74	3459.68	.00	.59	1.57	2.000	.000	.00	1 .0
.891	.0848					.0241	.02	.38	2.36	.28	.013	.00	.00	PIPE
681.452	3458.635	.393	3459.028	2.87	6.57	.67	3459.70	.00	.59	1.59	2.000	.000	.00	1 .0
.747	.0848					.0210	.02	.39	2.21	.28	.013	.00	.00	PIPE
682.198	3458.698	.407	3459.104	2.87	6.26	.61	3459.71	.00	.59	1.61	2.000	.000	.00	1 .0
.626	.0848					.0184	.01	.41	2.07	.28	.013	.00	.00	PIPE
682.824	3458.751	.421	3459.171	2.87	5.97	.55	3459.73	.00	.59	1.63	2.000	.000	.00	1 .0
.524	.0848					.0161	.01	.42	1.94	.28	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date:10-27-2020 Time:11: 5:42

SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR ULTIMATE CONDITION - LATERAL 2

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
683.348	3458.795	.435	3459.230	2.87	5.69	.50	3459.73	.00	.59	1.65	2.000	.000	.00	1 .0
.436	.0848					.0140	.01	.43	1.82	.28	.013	.00	.00	PIPE
683.785	3458.832	.450	3459.282	2.87	5.43	.46	3459.74	.00	.59	1.67	2.000	.000	.00	1 .0
.363	.0848					.0123	.00	.45	1.70	.28	.013	.00	.00	PIPE
684.147	3458.863	.465	3459.328	2.87	5.18	.42	3459.74	.00	.59	1.69	2.000	.000	.00	1 .0
.296	.0848					.0107	.00	.47	1.59	.28	.013	.00	.00	PIPE
684.443	3458.888	.481	3459.369	2.87	4.94	.38	3459.75	.00	.59	1.71	2.000	.000	.00	1 .0
.237	.0848					.0094	.00	.48	1.49	.28	.013	.00	.00	PIPE
684.681	3458.908	.497	3459.406	2.87	4.71	.34	3459.75	.00	.59	1.73	2.000	.000	.00	1 .0
.184	.0848					.0082	.00	.50	1.40	.28	.013	.00	.00	PIPE
684.864	3458.924	.515	3459.438	2.87	4.49	.31	3459.75	.00	.59	1.75	2.000	.000	.00	1 .0
.138	.0848					.0072	.00	.51	1.31	.28	.013	.00	.00	PIPE
685.002	3458.936	.532	3459.468	2.87	4.28	.28	3459.75	.00	.59	1.77	2.000	.000	.00	1 .0
.095	.0848					.0063	.00	.53	1.22	.28	.013	.00	.00	PIPE
685.097	3458.944	.551	3459.494	2.87	4.08	.26	3459.75	.00	.59	1.79	2.000	.000	.00	1 .0
.054	.0848					.0055	.00	.55	1.15	.28	.013	.00	.00	PIPE
685.151	3458.948	.570	3459.518	2.87	3.89	.23	3459.75	.00	.59	1.81	2.000	.000	.00	1 .0
.019	.0848					.0048	.00	.57	1.07	.28	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date:10-27-2020 Time:11: 5:42

SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR ULTIMATE CONDITION - LATERAL 2

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
685.170	3458.950	.591	3459.541	2.87	3.70	.21	3459.75	.00	.59	1.82	2.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE
T3 100-YEAR ULTIMATE CONDITION - LATERAL 1
SO   1000.9803481.150  1                          3486.229
REM*****FLEET WING AVENUE WEST LATERAL 1 - SDDI#4
R    1030.8003483.390  1      .013                                 .000    .000 0
SH   1030.8003483.390  1                          3483.390
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             6.750   .0
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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date:10-27-2020 Time:11: 5:58

SUMMERLIN WEST VILLAGE 22

FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE

100-YEAR ULTIMATE CONDITION - LATERAL 1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1000.980	3481.150	5.079	3486.229	6.75	2.15	.07	3486.30	.00	.92	.00	2.000	.000	.00	1 .0
29.820	.0751				.0009	.03	5.08	.00	.45	.013	.00	.00	PIPE	
1030.800	3483.390	2.866	3486.256	6.75	2.15	.07	3486.33	.00	.92	.00	2.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE
T3 100-YEAR ULTIMATE CONDITION - LATERAL 1
SO   1000.9803481.150  1                          3486.229
REM*****FLEET WING AVENUE WEST LATERAL 1 - SDDI#3
R    1012.8403483.230  1      .013                                 .000    .000 0
SH   1012.8403483.230  1                          3483.230
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             3.870   .0
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FILE: FWW-ULT-MH5-S.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1
Program Package Serial Number: 7271
WATER SURFACE PROFILE LISTING Date:10-27-2020 Time:11: 6:13

SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE - KETTLE RIDGE DRIVE TO SCURY BEND DRIVE
100-YEAR ULTIMATE CONDITION - LATERAL 1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1000.980	3481.150	5.079	3486.229	3.87	1.23	.02	3486.25	.00	.69	.00	2.000	.000	.00	1 .0
11.860	.1754				.0003	.00	5.08	.00	.28	.013		.00	.00	PIPE
1012.840	3483.230	3.002	3486.232	3.87	1.23	.02	3486.26	.00	.69	.00	2.000	.000	.00	1 .0

Appendix D. Referenced Report



SNC·LAVALIN

ATKINS
Member of the SNC-Lavalin Group

SUMMERLIN®

Summerlin West Village 22

Scurry Bend Drive

Sunset Run Drive (Street Q) to Fleet Wing Avenue (Street G)

Rough Grade Technical Drainage Memo

February 25th 2020

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Summerlin West Village 22 Scurry Bend Drive Rough Grade Date: February 25, 2020

Location of Development: a) Descriptive (Cross Streets) North/South: Scurry Bend Drive

East/West: Fleet Wing Avenue

b) Section: 23 and 14 Township: 20S Range: 59E

c) APN : 137-14-401-006, 137-23-101-002

Name of Owner: Howard Hughes Company, LLC

Telephone No.: (702) 791-4000 Fax No.: (702) 791-4450 E-Mail Address: chris.anderson@howardhughes.com

Address: 10801 West Charleston Blvd, Ste 300, Las Vegas, NV 89135

Contact Person-Name: Molly Anderson, PE **Telephone No.:** (702) 551-0330

* **E-Mail Address:** molly.anderson@atkinsglobal.com **Fax No.:** (702) 263-7200

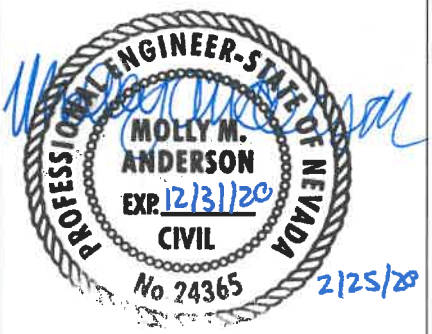
Firm: Atkins

Address: 2270 Corporate Circle, Ste 200, Henderson, NV 89074

Type of Land Development/Land Disturbance Process:

	Rezoning		Subdivision Map	x	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: +/- 446 acres Being Developed/Disturbed: +/- 12 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.): Rough Grade
5. Approximate upstream land area which drains to the subject site: 225.54 acres
6. Has the site drainage been evaluated in the past? ✔ **YES** **NO** If yes, please identify documentation: Overall Master Conceptual Drainage Study for Summerlin West
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Existing CC-215 Western Beltway Channel
8. Briefly describe your proposed schedule for the subject project: ASAP



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

Hydrologic Analysis

The existing site conditions 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 improvements and adjacent development. 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 22. An additional existing condition hydrologic model was not required as part of this study.

Atkins analyzed the interim condition for the proposed rough grade roadway, Scurry Bend Drive from Sunset Run Drive to Fleet Wing Avenue. Construction of Sunset Run Drive is to be completed prior to the interim conditions of Scurry Bend Drive but construction of Lake Mead Boulevard will not be complete. Drainage basins to the west of the newly constructed Sunset Run Drive will be intercepted before entering Scurry Bend Drive in the interim and ultimate conditions. However, there is additional area west of Lake Mead Boulevard which will not be intercepted in the interim condition. HEC-1 was used to model interim subbasins. The results are summarized in Figure 1.

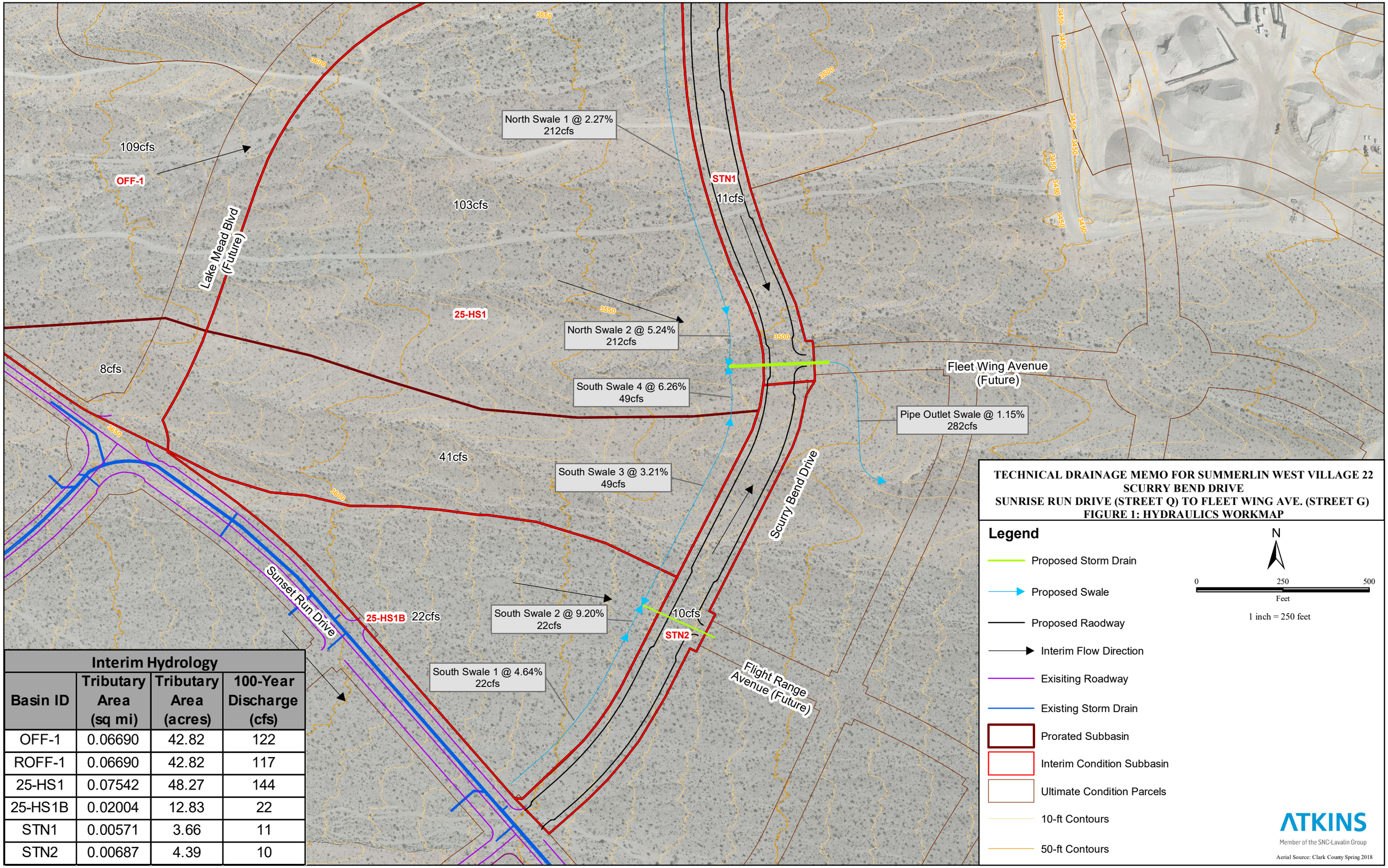
The ultimate condition flows were directly referenced from the approved MCDS as shown in the HEC-1 output and in the Ultimate Condition Basin Map.

Hydraulic Analysis

The computer program Bentley FlowMaster V10.2 was utilized to perform normal depth calculations for the proposed storm drains. The storm drain at Fleet Wing Avenue was designed to capture the total interim flows, 261 cfs, and return them to the natural flow path. This flow plus the additional street flow, 282 cfs, will drain east to the existing 42-inch stub that discharges into the 6'x10' regional storm drain facility in Kindle Rise Way. The storm drain at Flight Range Avenue was designed to capture the flow coming from 25-HS1B, 22 cfs.

Riprap calculations were performed utilizing shear stress calculations based on HCDDM Section 705 using HEC-11 methodology. Shear stress calculations show that a median riprap particle size (D50), for roadside swales parallel to Scurry Bend Drive, of 8 to 12 inches is required to resist the average channel shear stress for the channel velocities along the ditch. The interim outlet swale at Fleet Wing Avenue to return flows to the existing flow paths require a median riprap particle size (D50) of 8 inches.

Atkins developed a two-dimensional (2D) hydraulic model of the existing terrain in Summerlin West development area in August 2019 to establish baseline existing hydraulics. The model was developed using the US Army Corps of Engineers HEC-RAS V. 5.0.7. A proposed conditions 2D hydraulic model was created to determine the impacts from fill grading the proposed Desert Foothills Drive (Southbound) alignment, last shown in Summerlin Village 21/22 -3550 Zone 24" Waterline (DS#4076) per G.C.Wallace, Inc. This analysis found no negative impacts to the downstream areas due to the fill grading.



Interim Hydrology			
Basin ID	Tributary Area (sq mi)	Tributary Area (acres)	100-Year Discharge (cfs)
OFF-1	0.06690	42.82	122
ROFF-1	0.06690	42.82	117
25-HS1	0.07542	48.27	144
25-HS1B	0.02004	12.83	22
STN1	0.00571	3.66	11
STN2	0.00687	4.39	10

TECHNICAL DRAINAGE MEMO FOR SUMMERLIN WEST VILLAGE 22
SCURRY BEND DRIVE
SUNRISE RUN DRIVE (STREET Q) TO FLEET WING AVE. (STREET G)
FIGURE 1: HYDRAULICS WORKMAP

Legend

- Proposed Storm Drain
- Proposed Swale
- Proposed Raodway
- Interim Flow Direction
- Exisiting Roadway
- Existing Storm Drain
- Prorated Subbasin
- Interim Condition Subbasin
- Ultimate Condition Parcels
- 10-ft Contours
- 50-ft Contours

