DS #: 5013.2

APN: 137-26-101-001

PROJECT: Summerlin West V21 - Desert Foothills Drive

SUBMITTAL: 6th

SCANNED BY/DATE: _____

CHECKED BY/DATE: _____



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: February 26, 2019
TO: **Land Development Services** Department of Building & Safety				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Summerlin West V21 - Desert Foothills Drive – Update #2 (Far Hills Avenue to Street A)**			**COPIES TO:** VTN Nevada
Cross Streets:	Desert Foothills Dr. from Far Hills to Street A			Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5013G.doc			Bart Anderson, P.E., DevCo
Parcel Number:	137-26-101-001			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	7/3/2018 & 7/23/2018	7/26/2018 & 7/28/2018	Not Approved	$400.00	497101: $400
2nd Submittal	9/4/2018	9/18/2018	Conditional Approval	$400.00	498539: $400
3rd Submittal	10/25/2018	11/7/2018	Not Approved	$400.00	500578: $400
4th Submittal	11/26/2018 & 12/13/2018	12/13/018	Conditional Approval	$400.00	501153: $400
CCRFCD	1/7/2019	1/19/2019	Concurrence Recv'd	N/C	N/C
5th Submittal	1/23/2019	2/5/2019	Approved	$100.00	502619: $100
6th Submittal	2/12/2019	2/26/2019	See Comments Below	$100.00	503165: $100
			TOTAL FEES (LDDRS):	**$1,800.00**	**----**

REMARKS:

6th Submittal: Update #2 - Revision to match the overall Summerlin West Master Plan revision

5th Submittal: Update for minor change in the connection point of a storm drain in Redpoint Street to Desert Foothill Drive

3rd & 4th Submittals: Response to CCRFCD comments

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.

1. The proposed interim mainline 10'x10' box culvert just north of the intersection of *Desert Foothill Drive* and *Redpoint Drive* is an interim facility to capture flows from *Basins OFF1* and *OFF2*. However, in the ultimate condition, when all the interior roadways network are developed in *Summerlin West Village 21*, the 100-year flow will be drastically reduced to about 17cfs. Address whether this facility will be replaced with smaller storm drain or the 17cfs will be rerouted and this facility will just be capped or whatever in the next submittal. Also address the time frame of the ultimate condition happening.

The following conditions are repeated until they are complete:

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

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

3. Since the street and the associated storm drain facilities will eventually be accepted by the *City of Las Vegas*, the engineer/developer must coordinate with *City of Las Vegas Streets & Sanitation Department* for their review and approval prior to the final acceptance of the subject improvement plans.
4. All offsite interim flood control facilities such as but not limited to berms/ditches and temporary sump are privately owned and to be privately maintained by the *Howard Hughes Company*. Provide a note as such on the grading plans.
5. Add a note in all pertinent sheets for the construction of all storm drain drop inlets per USDCCA Drawing No. 421 (*Stormwater Quality Management Stamp and Sign Detail*).

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.

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

END OF REMARKS
WSP/AYS

T/R/S: T20S/R59E/26
AREA K-26

Update #2 to the Technical Drainage Study for

Summerlin West Village 21
Desert Foothills Drive
(Far Hills Avenue to Street A)

Las Vegas, Nevada

Prepared for:
Howard Hughes Company, LLC

Submitted to:
City of Las Vegas
Public Works

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Summerlin West Village 21 Desert Foothills Drive (Far Hills Ave to Street A) Date: February 12, 2019

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

East/West: Far Hills Avenue

b) Section: 26 Township: 20S Range: 59E

c) APN : 137-26-101-001

Name of Owner: The Howard Hughes Company, LLC

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

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

Contact Person-Name: Brian Ruiz **Telephone No.:** (702)-873-7550

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

Firm: VTN Nevada

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

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: +/-6 Acres Being Developed/Disturbed: +/-6 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.): Roadway
5. Approximate upstream land area which drains to the subject site: +/- 1,304 acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: TDS for Summerlin , West V21 Desert Foothills Drive Improvements (Far Hills to Street A) (DS5013B)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Existing 12x10 RCB south of the project
8. Briefly describe your proposed schedule for the subject project: As soon as possible

PROFESSIONAL ENGINEER - STATE OF NEVADA
BRIAN TROY RUIZ
EXP: 12/31/19
CIVIL
No. 15967
2/12/19

Engineer's Seal

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

*New Required Field

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

Revision	Date

Local Entity File No.

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

PROVIDING QUALITY PROFESSIONAL SERVICE SINCE 1960

February 8, 2019
W.O. #7851-5.6

City of Las Vegas
Land Development Services
Department of Building Safety

Attention: Albert Sung, P.E., CFM
Flood Control Project Engineer

SUBJECT: UPDATE #2 TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 21 DESERT FOOTHLILS DRIVE (FAR HILLS TO STREET A)

Dear Mr. Sung,

This update letter is being submitted to address revisions to the Desert Foothills Drive grading and storm drain plans between Far Hills and Street A. The revisions addressed in this update are summarized as follows and are discussed in more detail throughout this letter:

1. The interim channels along the western boundary of the project have been revised to convey flow southerly to redirect flow away from the future Redpoint Drive.
2. Lateral 1 in Redpoint Drive has been upsized to a 54-inch RCP due to an increase in anticipated flow as a result of the latest Summerlin West Land Plan update.
3. The 10'x10' RCB headwall has been removed and replaced by a riprap lined sump.
4. The construction of offsite berms are being proposed in the *Technical Drainage Study for Village 21 Redpoint Drive Improvements (Fox Hill Drive to Desert Foothills Drive)* by GCW, Inc. hereinafter referred to as the Redpoint Drive Study) to protect future parcels located west of the project.

In order to allow construction of Redpoint Drive, the interim channel along the western boundary of the project has been revised to redirect flow southerly away from Redpoint Drive. In addition, the Redpoint Drive Study submitted to the City of Las Vegas on January 17, 2019 included offsite berms that will revise flow patterns upstream of the proposed project. Refer to the referenced Sheet MG1 from the Redpoint Drive Improvements for the offsite berms. An updated interim condition hydrologic analysis has been provided with this update to reflect the revised offsite flow patterns. The interim condition drainage patterns are depicted on *Figure 7: Interim Condition Basin Map* which has been included in Appendix A. Basin OFF1 represents the area tributary to the 10'x10' RCB inlet north of Redpoint Drive. In addition, runoff generated by OFF2 will be diverted north of Redpoint Drive by an offsite channel within the Sky Vista alignment and will subsequently be conveyed to the 10'x10' RCB mainline inlet. Basins OFF3 and OFF4 represent the revised areas impacting the proposed roadside channels. The Sky Vista and Redpoint Drive roadway alignments are depicted on Figure 7 to help indicate the locations of the referenced offsite berms. In general, the flow rates impacting the proposed channels have decreased as a result of the Redpoint Drive Improvements. Please note that the offsite streets are not required to be fully developed prior to the construction of the proposed Desert Foothills Drive. The referenced Redpoint Drive improvements are expected to be constructed concurrently with this project. Updated hydrologic calculations have been included in Appendix B. Hydraulic calculations have been included in Appendix C. Pertinent reference material has been included in Appendix D.

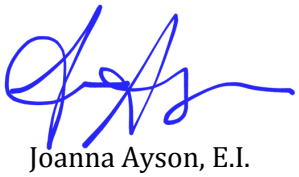
An updated ultimate condition hydrologic analysis is being provided with this update to reflect the latest Summerlin West Land Plan submitted with the *Update #1 to the Drainage Study for the Summerlin West Planning Area*, submitted to the City of Las Vegas (CLV) on January 3, 2019. The hydrology presented in this update is also consistent with the Village 25 Master Study is being submitted concurrently with this Update. According to the updated ultimate condition hydrologic analysis 360 cfs (CSTE) would be discharged to Lateral 1 in ultimate condition. Therefore, Lateral 1 has been upsized to a 54-inch RCP to accommodate the increase in anticipated flow. Hydraulic calculations for the mainline and laterals have been included in Appendix C. Pertinent reference material has been included in Appendix D.

The previously proposed 10'x10' RCB headwall structure is intended for a temporary condition only, and the total flow to impacting the 10'x10' RCB inlet will substantially reduce to approximately 17 cfs in the ultimate condition. Therefore, a riprap lined sump is proposed at the interim mainline inlet in lieu of the headwall structure. The proposed riprap lined sump should not present a negative hydraulic impact on the proposed storm drain system.

If there are any questions concerning this study or if additional information is needed, please do not hesitate to contact this office.

Respectfully Submitted,

VTN Nevada



Joanna Ayson, E.I.

APPENDIX INDEX

APPENDIX A - FIGURES

1) Figure 5A –Interim Condition Soil Map
2) Figure 5C – Precipitation Map
3) Figure 7 – Interim Condition Drainage Map
4) Figure 8 – Ultimate Condition Drainage Map
5) Figure 9 – Proposed Storm Drain Facilities Map

APPENDIX B - HYDROLOGIC CALCULATIONS

1) Interim Condition Hydrologic Calculations
    a. Curve Number
    b. Travel Time
    c. Standard Form 4
    d. HEC-1 Model
2) Ultimate Condition Hydrologic Calculations
    a. Curve Number
    b. Travel Time
    c. Standard Form 4
    d. Lag Time Calculations for Basins Larger than 1 Square Mile
    e. HEC-1 Model

APPENDIX C - HYDRAULIC CALCULATIONS

1) Channel Normal Depth Calculations
2) WSPG Models
    a. 100-Year Ultimate Condition Model
    b. 100-Year Interim Condition Model
3) Standard Form 6 Calculations
    a. 100-Year Ultimate Condition Models
    b. 100-Year Interim Condition Models
4) HY-8 Calculations (100-Year Interim Condition)

APPENDIX D - REFERENCE INFORMATION

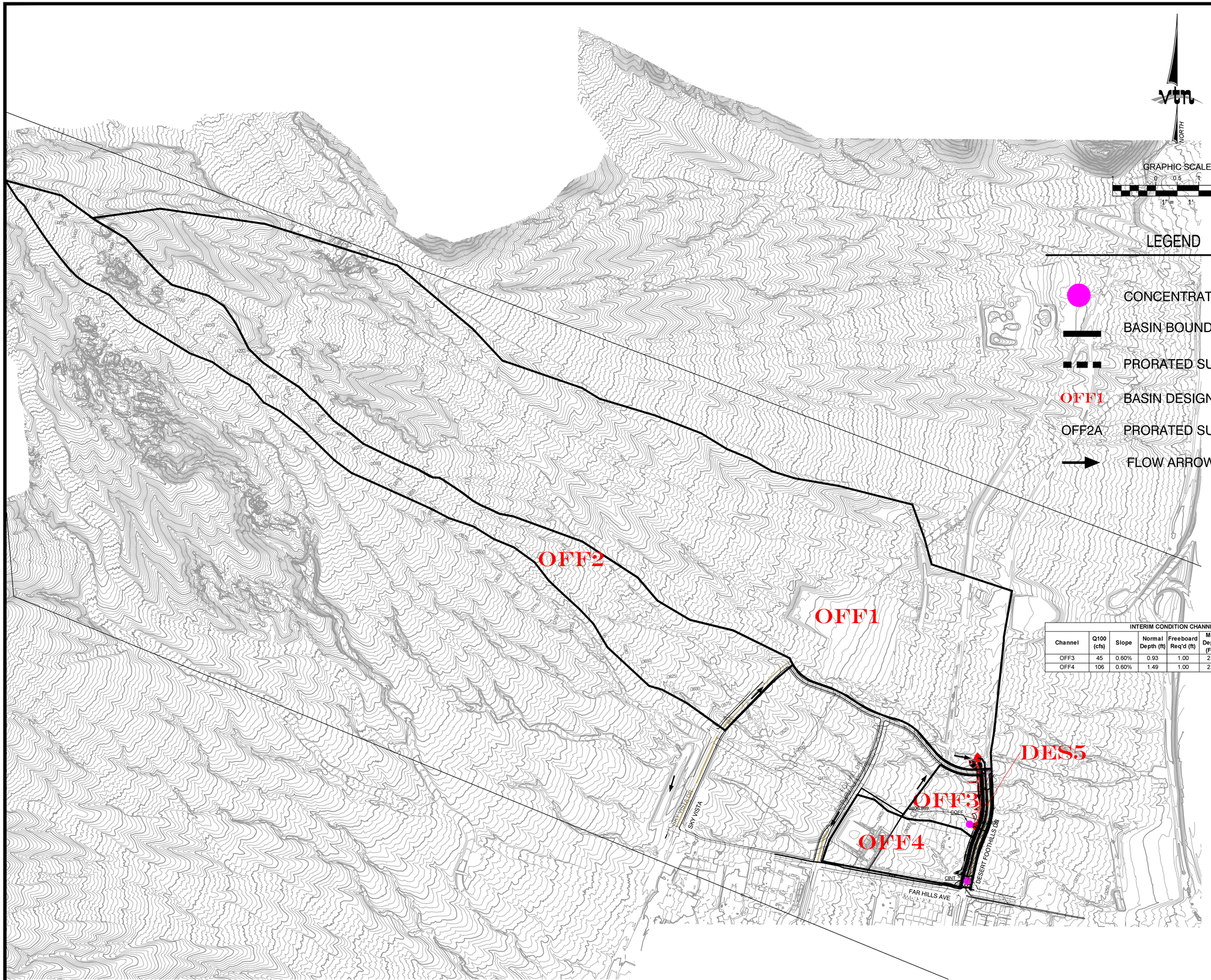
1) Summerlin West Planning Area Master Plan Update
    a. Overall Updated Land Use Map
    b. Figure A.6.6 – Village 21 Tributary Basin Map

2) Technical Drainage Study for Village 21 Redpoint Drive (Fox Hill Drive to Desert Foothills Drive)
    a. Improvement Plan Sheet MG1

3) Master Conceptual Drainage Study for Summerlin West Village 25
    a. Figure 5A – Soils Map
    b. Figure 5B - Rainfall Map

APPENDIX

APPENDIX A
FIGURES



INTERIM CONDITION HEC-1 SUMMARY TABLE

BASIN ID	AREA (ac)	Q100 (CFS)
DES5*	5.46	21
OFF2	190.10	316
OFF1	642.20	828
COFF1	-	1087
OFF3	15.54	45
OFF4	36.76	106
CINT	-	1120

*Refer to Master Study Village 21

INTERIM CONDITION CHANNEL SUMMARY TABLE

Channel	Q100 (cfs)	Slope	Normal Depth (ft)	Freeboard Req'd (ft)	Min Depth (FT)	Velocity (ft/s)	Riprap (D50)	Side Slopes	Description
OFF3	45	0.60%	0.93	1.00	2.0	3.79	N/A	3:1/3:1	10' BW Trap
OFF4	106	0.60%	1.49	1.00	2.5	4.93	N/A	3:1/3:1	10' BW Trap

REV	DATE	BY	REVISION

CLV

THE HOWARD HUGHES CORPORATION
10901 WEST CHARLESTON BLVD, 3RD FLOOR
LAS VEGAS, NEVADA 89135

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

FIGURE 7
INTERIM CONDITION BASIN MAP

SUMMERLIN VILLAGE 21
DESERT FOOTHILLS DRIVE
(FAR HILLS TO STREET A)

DRAWN BY: ATM/AH
DESIGNED BY: JYA
CHECKED BY: JYA
PROJECT NO: 7851-5.1
AUGUST 2018
SCALE:
HORIZ.
VERT.

SHEET
OF SHEETS
DRAWING NO.

H:\7851\Desert Foothills Drive-South\Drainage\4_LIP2\A Figures\Figure 7B - Interim Condition 2 Map.dwg



GRAPHIC SCALE

400 0 200 400 800

1" = 400'

LEGEND

- BASIN BOUNDARY
- A — BASIN DESIGNATION
- CROSS SECTION
- CONCENTRATION POINT

ULTIMATE CONDITION HEC-1 SUMMARY TABLE

BASIN ID	AREA (ac)	Q100 (CFS)
V25-C	26.54	99
STA1	2.29	10
CC	2.84	109
V25-COS2	1.72	5
CCOS2	-	114
V25-B	19.86	76
CB	-	190
V25-FOXN	3.2	14
V25-F	10.44	43
V25-COS4	5.04	16
CFOX4A	-	73
V25-FOXS	3.19	12
CFOX4B	-	275
STA2	2.84	12
CSTA2	-	287
V25-E	17.14	65
CSTE	-	360
F*	16.58	65
E*	20.15	78
DES5*	5.83	22

*Refer to Master Study for referenced Village 21 basins

ULTIMATE CONDITION STREET FLOW ANALYSIS SUMMARY

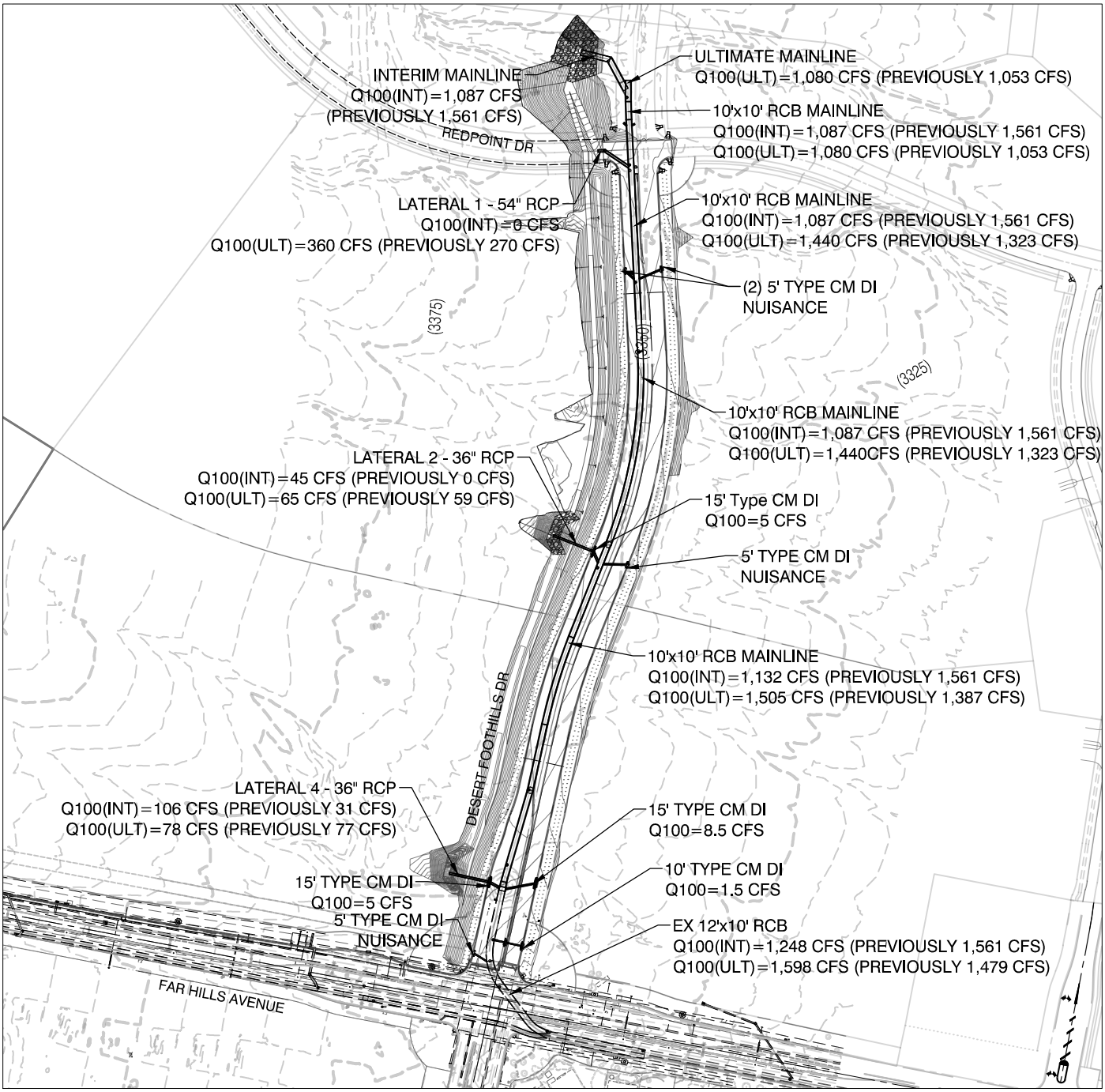
Section	Q100 (cfs)	Slope	Velocity (ft/s)	Depth (ft)	V x D	Tributary Basins
1 East	5	0.72%	2.26	0.43	0.97	1/4DES5
1 West	5	0.72%	2.26	0.43	0.97	1/4DES5
2 East	10	1.39%	3.42	0.47	1.61	1/2DES5
2 West	5	1.39%	2.92	0.39	1.14	1/4DES5 + Bypass 1 West
3 East	1.5	1.20%	2.11	0.29	0.61	Bypass 2 East

W.O.#: 7851-5.1
DATE: AUGUST 2018
BY: JYA/AH
SCALE: 1" = 400'
SHEET 1 OF 1

FIGURE 8: ULTIMATE CONDITION BASIN MAP
DESERT FOOTHILLS DRIVE
(FAR HILLS TO STREET A)

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NV 89146-5148

H:\7851\Dessert Foothills Drive-South\Drainage\4_UP21\A Figures\Figure 8 - Ultimate Drainage Map.dwg;jayson; Feb 07, 2019 - 4:56pm



GRAPHIC SCALE

300 0 150 300 600

1" = 300'

NORTH

H:\7851\Dessert Foothils Drive-South\Drainage\4_UP2\A Figures\Figure 9 - Storm Drain Facilities Map.dwg

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NV 89146-5148

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
(FAR HILLS AVE TO STREET A)

FIGURE 9:
PROPOSED STORM DRAIN FACILITIES MAP

SCALE	HORZ.	1" = 300'
	VERT.	N/A
W.O. NO.		7851-5.1
DRAWN BY:		JYA
DATE:		AUGUST 2018
SHEET	1	OF 1

APPENDIX B
HYDROLOGIC CALCULATIONS

INTERIM CONDITION
HYDROLOGIC CALCULATIONS

CURVE NUMBERS FOR SOILS

Soil # 112 Arizo very gravelly loamy sand, flooded, 0 to 4 percent slopes								
Soil	Percent	Group	Existing$_1$	Impervious$_2$	Open Space$_{3\ (Poor\ Condition)}$	Commercial$_4$	Residential$_{5\ (7{,}000\ ft^2)}$	Residential$_{6\ (10{,}000\ Ft2)}$
Arizo	100%	A	63	98	68	89	76	61
Total	**100%**		**63**	**98**	**68**	**89**	**76**	**61**

Soil # 152 Cave gravelly fine sandy loam, 0 to 4 percent slopes								
Soil	Percent	Group	Existing$_1$	Impervious$_2$	Open Space$_{4\ (Poor\ Condition)}$	Commercial	Residential$_{4\ (7{,}000\ ft^2)}$	Residential$_{5\ (10{,}000\ Ft2)}$
Cave	100%	D	88	98	89	95	91	87
Total	**100%**		**80**	**89**	**89**	**95**	**91**	**87**

Soil # 156 Vace - Wechech association								
Soil	Percent	Group	Existing$_1$	Impervious$_2$	Open Space$_{4\ (Poor\ Condition)}$	Commercial$_3$	Residential$_{4\ (7{,}000\ ft^2)}$	Residential$_{5\ (10{,}000\ Ft2)}$
Vace and Similar	45%	D	88	98	89	95	91	87
Wechech and Similar	25%	D	88	98	89	95	91	87
Wechech, steep, and similar	15%	D	88	98	89	95	91	87
Weiser	8%	B	77	98	79	92	84	75
Irongold	4%	D	88	98	89	95	91	87
Commski	2%	B	77	98	79	92	84	75
Threelakes	1%	A	63	98	68	89	76	61
Total	**100%**		**87**	**98**	**88**	**95**	**91**	**86**

Soil # 640 Rock outcrop, sand stone								
Soil	Percent	Group	Existing$_1$	Impervious$_2$	Open Space$_{4\ (Poor\ Condition)}$	Commercial$_3$	Residential$_{4\ (7{,}000\ ft^2)}$	Residential$_{5\ (10{,}000\ Ft2)}$
Rock outcrop	90%	D	88	98	89	95	91	87
Moentria	5%	D	88	98	89	95	91	87
Nupper	5%	D	88	98	89	95	91	87
Total	**100%**		**88**	**98**	**89**	**95**	**91**	87

Soil # 731 Purob-Irongold association								
Soil	Percent	Group	Existing$_1$	Impervious$_2$	Open Space$_{4\ (Poor\ Condition)}$	Commercial$_3$	Residential$_{4\ (7{,}000\ ft^2)}$	Residential$_{5\ (10{,}000\ Ft2)}$
Purob	60%	D	88	98	89	95	91	87
Irongold	25%	D	88	98	89	95	91	87
Typic torriorthents	5%	A	63	98	68	89	76	61
Arizo	3%	A	63	98	68	89	76	61
Purob	3%	D	88	98	89	95	91	87
Typic haplocalcids	2%	B	77	98	79	82	84	75
Xeric haplocambids	1%	A	63	98	68	89	76	87
Aridic calcixerolls	1%	A	63	98	68	89	76	87
Total	**100%**		**86**	**98**	**87**	**94**	**90**	**85**

Notes:

1- Referenced from Table 602 (4 of 4), Desert Shrub, Poor Condition
2- Referenced from Table 602 (1 of 4), Impervious Paved Streets and Roads
3- Referenced from Table 602 (1 of 4), Open space (Poor Condition)
4- Referenced from Table 602 (1 of 4) Commercial, Single Family Residential <6,000 sqft lots
5- Referenced from Table 602A, Single Family Residential 7,000 sqft lots
6- Referenced from Table 602A, Single Family Residential 10,000 sqft lots

Curve Number calculations for basins

Basin	Type	Soil	1	2	3	4	5	6	CN Value
INTERIM CONDITION									
OFF1	112	0.1%	100%						**85.8**
	152	8.1%	100%						
	156	33.6%	100%						
	731	58.1%	100%						
OFF2	112	14.2%	100%						**83.0**
	156	1.4%	100%						
	640	4.7%	100%						
	731	79.7%	100%						
OFF3	156	100%	100%						**87.0**
	731	0%	100%						
OFF4	156	100%	100%						**87.0**

TRAVEL TIME CALCULATIONS

DEVELOPMENT: Desert Foothills (Far Hills to Street A)
W.O. # 7851-5.1 **CALCULATED BY:** JYA

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

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

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

					First 500 feet		Remaining Travel Distance	
Basin	**Length** (ft)	**High Elev** (ft)	**Low Elev** (ft)	**Slope** (ft/ft)	**C1**	**V1** (fps)	**C2**	**V2** (fps)
INTERIM CONDITION								
OFF1	N/A							
OFF2	12742	4476	3547	0.073	14.8	4.0	29.4	7.9
OFF3	1005	3407	3353	0.054	14.8	3.4	29.4	6.8
OFF4	1631	3435	3338	0.059	14.8	3.6	29.4	7.2

STANDARD FORM 4

DEVELOPMENT: Desert Foothills (Far Hills to Street A)

CONDITION: Interim Condition

W.O. # 7851-5.1 **CALCULATED BY:** JYA

V1 applies to the first 500 feet of travel distance
V2 applies to the remaining travel distance

Existing:		Developed	
$V1 = 148 * S^{1/2}$	$V2 = 294 * S^{1/2}$	$V1 = 202 * S^{1/2}$	$V2 = 306 * S^{1/2}$

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

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

SUB-BASIN DATA					INITIAL/OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK (URBANIZED BASINS)		FINAL Tc	LAG TIME	REMARKS
DESIG. (1)	Cn	K (2)	AREA Ac. (3)	AREA Mi^2	LENGTH Ft (4)	SLOPE % (5)	Ti Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	V1 fps (9a)	V2 fps (9b)	Tt Min. (10)	TOTAL LENGTH (11)	Tc Min. (12)	Min.	TLAG Hr.	
INTERIM CONDITION																	
OFF1	85.8	0.743	642.20	1.0034	N/A		BASIN AREA GREATER THAN 1 SQUARE MILE										
OFF2	83.0	0.706	190.10	0.2970	950	9.6	10.30	12742	7.3	4.0	7.9	27.79	13692	86.07	38.08	0.381	
OFF3	87.0	0.758	15.54	0.0243	105	16.2	2.49	1005	5.4	3.4	6.8	3.66	1110	16.17	6.15	0.062	Min TLAG=0.10
OFF4	87.0	0.758	36.76	0.0574	245	8.7	4.68	1631	5.9	3.6	7.2	4.94	1876	20.42	9.62	0.096	Min TLAG=0.10

```
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   06FEB19  TIME  16:04:25  *                    *          (916) 756-1104              *
 *                                      *                    *                                      *
 ****************************************                    ****************************************

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


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

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

1                                              HEC-1 INPUT                                                PAGE  1

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

                        *DIAGRAM
 *** FREE ***
              1         ID    INTERIM CONDITION HYDROLOGIC MODEL
              2         ID    INPUT FILE DATE = FEBRUARY 6, 2019
              3         ID    DESIGN STORM = 100-YEAR 6-HR STORM
              4         ID    STORM DISTRIBUTION = SDN #3
              5         ID    MODELED BY VTN (JYA)
              6         ID
              7         ID    ********************************************************
              8         ID    * SUMMERLIN WEST VILLAGE 21                           *
              9         ID    * DESERT FOOTHILLS DRIVE - SOUTH (UPDATE #2)          *
             10         ID    ********************************************************
             11         ID
             12         ID                          AREA    DARF
             13         ID                          SQ. MI.
             14         ID                          0-0.5   0.99
             15         ID                          0.5-1   0.975
             16         ID                          1-2     0.95
             17         ID                          2-3     0.925
             18         ID                          3-4     0.915
             19         ID                          4-5     0.908
             20         ID                          5-6     0.903
             21         ID                          6-7     0.895
             22         ID                          7-8     0.885
             23         ID
             24         ID
             25         ID  JR CARD RATIOS REPRESENT DEPTH-AREA REDUCTION FACTORS (DARF'S)
             26         ID
             27         ID  100-YEAR,  6-HOUR STORM,  SDN3
             28         ID
             29         IT       5       0       0     300
             30         IO       5       0       0
             31         IN       5       0       0
             32         ID         0-0.5    0.5-1   1-2     2-3
             33         JR    PREC    0.99   0.975    0.95   0.925
                        *

             34         KK   DES5*
             35         KM   DEVELOPED ONSITE BASIN REFERENCED FROM MASTER STUDY
             36         BA  0.0091
             37         PB    3.38
             38         PC       0    0.02   0.057    0.07   0.087   0.108   0.124    0.13    0.13   0.130
             39         PC    0.13    0.13    0.13   0.133    0.14   0.142   0.148   0.158   0.172   0.181
             40         PC    0.19   0.197   0.199     0.2   0.201   0.204   0.214   0.229   0.241   0.249
             41         PC   0.251   0.256    0.27   0.278   0.281   0.283   0.295   0.322   0.352   0.409
             42         PC   0.499    0.59    0.71   0.744   0.781   0.812   0.819   0.835   0.851   0.856
             43         PC    0.86   0.868   0.876   0.888    0.91   0.926   0.937    0.95    0.97   0.976
             44         PC   0.982   0.985   0.987   0.989    0.99   0.993   0.993   0.994   0.995   0.998
             45         PC   0.998   0.999       1
             46         LS       0    98.0
             47         UD   0.108
```

```
                     *
1                                          HEC-1 INPUT                                          PAGE  2

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


             48      KK    OFF2
             49      KM   EXISTING OFFSITE BASIN
             50      BA  0.2970
             51      PB    3.54
             52      LS       0    83.0
             53      UD   0.381
                     *

             54      KK   ROFF2
             55      KM   ROUTE OFF2 TO COFF3
             56      RD    3718   0.055   0.035       0    TRAP
                     *

             57      KK    OFF1
             58      KM   EXISTING OFFSITE BASIN
             59      BA  1.0034
             60      PB    3.51
             61      LS       0    85.8
             62      UD   0.628
                     *

             63      KK   COFF1
             64      KM   COMBINE OFF1 AND OFF2
             65      HC       2
                     *

             66      KK    OFF3
             67      KM   EXISTING OFFSITE BASIN
             68      BA  0.0243
             69      PB    3.39
             70      LS       0    87.0
             71      UD   0.100
                     *

             72      KK    OFF4
             73      KM   EXISTING OFFSITE BASIN
             74      BA  0.0574
             75      PB    3.40
             76      LS       0    87.0
             77      UD   0.100
                     *

             78      KK    CINT
             79      KM   COMBINE DES5, COFF1, OFF3, OFF4
             80      HC       4
                     *
             81      ZZ
1
                 SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

    34       DES5*
                 .
                 .
    48           .        OFF2
                 .          V
                 .          V
    54           .       ROFF2
                 .          .
                 .          .
    57           .          .        OFF1
                 .          .          .
                 .          .          .
    63           .       COFF1.............
                 .          .
                 .          .
    66           .          .        OFF3
                 .          .          .
                 .          .          .
    72           .          .          .       OFF4
                 .          .          .          .
                 .          .          .          .
    78        CINT.....................................

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

* RUN DATE   06FEB19 TIME 16:04:25 *
*   DAVIS, CALIFORNIA 95616   *
*   (916) 756-1104   *

INTERIM CONDITION HYDROLOGIC MODEL
INPUT FILE DATE = FEBRUARY 6, 2019
DESIGN STORM = 100-YEAR 6-HR STORM
STORM DISTRIBUTION = SDN #3
MODELED BY VTN (JYA)

****
* SUMMERLIN WEST VILLAGE 21
* DESERT FOOTHILLS DRIVE - SOUTH (UPDATE #2)
****

AREA SQ. MI.	DARF
0-0.5	0.99
0.5-1	0.975
1-2	0.95
2-3	0.925
3-4	0.915
4-5	0.908
5-6	0.903
6-7	0.895
7-8	0.885

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

100-YEAR, 6-HOUR STORM, SDN3

```
   30 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                                0-0.5    0.5-1   1-2     2-3

      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       .98       .95       .93
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  RATIO 2  RATIO 3  RATIO 4
                                                        .99      .98      .95      .93

 HYDROGRAPH AT
+                 DES5*       .01     1   FLOW          21.      21.      20.      20.
                                           TIME         3.50     3.50     3.50     3.50

 HYDROGRAPH AT
+                  OFF2       .30     1   FLOW         316.     309.     297.     285.
                                           TIME         3.83     3.83     3.83     3.83
```

```
 ROUTED TO
+                  ROFF2       .30     1   FLOW         312.     303.     293.     280.
                                           TIME         3.92     3.83     3.92     3.92

 HYDROGRAPH AT
+                   OFF1      1.00     1   FLOW         878.     859.     828.     796.
                                           TIME         4.08     4.08     4.08     4.08

  2 COMBINED AT
+                  COFF1      1.30     1   FLOW        1155.    1129.    1087.    1043.
                                           TIME         4.00     4.00     4.00     4.00

 HYDROGRAPH AT
+                   OFF3       .02     1   FLOW          45.      44.      42.      41.
                                           TIME         3.50     3.50     3.50     3.50

 HYDROGRAPH AT
+                   OFF4       .06     1   FLOW         106.     104.     100.      96.
                                           TIME         3.50     3.50     3.50     3.50

  4 COMBINED AT
+                   CINT      1.39     1   FLOW        1189.    1162.    1120.    1075.
                                           TIME         4.00     4.00     4.00     4.00
1
                                       SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
                                           (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)
                                                                                 INTERPOLATED TO
                                                                               COMPUTATION INTERVAL
            ISTAQ    ELEMENT      DT       PEAK    TIME TO     VOLUME      DT       PEAK    TIME TO     VOLUME
                                                      PEAK                                    PEAK

                                  (MIN)     (CFS)      (MIN)     (IN)     (MIN)     (CFS)     (MIN)       (IN)

          FOR PLAN = 1  RATIO=  .00
             ROFF2  MANE         3.92    312.51    231.27      1.86      5.00    311.71    235.00        1.86


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .2950E+02 EXCESS= .0000E+00 OUTFLOW= .2950E+02 BASIN STORAGE= .8915E-03 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
             ROFF2  MANE         3.94    307.61    232.63      1.82      5.00    303.16    230.00        1.82


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .2879E+02 EXCESS= .0000E+00 OUTFLOW= .2880E+02 BASIN STORAGE= .1000E-02 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
             ROFF2  MANE         3.98    293.37    234.98      1.74      5.00    293.30    235.00        1.74


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .2763E+02 EXCESS= .0000E+00 OUTFLOW= .2763E+02 BASIN STORAGE= .8917E-03 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
             ROFF2  MANE         4.02    284.02    233.42      1.67      5.00    279.82    235.00        1.67


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .2646E+02 EXCESS= .0000E+00 OUTFLOW= .2646E+02 BASIN STORAGE= .8099E-03 PERCENT ERROR=    .0



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

ULTIMATE CONDITION
HYDROLOGIC CALCULATIONS

CURVE NUMBERS FOR SOILS - W.O. #7919

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

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

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

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

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

1-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602A
* Residential (Apartments / Condos)

2-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602A
* Residential (7,000 sq ft lots)

3-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602 page 1 of 4
* Open spaces in poor condition (grass cover < 50%)

4-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602 page 1 of 4
* Urban Districts (Commercial / Business & Residential with average lot size <6000 sqft)

5-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602 page 1 of 4
*Impervious (Paved Streets)

6-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602 page 1 of 4
*Urban Districts (Industrial)

Curve Number calculations for basins									
Basin Name	**Type**	**Soil Percentage**	**1**	**2**	**3**	**4**	**5**	**6**	**CN Value**
V25-B	156	100%				100%			**95.0**
V25-C	156	74%				100%			**95.0**
	731	26%				100%			
V25-E	156	100%				100%			**95.0**
V25-F	152	79%				100%			**95.0**
	156	21%				100%			
V25-COS2	156	100%			100%				**88.0**
V25-COS3	152	9%			100%				**88.1**
	156	91%			100%				
V25-COS4	156	100%			100%				**88.0**
	731	0%			100%				
V25-FOXN	152	62%					100%		**98.0**
	156	38%					100%		
V25-FOXS	156	100%					100%		**98.0**
STA1	156	82%					100%		**98.0**
	731	18%					100%		
STA2	156	100%					100%		**98.0**

STANDARD FORM 4

DEVELOPMENT: Desert Foothills South

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

V1 applies to the first 500 feet of travel distance V2 applies to the remaining travel distance

Existing:		Developed	
$V1 = 148 * S^{1/2}$	$V2 = 294 * S^{1/2}$	$V1 = 202 * S^{1/2}$	$V2 = 306 * S^{1/2}$

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

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

SUB-BASIN					INITIAL/OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK (URBANIZED BASINS)		FINAL Tc	LAG TIME	REMARKS
DESIG. (1)	Cn	K (2)	AREA Ac. (3)	AREA Mi^2	LENGTH Ft (4)	SLOPE % (5)	Ti Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	V1 fps (9a)	V2 fps (9b)	Tt Min. (10)	TOTAL LENGTH (11)	Tc Min. (12)	Min.	TLAG Hr.	
ULTIMATE CONDITION																	
V25-B	95.0	0.864	19.86	0.0310	100	1.0	4.25	1311	3.6	3.8	5.8	4.51	1411	17.84	8.76	0.088	
V25-C	95.0	0.864	26.54	0.0415	100	1.0	4.25	1465	2.7	3.3	5.1	5.68	1565	18.69	9.93	0.099	
V25-COS2	88.0	0.772	1.72	0.0027	100	1.0	5.91	1036	1.0	2.1	3.1	6.94	1136	16.31	12.85	0.128	
V25-COS3	88.1	0.773	2.40	0.0038	100	1.0	5.89	390	7.9	5.7	8.6	1.14	490	12.72	7.03	0.070	
V25-COS4	88.0	0.772	5.04	0.0079	100	1.0	5.91	1205	7.2	5.4	8.2	2.96	1305	17.25	8.88	0.089	
V25-E	95.0	0.864	17.14	0.0268	100	1.0	4.25	1250	3.3	3.7	5.5	4.53	1350	17.50	8.78	0.088	
V25-F	95.0	0.864	10.44	0.0163	100	1.0	4.25	1030	8.1	5.7	8.7	2.47	1130	16.28	6.72	0.067	
V25-FOXN	98.0	0.904	3.20	0.0050	60	2.0	2.17	1230	4.1	4.1	6.2	4.02	1290	17.17	6.19	0.062	
V25-FOXS	98.0	0.904	3.19	0.0050	60	2.0	2.17	1004	0.7	1.7	2.6	8.22	1064	15.91	10.39	0.104	
STA1	98.0	0.904	2.29	0.0036	32	2.0	1.59	1455	5.6	4.8	7.2	3.95	1487	18.26	5.54	0.055	
STA2	98.0	0.904	2.84	0.0044	35	2.0	1.67	1555	5.8	4.9	7.4	4.10	1590	18.84	5.77	0.058	
																	Tc Min (Urban)= 5 min
																	Tc Min (Non Urb)= 10 min

TRAVEL TIME CALCULATIONS

DEVELOPMENT: Desert Foothills South

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

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

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

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

					First 500 feet		Remaining Travel Distance	
Basin	**Length** (ft)	**High Elev** (ft)	**Low Elev** (ft)	**Slope** (ft/ft)	**C1**	**V1** (fps)	**C2**	**V2** (fps)
DEVELOPED CONDITION ONSITE								
V25-B	1311	3499	3452	0.036	20.2	3.8	30.6	5.8
V25-C	1465	3537	3497	0.027	20.2	3.3	30.6	5.1
V25-COS2	1036	3507	3496	0.010	20.2	2.1	30.6	3.1
V25-COS4	1205	3538	3451	0.072	20.2	5.4	30.6	8.2
V25-E	1250	3447	3406	0.033	20.2	3.7	30.6	5.5
V25-F	1030	3538	3455	0.081	20.2	5.7	30.6	8.7
V25-FOXN	1230	3502	3452	0.041	20.2	4.1	30.6	6.2
V25-FOX5A	1182	n/a	n/a	0.005	20.2	1.4	30.6	2.2
STA1	1455	3537	3456	0.056	20.2	4.8	30.6	7.2
STA2	1555	3450	3360	0.058	20.2	4.9	30.6	7.4

```
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   07FEB19  TIME  09:46:14  *                                   *          (916) 756-1104              *
 *                                      *                                   *                                      *
 ****************************************                                    ****************************************

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

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

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


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

                        *DIAGRAM
 *** FREE ***
             1          ID    ULTIMATE CONDITION HYDROLOGIC MODEL
             2          ID    OFFSITE BASINS DRAINING TO STUB AT STREET A
             3          ID    INPUT FILE DATE = FEBRUARY 7, 2019
             4          ID    DESIGN STORM = 100-YEAR 6-HR STORM
             5          ID    STORM DISTRIBUTION = SDN #3
             6          ID    MODELED BY VTN (JYA)
             7          ID
             8          ID    ********************************************************
             9          ID    * DESERT FOOTHILLS DRIVE (FAR HILLS TO STREET A)       *
            10          ID    ********************************************************
            11          ID
            12          ID
            13          ID  JR CARD RATIOS REPRESENT DEPTH-AREA REDUCTION FACTORS (DARF'S)
            14          ID
            15          ID  100-YEAR,  6-HOUR STORM,  SDN3
            16          ID
            17          IT       5       0       0     300
            18          IO       5       0       0
            19          IN       5       0       0
            20          JR    PREC    1.00
                        *

            21          KK   V25-C
            22          KM   ONSITE BASIN
            23          BA  0.0415
            24          PC       0    0.02   0.057    0.07   0.087   0.108   0.124    0.13    0.13   0.130
            25          PC    0.13    0.13    0.13   0.133    0.14   0.142   0.148   0.158   0.172   0.181
            26          PC    0.19   0.197   0.199     0.2   0.201   0.204   0.214   0.229   0.241   0.249
            27          PC   0.251   0.256    0.27   0.278   0.281   0.283   0.295   0.322   0.352   0.409
            28          PC   0.499    0.59    0.71   0.744   0.781   0.812   0.819   0.835   0.851   0.856
            29          PC    0.86   0.868   0.876   0.888    0.91   0.926   0.937    0.95    0.97   0.976
            30          PC   0.982   0.985   0.987   0.989    0.99   0.993   0.993   0.994   0.995   0.998
            31          PC   0.998   0.999       1
            32          PB    3.45
            33          LS       0    95.0
            34          UD   0.099
                        *

            35          KK    STA1
            36          KM   STREET BASIN
            37          BA  0.0036
            38          PB    3.43
            39          LS       0    98.0
            40          UD   0.055
                        *

            41          KK      CC
            42          KM   COMBINE STA1, AND C
            43          HC       2
```

```
                *
1                                       HEC-1 INPUT                                         PAGE  2

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


            44          KKV25-COS2
            45          KM   ONSITE BASIN
            46          BA  0.0027
            47          PB    3.43
            48          LS       0    88.0
            49          UD   0.128
                        *

            50          KK   CCOS2
            51          KM   COMBINE CC AND COS2
            52          HC       2
                        *

            53          KK   V25-B
            54          KM   ONSITE BASIN
            55          BA  0.0310
            56          PB    3.42
            57          LS       0    95.0
            58          UD   0.088
                        *

            59          KK      CB
            60          KM   COMBINE CCOS-2, AND B
            61          HC       2
                        *

            62          KKV25-FOXN
            63          KM   STREET BASIN
            64          BA  0.0050
            65          PB    3.41
            66          LS       0    98.0
            67          UD   0.062
                        *

            68          KK   V25-F
            69          KM   ONSITE BASIN
            70          BA  0.0163
            71          PB    3.44
            72          LS       0    95.0
            73          UD   0.067
                        *

            74          KKV25-COS4
            75          KM   ONSITE BASIN
            76          BA  0.0079
            77          PB    3.43
            78          LS       0    88.0
            79          UD   0.089
                        *
1                                       HEC-1 INPUT                                         PAGE  3

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


            80          KK  CFOX4A
            81          KM   COMBINE F, COS-4, AND FOX4
            82          HC       3
                        *

            83          KKV25-FOXS
            84          BA  0.0050
            85          PB    3.40
            86          LS       0    98.0
            87          UD   0.104
                        *

            88          KK  CFOX4B
            89          KM   COMBINE FOXS, CB AND CFOX4A
            90          HC       3
                        *

            91          KK    STA2
            92          KM   STREET BASIN
            93          BA  0.0044
            94          PB    3.39
            95          LS       0    98.0
            96          UD   0.058
                        *

            97          KK   CSTA2
            98          KM   COMBINE CFOX4B AND STA2
            99          HC       2
                        *
```

```
            100          KKV25-COS3
            101          KM   STREET BASIN
            102          BA  0.0038
            103          PB    3.41
            104          LS       0    88.1
            105          UD   0.070
                         *

            106          KK   CCOS3
            107          KM   COMBINE CSTA2 AND C25-COS3
            108          HC       2
                         *

            109          KK   V25-E
            110          KM   ONSITE BASIN
            111          BA  0.0268
            112          PB    3.40
            113          LS       0    95.0
            114          UD   0.088
                         *
1                                              HEC-1 INPUT                                                PAGE  4

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


            115          KK    CSTE
            116          KM   COMBINE CCOS3 AND E
            117          HC       2
                         *
            118          ZZ
1
                 SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE       (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

     21        V25-C
                   .
                   .
     35            .        STA1
                   .           .
                   .           .
     41          CC............
                   .
                   .
     44            .    V25-COS2
                   .           .
                   .           .
     50        CCOS2............
                   .
                   .
     53            .       V25-B
                   .           .
                   .           .
     59          CB............
                   .
                   .
     62            .    V25-FOXN
                   .           .
                   .           .
     68            .           .       V25-F
                   .           .           .
                   .           .           .
     74            .           .           .    V25-COS4
                   .           .           .           .
                   .           .           .           .
     80            .      CFOX4A.......................
                   .           .
                   .           .
     83            .           .    V25-FOXS
                   .           .           .
                   .           .           .
     88       CFOX4B.......................
                   .
                   .
     91            .        STA2
                   .           .
                   .           .
     97        CSTA2............
                   .
                   .
    100            .    V25-COS3
                   .           .
                   .           .
    106        CCOS3............
                   .
                   .
```

```
  109           .       V25-E
                .           .
                .           .
  115       CSTE.............

 (***) 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   07FEB19  TIME  09:46:14  *                                   *          (916) 756-1104              *
 *                                      *                                   *                                      *
 ****************************************                                    ****************************************



                          ULTIMATE CONDITION HYDROLOGIC MODEL
                          OFFSITE BASINS DRAINING TO STUB AT STREET A
                          INPUT FILE DATE = FEBRUARY 7, 2019
                          DESIGN STORM = 100-YEAR 6-HR STORM
                          STORM DISTRIBUTION = SDN #3
                          MODELED BY VTN (JYA)

                          ********************************************************
                          * DESERT FOOTHILLS DRIVE (FAR HILLS TO STREET A)       *
                          ********************************************************


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

                        100-YEAR,  6-HOUR STORM,  SDN3


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

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

                    COMPUTATION INTERVAL     .08 HOURS
                        TOTAL TIME BASE   24.92 HOURS

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

      JP          MULTI-PLAN OPTION
                       NPLAN           1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                     1.00
1

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


                                                                    RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION     AREA    PLAN            RATIO 1
                                                        1.00

 HYDROGRAPH AT
+                 V25-C       .04     1   FLOW          99.
                                           TIME         3.50

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

   2 COMBINED AT
```

```
+                     CC       .05     1   FLOW         109.
                                           TIME        3.50

 HYDROGRAPH AT
+               V25-COS2       .00     1   FLOW           5.
                                           TIME        3.58

  2 COMBINED AT
+                   CCOS2       .05     1   FLOW         114.
                                           TIME        3.50

 HYDROGRAPH AT
+                   V25-B       .03     1   FLOW          76.
                                           TIME        3.50

  2 COMBINED AT
+                      CB       .08     1   FLOW         190.
                                           TIME        3.50

 HYDROGRAPH AT
+               V25-FOXN       .00     1   FLOW          14.
                                           TIME        3.50

 HYDROGRAPH AT
+                   V25-F       .02     1   FLOW          43.
                                           TIME        3.50

 HYDROGRAPH AT
+               V25-COS4       .01     1   FLOW          16.
                                           TIME        3.50

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

 HYDROGRAPH AT
+               V25-FOXS       .00     1   FLOW          12.
                                           TIME        3.50

  3 COMBINED AT
+                  CFOX4B       .11     1   FLOW         275.
                                           TIME        3.50

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

  2 COMBINED AT
+                   CSTA2       .12     1   FLOW         287.
                                           TIME        3.50

 HYDROGRAPH AT
+               V25-COS3       .00     1   FLOW           8.
                                           TIME        3.50

  2 COMBINED AT
+                   CCOS3       .12     1   FLOW         295.
                                           TIME        3.50

 HYDROGRAPH AT
+                   V25-E       .03     1   FLOW          65.
                                           TIME        3.50

  2 COMBINED AT
+                    CSTE       .15     1   FLOW         360.
                                           TIME        3.50


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

APPENDIX C
HYDRAULIC CALCULATIONS

CHANNEL
NORMAL DEPTH CALCULATIONS

Worksheet for OFF3

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.025	
Channel Slope	0.60	%
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	10.00	ft
Discharge	45.00	ft³/s

Results

Normal Depth	0.93	ft
Flow Area	11.87	ft²
Wetted Perimeter	15.87	ft
Hydraulic Radius	0.75	ft
Top Width	15.57	ft
Critical Depth	0.79	ft
Critical Slope	0.01069	ft/ft
Velocity	3.79	ft/s
Velocity Head	0.22	ft
Specific Energy	1.15	ft
Froude Number	0.77	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.93	ft
Critical Depth	0.79	ft
Channel Slope	0.60	%

Worksheet for OFF3

GVF Output Data

Critical Slope	0.01069	ft/ft

Cross Section for OFF3

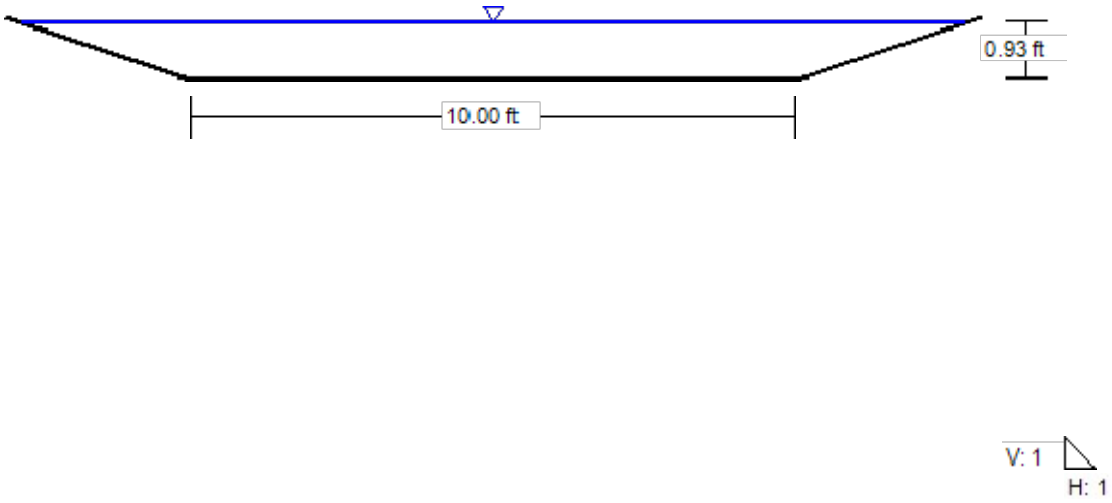
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.025	
Channel Slope	0.60	%
Normal Depth	0.93	ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	10.00	ft
Discharge	45.00	ft³/s

Cross Section Image



Worksheet for OFF4

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.025	
Channel Slope	0.60	%
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	10.00	ft
Discharge	106.00	ft³/s

Results

Normal Depth	1.49	ft
Flow Area	21.50	ft²
Wetted Perimeter	19.40	ft
Hydraulic Radius	1.11	ft
Top Width	18.92	ft
Critical Depth	1.32	ft
Critical Slope	0.00931	ft/ft
Velocity	4.93	ft/s
Velocity Head	0.38	ft
Specific Energy	1.86	ft
Froude Number	0.82	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.49	ft
Critical Depth	1.32	ft
Channel Slope	0.60	%

Worksheet for OFF4

GVF Output Data

Critical Slope	0.00931	ft/ft

Cross Section for OFF4

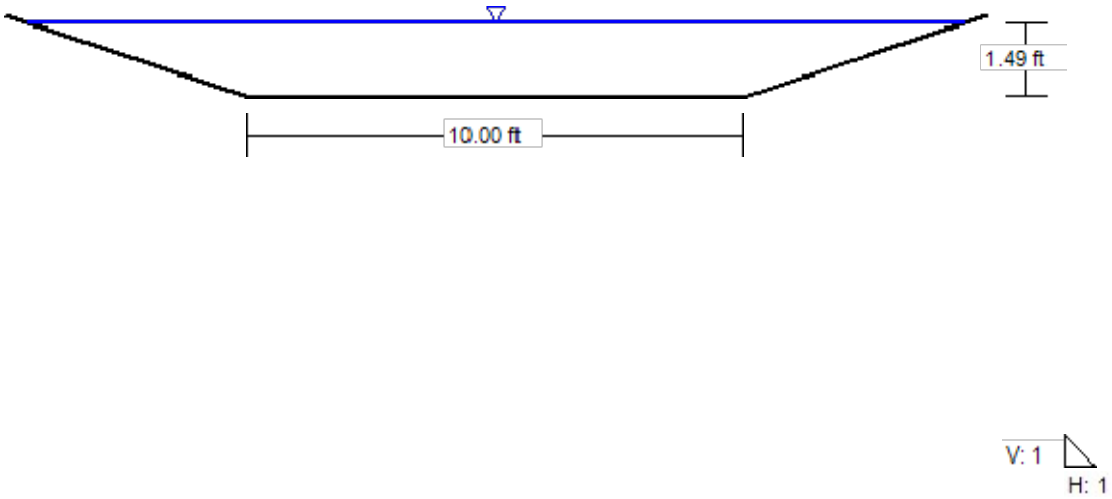
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.025	
Channel Slope	0.60	%
Normal Depth	1.49	ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	10.00	ft
Discharge	106.00	ft³/s

Cross Section Image



WSPG MAINLINE MODEL
100-YEAR ULTIMATE CONDITION

