

DS #:

5421

APN:

137-23-210.001

PROJECT:

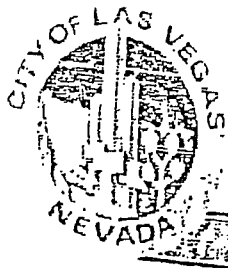
Summit West Village 22. Flight Range Ave (St. E)

SUBMITTAL:

1st

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		February 23, 2021
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:	COPIES TO:
Summerlin West Village 22 - Flight Range Avenue (St. E) (Desert Foothills Dr. to Kettle Ridge Dr.)		Atkins
Cross Streets:	Desert Foothills Drive & Flight Range Avenue	Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5421A.doc	Bart Anderson, P.E., DevCo
Parcel Number:	137-23-210-001	
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 #
1 st Submittal	2/3/2021	2/23/2021	See Comments Below	\$400.00	4157978: \$400
TOTAL FEES (LDDRS):				\$400.00	----

REMARKS:

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

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

1. The subject project is based on the premise that the upstream *Kettle Ridge Drive* and the downstream *Desert Foothill Drive* and the associated storm drain facilities are in place for flood protection. The subject drainage study will not be finally approved prior to the posting of the construction bonds of *Summerlin West Village 22 – Kettle Ridge Drive (Sunset Run to Kindle Rise)* and *Summerlin West Village 22 – Desert Foothill Drive (Sunset Run to Fleet Wing)*.
2. The project proposed to construct temporary drainage facilities including drainage berms/ditches along both sides of the proposed improvements. Prior to the final plans approval, the developer must complete a **Maintenance & Liability Agreement** for the interim drainage improvements and post a minimum maintenance bond of \$50,000 or 50-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for constructing the facilities and an exhibit that adequately shows the location and limits of the drainage facilities to *City Flood Control* for approval. Once the drainage study is conditionally approved, the engineer/developer should contact the *City's Land Development Section (702-229-6371)* to begin the agreement process.

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

3. Per **Table 6** in the subject *Study*, either it is typo error or the downstream system that the *Flight Range Avenue* system is connecting to is already surcharged and the HGL is well above the proposed ground. Therefore, the downstream system is not adequate to collect the flow from the proposed system. Address and revise accordingly in the next submittal.
4. The HGL shown on the Plan and Profile sheets does not appear to match the HGL provided in the WSPG.
5. *Storm Drain Construction Note #7* proposed to install Type A drop inlet which is not allowed by the **City of Las Vegas** anymore. Use modified Type CM. Review and revise in the next submittal.
6. Provide connection detail for the proposed main line 36"-RCP to the existing 36"-RCP in *Flight Range Avenue*.
7. All storm drain inlets that are more than 10'-deep require a special structural detail and calculations. Submit structural design and calculations to *City Building & Safety Department* for review and approval prior to the final approval of the drainage study.

Label clearly the depth of all proposed drop inlets on all pertinent plans. The aforementioned *Building & Safety Department* review requirement may be waived in the next submittal after the inlet depth information is confirmed.

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

END OF REMARKS
HDR/AYS

T/R/S: T20S/R59E/23
AREA K-23

Summerlin West Village 22

Flight Range Avenue (Street E):
Desert Foothills Drive to Kettle Ridge Drive
(Street J)

February 2021

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Flight Range Avenue (Street E): Desert Foothills Drive to Kettle Ridge Drive (Street J) Date: February 2021

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

East/West: Flight Edge Way

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

c) APN : 137-23-210-001

Name of Owner: Howard Hughes Company, LLC

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

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

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

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

Firm: Atkins

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

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: +/- 446 acres Being Developed/Disturbed: 5.26 acres

2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ Yes** ☒ No

3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? Yes** ☒ No

4. Proposed type of development (Residential, Commercial, Etc.): Public - Roadway Improvements

5. Approximate upstream land area which drains to the subject site: 0 acres

6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: Master Conceptual Drainage Study for Summerlin West Village 22 Update #2

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Existing CC-215 Western Beltway Channel

8. Briefly describe your proposed schedule for the subject project: ASAP

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

Engineer's Seal

Local Entity File No.

REFERENCE:

STANDARD FORM 1

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Flight Range Avenue: Desert Foothills Drive to Kettle Ridge Drive

Map ID:

Firm Name: **Atkins**

Engineer: **Molly Anderson, PE**

Address: **2270 Corporate Circle, Ste 200**

City: **Henderson**

State:

NV

Zip: **89074**

Phone Number: **(702) 551-0330**

Fax Number: **(702) 263-7200**

Property Owner: **Howard Hughes Company, LLC**

Address: **10801 West Charleston Blvd, Ste 300**

City: **Las Vegas**

State: **NV**

Zip: **89135**

Reviewed By:

Date Received:

Date Accepted for Review:

The following checklist is intended as a guide for the engineer preparing a Technical Drainage Study to submit to the local entity and Clark County Regional Flood Control District (if necessary). The listed items are the minimum information required prior to the entity performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (MANUAL).

This document is intended as an aid in preparing Technical Drainage Studies. Each study submitted is reviewed for compliance with local and regional criteria. This form is not intended to be all inclusive and does not limit the extent of the information, calculations or exhibits which may be necessary to properly evaluate the intended land use.

If items are not applicable for the subject site, provide N/A.

I. GENERAL REQUIREMENT

Yes

No

 x

Design Manual **Standard Form 1** with the engineer's seal and signature.

 X

Design Manual **Standard Form 4**.

 X

2 copies of the 24" x 36" Drainage Plan.

 N/A

A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.

II. MAPS AND EXHIBITS

Yes

No

 X

A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.