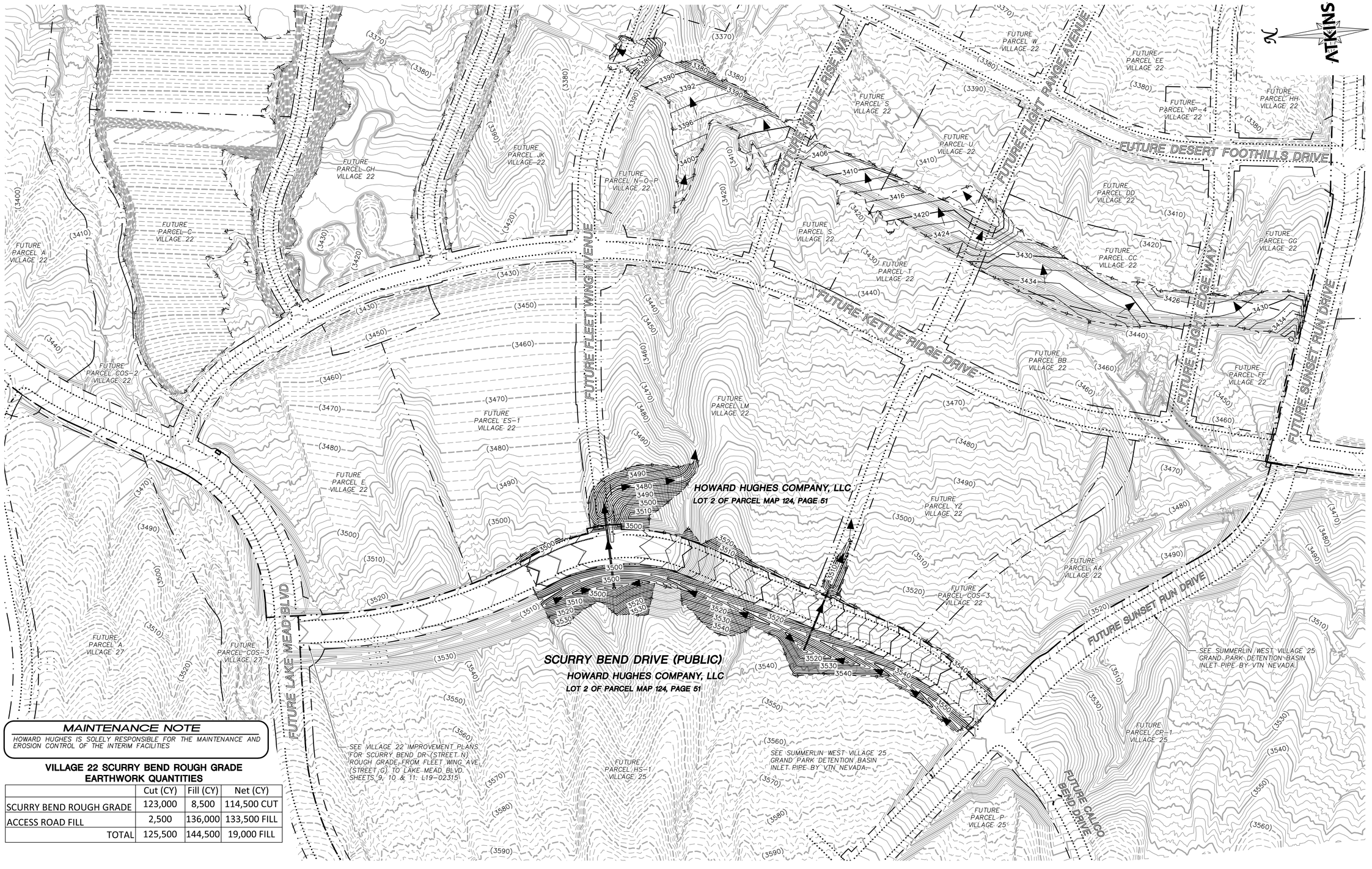
N

0 250 500
Feet

1 inch = 250 feet

ATKINS
Member of the SNC-Lavalin Group

Aerial Source: Clark County Spring 2018



MAINTENANCE NOTE

HOWARD HUGHES IS SOLELY RESPONSIBLE FOR THE MAINTENANCE AND EROSION CONTROL OF THE INTERIM FACILITIES

VILLAGE 22 SCURRY BEND ROUGH GRADE EARTHWORK QUANTITIES

	Cut (CY)	Fill (CY)	Net (CY)
SCURRY BEND ROUGH GRADE	123,000	8,500	114,500 CUT
ACCESS ROAD FILL	2,500	136,000	133,500 FILL
TOTAL	125,500	144,500	19,000 FILL

GRAPHIC SCALE
100 0 50 100 200
HORIZONTAL: 1"=100'

ROUGH GRADING NOTE

THE INTENT OF THESE PLANS IS TO PROVIDE GENERAL ROUGH GRADING OF A FUTURE ROADWAY TO EXTEND A WATERLINE TO A PRESSURE REDUCING VALVE AND TO RE-ESTABLISH PREVIOUSLY EXISTING DRAINAGE PATTERNS.

SOILS REPORT

BY NOVA
PROJECT NO. G-18-176
DATED 12/03/18 AND
SUBSEQUENT UPDATE LETTER
DATED 12/30/19
EARTHWORK QUANTITIES (RAW):
CUT= 125,500 CU YDS
FILL= 144,500 CU YDS

GRADING PLAN CERTIFICATION

ANTHONY J. ORTIZ PE#18849 10/15/2020 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.

DS#5253

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 FIBER/FAST 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

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PROFESSIONAL ENGINEER - STATE OF NEVADA
ANTHONY J. ORTIZ
EXP. 12-31-21
CIVIL
No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1702.263.7275
Fax: +1702.263.7200

SUMMERLIN

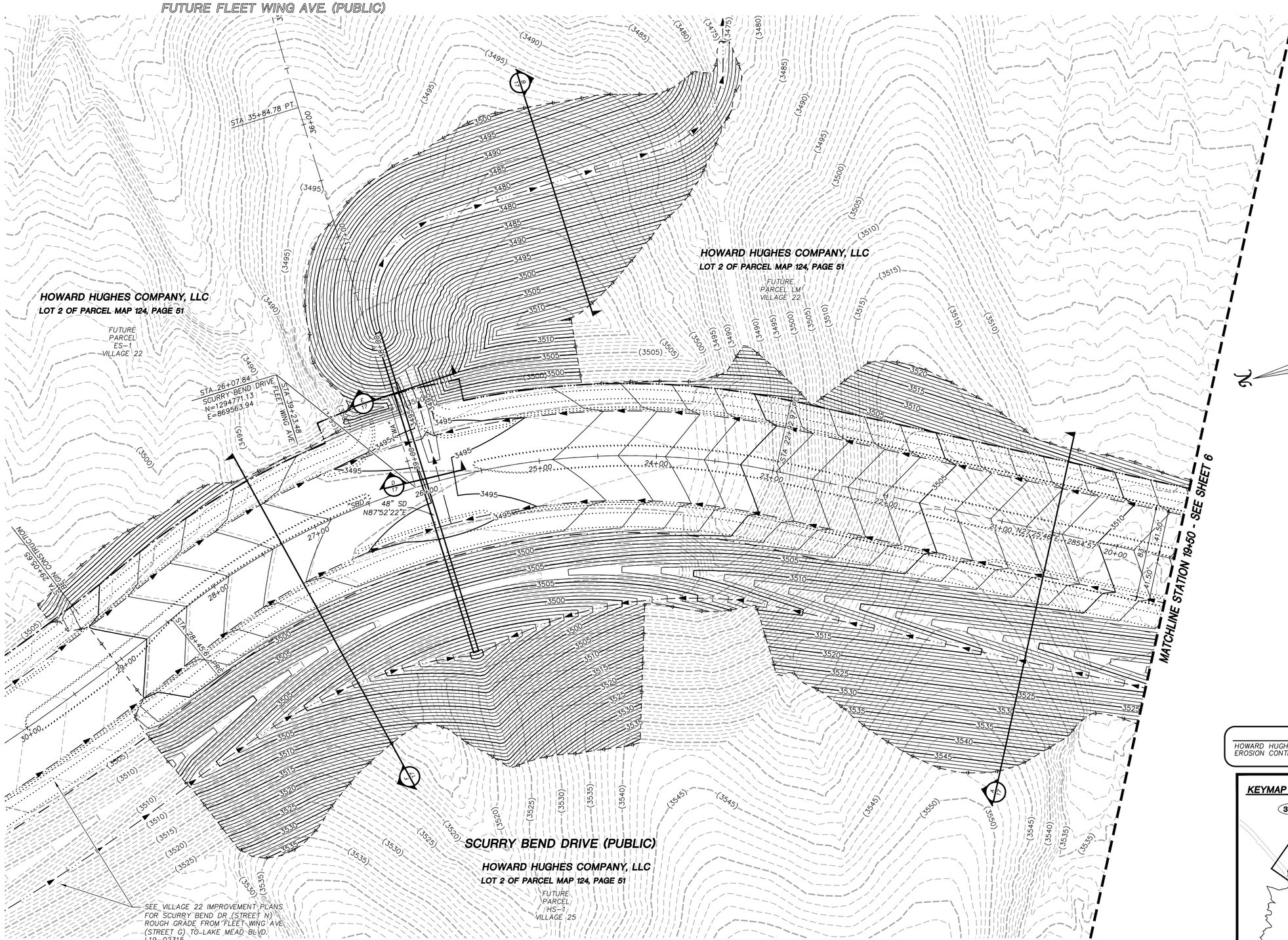
SUMMERLIN VILLAGE 22
SCURRY BEND DRIVE (STREET N) ROUGH GRADE
SUNSET RUN DRIVE TO FLEET WING AVENUE (STREET G)

MASTER GRADING PLAN

DESIGNED BY: J. BANTA
DRAWN BY: C. DANIELS
CHECKED BY: P. BATES
HORIZ.: 1"=40'
VERT.: 1"=8'

107V8560
L20-01966
DATE: OCTOBER, 2020
DRAWING NO. 4 /18
JOB NO. 100068040

X:\Projects\SummWest\Village 22\100068040 - V22 Scurry Bend Dr (Sunset Run to Fleet Wing)_Sheets\68040-04-GROA-61.dwg LAYOUT: 4 Oct 15, 2020 - 3:48PM



GRAPHIC SCALE
40 0 20 40 80
HORIZONTAL: 1"=40'

SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY	UNIT
DRAINAGE		
48" RCP CLASS III	285	LF
36" RCP CLASS III	259	LF
RIP-RAP (D50=8", 16" THICKNESS)	2,935	CY
RIP-RAP (D50=12", 24" THICKNESS)	544	CY
EARTHWORK		
CUT	125,500	CY
FILL	144,500	CY
NET	19,000	CY

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.

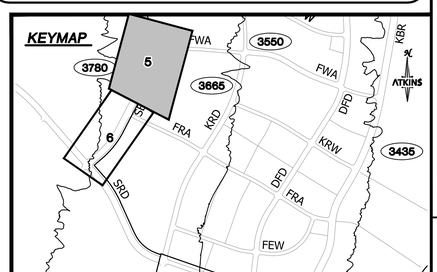
STORM DRAIN NOTES

1. SEE ROUGH GRADING PLAN AND PROFILE SHEETS FOR CONSTRUCTION DETAILS.
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.

MAINTENANCE NOTE

HOWARD HUGHES IS SOLELY RESPONSIBLE FOR THE MAINTENANCE AND EROSION CONTROL OF THE INTERIM FACILITIES

KEYMAP



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PROFESSIONAL ENGINEER-STATE OF NEVADA
ANTHONY J. ORTIZ
EXP. 12-31-21
CIVIL
No. 18849

SOILS REPORT

BY NOVA
PROJECT NO. G-18-176
DATED 12/03/18 AND
SUBSEQUENT UPDATE LETTER
DATED 12/30/19
EARTHWORK QUANTITIES (RAW):
CUT= 125,500 CU YDS
FILL= 144,500 CU YDS

GRADING PLAN CERTIFICATION

ANTHONY J. ORTIZ PE#18849 10/15/2020 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. DS#5253

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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T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 NEVADA 811 NATIONAL SYSTEM OF TRANSPORTATION

Call before you D g AVOID CUTTING UNDERGROUND UTILITY LINES IN YOUR COUNTY. Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES IN YOUR COUNTY. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1702.263.7275
Fax: +1702.263.7200

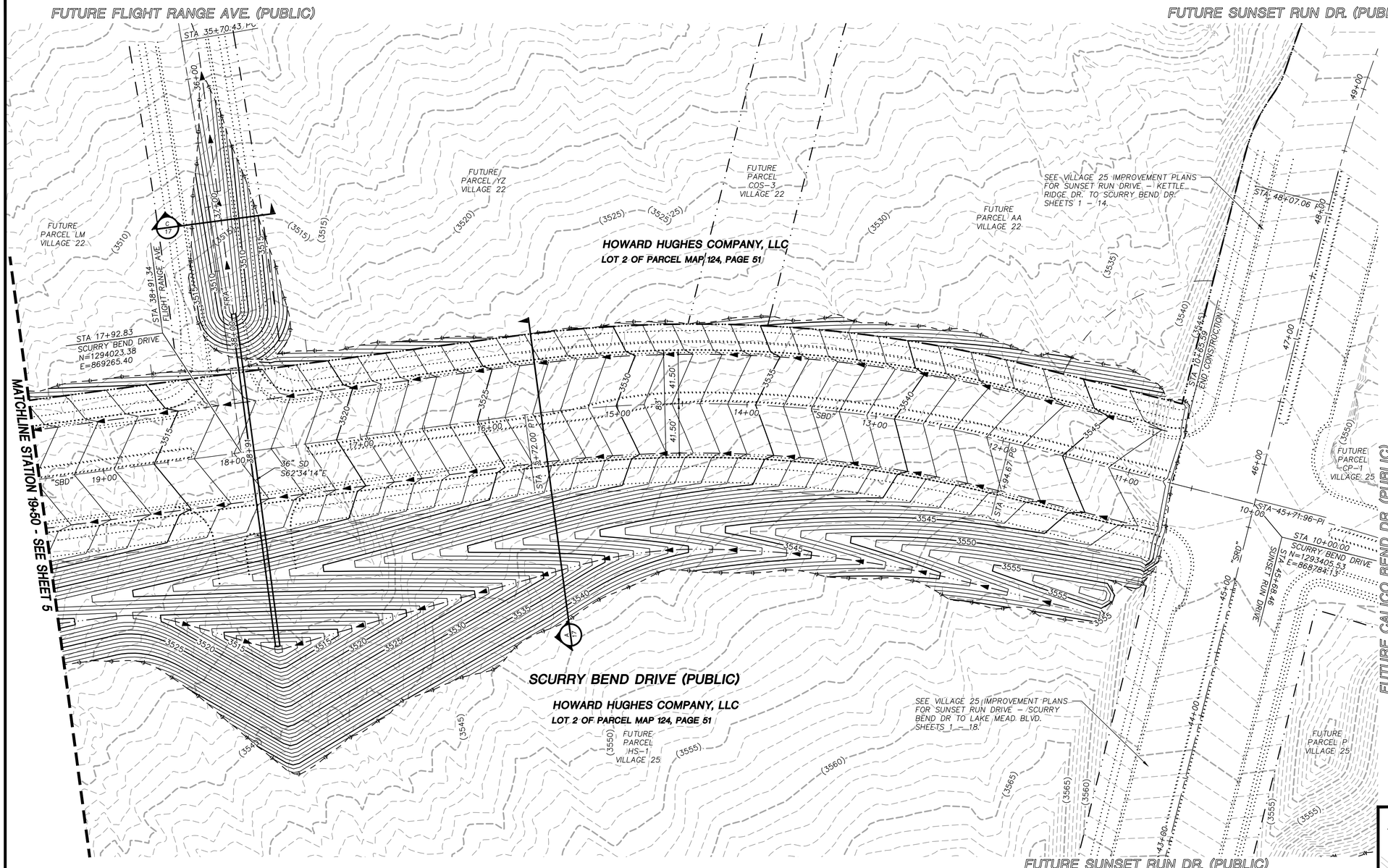
SUMMERLIN

SUMMERLIN VILLAGE 22
SCURRY BEND DRIVE (STREET N) ROUGH GRADE
SUNSET RUN DRIVE TO FLEET WING AVENUE (STREET G)

MASTER DRAINAGE PLAN
STA 19+50 TO END

DESIGNED BY:	BANTA
DRAWN BY:	C. DANIELS
CHECKED BY:	P. BATES
HORIZ.:	1"=40'
VERT.:	1"=8'
107V9560	
L20-01966	
DATE:	OCTOBER, 2020
DRAWING NO.	5 /18
JOB NO.	100068040

X:\Projects\SummWest\Village 22\100068040 - V22 Scurry Bend Dr (Sunset Run to Fleet Wing)_Sheets\68040-05-STRM-S01.dwg LAYOUT: 5 Oct 15, 2020 - 3:49PM



SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY	UNIT
DRAINAGE		
48" RCP CLASS III	285	LF
36" RCP CLASS III	259	LF
RIP-RAP (D50=8", 16" THICKNESS)	2,935	CY
RIP-RAP (D50=12", 24" THICKNESS)	544	CY
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CUT	125,500	CY
FILL	144,500	CY
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MASTER PLAN NOTE

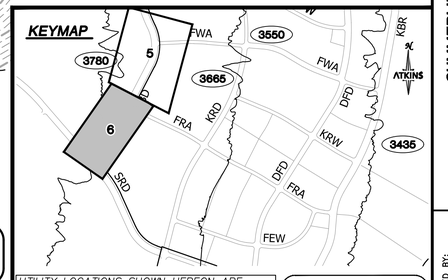
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STORM DRAIN NOTES

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3. CONTRACTOR TO PROVIDE 6" MINIMUM OF CLEARANCE BETWEEN OUTSIDE OF PIPE TO INSIDE WALL OF STORM DRAIN STRUCTURES.