```
T1 Summerlin West Village 21
T2 Desert Foothills Drive (Far Hills to Street A)
T3 EX 12'x10' RCB TO PROPOSED 10'X10' RCB - ULTIMATE CONDITION
SO   1000.00 3323.050  1      .015               3333.05
R    1026.58 3323.430  1      .015                                  20.69
R    1117.93 3324.590  1      .015
R    1167.65 3325.220  1      .015                                  28.47
R    1204.63 3325.690  1      .015                                  21.18
R    1309.13 3327.020  1      .015
R    1313.93 3327.049  1      .015
JX   1313.93 3327.049  1  4  3.015  83.00     8.50  3327.05 3327.05  72.0 67.0
R    1317.13 3327.068  1      .015
TS   1327.13 3327.128  2      .015
R    1515.61 3328.259  2      .015                                       3.00
R    1648.92 3329.059  2      .015                                      -3.00
R    1829.89 3330.145  2      .015                                   9.31
R    1986.44 3331.084  2      .015
JX   1986.44 3331.084  2  4   .015  65.00           3331.08 3331.08  45.0 69.0
R    2026.63 3331.325  2      .015
R    2416.77 3333.666  2      .015                               -24.48
R    2778.71 3335.837  2      .015
JX   2778.71 3335.837  2  5   .015 360.00           3336.34          53.0
R    2875.71 3336.419  2      .015
R    2953.34 3337.580  2      .015                               -3.94
SH   2953.34 3337.580  2      .015
CD   1  3   0   0.00    10.00    12.00  0.00  0.00
CD   2  3   0   0.00    10.00    10.00  0.00  0.00
CD   3  4   0   0.00     2.00     0.00  0.00  0.00
CD   4  4   0   0.00     3.00     0.00  0.00  0.00
CD   5  4   0   0.00     4.50     0.00  0.00  0.00
Q          1080.000   .0
```

Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING Date: 2- 7-2019 Time:10:26:16

Summerlin West Village 21
Desert Foothills Drive (Far Hills to Street A)
EX 12'x10' RCB TO PROPOSED 10'X10' RCB - ULTIMATE CONDITION

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1000.000	3323.050	6.104	3329.155	1596.50	21.79	7.38	3336.53	2.40	8.19	12.00	10.000	12.000	.00	0 .0
26.580	.0143				.0109	.29	8.51	1.55	5.55	.015	.00	.00	BOX	
1026.580	3323.430	6.169	3329.599	1596.50	21.57	7.22	3336.82	.00	8.19	12.00	10.000	12.000	.00	0 .0
91.350	.0127				.0104	.95	6.17	1.53	5.80	.015	.00	.00	BOX	
1117.930	3324.590	6.338	3330.928	1596.50	20.99	6.84	3337.77	1.64	8.19	12.00	10.000	12.000	.00	0 .0
49.720	.0127				.0097	.48	7.98	1.47	5.80	.015	.00	.00	BOX	
1167.650	3325.220	6.471	3331.691	1596.50	20.56	6.56	3338.25	1.57	8.19	12.00	10.000	12.000	.00	0 .0
36.980	.0127				.0092	.34	8.05	1.42	5.79	.015	.00	.00	BOX	
1204.630	3325.690	6.604	3332.294	1596.50	20.15	6.30	3338.60	.00	8.19	12.00	10.000	12.000	.00	0 .0
32.224	.0127				.0087	.28	6.60	1.38	5.79	.015	.00	.00	BOX	
1236.854	3326.100	6.756	3332.856	1596.50	19.69	6.02	3338.88	.00	8.19	12.00	10.000	12.000	.00	0 .0
45.647	.0127				.0080	.36	6.76	1.34	5.79	.015	.00	.00	BOX	
1282.501	3326.681	7.086	3333.767	1596.50	18.78	5.47	3339.24	.00	8.19	12.00	10.000	12.000	.00	0 .0
26.629	.0127				.0070	.19	7.09	1.24	5.79	.015	.00	.00	BOX	
1309.130	3327.020	7.432	3334.452	1596.50	17.90	4.98	3339.43	.00	8.19	12.00	10.000	12.000	.00	0 .0
4.800	.0061				.0066	.03	7.43	1.16	7.68	.015	.00	.00	BOX	
1313.930	3327.049	7.424	3334.473	1596.50	17.92	4.99	3339.46	.00	8.19	12.00	10.000	12.000	.00	0 .0
JUNCT STR	.0000				.0089	.00	7.42	1.16		.015	.00	.00	BOX	

Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING Date: 2- 7-2019 Time:10:26:16

Summerlin West Village 21
Desert Foothills Drive (Far Hills to Street A)
EX 12'x10' RCB TO PROPOSED 10'X10' RCB - ULTIMATE CONDITION

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1313.930	3327.049	5.828	3332.877	1505.00	21.52	7.19	3340.07	.00	7.88	12.00	10.000	12.000	.00	0 .0
3.200	.0060				.0111	.04	5.83	1.57	7.39	.015	.00	.00	BOX	
1317.130	3327.068	5.817	3332.885	1505.00	21.56	7.22	3340.10	.00	7.88	12.00	10.000	12.000	.00	0 .0
TRANS STR	.0060				.0087	.09	5.82	1.58		.015	.00	.00	BOX	
1327.130	3327.128	8.892	3336.020	1505.00	16.93	4.45	3340.47	.00	8.89	10.00	10.000	10.000	.00	0 .0
21.914	.0060				.0060	.13	8.89	1.00	9.00	.015	.00	.00	BOX	
1349.044	3327.260	9.003	3336.263	1505.00	16.72	4.34	3340.60	.00	8.89	10.00	10.000	10.000	.00	0 .0
166.566	.0060				.0060	1.00	9.00	.98	9.00	.015	.00	.00	BOX	

---------- WARNING - Flow depth near top of box conduit ----------

1515.610	3328.259	9.003	3337.262	1505.00	16.72	4.34	3341.60	.00	8.89	10.00	10.000	10.000	.00	0 .0
1.327	.0060				.0060	.01	9.00	.98	9.00	.015	.00	.00	BOX	

---------- WARNING - Flow depth near top of box conduit ----------

1516.937	3328.267	9.003	3337.270	1505.00	16.72	4.34	3341.61	.00	8.89	10.00	10.000	10.000	.00	0 .0
131.983	.0060				.0060	.79	9.00	.98	9.00	.015	.00	.00	BOX	

---------- WARNING - Flow depth near top of box conduit ----------

Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING Date: 2- 7-2019 Time:10:26:16

Summerlin West Village 21
Desert Foothills Drive (Far Hills to Street A)
EX 12'x10' RCB TO PROPOSED 10'X10' RCB - ULTIMATE CONDITION

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1648.920	3329.059	9.003	3338.062	1505.00	16.72	4.34	3342.40	.04	8.89	10.00	10.000	10.000	.00	0 .0
7.423	.0060				.0060	.04	9.04	.98	9.00	.015		.00	.00	BOX
		---------- WARNING - Flow depth near top of box conduit ----------												
1656.343	3329.104	9.004	3338.107	1505.00	16.72	4.34	3342.45	.04	8.89	10.00	10.000	10.000	.00	0 .0
173.547	.0060				.0060	1.04	9.04	.98	9.00	.015		.00	.00	BOX
		---------- WARNING - Flow depth near top of box conduit ----------												
1829.890	3330.145	9.004	3339.148	1505.00	16.72	4.34	3343.49	.00	8.89	10.00	10.000	10.000	.00	0 .0
42.911	.0060				.0060	.26	9.00	.98	9.01	.015		.00	.00	BOX
		---------- WARNING - Flow depth near top of box conduit ----------												
1872.801	3330.402	9.005	3339.407	1505.00	16.71	4.34	3343.74	.00	8.89	10.00	10.000	10.000	.00	0 .0
113.639	.0060				.0060	.68	9.01	.98	9.01	.015		.00	.00	BOX
		---------- WARNING - Flow depth near top of box conduit ----------												
1986.440	3331.084	9.005	3340.089	1505.00	16.71	4.34	3344.43	.00	8.89	10.00	10.000	10.000	.00	0 .0
JUNCT STR	.0000				.0062	.00	9.01	.98		.015		.00	.00	BOX
		---------- WARNING - Flow depth near top of box conduit ----------												

Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING Date: 2- 7-2019 Time:10:26:16

Summerlin West Village 21
Desert Foothills Drive (Far Hills to Street A)
EX 12'x10' RCB TO PROPOSED 10'X10' RCB - ULTIMATE CONDITION

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1986.440	3331.084	10.310	3341.394	1440.00	14.40	3.22	3344.61	.00	8.64	10.00	10.000	10.000	.00	0 .0
40.190	.0060				.0062	.25	10.31	.80	8.69	.015		.00	.00	BOX
2026.630	3331.325	10.320	3341.645	1440.00	14.40	3.22	3344.86	.00	8.64	10.00	10.000	10.000	.00	0 .0
390.140	.0060				.0062	2.43	.00	.80	8.69	.015		.00	.00	BOX
2416.770	3333.666	10.744	3344.410	1440.00	14.40	3.22	3347.63	.00	8.64	10.00	10.000	10.000	.00	0 .0
361.940	.0060				.0062	2.25	10.74	.80	8.69	.015		.00	.00	BOX
2778.710	3335.837	10.827	3346.664	1440.00	14.40	3.22	3349.88	.00	8.64	10.00	10.000	10.000	.00	0 .0
JUNCT STR	.0000				.0035	.00	10.83	.80		.015		.00	.00	BOX
2778.710	3335.837	12.236	3348.073	1080.00	10.80	1.81	3349.88	.00	7.13	10.00	10.000	10.000	.00	0 .0
97.000	.0060				.0035	.34	12.24	.60	6.92	.015		.00	.00	BOX
2875.710	3336.419	11.993	3348.412	1080.00	10.80	1.81	3350.22	.00	7.13	10.00	10.000	10.000	.00	0 .0
77.630	.0150				.0035	.27	.00	.60	4.88	.015		.00	.00	BOX
2953.340	3337.580	11.180	3348.760	1080.00	10.80	1.81	3350.57	.00	7.13	10.00	10.000	10.000	.00	0 .0

WSPG MAINLINE MODEL
100-YEAR INTERIM CONDITION

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T1 Summerlin West Village 21
T2 Desert Foothills Drive (Far Hills to Street A)
T3 EX 12'x10' RCB TO PROPOSED 10'X10' RCB - INTERIM CONDITION 1
SO   1000.00 3323.050  1      .015               3333.05
R    1026.58 3323.430  1      .015                                  20.69
R    1117.93 3324.590  1      .015
R    1167.65 3325.220  1      .015                                  28.47
R    1204.63 3325.690  1      .015                                  21.18
R    1309.13 3327.020  1      .015
R    1313.93 3327.049  1      .015
JX   1313.93 3327.049  1  4  3.015 106.00     8.50  3327.05 3327.05  72.0 67.0
R    1317.13 3327.068  1      .015
TS   1327.13 3327.128  2      .015
R    1515.61 3328.259  2      .015                                        3.00
R    1648.92 3329.059  2      .015                                       -3.00
R    1829.89 3330.145  2      .015                                   9.31
R    1986.44 3331.084  2      .015
JX   1986.44 3331.084  2  4   .015  45.00           3331.08 3331.08  45.0 69.0
R    2026.63 3331.325  2      .015
R    2416.77 3333.666  2      .015                                -24.48
R    2778.71 3335.837  2      .015
R    2875.71 3336.419  2      .015
R    2899.51 3336.799  2      .015
R    2915.93 3337.824  2      .015
R    2966.77 3341.001  2      .015                                     -48.00
R    3025.12 3344.646  2      .015
SH   3025.12 3344.646  2      .015
CD   1  3   0   0.00    10.00    12.00  0.00  0.00
CD   2  3   0   0.00    10.00    10.00  0.00  0.00
CD   3  4   0   0.00     2.00     0.00  0.00  0.00
CD   4  4   0   0.00     3.00     0.00  0.00  0.00
Q          1087.000   .0
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Summerlin West Village 21
Desert Foothills Drive (Far Hills to Street A)
EX 12'x10' RCB TO PROPOSED 10'X10' RCB - INTERIM CONDITION 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	
1000.000	3323.050	10.000	3333.050	1246.50	10.39	1.68	3334.73	10.00	6.95	12.00	10.000	12.000	.00	0 .0
7.464	.0143				.0024	.02	10.00	.58	4.62	.015	.00	.00	BOX	
1007.464	3323.157	10.000	3333.157	1246.50	10.39	1.68	3334.83	10.00	6.95	12.00	10.000	12.000	.00	0 .0
19.116	.0143				.0019	.04	10.00	.58	4.62	.015	.00	.00	BOX	
1026.580	3323.430	9.635	3333.065	1246.50	10.78	1.80	3334.87	.00	6.95	12.00	10.000	12.000	.00	0 .0
25.521	.0127				.0021	.05	9.63	.61	4.83	.015	.00	.00	BOX	
		---------- WARNING - Flow depth near top of box conduit ----------												
1052.101	3323.754	9.186	3332.940	1246.50	11.31	1.99	3334.93	.00	6.95	12.00	10.000	12.000	.00	0 .0
6.699	.0127				.0023	.02	9.19	.66	4.83	.015	.00	.00	BOX	
		---------- WARNING - Flow depth near top of box conduit ----------												
1058.800	3323.839	9.063	3332.902	1246.50	11.46	2.04	3334.94	.00	6.95	12.00	10.000	12.000	.00	0 .0
HYDRAULIC JUMP														
		---------- WARNING - Flow depth near top of box conduit ----------												
1058.800	3323.839	5.186	3329.025	1246.50	20.03	6.23	3335.26	.00	6.95	12.00	10.000	12.000	.00	0 .0
59.130	.0127				.0102	.60	5.19	1.55	4.83	.015	.00	.00	BOX	

Summerlin West Village 21
Desert Foothills Drive (Far Hills to Street A)
EX 12'x10' RCB TO PROPOSED 10'X10' RCB - INTERIM CONDITION 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	
1117.930	3324.590	5.292	3329.882	1246.50	19.63	5.98	3335.87	1.44	6.95	12.00	10.000	12.000	.00	0 .0
49.720	.0127				.0096	.48	6.73	1.50	4.83	.015	.00	.00	BOX	
1167.650	3325.220	5.421	3330.641	1246.50	19.16	5.70	3336.34	1.37	6.95	12.00	10.000	12.000	.00	0 .0
36.980	.0127				.0090	.33	6.79	1.45	4.83	.015	.00	.00	BOX	
1204.630	3325.690	5.555	3331.245	1246.50	18.70	5.43	3336.67	.00	6.95	12.00	10.000	12.000	.00	0 .0
12.903	.0127				.0086	.11	5.56	1.40	4.82	.015	.00	.00	BOX	
1217.533	3325.854	5.613	3331.467	1246.50	18.51	5.32	3336.79	.00	6.95	12.00	10.000	12.000	.00	0 .0
43.697	.0127				.0079	.35	5.61	1.38	4.82	.015	.00	.00	BOX	
1261.229	3326.410	5.887	3332.297	1246.50	17.65	4.83	3337.13	.00	6.95	12.00	10.000	12.000	.00	0 .0
26.498	.0127				.0070	.19	5.89	1.28	4.82	.015	.00	.00	BOX	
1287.728	3326.748	6.174	3332.922	1246.50	16.82	4.40	3337.32	.00	6.95	12.00	10.000	12.000	.00	0 .0
14.940	.0127				.0062	.09	6.17	1.19	4.82	.015	.00	.00	BOX	
1302.667	3326.938	6.475	3333.413	1246.50	16.04	4.00	3337.41	.00	6.95	12.00	10.000	12.000	.00	0 .0
6.463	.0127				.0054	.04	6.48	1.11	4.82	.015	.00	.00	BOX	
1309.130	3327.020	6.791	3333.812	1246.50	15.29	3.63	3337.44	.00	6.95	12.00	10.000	12.000	.00	0 .0
4.800	.0061				.0049	.02	6.79	1.03	6.36	.015	.00	.00	BOX	
1313.930	3327.049	6.945	3333.994	1246.50	14.96	3.47	3337.47	.00	6.95	12.00	10.000	12.000	.00	0 .0
JUNCT STR	.0000				.0020	.00	6.95	1.00		.015	.00	.00	BOX	

WATER SURFACE PROFILE LISTING Date: 2-11-2019 Time:10:18:16

Summerlin West Village 21
Desert Foothills Drive (Far Hills to Street A)
EX 12'x10' RCB TO PROPOSED 10'X10' RCB - INTERIM CONDITION 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
1313.930	3327.049	8.976	3336.025	1132.00	10.51	1.72	3337.74	.00	6.51	12.00	10.000	12.000	.00	0 .0
3.200	.0060					.0020	.01	8.98	.62	5.95	.015	.00	.00	BOX
1317.130	3327.068	8.955	3336.023	1132.00	10.53	1.72	3337.75	.00	6.51	12.00	10.000	12.000	.00	0 .0
TRANS STR	.0060							8.96	.62		.015	.00	.00	BOX
1327.130	3327.128	7.176	3334.304	1132.00	15.77	3.86	3338.17	.00	7.36	10.00	10.000	10.000	.00	0 .0
136.958	.0060					.0060	.82	7.18	1.04	7.18	.015	.00	.00	BOX
1464.088	3327.950	7.176	3335.126	1132.00	15.77	3.86	3338.99	.00	7.36	10.00	10.000	10.000	.00	0 .0
51.522	.0060					.0060	.31	7.18	1.04	7.18	.015	.00	.00	BOX
1515.610	3328.259	7.176	3335.435	1132.00	15.77	3.86	3339.30	.00	7.36	10.00	10.000	10.000	.00	0 .0
55.042	.0060					.0060	.33	7.18	1.04	7.18	.015	.00	.00	BOX
1570.653	3328.589	7.176	3335.765	1132.00	15.77	3.86	3339.63	.00	7.36	10.00	10.000	10.000	.00	0 .0
78.267	.0060					.0060	.47	7.18	1.04	7.18	.015	.00	.00	BOX
1648.920	3329.059	7.176	3336.236	1132.00	15.77	3.86	3340.10	.07	7.36	10.00	10.000	10.000	.00	0 .0
100.600	.0060					.0060	.60	7.25	1.04	7.18	.015	.00	.00	BOX
1749.520	3329.663	7.176	3336.839	1132.00	15.77	3.86	3340.70	.07	7.36	10.00	10.000	10.000	.00	0 .0
80.370	.0060					.0060	.48	7.25	1.04	7.18	.015	.00	.00	BOX
1829.890	3330.145	7.178	3337.323	1132.00	15.77	3.86	3341.18	.00	7.36	10.00	10.000	10.000	.00	0 .0
119.673	.0060					.0060	.72	7.18	1.04	7.18	.015	.00	.00	BOX

Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING Date: 2-11-2019 Time:10:18:16

Summerlin West Village 21
Desert Foothills Drive (Far Hills to Street A)
EX 12'x10' RCB TO PROPOSED 10'X10' RCB - INTERIM CONDITION 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
1949.563	3330.863	7.178	3338.041	1132.00	15.77	3.86	3341.90	.00	7.36	10.00	10.000	10.000	.00	0 .0
36.877	.0060					.0058	.21	7.18	1.04	7.18	.015	.00	.00	BOX
1986.440	3331.084	7.356	3338.440	1132.00	15.39	3.68	3342.12	.00	7.36	10.00	10.000	10.000	.00	0 .0
JUNCT STR	.0000					.0033	.00	7.36	1.00		.015	.00	.00	BOX
1986.440	3331.084	8.826	3339.910	1087.00	12.32	2.36	3342.27	.00	7.16	10.00	10.000	10.000	.00	0 .0
40.190	.0060					.0033	.13	8.83	.73	6.95	.015	.00	.00	BOX
2026.630	3331.325	8.591	3339.917	1087.00	12.65	2.49	3342.40	.05	7.16	10.00	10.000	10.000	.00	0 .0
66.875	.0060					.0035	.24	8.65	.76	6.95	.015	.00	.00	BOX
2093.505	3331.726	8.192	3339.918	1087.00	13.27	2.73	3342.65	.06	7.16	10.00	10.000	10.000	.00	0 .0
60.303	.0060					.0040	.24	8.25	.82	6.95	.015	.00	.00	BOX
2153.808	3332.088	7.810	3339.899	1087.00	13.92	3.01	3342.91	.07	7.16	10.00	10.000	10.000	.00	0 .0
26.781	.0060					.0045	.12	7.88	.88	6.95	.015	.00	.00	BOX
2180.589	3332.249	7.647	3339.896	1087.00	14.21	3.14	3343.03	.07	7.16	10.00	10.000	10.000	.00	0 .0
HYDRAULIC JUMP														
2180.589	3332.249	6.690	3338.939	1087.00	16.25	4.10	3343.04	.09	7.16	10.00	10.000	10.000	.00	0 .0

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   84.969    .0060                                    .0070      .59     6.78    1.11    6.95    .015       .00   .00  BOX
        |        |        |        |        |        |        |        |       |       |       |       |       |       |
 2265.558  3332.759    6.436  3339.194   1087.00   16.89    4.43  3343.62     .10    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   79.825    .0060                                    .0078      .62     6.53    1.17    6.95    .015       .00   .00  BOX
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Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING Date: 2-11-2019 Time:10:18:16

Summerlin West Village 21
Desert Foothills Drive (Far Hills to Street A)
EX 12'x10' RCB TO PROPOSED 10'X10' RCB - INTERIM CONDITION 1

```
         | Invert  | Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station |  Elev   |  (FT) |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  |  Width |Dia.-FT|or I.D.|  ZL   |Prs/Pip
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |        |        |        SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|********|********|*******|*******|*********|*******|********|********|*******|*******|*****  |*******
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2345.383  3333.238    6.136  3339.374   1087.00   17.71    4.87  3344.25     .11    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   71.387    .0060                                    .0088      .63     6.24    1.26    6.95    .015       .00   .00  BOX
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2416.770  3333.666    5.851  3339.517   1087.00   18.58    5.36  3344.88     .00    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   23.130    .0060                                    .0096      .22     5.85    1.35    6.95    .015       .00   .00  BOX
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2439.900  3333.805    5.756  3339.561   1087.00   18.88    5.54  3345.10     .00    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   64.440    .0060                                    .0104      .67     5.76    1.39    6.95    .015       .00   .00  BOX
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2504.340  3334.191    5.488  3339.680   1087.00   19.81    6.09  3345.77     .00    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   60.641    .0060                                    .0118      .72     5.49    1.49    6.95    .015       .00   .00  BOX
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2564.981  3334.555    5.233  3339.788   1087.00   20.77    6.70  3346.49     .00    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   57.429    .0060                                    .0134      .77     5.23    1.60    6.95    .015       .00   .00  BOX
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2622.410  3334.900    4.989  3339.889   1087.00   21.79    7.37  3347.26     .00    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   54.597    .0060                                    .0152      .83     4.99    1.72    6.95    .015       .00   .00  BOX
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2677.007  3335.227    4.757  3339.984   1087.00   22.85    8.11  3348.09     .00    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   52.033    .0060                                    .0173      .90     4.76    1.85    6.95    .015       .00   .00  BOX
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2729.040  3335.539    4.536  3340.075   1087.00   23.97    8.92  3348.99     .00    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   49.670    .0060                                    .0197      .98     4.54    1.98    6.95    .015       .00   .00  BOX
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2778.710  3335.837    4.325  3340.162   1087.00   25.13    9.81  3349.97     .00    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
    4.516    .0060                                    .0211      .10     4.32    2.13    6.95    .015       .00   .00  BOX
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Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING Date: 2-11-2019 Time:10:18:16

Summerlin West Village 21
Desert Foothills Drive (Far Hills to Street A)
EX 12'x10' RCB TO PROPOSED 10'X10' RCB - INTERIM CONDITION 1

```
         | Invert  | Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station |  Elev   |  (FT) |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  |  Width |Dia.-FT|or I.D.|  ZL   |Prs/Pip
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |        |        |        SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|********|********|*******|*******|*********|*******|********|********|*******|*******|*****  |*******
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2783.226  3335.864    4.305  3340.169   1087.00   25.25    9.90  3350.07     .00    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   47.273    .0060                                    .0227     1.07     4.31    2.14    6.95    .015       .00   .00  BOX
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2830.499  3336.148    4.105  3340.253   1087.00   26.48   10.89  3351.14     .00    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   45.211    .0060                                    .0259     1.17     4.10    2.30    6.95    .015       .00   .00  BOX
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2875.710  3336.419    3.914  3340.333   1087.00   27.77   11.98  3352.31     .00    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   23.800    .0160                                    .0281      .67     3.91    2.47    4.78    .015       .00   .00  BOX
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2899.510  3336.799    3.858  3340.657   1087.00   28.17   12.32  3352.98     .00    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   16.420    .0624                                    .0276      .45     3.86    2.53    2.92    .015       .00   .00  BOX
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2915.930  3337.824    3.970  3341.794   1087.00   27.38   11.64  3353.43     .00    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   13.870    .0625                                    .0255      .35     3.97    2.42    2.92    .015       .00   .00  BOX
         |         |        |        |        |       |       |         |       |        |        |       |       |       |
 2929.800  3338.691    4.081  3342.771   1087.00   26.64   11.02  3353.79     .00    7.16   10.00   10.000   10.000   .00   0   .0
       -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   20.354    .0625                                    .0231      .47     4.08    2.32    2.92    .015       .00   .00  BOX
```

2950.154	3339.963	4.280	3344.243	1087.00	25.40	10.02	3354.26	.00	7.16	10.00	10.000	10.000	.00	0 .0
16.616	.0625					.0203	.34	4.28	2.16	2.92	.015	.00	.00	BOX
2966.771	3341.001	4.489	3345.490	1087.00	24.22	9.11	3354.59	.00	7.16	10.00	10.000	10.000	.00	0 .0
11.059	.0625					.0180	.20	4.49	2.01	2.92	.015	.00	.00	BOX
2977.830	3341.692	4.662	3346.354	1087.00	23.31	8.44	3354.79	.00	7.16	10.00	10.000	10.000	.00	0 .0
11.638	.0625					.0161	.19	4.66	1.90	2.92	.015	.00	.00	BOX

Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING Date: 2-11-2019 Time:10:18:16

Summerlin West Village 21

Desert Foothills Drive (Far Hills to Street A)

EX 12'x10' RCB TO PROPOSED 10'X10' RCB - INTERIM CONDITION 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	
2989.468	3342.419	4.890	3347.309	1087.00	22.23	7.67	3354.98	.00	7.16	10.00	10.000	10.000	.00	0 .0
9.500	.0625					.0142	.13	4.89	1.77	2.92	.015	.00	.00	BOX
2998.969	3343.012	5.129	3348.141	1087.00	21.20	6.98	3355.12	.00	7.16	10.00	10.000	10.000	.00	0 .0
7.678	.0625					.0125	.10	5.13	1.65	2.92	.015	.00	.00	BOX
3006.647	3343.492	5.379	3348.871	1087.00	20.21	6.34	3355.21	.00	7.16	10.00	10.000	10.000	.00	0 .0
6.101	.0625					.0110	.07	5.38	1.54	2.92	.015	.00	.00	BOX
3012.748	3343.873	5.641	3349.515	1087.00	19.27	5.77	3355.28	.00	7.16	10.00	10.000	10.000	.00	0 .0
4.715	.0625					.0097	.05	5.64	1.43	2.92	.015	.00	.00	BOX
3017.462	3344.168	5.917	3350.084	1087.00	18.37	5.24	3355.33	.00	7.16	10.00	10.000	10.000	.00	0 .0
3.482	.0625					.0086	.03	5.92	1.33	2.92	.015	.00	.00	BOX
3020.944	3344.385	6.205	3350.591	1087.00	17.52	4.76	3355.36	.00	7.16	10.00	10.000	10.000	.00	0 .0
2.373	.0625					.0076	.02	6.21	1.24	2.92	.015	.00	.00	BOX
3023.317	3344.533	6.508	3351.042	1087.00	16.70	4.33	3355.37	.00	7.16	10.00	10.000	10.000	.00	0 .0
1.365	.0625					.0067	.01	6.51	1.15	2.92	.015	.00	.00	BOX
3024.682	3344.619	6.826	3351.445	1087.00	15.92	3.94	3355.38	.00	7.16	10.00	10.000	10.000	.00	0 .0
.438	.0625					.0059	.00	6.83	1.07	2.92	.015	.00	.00	BOX
3025.120	3344.646	7.160	3351.806	1087.00	15.18	3.58	3355.38	.00	7.16	10.00	10.000	10.000	.00	0 .0

STANDARD FORM 6 CALCULATIONS
100-YEAR INTERIM CONDITION MODELS

Starting HGL and EGL

Tailwater Elevation	Outlet Invert Elevation	Tailwater Depth (ft)	Critical Depth-Dc (ft)	Pipe Diameter-D (ft)	(Dc+D)/2 (ft)	Starting HGL (ft)	Hv (ft)	Starting EGL (ft)
3339.91	3331.42	8.49	2.44	3.0	2.721	3339.91	1.31	3341.22

$$Sf = \frac{\Phi Hv}{R^{1.33}} \qquad \Phi = \frac{2g\,(n^2)}{2.21}$$

Phi Index

n Value	Phi
0.013	0.004925

$$H_j = ({V_2}^2/_{2g}) - K_j({V_1}^2/_{2g}) \qquad H_m = K_m({V_2}^2/_{2g}) \qquad H_b = K_b({V_2}^2/_{2g}) \qquad H_i = K_i({V_2}^2/_{2g})$$

STANDARD FORM 6

DEVELOPMENT: Desert Foothills Drive (Far Hiis to Street A)
CALCULATED BY: JYA **WO#** 7851-5.1
STORM DRAIN SEGMENT: Lateral 2 West
DESCRIPTION: 100-YEAR INTERIM CONDITION

Segment Number	Segment Type	Starting Station	Ending Station	Diameter (ft)	D/S Invert	U/S Invert	Length (ft)	Area (sq, ft)	Phi	Flow (cfs)	Slope (%)	Velocity (fps)	Hv (ft)	Sf (ft/ft)	Ave. Sf (ft/ft)	Hf (ft)	Hj (ft)	Hm (ft)	Hb (ft)	Hi (ft)	H_ (ft)	H Total (ft)	U/S EGL Elevation	U/S HGL Elevation	Pressure Flow ?	D/S EGL of U/S Segment	Final U/S EGL	Final U/S HGL
1	PIPE	10+00.00	10+23.81	3	3331.42	3332.87	23.8	7.07	0.00492	65.0	6.10	9.20	1.31	0.00948	0.00948	0.23						0.23	3341.45	3340.14	Yes	3337.18	3341.45	3340.14
2	DI	10+23.81	10+23.81	3	3332.87	3332.87	0.0	7.07	0.00492	65.0	N/A	9.20	1.31	0.00948	0.00948	0.00		0.51				0.51	3341.95	3340.64	Yes	3337.18	3341.95	3340.64
3	PIPE	10+23.81	11+05.62	3	3332.87	3339.01	81.8	7.07	0.00492	65.0	7.50	9.20	1.31	0.00948	0.00948	0.78						0.78	3342.73	3341.42	Yes	3343.32	3343.32	3342.01
4	STUB	11+05.62	11+05.62	3	3339.01	3339.01	0.0	7.07	0.00492	65.0	N/A	9.20	1.31	0.00948	0.00948	0.00				0.66		0.66	3343.98	3342.67				

Manholes/Transition Losses

	Straight Through Manhole				Junction Manhole					Bend Losses				Inlet Losses		
Segment Number	Deflection Angle	Km	Hv (ft)	Hm (ft)	Junction Angle	Kj	D/S Hv (ft)	U/S Hv (ft)	Hj (ft)	Bend Angle	Kb	Hv (ft)	Hb (ft)	Ki	Hv (ft)	Hi (ft)
1																
2	45	0.385	1.313	0.506												
3																
4														0.5	1.313	0.657

HGL Criteria Check			
Segment Description	TMH Elevation	Cover (ft)	Criteria Met?
PIPE			
DI	3349.302	8.661	Yes
PIPE			
STUB	3358	15.333	Yes

Box		Elliptical/ Other			
Span (ft)	Rise (ft)	Rise (ft)	Area (ft^2)	Hyd. Rad. (ft)	#
					1.00
					1.00
					1.00
					1.00

Starting HGL and EGL

Tailwater Elevation	Outlet Invert Elevation	Tailwater Depth (ft)	Critical Depth-Dc (ft)	Pipe Diameter-D (ft)	(Dc+D)/2 (ft)	Starting HGL (ft)	Hv (ft)	Starting EGL (ft)
3336.03	3327.38	8.64	2.44	3.0	2.721	3336.025	3.83	3339.85

$$Sf = \frac{\Phi Hv}{R^{1.33}} \qquad \Phi = \frac{2g\,(n^2)}{2.21}$$

STANDARD FORM 6

DEVELOPMENT: Desert Foothills Drive (Far Hiis to Street A)
CALCULATED BY: JYA WO# 7851-5.1
STORM DRAIN SEGMENT: Lateral 4 West
DESCRIPTION: 100-YEAR INTERIM CONDITION

Phi Index

n Value	Phi
0.013	0.004925

$$H_j = ({V_2}^2/_{2g}) - K_j({V_1}^2/_{2g}) \qquad H_m = K_m({V_2}^2/_{2g}) \qquad H_b = K_b({V_2}^2/_{2g}) \qquad H_i = K_i({V_2}^2/_{2g})$$

Segment Number	Segment Type	Starting Station	Ending Station	Diameter (ft)	D/S Invert	U/S Invert	Length (ft)	Area (sq, ft)	Phi	Flow (cfs)	Slope (%)	Velocity (fps)	Hv (ft)	Sf (ft/ft)	Ave. Sf (ft/ft)	Hf (ft)	Hj (ft)	Hm (ft)	Hb (ft)	Hi (ft)	H_ (ft)	H Total (ft)	U/S EGL Elevation	U/S HGL Elevation	Pressure Flow ?	D/S EGL of U/S Segment	Final U/S EGL	Final U/S HGL
1	PIPE	10+00.00	10+22.80	3	3327.38	3327.50	22.8	7.07	0.00492	111.0	0.50	15.70	3.83	0.02765	0.02765	0.63						0.63	3340.48	3336.66	Yes	3334.33	3340.48	3336.66
2	DI	10+22.80	10+22.80	3	3327.50	3327.50	0.0	7.07	0.00492	111.0	N/A	15.70	3.83	0.02765	0.02765	0.00		0.36		1.91		2.28	3342.76	3338.93	Yes	3333.99	3342.76	3338.93
3	PIPE	10+22.80	10+99.96	3	3327.50	3334.83	77.2	7.07	0.00492	106.0	9.51	15.00	3.49	0.02521	0.02643	2.04						2.04	3344.80	3341.31	Yes	3341.33	3344.80	3341.31
4	STUB	10+99.96	10+99.96	3	3334.83	3334.83	0.0	7.07	0.00492	106.0	N/A	15.00	3.49	0.02521	0.02521	0.00				1.75		1.75	3346.55	3343.06				

Manholes/Transition Losses

	Straight Through Manhole				Junction Manhole					Bend Losses				Inlet Losses		
Segment Number	Deflection Angle	Km	Hv (ft)	Hm (ft)	Junction Angle	Kj	D/S Hv (ft)	U/S Hv (ft)	Hj (ft)	Bend Angle	Kb	Hv (ft)	Hb (ft)	Ki	Hv (ft)	Hi (ft)
1																
2	17	0.095	3.829	0.364										0.5	3.829	1.915
3																
4														0.5	3.492	1.746

HGL Criteria Check			
Segment Description	TMH Elevation	Cover (ft)	Criteria Met?
PIPE			
DI	3345.208	6.274	Yes
PIPE			
STUB	3354	10.944	Yes

Box		Elliptical/ Other			
Span (ft)	Rise (ft)	Rise (ft)	Area (ft^2)	Hyd. Rad. (ft)	#
					1.00
					1.00
					1.00
					1.00

STANDARD FORM 6 CALCULATIONS
100-YEAR ULTIMATE CONDITION MODELS

Starting HGL and EGL

Tailwater Elevation	Outlet Invert Elevation	Tailwater Depth (ft)	Critical Depth-Dc (ft)	Pipe Diameter-D (ft)	(Dc+D)/2 (ft)	Starting HGL (ft)	Hv (ft)	Starting EGL (ft)
3348.07	3336.34	11.73	4.49	4.5	4.493	3348.073	7.96	3356.03

$$Sf = \frac{\Phi Hv}{R^{1.33}} \qquad \Phi = \frac{2g\,(n^2)}{2.21}$$

STANDARD FORM 6

DEVELOPMENT: Desert Foothills Drive (Far Hiis to Street A)
CALCULATED BY: JYA **WO#** 7851-5.1
STORM DRAIN SEGMENT: Lateral 1
DESCRIPTION: 100-YEAR ULTIMATE CONDITION

Phi Index

n Value	Phi
0.013	0.004925

$$H_j = ({V_2}^2/_{2g}) - K_j({V_1}^2/_{2g}) \qquad H_m = K_m({V_2}^2/_{2g}) \qquad H_b = K_b({V_2}^2/_{2g}) \qquad H_i = K_i({V_2}^2/_{2g})$$

Segment Number	Segment Type	Starting Station	Ending Station	Diameter (ft)	D/S Invert	U/S Invert	Length (ft)	Area (sq, ft)	Phi	Flow (cfs)	Slope (%)	Velocity (fps)	Hv (ft)	Sf (ft/ft)	Ave. Sf (ft/ft)	Hf (ft)	Hj (ft)	Hm (ft)	Hb (ft)	Hi (ft)	H_ (ft)	H Total (ft)	U/S EGL Elevation	U/S HGL Elevation	Pressure Flow ?	D/S EGL of U/S Segment	Final U/S EGL	Final U/S HGL
1	PIPE	10+00.00	10+57.20	4.5	3336.34	3341.55	57.2	15.90	0.00492	360.0	9.10	22.64	7.96	0.03350	0.03350	1.92						1.92	3357.95	3349.99	Yes	3354.00	3357.95	3349.99
2	MH	10+57.20	10+57.20	4.5	3341.55	3341.55	0.0	15.90	0.00492	360.0	N/A	22.64	7.96	0.03350	0.03350	0.00		2.16				2.16	3360.11	3352.15	Yes	3354.00	3360.11	3352.15
3	PIPE	10+57.20	10+70.40	4.5	3341.55	3342.86	13.2	15.90	0.00492	360.0	9.98	22.64	7.96	0.03350	0.03350	0.44						0.44	3360.55	3352.60	Yes	3355.32	3360.55	3352.60
4	STUB	10+70.40	10+70.40	4.5	3342.86	3342.86	0.0	15.90	0.00492	360.0	N/A	22.64	7.96	0.03350	0.03350	0.00						0.00	3360.55	3352.60				

Manholes/Transition Losses

	Straight Through Manhole				Junction Manhole					Bend Losses				Inlet Losses		
Segment Number	Deflection Angle	Km	Hv (ft)	Hm (ft)	Junction Angle	Kj	D/S Hv (ft)	U/S Hv (ft)	Hj (ft)	Bend Angle	Kb	Hv (ft)	Hb (ft)	Ki	Hv (ft)	Hi (ft)
1																
2	36	0.272	7.956	2.164												
3																
4																

HGL Criteria Check			
Segment Description	TMH Elevation	Cover (ft)	Criteria Met?
PIPE			
MH	3355.954	3.80	Yes
PIPE			
STUB	3355.954	3.36	Yes

Box		Elliptical/ Other			
Span (ft)	Rise (ft)	Rise (ft)	Area (ft^2)	Hyd. Rad. (ft)	#
					1.00
					1.00
					1.00
					1.00

Starting HGL and EGL

Tailwater Elevation	Outlet Invert Elevation	Tailwater Depth (ft)	Critical Depth- Dc (ft)	Pipe Diameter- D (ft)	(Dc+D)/2 (ft)	Starting HGL (ft)	Hv (ft)	Starting EGL (ft)
3341.39	3331.42	9.97	2.57	3.0	2.785	3341.394	1.52	3342.92

$$Sf = \frac{\Phi Hv}{R^{1.33}} \qquad \Phi = \frac{2g\,(n^2)}{2.21}$$

Phi Index

n Value	Phi
0.013	0.004925

$$H_j = ({V_2}^2/_{2g}) - K_j({V_1}^2/_{2g}) \qquad H_m = K_m({V_2}^2/_{2g}) \qquad H_b = K_b({V_2}^2/_{2g}) \qquad H_i = K_i({V_2}^2/_{2g})$$

STANDARD FORM 6

DEVELOPMENT: Desert Foothills Drive (Far Hiis to Street A)
CALCULATED BY: AH **WO#** 7851-5.1
STORM DRAIN SEGMENT: Lateral 2
DESCRIPTION: 100-YEAR ULTIMATE CONDITION

Segment Number	Segment Type	Starting Station	Ending Station	Diameter (ft)	D/S Invert	U/S Invert	Length (ft)	Area (sq, ft)	Phi	Flow (cfs)	Slope (%)	Velocity (fps)	Hv (ft)	Sf (ft/ft)	Ave. Sf (ft/ft)	Hf (ft)	Hj (ft)	Hm (ft)	Hb (ft)	Hi (ft)	H_ (ft)	H Total (ft)	U/S EGL Elevation	U/S HGL Elevation	Pressure Flow ?	D/S EGL of U/S Segment	Final U/S EGL	Final U/S HGL
1	PIPE	10+00.00	10+23.81	3	3331.42	3332.87	23.8	7.07	0.00492	70.0	6.10	9.90	1.52	0.01099	0.01099	0.26						0.26	3343.18	3341.66	Yes	3337.39	3343.18	3341.66
2	DI	10+23.81	10+23.81	3	3332.87	3332.87	0.0	7.07	0.00492	70.0	N/A	9.90	1.52	0.01099	0.01099	0.00		0.59		0.76		1.35	3344.53	3343.00	Yes	3337.18	3344.53	3343.00
3	PIPE	10+23.81	11+05.62	3	3332.87	3339.01	81.8	7.07	0.00492	65.0	7.50	9.20	1.31	0.00948	0.01024	0.84						0.84	3345.36	3344.05	Yes	3343.32	3345.36	3344.05
4	STUB	11+05.62	11+05.62	3	3339.01	3339.01	0.0	7.07	0.00492	65.0	N/A	9.20	1.31	0.00948	0.00948	0.00						0.00	3345.36	3344.05				

Manholes/Transition Losses

	Straight Through Manhole				Junction Manhole					Bend Losses				Inlet Losses		
Segment Number	Deflection Angle	Km	Hv (ft)	Hm (ft)	Junction Angle	Kj	D/S Hv (ft)	U/S Hv (ft)	Hj (ft)	Bend Angle	Kb	Hv (ft)	Hb (ft)	Ki	Hv (ft)	Hi (ft)
1																
2	45	0.385	1.523	0.586										0.5	1.523	0.761
3																
4																

Segment Description	HGL Criteria Check TMH Elevation	Cover (ft)	Criteria Met?
PIPE			
DI	3349.302	6.299	Yes
PIPE			
STUB	3358	13.949	Yes

Box		Elliptical/ Other			
Span (ft)	Rise (ft)	Rise (ft)	Area (ft^2)	Hyd. Rad. (ft)	#
					1.00
					1.00
					1.00
					1.00

Starting HGL and EGL

Tailwater Elevation	Outlet Invert Elevation	Tailwater Depth (ft)	Critical Depth-Dc (ft)	Pipe Diameter-D (ft)	(Dc+D)/2 (ft)	Starting HGL (ft)	Hv (ft)	Starting EGL (ft)
3332.88	3327.38	5.49	1.70	3.0	2.349	3332.877	2.14	3335.02

$$Sf = \frac{\Phi Hv}{R^{1.33}} \qquad \Phi = \frac{2g\,(n^2)}{2.21}$$

Phi Index

n Value	Phi
0.013	0.004925

$$H_j = ({V_2}^2/_{2g}) - K_j({V_1}^2/_{2g}) \qquad H_m = K_m({V_2}^2/_{2g}) \qquad H_b = K_b({V_2}^2/_{2g}) \qquad H_i = K_i({V_2}^2/_{2g})$$

STANDARD FORM 6

DEVELOPMENT: Desert Foothills Drive (Far Hiis to Street A)
CALCULATED BY: JYA **WO#** 7851-5.1
STORM DRAIN SEGMENT: Lateral 4 West
DESCRIPTION: 100-YEAR ULTIMATE CONDITION

Segment Number	Segment Type	Starting Station	Ending Station	Diameter (ft)	D/S Invert	U/S Invert	Length (ft)	Area (sq, ft)	Phi	Flow (cfs)	Slope (%)	Velocity (fps)	Hv (ft)	Sf (ft/ft)	Ave. Sf (ft/ft)	Hf (ft)	Hj (ft)	Hm (ft)	Hb (ft)	Hi (ft)	H_ (ft)	H Total (ft)	U/S EGL Elevation	U/S HGL Elevation	Pressure Flow ?	D/S EGL of U/S Segment	Final U/S EGL	Final U/S HGL
1	PIPE	10+00.00	10+22.80	3	3327.38	3327.50	22.8	7.07	0.00492	83.0	0.50	11.74	2.14	0.01546	0.01546	0.35						0.35	3335.37	3333.23	Yes	3332.64	3335.37	3333.23
2	DI	10+22.80	10+22.80	3	3327.50	3327.50	0.0	7.07	0.00492	83.0	N/A	11.74	2.14	0.01546	0.01546	0.00		0.20		1.07		1.27	3336.64	3334.50	Yes	3332.39	3336.64	3334.50
3	PIPE	10+22.80	10+99.96	3	3327.50	3334.83	77.2	7.07	0.00492	78.0	9.51	11.03	1.89	0.01365	0.01455	1.12						1.12	3337.77	3335.88	Yes	3339.72	3339.72	3337.83
4	STUB	10+99.96	10+99.96	3	3334.83	3334.83	0.0	7.07	0.00492	78.0	N/A	11.03	1.89	0.01365	0.01365	0.00						0.00	3339.72	3337.83				

Manholes/Transition Losses

	Straight Through Manhole				Junction Manhole					Bend Losses				Inlet Losses		
Segment Number	Deflection Angle	Km	Hv (ft)	Hm (ft)	Junction Angle	Kj	D/S Hv (ft)	U/S Hv (ft)	Hj (ft)	Bend Angle	Kb	Hv (ft)	Hb (ft)	Ki	Hv (ft)	Hi (ft)
1																
2	17	0.095	2.141	0.203										0.5	2.141	1.070
3																
4																

HGL Criteria Check			
Segment Description	TMH Elevation	Cover (ft)	Criteria Met?
PIPE			
DI	3345.208	10.705	Yes
PIPE			
STUB	3354	16.166	Yes

Box		Elliptical/ Other			
Span (ft)	Rise (ft)	Rise (ft)	Area (ft^2)	Hyd. Rad. (ft)	#
					1.00
					1.00
					1.00
					1.00

HY-8 CALCULATIONS

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 106 cfs

Maximum Flow: 106 cfs

Table 1 - Summary of Culvert Flows at Crossing: Lateral 4 West (Interim)

Headwater Elevation (ft)	Total Discharge (cfs)	36-inch RCP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
3338.93	0.00	0.00	0.00	1
3338.96	10.60	10.60	0.00	1
3339.14	21.20	21.20	0.00	1
3339.45	31.80	31.80	0.00	1
3339.88	42.40	42.40	0.00	1
3340.43	53.00	53.00	0.00	1
3341.11	63.60	63.60	0.00	1
3341.90	74.20	74.20	0.00	1
3342.83	84.80	84.80	0.00	1
3343.87	95.40	95.40	0.00	1
3345.03	106.00	106.00	0.00	1
3354.00	161.59	161.59	0.00	Overtopping

Rating Curve Plot for Crossing: Lateral 4 West (Interim)

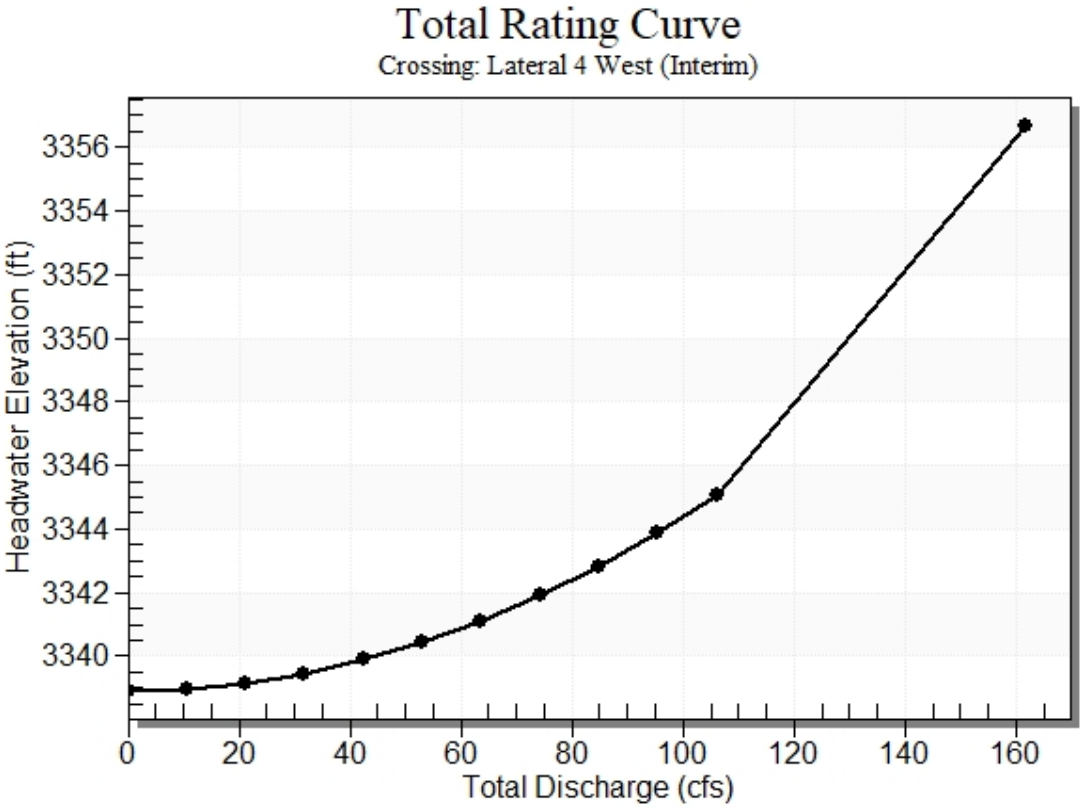


Table 2 - Culvert Summary Table: 36-inch RCP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	3338.93	0.000	4.100	0-NF	0.000	0.000	3.000	11.430	0.000	0.000
10.60	10.60	3338.96	1.305	4.128	4-FFf	0.450	1.028	3.000	11.430	1.500	0.000
21.20	21.20	3339.14	1.972	4.313	4-FFf	0.633	1.480	3.000	11.430	2.999	0.000
31.80	31.80	3339.45	2.527	4.619	4-FFf	0.776	1.827	3.000	11.430	4.499	0.000
42.40	42.40	3339.88	3.074	5.049	4-FFf	0.899	2.119	3.000	11.430	5.998	0.000
53.00	53.00	3340.43	3.709	5.601	4-FFf	1.011	2.363	3.000	11.430	7.498	0.000
63.60	63.60	3341.11	4.482	6.277	4-FFf	1.115	2.562	3.000	11.430	8.998	0.000
74.20	74.20	3341.90	5.414	7.075	4-FFf	1.213	2.710	3.000	11.430	10.497	0.000
84.80	84.80	3342.83	6.502	7.995	4-FFf	1.307	2.809	3.000	11.430	11.997	0.000
95.40	95.40	3343.87	7.733	9.039	4-FFf	1.398	2.797	3.000	11.430	13.496	0.000
106.00	106.00	3345.03	9.104	10.205	4-FFf	1.487	2.914	3.000	11.430	14.996	0.000

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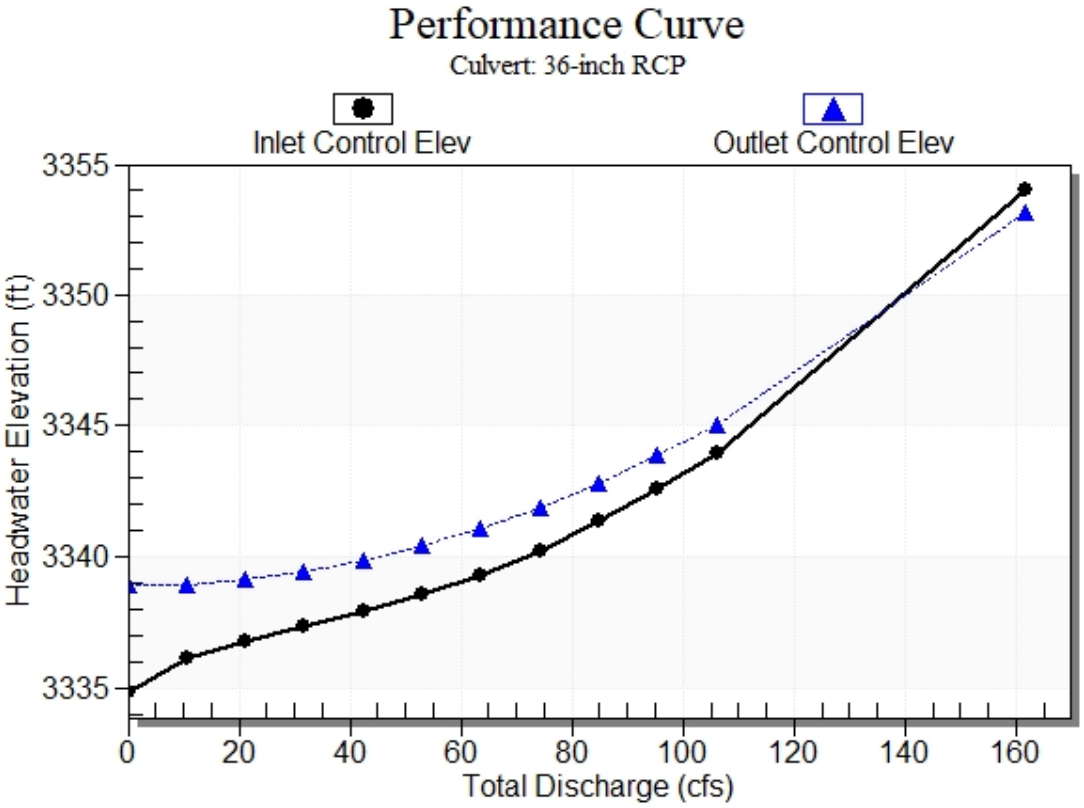
Straight Culvert

Inlet Elevation (invert): 3334.83 ft, Outlet Elevation (invert): 3327.50 ft

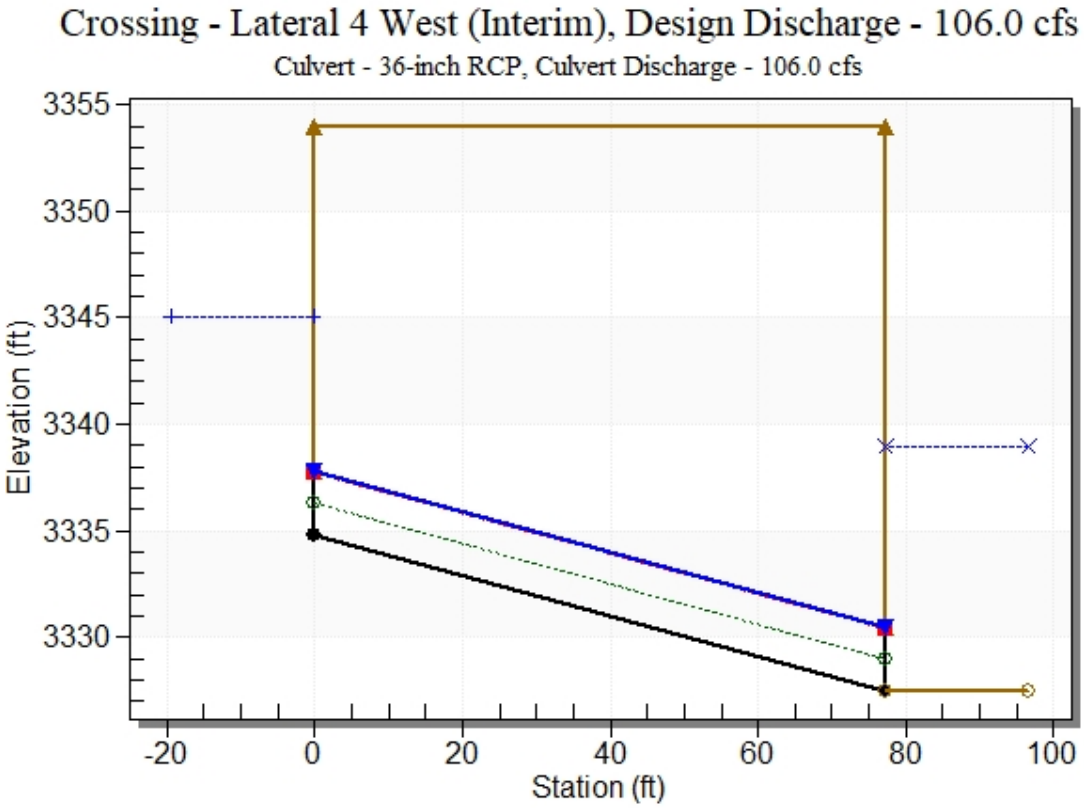
Culvert Length: 77.55 ft, Culvert Slope: 0.0949

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Culvert Performance Curve Plot: 36-inch RCP



Water Surface Profile Plot for Culvert: 36-inch RCP



Site Data - 36-inch RCP

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 3334.83 ft

Outlet Station: 77.20 ft

Outlet Elevation: 3327.50 ft

Number of Barrels: 1

Culvert Data Summary - 36-inch RCP

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Grooved End Projecting

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: Lateral 4 West (Interim))

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
0.00	3338.93	11.43
10.60	3338.93	11.43
21.20	3338.93	11.43
31.80	3338.93	11.43
42.40	3338.93	11.43
53.00	3338.93	11.43
63.60	3338.93	11.43
74.20	3338.93	11.43
84.80	3338.93	11.43
95.40	3338.93	11.43
106.00	3338.93	11.43

Tailwater Channel Data - Lateral 4 West (Interim)

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 3338.93 ft

Roadway Data for Crossing: Lateral 4 West (Interim)

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 77.20 ft

Crest Elevation: 3354.00 ft

Roadway Surface: Paved

Roadway Top Width: 77.20 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 65 cfs

Maximum Flow: 65 cfs

Table 4 - Summary of Culvert Flows at Crossing: Lateral 2 West (Interim)

Headwater Elevation (ft)	Total Discharge (cfs)	36-inch RCP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
3340.64	0.00	0.00	0.00	1
3340.67	6.50	6.50	0.00	1
3340.77	13.00	13.00	0.00	1
3340.91	19.50	19.50	0.00	1
3341.27	26.00	26.00	0.00	1
3341.60	32.50	32.50	0.00	1
3341.93	39.00	39.00	0.00	1
3342.29	45.50	45.50	0.00	1
3342.68	52.00	52.00	0.00	1
3343.13	58.50	58.50	0.00	1
3343.64	65.00	65.00	0.00	1
3358.00	160.42	160.42	0.00	Overtopping

Rating Curve Plot for Crossing: Lateral 2 West (Interim)

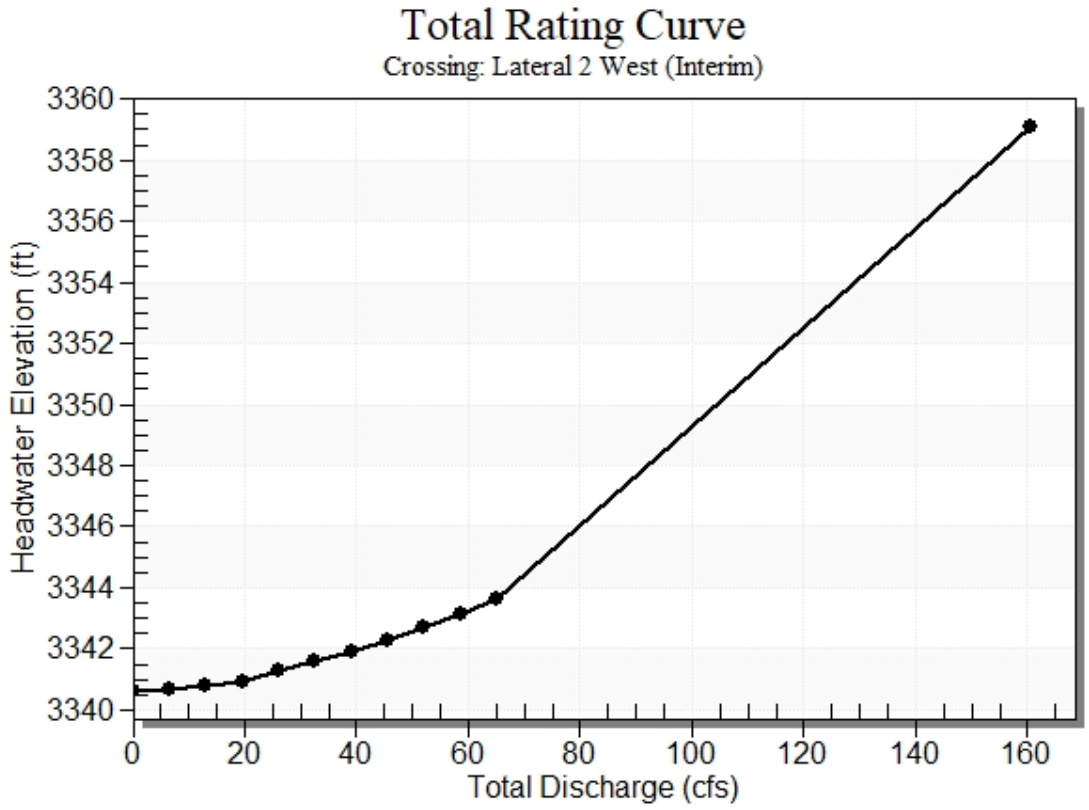


Table 5 - Culvert Summary Table: 36-inch RCP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	3340.64	0.000	1.630	0-NF	0.000	0.000	3.000	7.770	0.000	0.000
6.50	6.50	3340.67	1.025	1.660	1-S1f	0.376	0.799	3.000	7.770	0.920	0.000
13.00	13.00	3340.77	1.480	1.758	1-S1f	0.527	1.143	3.000	7.770	1.839	0.000
19.50	19.50	3340.91	1.903	1.824	1-JS1f	0.643	1.417	3.000	7.770	2.759	0.000
26.00	26.00	3341.27	2.262	1.989	1-JS1f	0.743	1.641	3.000	7.770	3.678	0.000
32.50	32.50	3341.60	2.592	2.200	1-JS1f	0.833	1.847	3.000	7.770	4.598	0.000
39.00	39.00	3341.93	2.922	2.459	1-JS1f	0.916	2.027	3.000	7.770	5.517	0.000
45.50	45.50	3342.29	3.278	2.764	5-JS1f	0.993	2.195	3.000	7.770	6.437	0.000
52.00	52.00	3342.68	3.673	3.117	5-JS1f	1.066	2.342	3.000	7.770	7.356	0.000
58.50	58.50	3343.13	4.121	3.516	5-JS1f	1.135	2.472	3.000	7.770	8.276	0.000
65.00	65.00	3343.64	4.626	3.963	5-JS1f	1.203	2.584	3.000	7.770	9.196	0.000

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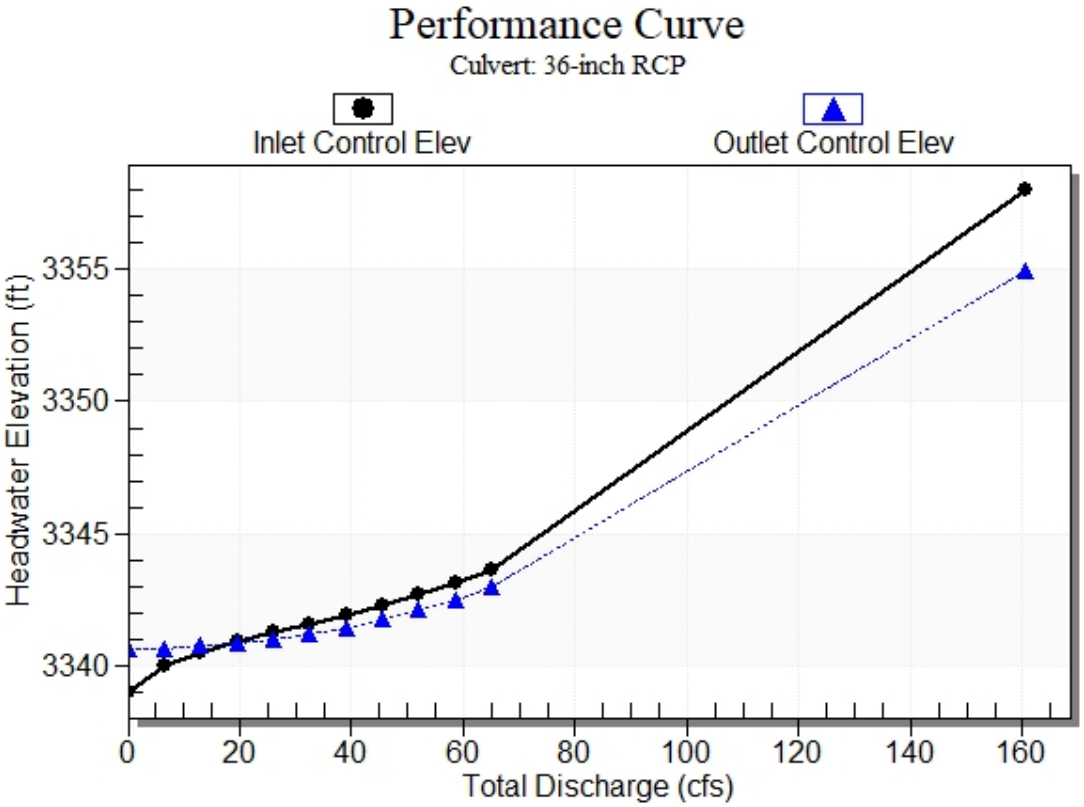
Straight Culvert

Inlet Elevation (invert): 3339.01 ft, Outlet Elevation (invert): 3332.87 ft

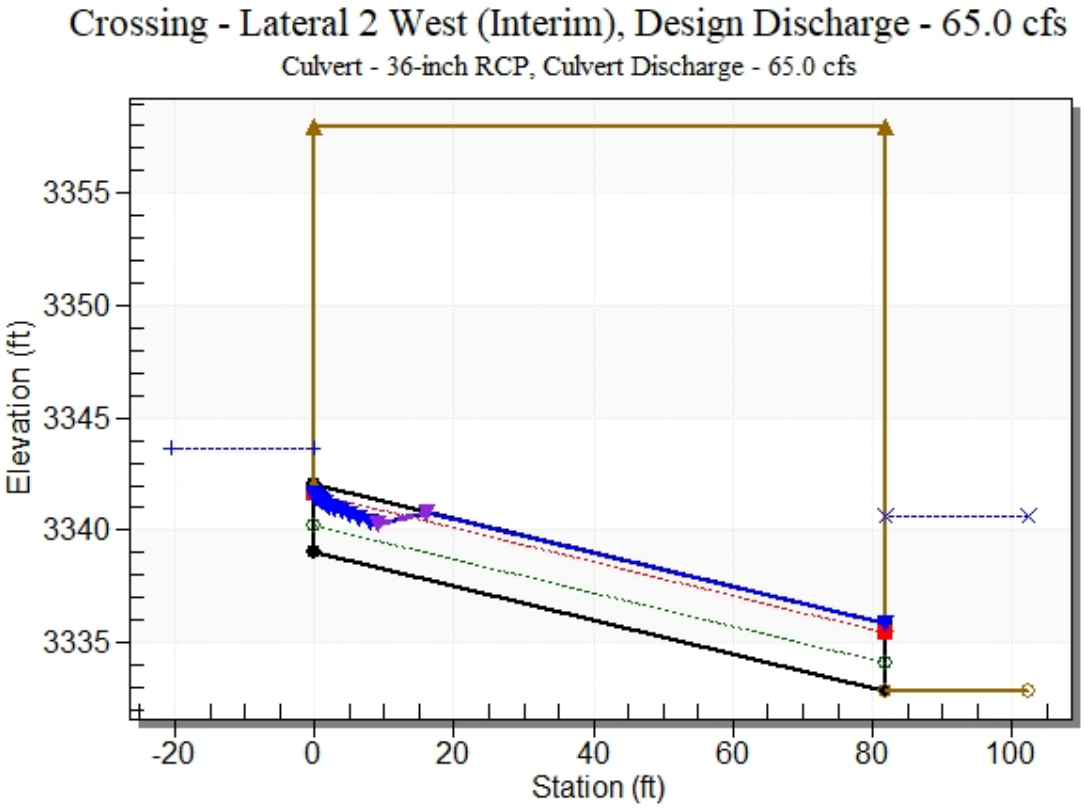
Culvert Length: 82.03 ft, Culvert Slope: 0.0751

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Culvert Performance Curve Plot: 36-inch RCP



Water Surface Profile Plot for Culvert: 36-inch RCP



Site Data - 36-inch RCP

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 3339.01 ft

Outlet Station: 81.80 ft

Outlet Elevation: 3332.87 ft

Number of Barrels: 1

Culvert Data Summary - 36-inch RCP

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Grooved End Projecting

Inlet Depression: None

Table 6 - Downstream Channel Rating Curve (Crossing: Lateral 2 West (Interim))

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
0.00	3340.64	7.77
6.50	3340.64	7.77
13.00	3340.64	7.77
19.50	3340.64	7.77
26.00	3340.64	7.77
32.50	3340.64	7.77
39.00	3340.64	7.77
45.50	3340.64	7.77
52.00	3340.64	7.77
58.50	3340.64	7.77
65.00	3340.64	7.77

Tailwater Channel Data - Lateral 2 West (Interim)

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 3340.64 ft

Roadway Data for Crossing: Lateral 2 West (Interim)

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 81.80 ft

Crest Elevation: 3358.00 ft

Roadway Surface: Paved

Roadway Top Width: 81.80 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 1087 cfs

Maximum Flow: 1087 cfs

Table 7 - Summary of Culvert Flows at Crossing: Mainline Inlet

Headwater Elevation (ft)	Total Discharge (cfs)	10'X10' RCB Mainline Inlet Discharge (cfs)	Roadway Discharge (cfs)	Iterations
3344.64	0.00	0.00	0.00	1
3347.13	108.70	108.70	0.00	1
3348.59	217.40	217.40	0.00	1
3349.82	326.10	326.10	0.00	1
3350.94	434.80	434.80	0.00	1
3351.97	543.50	543.50	0.00	1
3352.94	652.20	652.20	0.00	1
3353.89	760.90	760.90	0.00	1
3354.83	869.60	869.60	0.00	1
3355.79	978.30	978.30	0.00	1
3356.79	1087.00	1087.00	0.00	1
3358.50	1260.07	1260.07	0.00	Overtopping

Rating Curve Plot for Crossing: Mainline Inlet

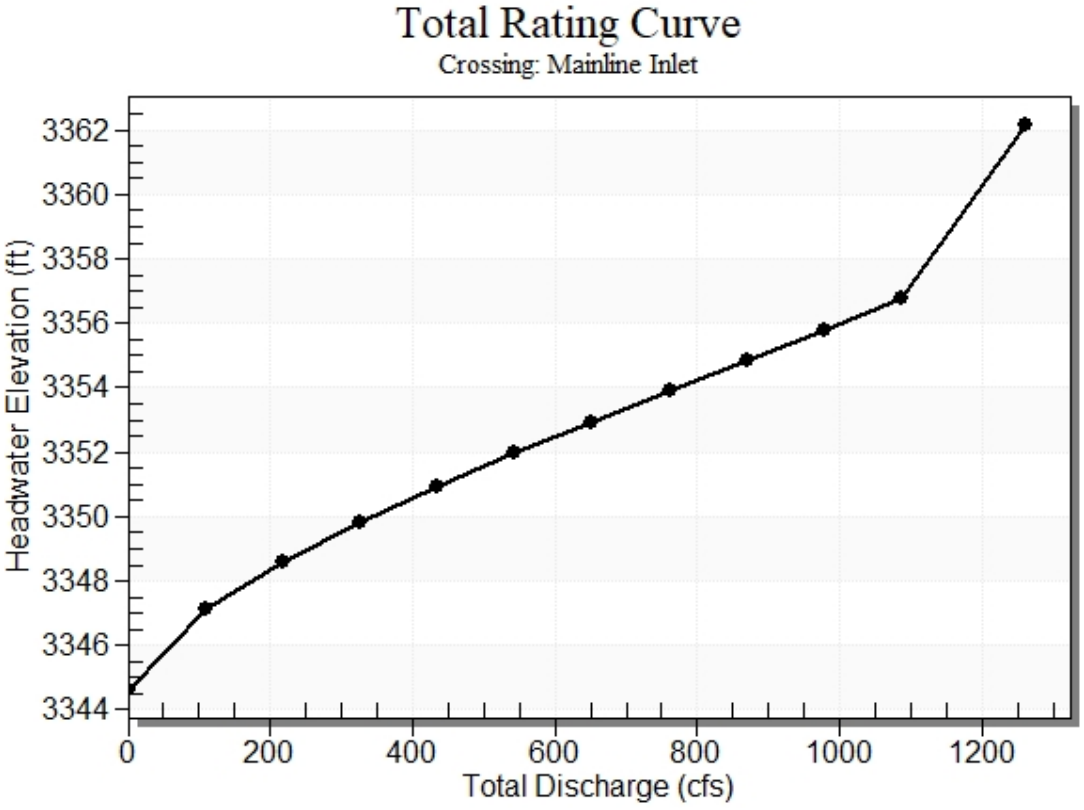


Table 8 - Culvert Summary Table: 10'X10' RCB Mainline Inlet

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	3344.64	0.000	0.000	0-NF	0.000	0.000	0.000	-0.360	0.000	0.000
108.70	108.70	3347.13	2.488	0.0*	1-S2n	0.617	1.542	0.718	-0.360	15.146	0.000
217.40	217.40	3348.59	3.949	0.0*	1-S2n	0.965	2.448	1.227	-0.360	17.711	0.000
326.10	326.10	3349.82	5.180	0.0*	1-S2n	1.258	3.208	1.699	-0.360	19.196	0.000
434.80	434.80	3350.94	6.300	0.720	1-S2n	1.521	3.887	2.144	-0.360	20.282	0.000
543.50	543.50	3351.97	7.331	1.610	1-S2n	1.766	4.510	2.569	-0.360	21.160	0.000
652.20	652.20	3352.94	8.305	2.518	1-S2n	1.997	5.093	2.977	-0.360	21.907	0.000
760.90	760.90	3353.89	9.250	3.454	1-S2n	2.218	5.644	3.372	-0.360	22.566	0.000
869.60	869.60	3354.83	10.193	4.423	5-S2n	2.432	6.170	3.755	-0.360	23.158	0.000
978.30	978.30	3355.79	11.154	5.430	5-S2n	2.640	6.674	4.128	-0.360	23.700	0.000
1087.00	1087.00	3356.79	12.153	6.478	5-S2n	2.843	7.159	4.492	-0.360	24.197	0.000

* Full Flow Headwater elevation is below inlet invert.

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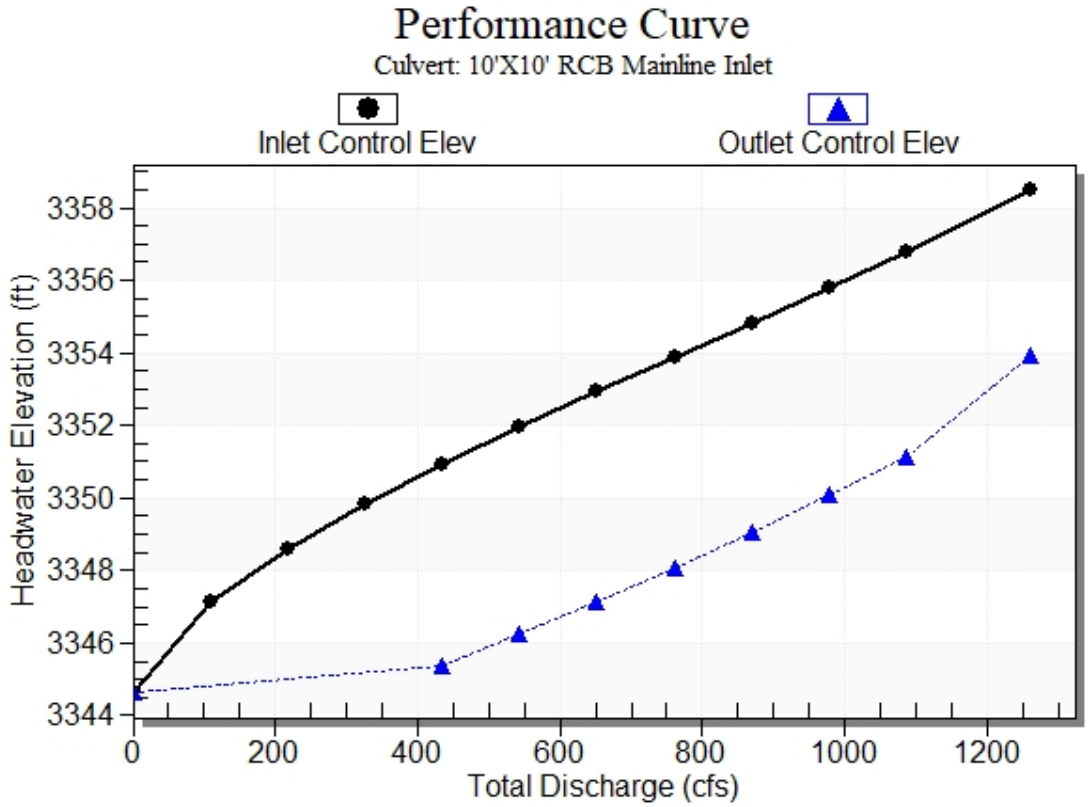
Straight Culvert

Inlet Elevation (invert): 3344.64 ft, Outlet Elevation (invert): 3341.00 ft

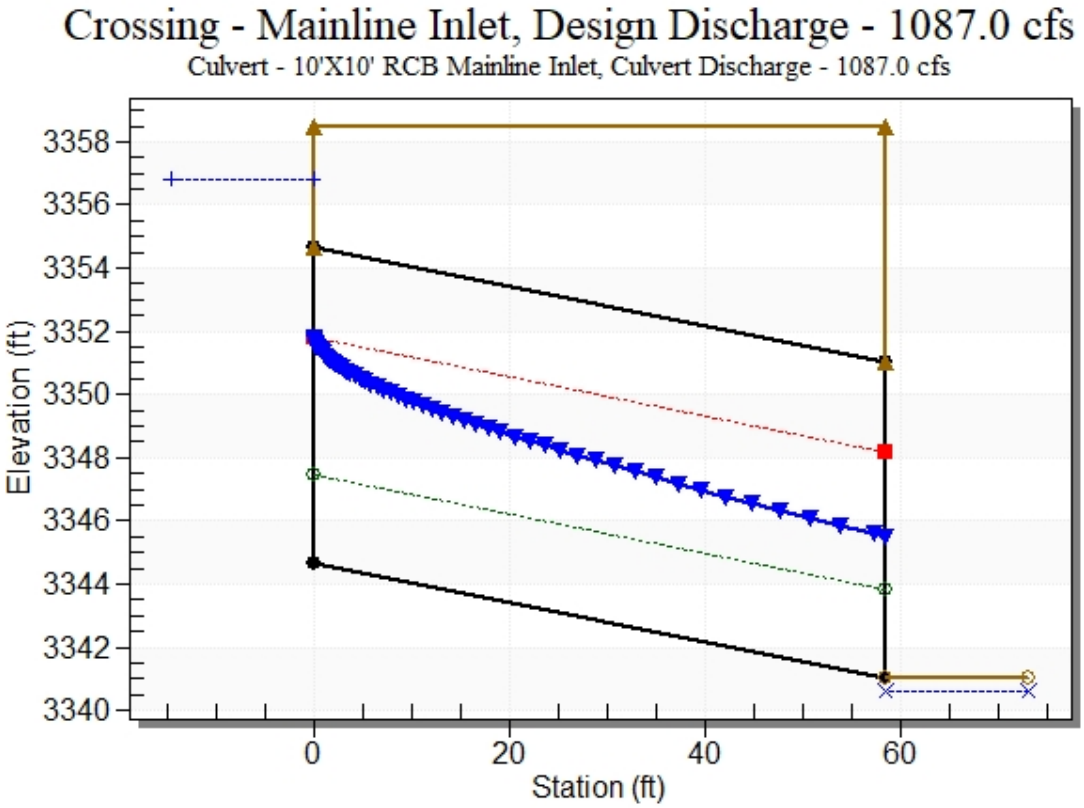
Culvert Length: 58.51 ft, Culvert Slope: 0.0623

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Culvert Performance Curve Plot: 10'X10' RCB Mainline Inlet



Water Surface Profile Plot for Culvert: 10'X10' RCB Mainline Inlet



Site Data - 10'X10' RCB Mainline Inlet

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 3344.64 ft

Outlet Station: 58.40 ft

Outlet Elevation: 3341.00 ft

Number of Barrels: 1

Culvert Data Summary - 10'X10' RCB Mainline Inlet

Barrel Shape: Concrete Box

Barrel Span: 10.00 ft

Barrel Rise: 10.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0150

Culvert Type: Straight

Inlet Configuration: Square Edge (90º) Headwall

Inlet Depression: None

Table 9 - Downstream Channel Rating Curve (Crossing: Mainline Inlet)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
0.00	3340.64	-0.36
108.70	3340.64	-0.36
217.40	3340.64	-0.36
326.10	3340.64	-0.36
434.80	3340.64	-0.36
543.50	3340.64	-0.36
652.20	3340.64	-0.36
760.90	3340.64	-0.36
869.60	3340.64	-0.36
978.30	3340.64	-0.36
1087.00	3340.64	-0.36

Tailwater Channel Data - Mainline Inlet

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 3340.64 ft

Roadway Data for Crossing: Mainline Inlet

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 58.40 ft

Crest Elevation: 3358.50 ft

Roadway Surface: Paved

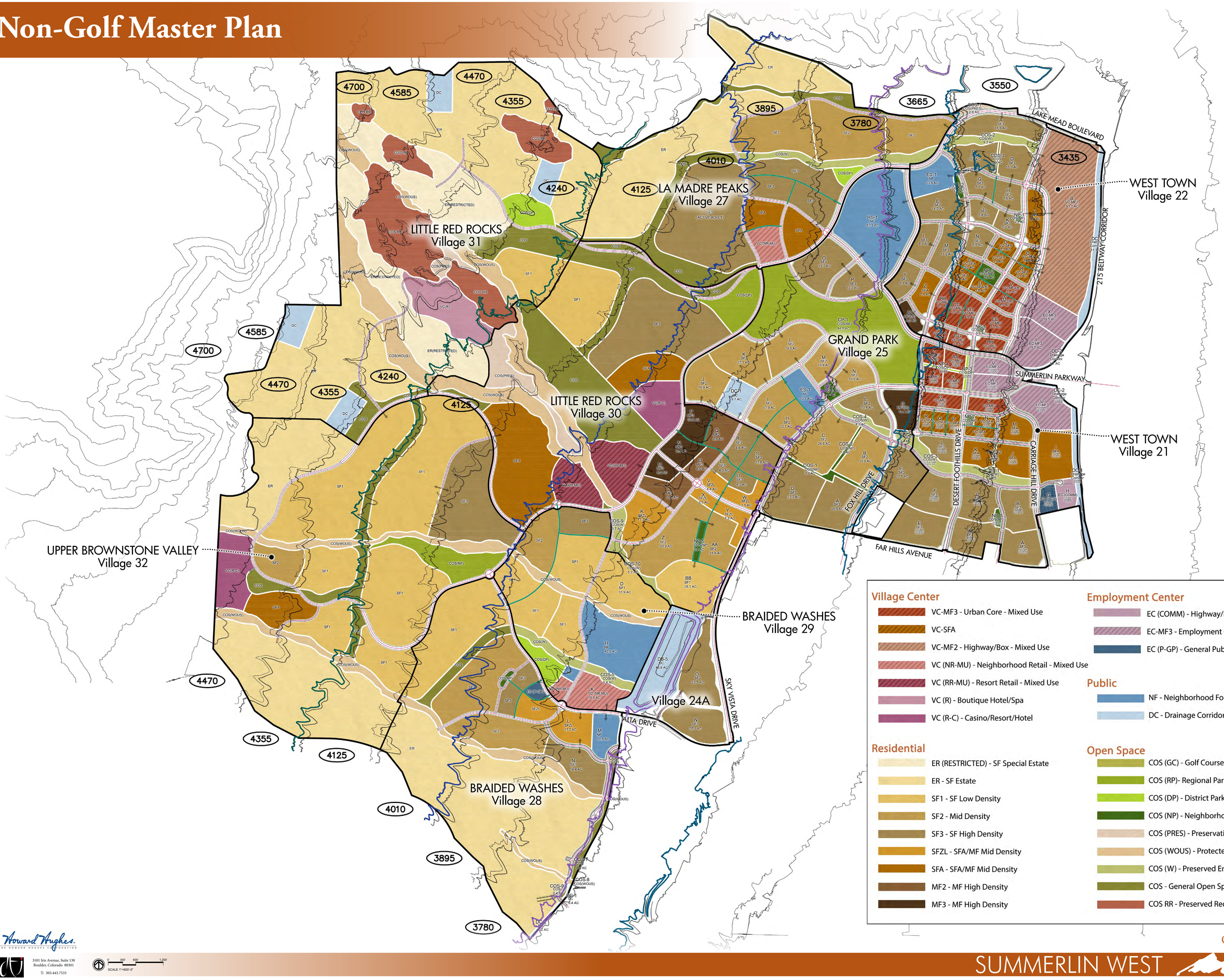
Roadway Top Width: 58.40 ft

APPENDIX D
REFERENCE MATERIAL

SUMMERLIN WEST PLANNING AREA
MASTER PLAN UPDATE

(CLV DS4926)

Non-Golf Master Plan



Village Center

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

Residential

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

Employment Center

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

Public

- NF - Neighborhood Focus
- DC - Drainage Corridor

Open Space

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

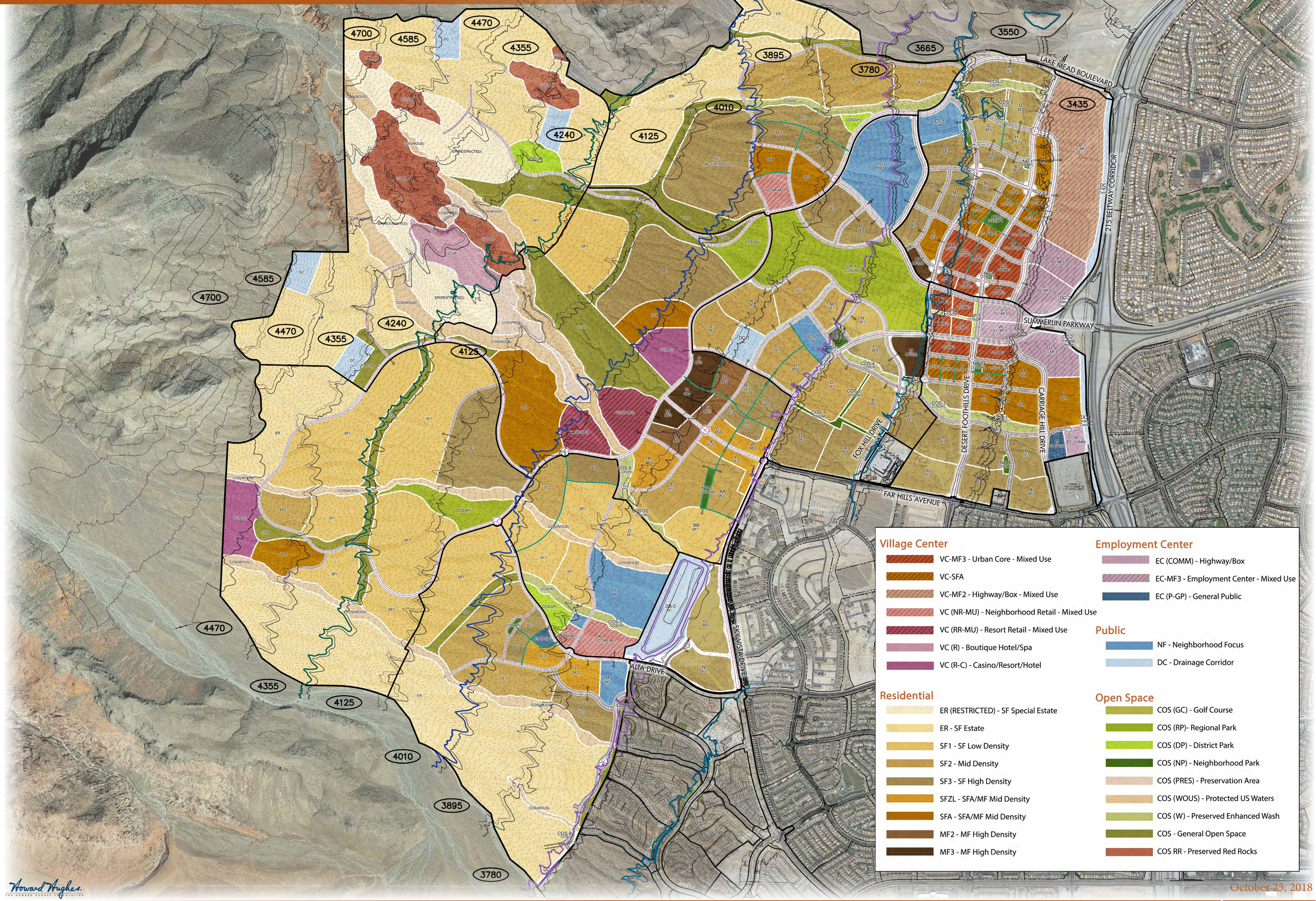
Howard Hughes
THE HOWARD HUGHES CORPORATION

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

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

October 25, 2018

Non-Golf Master Plan



Village Center

- VC-MF3 - Urban Core - Mixed Use
- VC-SFA
- VC-MF2 - Highway/Box - Mixed Use
- VC (NR-MU) - Neighborhood Retail - Mixed Use
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3101 Iris Avenue, Suite 130
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T: 303.443.7533

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

October 25, 2018



LEGEND

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

NORTH

GRAPHIC SCALE

300 0 150 300 600

1" = 300'

HEC-1 SUMMARY TABLE
VILLAGE 21
ULTIMATE CONDITION

Basin / Concentration Point	Area (Acre)			Q_{100} (cfs)			SDN
	Update	Previous	Difference	Update	Previous	Difference	
SUMM3	7.73	5.00	2.73	13	30	-17	SDN3
Z	4.50	4.50	0.00	18	17	1	SDN3
AA	4.02	3.71	0.31	17	14	3	SDN3
CAA	16.25	13.21	3.04	48	-	N/A	SDN3
NP-4	1.05	N/A	N/A	3	0	n/a	SDN3
NP-3	1.14	1.49	-0.35	3	4	-1	SDN3
CNP-3	2.18	1.49	0.69	7	-	N/A	SDN3
SUMM1	5.05	5.00	0.05	20	19	1	SDN3
Y	3.98	3.98	0.00	16	15	1	SDN3
X	3.94	3.63	0.31	16	14	2	SDN3
DES1	1.80	1.83	-0.03	8	7	1	SDN3
CSUMM1	33.20	N/A	N/A	113	-	N/A	SDN3
S	6.33	6.56	-0.23	24	25	-1	SDN3
V25-G	11.44	N/A	N/A	45	-	N/A	SDN3
R	3.07	3.10	-0.03	12	11	1	SDN3
CR	14.51	3.10	11.41	56	-	N/A	SDN3
Q	3.16	3.16	0.00	12	11	1	SDN3
CQ	17.67	6.26	11.41	68	-	N/A	SDN3
ST1	1.50	1.62	-0.12	7	6	1	SDN3
CST1	19.18	14.44	4.74	74	54	20	SDN3
P	3.00	3.17	-0.17	11	11	0	SDN3
DES2	2.39	2.27	0.12	10	9	1	SDN3
CDES2	30.89	N/A	N/A	119	-	N/A	SDN3
DES3	3.73	3.78	-0.05	17	15	2	SDN3
L	7.44	7.36	0.08	30	26	4	SDN3
COS-3	5.90	6.10	-0.20	17	18	-1	SDN3
DES4	2.79	2.88	-0.09	12	11	1	SDN3
V25-F	10.45	N/A	N/A	43	-	N/A	SDN3
V25-COS4	4.64	N/A	N/A	15	-	N/A	SDN3
V25-FOXN	3.23	N/A	N/A	14	-	N/A	SDN3
CFOXN	18.32	N/A	N/A	72	-	N/A	SDN3
V25-B	19.93	N/A	N/A	67	-	N/A	SDN3
V25-FOXS	3.19	N/A	N/A	11	-	N/A	SDN3
CFOXS	23.11	N/A	N/A	77	-	N/A	SDN3
V25-C	26.54	N/A	N/A	86	-	N/A	SDN3
V25-COS2	1.79	N/A	N/A	5	-	N/A	SDN3
STA1	2.98	N/A	N/A	13	-	N/A	SDN3
CSTA1	72.75	N/A	N/A	238	-	N/A	SDN3
V25-E	17.13	N/A	N/A	65	-	N/A	SDN3
V25-COS3	2.37	N/A	N/A	8	-	N/A	SDN3
ST2	2.88	2.93	-0.05	12	12	0	SDN3
CST2	95.12	2.93	92.19	291	-	N/A	SDN3
F	16.58	16.88	-0.30	65	59	6	SDN3
E	20.15	20.20	-0.05	78	77	1	SDN3
DES5	5.83	5.46	0.37	22	20	2	SDN3
CDES5	185.60	N/A	N/A	624	-	N/A	SDN3
C	14.83	14.05	0.78	54	44	10	SDN3
NP-1	1.27	1.35	-0.08	4	5	-1	SDN3
ST7	2.30	2.30	0.00	9	9	0	SDN3
D	14.73	15.42	-0.69	56	53	3	SDN3
CST7	33.13	33.12	0.01	124	108	16	SDN3
W	8.31	7.11	1.20	31	27	4	SDN3
SUMM2	3.63	3.28	0.35	16	13	3	SDN3
T	5.98	5.99	-0.01	23	23	0	SDN3
NP-2	0.93	0.87	0.06	3	3	0	SDN3
ST3	1.70	2.09	-0.39	8	8	0	SDN3
CST3	2.63	8.08	-5.45	11	43	-32	SDN3
CARR1	3.52	3.52	0.00	15	14	1	SDN3
M	9.11	9.11	0.00	32	32	0	SDN3
CCARR1	32.00	N/A	N/A	129	-	N/A	SDN3
N	2.54	2.54	0.00	10	9	1	SDN3
O	3.47	3.43	0.04	13	13	0	SDN3
STD	0.88	N/A	N/A	4	-	N/A	SDN3
CSTD	6.90	5.97	0.93	26	-	N/A	SDN3
K	8.20	8.01	0.19	30	29	1	SDN3
STB	2.65	N/A	N/A	12	-	N/A	SDN3
CSTB	17.75	8.01	9.74	68	-	N/A	SDN3
J	11.83	11.83	0.00	42	42	0	SDN3
COS-2	0.58	N/A	N/A	2	-	N/A	SDN3
COS-1	7.80	7.78	0.02	22	22	0	SDN3
CCOS-1	8.38	7.78	0.60	24	-	N/A	SDN3
CARR2	2.45	2.49	-0.04	10	10	0	SDN3
ST6	3.08	3.01	0.07	13	12	1	SDN3
CCARR2	76.80	N/A	N/A	286	-	N/A	SDN3
B	13.90	13.71	0.19	54	46	8	SDN3
A	14.15	14.36	-0.21	51	47	4	SDN3
CARR3	4.87	4.85	0.02	19	19	0	SDN3
CCARR3	109.72	N/A	N/A	410	-	N/A	SDN3
V	7.25	7.19	0.06	29	27	2	SDN3
SUMM4	4.87	N/A	N/A	21	-	N/A	SDN3
CSUMM4	12.12	7.19	N/A	50	-	N/A	SDN3
DC-2	1.19	1.40	-0.21	5	5	0	SDN3
U	20.17	20.42	-0.25	73	74	-1	SDN3
I	18.69	18.50	0.19	61	60	1	SDN3
STA	1.01	0.00	n/a	5	0	n/a	SDN3
G	5.01	5.71	-0.70	19	21	-2	SDN3
H	5.79	6.26	-0.47	21	22	-1	SDN3
CGH	10.80	11.97	-1.17	39	-	N/A	SDN3
DC-1	8.19	8.19	0.00	23	25	-2	SDN3
NVE	21.74	21.74	0.00	75	79	-4	SDN3
CDC1	104.69	101.38	3.31	326	-	N/A	SDN3
CFAR	454.4	N/A	N/A	1598	-	N/A	SDN3

REVISION | BY | DATE | REV

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

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

2018 UPDATE TO SUMMERLIN WEST PLANNING AREA

A.6.6 VILLAGE 21 DRAINAGE BASIN MAP

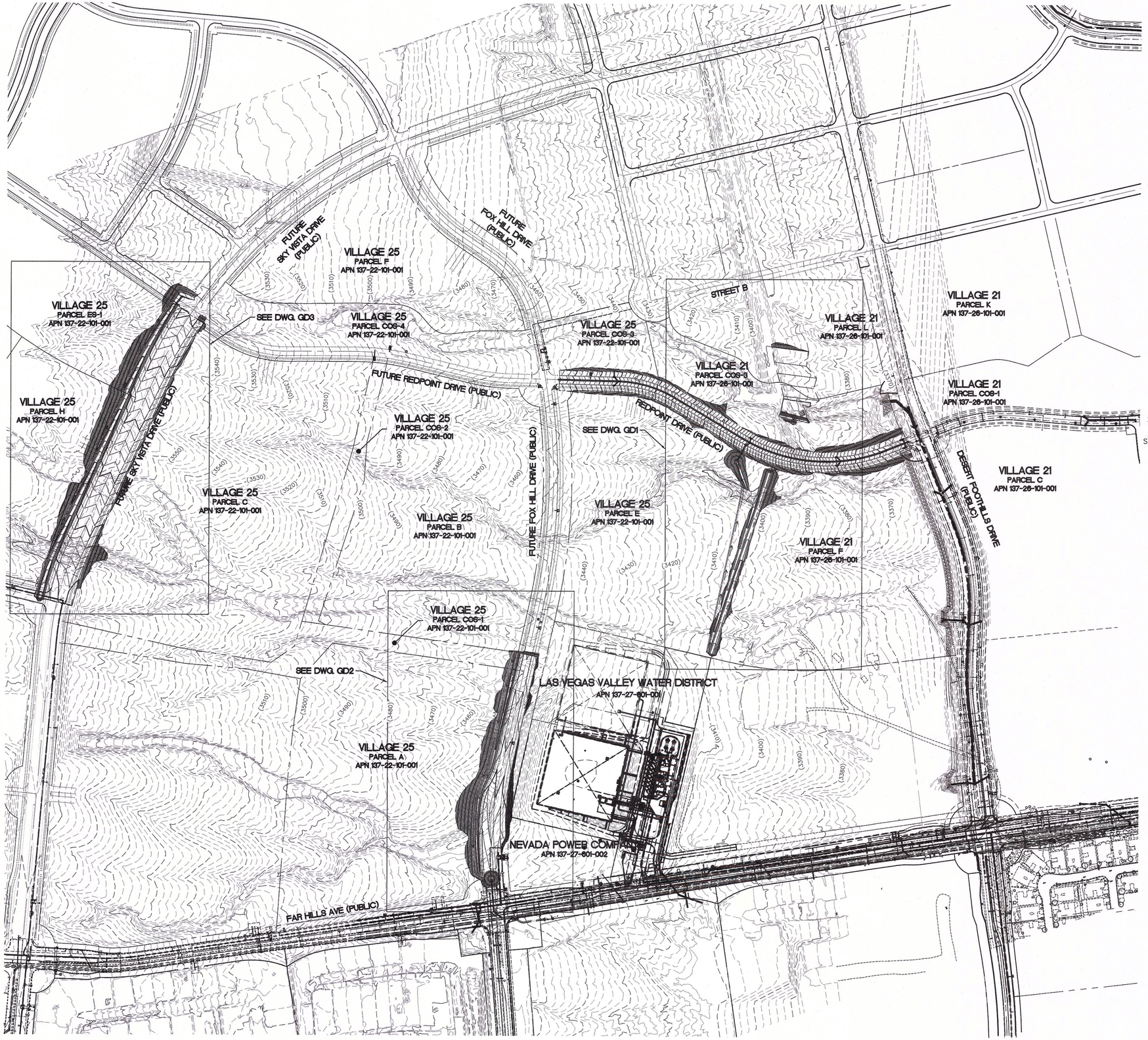
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DESIGNED BY: JYA/GSB — NOV 2018
CHECKED BY: WJM — FEB 2018
PROJECT NO: 7809
SCALE: HORIZ. N/A, VERT. N/A

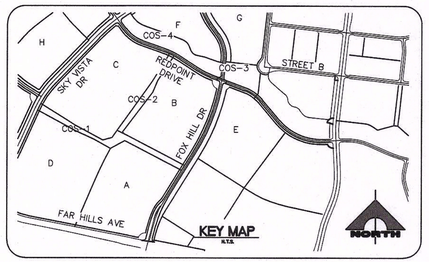
SHEET A.6.6 OF SHEETS
DRAWING NO.

H:\7809\Drainage\5_UP\A Figures\A.6.6 Village 21 Drainage Basin Map\A.6.6 Area 1 Drainage Basin Map.dwg

TECHNICAL DRAINAGE STUDY
FOR
VILLAGE 21
REDPOINT DRIVE – FOX HILL TO DESERT FOOTHILLS DRIVE IMPROVEMENTS

(CLV DS5088)





OFF-SITE FLOOD CONTROL NOTE:

ALL OFF-SITE INTERIM FLOOD CONTROL FACILITIES SUCH AS, BUT NOT LIMITED TO, BERMS/DITCHES AND TEMPORARY SUMPS ARE PRIVATELY OWNED AND ARE TO BE PRIVATELY MAINTAINED BY THE HOWARD HUGHES COMPANY.

BASIS OF BEARINGS AND COORDINATES

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 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 PROJECT AREA.
2. GRID BEARINGS SHOWN HEREON (OR IMPLIED BY GRID COORDINATES) DO NOT EQUAL GEODETIC BEARINGS DUE TO MERIDIAN CONVERGENCE.

BENCHMARK

BM #	DESCRIPTION	NAVD 88 DATUM	NAVD 88 DATUM
CLV BM No. 7LVD934SW6	FND RIVET AND PLATE IN TOP OF CURB SE CORNER OF DESERT MOON RD. AND SKY VISTA DR. T20S,R59E,S34	3318.31 (FEET)	1,011.422 (METERS)

Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call 811
OR 1-800-227-2600
AND CLARK COUNTY TRAFFIC OPERATIONS 1-702-455-6000

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

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

CLV #

ENGINEER'S STATE OF NEVADA
MICHAEL FANG
No. 16/20/2019
No. 24457
PROFESSIONAL
CIVIL
DATE: 1/17/19

FOR AGENCY REVIEW - NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

PROJECT NO. 62021-206
DESIGN: LG
DRAWN: AS
CHECK: LG
PLOT DATE: 01-17-19
PLOT TIME: 10:57:51

GCW
ENGINEERS & SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\600\62021-206\DWG\production\62021-206_MGD.dwg
Andrew Park-Murray

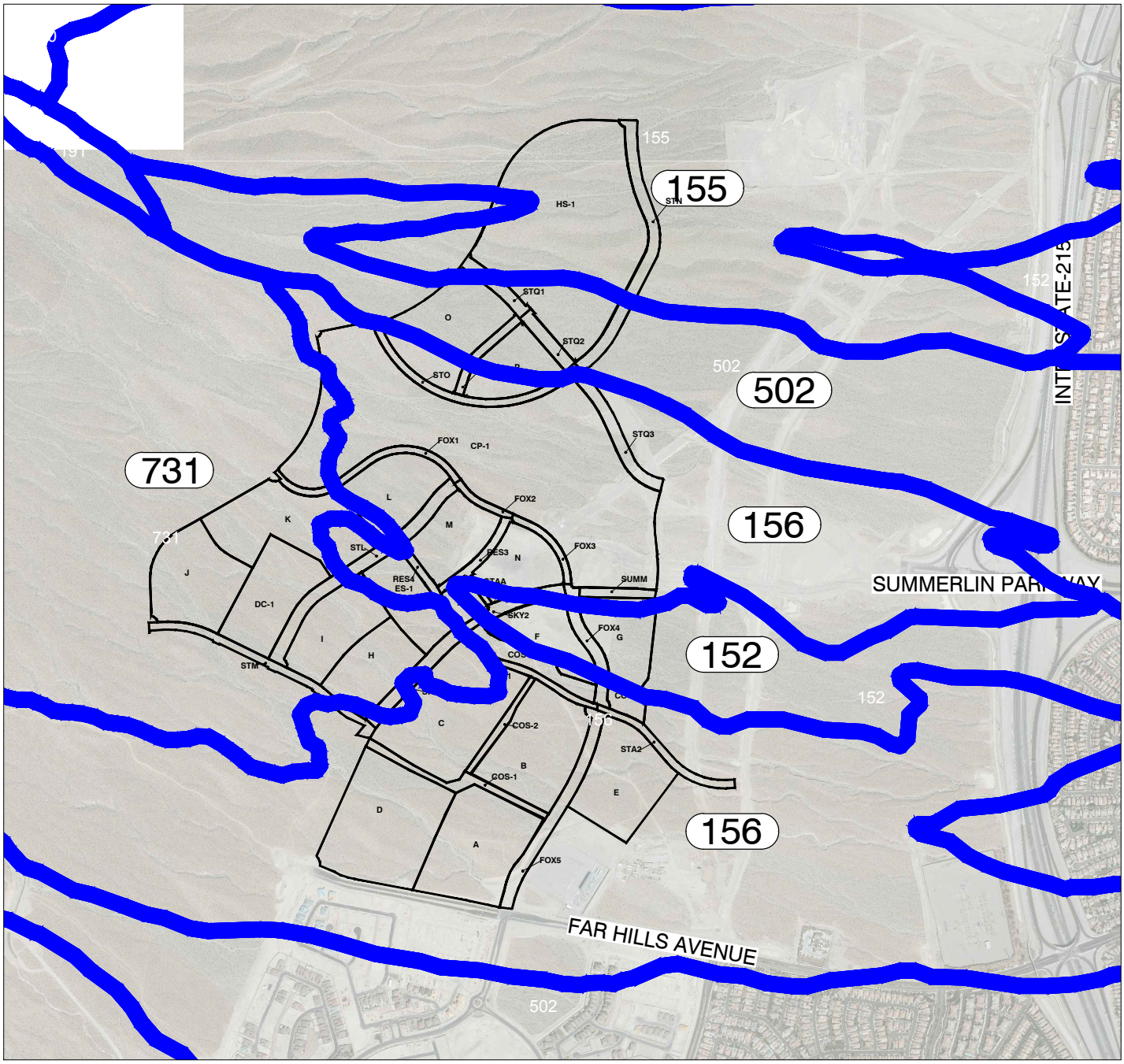
THE HOWARD HUGHES COMPANY, LLC

VILLAGE 21 REDPOINT DRIVE IMPROVEMENTS
FOX HILL DRIVE TO DESERT FOOTHILLS DRIVE

MASTER GRADING PLAN

DRAWING
MG1
5 OF 27 SHTS

MASTER CONCEPTUAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 25



LEGEND

SITE BOUNDARY

300 SOIL NUMBER

SOIL BOUNDARY

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

NORTH

GRAPHIC SCALE

1500 0 750 1500 3000

1" = 1500'

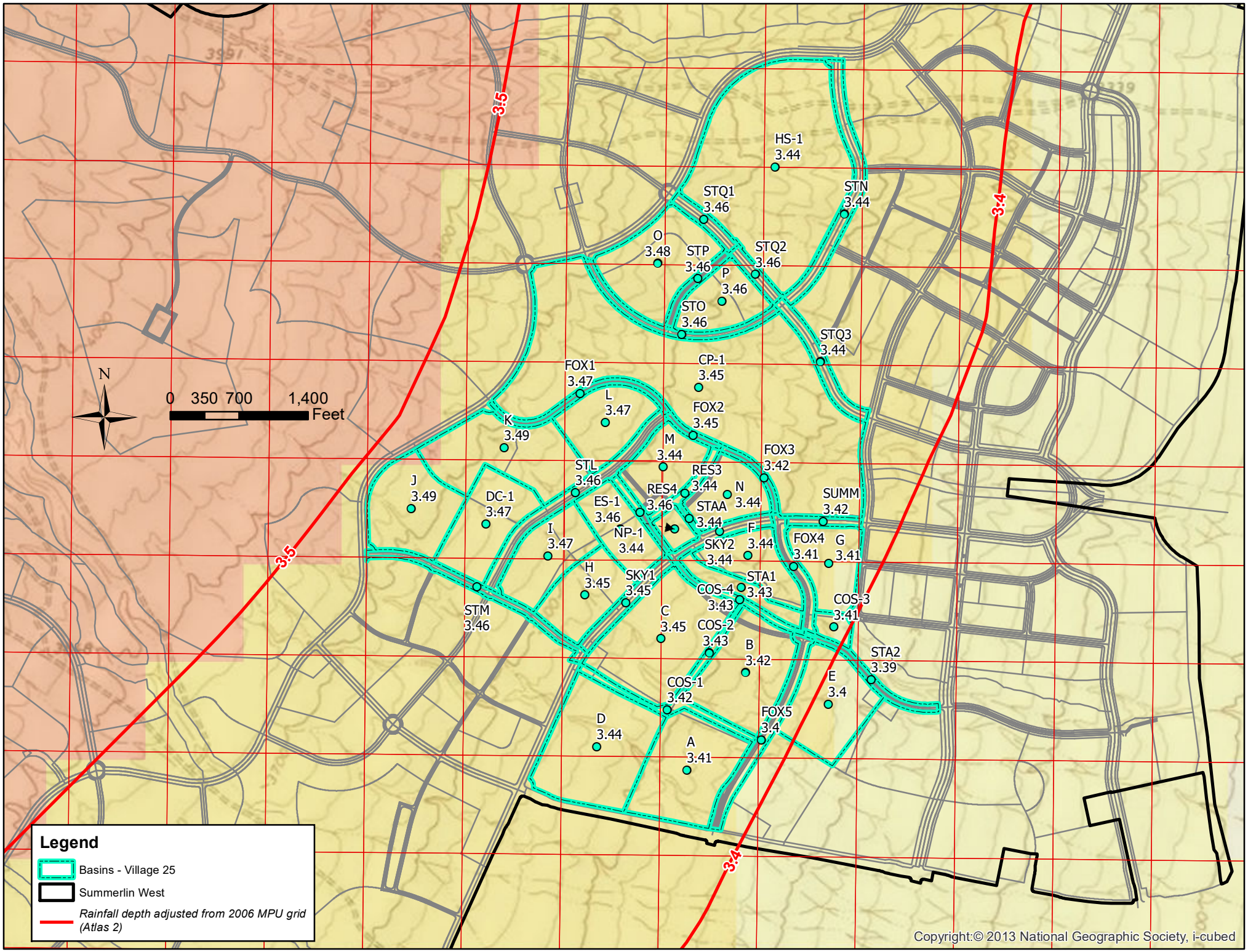
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2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NV 89146-5148

FIGURE 5A
SOILS MAP

SUMMERLIN WEST
VILLAGE 25

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



H:\7919\GIS\Rainfall\mxd\Village25-2006MPU-Precipitation.mxd Date: 1/18/2019

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE
APN: 137-26-101-001
CITY OF LAS VEGAS
STATE OF NEVADA

DEVELOPED BY:

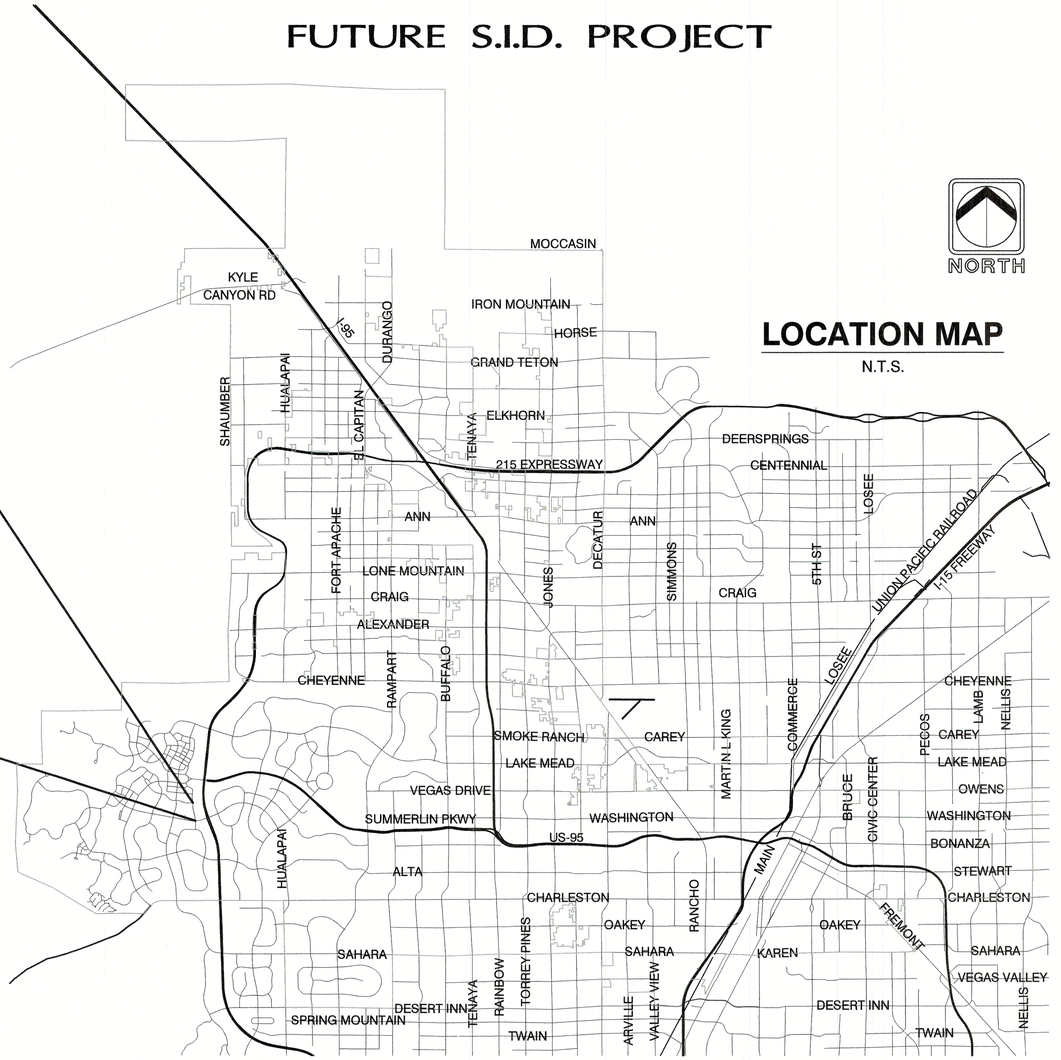
HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILTY COMPANY

10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

FUTURE S.I.D. PROJECT

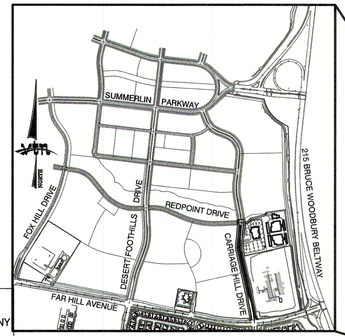
SHEET INDEX

SHEET #	SHEET	DESCRIPTION	STATION RANGE
1	CV	COVER SHEET	
2	NT	NOTE SHEET	
3	HC	HORIZONTAL CONTROL	
4	MUTSS	MASTER SANITARY SEWER UTILITY	
5	MUTSD	MASTER STORM DRAIN UTILITY	
6	MUTW	MASTER WATER UTILITY	
7	MGRD	MASTER GRADING PLAN	
8	MUTEX	MASTER EXISTING UTILITY SHEET	
9	GR1	GRADING PLAN 1	
10	GR2	GRADING PLAN 2	
11	GR3	GRADING PLAN 3	
12	GR4	GRADING PLAN 4	
13	GR5	GRADING PLAN 5	
14	DT1	DETAIL SHEET 1	
15	DT2	DETAIL SHEET 2	
16	UT1	UTILITY PLAN & PROFILE 1	10+00 TO 13+75
17	UT2	UTILITY PLAN & PROFILE 2	13+75 TO 18+00
18	UT3	UTILITY PLAN & PROFILE 3	18+00 TO 22+50
19	UT4	UTILITY PLAN & PROFILE 4	22+50 TO 26+50
20	UT5	UTILITY PLAN & PROFILE 5	26+50 TO 29+50
21	UT6	UTILITY PLAN & PROFILE 6 STORM DRAIN LATERAL	
22	UT7	UTILITY PLAN & PROFILE 7 SEWER & WATER LATERALS	
23	UT8	UTILITY PLAN & PROFILE 8 WATER LATERAL	
24	UT9	UTILITY PLAN & PROFILE 9 STORM DRAIN LATERAL	
25	UT10	UTILITY PLAN & PROFILE 10 SEWER & WATER LATERALS	
26	UT11	UTILITY PLAN & PROFILE 11 STORM DRAIN LATERAL	
27	UT12	UTILITY PLAN & PROFILE 12 STORM DRAIN LATERAL	
28	UT13	UTILITY PLAN & PROFILE 13 WATER & SEWER LATERALS	
29	UT14	UTILITY PLAN & PROFILE 14 STORM DRAIN LATERAL	
30	TR1	PLAN 1	
31	TR2	PLAN 2	
32	TR3	PLAN 3	
33	TR4	PLAN 4	
34	S1	TRANSITION STRUCTURE DETAIL	
35	S2	DROP INLET DETAIL	
36	S3	JUNCTION STRUCTURE	
37	S4	JUNCTION STRUCTURE	



NORTH

LOCATION MAP
N.T.S.