MAINTENANCE NOTE

HOWARD HUGHES IS SOLELY RESPONSIBLE FOR THE MAINTENANCE AND EROSION CONTROL OF THE INTERIM FACILITIES



GRAPHIC SCALE
40 0 20 40 80
HORIZONTAL: 1"=40'

SOILS REPORT

BY NOVA
PROJECT NO. G-18-176
DATED 12/03/18 AND
SUBSEQUENT UPDATE LETTER
DATED 12/30/19
EARTHWORK QUANTITIES (RAW):
CUT= 125,500 CU YDS
FILL= 144,500 CU YDS

GRADING PLAN CERTIFICATION

ANTHONY J. ORTIZ PE#18849 — 10/15/2020 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. DS#5253

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 NATIONAL SYSTEM OF TRANSPORTATION

Call before you D g AVOID CUTTING UNDERGROUND UTILITY LINES IN CONTY. Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES. IT'S CONTY. 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

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1702.263.7275
Fax: +1702.263.7200

SUMMERLIN

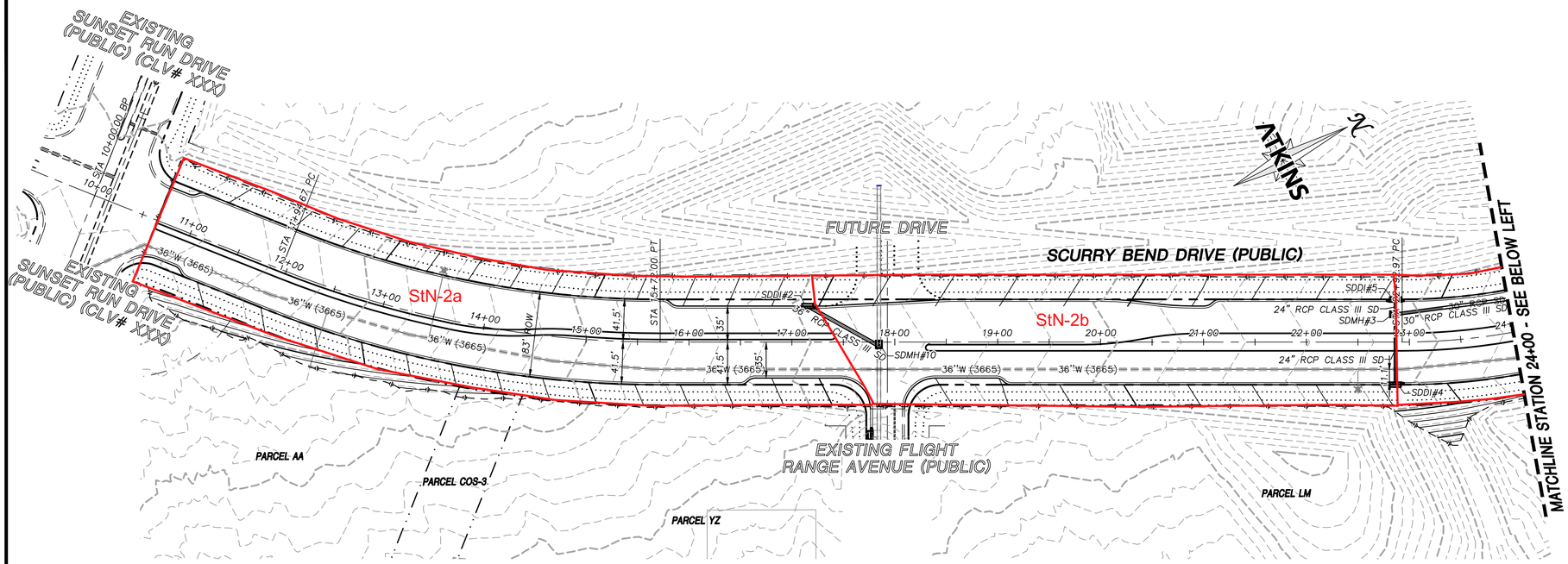
SUMMERLIN VILLAGE 22
SCURRY BEND DRIVE (STREET N) ROUGH GRADE
SUNSET RUN DRIVE TO FLEET WING AVENUE (STREET G)

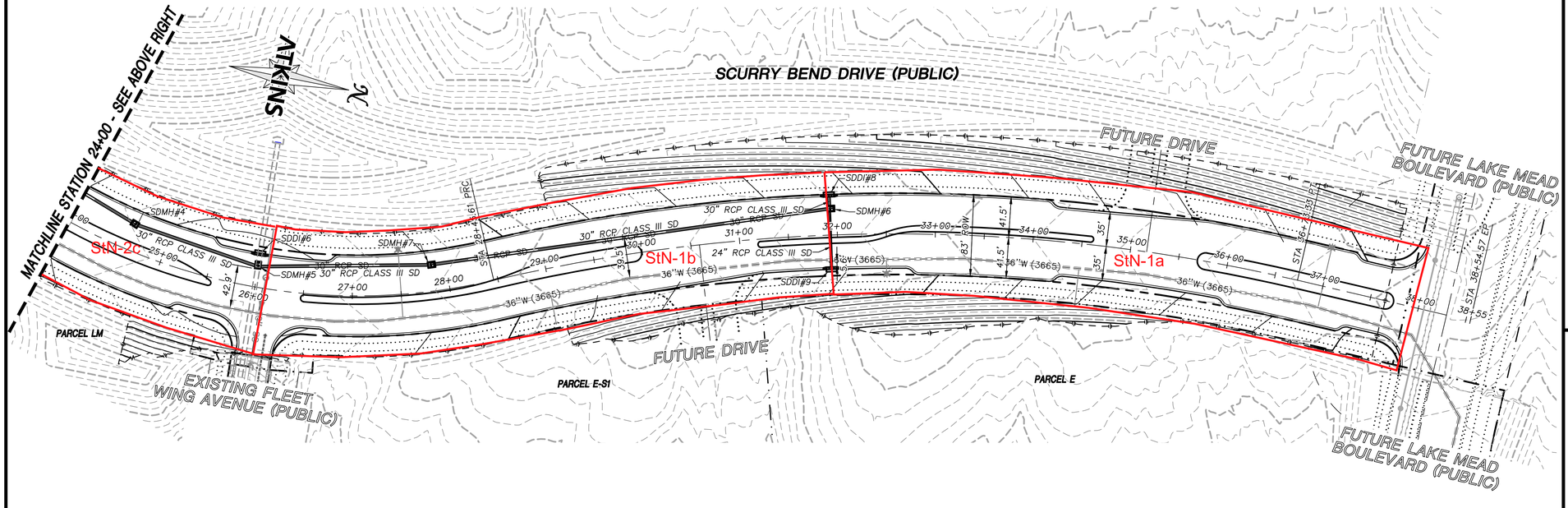
MASTER DRAINAGE PLAN BEGIN TO STA 19+50

DESIGNED BY: N. BARCOS
DRAWN BY: L. MAMACLAY
CHECKED BY: P. BATES
HORIZ.: 1"=40'
VERT.: 1"=8'

107V8560
L20-01966
DATE: OCTOBER, 2020
DRAWING NO. 6 /18
JOB NO. 100068040

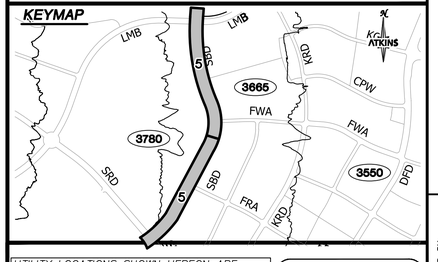
X:\Projects\SummerWest\Village 22\100068040 - V22 Scurry Bend Dr (Sunset Run to Fleet Wing)_Sheets\68040-05-STRM-SD1.dwg LAYOUT: 6 Oct 15, 2020 - 3:49PM





SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY	UNIT
DRAINAGE		
	XX	



GRAPHIC SCALE
60 0 30 60 120
HORIZONTAL: 1"= 60'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT

PROJECT NO. 000000 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 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.

DS#XXX-0000

BASIS OF BEARING

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T21S,R59E,S03

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Call before you Dig AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COURTLY. Call 811 OR 1-800-642-2444

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NOT FOR CONSTRUCTION 60% SUBMITTAL

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 WEST VILLAGE 25
SCURRY BEND DRIVE (STREET N)
SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD

MASTER STORM DRAIN PLAN

DESIGNED BY: G. BLAKE
DRAWN BY: L. MAMACLAY
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE
XXXVXXXX
LXX=XXXXX
DATE: JUNE, 2020
DRAWING NO. 5/23
JOB NO. 100069098

K:\Projects\SummitWest\Village 25\100069098 - V25 Scurry Bend Dr (Sunset Run to Lake Mead)_Sheets\69098-07-STRM-SD1.dwg LAYOUT: SD1 Jun 25, 2020 - 4:21PM



SNC·LAVALIN

ATKINS
Member of the SNC-Lavalin Group

SUMMERLIN®

Summerlin West Village 22

Fleet Wing Avenue (Street G)

Desert Foothills Drive to Kettle Ridge Drive (Street J)

October 2020

Addendum #1

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Fleet Wing Avenue (Street G): Desert Foothills Drive to Kettle Ridge Drive (Street J) Date: October 2020

Location of Development: a) Descriptive (Cross Streets) North/South: Desert Foothills Drive

East/West: Lake Mead Blvd

b) Section: 03 Township: 21S Range: 59E

c) APN : 137-23-210-001

Name of Owner: Howard Hughes Company, LLC

Telephone No.: (702) 791-4000 Fax No.: (702) 791-4450 E-Mail Address: april.chapman@howardhughes.com

Address: 10801 West Charleston Blvd, Ste 300, Las Vegas, NV 89135

Contact Person-Name: Molly Anderson, PE **Telephone No.:** (702) 551-0330

* **E-Mail Address:** molly.anderson@atkinsglobal.com **Fax No.:** (702) 263-7200

Firm: Atkins

Address: 2270 Corporate Circle, Ste 200, Henderson, NV 89074

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	X	Roadway Improvements

1. Total Owned Land Area: At Site: +/- 446 acres Being Developed/Disturbed: 11.7 acres
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ **Yes**** ✔ **No**
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? **Yes**** ✔ **No**
4. Proposed type of development (Residential, Commercial, Etc.): Public - Roadway Improvements
5. Approximate upstream land area which drains to the subject site: 0 acres
6. Has the site drainage been evaluated in the past? ✔ **YES** **NO** If yes, please identify documentation: Master Conceptual Drainage Study for Summerlin West Village 22
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Existing CC-215 Western Beltway Channel
8. Briefly describe your proposed schedule for the subject project: ASAP

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.**

DS #5278A

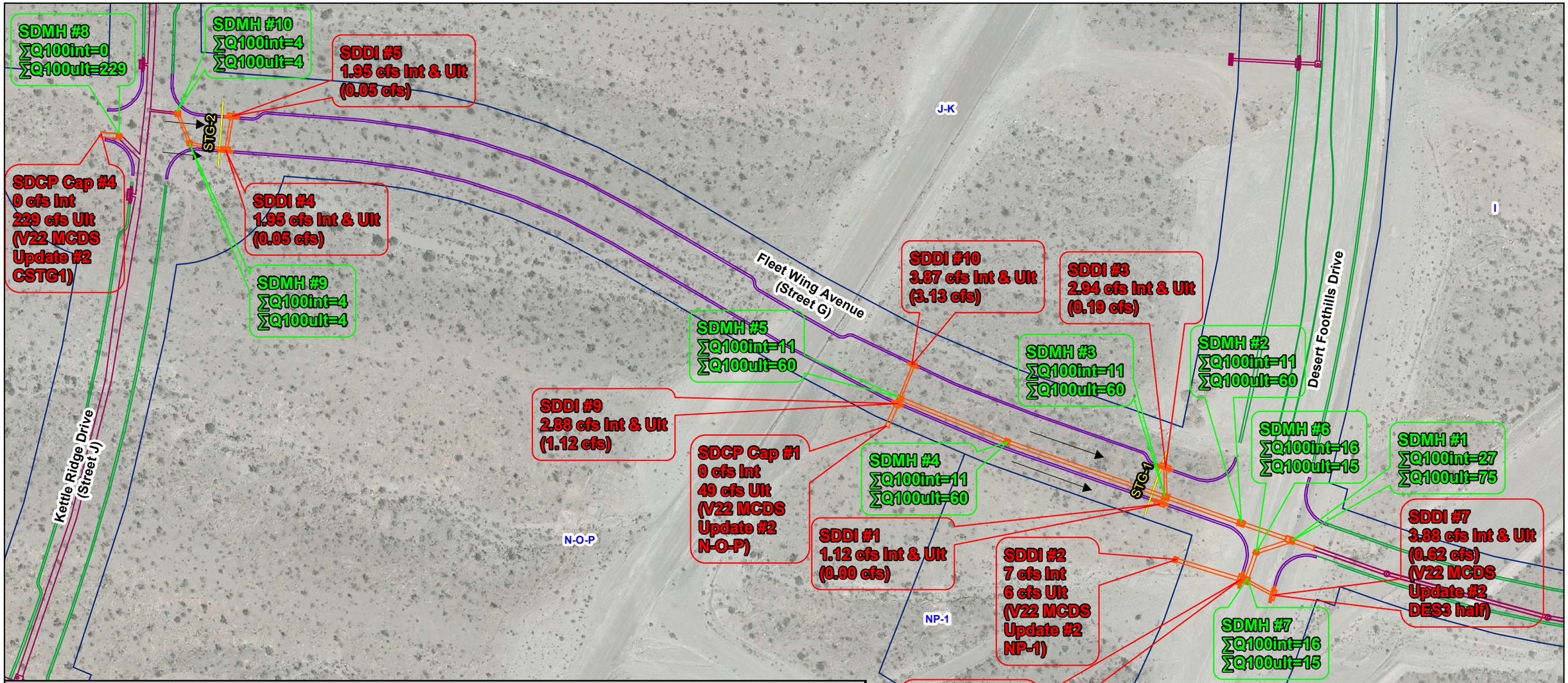
Local Entity File No.

Revision	Date
Original TDS	May 7, 2020

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008



Interim / Ultimate Condition (100-Year) Street Flow and Drop Inlet Calculations Summary Table

XS/SD ID	Total Discharge (cfs)	Total Discharge Source	Drop Inlet			Flow Depth in Street (ft)	Velocity of Flow in Street (ft/s)	Depth*Velocity (must be less than 8)
			Intercepted Flow (cfs)	Bypass Flow (cfs)	Sump Depth (ft)			
STG-1	**11.0**	StrG-N + StrG-S	N/A	N/A	N/A	0.26	5.80	1.51
STG-2	**4.0**	StrJ-3E + StrJ-4E	N/A	N/A	N/A	0.22	3.19	0.70
SDDI #1	**1.12**	Bypass SDDI #9	1.12	0.00	N/A	N/A	N/A	N/A
SDDI #2	**7 (int) / 6 (ult)**	Int-G1 (int) / V22 MCDS Update #2 NP-1 (ult)	7.00 / 6.00	N/A	0.7	N/A	N/A	N/A
SDDI #3	**3.13**	Bypass SDDI #10	2.94	0.19	N/A	N/A	N/A	N/A
SDDI #4	**2.00**	StrJ-4E	1.95	0.05	N/A	N/A	N/A	N/A
SDDI #5	**2.00**	StrJ-3E	1.95	0.05	N/A	N/A	N/A	N/A
SDDI #7	**4.50**	Half of V22 MCDS Update #2 DES3	3.88	0.62	N/A	N/A	N/A	N/A
SDDI #8	**4.50**	Half of V22 MCDS Update #2 DES3	3.88	0.62	N/A	N/A	N/A	N/A
SDDI #9	**4.00**	StrG-S	2.88	1.12	N/A	N/A	N/A	N/A
SDDI #10	**7.00**	StrG-N	5.76	0.24	N/A	N/A	N/A	N/A

TECHNICAL DRAINAGE STUDY FOR SUMMERLIN VILLAGE 22
FLEET WING AVENUE (STREET G)
(DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J))
FIGURE 4: HYDRAULICS WORKMAP

- Proposed Storm Drain
- Existing Storm Drain
- Street Flows
- Cross Sections
- Existing Roadways
- Proposed Roadway
- Ultimate Condition Parcels

Intercepted Flow (Bypass Flow)

N

1 inch = 100 feet

ATKINS
Member of the SNC-Lavalin Group

Aerial Source: Clark County Spring 2018

0 50 100 200 300 400 Feet

Appendix E. CD-ROM

Atkins

2270 Corporate Circle
Suite 200
Henderson, NV 89074-7755

Tel: +1 702 263 7275/+1 800 483 6244
Fax: +1 702 263 7200
Direct: +1 702 551 0365
Janelle.Klein@atkinsglobal.com

© Atkins North America, Inc. except where stated otherwise

SUMMERLIN VILLAGE 22
IMPROVEMENT PLANS FOR:

FLEET WING AVENUE (STREET G)

KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRIVE (STREET N) FUTURE SID PROJECT

APN: 137-23-201-001

SUMMERLIN®

SHEET INDEX

1	COVER SHEET	
2	LEGEND AND ABBREVIATIONS	
3	GENERAL NOTES	
4	HORIZONTAL CONTROL PLAN	
5	MASTER DRAINAGE PLAN	
6	MASTER WATER PLAN	
7	MASTER SEWER PLAN	
8	ROADWAY GRADING PLAN	SCURRY BEND DRIVE TO STA 35+00
9	ROADWAY PLAN AND PROFILE	SCURRY BEND DRIVE TO STA 35+00
10	ROADWAY GRADING PLAN	STA 35+00 TO STA 31+00
11	ROADWAY PLAN AND PROFILE	STA 35+00 TO STA 31+00
12	ROADWAY GRADING PLAN	STA 31+00 TO KETTLE RIDGE DRIVE
13	ROADWAY PLAN AND PROFILE	STA 31+00 TO KETTLE RIDGE DRIVE
14	STORM DRAIN LATERAL PROFILES	
15	WATER LATERAL PROFILES	
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18	SIGNAGE AND STRIPING PLAN	
19	TYPICAL SECTIONS	
20	WATER DETAILS	
21	STREETLIGHT DETAILS	

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.