OWNER
HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILTY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

DEVELOPER
HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILTY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

ENGINEERING FIRM
VTN
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7550
FAX (702) 362-2597

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

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811
OR 1-800-227-2600
AND 1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL AND STREET LIGHT SYSTEM CONDUITS. IT'S COSTLY.
Call before you Dig Underground
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-229-6611
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

FIRE DEPARTMENT APPROVAL

APPROVAL BY THE FIRE DEPARTMENT HAVING JURISDICTION IS REQUIRED PRIOR TO OBTAINING FINAL APPROVAL FROM THE LVVWD.

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

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 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 PROJECT AREA.

2. GRID BEARINGS SHOWN HEREON (OR IMPLIED BY GRID COORDINATES) DO NOT EQUAL GEODETIC BEARINGS DUE TO MERIDIAN CONVERGENCE.

THESE PLANS AND THE DESIGN CRITERIA CONTAINED WITHIN THESE PLANS ARE BASED UPON THE INFORMATION PRESENTLY KNOWN BY THE ENGINEER AND INTENDED SOLELY AS A GENERAL GUIDELINE FOR CONSTRUCTION. ALL CONSTRUCTION SHALL BE IN CONFORMANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL STATUTES, LAWS, CODES, REGULATIONS AND ORDINANCES, INCLUDING BUT NOT LIMITED TO THE FEDERAL FAIR HOUSING AMENDMENTS ACT, AMERICANS WITH DISABILITIES ACT, THE ARCHITECTURAL BARRIERS ACT AND ANY APPLICABLE UNIFORM STANDARDS, SPECIFICATIONS OR DRAWINGS. THE PERSON OR ENTITY PERFORMING THE CONSTRUCTION SHALL BE SOLELY RESPONSIBLE TO MAKE SURE CONSTRUCTION IS IN CONFORMANCE WITH ALL LOCAL, STATE AND FEDERAL STATUES, LAWS, CODES, REGULATIONS, STANDARDS, GUIDELINES AND ORDINANCES AND FURTHER, IS IN CONFORMANCE WITH ANY APPLICABLE DESIGN CRITERIA, INCLUDING BUT NOT LIMITED TO SOILS REPORTS, TRAFFIC STUDIES, GEOTECHNICAL REPORTS, ARCHITECTURAL PLANS AND SPECIFICATIONS, DRAINAGE PLANS OR STUDIES AND ANY OTHER CRITERIA, STANDARDS OR REQUIREMENTS LISTED IN THE PLANS OR THE GENERAL NOTES RELATED TO THESE PLANS OR PROVIDED BY ANYONE IN REFERENCE TO THIS PROJECT.

APPROVALS

CITY ENGINEER ALLEN PAVELKA, P.E. # 9029

APPROVAL OF THESE PLANS BY THE CITY ENGINEER 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 STANDARD DRAWINGS AND SPECIFICATIONS CLARK COUNTY AREA NEVADA.

NA
CITY OF LAS VEGAS PLANNING DEPARTMENT DATE

THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING AND DEVELOPMENT DEPARTMENT

CENTRAL TELEPHONE COMPANY d/b/a CENTURYLINK DATE

"THE AFFIXED CENTURY LINK NEVADA APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS."

NV ENERGY DATE

NV ENERGY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NVENERGY 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 PUBLIC UTILITY COMMISSION'S RULES AND REGULATIONS.

COX COMMUNICATIONS LAS VEGAS, INC. DATE

SOUTHWEST GAS CORPORATION DATE

LAS VEGAS FIRE & RESCUE DATE

KEVIN T. ORROCK, VICE PRESIDENT DATE

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY

LAS VEGAS VALLEY WATER DISTRICT

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO:135582 FIRST APPROVED DATE:

LVVWD APPROVED FIRE FLOW 1,500 GPM / ONSITE N/A GPM

SHEETS: CV, NT, MUTSS, MUTSD, MUTW, MUTEX, DT1, UT1-UT14

REV	DATE	BY	REVISION
1	01/10/2019	BCC	SANITARY SEWER AND STORM DRAIN LOCATION CHANGE
2	02/12/2019	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL REMOVED HEADWALL ADDED INTERSECTION INFORMATION REVISED HGLS & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

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

COVER SHEET

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY: BCC 04/03/2018
DESIGNED BY: DEH 04/03/2018
CHECKED BY: WJM 02/12/2018
SCALE: HORIZ. N/A VERT. N/A
PROJECT NO: 7651

PROFESSIONAL ENGINEER STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
No. 15745
2/12/19

SHEET
CV
1 OF 37 SHEETS
DRAWING NO.
L18-01896

H:\7651\Dissert Foothills Drive South\Sheet Set\7651-CV.dwg

107V7501

CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE 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 PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCES 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: NOVA GEOTECHNICAL, PROJECT NO. G-18-003, DATED MARCH 5, 2018, 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 N.R.S. 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, 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.
24. REVISED 02/03/15

CITY OF LAS VEGAS STREETLIGHT 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. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS, ETC., LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE TRAFFIC AND CITY ENGINEER. ANY DEVIATION FROM THE PLAN LOCATION WILL REQUIRE COMPLIANCE WITH SECTION 623 OF THE USS.
3. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION IN ACCORDANCE WITH SECTION 623 G.03.01 OF THE USS.
4. ALL EMPTY CONDUIT SHALL HAVE AT LEAST ONE GREEN NO. #8 AWG WIRE INSTALLED AS TRACER WIRE IN ACCORDANCE WITH SECTION 623 G.02.01 OF THE USS PRIOR TO BACKFILLING AND FINAL INSPECTION.
5. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN COMPLIANCE WITH USD NO. 320A WHEN POLE IS INSTALLED BEHIND SIDEWALK, AND SHALL AT NO TIME COMPLETELY ENCLOSE THE STREET LIGHTING POLE.
6. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TRAFFIC ENGINEERING DIVISION PRIOR TO ANY PRE-FINAL INSPECTION. THE AS-BUILT DRAWING NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.
7. SERVICE POINTS SHALL BE COORDINATED WITH NV ENERGY, AND WHEREVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT. SERVICEPOINTS SHALL BE SHOWN ON THE PLANS.
8. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREETLIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS MUST BE RESOLVED BETWEEN THE DEVELOPER AND THE UTILITIES INVOLVED BEFORE STREETLIGHT BASES ARE INSTALLED. AT NO EXPENSE TO THE CITY OF LAS VEGAS.
9. THE CONTRACTOR SHALL FURNISH COMPLETE CONDUIT, WIRE, ETC. FROM SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON THE PLANS.

REVISED JUNE 28, 2016 (LD VERSION)

ABBREVIATIONS

FF	FINISH FLOOR	PT	POINT OF TANGENCY	O/C	OFFSET CROWN
FG	FINISH GRADE	PRC	POINT OF REVERSE CURVATURE	BC	BACK OF CURB
FL	FLOW LINE	PCC	POINT OF COMPOUND CURVATURE	BCR	BEGIN CURB RETURN
TC	TOP OF CURB	BVC	BEGIN VERTICAL CURVE	BCL	BACK OF CURB LENGTH
TRC	TOP OF ROLL CURB	MVC	MID-POINT OF VERTICAL CURVE	TF	TOP OF FOOTING
EOP	EDGE OF ASPHALT PAVEMENT	EVC	END VERTICAL CURVE	GB	GRADE BREAK
FUT.	FUTURE	PRVC	POINT OF REVERSE VERTICAL CURVE	PC	POINT OF CURVATURE
EX.	EXISTING	R/W	RIGHT-OF-WAY	TPW	TOP OF PLANTER WALL
VG	VALLEY GUTTER	DI	DROP INLET	TRW	TOP OF RETAINMENT WALL
NG	NATURAL GROUND	BFE	BASE FLOOD ELEVATION	TOP	TOP OF CHANNEL/SCARP
H.P.	HIGH POINT	CCUSD	CLARK COUNTY UNIFORM STANDARD DRAWINGS	TOE	TOE OF CHANNEL/SCARP
L.P.	LOW POINT	SW	SIDEWALK	TOB	TOP OF BOX
SSMH	SEWER MANHOLE	TSW	TOP OF SIDEWALK	PP	POWER POLE
WTR	WATER LINE	INT.	INTERSECTION	TRANS.	TRANSITION
SD	STORM DRAIN	D.G.	DESIGN GRADE	RET.	RETAINMENT
RCP	REINFORCED CONCRETE PIPE	C/L	CENTER LINE		

GENERAL CONSTRUCTION NOTE:

THE FOLLOWING SEPARATE VILLAGE 21 ROADWAY INFRASTRUCTURE PLANS ARE TO BE CONSTRUCTED GENERALLY ALL TOGETHER.
1. CARRIAGE HILL(FAR HILLS TO REDPOINT DRIVE)
2. REDPOINT DRIVE (CARRIAGE HILL TO DESERT FOOTHILLS)
3. RIDGE PINE (FAR HILLS TO REDPOINT DRIVE)
4. DESERT FOOTHILLS (FAR HILLS TO REDPOINT DRIVE)
5. SUMMERLIN WEST 3435 WATER MAIN (FAR HILLS TO RIDGE PINE)
6. REDPOINT DRIVE POLICE SUBSTATION (CARRIAGE HILL TO PARCEL H)
7. BELTWAY SEWER (FAR HILLS TO REDPOINT DRIVE)
8.DESERT FOOTHILLS (REDPOINT DRIVE TO SUMMERLIN PARKWAY)
9. CARRIAGE HILL(REDPOINT DRIVE TO SUMMERLIN PARKWAY)
10. STREET B (CARRIAGE HILL TO DESERT FOOTHILLS)
11. STREET B (DESERT FOOTHILLS TO SUMMERLIN PARKWAY)
12.STREET C (CARRIAGE HILL TO SUMMERLIN PARKWAY)
13.STREET D (STREET B TO STREET C)

DEVIATION FROM CITY OF LAS VEGAS STANDARDS

- NONE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE:

CITY OF LAS VEGAS FIRE DEPARTMENT NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE #6325 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS.
2. ONLY FIRE HYDRANTS THAT ARE ON THE LAS VEGAS VALEY WATER DISTRICTS - APPROVED PRODUCTS LIST ARE ALLOWED TO BE INSTALLED.
3. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK. [IFC § 105.7.12]
4. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. [IFC § 3310, § 3312]
5. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTERLINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. [IFC § 507.5.7.3]
6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL. [IFC § 106.3]
7. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. [IFC § 507.2.1, NFPA 24]
8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. **IFC 507**
9. PRIVATE HYDRANTS SHALL BE PAINTED RED. [IFC § 507.5.7.1]
10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. [IFC § 507]
11. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: [IFC § C102]

    • RESIDENTIAL – 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
    • COMMERCIAL – 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
12. WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. [IFC § C102.8]
13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.
14. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. [IFC § C102.12]
15. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. [IFC § C102.4]
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. [IFC § C102.7]
17. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. [IFC § C102.6]
18. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN. [IFC § C104]
19. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. [IFC § 503.2.3]
20. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12%. ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FT PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. [IFC § 503.2.7, § 503.2.8]
21. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. [IFC § 503.2.4]
22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13FT 6 INS. [IFC § 503.2.1]
23. FIRE DEPARTMENT ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 40 FT FLOW LINE TO FLOW LINE WITH PARALLEL PARKING PERMITTED ON BOTH SIDES. NOT LESS THAN 32 FT WIDE, FLOW-LINE TO FLOW-LINE, WHERE PARKING IS PERMITTED ONLY ON ONE SIDE OF THE FIRE APPARATUS ACCESS ROAD. NOT LESS THAN 24 FT WIDE, FLOW-LINE TO FLOW-LINE, WHERE NO PARKING IS PERMITTED ON EITHER SIDE. FIRE LANES THROUGH PARKING LOTS SHALL BE NOT LESS THAN 24 FT. [IFC § 503.2.1.1]
24. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. THIS DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED. [IFC § 503.1.1
25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT. COMMERCIAL AND INDUSTRIAL DEVELOPMENTS WHERE BUILDINGS EXCEED 2 STORIES OR 30 FEET IN HEIGHT, OR EXCEEDING 62,000 SQUARE FEET IN AREA. [IFC § 503.1.2]
26. ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. [IFC § 503.2.5]
27. ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS OF 100 FT ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM THE ROADWAY LEVEL, THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. [IFC § 503.3]
28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM. SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE IFC § 503.6 AND IFC APPENDIX M.

EFFECTIVE DATE: MARCH 1st, 2016

CITY OF LAS VEGAS TRAFFIC NOTES

1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.
2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.
3. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
4. WHEN A DESIGNATED "SUGGESTED ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD". THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.
5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW TRAFFIC SIGNS SHALL UTILIZE TYPE XI RETROREFLECTIVE SHEETING IN ACCORDANCE WITH 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 AREA. 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 CITIZENS AREA TRANSIT (C.A.T.) 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.

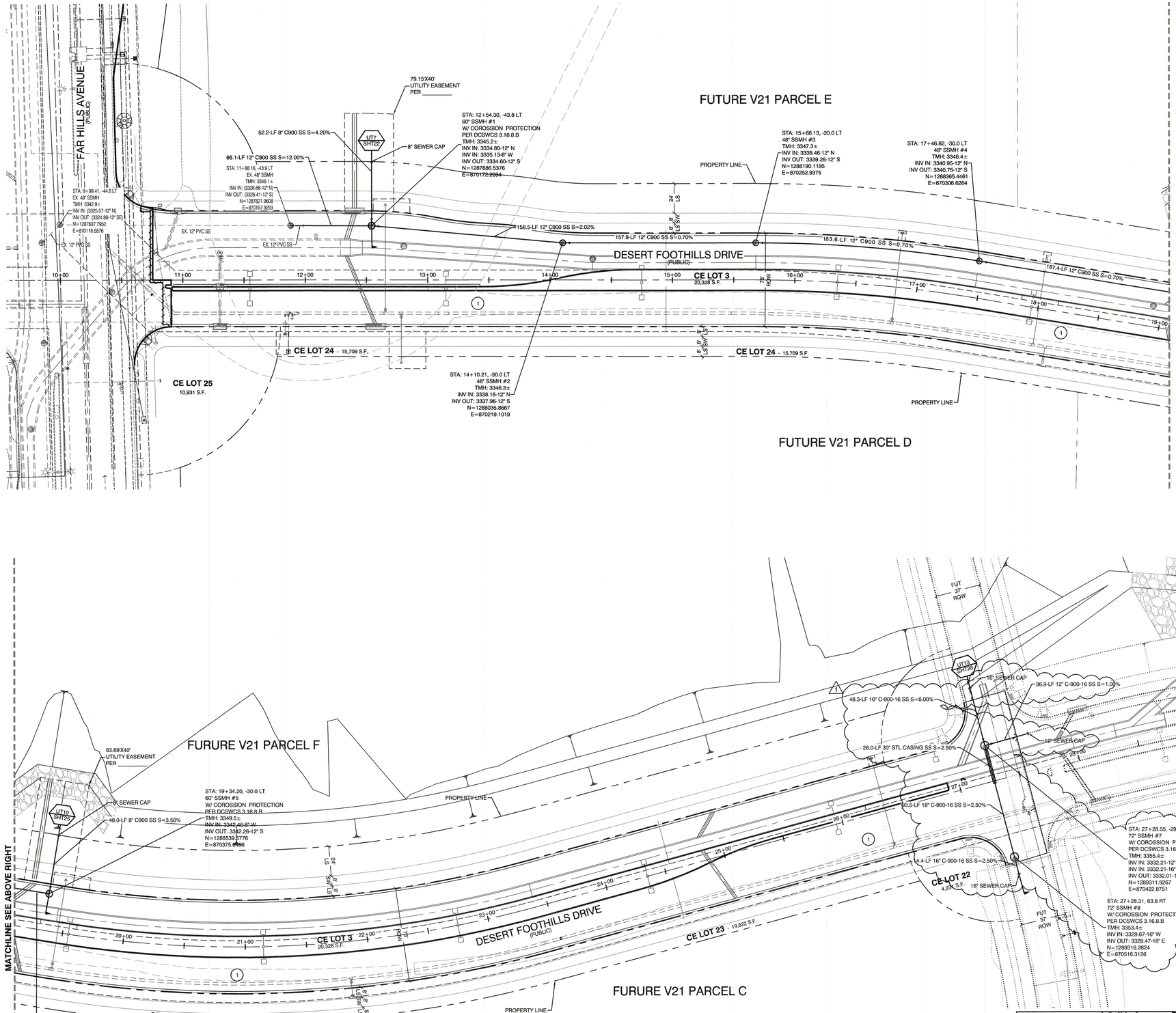
REVISED 7/3/13

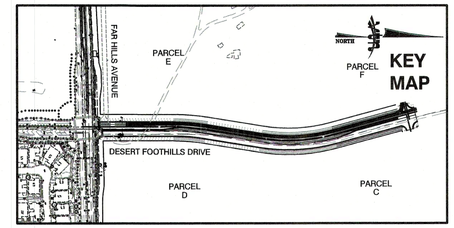
LAS VEGAS VALLEY WATER DISTRICT STANDARD NOTES

LVVWD PROJECT #135582

(REVISED 08/01/2017)

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVVWD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVWD COMMUNICATION SUPPORT CENTER (258-7171) TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. FOR FUTURE INSPECTIONS, NOTICE MUST BE GIVEN BY 2:00 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED LVVWD INSPECTION. **WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.**
2. ALL WORK SHALL CONFORM TO LVVWD STANDARD PLATES, DRAWINGS, AND SPECIFICATIONS, AND TO THE **2010** EDITION OF THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS (UDACS). **THE LATEST EDITION OF UDACS SHALL SUPERSEDE ANY CONFLICTS CONTAINED IN THE APPROVED DRAWINGS AND/OR SPECIFICATIONS.**
3. ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2 ABOVE, SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT DRAFT OR EDITION OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.
4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.
5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.
6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.
8. ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSINGS SHALL CONFORM TO SECTION 2.22 OF THE **2010** EDITION OF THE UDACS.
9. ALL WATER FACILITIES AND APPURTENANCES SHALL BE DISINFECTED, PRESSURE TESTED, AND HAVE AN ACCEPTABLE PASSING HEALTH WATER SAMPLE OBTAINED, PRIOR TO OPERATION AND USE.
10. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802, TWO (2) WORKING DAYS PRIOR TO METER





NORTH

GRAPHIC SCALE

-40 0 20 40 80

1" = 40'

SEWER

S	STANDARD MANHOLE PER SD-1A & 1B	7 EA.
	12" SDR-35 PVC SANITARY SEWER MAIN	1,060 LF.
	12" SDR-35 PVC SANITARY SEWER MAIN	5 EA.
POC	SEWER POINT OF CONNECTION	

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

CONSTRUCTION NOTES

UT # / SHT # — UTILITY PROFILE REFERENCE LABEL
UT # = SHEET INDEX
SHT# = SHEET NUMBER

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:

ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATERLINE TRENCH NOTE:

CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE

INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

FIRE HYDRANT MARKER NOTES

BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKERS ARE TO BE INSTALLED:

1. ON ROADWAYS WITH NO PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 8" FROM FACE OF CURB ON HYDRANT SIDE.
2. ON ROADWAYS WITH PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 16" FROM FACE OF CURB ON HYDRANT SIDE.

WATER MAIN JOINT DEFLECTION

PVC PIPE SHALL BE DEFLECTED AT THE JOINT ONLY. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE ONE (1) DEGREE PER JOINT WITH A MINIMUM RADIUS OF CURVATURE OF 1,150 FEET, PER UDACS 2.07.01 AND 2.07.02.

FOR CHANGES IN DIRECTION EXCEEDING THE MAXIMUM ALLOWABLE JOINT DEFLECTION, FITTINGS SHALL BE USED.

UTILITY CROSSING NOTE:

ALL SEWER/STORM DRAINS CROSSING WATER LINES MUST CONFORM TO SECTION 2.22 OF UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR PORTABL WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.

ENGINEER DISCLAIMER NOTE:

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

LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1500 GPM AT 20 P.S.I. RESIDUAL.

SEWER CONNECTION NOTE

ONE OR MORE SEGMENTS OF THE DOWNSTREAM SEWER SYSTEM THAT WILL SERVE THIS PROJECT HAS NOT BEEN COMPLETED AND/OR ACCEPTED FOR MAINTENANCE BY THE CITY OF LAS VEGAS. ANY WORK DONE ON THIS PROJECT PRIOR TO THE COMPLETION AND/OR ACCEPTANCE OF THE DOWNSTREAM SEWER SYSTEM(S) SHALL BE DONE AT THE DEVELOPERS OWN RISK. THE CITY OF LAS VEGAS RESERVES THE RIGHT TO PREVENT THE PHYSICAL CONNECTION OF THIS PROJECT INTO THE DOWNSTREAM SEWER SYSTEM UNTIL ALL SEGMENTS HAVE BEEN COMPLETED AND ACCEPTED FOR MAINTENANCE, OR UNTIL SUCH TIME AS THEY ARE DEEMED AVAILABLE FOR SERVICE.

Call before you Dig
Underground
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-229-6811
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811
OR
1-800-227-2600
AND
1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS

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

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM

REV	DATE	BY	REVISION
1	01/10/2019	BCC	SANITARY SEWER AND STORM DRAIN LOCATION CHANGE

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10861 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4500

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

CITY OF LAS VEGAS

MASTER SANITARY SEWER UTILITY

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

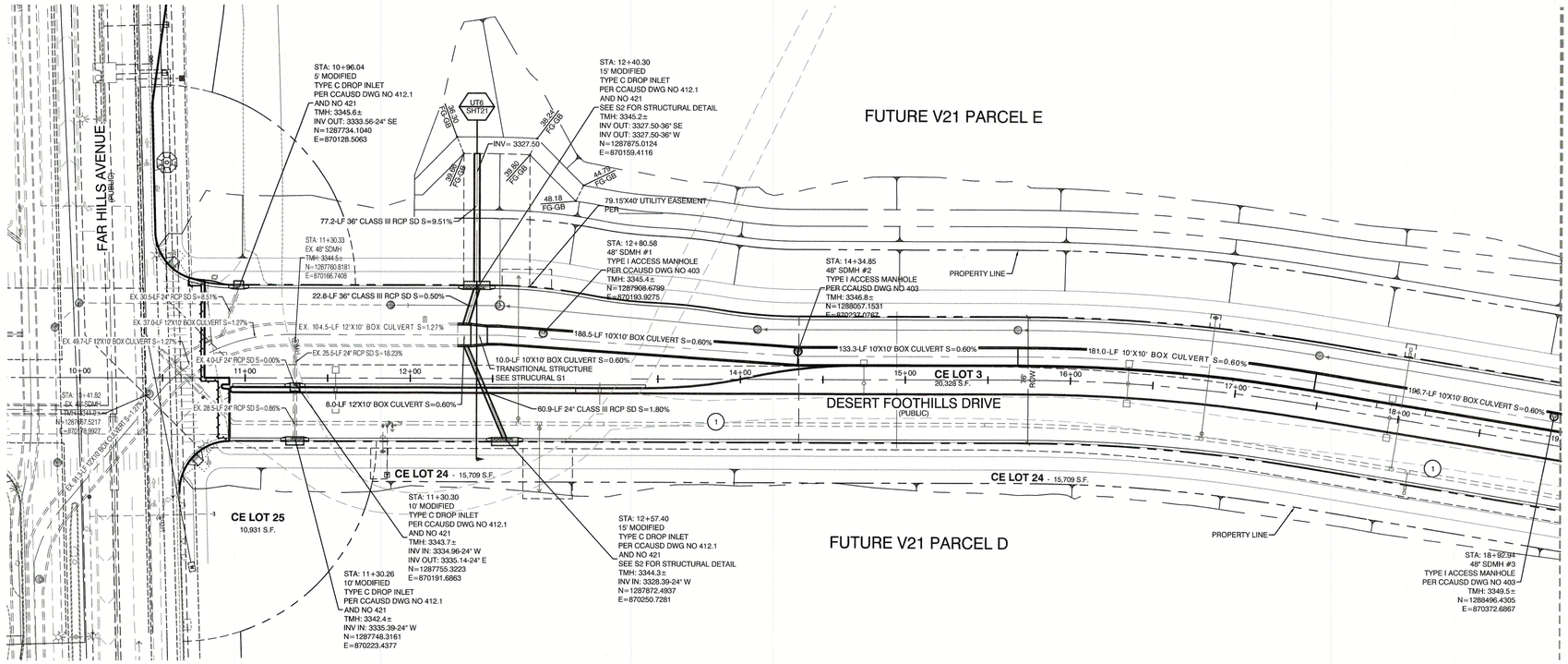
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DESIGNED BY: DBH	04/12/2018	PROJECT NO: 7651			

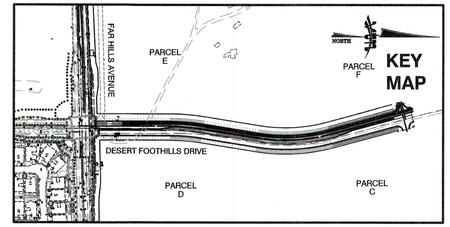
PROFESSIONAL ENGINEER STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
No. 15774
2/12/19

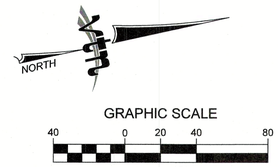
SHEET
MUTSS
4 OF 37 SHEETS
DRAWING NO.
L18-01896

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107V7501







EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

OFFSITE FLOOD CONTROL NOTE:

ALL OFFSITE INTERIM FLOOD CONTROL FACILITIES SUCH AS BUT NOT LIMITED TO BERMS/DITCHES AND TEMPORARY SUMPS ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOWARD HUGHES COMPANY.

STORM DRAIN DROP INLET NOTE:

ALL STORM DRAIN INLETS SHALL INCLUDE A STORM WATER INLET CONCRETE STAMP IN ACCORDANCE WITH CCAUSD DWG NO. 421

CONSTRUCTION NOTES

UT # / SHT # — UTILITY PROFILE REFERENCE LABEL
UT # = SHEET INDEX
SHT# = SHEET NUMBER

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:

ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATERLINE TRENCH NOTE:

CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE

INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

FIRE HYDRANT MARKER NOTES

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WATER MAIN JOINT DEFLECTION

PVC PIPE SHALL BE DEFLECTED AT THE JOINT ONLY. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE ONE (1) DEGREE PER JOINT WITH A MINIMUM RADIUS OF CURVATURE OF 1,150 FEET, PER UDACS 2.07.01 AND 2.07.02.

FOR CHANGES IN DIRECTION EXCEEDING THE MAXIMUM ALLOWABLE JOINT DEFLECTION, FITTINGS SHALL BE USED.

UTILITY CROSSING NOTE:

ALL SEWER/STORM DRAINS CROSSING WATER LINES MUST CONFORM TO SECTION 2.22 OF UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR PORTABL WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.

ENGINEER DISCLAIMER NOTE:

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LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

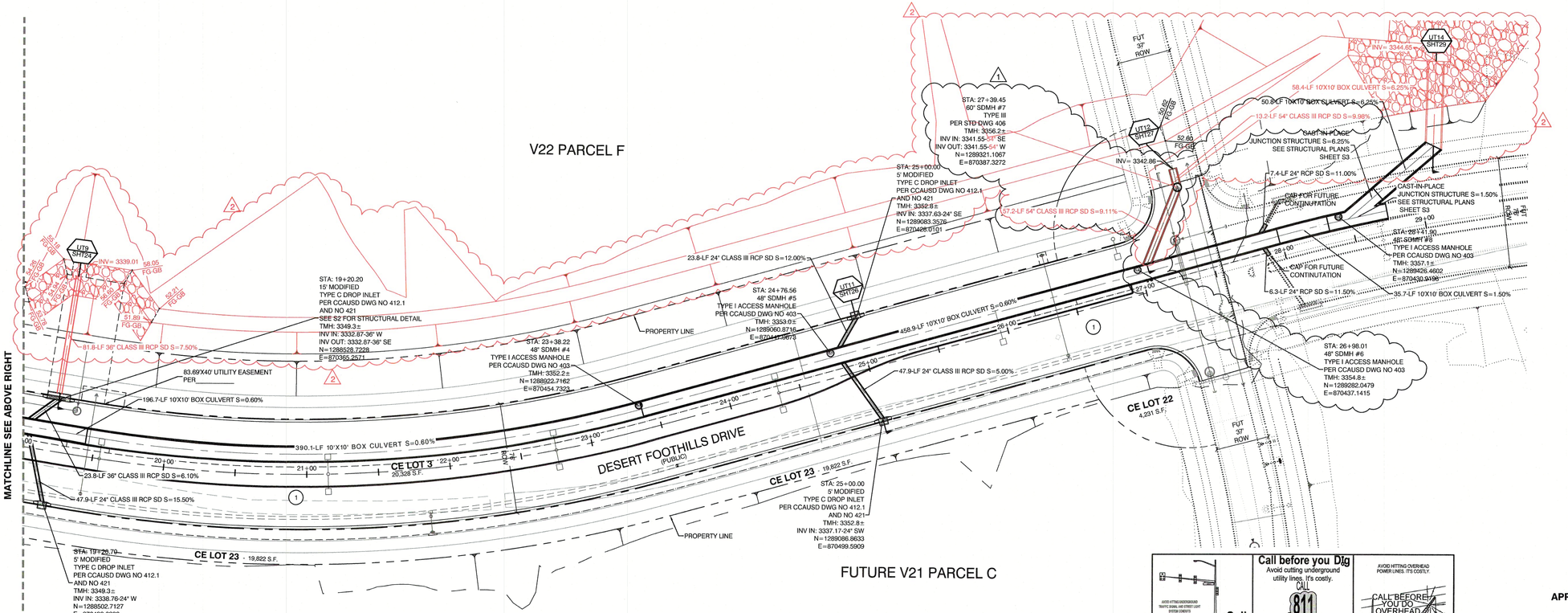
APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1500 GPM AT 20 P.S.I. RESIDUAL.

APPROVED FOR CONSTRUCTION

_____
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM



Call before you Underground
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-229-6611
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

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

REV	DATE	BY	REVISION
1	01/10/2019	BCC	SANITARY SEWER AND STORM DRAIN LOCATION CHANGE
2	02/12/2018	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL REMOVED HEADWALL ADDED INTERSECTION INFORMATION REVISED HGL'S & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7550 FAX (702) 362-2997 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

CITY OF LAS VEGAS

MASTER STORM DRAIN UTILITY

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY:	DESIGNED BY:	CHECKED BY:	PROJECT NO:	SCALE:	HORIZ.
KDH	DEH	W.M.	7931	1"=40'	VERT.
04/12/2018	04/12/2018	02/12/2018		N/A	

PROFESSIONAL ENGINEER - STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
No. 13745
7/12/19

SHEET
MUTSD
5 OF 37 SHEETS

DRAWING NO.
L18-01896

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107V7501

LVVWD NOTE:

THIS PROJECT PROVIDES FOR THE INSTALLATION OF OFF-SITE WATER MAINS ONLY, AND DOES NOT PROVIDE OR IMPLY ANY WATER COMMITMENT.

CONDITIONAL APPROVAL OF VALVED OUTLET (6-INCH AND LARGER)

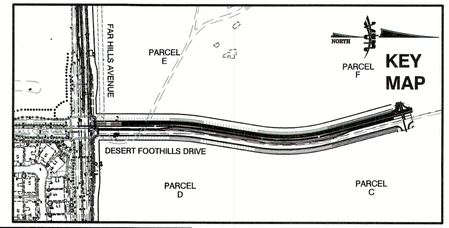
THE WATER PLANS SHOW ONE OR MORE VALVED OUTLETS EXTENDING OUT OF PAVED AREAS. INSTALLATION OF THESE OUTLETS IS ACCEPTABLE, HOWEVER, IF THE OUTLETS ARE INCORRECTLY LOCATED OR NOT USED FOR ANY REASON WHEN THE PROPERTY IS ACTUALLY DEVELOPED, THE DEVELOPER SHALL ABANDON THE OUTLETS AT THE CONNECTION TO THE ACTIVE MAIN IN ACCORDANCE WITH LVVWD STANDARDS AND AT THE DEVELOPER'S EXPENSE. APPROVAL OF THE VALVED OUTLET DOES NOT PROVIDE OR IMPLY A WATER COMMITMENT.

NORTH

GRAPHIC SCALE

-40 0 20 40 80

1" = 40 '



CONSTRUCTION NOTES

UT # SHT # — UTILITY PROFILE REFERENCE LABEL
UT #= SHEET INDEX
SHT#= SHEET NUMBER

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

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WATERLINE TRENCH NOTE:

CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE

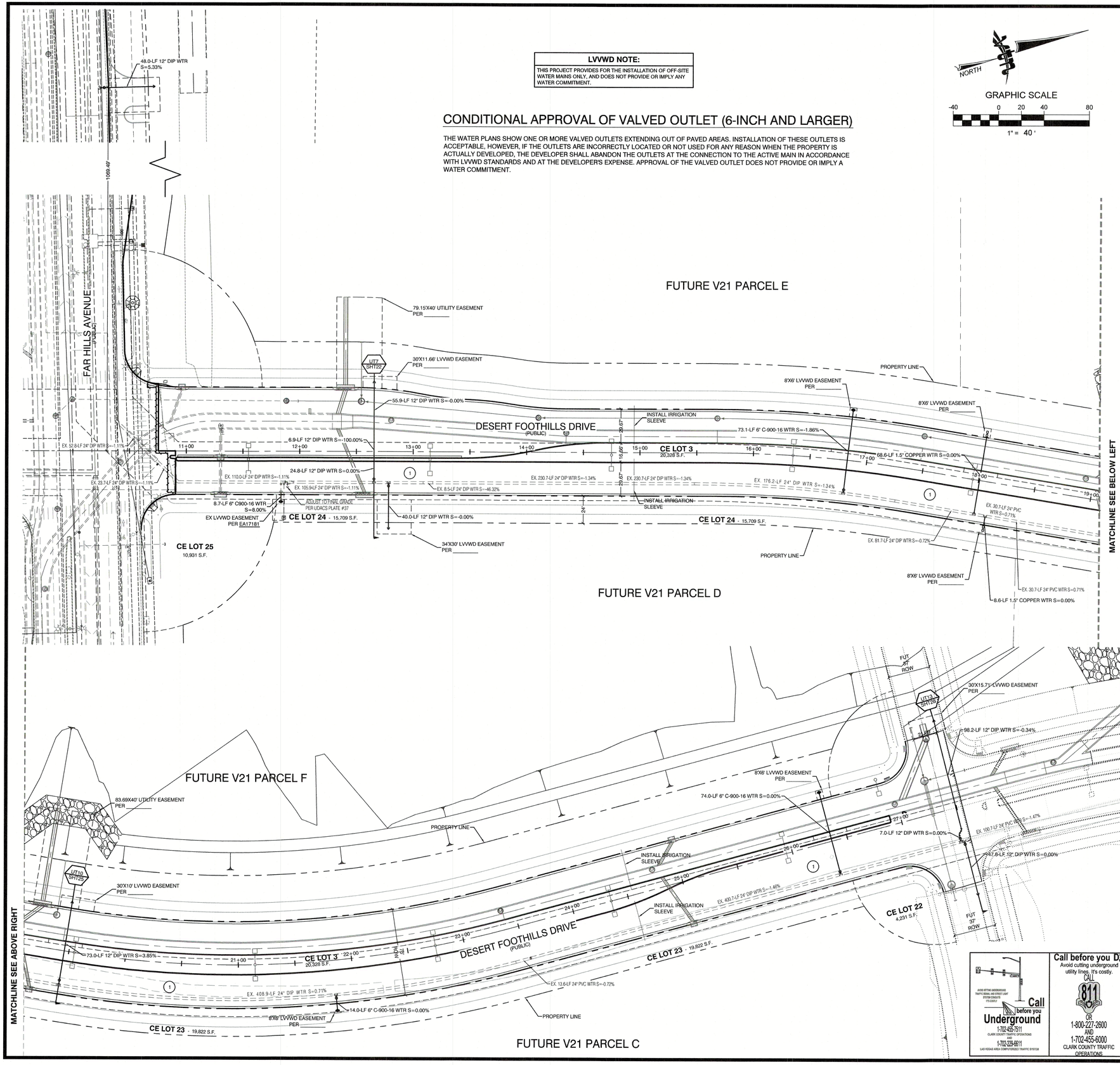
INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

RESTRAINTS NOTE:

ALL FITTINGS AND JOINT ON 12 INCH DIP TO BE RESTRAINED.

CONSTRUCTION NOTES

		PUBLIC
WATER		
1 W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41)	4 EA.
2 W	12" GATE VALVE (PER UDACS PLATE 30 & 39)	5 EA.
3 W	12" CAP & BLOW OFF(PER UDACS PLATE 36)	5 EA.
4 W	24"X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	5 EA.
5 W	12" 45° VERTICAL BEND (W/ RESTRAINTS)	2 EA.
6 W	12" 45° BEND (W/ RESTRAINTS)	2 EA.
7 W	1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" METER PER UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #8 PER DETAIL ON SHEET DT1	2 EA.
	6" C-900-16 WATER LATERAL PER UDACS 2.06.01 & PLATE 17	170 LF.
	12" DIP WATER PER UDACS 2.06.03 & PLATE 17	358 LF.
POC	WATER POINT OF CONNECTION	
SEWER		
S	STANDARD MANHOLE PER SD-1A & 1B W/ SINGLE 24" LID	7 EA.
	8" C-900-16 SANITARY SEWER MAIN	100 LF.
	12" C-900-16 SANITARY SEWER MAIN	789 LF.
	16" C-900-16 SANITARY SEWER MAIN	156 LF.
	8" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
	12" SDR-35 PVC SANITARY SEWER MAIN	1 EA.
	16" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
POC	SEWER POINT OF CONNECTION	



EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

FIRE HYDRANT MARKER NOTES

BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKERS ARE TO BE INSTALLED:

1. ON ROADWAYS WITH NO PARKING PERMITTED ON HYDRANT SIDE; LOCATE MAKER 8' FROM FACE OF CURB ON HYDRANT SIDE.
2. ON ROADWAYS WITH PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 16' FROM FACE OF CURB ON HYDRANT SIDE.

WATER MAIN JOINT DEFLECTION

PVC PIPE SHALL BE DEFLECTED AT THE JOINT ONLY. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE ONE (1) DEGREE PER JOINT WITH A MINIMUM RADIUS OF CURVATURE OF 1,150 FEET, PER UDACS 2.07.01 AND 2.07.02.

FOR CHANGES IN DIRECTION EXCEEDING THE MAXIMUM ALLOWABLE JOINT DEFLECTION, FITTINGS SHALL BE USED.

UTILITY CROSSING NOTE:

ALL SEWER/STORM DRAINS CROSSING WATER LINES MUST CONFORM TO SECTION 2.22 OF UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR PORTABL WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.

ENGINEER DISCLAIMER NOTE:

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

LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1500 GPM AT 20 P.S.I. RESIDUAL.

APPROVED FOR CONSTRUCTION

_____
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM

Call before you Underground
AVOID HITTING UNDERGROUND TRAFFIC SIGNAL AND STREET LIGHT SYSTEM CONDUITS. IT'S COSTLY.
1-702-455-7511 CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-229-6611 LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-227-2600 AND 1-702-455-5000 CLARK COUNTY TRAFFIC OPERATIONS

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

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W. CHARLESTON BLVD SUITE 800
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7550 FAX (702) 362-2697 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

REV	DATE	BY	REVISION

MASTER WATER UTILITY

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY: KDH	04/12/2018	SCALE:	1"=40' HORIZ. N/A VERT.
DESIGNED BY: DEH	04/12/2018		
CHECKED BY: WJM	02/12/2018		
PROJECT NO: 7851			

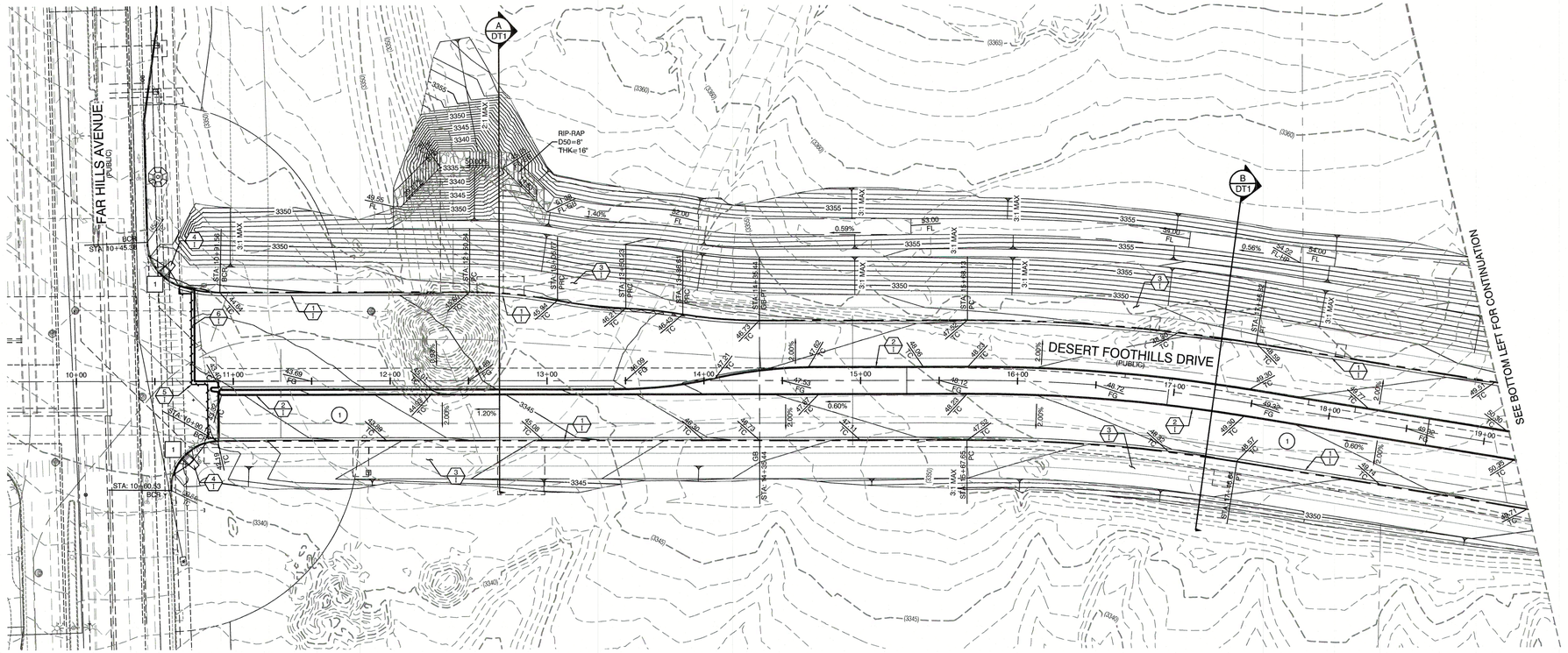
PROFESSIONAL ENGINEER STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
No. 18745
2/12/19

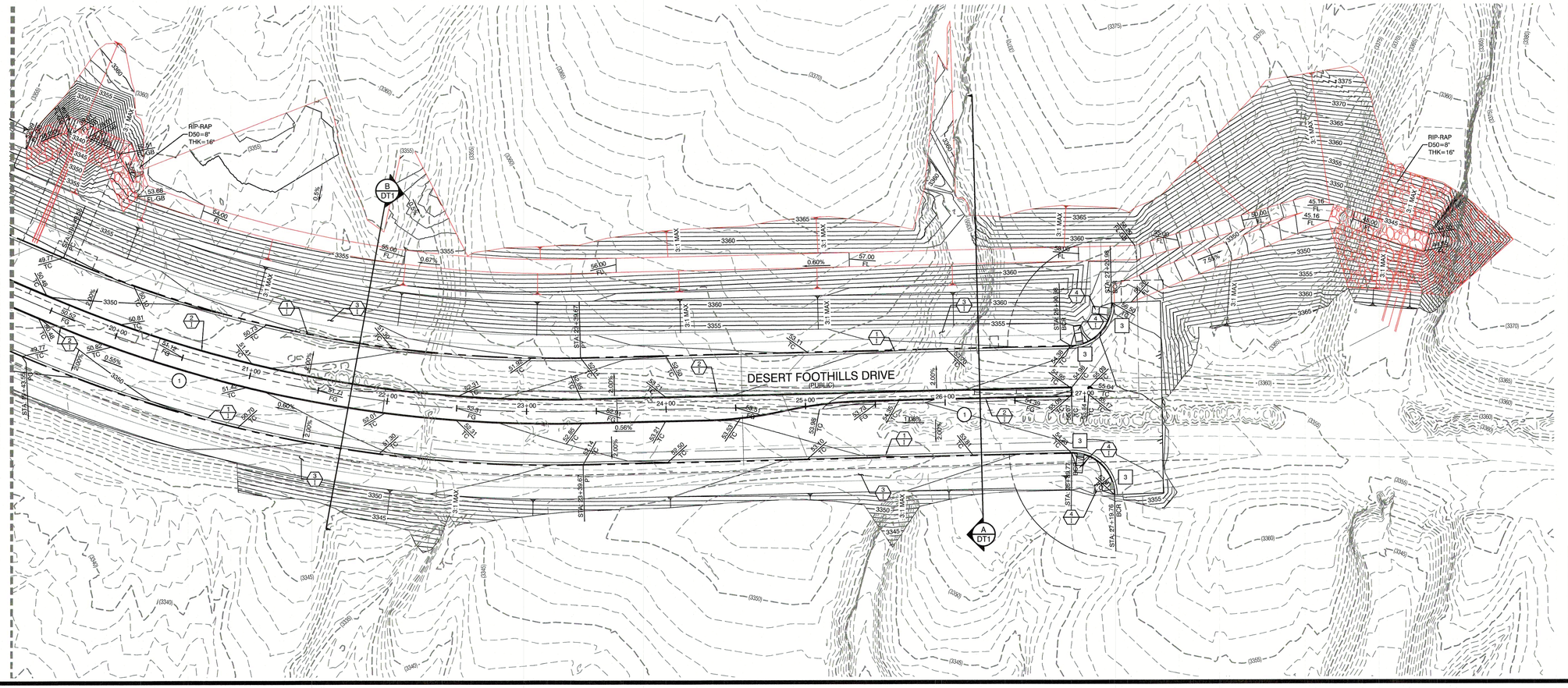
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MUTW
6 OF 37 SHEETS

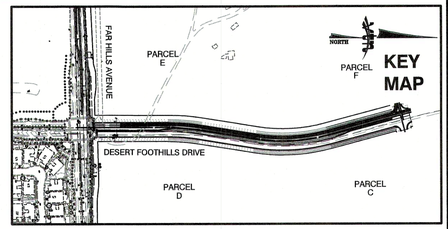
DRAWING NO.
L18-01896

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107V7501







KEY MAP

NORTH

GRAPHIC SCALE

40 0 20 40 80

1" = 40'

SIDEWALK RAMPS TABLE

(PER CCAUSD No. 235, CASE II)

NO.	DIM "A"	DIM "B"	CASE
1	4.5'	12'	II
2	4.5'	9.5'	II
3	8'	8'	II
4	9.5'	4.5'	II
5	12'	4.5'	II

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

OFFSITE FLOOD CONTROL NOTE:

ALL OFFSITE INTERIM FLOOD CONTROL FACILITIES SUCH AS BUT NOT LIMITED TO BERMS/DITCHES AND TEMPORARY SUMPS ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOWARD HUGHES COMPANY.

GRADING PERMIT NOTE

THIS GRADING PERMIT DOES NOT INCLUDE THE CONSTRUCTION OF RETAINING WALLS AND OTHERS STRUCTURES. SEPARATE PERMITS AND APPLICATIONS ARE REQUIRED FOR THESE.

GEOTECHNICAL NOTE:

REFER TO SOILS REPORT: NOVA GEOTECHNICAL
PROJECT #G-18-003, DATED MARCH 5, 2018
HTE #L18-01896

SIGHT VISIBILITY ZONES:

NO STRUCTURE, WALLS, VEGETATION, OR OBJECT OF ANY KIND IS PERMITTED OVER TWENTY-FOUR (24) INCHES IN HEIGHT (MEASURED FROM THE TOP OF ADJACENT CURB IF CURB EXISTS) WITHIN THE SIGHT VISIBILITY ZONES.

CONSTRUCTION NOTES

1. CONSTRUCT 24" TYPE "L" CURB & GUTTER PER STD. DWG. 216.
2. CONSTRUCT TYPE "A" CURB PER STD. DWG. 219.
3. FUTURE SIDEWALK
4. CONSTRUCT HANDICAP RAMP PER STD. DWG. 235 CASE II SEE SHEET DT2
5. SAWCUT AND REMOVE ASPHALT PAVING AND MATCH WITH NEW CONSTRUCTION PER CCAUSD #500.5 & #503.
6. FIELD VERIFY AND MATCH EXISTING

ENGINEER DISCLAIMER NOTE:

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

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE WITH CITY OF LAS VEGAS, #DS5013B

WILLIAM J MEYER , P.E. No. 15745 DATE

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Avoid cutting underground utility lines. It's costly.
CALL 811
OR
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AND
1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS

Call before you Underground
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REV	DATE	BY	REVISION

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

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

MASTER GRADING PLAN

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY:	KDH
DESIGNED BY:	DEH
CHECKED BY:	HJM
PROJECT NO:	7851
DATE	04/12/2018
DATE	04/12/2018
DATE	09/13/2018
SCALE:	HORIZ: 1"=40' VERT: N/A

PROFESSIONAL ENGINEER - STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
No. 15745

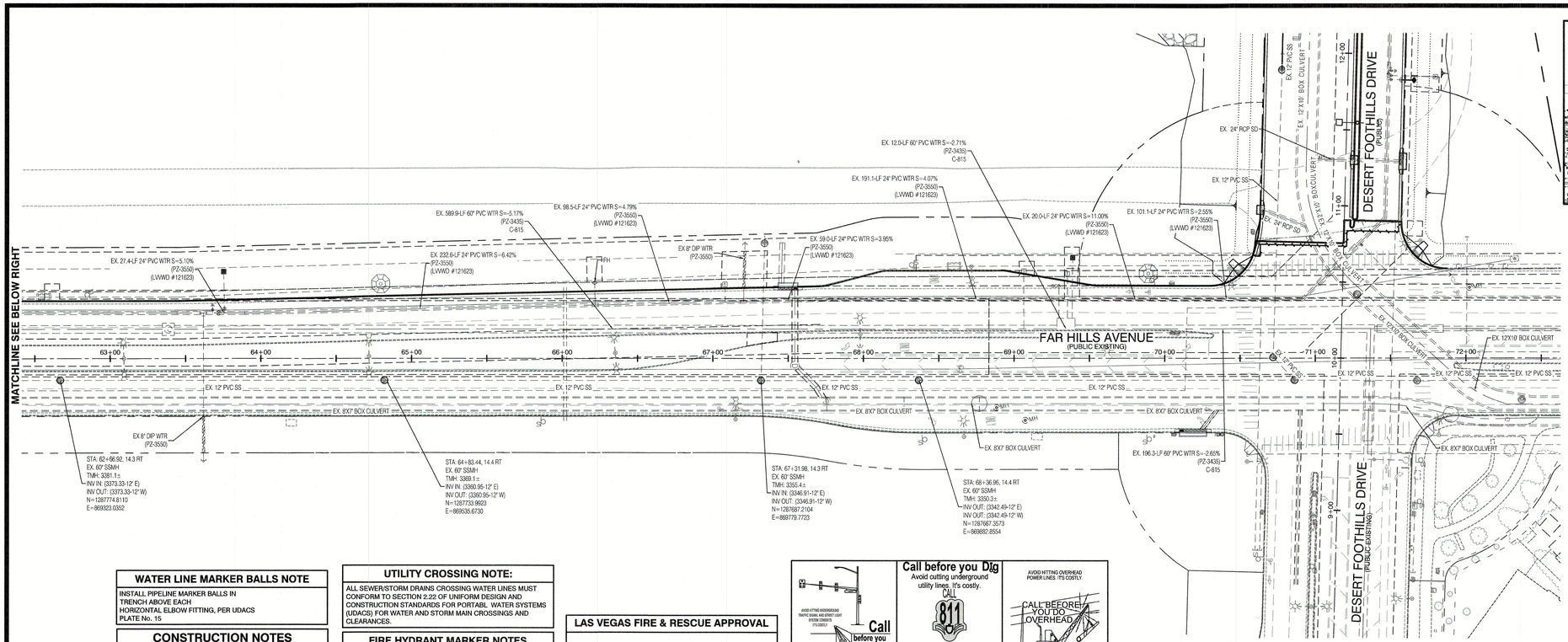
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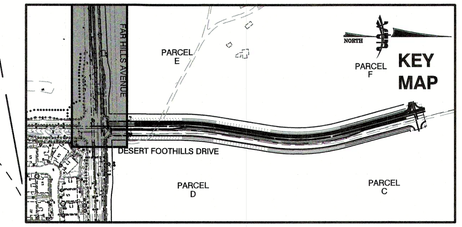
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MGRD
7 OF 37 SHEETS

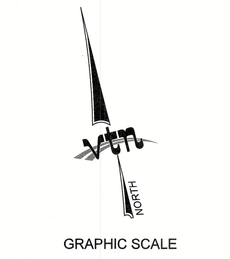
DRAWING NO.
L18-01896

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107V7501







WATER LINE MARKER BALLS NOTE

INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

CONSTRUCTION NOTES

UT # / SHT # — UTILITY PROFILE REFERENCE LABEL
UT #= SHEET INDEX
SHT#= SHEET NUMBER

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:

ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATERLINE TRENCH NOTE:

CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

UTILITY CROSSING NOTE:

ALL SEWER/STORM DRAINS CROSSING WATER LINES MUST CONFORM TO SECTION 2.22 OF UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR PORTABL WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.

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FOR CHANGES IN DIRECTION EXCEEDING THE MAXIMUM ALLOWABLE JOINT DEFLECTION, FITTINGS SHALL BE USED.

LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

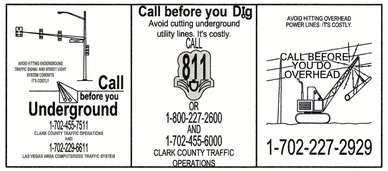
APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1500 GPM AT 20 P.S.I. RESIDUAL.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

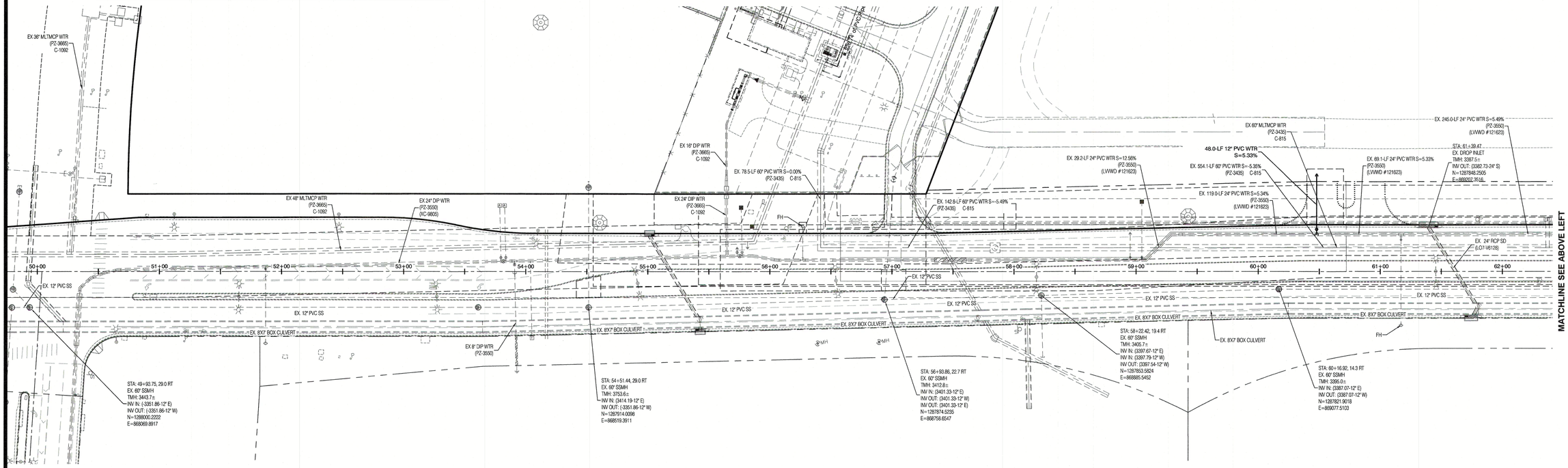
PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM



ENGINEER DISCLAIMER NOTE:

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DRAWN BY:	BCC
DESIGNED BY:	BCC
CHECKED BY:	WJM
PROJECT NO:	7851
SCALE: HORIZ.	N/A
SCALE: VERT.	N/A

08/25/2018
08/25/2018
02/12/2018

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7500 FAX (702) 362-2897 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

REV	DATE	BY	REVISION

MASTER EXISTING UTILITY SHEET

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

PROFESSIONAL ENGINEER — STATE OF NEVADA — No. 15745 — WILLIAM J. MEYER — EXP: 12/31/19 — CIVIL

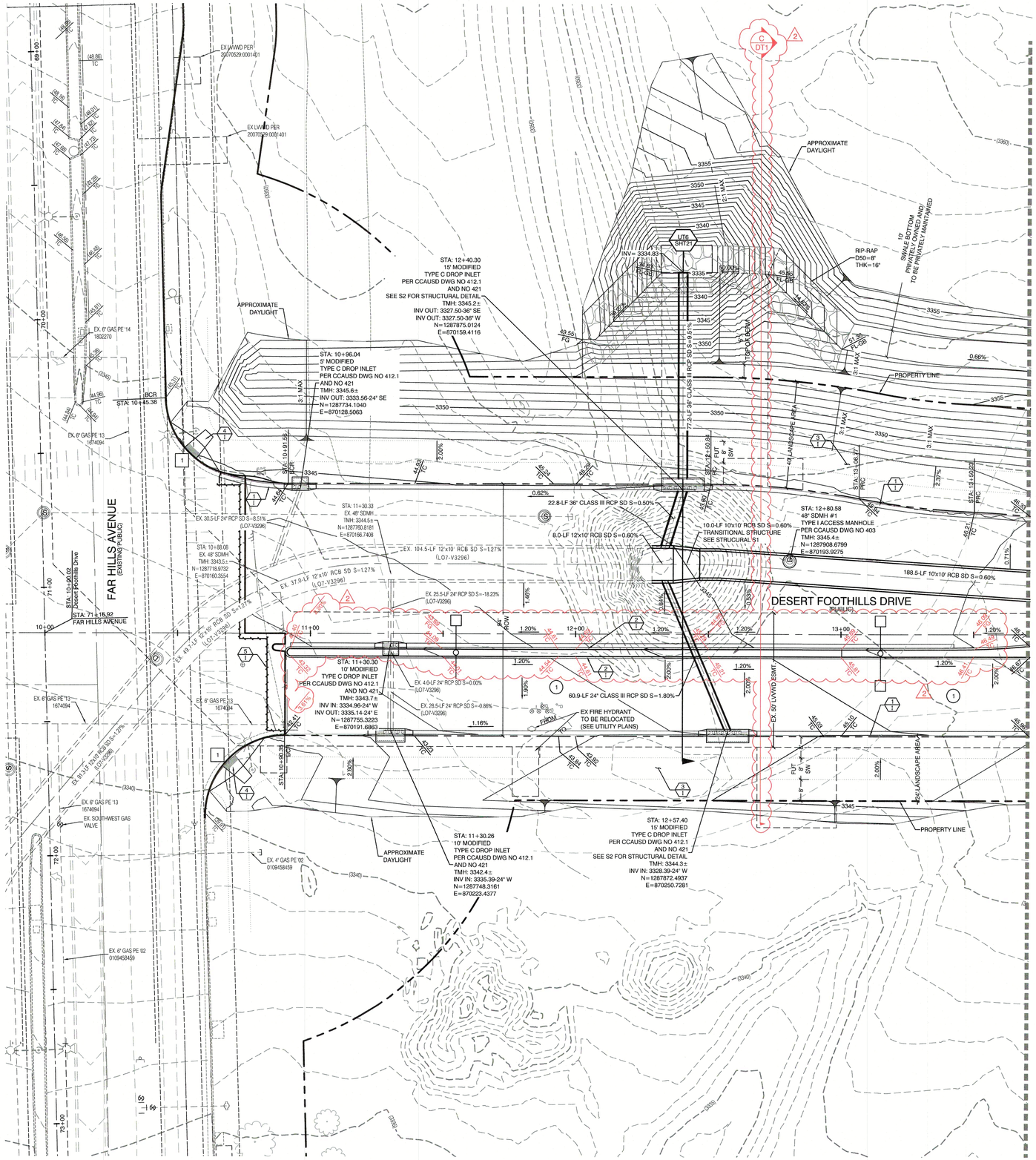
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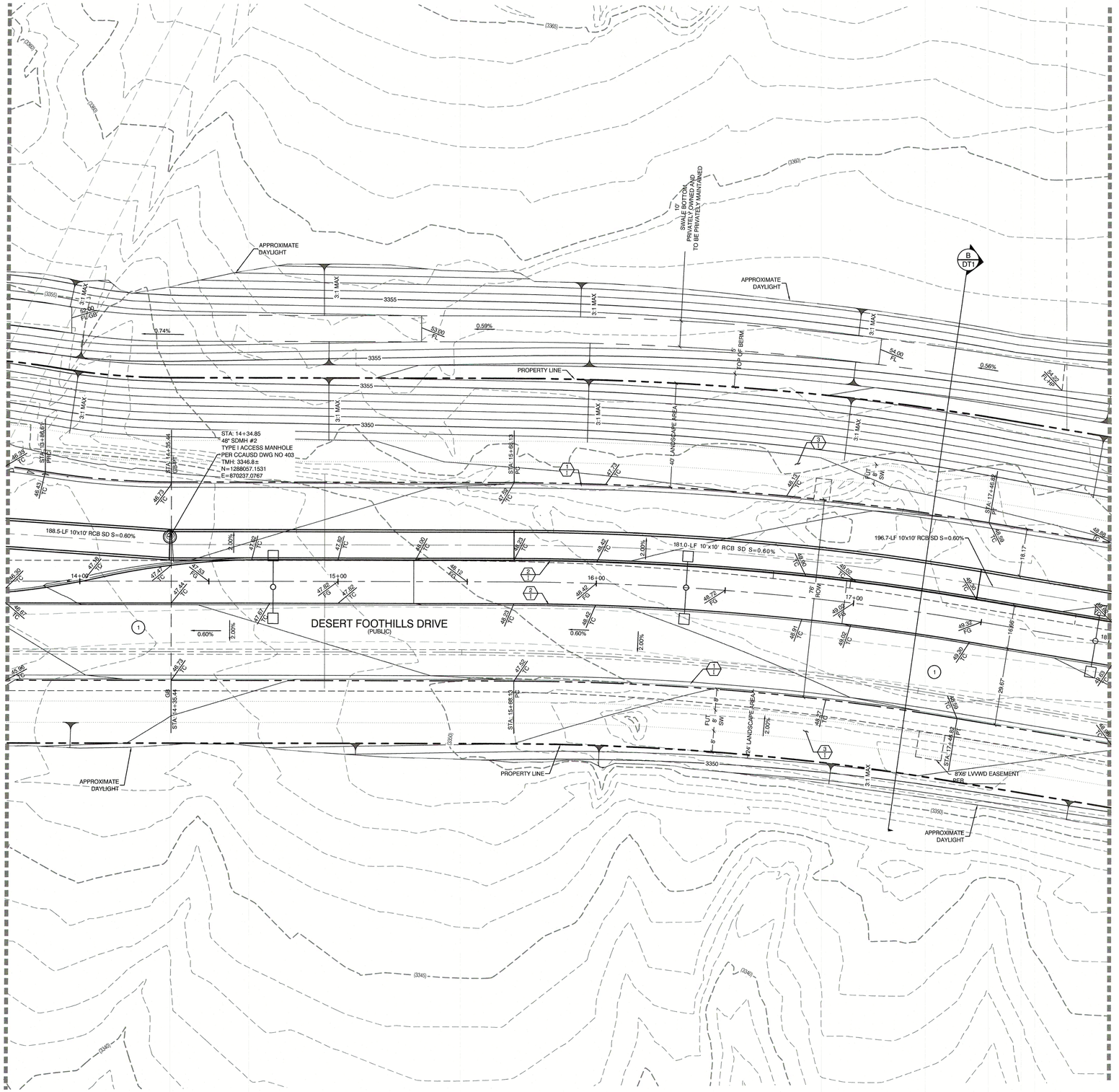
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MUTEX
8 OF 37 SHEETS

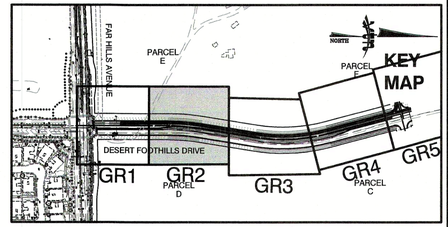
DRAWING NO.
L18-01896

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FAR HILLS AVENUE
(EXISTING PUBLIC)
DESERT FOOTHILLS DRIVE
(PUBLIC)
EX.LVWD PER 20070529:0001401
APPROXIMATE DAYLIGHT
STA: 12+40.30
15' MODIFIED
TYPE C DROP INLET
PER CCAUSD DWG NO 412.1
AND NO 421
SEE S2 FOR STRUCTURAL DETAIL
TMH: 3345.2±
INV OUT: 3327.50-36" SE
INV OUT: 3327.50-36" W
N=1287975.0124
E=870159.4116
STA: 10+96.04
5' MODIFIED
TYPE C DROP INLET
PER CCAUSD DWG NO 412.1
AND NO 421
TMH: 3345.6±
INV OUT: 3333.56-24" SE
N=1287734.1040
E=870128.5063
STA: 10+45.38
BCR
STA: 10+91.55
ECR
STA: 11+30.30
EX. 48" SDMH
TMH: 3344.5±
N=1287760.8181
E=870166.7408
STA: 10+88.08
EX. 48" SDMH
TMH: 3343.5±
N=1287718.9732
E=870160.3554
STA: 10+90.02
Desert Foothills Drive
STA: 71+16.92
FAR HILLS AVENUE
STA: 11+30.30
10' MODIFIED
TYPE C DROP INLET
PER CCAUSD DWG NO 412.1
AND NO 421
TMH: 3343.7±
INV IN: 3334.96-24" W
INV OUT: 3335.14-24" E
N=1287755.3223
E=870191.6863
STA: 10+30.53
BCR
STA: 11+30.26
10' MODIFIED
TYPE C DROP INLET
PER CCAUSD DWG NO 412.1
AND NO 421
TMH: 3342.4±
INV IN: 3335.39-24" W
N=1287748.3161
E=870223.4377
STA: 12+57.40
15' MODIFIED
TYPE C DROP INLET
PER CCAUSD DWG NO 412.1
AND NO 421
SEE S2 FOR STRUCTURAL DETAIL
TMH: 3344.3±
INV IN: 3328.39-24" W
N=1287872.4937
E=870250.7281
STA: 12+80.58
48" SDMH #1
TYPE I ACCESS MANHOLE
PER CCAUSD DWG NO 403
TMH: 3345.4±
N=1287908.6799
E=870193.9275
STA: 13+06.77
PRC
STA: 13+50.23
PRC
STA: 10+50.84
PRC
STA: 10+91.55
PRC
STA: 11+30.30
PRC
STA: 11+30.30
ECR
STA: 11+70.03
PRC
STA: 12+10.03
PRC
STA: 12+50.03
PRC
STA: 12+90.03
PRC
STA: 13+30.03
PRC
STA: 13+70.03
PRC
STA: 14+10.03
PRC
STA: 14+50.03
PRC
STA: 14+90.03
PRC
STA: 15+30.03
PRC
STA: 15+70.03
PRC
STA: 16+10.03
PRC
STA: 16+50.03
PRC
STA: 16+90.03
PRC
STA: 17+30.03
PRC
STA:





NORTH

GRAPHIC SCALE

-20 0 10 20 40

1" = 20'

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

CONSTRUCTION NOTES

1. CONSTRUCT 24" TYPE "L" CURB & GUTTER PER STD. DWG. 216.
2. CONSTRUCT TYPE "A" CURB PER STD. DWG. 219.
3. FUTURE SIDEWALK
4. CONSTRUCT HANDICAP RAMP PER STD. DWG. 235 CASE II SEE SHEET DT2
5. SAWCUT AND REMOVE ASPHALT PAVING AND MATCH WITH NEW CONSTRUCTION PER CCAUSD #500.5 & #503.
6. FIELD VERIFY AND MATCH EXISTING

CONSTRUCTION NOTES

UT # / SHT # — UTILITY PROFILE REFERENCE LABEL
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GRADING PERMIT NOTE

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GEOTECHNICAL NOTE:

REFER TO SOILS REPORT: NOVA GEOTECHNICAL
PROJECT #G-18-003, DATED MARCH 5, 2018
HTE #L18-01896

SIDEWALK RAMPS TABLE

(PER CCAUSD No. 235, CASE II)

NO.	DIM "A"	DIM "B"	CASE
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SIGHT VISIBILITY ZONES:

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I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE WITH CITY OF LAS VEGAS, #DSS013B

WILLIAM J MEYER , P.E. No. 15745 DATE

REV	DATE	BY	REVISION
2	02/12/2019	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL REMOVED HEADWALL ADDED INTERSECTION INFORMATION
1	04/10/2018	BCC	REVISED HGLS & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

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LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7500 FAX (702) 362-2697 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

GRADING PLAN 2

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY: BCC — 04/10/2018
DESIGNED BY: DEH — 04/10/2018
CHECKED BY: WJM — 02/12/2018
PROJECT NO: 7951
SCALE: HORIZ. N/A, VERT. N/A

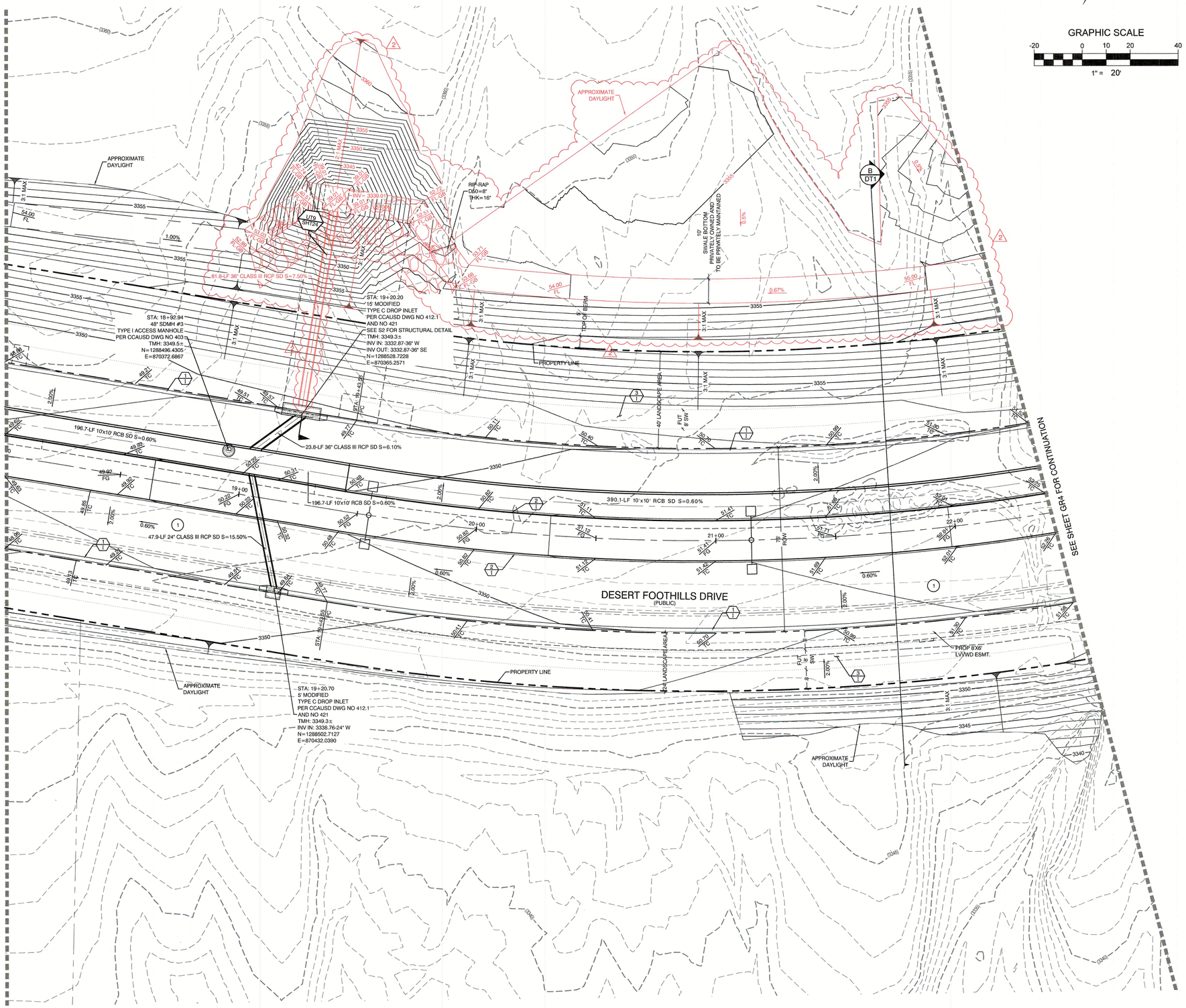
PROFESSIONAL ENGINEER-STATE OF NEVADA
WILLIAM J MEYER
EXP: 12/31/19
CIVIL
No. 15745
2/12/19

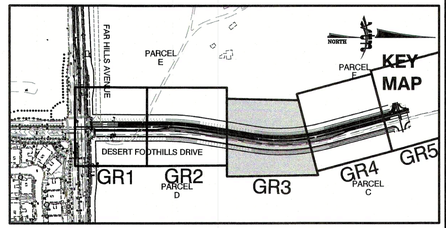
SHEET
GR2
10 OF 37 SHEETS

DRAWING NO.
L18-01896

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107V7501





EASEMENT REFERENCE LEGEND

1. 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

CONSTRUCTION NOTES

1. CONSTRUCT 24" TYPE "L" CURB & GUTTER PER STD. DWG. 216.
2. CONSTRUCT TYPE "A" CURB PER STD. DWG. 219.
3. FUTURE SIDEWALK
4. CONSTRUCT HANDICAP RAMP PER STD. DWG. 235 CASE II SEE SHEET DT2
5. SAWCUT AND REMOVE ASPHALT PAVING AND MATCH WITH NEW CONSTRUCTION PER CCAUSD #500.5 & #503.
6. FIELD VERIFY AND MATCH EXISTING

CONSTRUCTION NOTES

UT # / SHT # — UTILITY PROFILE REFERENCE LABEL
UT #= SHEET INDEX
SHT#= SHEET NUMBER

GRADING PERMIT NOTE

THIS GRADING PERMIT DOES NOT INCLUDE THE CONSTRUCTION OF RETAINING WALLS AND OTHERS STRUCTURES. SEPARATE PERMITS AND APPLICATIONS ARE REQUIRED FOR THESE.

GEOTECHNICAL NOTE:

REFER TO SOILS REPORT: NOVA GEOTECHNICAL
PROJECT #G-18-003, DATED MARCH 5, 2018
HTE #L18-01896

SIDEWALK RAMPS TABLE

(PER CCAUSD No. 235, CASE II)

NO.	DIM "A"	DIM "B"	CASE
1	4.5'	12'	II
2	4.5'	9.5'	II
3	8'	8'	II
4	9.5'	4.5'	II
5	12'	4.5'	II

SIGHT VISIBILITY ZONES:

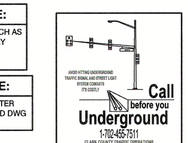
NO STRUCTURE, WALLS, VEGETATION, OR OBJECT OF ANY KIND IS PERMITTED OVER TWENTY-FOUR (24) INCHES IN HEIGHT (MEASURED FROM THE TOP OF ADJACENT CURB IF CURB EXISTS) WITHIN THE SIGHT VISIBILITY ZONES.

OFFSITE FLOOD CONTROL NOTE:

ALL OFFSITE INTERIM FLOOD CONTROL FACILITIES SUCH AS BUT NOT LIMITED TO BERMS/DITCHES AND TEMPORARY SUMPS ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOWARD HUGHES COMPANY.

STORM DRAIN DROP INLET NOTE:

ALL STORM DRAIN INLETS SHALL INCLUDE A STORM WATER INLET CONCRETE STAMP IN ACCORDANCE WITH CCAUSD DWG NO. 421





ENGINEER DISCLAIMER NOTE:

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I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE WITH CITY OF LAS VEGAS, #DS5013B

WILLIAM J MEYER , P.E. No. 15745 DATE

REV	DATE	BY	REVISION
2	02/12/2019	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL REMOVED HEADWALL ADDED INTERSECTION INFORMATION REVISED HGLS & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5146
PH. (702) 873-7550 FAX (702) 362-2697 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

CITY OF LAS VEGAS

GRADING PLAN 3

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY:	04/10/2018
BCC	
DESIGNED BY:	04/10/2018
DEH	
CHECKED BY:	02/12/2018
WJM	
PROJECT NO:	SCALE: N/A HORIZ. N/A VERT:
7951	

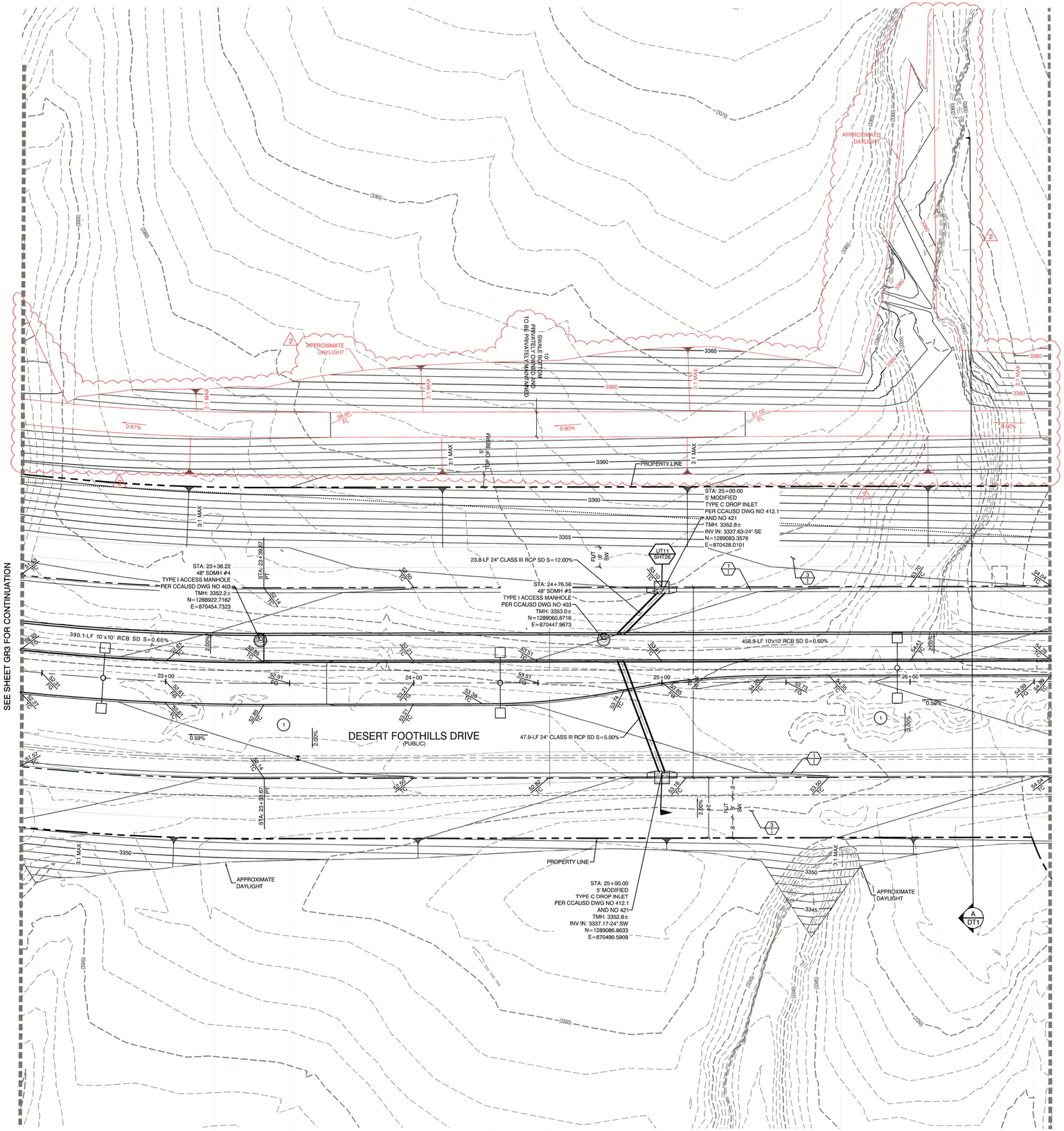
PROFESSIONAL ENGINEER STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
No. 15745
2/12/19

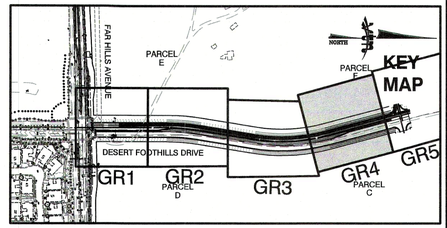
SHEET
GR3
11 OF 37 SHEETS

DRAWING NO.
L18-01896

107V7501

H:\7951\Dessert Foothills Drive-South\Sheet Set\7951-GRD.dwg





NORTH

GRAPHIC SCALE

-20 0 10 20 40

1" = 20'

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

CONSTRUCTION NOTES

1. CONSTRUCT 24" TYPE "L" CURB & GUTTER PER STD. DWG. 216.
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6. FIELD VERIFY AND MATCH EXISTING

CONSTRUCTION NOTES

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GEOTECHNICAL NOTE:

REFER TO SOILS REPORT: NOVA GEOTECHNICAL
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WILLIAM J MEYER , P.E. No. 15745 DATE

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SIDEWALK RAMPS TABLE

(PER CCAUSD No. 235, CASE II)

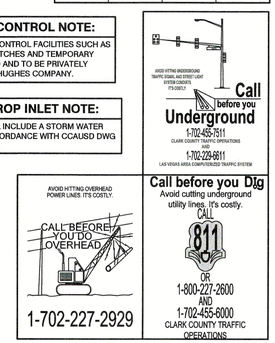
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2	4.5'	9.5'	II
3	8'	8'	II
4	9.5'	4.5'	II
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STORM DRAIN DROP INLET NOTE:

ALL STORM DRAIN INLETS SHALL INCLUDE A STORM WATER INLET CONCRETE STAMP IN ACCORDANCE WITH CCAUSD DWG NO. 421



REV	DATE	BY	REVISION
2	02/12/2019	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL REMOVED HEADWALL ADDED INTERSECTION INFORMATION
1			REVISED HGL'S & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7550 FAX (702) 382-2397 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

GRADING PLAN 4

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY: BCC	04/10/2018
DESIGNED BY: DEH	04/10/2018
CHECKED BY: WJM	02/12/2018
PROJECT NO: 7851	SCALE: HORIZ. N/A, VERT. N/A

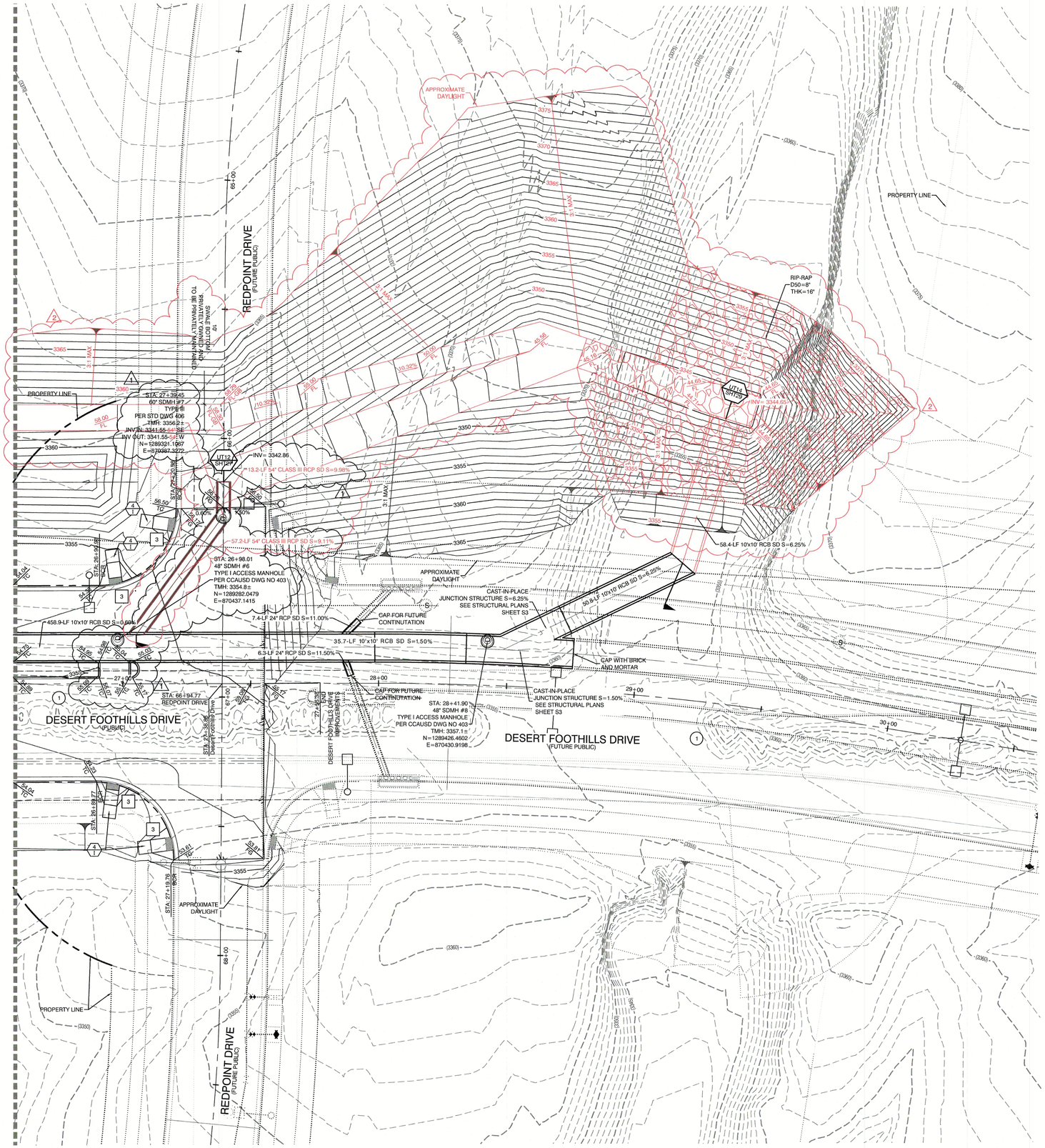
PROFESSIONAL ENGINEER · STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
NO. 15745
2/12/19

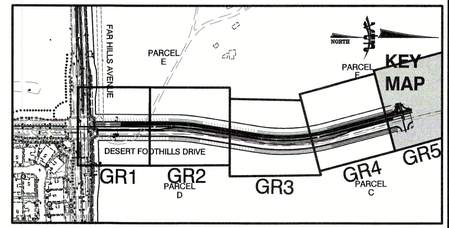
SHEET
GR4
12 OF 37 SHEETS

DRAWING NO.
L18-01896

H:\7851\Desert Foothills Drive-South\Sheet Set\7851-GRD.dwg

107V7501





NORTH

GRAPHIC SCALE

-20 0 10 20 40

1" = 20'

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

CONSTRUCTION NOTES

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REFER TO SOILS REPORT: NOVA GEOTECHNICAL PROJECT #G-18-003, DATED MARCH 5, 2018 HTE #L18-01896

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WILLIAM J MEYER , P.E. No. 15745 DATE

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(PER CCAUSD No. 235, CASE II)

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STORM DRAIN DROP INLET NOTE:

ALL STORM DRAIN INLETS SHALL INCLUDE A STORM WATER INLET CONCRETE STAMP IN ACCORDANCE WITH CCAUSD DWG NO. 421

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

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL AND STREET LIGHT SYSTEM CONDUITS IT'S COSTLY.
Call before you Underground
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
OR
1-702-229-6611
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811
OR
1-800-227-2600
AND
1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS

REV	DATE	BY	REVISION
1	01/10/2019	BCC	SANITARY SEWER AND STORM DRAIN LOCATION CHANGE
2	02/12/2019	BCC	REVISED FLOW DIRECTION OF TEMPORARY CHANNEL REMOVED HEADWALL ADDED INTERSECTION INFORMATION REVISED HGLS & SD PIPE FROM 48" TO 54" PER REVISION 1

CITY OF LAS VEGAS

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7500 FAX (702) 362-2697 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

GRADING PLAN 5

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY: BCC — 06/14/2018
DESIGNED BY: DEH — 04/10/2018
CHECKED BY: WJM — 02/12/2018
PROJECT NO: 7951
SCALE: HORIZ. N/A VERT: N/A

PROFESSIONAL ENGINEER STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
No. 15745
2/12/19

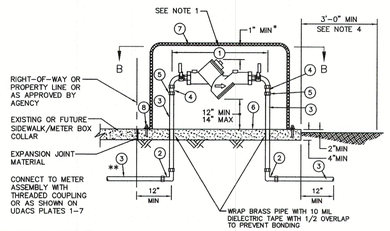
SHEET
GR5
13 OF 37 SHEETS

DRAWING NO.
L18-01896

H:\7951 Desert Foothills Drive-South\Sheet Set\7951-GRD.dwg

107V7501

UNIFORM DESIGN STANDARDS FOR WATER DISTRIBUTION SYSTEMS

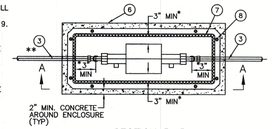


SECTION A–A

NOTES

1. APPROVED COMPACT BACKFLOW PREVENTION DEVICE INCLUDING ABOVE GRADE PIPING NOT TO BE PAINTED.
2. INSTALL BOLLARDS AS REQUIRED. SEE UDACS PLATE 75.
3. ADDITIONAL TRENCH BACKFILL REQUIREMENTS SEE UDACS PLATES 16, 17, 18, AND 19.
4. IN ORDER TO ALLOW FOR ACCESS AND MAINTENANCE OF BACKFLOW ASSEMBLIES A MINIMUM OF THREE (3) FEET ADJACENT TO BACKFLOW ASSEMBLY PAD SHALL BE LEVEL AND FREE OF SHRUBBERY AND OBSTRUCTIONS (TYP).

* INSIDE ENCLOSURE DIMENSIONS



SECTION B–B

** DEPENDING ON CONFIGURATION, ONE (1) BRASS 90° HORIZONTAL BEND (IPF x IPF) MAY BE INSTALLED BETWEEN METER AND BACKFLOW ASSEMBLY.

LEGEND

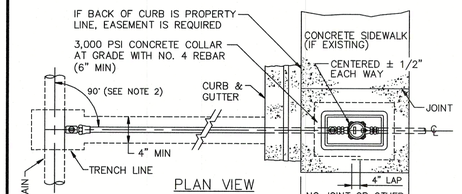
1. APPROVED BACKFLOW ASSEMBLY
2. BRASS 90° BEND – IRON PIPE THREAD (IPF x IPF)
3. BRASS PIPE – STANDARD – TBE
4. BRASS CLOSE NIPPLE
5. BRASS UNION – IRON PIPE THREAD (IPF x IPF) (IF NOT PROVIDED WITH ASSEMBLY)
6. CONCRETE PAD – 3000 PSI (PAD SIZE TO MEET ENCLOSURE MANUFACTURERS SPECIFICATIONS)
7. AGENCY APPROVED ENCLOSURE
8. ANCHOR PER MANUFACTURERS REQUIREMENTS

(IPF = IRON PIPE FEMALE, IPM = IRON PIPE MALE, TBE = THREADED BOTH ENDS)

NOT TO SCALE	FILE NAME: UDACS-8	DRAWN BY: SDM	CHECKED BY: SPM	BACKFLOW PREVENTION ASSEMBLY 1" - 2" DIAMETER	UDACS PLATE NO. 8	SHEET 1 OF 1

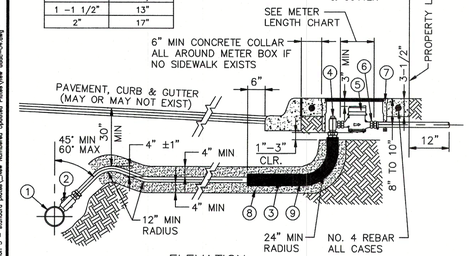
07-08 Plot @ 12/31/08 - I:\UDACS\section 5 - standard plates_New Numbered Updated Plates\new udacs-08.dwg

UNIFORM DESIGN STANDARDS FOR WATER DISTRIBUTION SYSTEMS



PLAN VIEW

METER LENGTH CHART	
METER SIZE	METER LENGTH
5/8"	7-1/2"
3/4"	7-1/2"
1"	10-3/4"
1 -1 1/2"	13"
2"	17"



ELEVATION

FOR NOTES AND LEGEND SEE SHEET 2

NOT TO SCALE	FILE NAME: UDACS-4	DRAWN BY: SDM	CHECKED BY: SPM	NEW SERVICE INSTALLATION WITH SINGLE ANGLE METER STOPS COMMERCIAL & RESIDENTIAL GREATER THAN 1/4 ACRE GROSS 5/8", 3/4", 1", 1-1/2", AND 2" METER SIZES	UDACS PLATE NO. 4	SHEET 1 OF 2

07-08 Plot @ 03/10/09 - I:\UDACS\section 5 - standard plates_New Numbered Updated Plates\new udacs-04.dwg

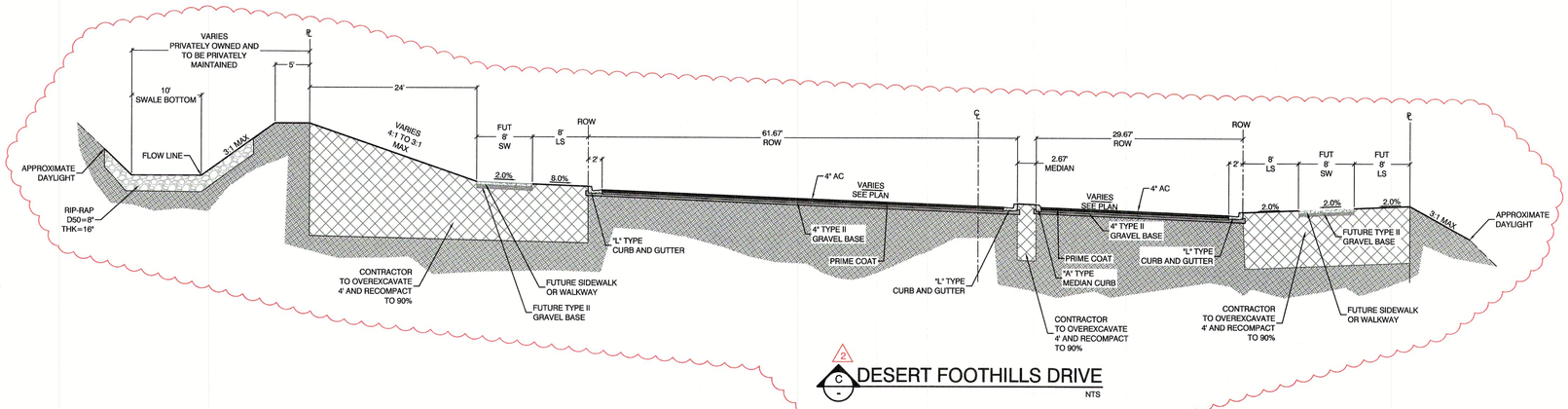
METER AND RPPA PER UDACS PLATE NO. 4 AND 8 WITH CURB STOP

APPROVED FOR CONSTRUCTION

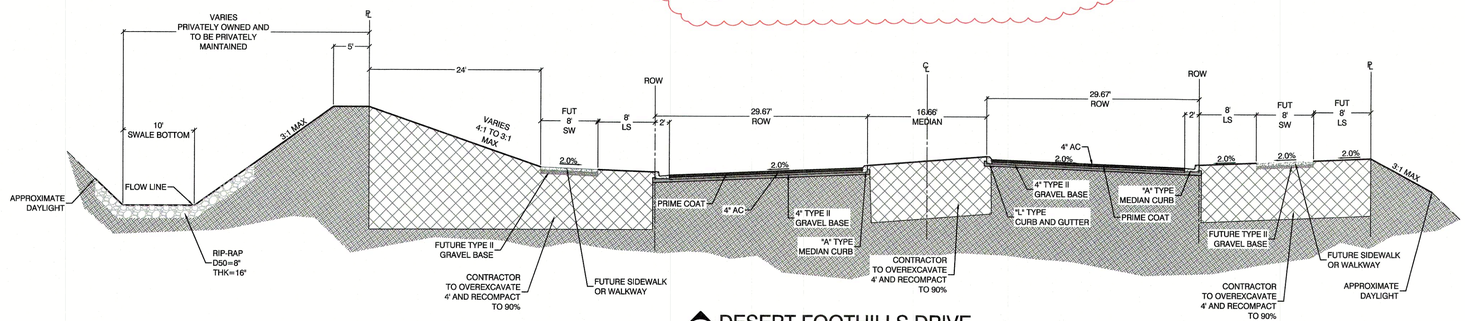
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT: 135582 FIRST APPROVED DATE: .

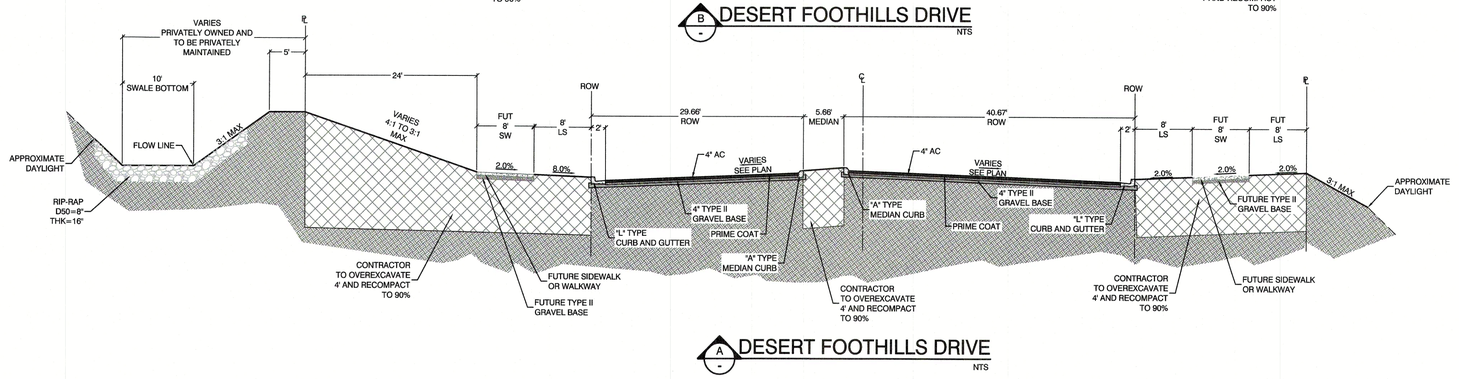
LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM



C DESERT FOOTHILLS DRIVE NTS



B DESERT FOOTHILLS DRIVE NTS



A DESERT FOOTHILLS DRIVE NTS

REV	DATE	BY	REVISION
2	02/12/2019	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL REMOVED HEADWALL ADDED INTERSECTION INFORMATION REVISED HGL'S & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
13801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4500

CITY OF LAS VEGAS
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7350 FAX (702) 362-2697 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

DETAIL SHEET 2

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY:	DESIGNED BY:	CHECKED BY:	PROJECT NO:	SCALE:	HORIZ.	VERT:
KDH	DEH	WJM	7951	N/A	N/A	
04/13/2018	04/13/2018	02/12/2018				

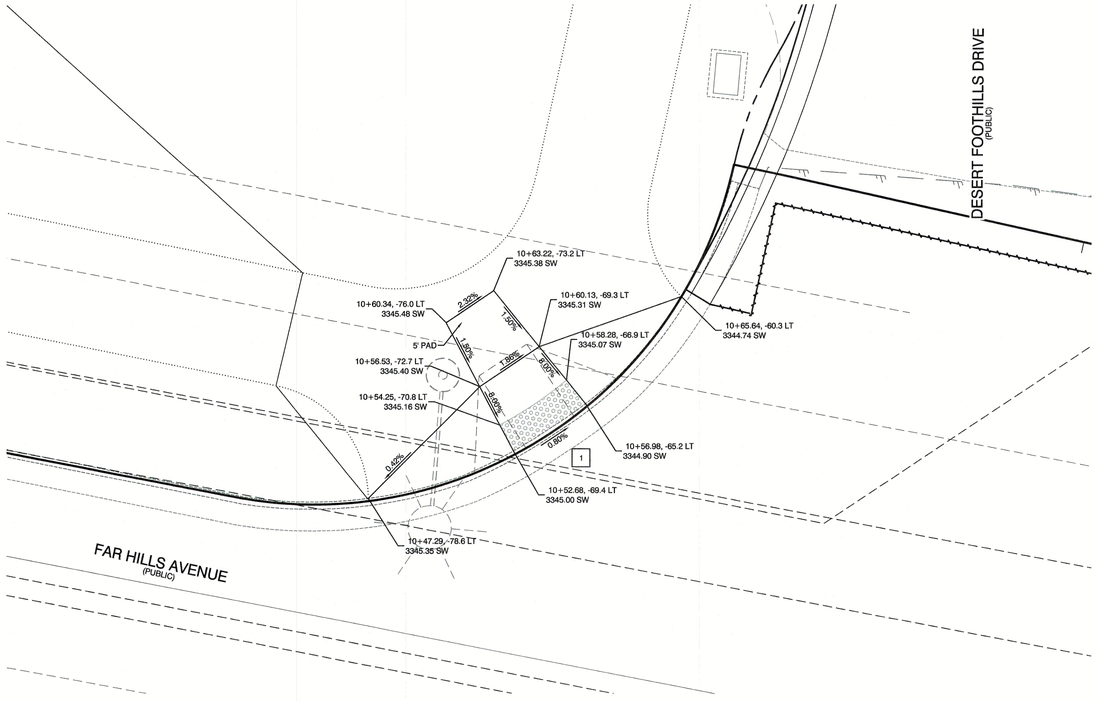
PROFESSIONAL ENGINEER STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
No. 15745
2/12/19

SHEET
DT1
14 OF 37 SHEETS

DRAWING NO.
L18-01896

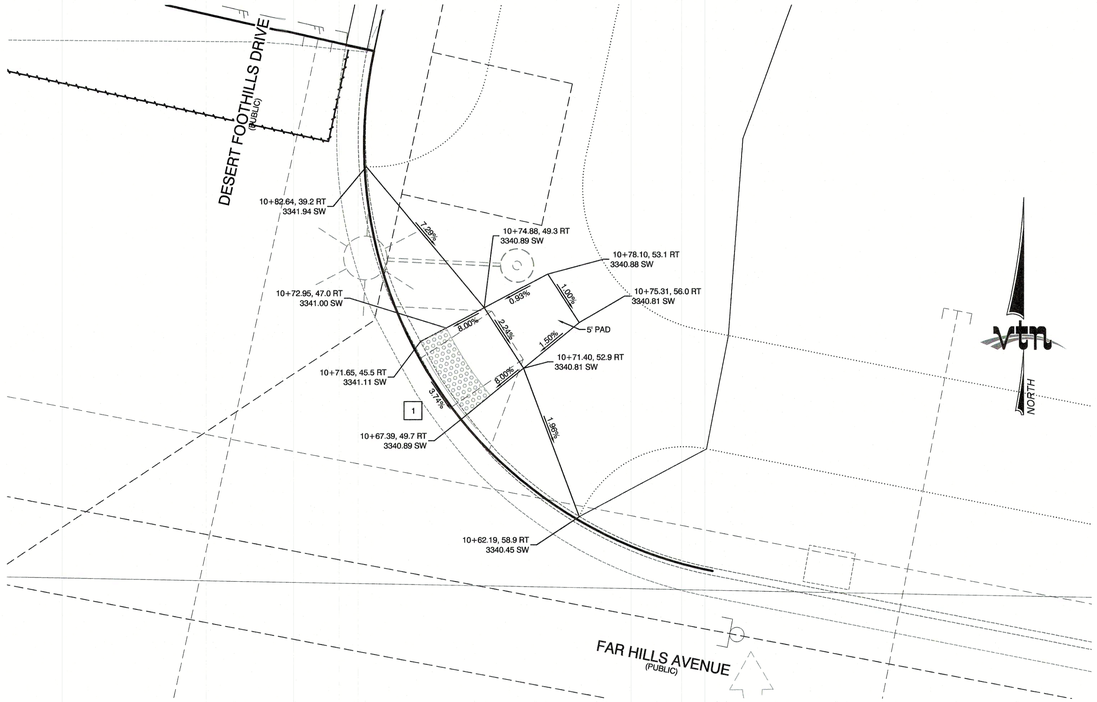
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107V7501



DESERT FOOTHILLS AND FAR HILLS HANDICAP RAMP NORTHWEST CORNER

NTS



DESERT FOOTHILLS AND FAR HILLS HANDICAP RAMP NORTHEAST CORNER

NTS

GRAPHIC SCALE

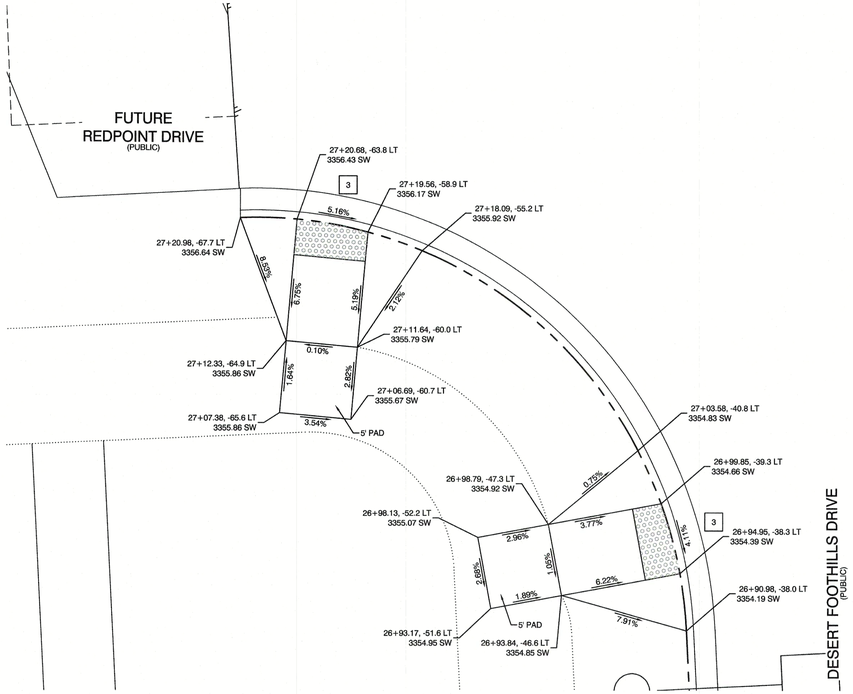
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1" = 5'

SIDEWALK RAMPS TABLE

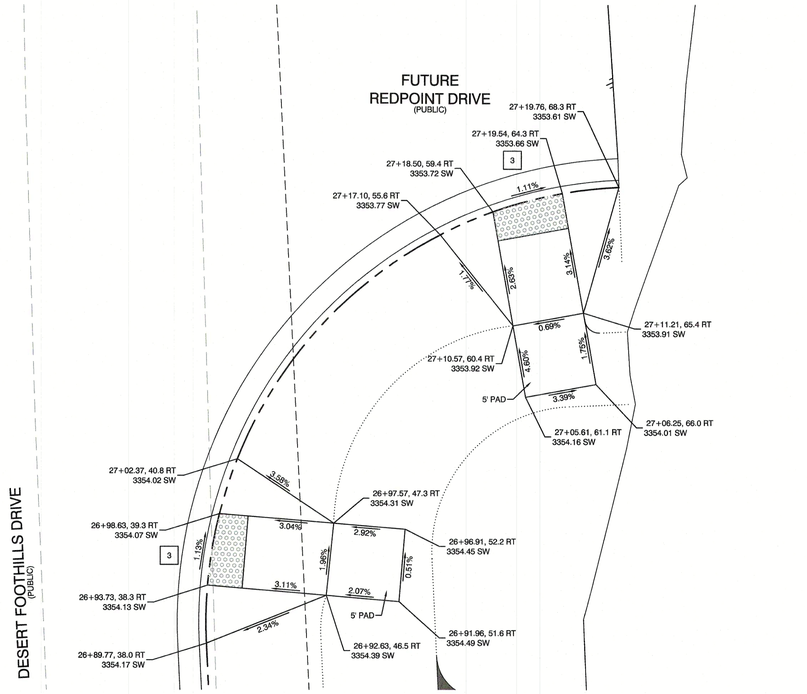
(PER CCAUSD No. 235, CASE II)

NO.	DIM "A"	DIM "B"	CASE
1	4.5'	12'	II
2	4.5'	9.5'	II
3	8'	8'	II
4	9.5'	4.5'	II
5	12'	4.5'	II



DESERT FOOTHILLS AND REDPOINT HANDICAP RAMP SOUTHWEST CORNER

NTS



DESERT FOOTHILLS AND REDPOINT HANDICAP RAMP SOUTHEAST CORNER

NTS

REV	DATE	BY	REVISION

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702.791.4000

CITY OF LAS VEGAS

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7500 FAX (702) 362-2697 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

DETAIL SHEET 1

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY: RDH	04/13/2018	SCALE:	HORIZ. N/A
DESIGNED BY: DEH	04/13/2018		VERT. N/A
CHECKED BY: WJM	02/12/2018		
PROJECT NO: 7851			

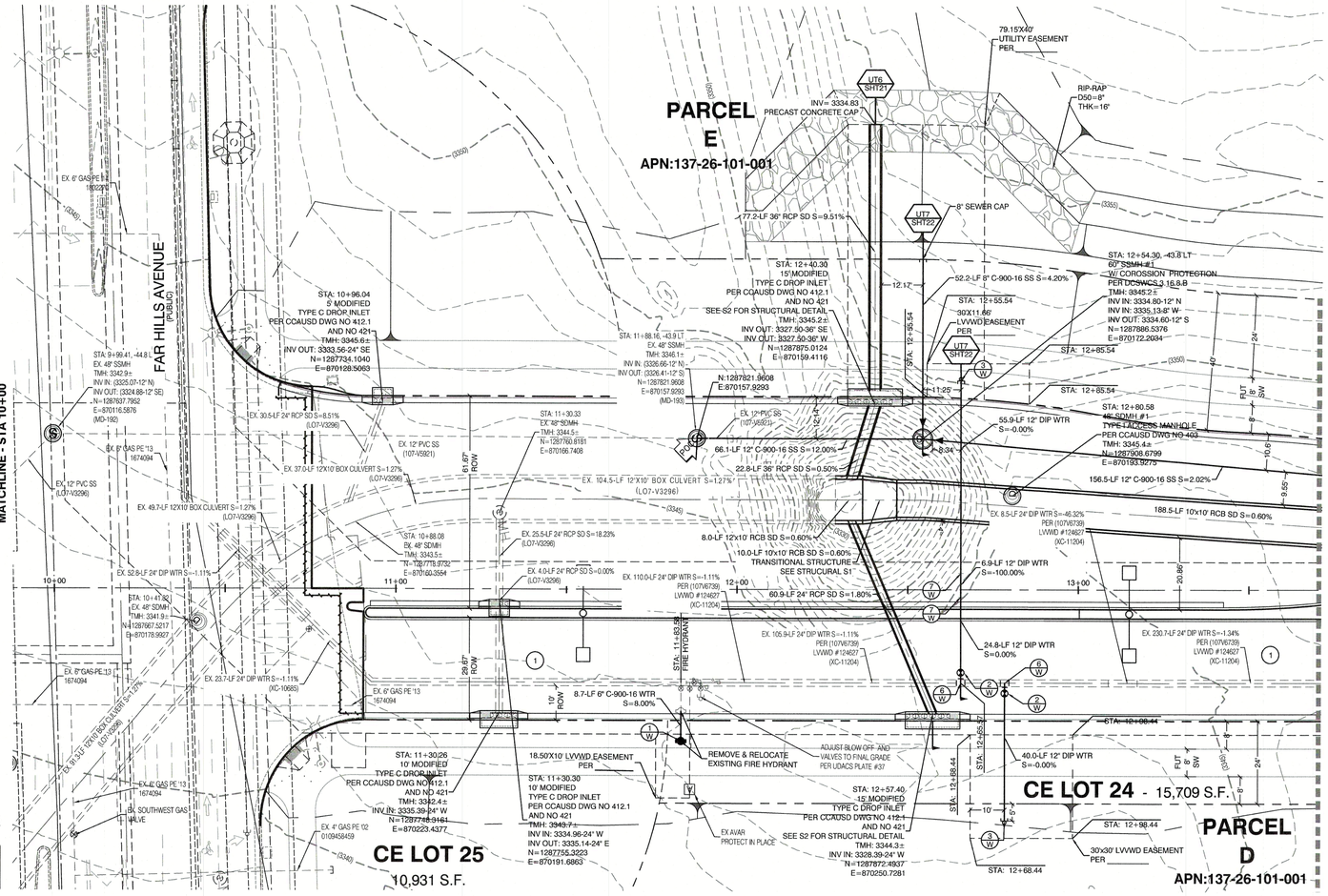
PROFESSIONAL ENGINEER STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
NO. 15749
2/12/19

SHEET
DT2
15 OF 37 SHEETS

DRAWING NO.
L18-01896

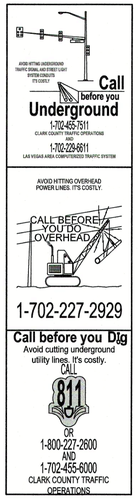
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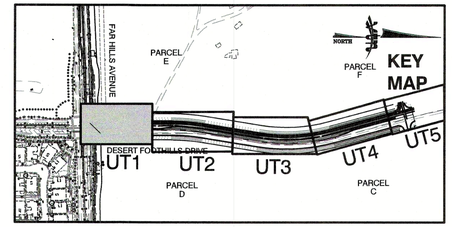
107V7501



DESERT FOOTHILLS
(PUBLIC)

PROFILE SCALES:
HORIZ. = 1"=20'
VERT. = 1"=4'







CONSTRUCTION NOTES

	WATER	PUBLIC
1/W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41)	4 EA.
2/W	12" GATE VALVE (PER UDACS PLATE 30 & 39)	5 EA.
3/W	12" CAP & BLOW OFF(PER UDACS PLATE 36)	5 EA.
4/W	24"X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	5 EA.
5/W	12" 45° VERTICAL BEND (W/ RESTRAINTS)	2 EA.
6/W	12" 45° BEND (W/ RESTRAINTS)	2 EA.
7/W	1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" METER PER UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #6 PER DETAIL ON SHEET DT1	2 EA.
	6" C-900-16 WATER LATERAL PER UDACS 2.06.01 & PLATE 17	170 LF.
	12" DIP WATER PER UDACS 2.06.03 & PLATE 17	358 LF.
POC	WATER POINT OF CONNECTION	

	SEWER	
S	STANDARD MANHOLE PER SD-1A & 1B W/ SINGLE 24" LID	7 EA.
	8" C-900-16 SANITARY SEWER MAIN	100 LF.
	12" C-900-16 SANITARY SEWER MAIN	789 LF.
	16" C-900-16 SANITARY SEWER MAIN	156 LF.
	8" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
	12" SDR-35 PVC SANITARY SEWER MAIN	1 EA.
	16" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
POC	SEWER POINT OF CONNECTION	

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

STORM DRAIN DROP INLET NOTE:
ALL STORM DRAIN INLETS SHALL INCLUDE A STORM WATER INLET CONCRETE STAMP IN ACCORDANCE WITH CCAUSD DWG NO. 421

RESTRAINTS NOTE:
ALL FITTINGS AND JOINT ON 12 INCH DIP TO BE RESTRAINED.

FIRE HYDRANT NOTE:
(EXTENSION OF EXISTING LATERAL)
THE CONTRACTOR SHALL REMOVE AND RELOCATE BOTH THE UPPER AND LOWER BARRELS OF THE EXISTING FIRE HYDRANT(S) WHERE SHOWN, EXTEND THE EXISTING LATERAL AS REQUIRED, AND REINSTALL SUCH HYDRANT(S) AT THE NEW LOCATION(S) INDICATED. FIRE HYDRANTS SHALL BE TESTED PRIOR TO AND AFTER RELOCATION, UNDER THE DIRECTION OF LVVWD, TO ENSURE QUALITY. INSTALLATION SHALL BE IN ACCORDANCE WITH UDACS PLATE 40/41. LATERALS MADE OF UNAPPROVED MATERIALS SHALL BE REPLACED FROM THE MAIN TO THE FIRE HYDRANT. RELOCATIONS WHERE THE LATERAL CANNOT BE EXTENDED SHALL BE TREATED AS NEW INSTALLATIONS.

DROP INLET NOTE:
WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE: CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS. BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BULB, OR FLAT STRIP. (VINYLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL)

LVVWD EXISTING FACILITIES NOTE:
PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

WATER PRESSURE ZONE:
WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:
ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATERLINE TRENCH NOTE:
CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE
INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

FIRE HYDRANT MARKER NOTES
BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKERS ARE TO BE INSTALLED:
1. ON ROADWAYS WITH NO PARKING PERMITTED ON HYDRANT SIDE; LOCATE MAKER 8' FROM FACE OF CURB ON HYDRANT SIDE.
2. ON ROADWAYS WITH PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 16' FROM FACE OF CURB ON HYDRANT SIDE.

WATER MAIN JOINT DEFLECTION
PVC PIPE SHALL BE DEFLECTED AT THE JOINT ONLY. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE ONE (1) DEGREE PER JOINT WITH A MINIMUM RADIUS OF CURVATURE OF 1,150 FEET, PER UDACS 2.07.01 AND 2.07.02.

FOR CHANGES IN DIRECTION EXCEEDING THE MAXIMUM ALLOWABLE JOINT DEFLECTION, FITTINGS SHALL BE USED.

UTILITY CROSSING NOTE:
ALL SEWER/STORM DRAINS CROSSING WATER LINES MUST CONFORM TO SECTION 2.22 OF UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR PORTABL WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.

ENGINEER DISCLAIMER NOTE:
UTILITY LOCATIONS SHOWN HERE ON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND AND OVERHEAD UTILITIES AND NOTIFY THE DESIGN ENGINEER IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HERE ON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

LAS VEGAS FIRE & RESCUE APPROVAL
BY: _____ DATE: _____

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1500 GPM AT 20 P.S.I. RESIDUAL.

SEWER CONNECTION NOTE
ONE OR MORE SEGMENTS OF THE DOWNSTREAM SEWER SYSTEM THAT WILL SERVE THIS PROJECT HAS NOT BEEN COMPLETED AND/OR ACCEPTED FOR MAINTENANCE BY THE CITY OF LAS VEGAS. ANY WORK DONE ON THIS PROJECT PRIOR TO THE COMPLETION AND/OR ACCEPTANCE OF THE DOWNSTREAM SEWER SYSTEM(S) SHALL BE DONE AT THE DEVELOPERS OWN RISK. THE CITY OF LAS VEGAS RESERVES THE RIGHT TO PREVENT THE PHYSICAL CONNECTION OF THIS PROJECT INTO THE DOWNSTREAM SEWER SYSTEM UNTIL ALL SEGMENTS HAVE BEEN COMPLETED AND ACCEPTED FOR MAINTENANCE, OR UNTIL SUCH TIME AS THEY ARE DEEMED AVAILABLE FOR SERVICE.

_____
SOUTHWEST GAS CORPORATION DATE

APPROVED FOR CONSTRUCTION

_____
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM

REV	DATE	BY	REVISION
2	02/12/2018	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL REMOVED HEADWALL ADDED INTERSECTION INFORMATION REVISED HGLS & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

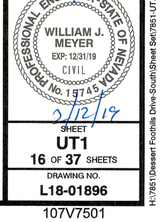
CITY OF LAS VEGAS

2727 S RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7500 FAX (702) 382-2697 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY PLAN & PROFILE 1
10+00 TO 13+75

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY: BCC	04/11/2018
DESIGNED BY: BCC	04/11/2018
CHECKED BY: WJM	02/12/2018
PROJECT NO: 7951	SCALE: HORIZ. 1"=20' VERT. 1"=4'

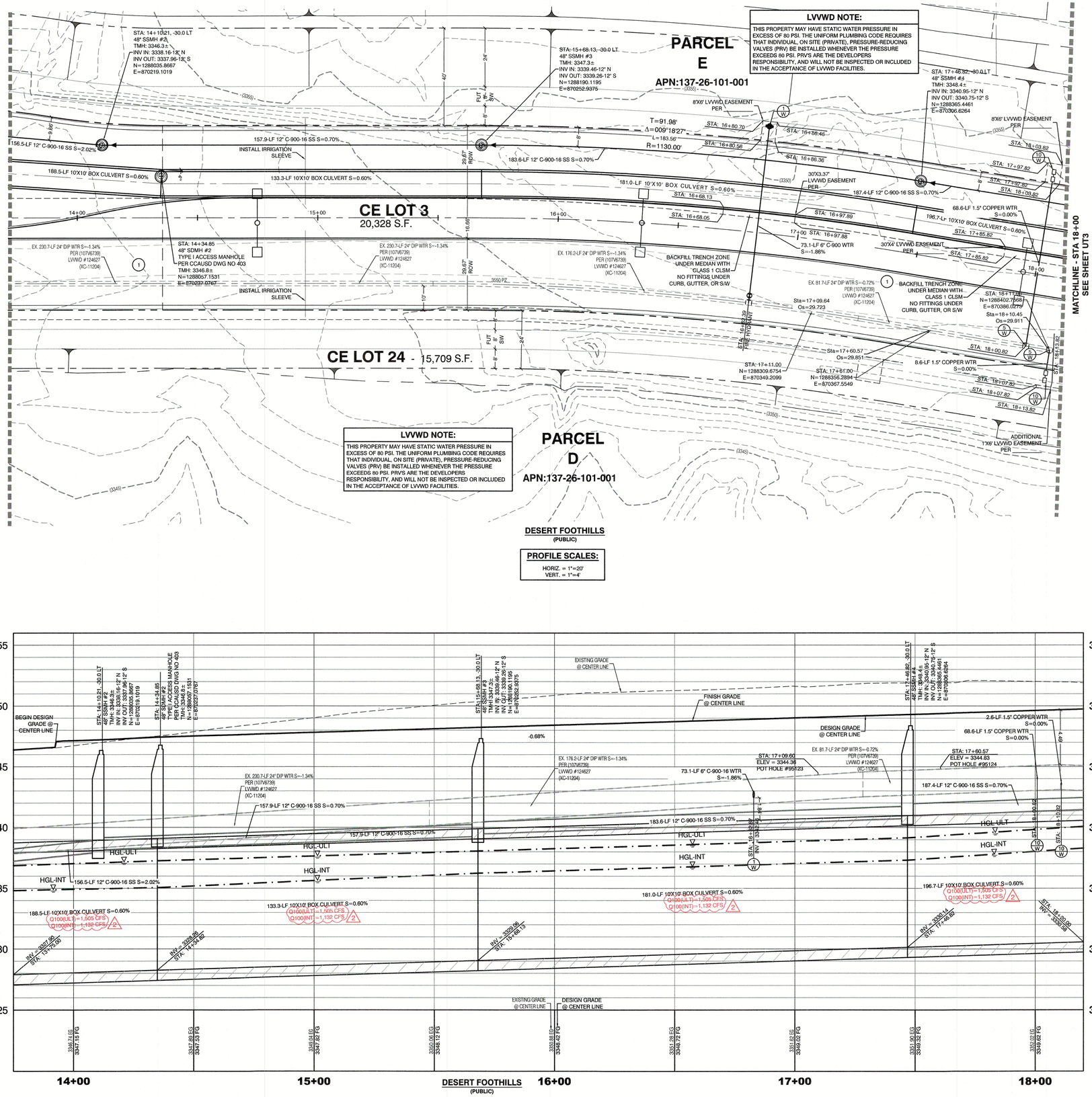


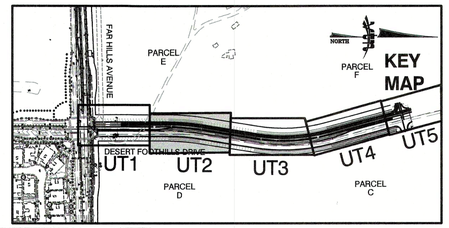
SHEET
UT1
16 OF **37** SHEETS

DRAWING NO.
L18-01896

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107V7501





CONSTRUCTION NOTES

WATER		**PUBLIC**
1/W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41)	4 EA.
2/W	12" GATE VALVE (PER UDACS PLATE 30 & 39)	5 EA.
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POC	WATER POINT OF CONNECTION	
SEWER		
S	STANDARD MANHOLE PER SD-1A & 1B W/ SINGLE 24" LID	7 EA.
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	16" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
POC	SEWER POINT OF CONNECTION	

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

RESTRAINTS NOTE:

ALL FITTINGS AND JOINT ON 12 INCH DIP TO BE RESTRAINED.

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(EXTENSION OF EXISTING LATERAL)
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GRAPHIC SCALE

-20 0 10 20 40

1" = 20'

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:

ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATERLINE TRENCH NOTE:

CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE

INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

FIRE HYDRANT MARKER NOTES

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LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

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APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM

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

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL AND STREET LIGHT SYSTEM CONDUITS. IT'S COSTLY.
Call before you Underground
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-229-6611
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR
1-800-227-2600
AND
1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS

REV	DATE	BY	REVISION
2	12/12/2018	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL
			REMOVED HEADWALL ADDED INTERSECTION INFORMATION
			REVISED HGLS & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

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CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY PLAN & PROFILE 2
13+75 TO 18+00

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY: BCC	04/11/2018
DESIGNED BY: DEH	04/11/2018
CHECKED BY: WJM	02/12/2018
PROJECT NO: 7951	SCALE: 1"=20' HORIZ. 1"=4' VERT.

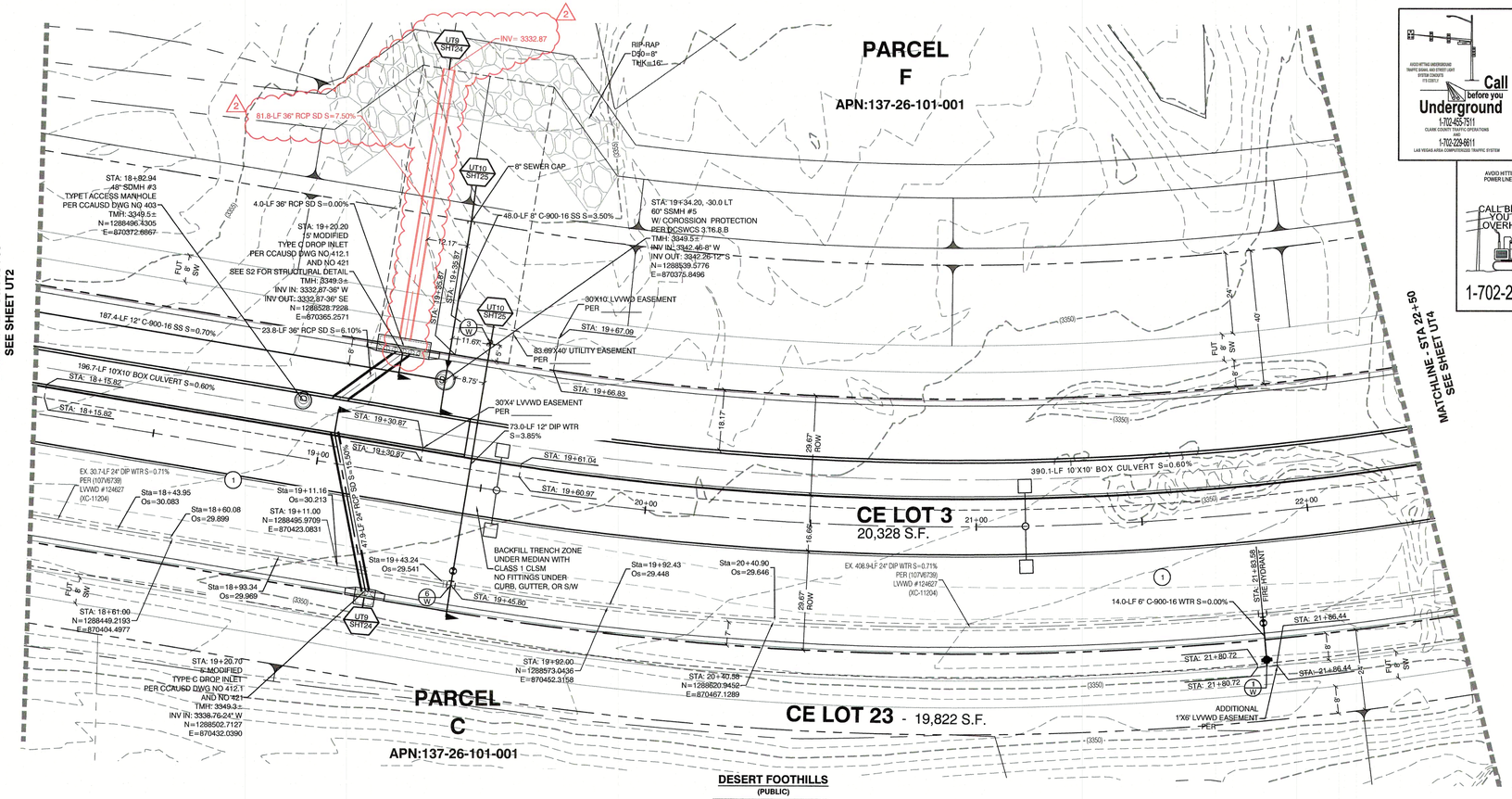
PROFESSIONAL ENGINEER - STATE OF NEVADA
WILLIAM J MEYER
No. 15745
EXP: 12/31/19
CIVIL
2/12/19

SHEET
UT2
17 OF 37 SHEETS

DRAWING NO.
L18-01896

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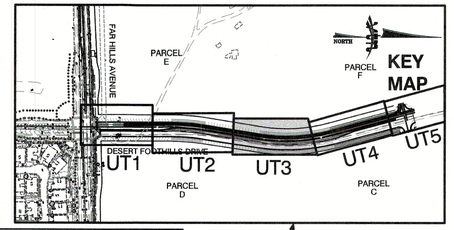
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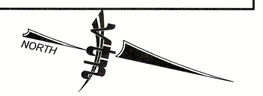


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OR
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AND
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CLARK COUNTY TRAFFIC OPERATIONS

Call before you Underground
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AND
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1-702-227-2929





GRAPHIC SCALE

-20 0 10 20 40

1" = 20'

CONSTRUCTION NOTES

	WATER	PUBLIC
1W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41)	4 EA.
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4W	24"X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	5 EA.
5W	12" 45° VERTICAL BEND (W/ RESTRAINTS)	2 EA.
6W	12" 45° BEND (W/ RESTRAINTS)	2 EA.
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	6" C-900-16 WATER LATERAL PER UDACS 2.06.01 & PLATE 17	170 LF.
	12" DIP WATER PER UDACS 2.06.03 & PLATE 17	358 LF.
POC	WATER POINT OF CONNECTION	
	SEWER	
S	STANDARD MANHOLE PER SD-1A & 1B W/ SINGLE 24" LID	7 EA.
	8" C-900-16 SANITARY SEWER MAIN	100 LF.
	12" C-900-16 SANITARY SEWER MAIN	789 LF.
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POC	SEWER POINT OF CONNECTION	

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ALL STORM DRAIN INLETS SHALL INCLUDE A STORM WATER INLET CONCRETE STAMP IN ACCORDANCE WITH CCAUSD DWG NO. 421

RESTRAINTS NOTE:
ALL FITTINGS AND JOINT ON 12 INCH DIP TO BE RESTRAINED.

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2. ON ROADWAYS WITH PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 16' FROM FACE OF CURB ON HYDRANT SIDE.

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

FIRE HYDRANT NOTE:
(EXTENSION OF EXISTING LATERAL)
THE CONTRACTOR SHALL REMOVE AND RELOCATE BOTH THE UPPER AND LOWER BARRELS OF THE EXISTING FIRE HYDRANT(S) WHERE SHOWN, EXTEND THE EXISTING LATERAL AS REQUIRED, AND REINSTALL SUCH HYDRANT(S) AT THE NEW LOCATION(S) INDICATED. FIRE HYDRANTS SHALL BE TESTED PRIOR TO AND AFTER RELOCATION, UNDER THE DIRECTION OF LVVWD, TO ENSURE QUALITY. INSTALLATION SHALL BE IN ACCORDANCE WITH UDACS PLATE 40/41. LATERALS MADE OF UNAPPROVED MATERIALS SHALL BE REPLACED FROM THE MAIN TO THE FIRE HYDRANT. RELOCATIONS WHERE THE LATERAL CANNOT BE EXTENDED SHALL BE TREATED AS NEW INSTALLATIONS.

LVVWD EXISTING FACILITIES NOTE:
PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

DROP INLET NOTE:
WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE: CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS. BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BULB, OR FLAT STRIP. (VINYLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL)

SEWER CONNECTION NOTE
ONE OR MORE SEGMENTS OF THE DOWNSTREAM SEWER SYSTEM THAT WILL SERVE THIS PROJECT HAS NOT BEEN COMPLETED AND/OR ACCEPTED FOR MAINTENANCE BY THE CITY OF LAS VEGAS. ANY WORK DONE ON THIS PROJECT PRIOR TO THE COMPLETION AND/OR ACCEPTANCE OF THE DOWNSTREAM SEWER SYSTEM(S) SHALL BE DONE AT THE DEVELOPERS OWN RISK. THE CITY OF LAS VEGAS RESERVES THE RIGHT TO PREVENT THE PHYSICAL CONNECTION OF THIS PROJECT INTO THE DOWNSTREAM SEWER SYSTEM UNTIL ALL SEGMENTS HAVE BEEN COMPLETED AND ACCEPTED FOR MAINTENANCE, OR UNTIL SUCH TIME AS THEY ARE DEEMED AVAILABLE FOR SERVICE.

WATER MAIN JOINT DEFLECTION
PVC PIPE SHALL BE DEFLECTED AT THE JOINT ONLY. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE ONE (1) DEGREE PER JOINT WITH A MINIMUM RADIUS OF CURVATURE OF 1,150 FEET, PER UDACS 2.07.01 AND 2.07.02.

FOR CHANGES IN DIRECTION EXCEEDING THE MAXIMUM ALLOWABLE JOINT DEFLECTION, FITTINGS SHALL BE USED.

UTILITY CROSSING NOTE:
ALL SEWER/STORM DRAINS CROSSING WATER LINES MUST CONFORM TO SECTION 2.22 OF UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR PORTABL. WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.

ENGINEER DISCLAIMER NOTE:
UTILITY LOCATIONS SHOWN HERE ON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND AND OVERHEAD UTILITIES AND NOTIFY THE DESIGN ENGINEER IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HERE ON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

LAS VEGAS FIRE & RESCUE APPROVAL
BY: _____ DATE: _____

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1500 GPM AT 20 P.S.I. RESIDUAL.

APPROVED FOR CONSTRUCTION

_____
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM

REV	DATE	REVISION
2	02/12/2018	BCC REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL REMOVED HEADWALL ADDED INTERSECTION INFORMATION REVISED HGL'S & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7550 FAX: (702) 362-2697 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY PLAN & PROFILE 3
18+00 TO 22+50

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY: BCC	04/11/2018
DESIGNED BY: DBH	04/11/2018
CHECKED BY: WJM	02/12/2018
PROJECT NO: 7851	SCALE: 1"=20' HORIZ. 1"=4' VERT.

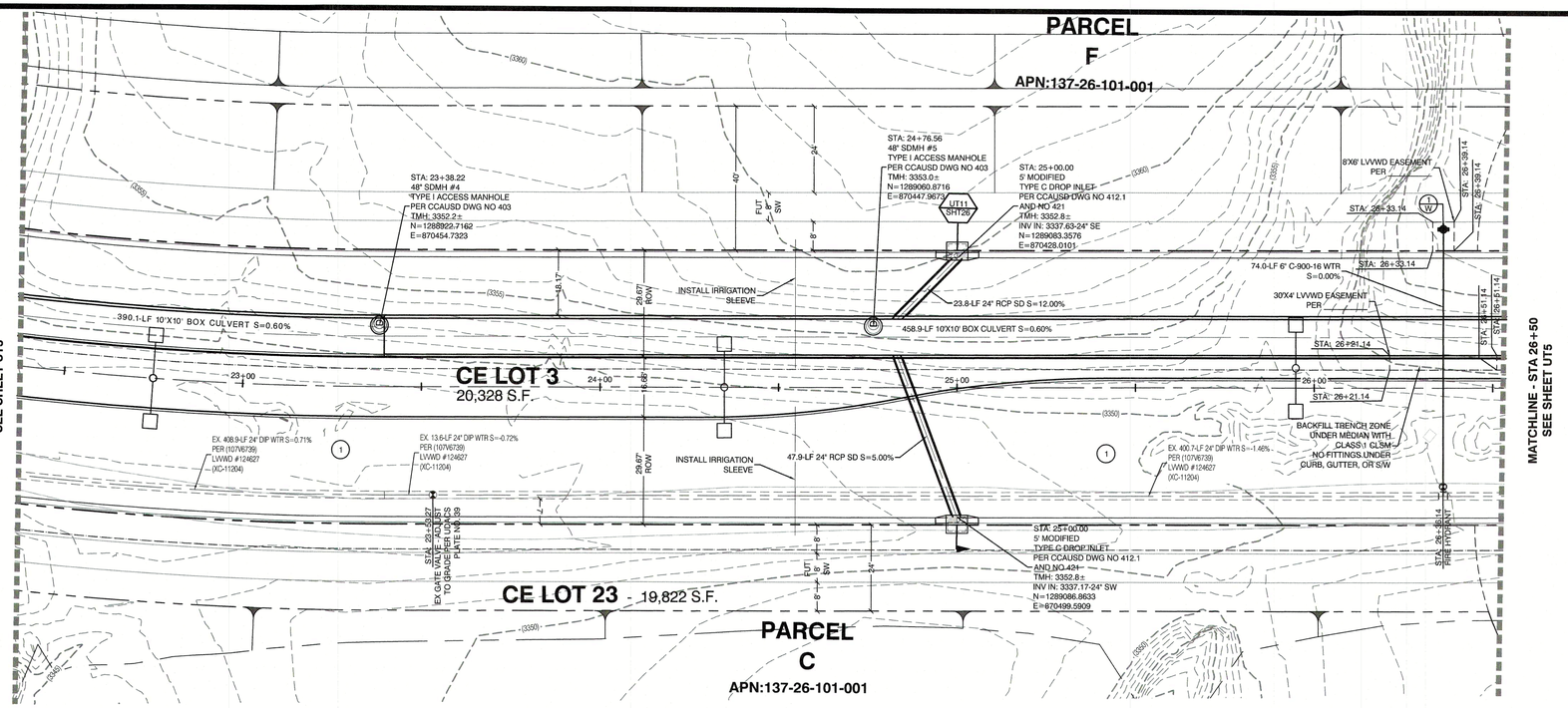
PROFESSIONAL ENGINEER - STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
NO. 15745
7/12/19

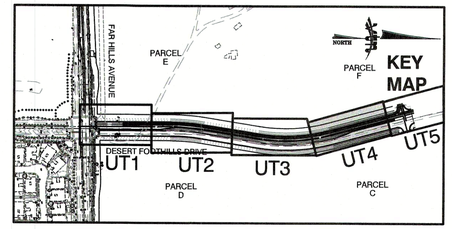
SHEET
UT3
18 OF 37 SHEETS

DRAWING NO.
L18-01896

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107V7501





CONSTRUCTION NOTES

		PUBLIC
	WATER	
1W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41)	4 EA.
2W	12" GATE VALVE (PER UDACS PLATE 30 & 39)	5 EA.
3W	12" CAP & BLOW OFF(PER UDACS PLATE 38)	5 EA.
4W	3/4"X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	5 EA.
5W	12" 45° VERTICAL BEND (W/ RESTRAINTS)	2 EA.
6W	12" 45° BEND (W/ RESTRAINTS)	2 EA.
7W	1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" METER PER UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #8 PER DETAIL ON SHEET DT1	2 EA.
	6" C-900-16 WATER LATERAL PER UDACS 2.06.01 & PLATE 17	170 LF.
	12" DIP WATER PER UDACS 2.06.03 & PLATE 17	358 LF.
POC	WATER POINT OF CONNECTION	
	SEWER	
S	STANDARD MANHOLE PER SD-1A & 1B W/ SINGLE 24" LID	7 EA.
	8" C-900-16 SANITARY SEWER MAIN	100 LF.
	12" C-900-16 SANITARY SEWER MAIN	789 LF.
	16" C-900-16 SANITARY SEWER MAIN	156 LF.
	8" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
	12" SDR-35 PVC SANITARY SEWER MAIN	1 EA.
	16" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
POC	SEWER POINT OF CONNECTION	

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

FIRE HYDRANT NOTE:

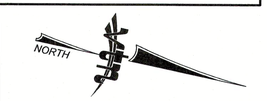
(EXTENSION OF EXISTING LATERAL)
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DROP INLET NOTE:

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LVVWD EXISTING FACILITIES NOTE:

PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.



STORM DRAIN DROP INLET NOTE:

ALL STORM DRAIN INLETS SHALL INCLUDE A STORM WATER INLET CONCRETE STAMP IN ACCORDANCE WITH CCAUSD DWG NO. 421

FIRE HYDRANT MARKER NOTES

BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKERS ARE TO BE INSTALLED:

1. ON ROADWAYS WITH NO PARKING PERMITTED ON HYDRANT SIDE; LOCATE MAKER 8' FROM FACE OF CURB ON HYDRANT SIDE.
2. ON ROADWAYS WITH PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 16' FROM FACE OF CURB ON HYDRANT SIDE.

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:

ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATERLINE TRENCH NOTE:

CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE

INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

WATER MAIN JOINT DEFLECTION

PVC PIPE SHALL BE DEFLECTED AT THE JOINT ONLY. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE ONE (1) DEGREE PER JOINT WITH A MINIMUM RADIUS OF CURVATURE OF 1,150 FEET, PER UDACS 2.07.01 AND 2.07.02.

FOR CHANGES IN DIRECTION EXCEEDING THE MAXIMUM ALLOWABLE JOINT DEFLECTION, FITTINGS SHALL BE USED.

UTILITY CROSSING NOTE:

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ENGINEER DISCLAIMER NOTE:

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LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1500 GPM AT 20 P.S.I. RESIDUAL.

APPROVED FOR CONSTRUCTION

_____
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

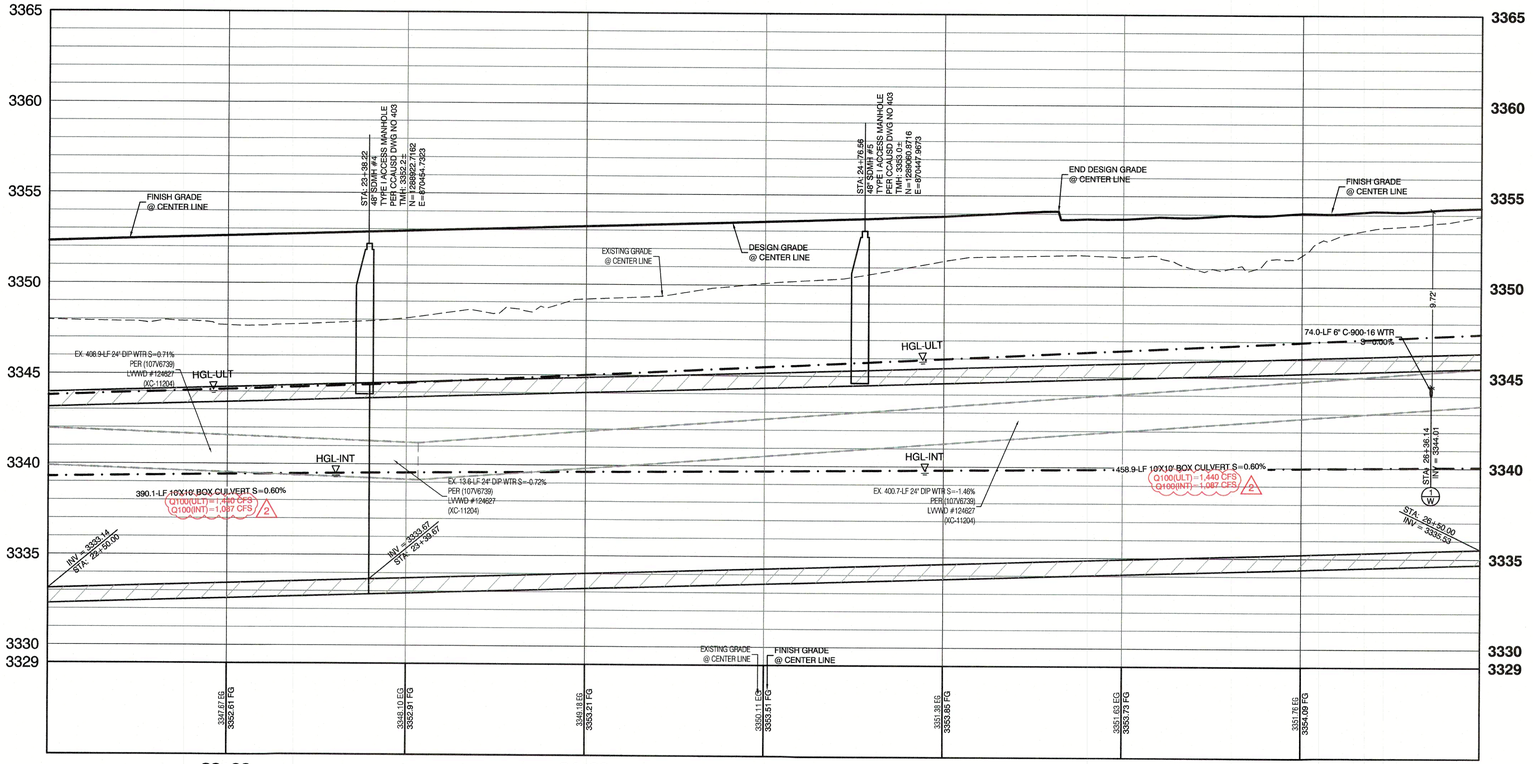
PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM

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

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR
1-800-227-2600 AND
1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS

Call before you Underground
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
1-702-229-9811
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM



REV	DATE	BY	REVISION
2	02/12/2018	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL REMOVED HEADWALL, ADDED INTERSECTION INFORMATION REVISED HGL'S & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W. CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH: (702) 873-7550 FAX: (702) 382-2597 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY PLAN & PROFILE 4
22+50 TO 26+50

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY:	DESIGNED BY:	CHECKED BY:	PROJECT NO:
BCC	DEK	WJM	7651

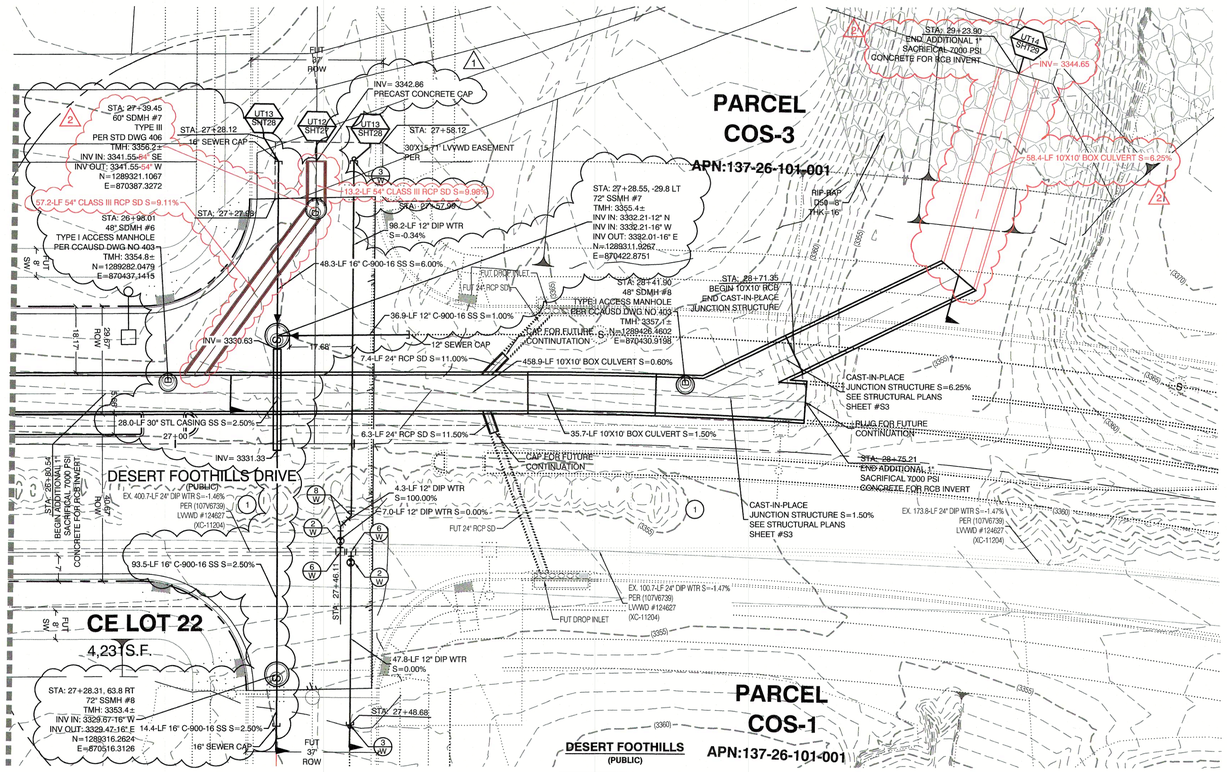
04/11/2018 | 04/11/2018 | 02/12/2018 | SCALE: 1"=20' 1"=4' | HORIZ. VERT.:

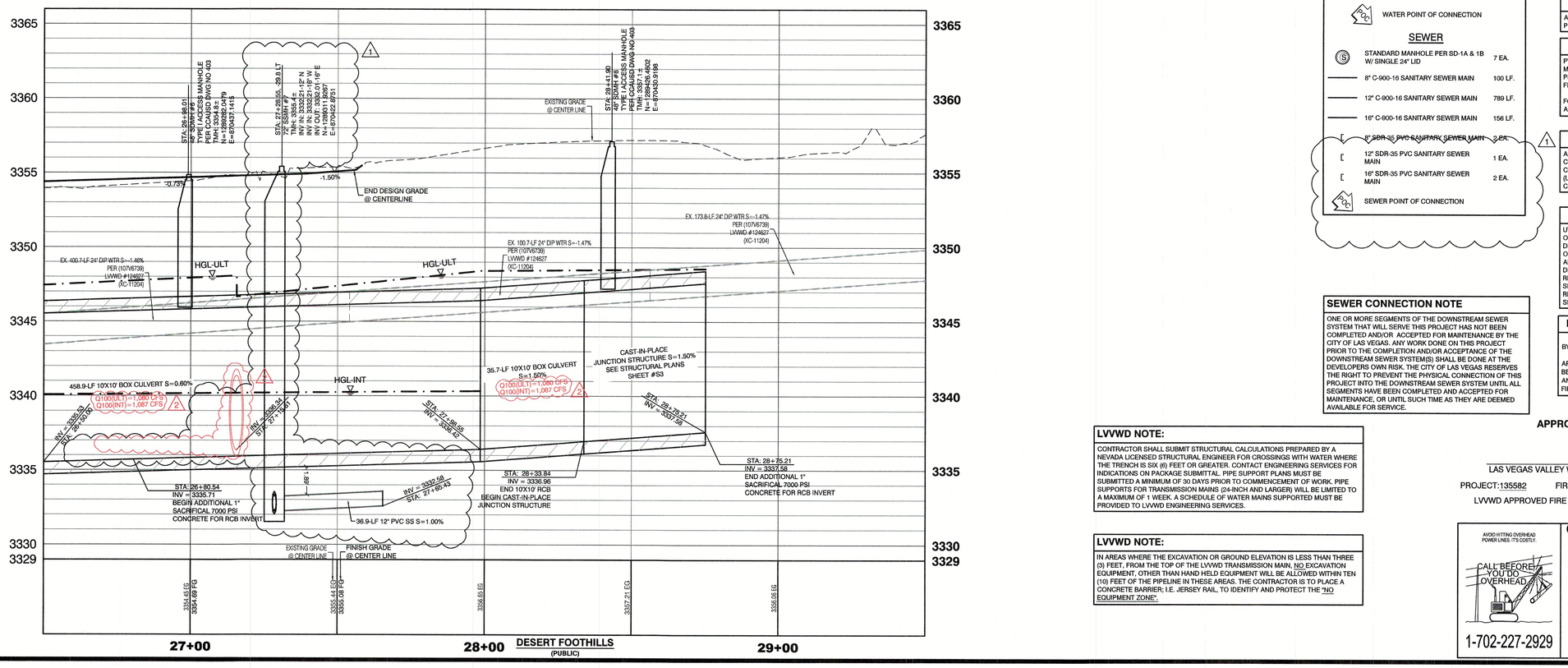
PROFESSIONAL ENGINEER STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
No. 15745
CIVIL
2/12/19

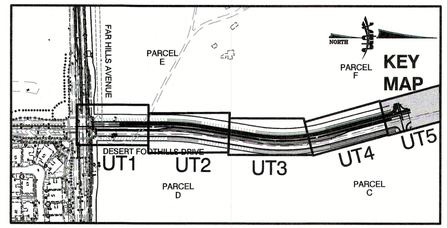
SHEET
UT4
19 OF 37 SHEETS
DRAWING NO.
L18-01896

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107V7501







NORTH

GRAPHIC SCALE

-20 0 10 20 40

1" = 20'

CONSTRUCTION NOTES

WATER		PUBLIC
FH W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41)	4 EA.
GV W	12" GATE VALVE (PER UDACS PLATE 30 & 39)	5 EA.
CAP W	12" CAP & BLOW OFF(PER UDACS PLATE 36)	5 EA.
TV W	24'X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	5 EA.
45 W	12" 45° VERTICAL BEND (W/ RESTRAINTS)	2 EA.
45 W	12" 45° BEND (W/ RESTRAINTS)	2 EA.
SV W	1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" METER PER UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #6 PER DETAIL ON SHEET DT1	2 EA.
	6" C-900-16 WATER LATERAL PER UDACS 2.06.01 & PLATE 17	170 LF.
	12" DIP WATER PER UDACS 2.06.03 & PLATE 17	358 LF.
WPC	WATER POINT OF CONNECTION	

SEWER		
S	STANDARD MANHOLE PER SD-1A & 1B W/ SINGLE 24" LID	7 EA.
	8" C-900-16 SANITARY SEWER MAIN	100 LF.
	12" C-900-16 SANITARY SEWER MAIN	789 LF.
	16" C-900-16 SANITARY SEWER MAIN	156 LF.
	8" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
	12" SDR-35 PVC SANITARY SEWER MAIN	1 EA.
	16" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
SPC	SEWER POINT OF CONNECTION	

SEWER CONNECTION NOTE

ONE OR MORE SEGMENTS OF THE DOWNSTREAM SEWER SYSTEM THAT WILL SERVE THIS PROJECT HAS NOT BEEN COMPLETED AND/OR ACCEPTED FOR MAINTENANCE BY THE CITY OF LAS VEGAS. ANY WORK DONE ON THIS PROJECT PRIOR TO THE COMPLETION AND/OR ACCEPTANCE OF THE DOWNSTREAM SEWER SYSTEM(S) SHALL BE DONE AT THE DEVELOPERS OWN RISK. THE CITY OF LAS VEGAS RESERVES THE RIGHT TO PREVENT THE PHYSICAL CONNECTION OF THIS PROJECT INTO THE DOWNSTREAM SEWER SYSTEM UNTIL ALL SEGMENTS HAVE BEEN COMPLETED AND ACCEPTED FOR MAINTENANCE, OR UNTIL SUCH TIME AS THEY ARE DEEMED AVAILABLE FOR SERVICE.

LVVWD NOTE:

CONTRACTOR SHALL SUBMIT STRUCTURAL CALCULATIONS PREPARED BY A NEVADA LICENSED STRUCTURAL ENGINEER FOR CROSSINGS WITH WATER WHERE THE TRENCH IS SIX (6) FEET OR GREATER. CONTACT ENGINEERING SERVICES FOR INDICATIONS ON PACKAGE SUBMITTAL. PIPE SUPPORT PLANS MUST BE SUBMITTED A MINIMUM OF 30 DAYS PRIOR TO COMMENCEMENT OF WORK. PIPE SUPPORTS FOR TRANSMISSION MAINS (24-INCH AND LARGER) WILL BE LIMITED TO A MAXIMUM OF 1 WEEK. A SCHEDULE OF WATER MAINS SUPPORTED MUST BE PROVIDED TO LVVWD ENGINEERING SERVICES.

LVVWD NOTE:

IN AREAS WHERE THE EXCAVATION OR GROUND ELEVATION IS LESS THAN THREE (3) FEET, FROM THE TOP OF THE LVVWD TRANSMISSION MAIN, NO EXCAVATION EQUIPMENT, OTHER THAN HAND HELD EQUIPMENT WILL BE ALLOWED WITHIN TEN (10) FEET OF THE PIPELINE IN THESE AREAS. THE CONTRACTOR IS TO PLACE A CONCRETE BARRIER; I.E. JERSEY RAIL, TO IDENTIFY AND PROTECT THE "NO EQUIPMENT ZONE".

EASEMENT REFERENCE LEGEND

1 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

RESTRAINTS NOTE:

ALL FITTINGS AND JOINT ON 12 INCH DIP TO BE RESTRAINED.

LVVWD EXISTING FACILITIES NOTE:

PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

WATERLINE TRENCH NOTE:

CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE

INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

FIRE HYDRANT MARKER NOTES

BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKERS ARE TO BE INSTALLED:

1. ON ROADWAYS WITH NO PARKING PERMITTED ON HYDRANT SIDE; LOCATE MAKER 8' FROM FACE OF CURB ON HYDRANT SIDE.
2. ON ROADWAYS WITH PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 16' FROM FACE OF CURB ON HYDRANT SIDE.

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:

ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATER MAIN JOINT DEFLECTION

PVC PIPE SHALL BE DEFLECTED AT THE JOINT ONLY. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE ONE (1) DEGREE PER JOINT WITH A MINIMUM RADIUS OF CURVATURE OF 1,150 FEET, PER UDACS 2.07.01 AND 2.07.02.

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UTILITY CROSSING NOTE:

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LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

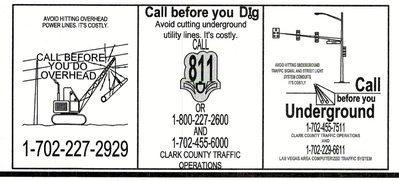
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APPROVED FOR CONSTRUCTION

_____
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM



REV	DATE	BY	REVISION
1	01/10/2019	BCC	SANITARY SEWER AND STORM DRAIN LOCATION CHANGE
2	02/12/2018	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL
			REMOVED HEADWALL ADDED INTERSECTION INFORMATION
			REVISED HGL'S & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7550 FAX (702) 382-2597 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY PLAN & PROFILE 5
26+50 TO 29+50

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY:	DESIGNED BY:	CHECKED BY:	PROJECT NO:
BCC	DEH	WJM	7351
06/14/2018	04/11/2018	02/12/2018	SCALE: HORIZ. 1"=20' VERT. 1"=4'

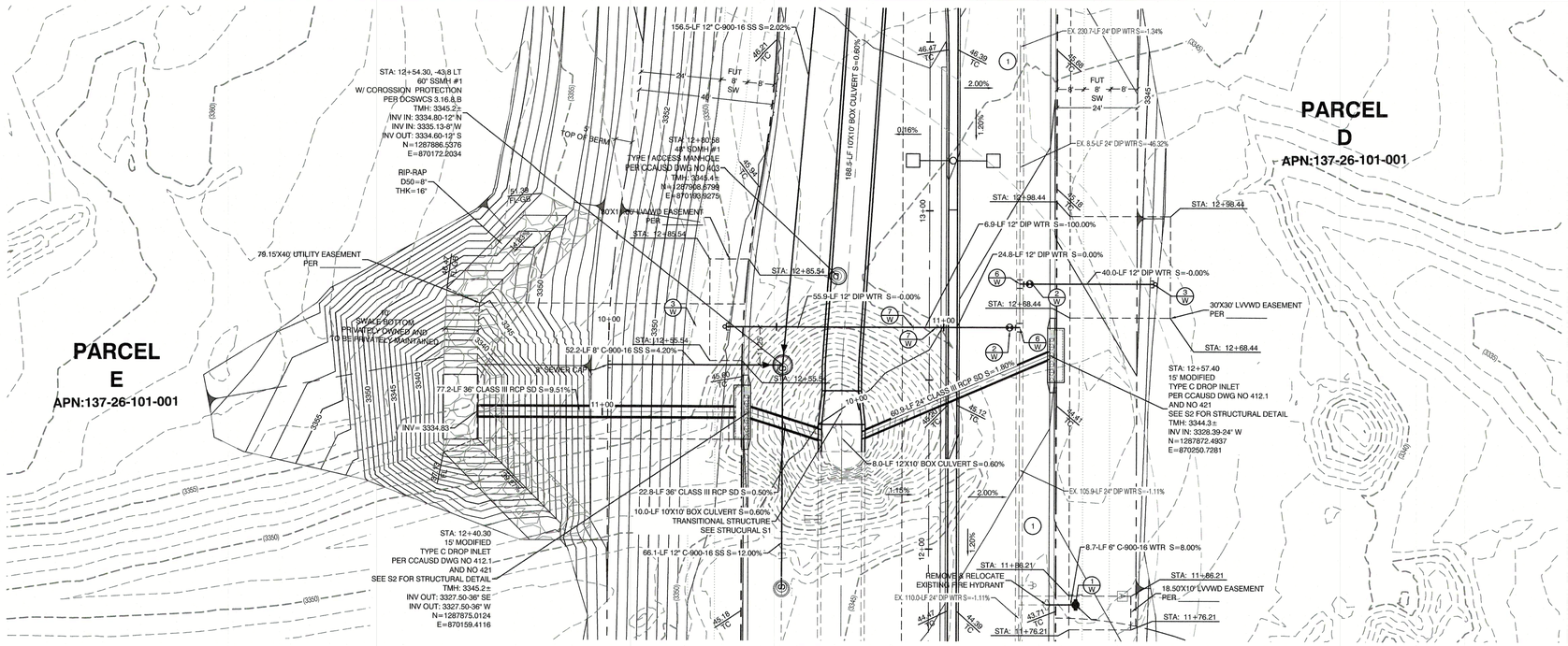
WILLIAM J MEYER
EXP: 12/31/19
CIVIL
No. 15745
PROFESSIONAL ENGINEER - STATE OF NEVADA
2/12/19

SHEET
UT5
20 OF 37 SHEETS

DRAWING NO.
L18-01896

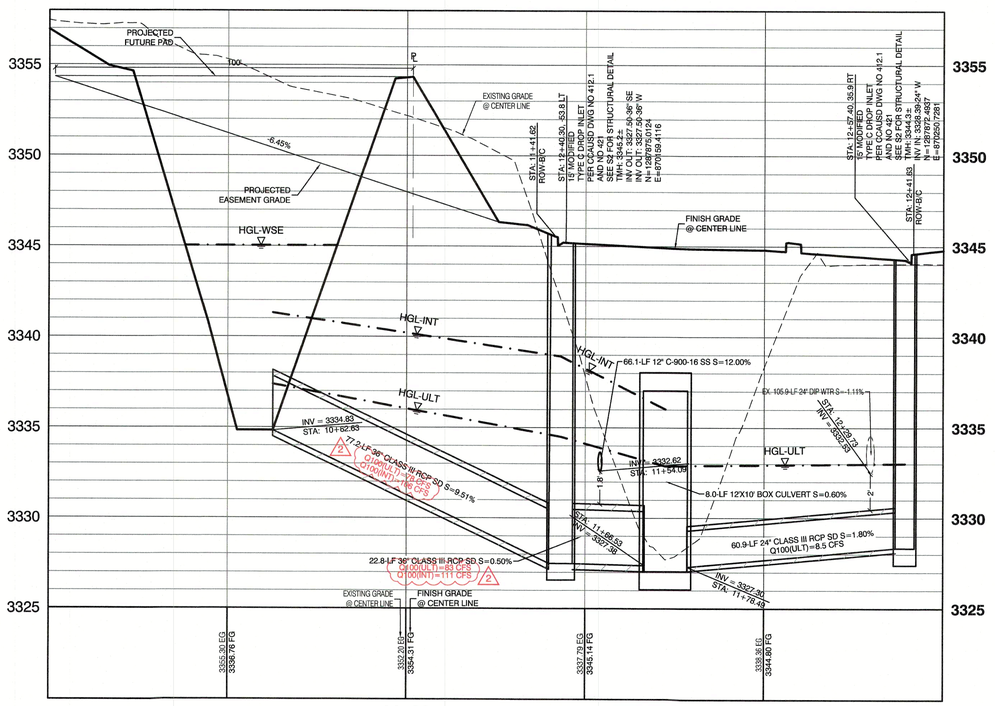
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107V7501



PROFILE SCALES:

HORIZ. = 1"=20'
VERT. = 1"=4'



DESERT FOOTHILLS
(PUBLIC)

CONSTRUCTION NOTES

WATER

		PUBLIC
1 W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41)	4 EA.
2 W	12" GATE VALVE (PER UDACS PLATE 30 & 39)	5 EA.
3 W	12" CAP & BLOW OFF(PER UDACS PLATE 36)	5 EA.
4 W	24"X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	5 EA.
5 W	12" 45° VERTICAL BEND (W/ RESTRAINTS)	2 EA.
6 W	12" 45° BEND (W/ RESTRAINTS)	2 EA.
7 W	1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" METER PER UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #8 PER DETAIL ON SHEET DT1	2 EA.
	6" C-900-16 WATER LATERAL PER UDACS 2.06.01 & PLATE 17	170 LF.
	12" DIP WATER PER UDACS 2.06.03 & PLATE 17	358 LF.
WPC	WATER POINT OF CONNECTION	

SEWER

S	STANDARD MANHOLE PER SD-1A & 1B W/ SINGLE 24" LID	7 EA.
	8" C-900-16 SANITARY SEWER MAIN	100 LF.
	12" C-900-16 SANITARY SEWER MAIN	789 LF.
	16" C-900-16 SANITARY SEWER MAIN	156 LF.
	8" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
	12" SDR-35 PVC SANITARY SEWER MAIN	1 EA.
	16" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
SPC	SEWER POINT OF CONNECTION	

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

FIRE HYDRANT NOTE:

(EXTENSION OF EXISTING LATERAL)
THE CONTRACTOR SHALL REMOVE AND RELOCATE BOTH THE UPPER AND LOWER BARRELS OF THE EXISTING FIRE HYDRANT(S) WHERE SHOWN, EXTEND THE EXISTING LATERAL AS REQUIRED, AND REINSTALL SUCH HYDRANT(S) AT THE NEW LOCATION(S) INDICATED. FIRE HYDRANTS SHALL BE TESTED PRIOR TO AND AFTER RELOCATION, UNDER THE DIRECTION OF LVVWD, TO ENSURE QUALITY. INSTALLATION SHALL BE IN ACCORDANCE WITH UDACS PLATE 40/41. LATERALS MADE OF UNAPPROVED MATERIALS SHALL BE REPLACED FROM THE MAIN TO THE FIRE HYDRANT. RELOCATIONS WHERE THE LATERAL CANNOT BE EXTENDED SHALL BE TREATED AS NEW INSTALLATIONS.

DROP INLET NOTE:

WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE: CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS. BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BULB, OR FLAT STRIP. (VINYLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL)

LVVWD EXISTING FACILITIES NOTE:

PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

LVVWD NOTE:

CONTRACTOR SHALL SUBMIT STRUCTURAL CALCULATIONS PREPARED BY A NEVADA LICENSED STRUCTURAL ENGINEER FOR CROSSINGS WITH WATER WHERE THE TRENCH IS SIX (6) FEET OR GREATER. CONTACT ENGINEERING SERVICES FOR INDICATIONS ON PACKAGE SUBMITTAL. PIPE SUPPORT PLANS MUST BE SUBMITTED A MINIMUM OF 30 DAYS PRIOR TO COMMENCEMENT OF WORK. PIPE SUPPORTS FOR TRANSMISSION MAINS (24-INCH AND LARGER) WILL BE LIMITED TO A MAXIMUM OF 1 WEEK. A SCHEDULE OF WATER MAINS SUPPORTED MUST BE PROVIDED TO LVVWD ENGINEERING SERVICES.

LVVWD NOTE:

IN AREAS WHERE THE EXCAVATION OR GROUND ELEVATION IS LESS THAN THREE (3) FEET, FROM THE TOP OF THE LVVWD TRANSMISSION MAIN, NO EXCAVATION EQUIPMENT, OTHER THAN HAND HELD EQUIPMENT WILL BE ALLOWED WITHIN TEN (10) FEET OF THE PIPELINE IN THESE AREAS. THE CONTRACTOR IS TO PLACE A CONCRETE BARRIER; I.E. JERSEY RAIL, TO IDENTIFY AND PROTECT THE "NO EQUIPMENT ZONE".

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM

OFFSITE FLOOD CONTROL NOTE:

ALL OFFSITE INTERIM FLOOD CONTROL FACILITIES SUCH AS BUT NOT LIMITED TO BERMS/DITCHES AND TEMPORARY SUMPS ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOWARD HUGHES COMPANY.

STORM DRAIN DROP INLET NOTE:

ALL STORM DRAIN INLETS SHALL INCLUDE A STORM WATER INLET CONCRETE STAMP IN ACCORDANCE WITH CCAUSD DWG NO. 421

RESTRAINTS NOTE:

ALL FITTINGS AND JOINT ON 12 INCH DIP TO BE RESTRAINED.