DISCLAIMER NOTE

EXISTING 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 IN THEIR PROPER LOCATION.

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
0.97 AC

PROPOSED DISTURBED AREA ACREAGE
3.56 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-18-176
DATED: DECEMBER 3, 2018
AND SUBSEQUENT UPDATE LETTER
DATED: DECEMBER 30, 2019

OWNER /DEVELOPER

OWNER

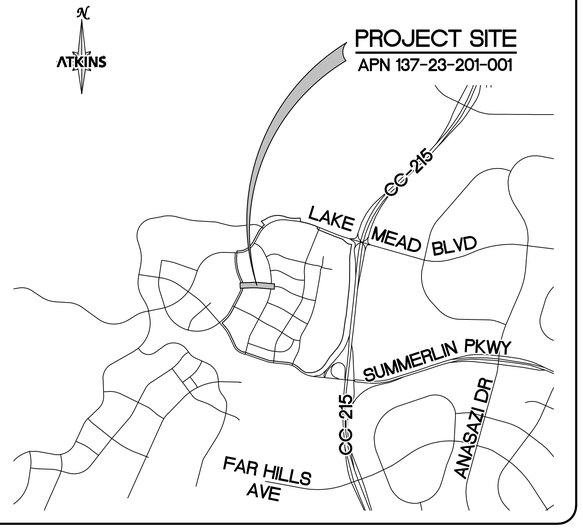
CONTACT: KEVIN ORROCK
HOWARD HUGHES COMPANY LLC, A DELAWARE LIMITED LIABILITY COMPANY
10845 GRIFFITH PEAK DRIVE, SUITE 160
LAS VEGAS, NV 89135

ENGINEER / CONSULTANT

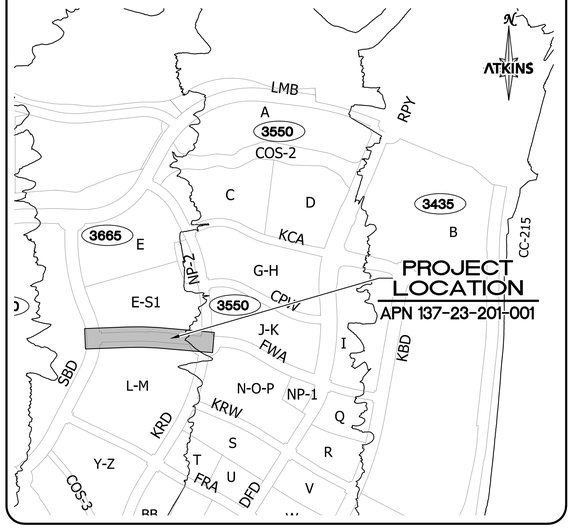
CIVIL

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

STEVEN FORD, P.E. #012175 — DATE
CITY ENGINEER

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 PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

SHEETS: _____

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 123 OF PLATS, PAGE 08, OFFICIAL RECORDS, CITY OF LAS VEGAS CLARK COUNTY, NEVADA

FAST Call before you UnderGround 1-702-432-5300 — FUNDED AND ACCEPTED 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

NOT FOR CONSTRUCTION
90% SUBMITTAL

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 WEST VILLAGE 22
FLEET WING AVENUE (STREET G)
KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRIVE (STREET N)

COVER SHEET

DESIGNED BY: L. MAHAJLAY
DRAWN BY: G. HANSEN
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE

XXXVXXXX
LXX-YXXXX

DATE: OCTOBER, 2020

DRAWING NO. 1/21

JOB NO. 100068235

K:\Projects\SummWest\Village 22\100068235 - V22 Fleet Wing (Kettle Ridge to Scurry Bend)_Sheets\68235-01-TTL-01.dwg LAYOUT: 1 TITLE Oct 28, 2020 - 10:50AM

@	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
COS	COMMUNITY OPEN SPACE
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/INTERIM
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
ULT	ULTIMATE
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)

	EXISTING	PROPOSED
DAYLIGHT LINE		
FLOWLINE		
CENTERLINE		
PARCEL LINE		
RIGHT OF WAY		
PAVEMENT STRIPING		
OVERHEAD POWER	—OHP— — — — —OHP— — — —	
UNDERGROUND POWER	—UGP— — — — —UGP— — — —	
SANITARY SEWER	—S— — — — —S— — — — —S— — — —	15" SS
WATER		24"W (3550)
STORM DRAIN		
GAS	—G— — — — —G— — — — —G— — — —	
CABLE T.V.	—CATV— — — — —CATV— — — —	
TELEPHONE	—T— — — — —T— — — — —T— — — —	
STREETLIGHT CONDUIT	—STLT— — — — —STLT— — — —	STLT
STOP BAR		
CONCRETE ENCASEMENT		
FENCE		
BLOCK WALL		
RETAINING WALL		
SAWCUT PAVEMENT		
CONTOUR	—(3000)— — — — —	3005
CURB AND GUTTER		
EDGE OF PAVEMENT		
EASEMENT		
MATCHLINE		
SIGN		
DOUBLE POST SIGN		
STORM DRAIN MANHOLE	SD	
STORM DRAIN STRUCTURE		
DROP INLET		
BEEHIVE INLET		
SEWER MANHOLE	S	S
FIRE HYDRANT		
CAP AND BLOWOFF		
GATE VALVE		
REDUCER		
STREETLIGHT	OR	
PULLBOX		
SIGNAL POLE		
ELEVATION	(0000.0) FG	0000.0 FG
WATER PRESSURE ZONE BOUNDARY		
WATER PRESSURE ZONE		3550
RIP–RAP		
		FUTURE
HARDSCAPE		

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.

ROADWAY ALIGNMENT DESIGNATIONS
"KRD" = KETTLE RIDGE DRIVE
"SRD" = SUNSET RUN DRIVE
"FWA" = FLEET WING AVENUE
"FEW" = FLIGHT EDGE WAY
"FRA" = FLIGHT RANGE AVENUE
"KRW" = KINDLE RISE WAY
"SBD" = SCURRY BEND DRIVE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT NO. 0000 FIRST APPROVED 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.

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 NEVADA811.COM NATIONAL SYSTEM OF TRANSPORTATION

Call before you D g VOID CUTTING UNDERGROUND UTILITY LINES IN CLARK COUNTY. Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES, IT'S CLARK'S. 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.

NOT FOR CONSTRUCTION
90% SUBMITTAL

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 WEST VILLAGE 22
FLEET WING AVENUE (STREET G)
KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRIVE (STREET N)

LEGEND AND ABBREVIATIONS

DESIGNED BY: L. MANACLAY
DRAWN BY: G. HANSEN
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE

XXVXVXXX
LXX–XXXXX
DATE: OCTOBER, 2020
DRAWING NO. 2 /21
JOB NO. 100068235

X:\Projects\SummWest\Village 22\100068235 – V22 Fleet Wing (Kettle Ridge to Scurry Bend)_Sheets\68235–02–LNGD–01.dwg LAYOUT: 2 LEGEND AND ABBREVIATIONS Oct 28, 2020 – 10:51AM

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 OWN 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

PLAN CONCURRENCE NOTE

THE FOLLOWING SEPARATE VILLAGE 22 ROADWAY IMPROVEMENT PLANS ARE TO BE CONSTRUCTED CONCURRENTLY AND ARE SHOWN AS FUTURE (BY OTHERS):

1. KETTLE RIDGE DRIVE (STREET J) (FLEET WING AVE TO LAKE MEAD BLVD)
2. SUMMERLIN WEST VILLAGE 21 SUMMERLIN PARKWAY EXTENSION BY VTN
3. CONTRACT NO. C1554 SUMMERLIN VILLAGE 25 3665 ZONE NORTH PIPELINE PHASE II BY GCW
4. FLEET WING AVENUE (STREET G) (DESERT FOOTHILLS DR TO KETTLE RIDGE DR)
5. KETTLE RIDGE DRIVE/ KINDLE RISE WAY COUPLET
6. SCURRY BEND DRIVE (STREET N) ROUGH GRADE
7. SUMMERLIN VILLAGE 25 3665 ZONE NORTH PIPELINE PHASE I

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 #6631 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 § 105.6.15
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 § C102.10
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. FOR SYSTEMS REQUIRED TO HAVE TWO (2) SOURCES OF WATER SUPPLY, SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS AND/OR FIRE SPRINKLER LEAD–INS CAN BE OUT OF SERVICE DUE TO A SERVICE INTERRUPTION. FOR SYSTEMS PERMITTED TO HAVE ONE SOURCE OF WATER SUPPLY, SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 3 FIRE HYDRANTS AND/OR FIRE SPRINKLER LEAD–IN CAN BE OUT OF SERVICE DUE TO A SERVICE INTERRUPTION. 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 33 FT WITH PARKING ON BOTH SIDES MEASURED TO FACE OF CURB. NOT LESS THAN 28 FT WIDE WITH PARKING RESTRICTED TO ONE SIDE MEASURED TO FACE OF CURB. NOT LESS THAN 24 FT WIDE WITH NO PARKING ON EITHER SIDE MEASURED TO FACE OF CURB. 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. IFC § 503.1.1
25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 200 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD–ENDS OR A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT. CLV REGULATION AND MOU
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. CLV REGULATION
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. IFC § 503.6
29. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS, OR HAVING FOUR OR MORE TRAVEL LANES AND A TRAFFIC COUNT OF MORE THAN 30,000 VEHICLES PER DAY, ALL HYDRANTS BEINGS UTILIZED TO DELIVER FIRE FLOW TO THE PROPOSED LOCATION SHALL BE LOCATED ON THE SAME SIDE OF THE STREET AS THE PROPOSED DEVELOPMENT. CLV REGULATION

REVISED FEBRUARY 4, 2019

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 CCAUSS 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

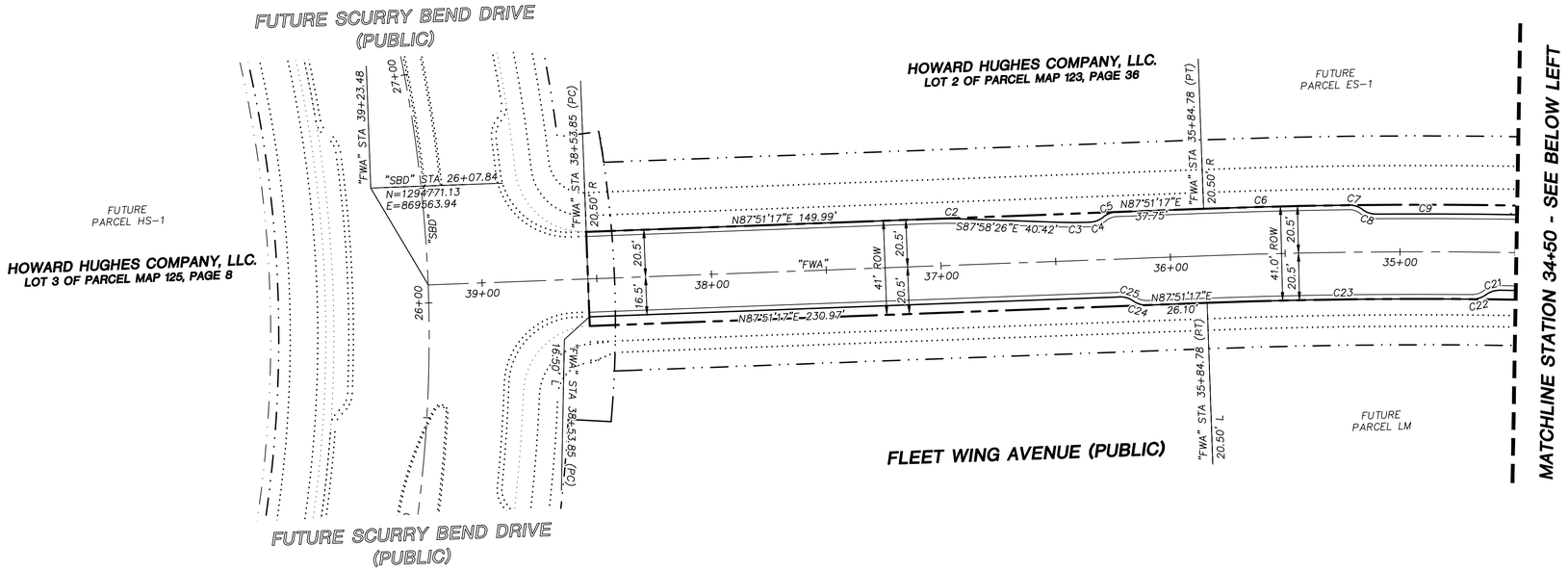
CITY OF LAS VEGAS SEWER NOTES

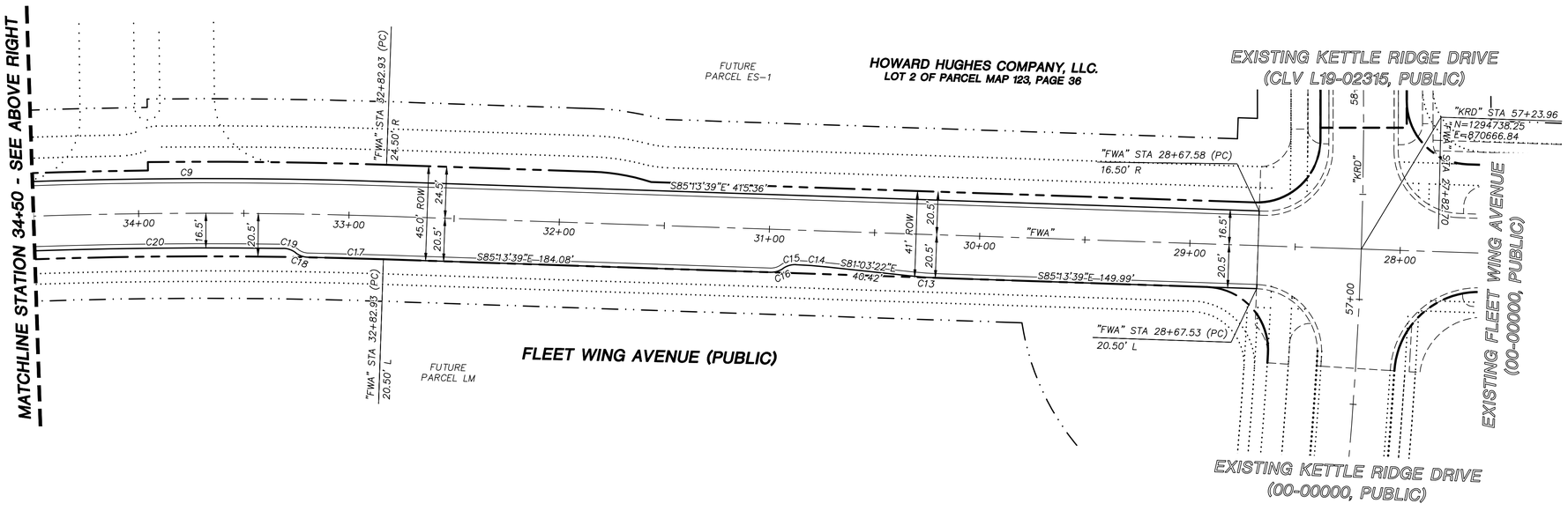
1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE 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 LVVWD 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 AND SAFETY FORMS, PRIOR TO ORDERING MATERIALS.
3. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS, ETC. LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL





SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY	UNIT
ROADWAY		
3" PLANTMIX BITUMINOUS PAVEMENT	16418	SY
4" AGGREGATE BASE, TYPE II	528	SY
4.5" PLANTMIX BITUMINOUS PAVEMENT	1883	CY
STANDARD "L" TYPE CURB & GUTTER W/ TYPE II AGGREGATE BASE	5940	LF

ROADWAY NOTES

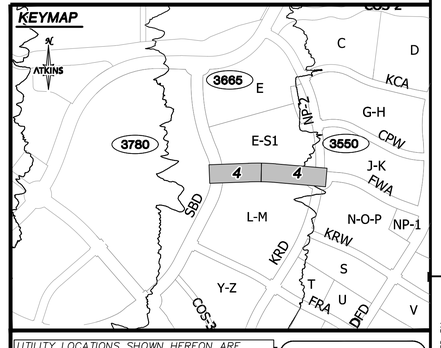
1. SEE SHEET 19 FOR TYPICAL SECTIONS, DETAILS
2. SEE SHEET 2 FOR ROADWAY ALIGNMENT ABBREVIATIONS

CENTERLINE CURVE TABLE

NO.	RADIUS	DELTA	LENGTH	TANGENT

BACK OF CURB CURVE TABLE

NO.	RADIUS	DELTA	LENGTH	TANGENT
C2	200.00'	4°10'18"	14.56'	7.28'
C3	200.01'	4°09'02"	14.49'	7.25'
C4	10.00'	36°52'12"	6.44'	3.33'
C5	10.00'	36°52'12"	6.44'	3.33'
C6	2520.50'	1°26'17"	63.26'	31.63'
C7	10.00'	37°00'24"	6.46'	3.35'
C8	10.00'	36°45'13"	6.41'	3.32'
C9	2516.50'	5°12'24"	228.68'	114.42'
C13	200.00'	4°10'18"	14.56'	7.28'
C14	200.01'	4°09'02"	14.49'	7.25'
C15	10.00'	36°52'12"	6.44'	3.33'
C16	10.00'	36°52'12"	6.44'	3.33'
C17	2479.40'	0°49'33"	35.73'	17.87'
C18	10.00'	36°43'54"	6.41'	3.32'
C19	10.00'	37°00'31"	6.46'	3.35'
C20	2483.50'	2°52'08"	124.35'	62.19'
C21	10.00'	37°00'31"	6.46'	3.35'
C22	10.00'	36°43'54"	6.41'	3.32'
C23	2479.50'	2°40'08"	115.50'	57.76'
C24	10.00'	36°52'12"	6.44'	3.33'
C25	10.00'	36°52'12"	6.44'	3.33'



GRAPHIC SCALE
30' 0 15' 30' 60'
HORIZONTAL: 1"= 30'

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 UTILITY LINES. ITS COSTLY. Call 811 or 1-800-642-2444

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

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NOT FOR CONSTRUCTION
90% SUBMITTAL

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 WEST VILLAGE 22
FLEET WING AVENUE (STREET G)
KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRIVE (STREET N)

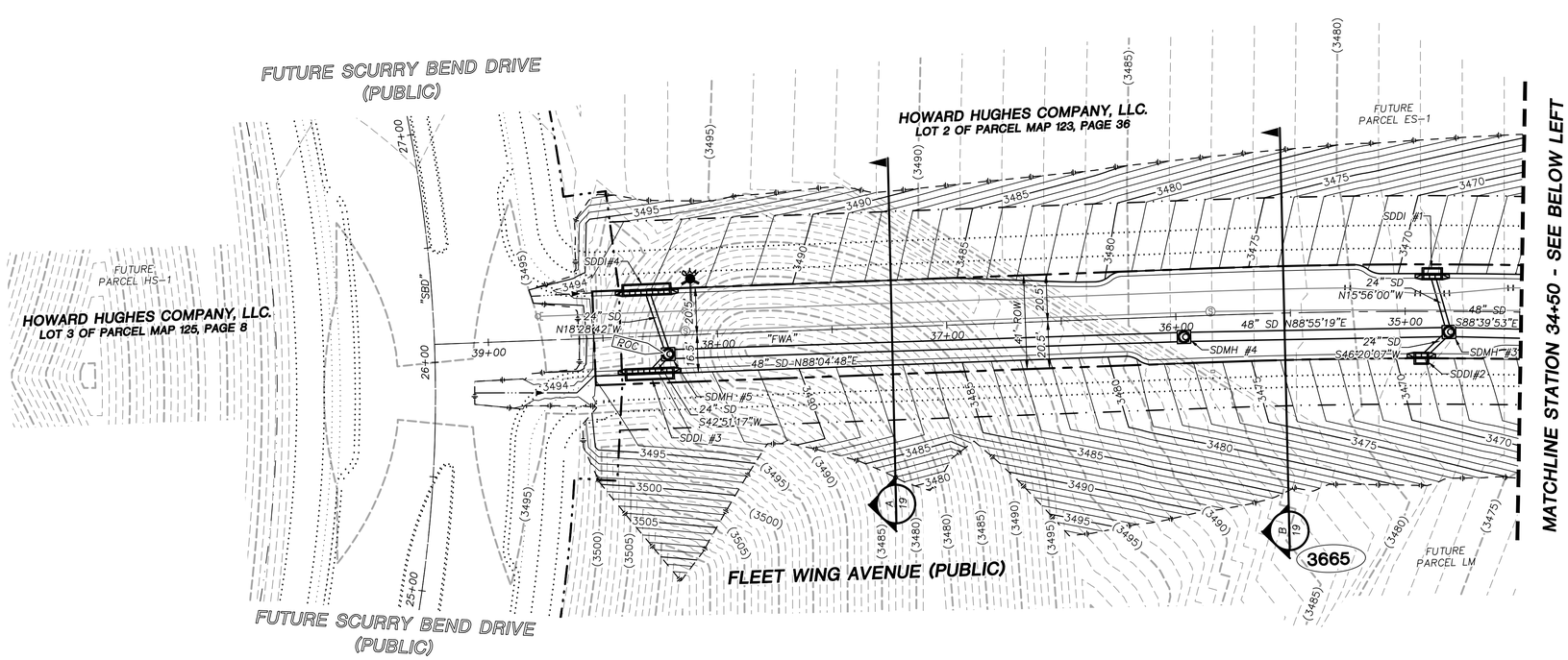
HORIZONTAL CONTROL PLAN

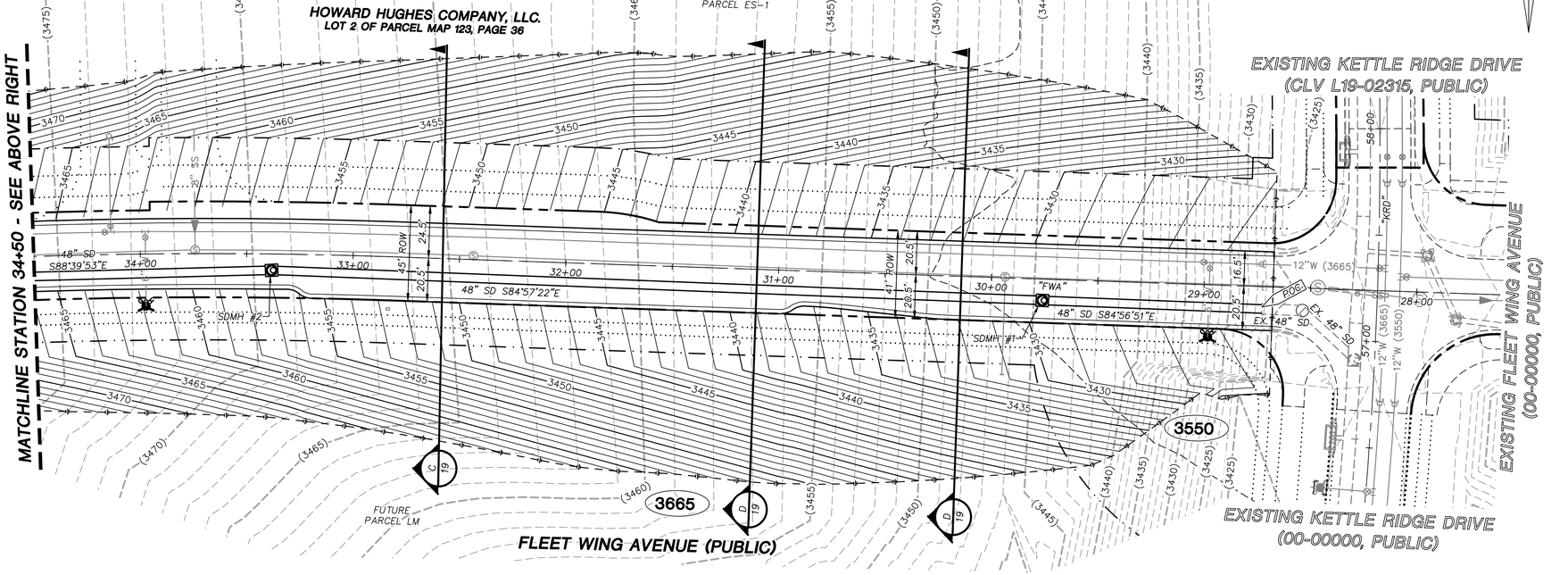
DESIGNED BY: E. MAMACLAY
DRAWN BY: G. HANSEN
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE

XXVVXXXX
LXX-XXXXX
DATE: OCTOBER, 2020
DRAWING NO. 4 /21

JOB NO. 100068235

X:\Projects\SummWest\Village 22\100068235 - V22 Fleet Wing (Kettle Ridge to Scurry Bend)_Sheets\68235-05-HOR2-01.dwg LAYOUT: H-1 Oct 28, 2020 - 10:51AM





SUMMARY OF QUANTITIES

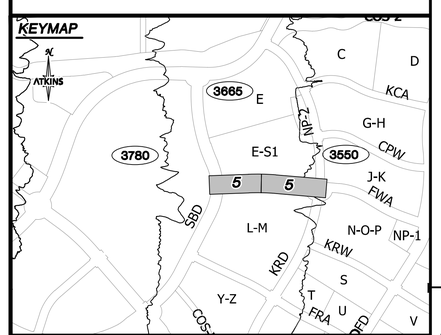
DESCRIPTION	QUANTITY	UNIT
DRAINAGE		
24" RCP CLASS III	90	LF
48" RCP CLASS III	955	LF
TYPE II SDMH	2	EA
TYPE III SDMH	3	EA
5' TYPE CM2 SDDI	1	EA
7.5' TYPE CM2 SDDI	2	EA
15' TYPE CM2 SDDI	1	EA

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 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.



GRAPHIC SCALE
30' 0 15 30' 60'
HORIZONTAL: 1"= 30'

SOILS REPORT

BY NOVA
PROJECT NO. G-18-176
DATED 12/03/18 AND
SUBSEQUENT UPDATE LETTER
DATED 12/30/19
EARTHWORK QUANTITIES (RAW):
CUT= 53,600 CU YDS
FILL= 1,400 CU YDS

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 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.

DS#XXX

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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(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 PRIORITY 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

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NOT FOR CONSTRUCTION
90% SUBMITTAL

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

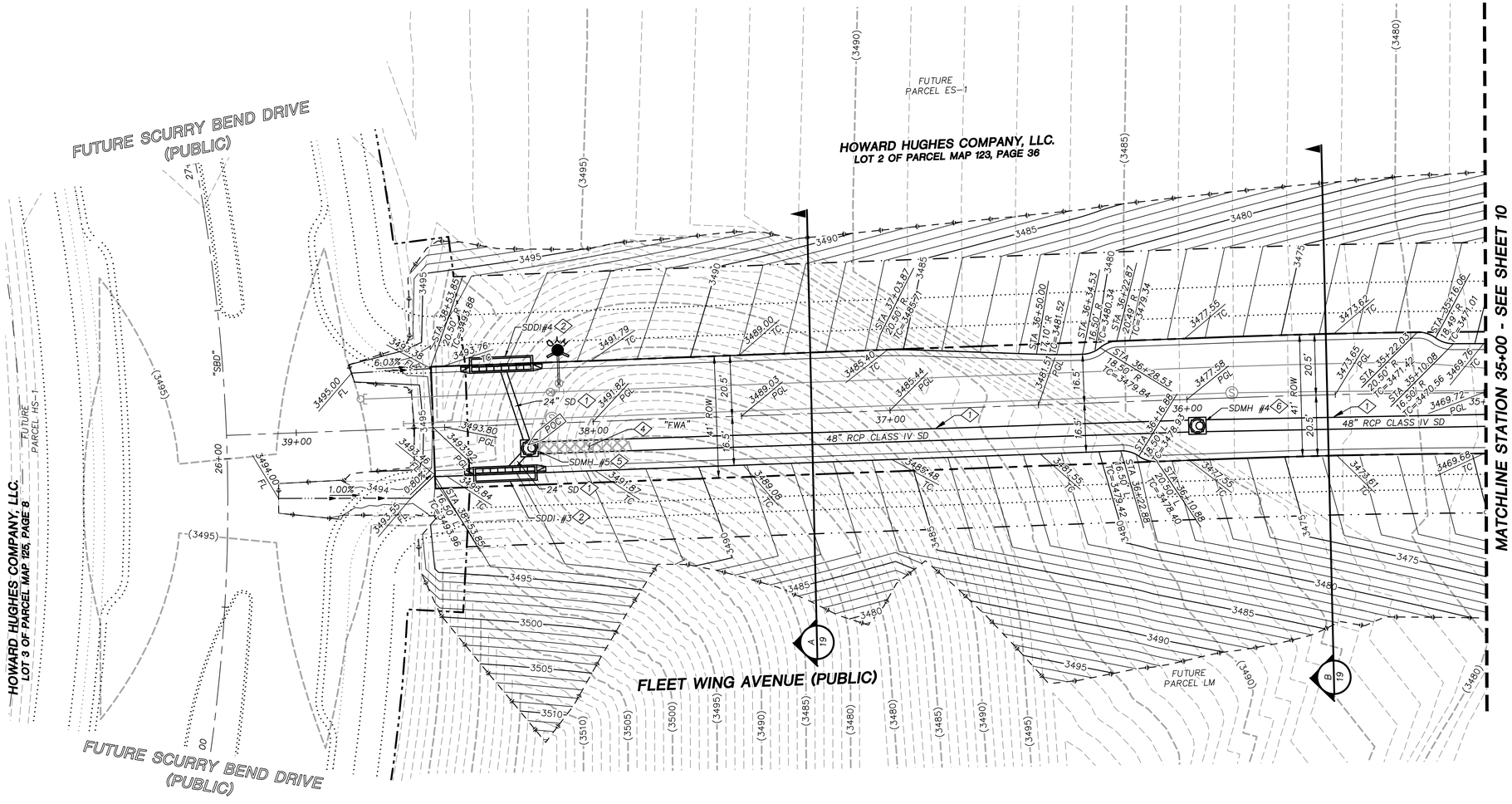
SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (STREET G)
KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRIVE (STREET N)

MASTER DRAINAGE PLAN

DESIGNED BY: L. MANAGLAY
DRAWN BY: G. HANSEN
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE

XXXVXXXX
LXX-XXXXX
DATE OCTOBER, 2020
DRAWING NO. 5 /21
JOB NO. 100068235

X:\Projects\SummWest\Village 22\100068235 - V22 Fleet Wing (Kettle Ridge to Scurry Bend)_Sheets\68235-07-STRM-01.dwg LAYOUT: SD-1 Oct 28, 2020 - 10:52AM



STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
4. 38± LF EXISTING 48" STORM DRAIN TO BE REMOVED
5. INSTALL TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL TYPE III SD MANHOLE PER CCAUSD #406

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

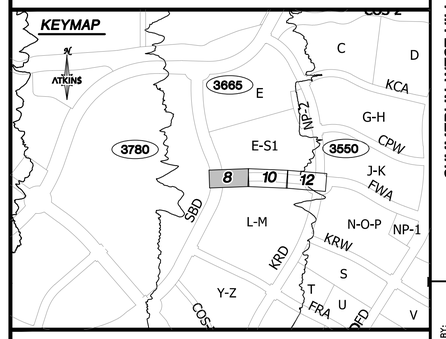
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SUMMERLIN

SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (STREET G)
KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRIVE (STREET N)

ROADWAY GRADING PLAN
SCURRY BEND DRIVE TO STA 35+00

KEYMAP



GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"=20'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT NO. ____ FIRST APPROVED DATE: _____

GRADING PLAN CERTIFICATION

PAUL BATES PE#25673 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.