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:

ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATERLINE TRENCH NOTE:

CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE

INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

FIRE HYDRANT MARKER NOTES

BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKERS ARE TO BE INSTALLED:

1. ON ROADWAYS WITH NO PARKING PERMITTED ON HYDRANT SIDE; LOCATE MAKER 8' FROM FACE OF CURB ON HYDRANT SIDE.
2. ON ROADWAYS WITH PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 16' FROM FACE OF CURB ON HYDRANT SIDE.

WATER MAIN JOINT DEFLECTION

PVC PIPE SHALL BE DEFLECTED AT THE JOINT ONLY. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE ONE (1) DEGREE PER JOINT WITH A MINIMUM RADIUS OF CURVATURE OF 1,150 FEET, PER UDACS 2.07.01 AND 2.07.02.

FOR CHANGES IN DIRECTION EXCEEDING THE MAXIMUM ALLOWABLE JOINT DEFLECTION, FITTINGS SHALL BE USED.

UTILITY CROSSING NOTE:

ALL SEWER/STORM DRAINS CROSSING WATER LINES MUST CONFORM TO SECTION 2.22 OF UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR PORTABL WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.

ENGINEER DISCLAIMER NOTE:

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

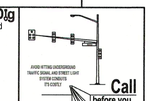
LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1500 GPM AT 20 P.S.I. RESIDUAL.



Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR
1-800-227-2600 AND
1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS



REV	DATE	BY	REVISION
2	02/12/2019	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL REMOVED HEADWALL ADDED INTERSECTION INFORMATION
			REVISED HGL'S & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W. CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

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

UTILITY PLAN & PROFILE 6
STORM DRAIN LATERAL

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

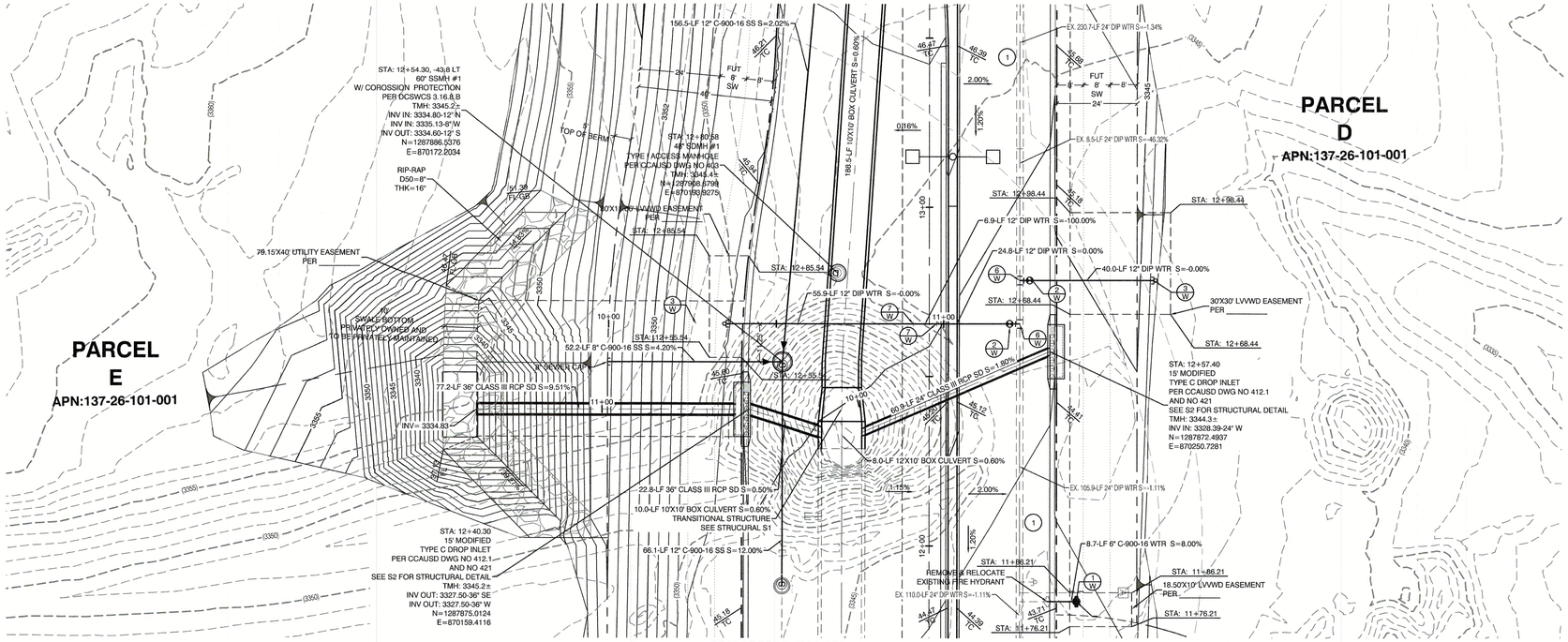
DRAWN BY: BCC — 06/18/2018
DESIGNED BY: DEH — 04/11/2018
CHECKED BY: WJM — 02/12/2019
PROJECT NO: 2551 — SCALE: HORIZ. 1"=20' VERT. 1"=4'

PROFESSIONAL ENGINEER-STATE OF NEVADA
WILLIAM J MEYER
EXP: 12/31/19
CIVIL
No. 15745
2/12/19

SHEET
UT6
21 OF 37 SHEETS
DRAWING NO.
L18-01896

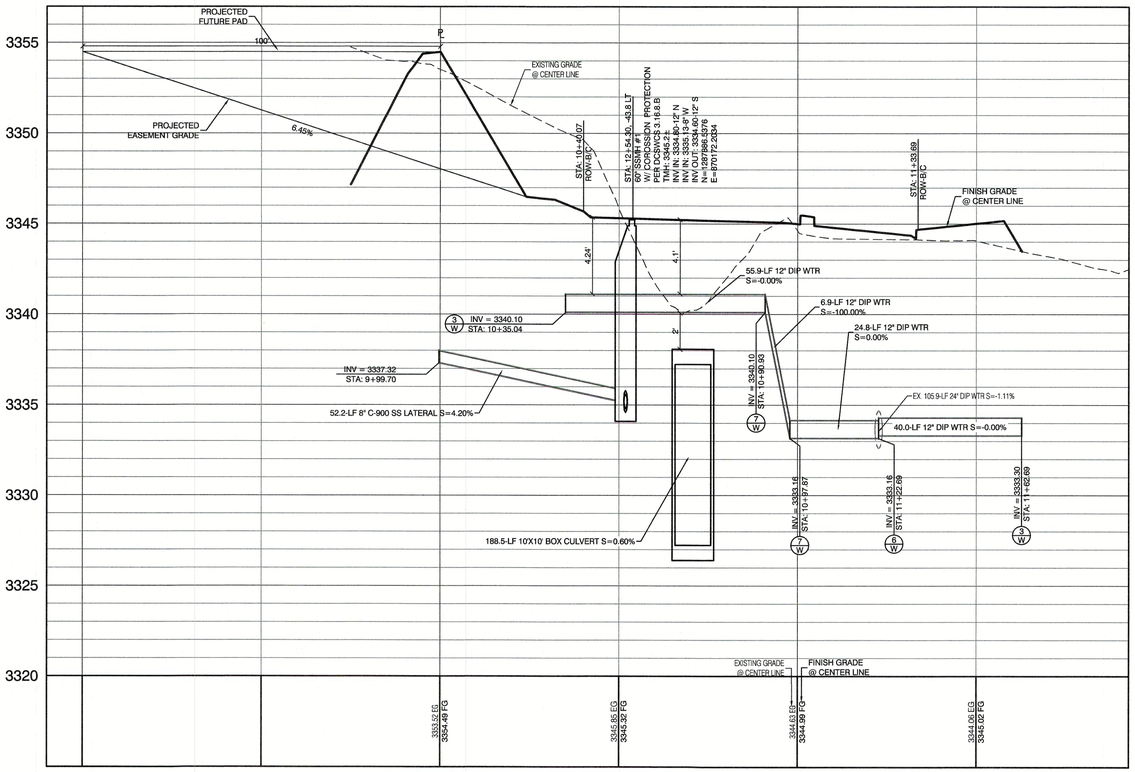
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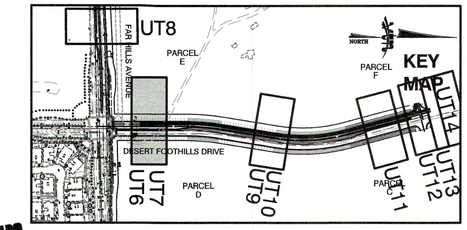


DESERT FOOTHILLS STA:11+92.69
(PUBLIC)

PROFILE SCALES:
HORIZ. = 1"=20'
VERT. = 1"=4'



DESERT FOOTHILLS STA:11+92.69
(PUBLIC)



GRAPHIC SCALE
-20 0 10 20 40
1" = 20'

CONSTRUCTION NOTES

	WATER	**PUBLIC**
1 W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41)	4 EA.
2 W	12" GATE VALVE (PER UDACS PLATE 30 & 39)	5 EA.
3 W	12" CAP & BLOW OFF(PER UDACS PLATE 36)	5 EA.
4 W	24"X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	5 EA.
5 W	12" 45° VERTICAL BEND (W/ RESTRAINTS)	2 EA.
6 W	12" 45° BEND (W/ RESTRAINTS)	2 EA.
7 W	1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" METER PER UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #8 PER DETAIL ON SHEET DT1	2 EA.
	6" C-900-16 WATER LATERAL PER UDACS 2.06.01 & PLATE 17	170 LF.
	12" DIP WATER PER UDACS 2.06.03 & PLATE 17	358 LF.
POC	WATER POINT OF CONNECTION	
	SEWER	
S	STANDARD MANHOLE PER SD-1A & 1B W/ SINGLE 24" LID	7 EA.
	8" C-900-16 SANITARY SEWER MAIN	100 LF.
	12" C-900-16 SANITARY SEWER MAIN	789 LF.
	16" C-900-16 SANITARY SEWER MAIN	156 LF.
	8" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
	12" SDR-35 PVC SANITARY SEWER MAIN	1 EA.
	16" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
POC	SEWER POINT OF CONNECTION	

EASEMENT REFERENCE LEGEND

1 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

RESTRAINTS NOTE:
ALL FITTINGS AND JOINT ON 12 INCH DIP TO BE RESTRAINED.

FIRE HYDRANT NOTE:
(EXTENSION OF EXISTING LATERAL)
THE CONTRACTOR SHALL REMOVE AND RELOCATE BOTH THE UPPER AND LOWER BARRELS OF THE EXISTING FIRE HYDRANT(S) WHERE SHOWN, EXTEND THE EXISTING LATERAL AS REQUIRED, AND REINSTALL SUCH HYDRANT(S) AT THE NEW LOCATION(S) INDICATED. FIRE HYDRANTS SHALL BE TESTED PRIOR TO AND AFTER RELOCATION, UNDER THE DIRECTION OF LVVWD, TO ENSURE QUALITY. INSTALLATION SHALL BE IN ACCORDANCE WITH UDACS PLATE 40/41. LATERALS MADE OF UNAPPROVED MATERIALS SHALL BE REPLACED FROM THE MAIN TO THE FIRE HYDRANT. RELOCATIONS WHERE THE LATERAL CANNOT BE EXTENDED SHALL BE TREATED AS NEW INSTALLATIONS.

DROP INLET NOTE:
WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE: CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS. BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BULB, OR FLAT STRIP. (VINYLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL)

LVVWD EXISTING FACILITIES NOTE:
PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

SEWER CONNECTION NOTE
ONE OR MORE SEGMENTS OF THE DOWNSTREAM SEWER SYSTEM THAT WILL SERVE THIS PROJECT HAS NOT BEEN COMPLETED AND/OR ACCEPTED FOR MAINTENANCE BY THE CITY OF LAS VEGAS. ANY WORK DONE ON THIS PROJECT PRIOR TO THE COMPLETION AND/OR ACCEPTANCE OF THE DOWNSTREAM SEWER SYSTEM(S) SHALL BE DONE AT THE DEVELOPERS OWN RISK. THE CITY OF LAS VEGAS RESERVES THE RIGHT TO PREVENT THE PHYSICAL CONNECTION OF THIS PROJECT INTO THE DOWNSTREAM SEWER SYSTEM UNTIL ALL SEGMENTS HAVE BEEN COMPLETED AND ACCEPTED FOR MAINTENANCE, OR UNTIL SUCH TIME AS THEY ARE DEEMED AVAILABLE FOR SERVICE.

STORM DRAIN DROP INLET NOTE:
ALL STORM DRAIN INLETS SHALL INCLUDE A STORM WATER INLET CONCRETE STAMP IN ACCORDANCE WITH CCAUSD DWG NO. 421

WATER PRESSURE ZONE:
WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:
ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATERLINE TRENCH NOTE:
CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE
INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

FIRE HYDRANT MARKER NOTES
BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKERS ARE TO BE INSTALLED:
1. ON ROADWAYS WITH NO PARKING PERMITTED ON HYDRANT SIDE: LOCATE MAKER 8' FROM FACE OF CURB ON HYDRANT SIDE.
2. ON ROADWAYS WITH PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 16' FROM FACE OF CURB ON HYDRANT SIDE.

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PVC PIPE SHALL BE DEFLECTED AT THE JOINT ONLY. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE ONE (1) DEGREE PER JOINT WITH A MINIMUM RADIUS OF CURVATURE OF 1,150 FEET, PER UDACS 2.07.01 AND 2.07.02.

FOR CHANGES IN DIRECTION EXCEEDING THE MAXIMUM ALLOWABLE JOINT DEFLECTION, FITTINGS SHALL BE USED.

UTILITY CROSSING NOTE:
ALL SEWER/STORM DRAINS CROSSING WATER LINES MUST CONFORM TO SECTION 2.22 OF UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR PORTABL WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.

ENGINEER DISCLAIMER NOTE:
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LAS VEGAS FIRE & RESCUE APPROVAL
BY: _____ DATE: _____

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1500 GPM AT 20 P.S.I. RESIDUAL.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM

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

Call before you DIg
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-227-2600 AND 1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS

Call before you Underground
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
1-702-229-6611
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

REV | DATE | BY | REVISION

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7550 FAX: (702) 382-2997 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY PLAN & PROFILE 7
SEWER & WATER LATERALS

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

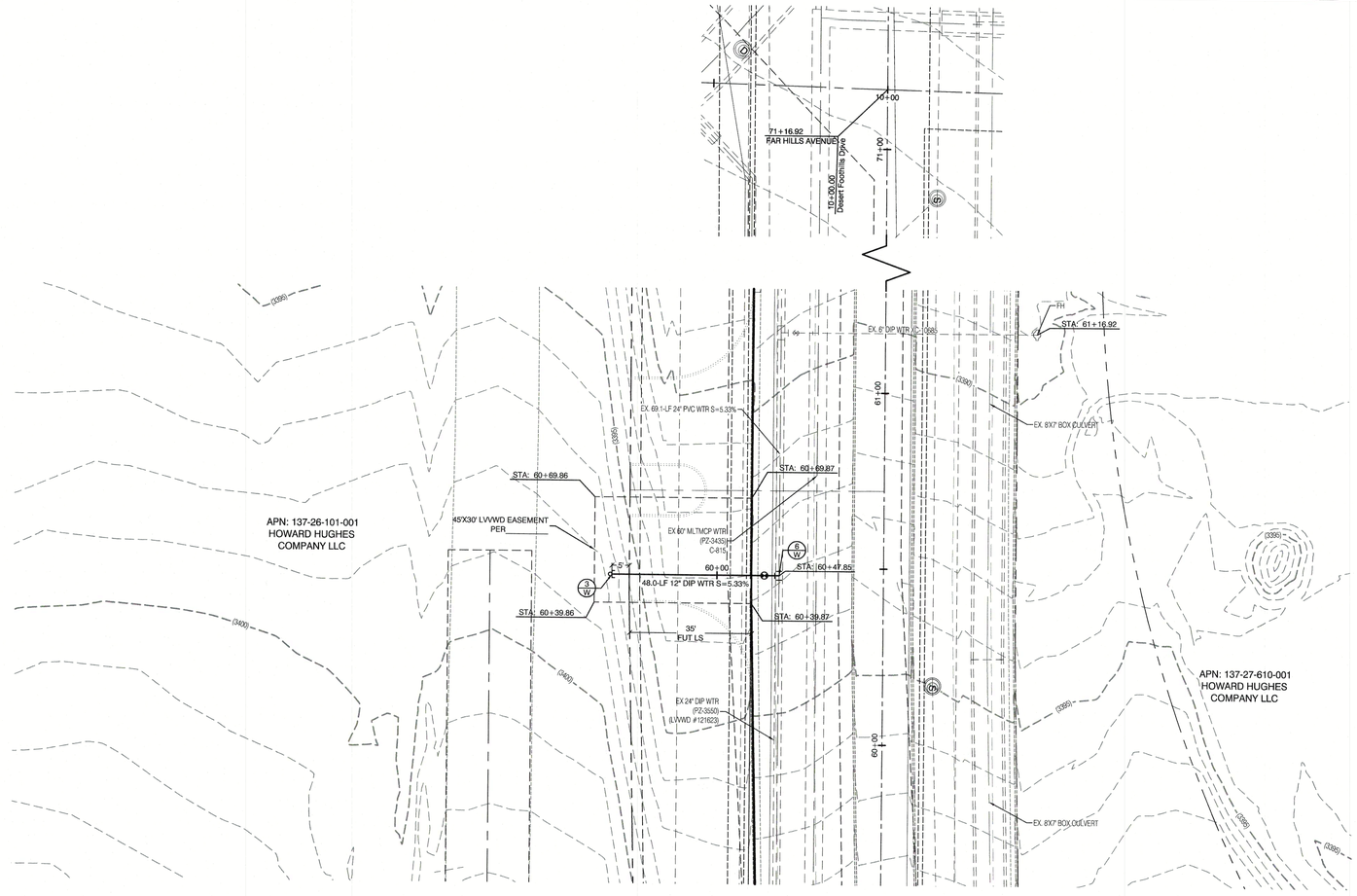
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DESIGNED BY: DBH
CHECKED BY: WJM
PROJECT NO: 7851
SCALE: HORIZ. 1"=20' VERT. 1"=4'
06/18/2018
04/11/2018
02/12/2018

PROFESSIONAL ENGINEER STATE OF NEVADA
WILLIAM J MEYER
EXP: 12/31/19
CIVIL
No. 15745
2/12/19

SHEET
UT7
22 OF **37** SHEETS
DRAWING NO.
L18-01896

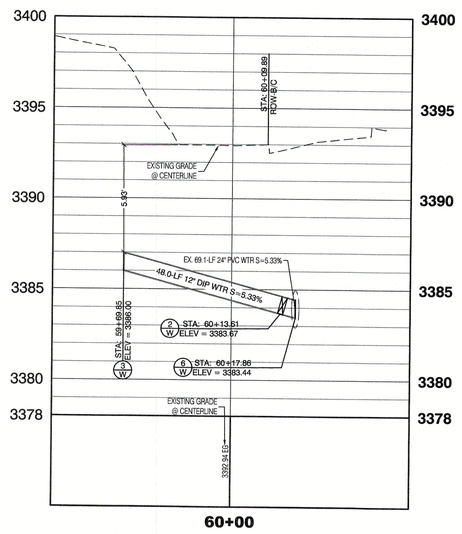
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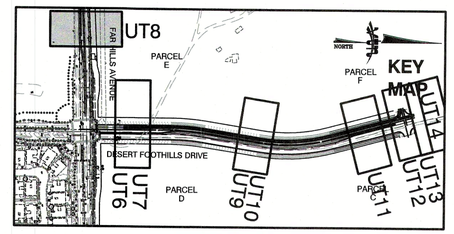


FAR HILLS AVENUE
(PUBLIC)

PROFILE SCALES:
HORIZ. = 1"=20'
VERT. = 1"=4'



FAR HILLS AVENUE
(PUBLIC)





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

CONSTRUCTION NOTES

		WATER	PUBLIC
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RESTRAINTS NOTE:
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WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

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LAS VEGAS FIRE & RESCUE APPROVAL
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APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES
PROJECT:135582 FIRST APPROVED DATE: _____.
LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM

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

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL AND STREET LIGHT SYSTEM CONDUITS
IT'S COSTLY.
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1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-229-6511
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR
1-800-227-2600
AND
1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS

REV	DATE	BY	REVISION

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
2990 GRAND CANYON BLVD SUITE 300
LAS VEGAS, NEVADA 89146
702-791-4000

CITY OF LAS VEGAS
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH: (702) 875-7550 FAX (702) 362-2597 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY PLAN & PROFILE 8
WATER LATERAL

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY: BCC	06/18/2018	SCALE:	HORIZ: 1"=20' VERT: 1"=4'
DESIGNED BY: DEH	04/11/2018		
CHECKED BY: WJM	02/12/2018	PROJECT NO:	7851

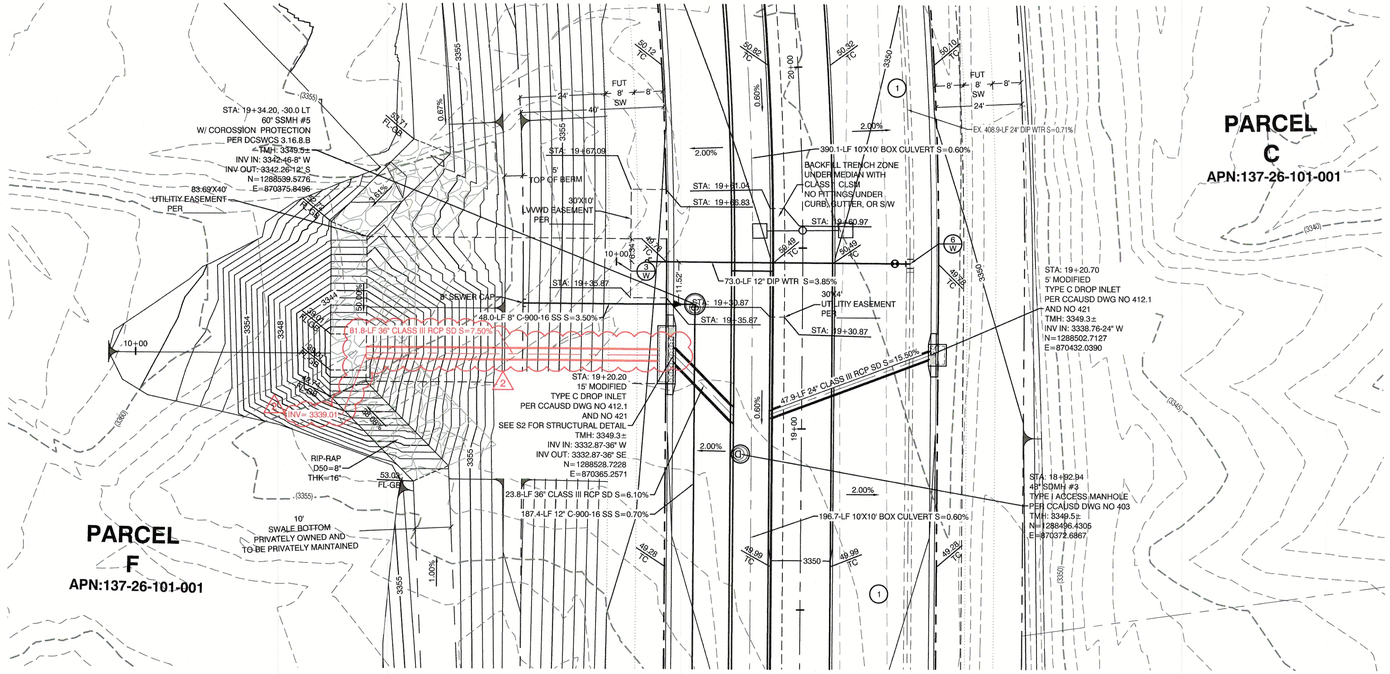
PROFESSIONAL ENGINEER STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
No. 15719
2/12/19

SHEET
UT8
23 OF 37 SHEETS

DRAWING NO.
L18-01896

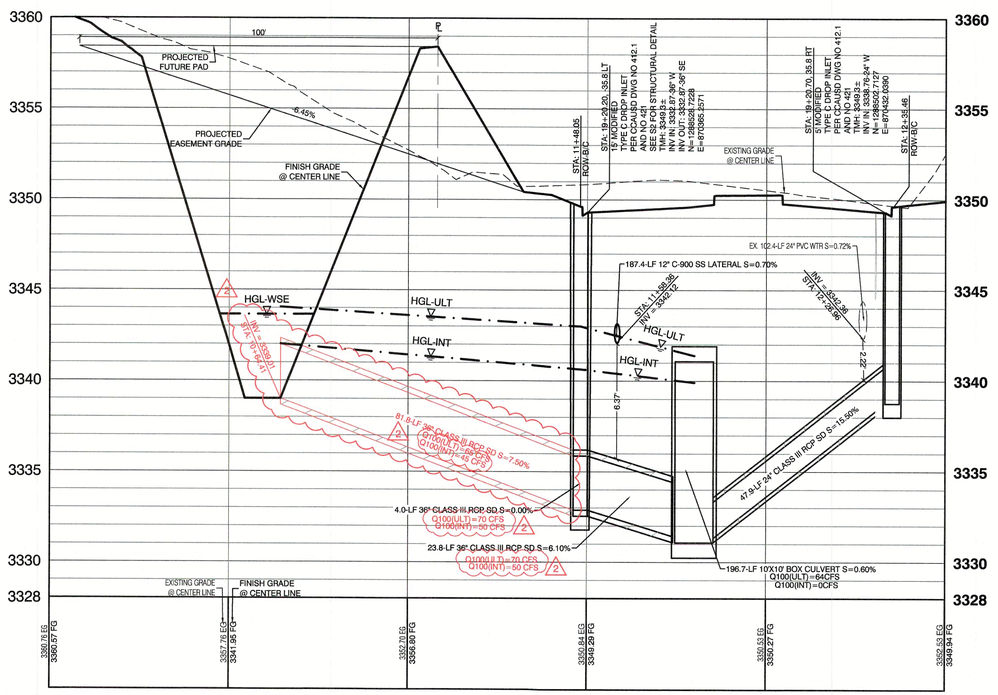
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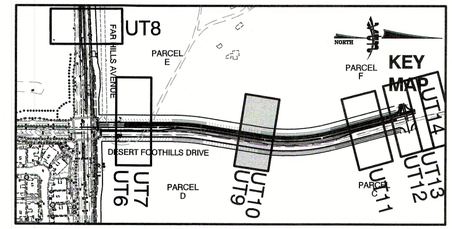


DESERT FOOTHILLS
(PUBLIC)

PROFILE SCALES:
HORIZ. = 1"=20'
VERT. = 1"=4'



DESERT FOOTHILLS
(PUBLIC)



CONSTRUCTION NOTES

WATER

		PUBLIC
W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41)	4 EA.
W	12" GATE VALVE (PER UDACS PLATE 30 & 39)	5 EA.
W	12" CAP & BLOW OFF(PER UDACS PLATE 36)	5 EA.
W	24"X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	5 EA.
W	12" 45° VERTICAL BEND (W/ RESTRAINTS)	2 EA.
W	12" 45° BEND (W/ RESTRAINTS)	2 EA.
W	1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" METER PER UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #8 PER DETAIL ON SHEET DT1	2 EA.
	6" C-900-16 WATER LATERAL PER UDACS 2.06.01 & PLATE 17	170 LF.
	12" DIP WATER PER UDACS 2.06.03 & PLATE 17	358 LF.
POC	WATER POINT OF CONNECTION	

SEWER

S	STANDARD MANHOLE PER SD-1A & 1B W/ SINGLE 24" LID	7 EA.
	8" C-900-16 SANITARY SEWER MAIN	100 LF.
	12" C-900-16 SANITARY SEWER MAIN	789 LF.
	16" C-900-16 SANITARY SEWER MAIN	156 LF.
[	8" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
[	12" SDR-35 PVC SANITARY SEWER MAIN	1 EA.
[	16" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
POC	SEWER POINT OF CONNECTION	

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

RESTRAINTS NOTE:

ALL FITTINGS AND JOINT ON 12 INCH DIP TO BE RESTRAINED.

OFFSITE FLOOD CONTROL NOTE:

ALL OFFSITE INTERIM FLOOD CONTROL FACILITIES SUCH AS BUT NOT LIMITED TO BERMS/DITCHES AND TEMPORARY SUMPS ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOWARD HUGHES COMPANY.

LVVWD NOTE:

CONTRACTOR SHALL SUBMIT STRUCTURAL CALCULATIONS PREPARED BY A NEVADA LICENSED STRUCTURAL ENGINEER FOR CROSSINGS WITH WATER WHERE THE TRENCH IS SIX (6) FEET OR GREATER. CONTACT ENGINEERING SERVICES FOR INDICATIONS ON PACKAGE SUBMITTAL. PIPE SUPPORT PLANS MUST BE SUBMITTED A MINIMUM OF 30 DAYS PRIOR TO COMMENCEMENT OF WORK. PIPE SUPPORTS FOR TRANSMISSION MAINS (24-INCH AND LARGER) WILL BE LIMITED TO A MAXIMUM OF 1 WEEK. A SCHEDULE OF WATER MAINS SUPPORTED MUST BE PROVIDED TO LVVWD ENGINEERING SERVICES.

LVVWD NOTE:

IN AREAS WHERE THE EXCAVATION OR GROUND ELEVATION IS LESS THAN THREE (3) FEET, FROM THE TOP OF THE LVVWD TRANSMISSION MAIN, NO EXCAVATION EQUIPMENT, OTHER THAN HAND HELD EQUIPMENT WILL BE ALLOWED WITHIN TEN (10) FEET OF THE PIPELINE IN THESE AREAS. THE CONTRACTOR IS TO PLACE A CONCRETE BARRIER; I.E. JERSEY RAIL, TO IDENTIFY AND PROTECT THE "NO EQUIPMENT ZONE".

STORM DRAIN DROP INLET NOTE:

ALL STORM DRAIN INLETS SHALL INCLUDE A STORM WATER INLET CONCRETE STAMP IN ACCORDANCE WITH CCAUSD DWG NO. 421

DROP INLET NOTE:

WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE: CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS. BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BULB, OR FLAT STRIP. (VINYLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL)

LVVWD EXISTING FACILITIES NOTE:

PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:

ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATERLINE TRENCH NOTE:

CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE

INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

FIRE HYDRANT MARKER NOTES

BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKERS ARE TO BE INSTALLED:

1. ON ROADWAYS WITH NO PARKING PERMITTED ON HYDRANT SIDE; LOCATE MAKER 8' FROM FACE OF CURB ON HYDRANT SIDE.
2. ON ROADWAYS WITH PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 16' FROM FACE OF CURB ON HYDRANT SIDE.

WATER MAIN JOINT DEFLECTION

PVC PIPE SHALL BE DEFLECTED AT THE JOINT ONLY. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE ONE (1) DEGREE PER JOINT WITH A MINIMUM RADIUS OF CURVATURE OF 1,150 FEET, PER UDACS 2.07.01 AND 2.07.02.

FOR CHANGES IN DIRECTION EXCEEDING THE MAXIMUM ALLOWABLE JOINT DEFLECTION, FITTINGS SHALL BE USED.

UTILITY CROSSING NOTE:

ALL SEWER/STORM DRAINS CROSSING WATER LINES MUST CONFORM TO SECTION 2.22 OF UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR PORTABL WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.

ENGINEER DISCLAIMER NOTE:

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

LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1500 GPM AT 20 P.S.I. RESIDUAL.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM



REV	DATE	BY	REVISION
2	02/12/2019	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL REMOVED HEADWALL ADDED INTERSECTION INFORMATION
1			REVISED HGL'S & SD PIPE FROM 48" TO 54" PER REVISION 1

CITY OF LAS VEGAS

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
(702) 247-4000

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7550 FAX (702) 362-2697 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY PLAN & PROFILE 9
STORM DRAIN LATERAL

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

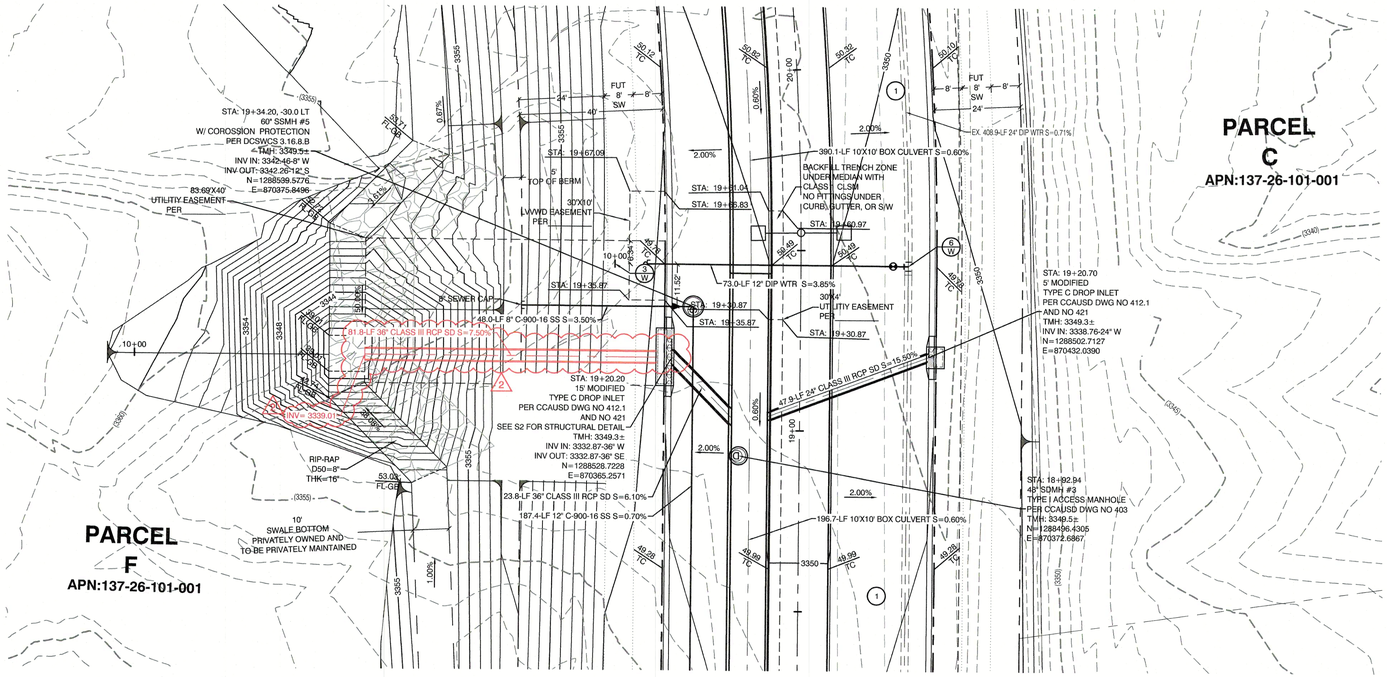
DRAWN BY: BCC
DESIGNED BY: DEH
CHECKED BY: WJM
PROJECT NO: 7851
DATE: 06/18/2018 | 06/18/2018 | 02/12/2018
SCALE: 1"=20' HORIZ. | 1"=4' VERT.

WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
No. 15745
STATE OF NEVADA
PROFESSIONAL ENGINEER
2/12/19

SHEET
UT9
24 OF **37** SHEETS
DRAWING NO.
L18-01896

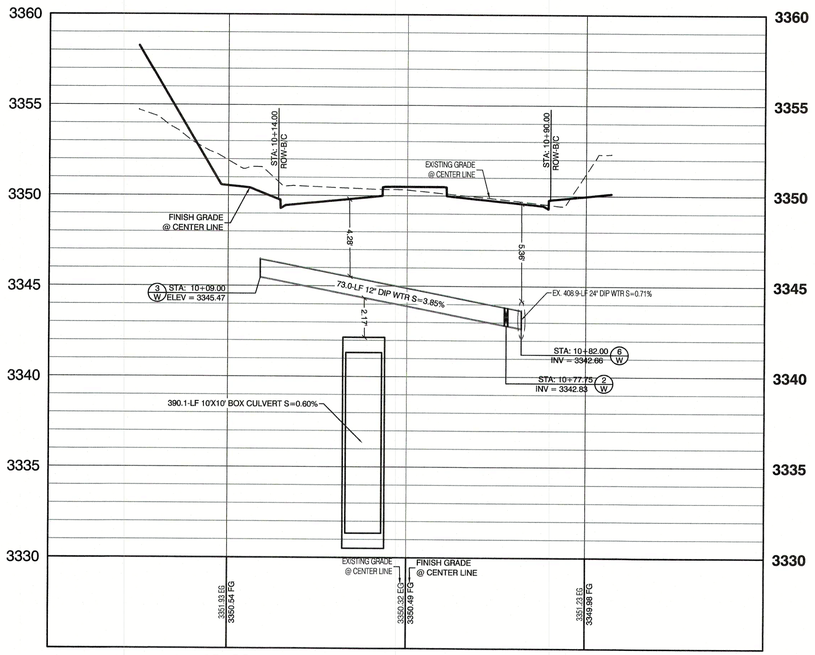
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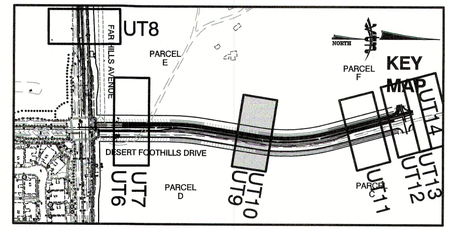


PROFILE SCALES:

HORIZ. = 1"=20'
VERT. = 1"=4'



DESERT FOOTHILLS
(PUBLIC)





GRAPHIC SCALE

40 0 20 40 80

1" = 40 '

CONSTRUCTION NOTES

		WATER	PUBLIC
1 W		FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41)	4 EA.
2 W		12" GATE VALVE (PER UDACS PLATE 30 & 39)	5 EA.
3 W		12" CAP & BLOW OFF(PER UDACS PLATE 36)	5 EA.
4 W		24"X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	5 EA.
5 W		12" 45° VERTICAL BEND (W/ RESTRAINTS)	2 EA.
6 W		12" 45° BEND (W/ RESTRAINTS)	2 EA.
7 W		1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" METER PER UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #8 PER DETAIL ON SHEET DT1	2 EA.
		6" C-900-16 WATER LATERAL PER UDACS 2.06.01 & PLATE 17	170 LF.
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	POC	WATER POINT OF CONNECTION	
		SEWER	
S		STANDARD MANHOLE PER SD-1A & 1B W/ SINGLE 24" LID	7 EA.
		8" C-900-16 SANITARY SEWER MAIN	100 LF.
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	POC	SEWER POINT OF CONNECTION	

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

RESTRAINTS NOTE:

ALL FITTINGS AND JOINT ON 12 INCH DIP TO BE RESTRAINED.

DROP INLET NOTE:

WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE; CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS. BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BULB, OR FLAT STRIP. (VINYLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL)

LVVWD EXISTING FACILITIES NOTE:

PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

SEWER CONNECTION NOTE

ONE OR MORE SEGMENTS OF THE DOWNSTREAM SEWER SYSTEM THAT WILL SERVE THIS PROJECT HAS NOT BEEN COMPLETED AND/OR ACCEPTED FOR MAINTENANCE BY THE CITY OF LAS VEGAS. ANY WORK DONE ON THIS PROJECT PRIOR TO THE COMPLETION AND/OR ACCEPTANCE OF THE DOWNSTREAM SEWER SYSTEM(S) SHALL BE DONE AT THE DEVELOPERS OWN RISK. THE CITY OF LAS VEGAS RESERVES THE RIGHT TO PREVENT THE PHYSICAL CONNECTION OF THIS PROJECT INTO THE DOWNSTREAM SEWER SYSTEM UNTIL ALL SEGMENTS HAVE BEEN COMPLETED AND ACCEPTED FOR MAINTENANCE, OR UNTIL SUCH TIME AS THEY ARE DEEMED AVAILABLE FOR SERVICE.

STORM DRAIN DROP INLET NOTE:

ALL STORM DRAIN INLETS SHALL INCLUDE A STORM WATER INLET CONCRETE STAMP IN ACCORDANCE WITH CCAUSD DWG NO. 421

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:

ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATERLINE TRENCH NOTE:

CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE

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LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

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APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM

Call before you Underground
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-229-6611
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

Call before you Dig
Avoid cutting underground utility lines. It's costly.
DIAL 811
OR
1-800-227-2600
AND
1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS

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

REV	DATE	BY	REVISION
2	02/12/2018	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL
			REMOVED HEADWALL; ADDED INTERSECTION INFORMATION
			REVISED HGL'S & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
1980 FESTIVAL PLAZA DRIVE, SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5146
PH: (702) 873-7550 FAX: (702) 362-2397 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY PLAN & PROFILE 10
SEWER & WATER LATERALS

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY: BCC	06/16/2018
DESIGNED BY: DBH	04/11/2018
CHECKED BY: WJM	02/12/2018
PROJECT NO: 7651	SCALE: 1"=20' 1"=4'
	HORIZ. VERT.

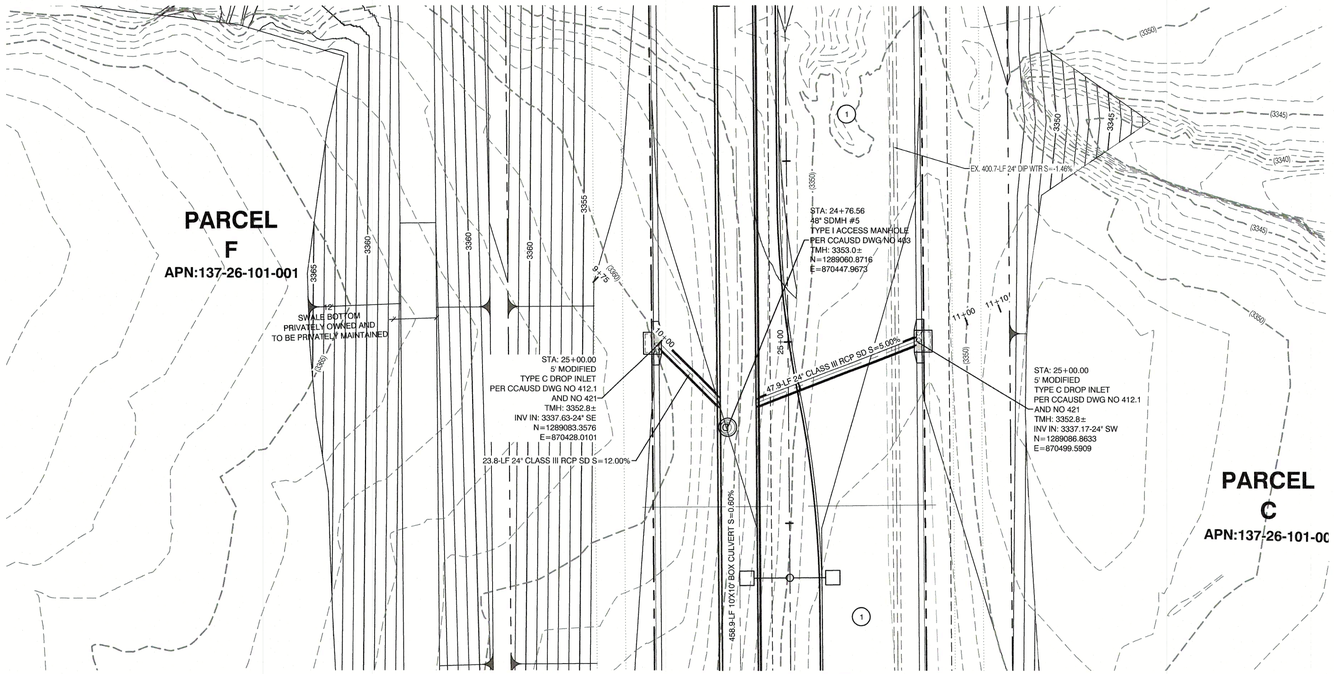
PROFESSIONAL ENGINEER STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
No. 15745
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SHEET
UT10
25 OF 37 SHEETS

DRAWING NO.
L18-01896

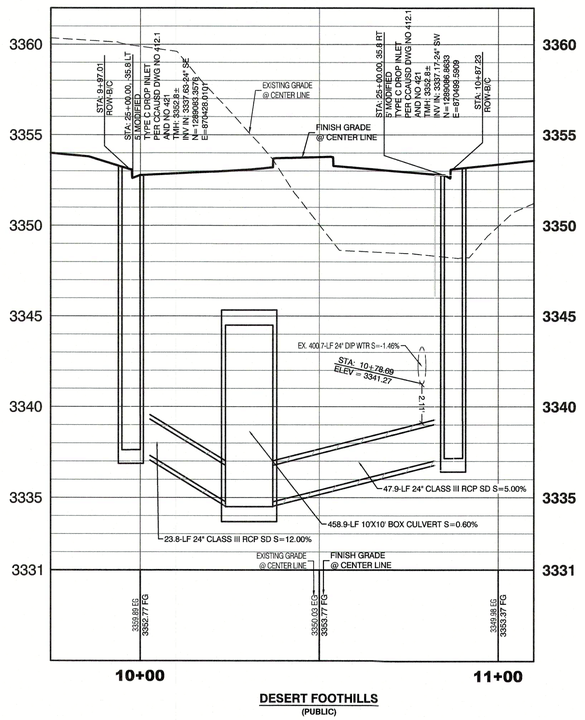
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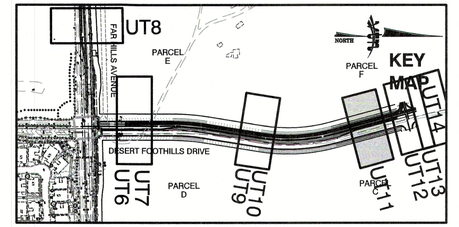


PROFILE SCALES:

HORIZ. = 1"=20'
VERT. = 1"=4'



DESERT FOOTHILLS
(PUBLIC)



NORTH

GRAPHIC SCALE

40 0 20 40 80

1" = 40 '

CONSTRUCTION NOTES

	WATER	PUBLIC
W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41)	4 EA.
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POC	WATER POINT OF CONNECTION	

	SEWER	
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POC	SEWER POINT OF CONNECTION	

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DROP INLET NOTE:

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WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:

ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATERLINE TRENCH NOTE:

CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE

INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

FIRE HYDRANT MARKER NOTES

BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKERS ARE TO BE INSTALLED:

1. ON ROADWAYS WITH NO PARKING PERMITTED ON HYDRANT SIDE; LOCATE MAKER 8' FROM FACE OF CURB ON HYDRANT SIDE.
2. ON ROADWAYS WITH PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 16' FROM FACE OF CURB ON HYDRANT SIDE.

WATER MAIN JOINT DEFLECTION

PVC PIPE SHALL BE DEFLECTED AT THE JOINT ONLY. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE ONE (1) DEGREE PER JOINT WITH A MINIMUM RADIUS OF CURVATURE OF 1,150 FEET, PER UDACS 2.07.01 AND 2.07.02.

FOR CHANGES IN DIRECTION EXCEEDING THE MAXIMUM ALLOWABLE JOINT DEFLECTION, FITTINGS SHALL BE USED.

UTILITY CROSSING NOTE:

ALL SEWER/STORM DRAINS CROSSING WATER LINES MUST CONFORM TO SECTION 2.22 OF UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR PORTABL. WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.

ENGINEER DISCLAIMER NOTE:

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

LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

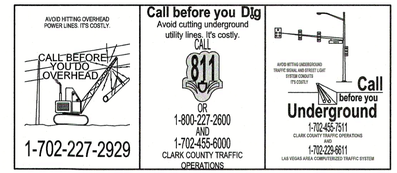
APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1500 GPM AT 20 P.S.I. RESIDUAL.

APPROVED FOR CONSTRUCTION

_____
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE:_____.

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM



REV | DATE | BY | REVISION

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5146
PH. (702) 873-7550 FAX (702) 382-2697 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY PLAN & PROFILE 11
STORM DRAIN LATERAL

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY: BCC
DESIGNED BY: DEH
CHECKED BY: WJM
PROJECT NO: 7851
DATE: 06/18/2018 | 06/18/2018 | 02/12/2018
SCALE: HORIZ. 1"=20' VERT. 1"=4'

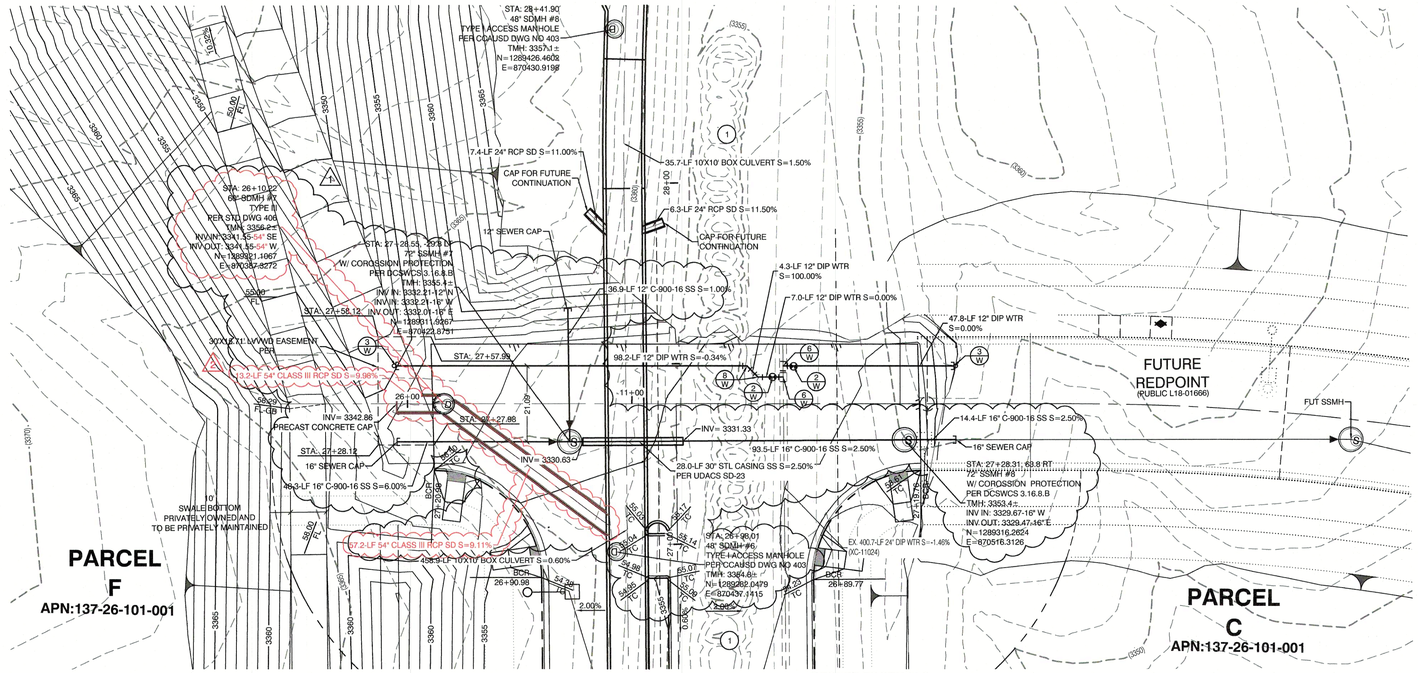
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
No. 15145
PROFESSIONAL ENGINEER STATE OF NEVADA
2/12/19

SHEET
UT11
26 OF **37** SHEETS

DRAWING NO.
L18-01896

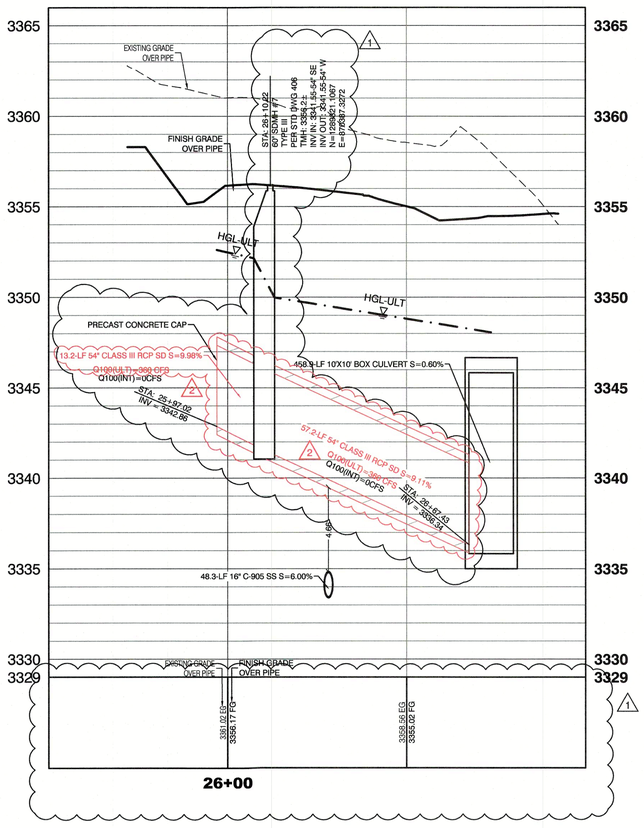
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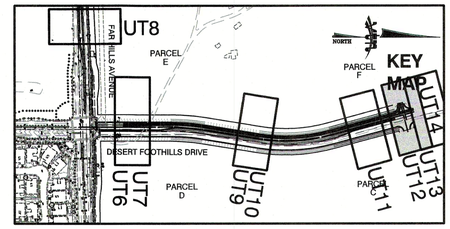
107V7501



PROFILE SCALES:

HORIZ. = 1"=20'
VERT. = 1"=4'







GRAPHIC SCALE

40 0 20 40 80

1" = 40 '

CONSTRUCTION NOTES

	WATER	PUBLIC
W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41)	4 EA.
W	12" GATE VALVE (PER UDACS PLATE 30 & 39)	5 EA.
W	12" CAP & BLOW OFF(PER UDACS PLATE 36)	5 EA.
W	24"X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	5 EA.
W	12" 45° VERTICAL BEND (W/ RESTRAINTS)	2 EA.
W	12" 45° BEND (W/ RESTRAINTS)	2 EA.
W	1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" METER PER UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #8 PER DETAIL ON SHEET DT1	2 EA.
	6" C-900-16 WATER LATERAL PER UDACS 2.06.01 & PLATE 17	170 LF.
	12" DIP WATER PER UDACS 2.06.03 & PLATE 17	358 LF.
POC	WATER POINT OF CONNECTION	

	SEWER	
S	STANDARD MANHOLE PER SD-1A & 1B W/ SINGLE 24" LID	7 EA.
	8" C-900-16 SANITARY SEWER MAIN	100 LF.
	12" C-900-16 SANITARY SEWER MAIN	789 LF.
	16" C-900-16 SANITARY SEWER MAIN	156 LF.
	8" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
	12" SDR-35 PVC SANITARY SEWER MAIN	1 EA.
	16" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
POC	SEWER POINT OF CONNECTION	

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

RESTRAINTS NOTE:

ALL FITTINGS AND JOINT ON 12 INCH DIP TO BE RESTRAINED.

OFFSITE FLOOD CONTROL NOTE:

ALL OFFSITE INTERIM FLOOD CONTROL FACILITIES SUCH AS BUT NOT LIMITED TO BERMS/DITCHES AND TEMPORARY SUMPS ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOWARD HUGHES COMPANY.

LVVWD EXISTING FACILITIES NOTE:

PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:

ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATERLINE TRENCH NOTE:

CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE

INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

FIRE HYDRANT MARKER NOTES

BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKERS ARE TO BE INSTALLED:

1. ON ROADWAYS WITH NO PARKING PERMITTED ON HYDRANT SIDE; LOCATE MAKER 8' FROM FACE OF CURB ON HYDRANT SIDE.
2. ON ROADWAYS WITH PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 16' FROM FACE OF CURB ON HYDRANT SIDE.

WATER MAIN JOINT DEFLECTION

PVC PIPE SHALL BE DEFLECTED AT THE JOINT ONLY. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE ONE (1) DEGREE PER JOINT WITH A MINIMUM RADIUS OF CURVATURE OF 1,150 FEET, PER UDACS 2.07.01 AND 2.07.02.

FOR CHANGES IN DIRECTION EXCEEDING THE MAXIMUM ALLOWABLE JOINT DEFLECTION, FITTINGS SHALL BE USED.

UTILITY CROSSING NOTE:

ALL SEWER/STORM DRAINS CROSSING WATER LINES MUST CONFORM TO SECTION 2.22 OF UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR PORTABL WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.