DS#XXX

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 Dig
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

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1-702-227-2929

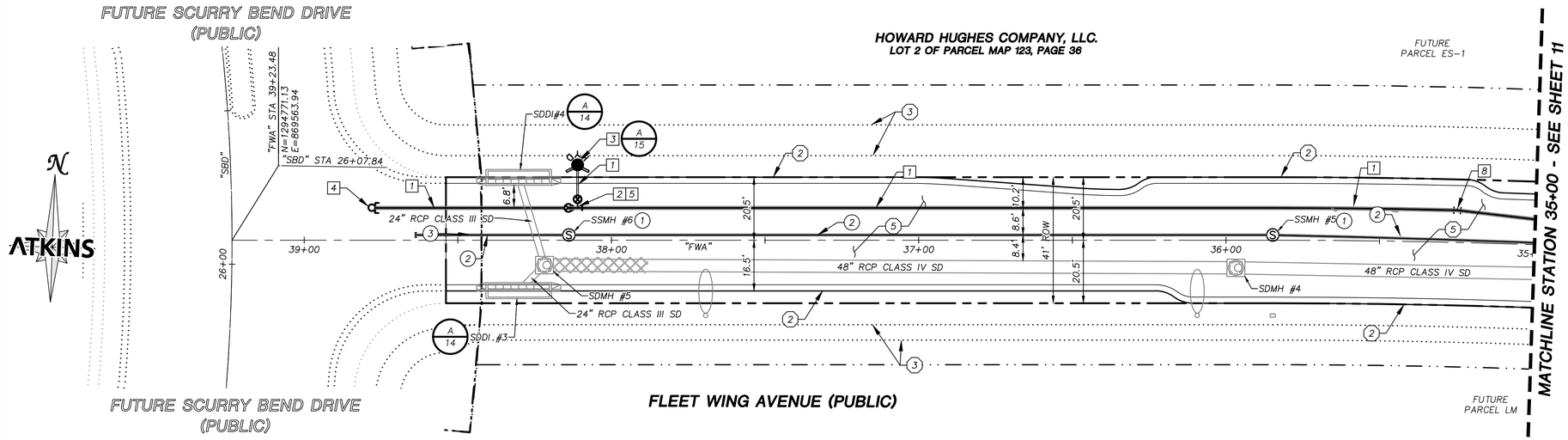
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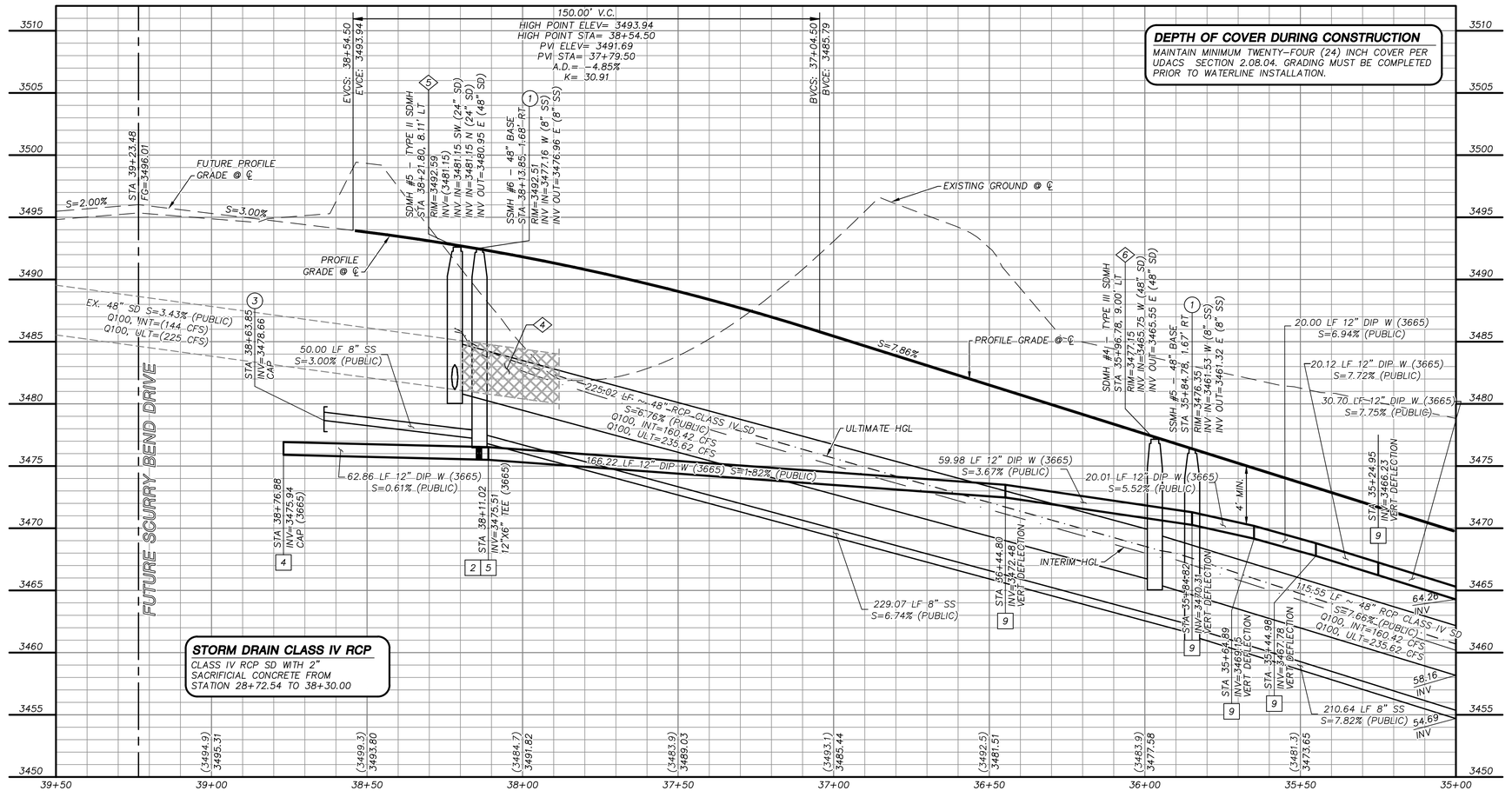
NOT FOR CONSTRUCTION
90% SUBMITTAL

DESIGNED BY:	L. MAMALAY
DRAWN BY:	G. HANSEN
CHECKED BY:	N. BARCOS
HORIZ.:	1"=20'
VERT.:	NONE
XXXVXXXX LXX-YXXXX	
DATE:	OCTOBER, 2020
DRAWING NO.	8 /21

JOB NO. 100068235

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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.

STORM DRAIN CLASS IV RCP

CLASS IV RCP SD WITH 2" SACRIFICIAL CONCRETE FROM STATION 28+72.54 TO 38+30.00

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 PLANNING AND ENGINEERING SERVICES

PROJECT NO. ____ FIRST APPROVED DATE: _____

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
4. 38± LF EXISTING 48" STORM DRAIN TO BE REMOVED
5. INSTALL TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL TYPE III SD MANHOLE PER CCAUSD #406

SEWER CONSTRUCTION NOTES

1. INSTALL SEWER MANHOLE PER DCSWCS SD-1 AND SD-4
2. INSTALL 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. REMOVE CAP AND CONNECT TO EXISTING SEWER STUB
5. ADJUST EXISTING MANHOLE TO GRADE PER DCSWCS SD-5
6. PROTECT SEWER AT UTILITY CROSSING PER DCSWCS SD-19

WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN PER UDACS PLATES #17 AND PLATE #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
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 COMBINATION AIR VALVE ASSEMBLY WITH ALL APPURTENANCES PER UDACS PLATE #38
7. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
8. INSTALL 5° HORIZONTAL BEND PER UDACS 2.15
9. INSTALL DEFLECTION AT PIPE JOINTS (MAXIMUM OF 1°)
10. INSTALL 45° VERTICAL BEND PER UDACS 2.15

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT CONCRETE SIDEWALK PER CCAUSD #234
5. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 19 FOR TYPICAL PAVEMENT SECTION

BASIS OF BEARING

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T21S,R59E,S03

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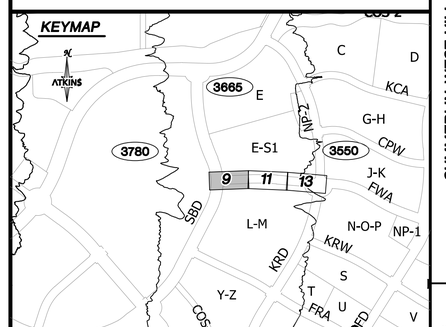
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NOT FOR CONSTRUCTION 90% SUBMITTAL

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

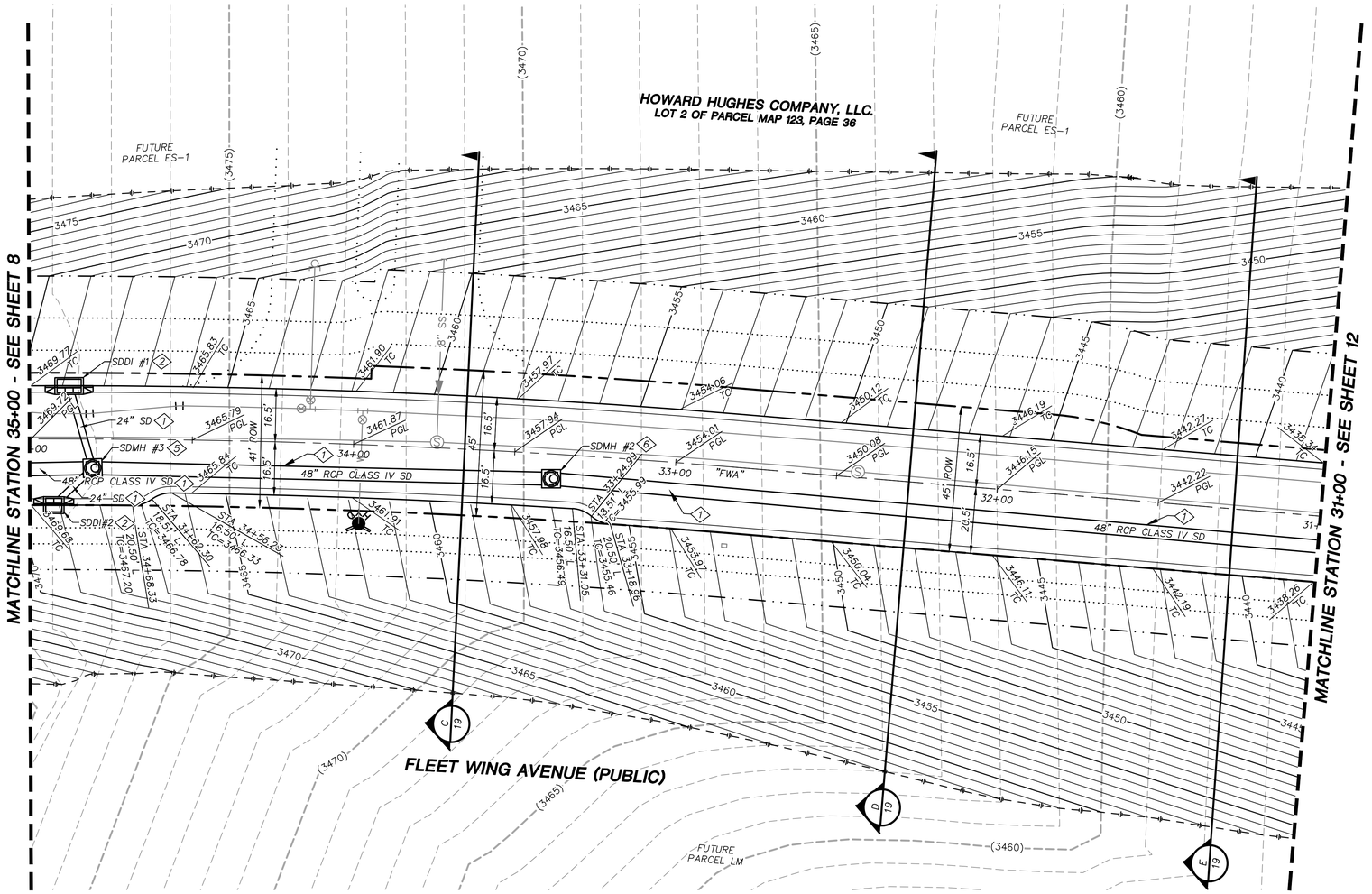
SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (STREET G)
KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRIVE (STREET N)

ROADWAY PLAN AND PROFILE
SCURRY BEND DRIVE TO STA 35+00

DESIGNED BY:	L. MANACLAY
DRAWN BY:	G. HANSEN
CHECKED BY:	N. BARCOS
HORIZ.:	NONE
VERT.:	NONE
XXXVXXXX LXX-XXXXX	
DATE:	OCTOBER, 2020
DRAWING NO.	9 /21

JOB NO. 100068235

K:\Projects\SummWest\Village 22\100068235 – V22 Fleet Wing (Kettle Ridge to Scurry Bend)\...Sheets\68235-11-PLAN-11.dwg LAYOUT: P1(9) Oct 28, 2020 – 10:54AM



STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
4. 38± LF EXISTING 48" STORM DRAIN TO BE REMOVED
5. INSTALL TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL TYPE III SD MANHOLE PER CCAUSD #406

GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"=20'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT NO. ____ FIRST APPROVED DATE: _____

GRADING PLAN CERTIFICATION

PAUL BATES PE#25673 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.

DS#XXX

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

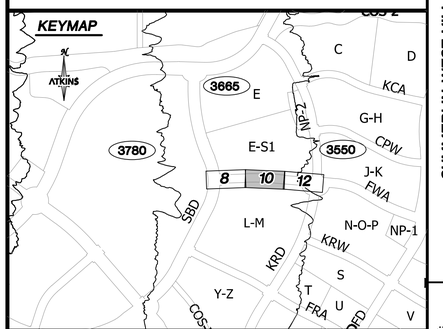
FAST Call before you UnderGround 1-702-432-5300 (FREEWAY AND ARTERIAL SYSTEMS OF TRANSPORTATION)

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.