ENGINEER DISCLAIMER NOTE:

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LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1500 GPM AT 20 P.S.I. RESIDUAL.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM

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

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL
811
OR
1-800-227-2600
AND
1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS

Call before you Underground
1-702-455-7511
CLARK COUNTY TRAFFIC SIGNAL OPERATIONS
1-702-229-6811
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

REV	DATE	BY	REVISION
1	01/10/2019	BCC	SANITARY SEWER AND STORM DRAIN LOCATION CHANGE
2	02/12/2019	BCC	REVISED FLOW DIRECTION OF TEMPORARY CHANNEL
			REMOVED HEADWALL ADDED INTERSECTION INFORMATION
			REVISED HGLS & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-792-4000

CITY OF LAS VEGAS

2727 SOUTH RAINBOW BOULEVARD
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PH: (702) 873-7500 FAX: (702) 362-2699 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY PLAN & PROFILE 12 STORM DRAIN LATERAL

SUMMERLIN WEST VILLAGE 21 DESERT FOOTHILLS DRIVE FAR HILLS TO REDPOINT DRIVE

DRAWN BY:	BCC	06/18/2018
DESIGNED BY:	DEH	06/18/2018
CHECKED BY:	VJM	02/12/2018
PROJECT NO:	7851	SCALE: HORIZ. 1"=20' VERT. 1"=4'

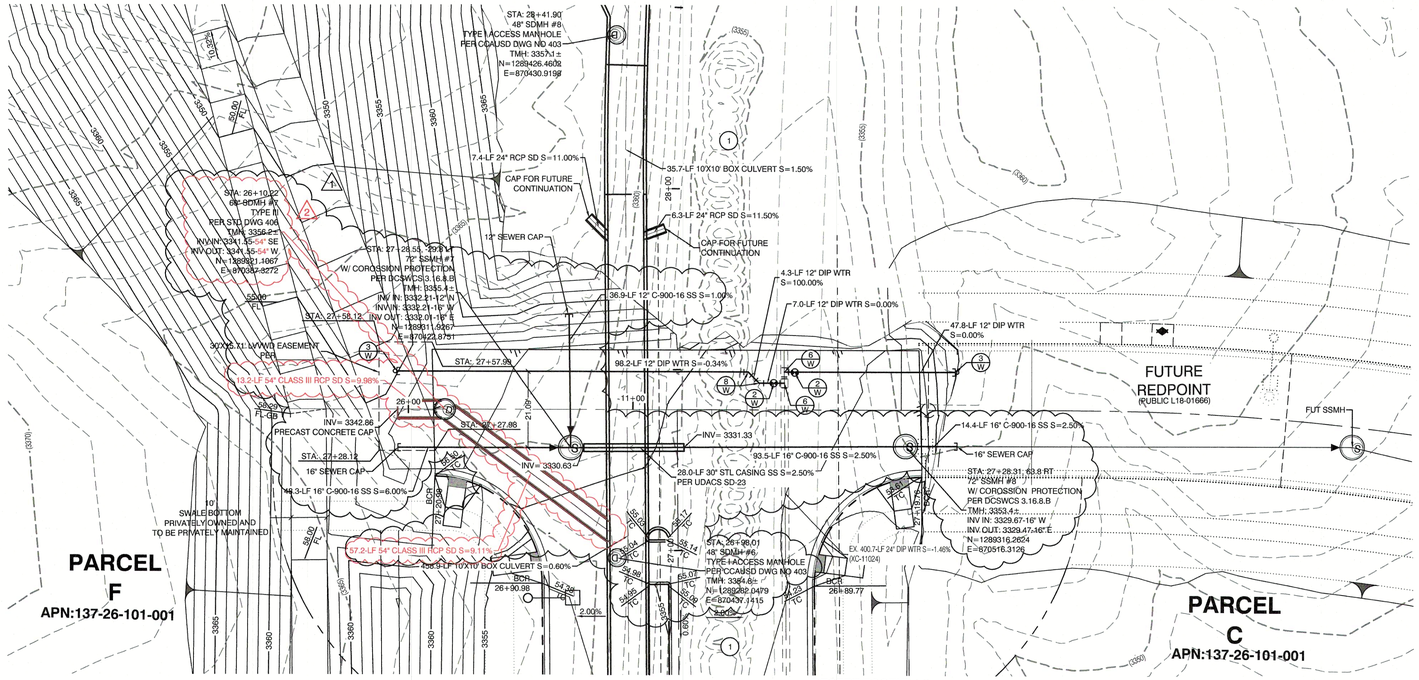


SHEET
UT12
27 OF 37 SHEETS

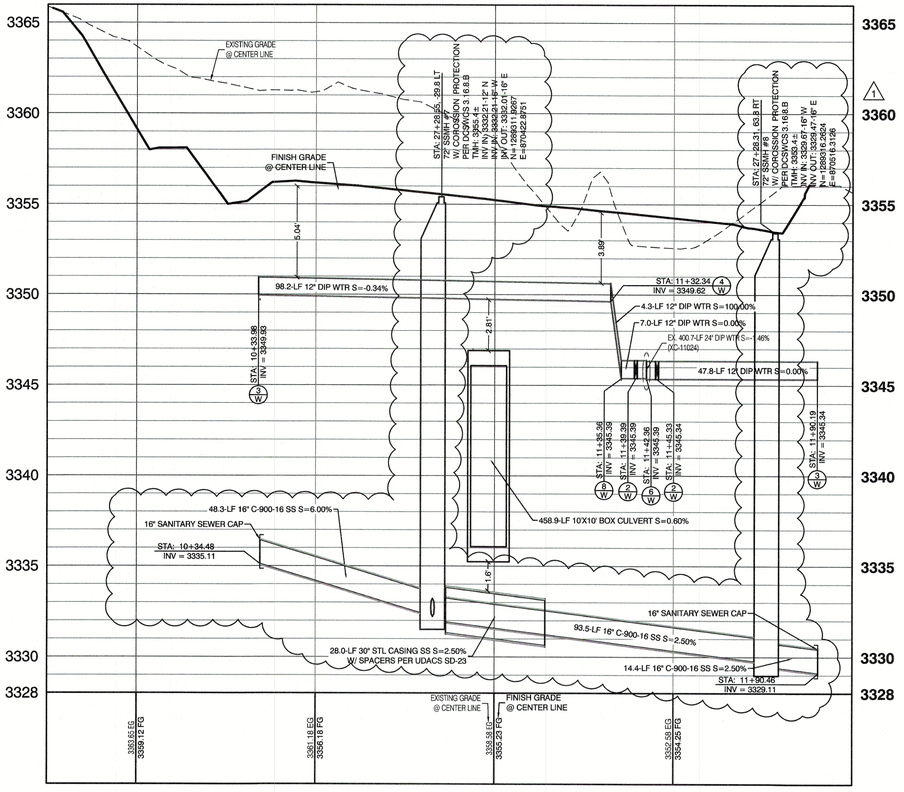
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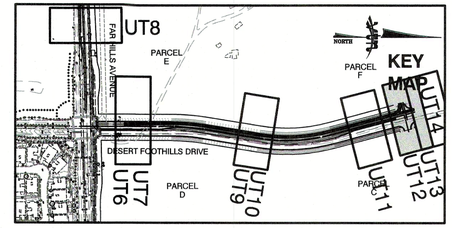
107V7501



PROFILE SCALES:
HORIZ. = 1"=20'
VERT. = 1"=4'







CONSTRUCTION NOTES

WATER

		PUBLIC
1 W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41)	4 EA.
2 W	12" GATE VALVE (PER UDACS PLATE 30 & 39)	5 EA.
3 W	12" CAP & BLOW OFF(PER UDACS PLATE 36)	5 EA.
4 W	24"X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	5 EA.
5 W	12" 45° VERTICAL BEND (W/ RESTRAINTS)	2 EA.
6 W	12" 45° BEND (W/ RESTRAINTS)	2 EA.
7 W	1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" METER PER UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #8 PER DETAIL ON SHEET DT1	2 EA.
	6" C-900-16 WATER LATERAL PER UDACS 2.06.01 & PLATE 17	170 LF.
	12" DIP WATER PER UDACS 2.06.03 & PLATE 17	358 LF.
POC	WATER POINT OF CONNECTION	

SEWER

S	STANDARD MANHOLE PER SD-1A & 1B W/ SINGLE 24" LID	7 EA.
	8" C-900-16 SANITARY SEWER MAIN	100 LF.
	12" C-900-16 SANITARY SEWER MAIN	780 LF.
	16" C-900-16 SANITARY SEWER MAIN	156 LF.
	8" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
	12" SDR-35 PVC SANITARY SEWER MAIN	1 EA.
	16" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
SPOC	SEWER POINT OF CONNECTION	

EASEMENT REFERENCE LEGEND

1 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

RESTRAINTS NOTE:

ALL FITTINGS AND JOINT ON 12 INCH DIP TO BE RESTRAINED.

SEWER CONNECTION NOTE

ONE OR MORE SEGMENTS OF THE DOWNSTREAM SEWER SYSTEM THAT WILL SERVE THIS PROJECT HAS NOT BEEN COMPLETED AND/OR ACCEPTED FOR MAINTENANCE BY THE CITY OF LAS VEGAS. ANY WORK DONE ON THIS PROJECT PRIOR TO THE COMPLETION AND/OR ACCEPTANCE OF THE DOWNSTREAM SEWER SYSTEM(S) SHALL BE DONE AT THE DEVELOPERS OWN RISK. THE CITY OF LAS VEGAS RESERVES THE RIGHT TO PREVENT THE PHYSICAL CONNECTION OF THIS PROJECT INTO THE DOWNSTREAM SEWER SYSTEM UNTIL ALL SEGMENTS HAVE BEEN COMPLETED AND ACCEPTED FOR MAINTENANCE, OR UNTIL SUCH TIME AS THEY ARE DEEMED AVAILABLE FOR SERVICE.

LVVWD EXISTING FACILITIES NOTE:

PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:

ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATERLINE TRENCH NOTE:

CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE

INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

FIRE HYDRANT MARKER NOTES

BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKERS ARE TO BE INSTALLED:

1. ON ROADWAYS WITH NO PARKING PERMITTED ON HYDRANT SIDE; LOCATE MAKER 8' FROM FACE OF CURB ON HYDRANT SIDE.
2. ON ROADWAYS WITH PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 16' FROM FACE OF CURB ON HYDRANT SIDE.

WATER MAIN JOINT DEFLECTION

PVC PIPE SHALL BE DEFLECTED AT THE JOINT ONLY. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE ONE (1) DEGREE PER JOINT WITH A MINIMUM RADIUS OF CURVATURE OF 1,150 FEET, PER UDACS 2.07.01 AND 2.07.02.

FOR CHANGES IN DIRECTION EXCEEDING THE MAXIMUM ALLOWABLE JOINT DEFLECTION, FITTINGS SHALL BE USED.

UTILITY CROSSING NOTE:

ALL SEWER/STORM DRAINS CROSSING WATER LINES MUST CONFORM TO SECTION 2.22 OF UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR PORTABL WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.

ENGINEER DISCLAIMER NOTE:

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LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1500 GPM AT 20 P.S.I. RESIDUAL.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM

LVVWD NOTE:

CONTRACTOR SHALL SUBMIT STRUCTURAL CALCULATIONS PREPARED BY A NEVADA LICENSED STRUCTURAL ENGINEER FOR CROSSINGS WITH WATER WHERE THE TRENCH IS SIX (6) FEET OR GREATER. CONTACT ENGINEERING SERVICES FOR INDICATIONS ON PACKAGE SUBMITTAL. PIPE SUPPORT PLANS MUST BE SUBMITTED A MINIMUM OF 30 DAYS PRIOR TO COMMENCEMENT OF WORK. PIPE SUPPORTS FOR TRANSMISSION MAINS (24-INCH AND LARGER) WILL BE LIMITED TO A MAXIMUM OF 1 WEEK. A SCHEDULE OF WATER MAINS SUPPORTED MUST BE PROVIDED TO LVVWD ENGINEERING SERVICES.

LVVWD NOTE:

IN AREAS WHERE THE EXCAVATION OR GROUND ELEVATION IS LESS THAN THREE (3) FEET, FROM THE TOP OF THE LVVWD TRANSMISSION MAIN, NO EXCAVATION EQUIPMENT, OTHER THAN HAND HELD EQUIPMENT WILL BE ALLOWED WITHIN TEN (10) FEET OF THE PIPELINE IN THESE AREAS. THE CONTRACTOR IS TO PLACE A CONCRETE BARRIER; I.E. JERSEY RAIL, TO IDENTIFY AND PROTECT THE 'NO EQUIPMENT ZONE'.

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

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-227-2600 AND 1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL AND ITS CLARK COUNTY TRAFFIC OPERATIONS SYSTEM CABLE(S)! IT'S COSTLY.
Call before you Underground
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-229-6611
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

REV	DATE	BY	REVISION
1	01/10/2019	BCC	SANITARY SEWER AND STORM DRAIN LOCATION CHANGE
2	02/12/2018	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL
			REMOVED HEADWALL ADDED INTERSECTION INFORMATION
			REVISED HGLS & SD PIPE FROM 48" TO 54" PER REVISION 1

HOWARD HUGHES COMPANY, LLC
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10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

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LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7550 FAX: (702) 362-2597 WEB WWW.VTNNV.COM
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UTILITY PLAN & PROFILE 13
WATER & SEWER LATERALS

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY: BCC	06/18/2018
DESIGNED BY: DEH	06/18/2018
CHECKED BY: WJM	02/12/2018
PROJECT NO: 7951	SCALE: HORIZ. 1"=20' VERT. 1"=4'

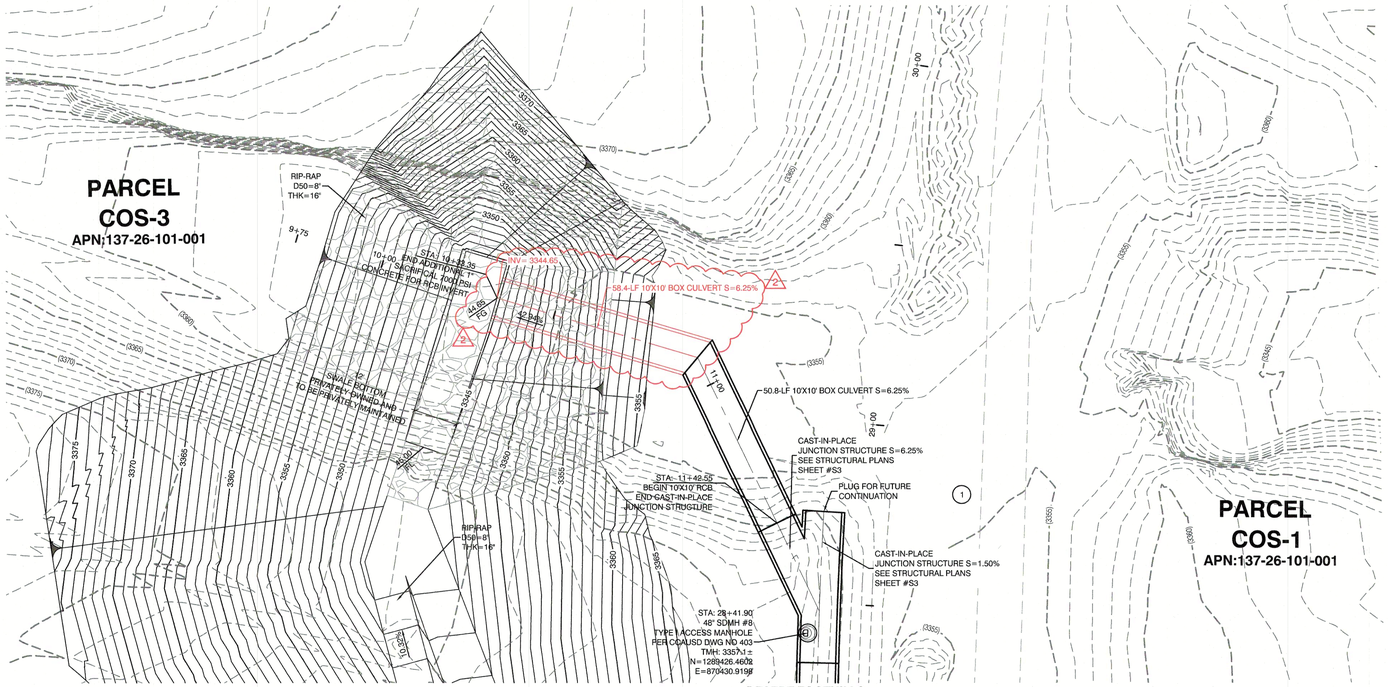
PROFESSIONAL ENGINEER STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
No. 15745
2/12/19

SHEET
UT13
28 OF 37 SHEETS

DRAWING NO.
L18-01896

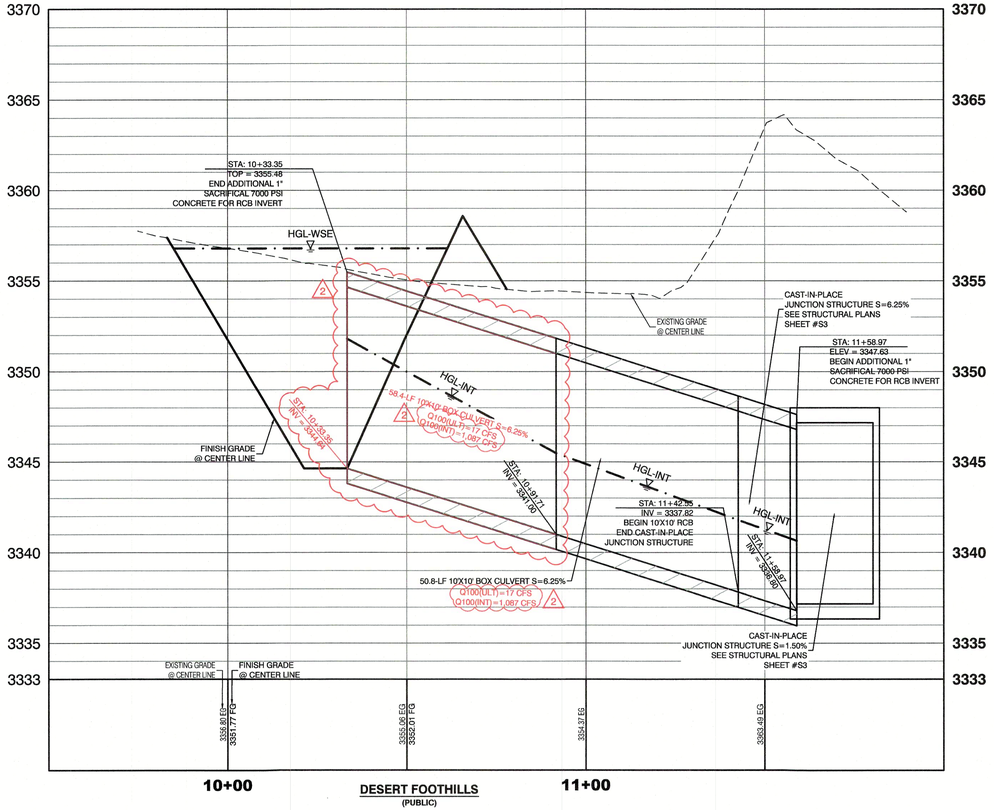
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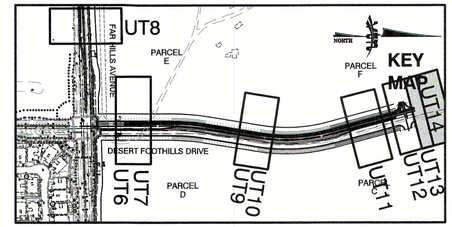
107V7501



PROFILE SCALES:

HORIZ. = 1"=20'
VERT. = 1"=4'





NORTH

GRAPHIC SCALE

40 0 20 40 80

1" = 40 '

CONSTRUCTION NOTES

	WATER	PUBLIC
W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41)	4 EA.
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W	24"X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	5 EA.
W	12" 45° VERTICAL BEND (W/ RESTRAINTS)	2 EA.
W	12" 45° BEND (W/ RESTRAINTS)	2 EA.
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	16" C-900-16 SANITARY SEWER MAIN	156 LF.
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	16" SDR-35 PVC SANITARY SEWER MAIN	2 EA.
POC	SEWER POINT OF CONNECTION	

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401.

OFFSITE FLOOD CONTROL NOTE:

ALL OFFSITE INTERIM FLOOD CONTROL FACILITIES SUCH AS BUT NOT LIMITED TO BERMS/DITCHES AND TEMPORARY SUMPS ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOWARD HUGHES COMPANY.

LVVWD EXISTING FACILITIES NOTE:

PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE PER UDACS. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:

ALL NEW WATER MAIN TO HAVE MINIMUM DEPTH OF COVER PER UDACS SECTION 2.08

WATERLINE TRENCH NOTE:

CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

WATER LINE MARKER BALLS NOTE

INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE No. 15

FIRE HYDRANT MARKER NOTES

BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKERS ARE TO BE INSTALLED:

1. ON ROADWAYS WITH NO PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 8' FROM FACE OF CURB ON HYDRANT SIDE.
2. ON ROADWAYS WITH PARKING PERMITTED ON HYDRANT SIDE; LOCATE MARKER 16' FROM FACE OF CURB ON HYDRANT SIDE.

WATER MAIN JOINT DEFLECTION

PVC PIPE SHALL BE DEFLECTED AT THE JOINT ONLY. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE ONE (1) DEGREE PER JOINT WITH A MINIMUM RADIUS OF CURVATURE OF 1,150 FEET, PER UDACS 2.07.01 AND 2.07.02.

FOR CHANGES IN DIRECTION EXCEEDING THE MAXIMUM ALLOWABLE JOINT DEFLECTION, FITTINGS SHALL BE USED.

UTILITY CROSSING NOTE:

ALL SEWER/STORM DRAINS CROSSING WATER LINES MUST CONFORM TO SECTION 2.22 OF UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR PORTABL WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.

ENGINEER DISCLAIMER NOTE:

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

LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1500 GPM AT 20 P.S.I. RESIDUAL

APPROVED FOR CONSTRUCTION

_____
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:135582 FIRST APPROVED DATE:_____

LVVWD APPROVED FIRE FLOW: TOTAL 1500 GPM/ONSITE N/A GPM

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

Call before you Dig
Avoid cutting underground utility lines. It's costly.
DIAL 811
OR
1-800-227-2600
AND
1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL AND STREET LIGHT SYSTEM CONDUITS. IT'S COSTLY.
Call before you Underground
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
OR
1-702-229-6611
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

REV	DATE	BY	REVISION
2	02/12/2019	BCC	REVERSED FLOW DIRECTION OF TEMPORARY CHANNEL REMOVED HEADWALL, ADDED INTERSECTION INFORMATION REVISED HGLS & SD PIPE FROM 48" TO 54" PER REVISION 1

CITY OF LAS VEGAS

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W CHARLESTON BLVD SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7500 FAX (702) 362-2697 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY PLAN & PROFILE 14
STORM DRAIN LATERAL

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT DRIVE

DRAWN BY: BCC	06/18/2018
DESIGNED BY: DEH	06/18/2018
CHECKED BY: WJM	02/12/2019
PROJECT NO: 7851	SCALE: HORIZ. 1"=20' VERT. 1"=4'

PROFESSIONAL ENGINEER · STATE OF NEVADA · WILLIAM J. MEYER · EXP: 12/31/19 · CIVIL · No. 15745

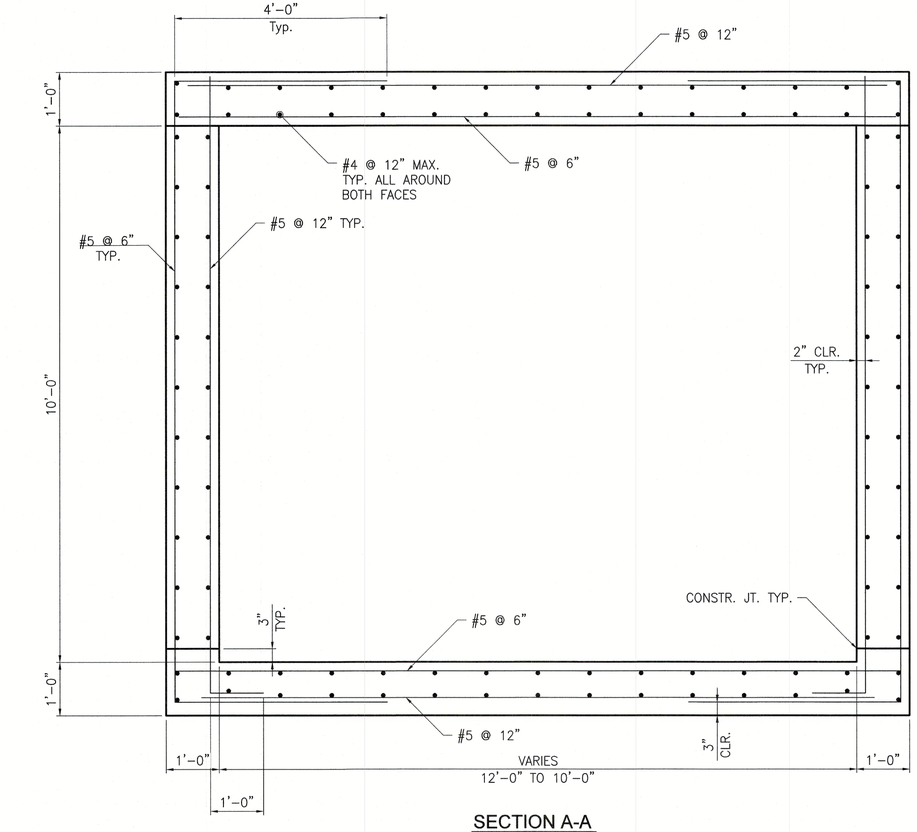
2/12/19

SHEET
UT14
29 OF 37 SHEETS

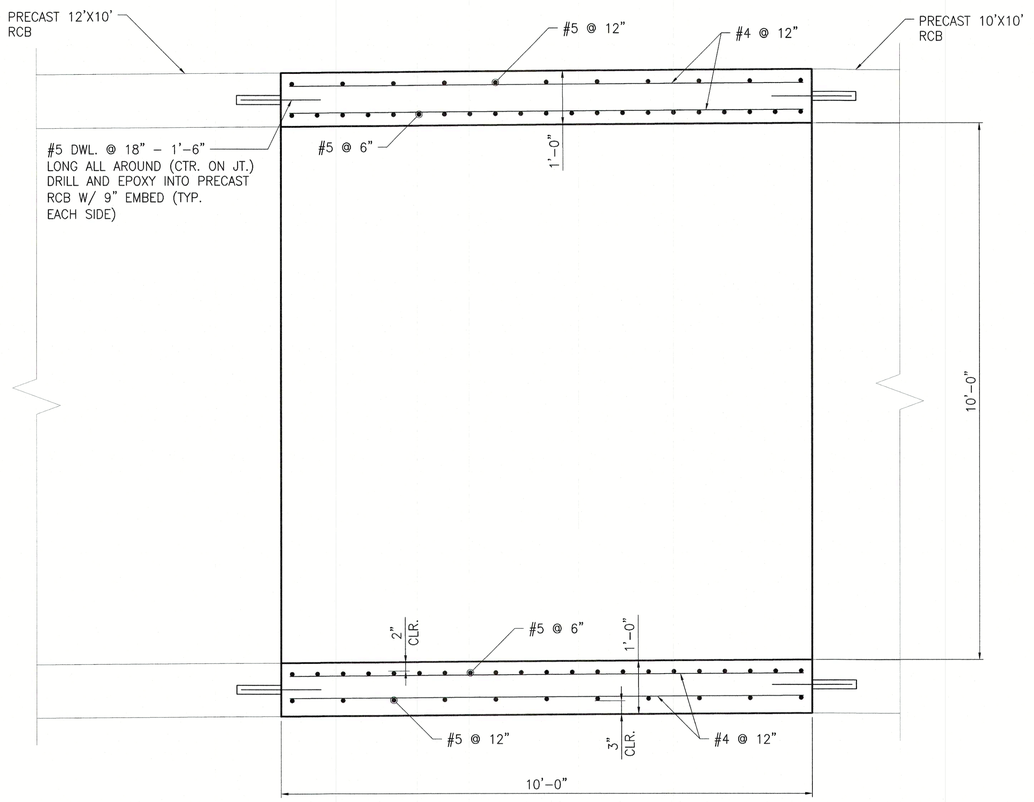
DRAWING NO.
L18-01896

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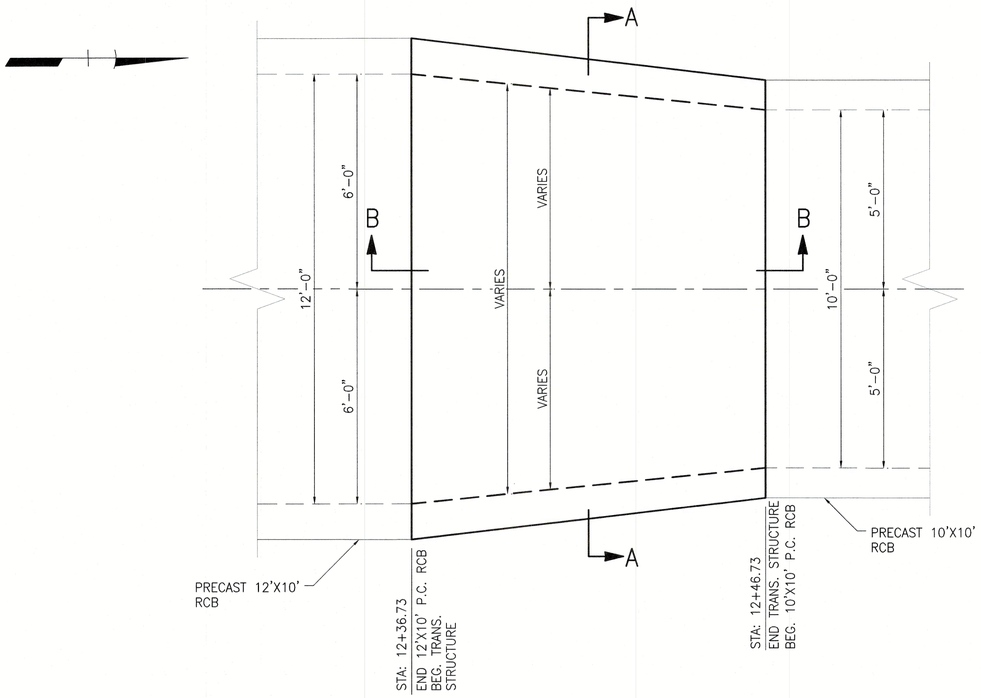
107V7501



SECTION A-A



SECTION B-B



PARTIAL PLAN

(NOTE: DESIGN COVER=7')

GENERAL STRUCTURAL NOTES

1. DESIGN SPECIFICATIONS: AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS, 7TH. EDITION, 2017
2. CONSTRUCTION SPECIFICATIONS: STATE OF NEVADA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2014" EXCEPT AS NOTED BELOW AND IN THE SPECIAL PROVISIONS FOR THIS CONTRACT.
3. DESIGN LIVE LOAD IS AASHTO HL–93
4. PORTLAND CEMENT SHALL CONFORM TO ASTM C–150, TYPE V AGGREGATE SHALL CONFORM TO ASTM C–33
5. ALL STRUCTURAL CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4500 PSI AT 28 DAYS.
6. ALL REINFORCEMENT STEEL SHALL BE ASTM DESIGNATION A615 GRADE 60.
7. COVERAGE FOR REINFORCING BARS, EXCEPT WHERE OTHERWISE SHOWN, SHALL BE: 3" FOR CONCRETE PLACED AGAINST EARTH; 2" FOR OTHERS.
8. USE 3/4" CHAMFER ON ALL EXPOSED CORNERS.
9. PRECAST RCB WALL AND SLAB THICKNESSES ARE ASSUMED. CONTRACTOR SHALL VERIFY ACTUAL RCB THICKNESSES.

REV	DATE	BY	REVISION

CITY OF LAS VEGAS

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
3930 HOWARD HUGHES PARKWAY, 5TH FLOOR, SUITE 500
LAS VEGAS, NEVADA 89169
702-791-4000

HORROCKS ENGINEERS
1401 N. GREEN VALLEY PARKWAY, STE. 180
HENDERSON, NV 89074
PH. (702) 968-4093 WEB WWW.HORROCKSENGINEERS.COM

TRANSITION STRUCTURE 12' x 10' to 10' x 10'

SUMMERLIN WEST VILLAGE 21 DESERT FOOTHILLS DRIVE FARHILLS TO STREET A

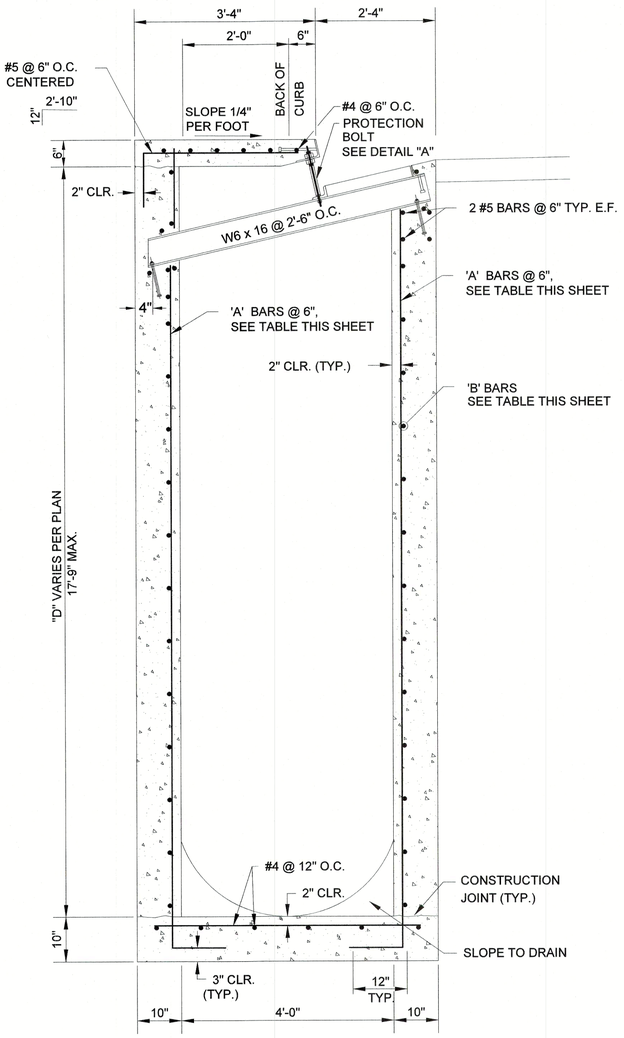
DRAWN BY: AF	01-28-19		
DESIGNED BY: PLK	01-28-19		
CHECKED BY: DAA	01-28-19	SCALE:	1"=1'-0" HORIZ. 1"=1'-0" VERT.
PROJECT NO: NV-1317-1808			

PROFESSIONAL ENGINEER STATE OF NEVADA
PEGGY KNOTT
EXP. 6/30/19
CIVIL
No. 7374
01/28/2019

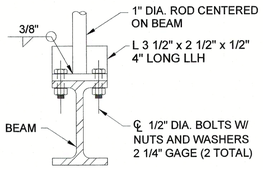
SHEET
S1
34 OF 37 SHEETS

DRAWING NO.

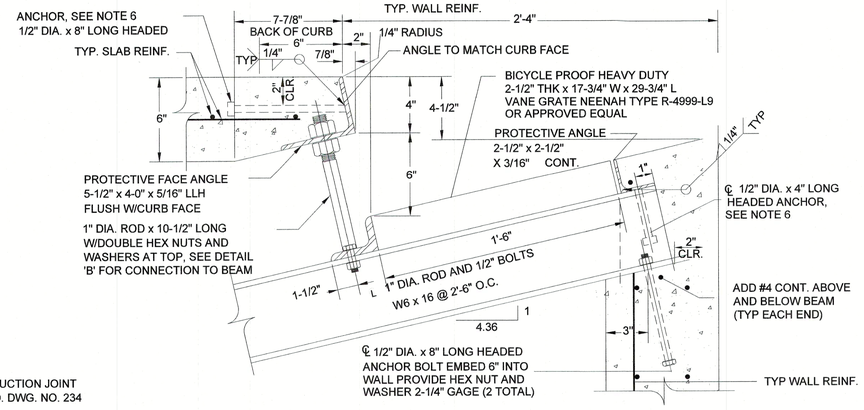
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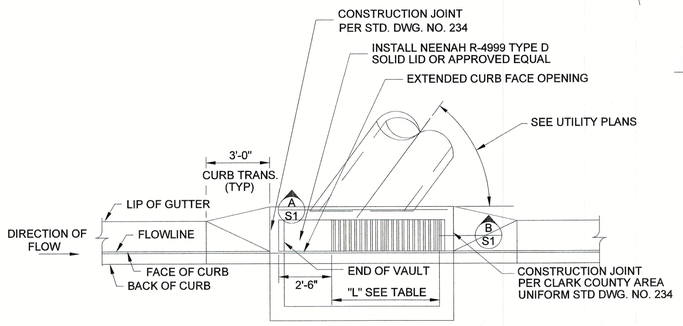
TYPE C MODIFIED DROP INLET SECTION



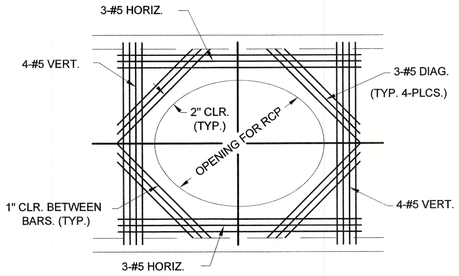
DETAIL "B"



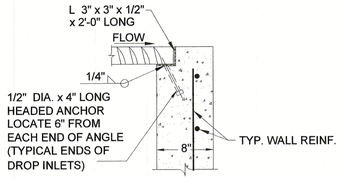
PROTECTIVE FACE & ROD - DETAIL "A"



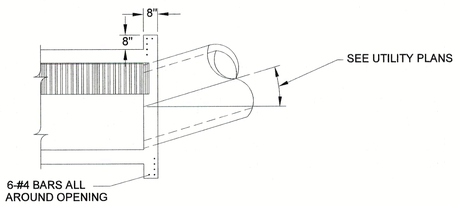
DROP INLET LAYOUT PLAN



SECTION "A"



SECTION "B"



ALTERNATE CONNECTION DETAIL

Station of Drop Inlet	TMH	INV. ELEV.	D	'A' BARS VERTICAL	'B' BARS HORIZONTAL	L
10+96.04 LEFT	3345.6	3333.56	12'-0 ½"	# 5	# 4 @ 12"	5'
12+40.30 LEFT	3345.2±	3327.5	17'-8 ½"	# 4	# 5 @ 6"	15'
12+57.40 RIGHT	3344.3±	3328.39	15'-11"	# 4	# 5 @ 6"	15'
19+20.20 LEFT	3349.3±	3332.87	16'-5"	# 4	# 5 @ 6"	15'
19+20.70 RIGHT	3349.3±	3338.76	10'-6 ½"	# 5	# 4 @ 12"	5'
25+00 LEFT	3352.8±	3337.63	15'-2"	# 4	# 5 @ 6"	5'
25+00 RIGHT	3352.8±	3337.17	15'-7 ½"	# 4	# 5 @ 6"	5'

NOTE: WALLS WITH D OVER 15' WERE DESIGNED WITH THE MAIN FLEXURAL REINFORCEMENT IN THE HORIZONTAL DIRECTION

NOTES:

1. ALL EXPOSED METALS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
2. PROVIDE 1/2" (MIN.) CLEARANCE ALL AROUND THE STEEL BEAM, DRY PACK AFTER INSTALLATION.
3. WHEN REQUIRED BY LENGTH OF OPENING, PLATE ANGLE MAY BE DELIVERED IN SECTIONS AND BUTT WELDED IN PLACE.
4. ALL GALVANIZED DAMAGED BY WELDING SHALL RECEIVE TWO COATS OF GALVALLOY OR EQUAL.
5. CONCRETE SHALL BE MODIFIED CLASS DA 4000 PSI
6. ANGLE ANCHORS SHALL BE EMBEDDED MIDPOINT IN EACH ENDWALL AND EVENLY SPACED, (MAXIMUM SPACING OF 2').

REVISION | BY | DATE | REV

CITY OF LAS VEGAS

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10801 W. CHARLESTON BLVD., SUITE 500
LAS VEGAS, NEVADA 89135
702-791-4000

HORROCKS ENGINEERS
1401 N. GREEN VALLEY PARKWAY, STE. 160
HENDERSON, NV 89074
PH. (702) 966-4083 WEB WWW.HORROCKSENGINEERS.COM

SPECIAL TYPE C
MODIFIED DROP INLETS

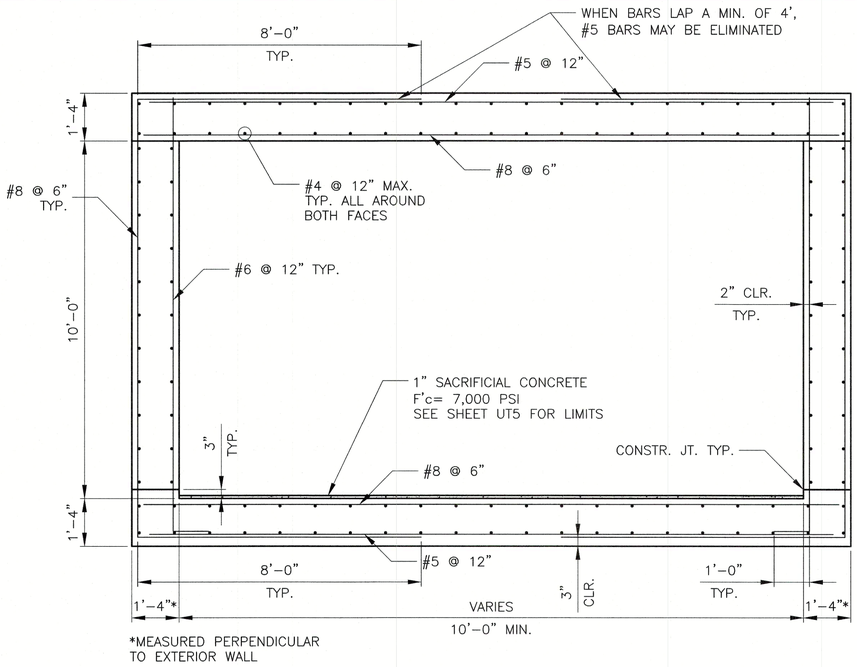
SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FAR HILLS TO REDPOINT

DRAWN BY: AF — 01-28-19
DESIGNED BY: PJK — 01-28-19
CHECKED BY: DIA — 01-28-19
SCALE: 1"=1'-0" HORIZ. 1"=1'-0" VERT.
PROJECT NO: NV-1317-1408

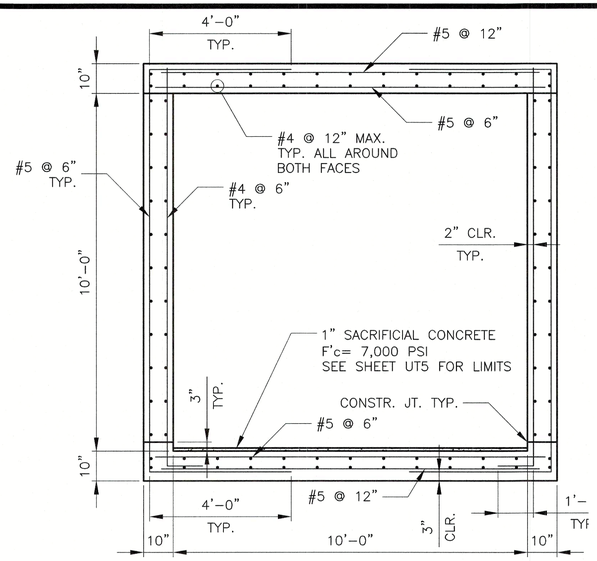
PEGGY KNOTT
EXP. 6/30/19
CIVIL
No. 7374
STATE OF NEVADA
PROFESSIONAL ENGINEER
01/28/2019

SHEET
S2
35 OF 37 SHEETS
DRAWING NO.

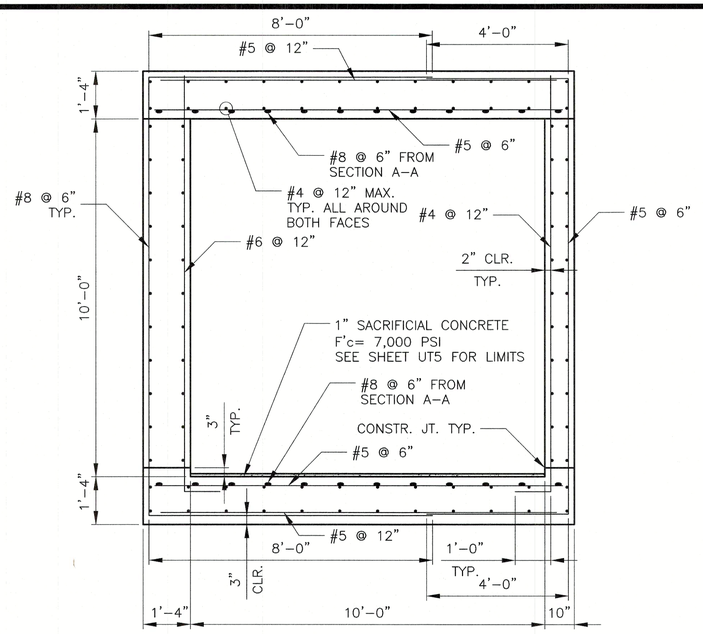
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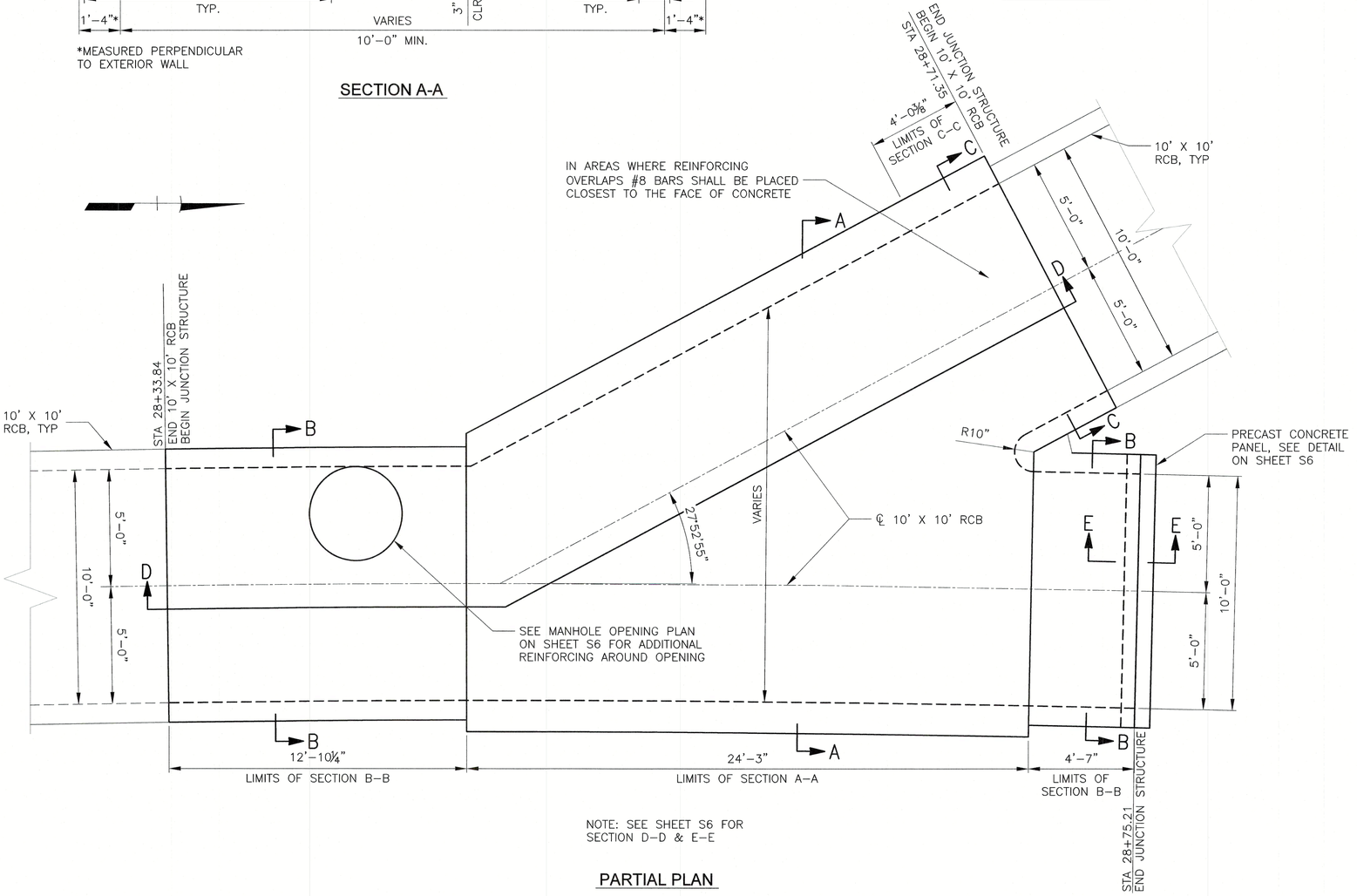
SECTION A-A



SECTION B-B



SECTION C-C



NOTE: SEE SHEET S6 FOR SECTION D-D & E-E

PARTIAL PLAN

GENERAL STRUCTURAL NOTES

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REV	DATE	BY	REVISION

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
1980 FESTIVAL PLAZA DRIVE, SUITE 300
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

HORROCKS ENGINEERS
1401 N. GREEN VALLEY PARKWAY, STE. 180
HENDERSON, NV 89074
PH. (702) 998-4063 WEB WWW.HORROCKSENGINEERS.COM

JUNCTION STRUCTURE 1 OF 2

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FARHILLS TO REDPOINT DRIVE

DRAWN BY:	DESIGNED BY:	CHECKED BY:	PROJECT NO:
AF	PLK	NJW	NV-1317-1808
01-28-19	01-28-19	01-28-19	

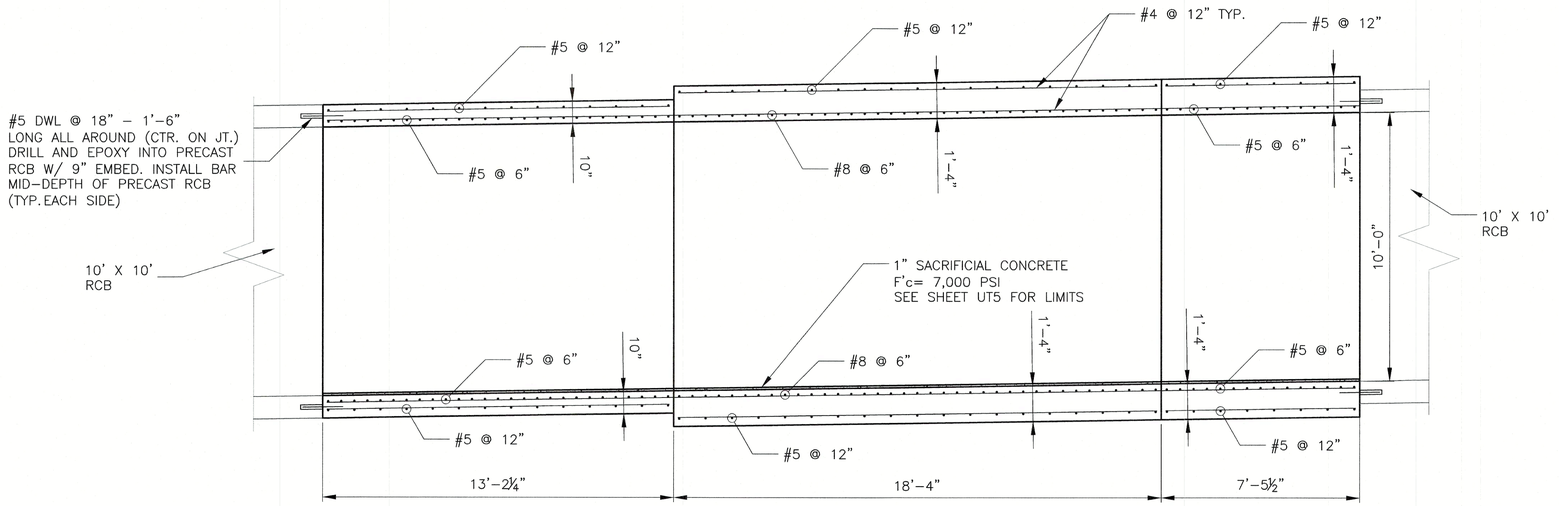
SCALE: HORZ: N.T.S. VERT: N.T.S.

PROFESSIONAL ENGINEER STATE OF NEVADA
PEGGY KNOTT
EXP. 6/30/19
CIVIL
No. 7374
01/28/2019

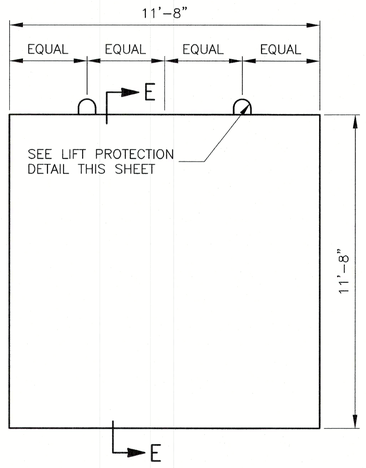
SHEET
S3
36 OF **37** SHEETS

DRAWING NO.

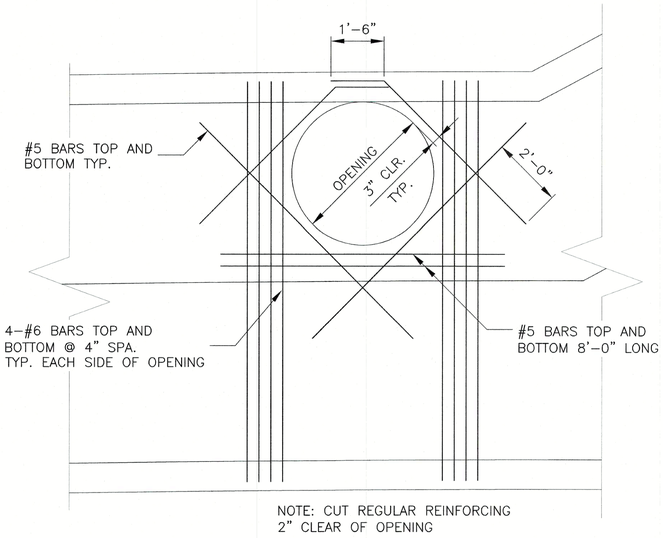
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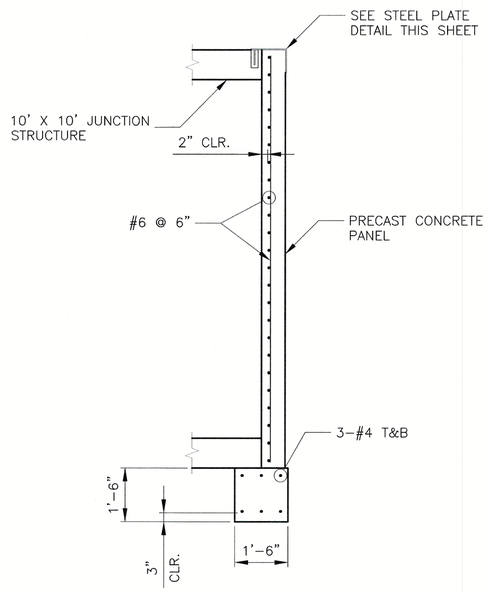
SECTION D-D



PRECAST CONCRETE PANEL DETAIL

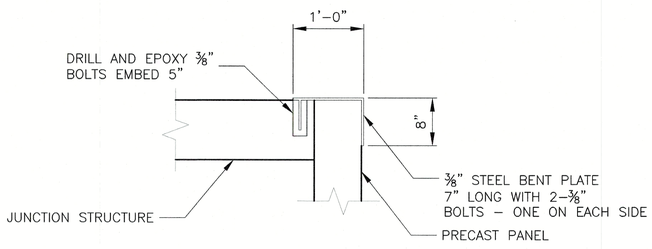


MANHOLE OPENING PLAN

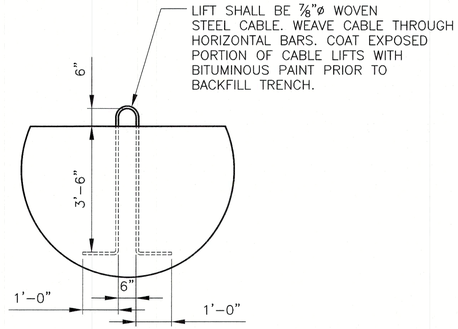


NOTE: MINIMUM COMPRESSIVE CONCRETE STRENGTH FOR PRECAST CONCRETE SHALL BE 5,000 PSI

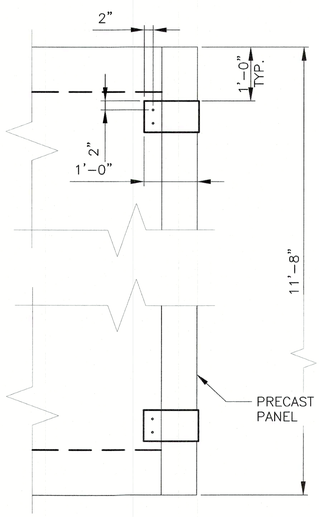
SECTION E-E



STEEL PLATE DETAIL



LIFT PROTECTION



STEEL PLATE PLAN

REV	DATE	BY	REVISION

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
1980 FESTIVAL PLAZA DRIVE, 3RD FLOOR
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

HORROCKS ENGINEERS
1401 N. GREEN VALLEY PARKWAY, STE. 160
HENDERSON, NV 89074
PH. (702) 990-4063 WEB WWW.HORROCKSENGINEERS.COM

JUNCTION STRUCTURE
2 OF 2

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
FARHILLS TO REDPOINT DRIVE

DRAWN BY: AF	01-28-19	SCALE:	HORIZ. N.T.S
DESIGNED BY: PLK	01-28-19		VERT. N.T.S
CHECKED BY: CAW	01-28-19		
PROJECT NO: NV-1317-1808			

PROFESSIONAL ENGINEER PEGGY KNOTT EXP. 6/30/19 CIVIL No. 7374 STATE OF NEVADA
01/28/2019

SHEET
S4
37 OF 37 SHEETS
DRAWING NO.

DRAWINGNAME