NOT FOR CONSTRUCTION
90% SUBMITTAL



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

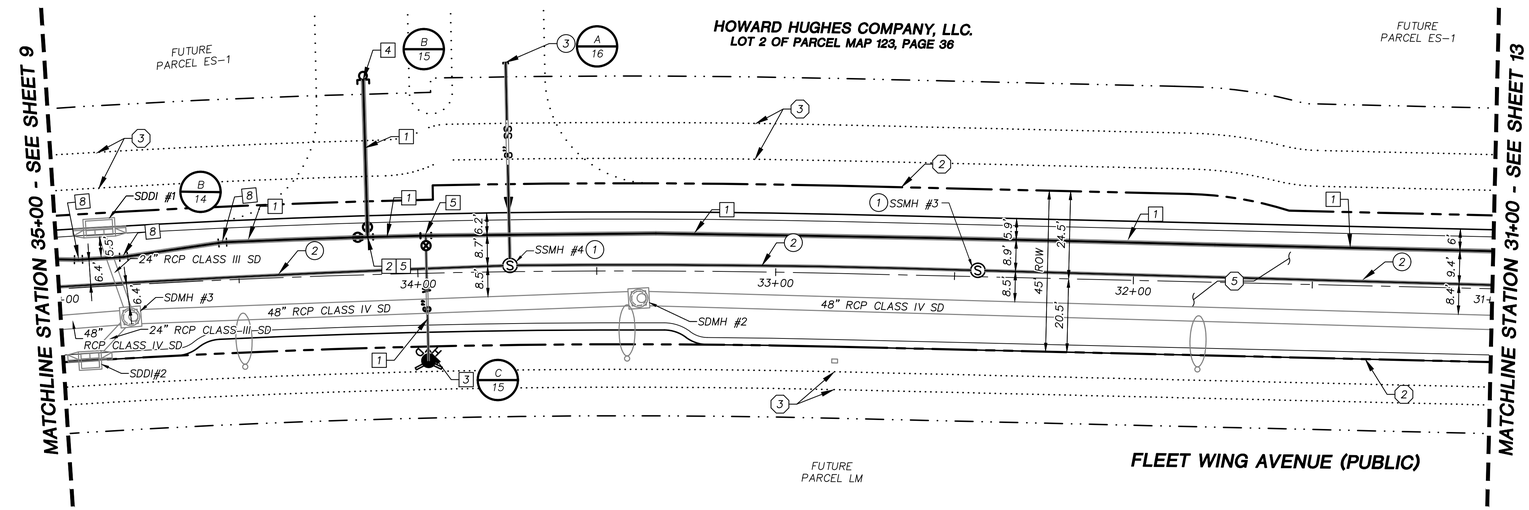
SUMMERLIN

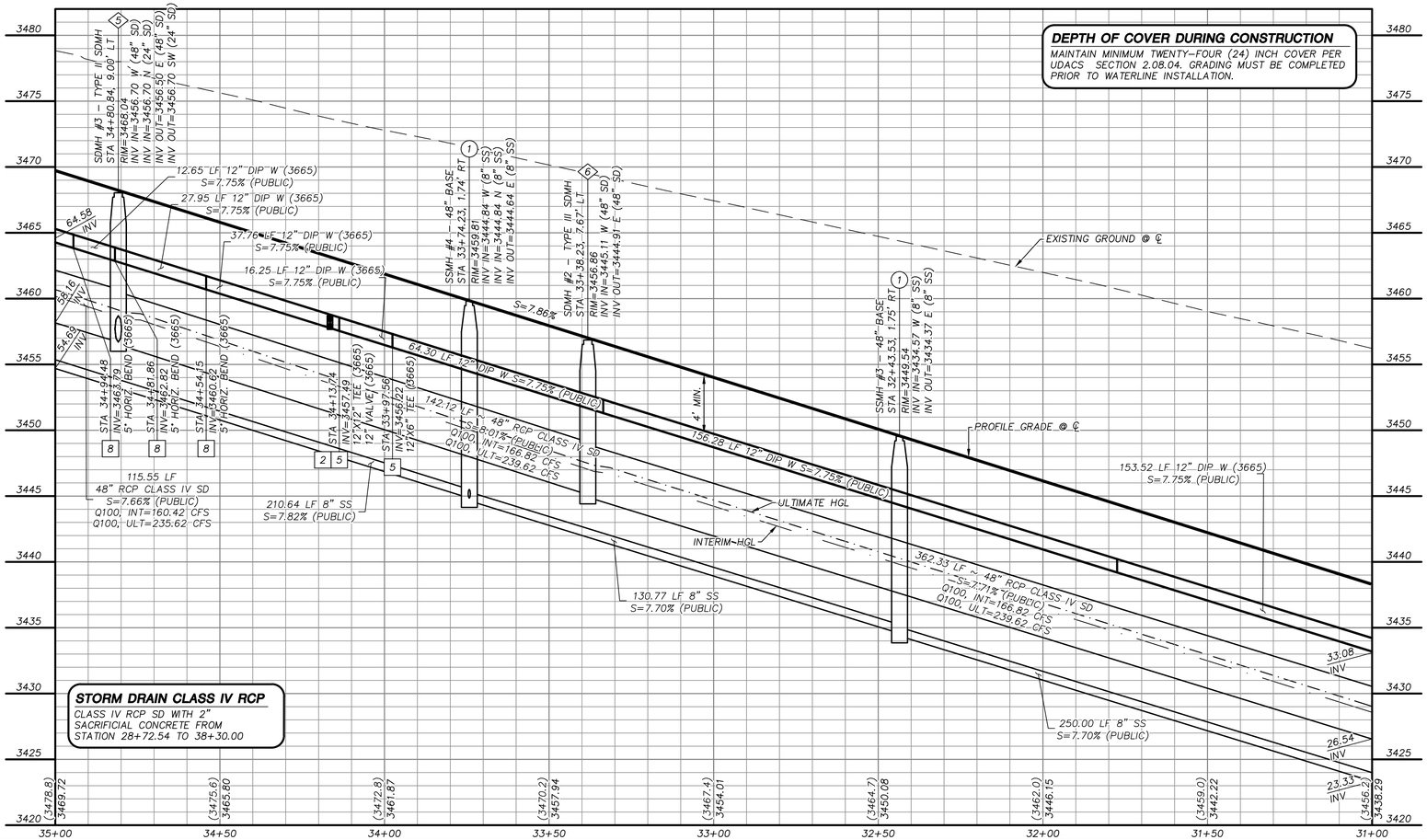
SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (STREET G)
KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRIVE (STREET N)

ROADWAY GRADING PLAN
STA 35+00 TO STA 31+00

DESIGNED BY: L. MAMACLAY
DRAWN BY: G. HANSEN
CHECKED BY: N. BARCOS
HORIZ.: 1"=20'
VERT.: NONE
XXXVXXXX.
LXX-XXXXX
DATE: OCTOBER, 2020
DRAWING NO. 10/21
JOB NO. 100068235

X:\Projects\SummWest\Village 22\100068235 - V22 Fleet Wing (Kettle Ridge to Scurry Bend)_Sheets\68235-10-GRAD-10.dwg LAYOUT: G2 (10) Oct 28, 2020 - 10:55AM





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.

STORM DRAIN CLASS IV RCP

CLASS IV RCP SD WITH 2" SACRIFICIAL CONCRETE FROM STATION 28+72.54 TO 38+30.00

GRAPHIC SCALE

HORIZONTAL: 1"=20'

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT NO. ____ FIRST APPROVED 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.

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

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Call before you D g AVOID GUTTER ENCROACHMENT UTILITY LINES 811 Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES 811 CONTACT CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

STORM DRAIN CONSTRUCTION NOTES

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4. 38± LF EXISTING 48" STORM DRAIN TO BE REMOVED
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6. INSTALL TYPE III SD MANHOLE PER CCAUSD #406

SEWER CONSTRUCTION NOTES

1. INSTALL SEWER MANHOLE PER DCSWCS SD-1 AND SD-4
2. INSTALL 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. REMOVE CAP AND CONNECT TO EXISTING SEWER STUB
5. ADJUST EXISTING MANHOLE TO GRADE PER DCSWCS SD-5
6. PROTECT SEWER AT UTILITY CROSSING PER DCSWCS SD-19

WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN PER UDACS PLATES #17 AND PLATE #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
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 COMBINATION AIR VALVE ASSEMBLY WITH ALL APPURTENANCES PER UDACS PLATE #38
7. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
8. INSTALL 5° HORIZONTAL BEND PER UDACS 2.15
9. INSTALL DEFLECTION AT PIPE JOINTS (MAXIMUM OF 1°)
10. INSTALL 45° VERTICAL BEND PER UDACS 2.15

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT CONCRETE SIDEWALK PER CCAUSD #234
5. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 19 FOR TYPICAL PAVEMENT SECTION

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

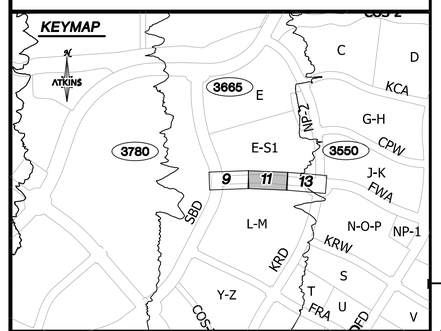
ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (STREET G)
KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRIVE (STREET N)

ROADWAY PLAN AND PROFILE
STA 35+00 TO STA 31+00

KEYMAP

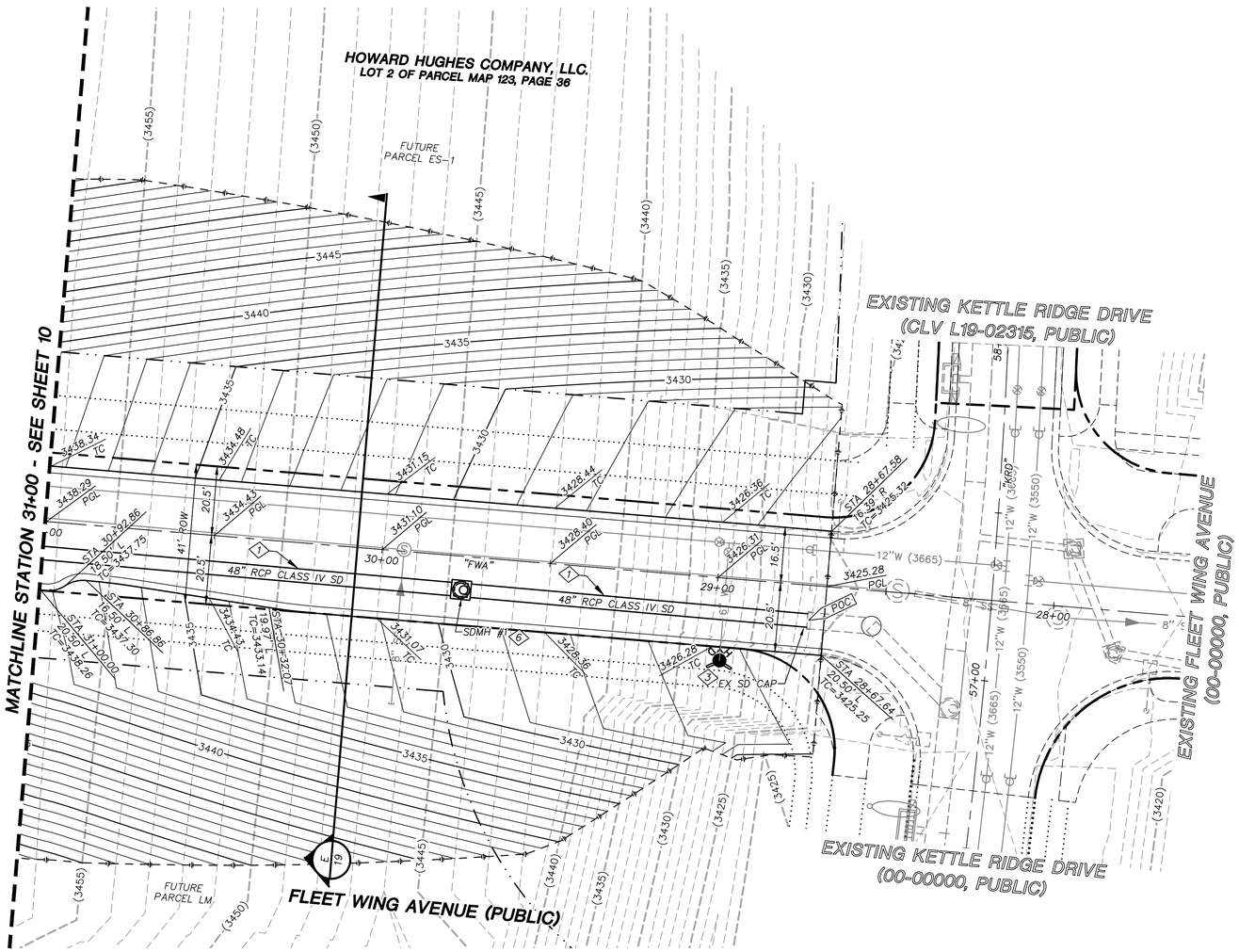


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NOT FOR CONSTRUCTION
90% SUBMITTAL

DESIGNED BY:	L. MANAGLAY
DRAWN BY:	G. HANSEN
CHECKED BY:	N. BARCOS
HORIZ.:	NONE
VERT.:	NONE
XXXVXXXX LXX-YXXXX	
DATE:	OCTOBER, 2020
DRAWING NO.	11/21
JOB NO.	100068235

K:\Projects\SummitWest\Village 22\100068235 - V22 Fleet Wing (Kettle Ridge to Scurry Bend)_Sheets\68235-11-PLAN-11.dwg LAYOUT: P2(11) Oct 28, 2020 - 10:56AM



STORM DRAIN CONSTRUCTION NOTES

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5. INSTALL TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL TYPE III SD MANHOLE PER CCAUSD #406

GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"=20'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT NO. ____ FIRST APPROVED DATE: _____

GRADING PLAN CERTIFICATION

PAUL BATES PE#25673 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.

DS#XXX

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

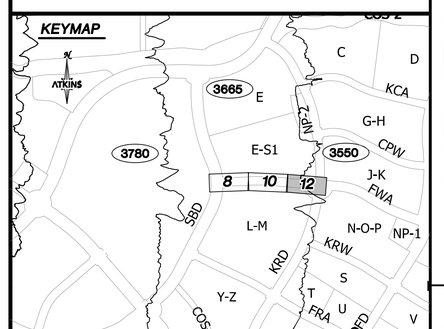
FAST Call before you UnderGround 1-702-432-5300 — NEVADA'S ONE-CALL NOTIFICATION SYSTEM OF UNDERGROUND UTILITY LINES FOR MEMBERS OF THE NEVADA ONE-CALL SYSTEM OF TRANSPORTATION

Call before you D g AVOID CUTTING UNDERGROUND UTILITY LINES IN YOUR CONTRACT. Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES IN YOUR CONTRACT. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

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NOT FOR CONSTRUCTION 90% SUBMITTAL



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

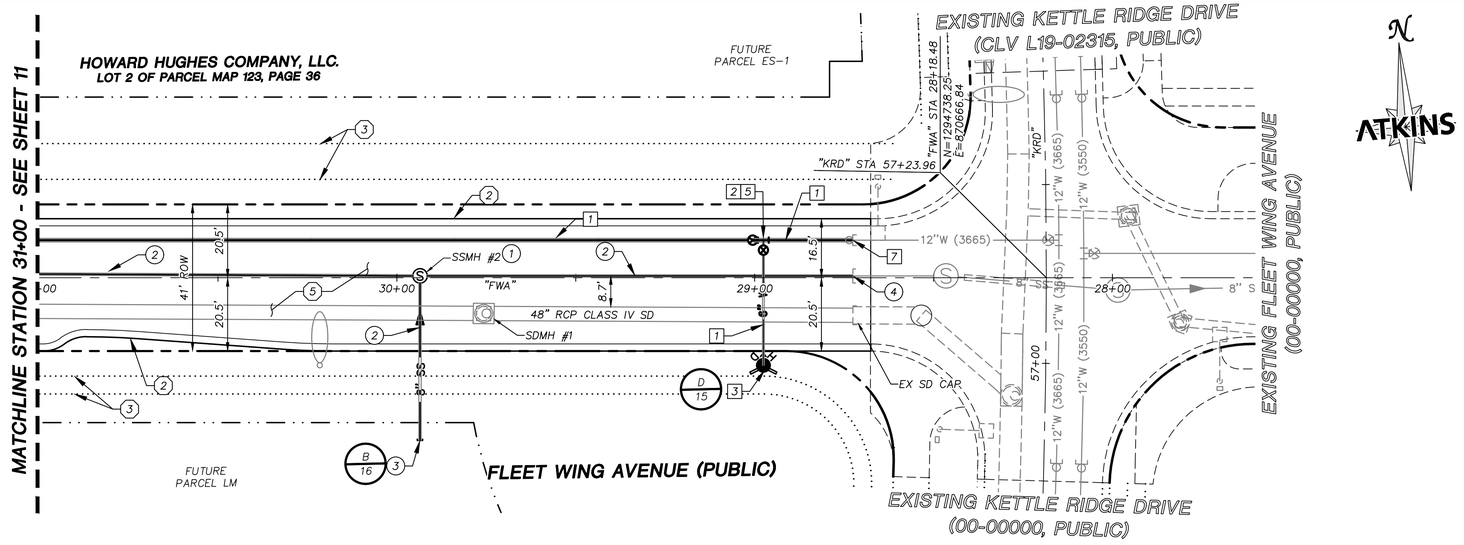
SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (STREET G)
KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRIVE (STREET N)

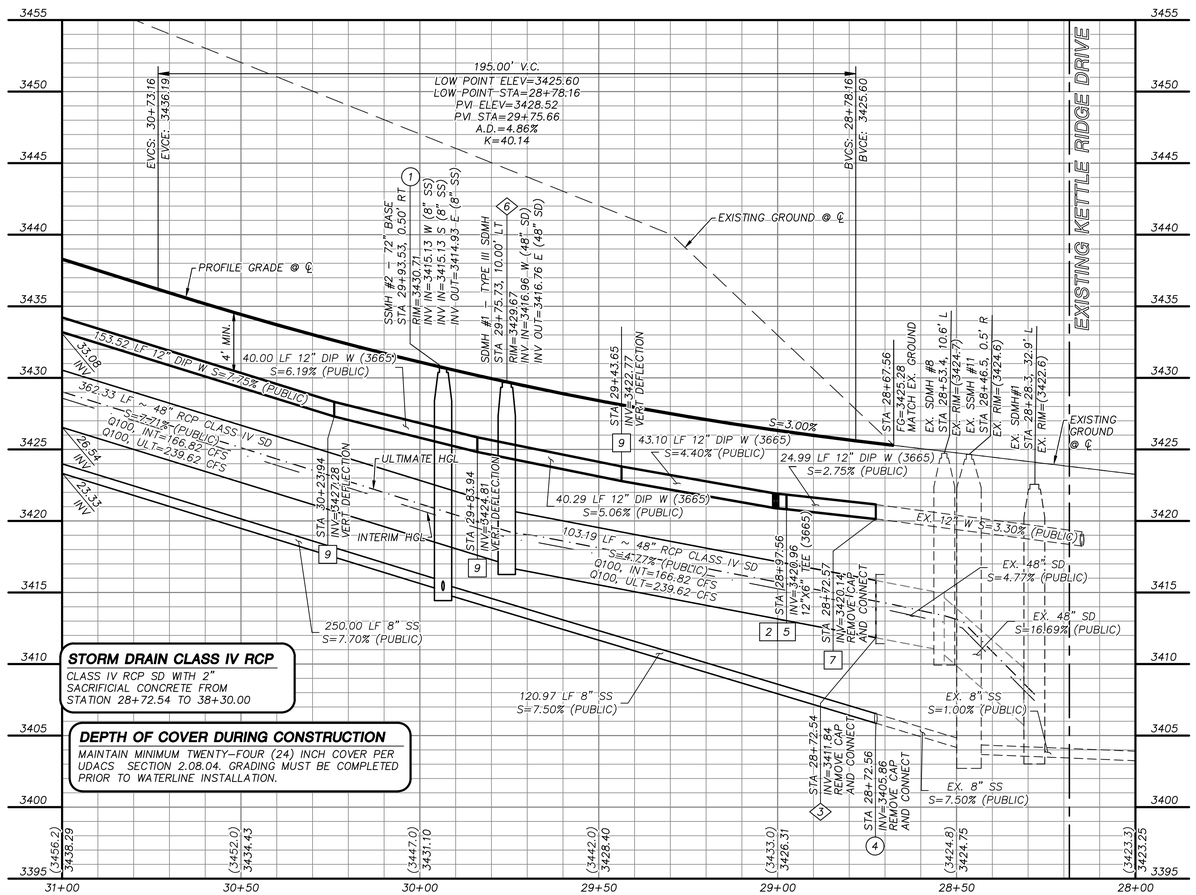
ROADWAY GRADING PLAN
STA 31+00 TO KETTLE RIDGE DRIVE

DESIGNED BY: L. MANACLAY
DRAWN BY: G. HANSEN
CHECKED BY: N. BARCOS
HORIZ.: 1"=20'
VERT.: NONE

XXXVXXXX
LXX-XXXXX
DATE: OCTOBER, 2020
DRAWING NO. 12/21
JOB NO. 100068235

K:\Projects\SummWest\Village 22\100068235 - V22 Fleet Wing (Kettle Ridge to Scurry Bend)_Sheets\68235-10-GRAD-10.dwg LAYOUT: G3 (12) Oct 28, 2020 - 10:57AM





STORM DRAIN CLASS IV RCP
CLASS IV RCP SD WITH 2" SACRIFICIAL CONCRETE FROM STATION 28+72.54 TO 38+30.00

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.

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 PLANNING AND ENGINEERING SERVICES

PROJECT NO. ____ FIRST APPROVED DATE: _____

STORM DRAIN CONSTRUCTION NOTES

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SEWER CONSTRUCTION NOTES

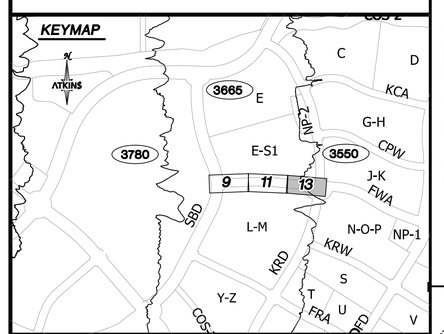
1. INSTALL SEWER MANHOLE PER DCSWCS SD-1 AND SD-4
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5. ADJUST EXISTING MANHOLE TO GRADE PER DCSWCS SD-5
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ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
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5. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 19 FOR TYPICAL PAVEMENT SECTION



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

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NOT FOR CONSTRUCTION 90% SUBMITTAL

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

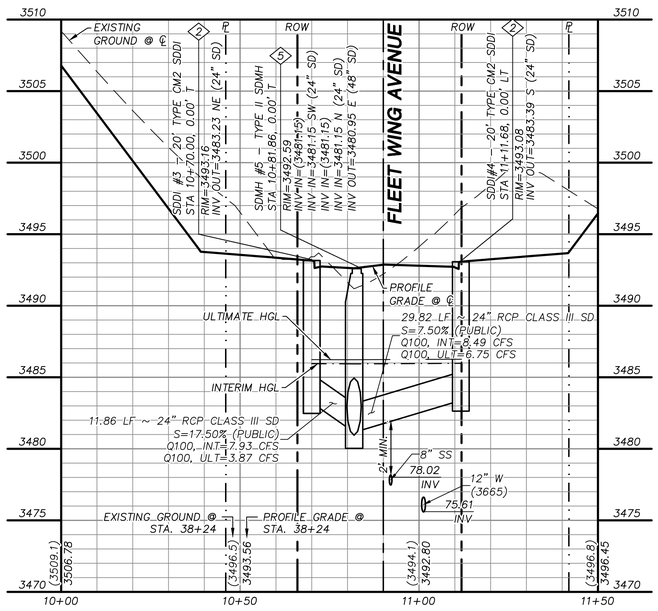
SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (STREET G)
KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRIVE (STREET N)

ROADWAY PLAN AND PROFILE
STA 31+00 TO KETTLE RIDGE DRIVE

DESIGNED BY: L. MANACLAY
DRAWN BY: G. HANSEN
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE

XXXVXXXX
LXX-XXXXX
DATE: OCTOBER, 2020
DRAWING NO. 13/21
JOB NO. 100068235

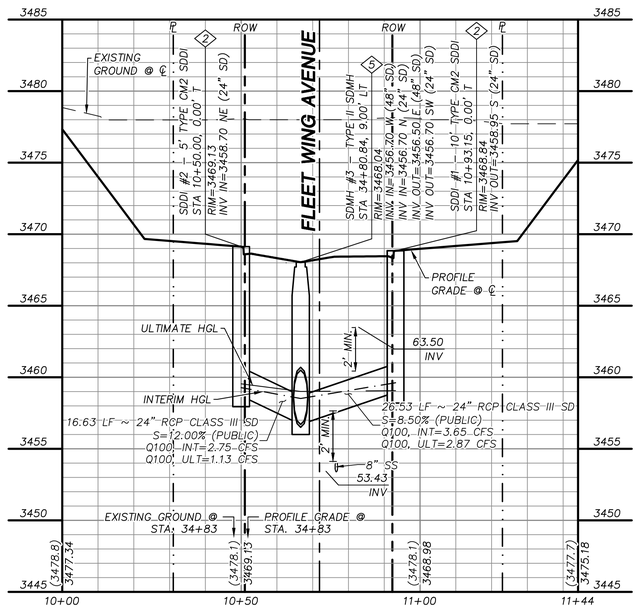
X:\Projects\SummWest\Village 22\100068235 - V22 Fleet Wing (Kettle Ridge to Scurry Bend)_Sheets\68235-11-PLAN-11.dwg LAYOUT: P3(13) Oct 28, 2020 - 10:58AM



STORM DRAIN LATERAL 1

"FWA" STA. 38+24 SEE SHEET 9

A / 14



STORM DRAIN LATERAL 2

"FWA" STA. 34+83 SEE SHEET 11

B / 14

STORM DRAIN CONSTRUCTION NOTES

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4. CONSTRUCT CONCRETE SIDEWALK PER CCAUSD #234
5. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 19 FOR TYPICAL PAVEMENT SECTION

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 PLANNING AND ENGINEERING SERVICES

PROJECT NO. ____ FIRST APPROVED 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.

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 INTERRUPTING UTILITY LINES. ITS COSTLY. Call 811 or 1-800-642-2444

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

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NOT FOR CONSTRUCTION 90% SUBMITTAL

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 WEST VILLAGE 22
FLEET WING AVENUE (STREET G)
KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRIVE (STREET N)

STORM DRAIN LATERAL PROFILES

DESIGNED BY: L. MAMACLAY
DRAWN BY: G. HANSEN
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE

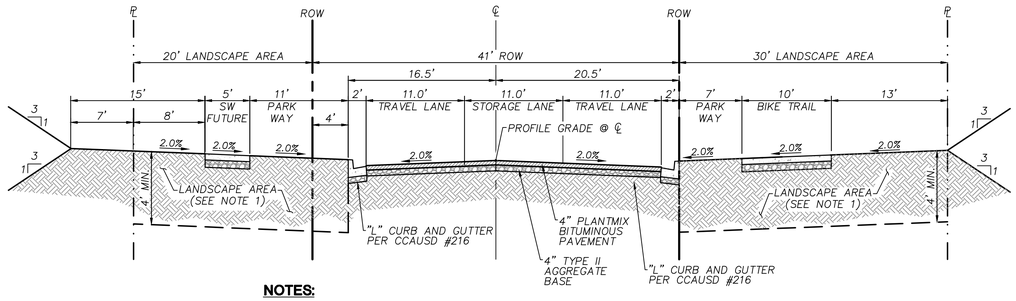
XXXVXXXX
LXX-XXXXX

DATE: OCTOBER, 2020

DRAWING NO. 14/21

JOB NO. 100068235

X:\Projects\SummWest\Village 22\100068235 – V22 Fleet Wing (Kettle Ridge to Scurry Bend)_Sheets\68235-12-LATL-12.dwg LAYOUT: SDLAT Oct 28, 2020 – 10:58AM

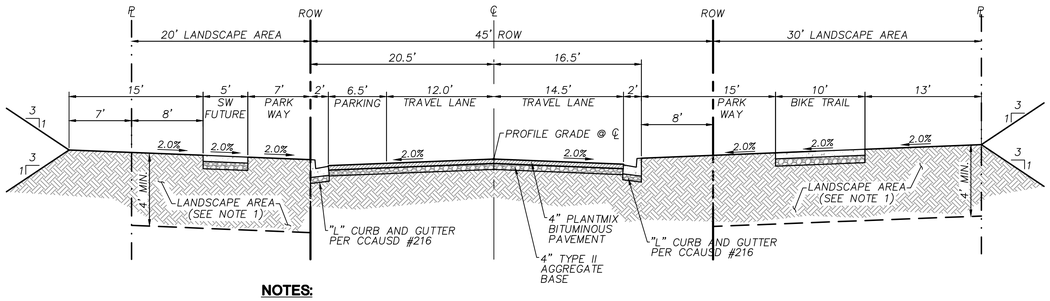


NOTES:

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.

FLEET WING AVENUE - TYPICAL WITH SOUTH CURB EXTENSIONS

N.T.S. — A / 19

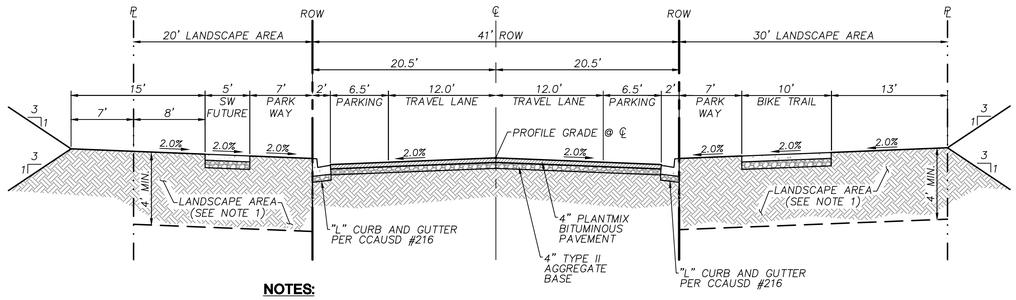


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FLEET WING AVENUE - TYPICAL WITH NORTH CURB EXTENSIONS

N.T.S. — D / 19

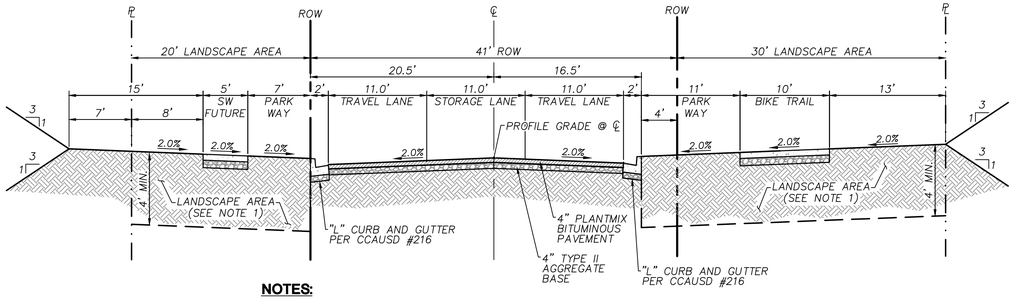


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FLEET WING AVENUE - TYPICAL

N.T.S. — B / 19

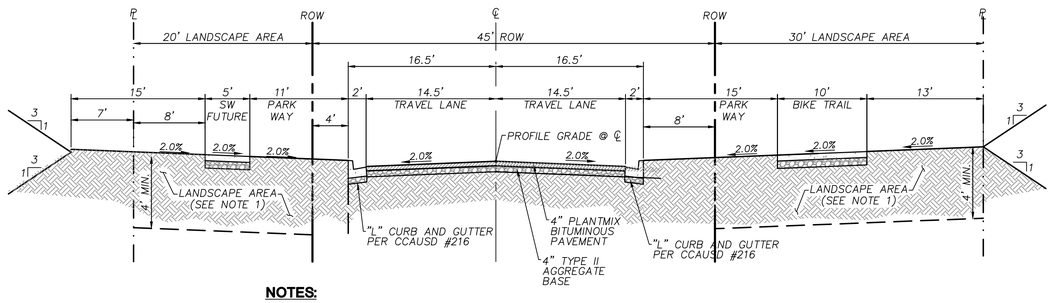


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FLEET WING AVENUE - TYPICAL WITH NORTH CURB EXTENSIONS

N.T.S. — E / 19



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FLEET WING AVENUE - TYPICAL WITH CURB EXTENSIONS

N.T.S. — C / 19

BASIS OF BEARING

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T21S,R59E,S03

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REVISIONS

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 22
FLEET WING AVENUE (STREET G)
KETTLE RIDGE DRIVE (STREET J) TO SCURRY BEND DRIVE (STREET N)

TYPICAL SECTIONS

DESIGNED BY: L. MANACLAY
DRAWN BY: G. HANSEN
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE

XXXVXXXX
LXX-XXXXX
DATE: OCTOBER, 2020
DRAWING NO. 19/21
JOB NO. 100068235

X:\Projects\SummWest\Village 22\100068235 - V22 Fleet Wing (Kettle Ridge to Scurry Bend)_Sheets\68235-15-DETL-C01.dwg LAYOUT: D1 Oct 28, 2020 - 11:01AM