 X

A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

Yes	No	
<u>X</u>	<u> </u>	Off-site drainage basin maps for existing, interim and future conditions showing the existing topography, basin boundaries, concentration points, and flows in cfs.
<u>X</u>	<u> </u>	On-site drainage basin maps for existing and proposed conditions showing the existing topography, basin boundaries, concentration points, and on-site and off-site flows in cfs.
<u>X</u>	<u> </u>	Vicinity Map with local and major cross streets identified and a north arrow.

III. DRAINAGE PLAN

Yes	No	
<u>X</u>	<u> </u>	Sheet size: 24" x 36" sealed by a registered engineer in the State of Nevada.
<u>X</u>	<u> </u>	Minimum scale: 1" = 60'.
<u>X</u>	<u> </u>	Project name.
<u>X</u>	<u> </u>	Vicinity Map with local and major cross streets.
<u>X</u>	<u> </u>	Revision box.
<u>X</u>	<u> </u>	North arrow and bar scale.
<u>X</u>	<u> </u>	Engineer's/consultant's address and phone number.
<u>X</u>	<u> </u>	Elevation datum and benchmark.
<u>X</u>	<u> </u>	Legend for symbols and abbreviations.
<u>X</u>	<u> </u>	Cut/fill scarps, where applicable.
<u>X</u>	<u> </u>	Street names, grades, widths.
<u>X</u>	<u> </u>	Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street.
<u>X</u>	<u> </u>	Existing contours encompassing the site and 100 feet beyond with spot elevations for important locations, where appropriate.
<u>X</u>	<u> </u>	Minimum finish floor elevations with top-of-curb elevations at upstream end of lot.
<u>X</u>	<u> </u>	Proposed typical street sections.

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
<u>X</u>	<u> </u>	Streets with off-set crowns.
<u>X</u>	<u> </u>	Proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns and slopes.
<u>X</u>	<u> </u>	Property lines.
<u>X</u>	<u> </u>	Right-of-way lines and widths, existing and proposed.
<u>X</u>	<u> </u>	Existing improvements and their elevations.
<u>X</u>	<u> </u>	Delineation of proposed on-site drainage basins indicating area and 10-year and 100-year storm peak flows at basin concentration points.
<u>X</u>	<u> </u>	Concentration points and drainage flow direction with Q_{100} and V_{100} and D_{100} in streets.
<u>X</u>	<u> </u>	Cumulative flows, velocity, and direction of flow at upstream and downstream ends of site for the 10-year and 100-year flows.
<u>X</u>	<u> </u>	Location and cross-section of street capacity calculations.
<u>X</u>	<u> </u>	Cross-sectional detail for channels, including cutoff wall locations.
<u>X</u>	<u> </u>	Existing and proposed drainage facilities, appurtenances, and connections (i.e., sidewalk, ditches, swales, storm drain systems, unimproved and improved channels, and culverts, etc.) stating size, material, shape, and slope with plan and profile and HGL calculations.
<u>X</u>	<u> </u>	Existing and proposed drainage easements and widths shown with sufficient detail. A cross sectional detail must be provided that shows appropriate lining and reinforcement.
<u> </u>	<u>N/A</u>	Location and detail of existing, proposed, and future block wall openings. Minimum size is 16" x 48". Wrought iron gate is required for flows > 10 cfs.
<u> </u>	<u>N/A</u>	Location and detail of flood walls illustrating depth of flow, proposed grouting height, etc.
<u> </u>	<u>N/A</u>	Perimeter retaining wall locations. All existing and proposed walls (retaining screen and flood) must be shown with adjacent ground elevations. Flood walls with 8-inch concrete masonry unit.
<u>X</u>	<u> </u>	Building and/or lot numbers.
<u>X</u>	<u> </u>	Alignment of all existing, proposed, or future Regional Facilities adjacent to the site.
<u>X</u>	<u> </u>	Limits of existing floodplain based on current FIRM or best available information; limits of proposed floodplains based on best available information.

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes No

- | | | |
|--------------|---------------|--|
| <u> X </u> | <u> </u> | For areas in Zone A, AE, AH, and AO, base flood elevations (BFEs) must be shown for each lot; BFEs may be listed on each lot, or in a table. Finish floor elevations must be a minimum of 18 inches above BFE. |
| <u> X </u> | <u> </u> | Appropriately elevated "humps" 6 inches above the 100 year water surface elevation at site accesses where the intent is to protect the site from the Q_{100} flows. |
| <u> X </u> | <u> </u> | Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent. |
| <u> X </u> | <u> </u> | Location and detail of best management practice (BMP) for parking lots and low impact development (LID) (if required). |

IV. HYDROLOGIC ANALYSIS

Yes No

- | | | |
|---------------|----------------|--|
| <u> X </u> | <u> </u> | Appropriate soil information and Soils Map for existing and future conditions with subbasins and property delineated. |
| <u> X </u> | <u> </u> | Input and output information for existing conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models. |
| <u> X </u> | <u> </u> | Input and output information for future conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models. |
| <u> X </u> | <u> </u> | Use of correct precipitation values in and around the McCarran Airport rainfall area. |
| <u> X </u> | <u> </u> | A discussion in the text of the hydrologic analysis justifying subbasin boundaries and cutoffs, supporting assumptions, and calculations. |
| <u> X </u> | <u> </u> | A summary table of stormwater flows showing basin area, Q_{10} and Q_{100} for both individual basins and combined basin flows, where applicable. |
| <u> X </u> | <u> </u> | Copies of supporting technical information referenced from a previously approved study and a statement accepting these results. |
| <u> X </u> | <u> </u> | On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners in accordance with current Nevada Drainage Law. |
| <u> </u> | <u> N/A </u> | Calculation for impervious area for parking lots and LIDs (if required). |

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes	No	
☐	<u>N/A</u>	Flow split calculations and supporting documentation or reference for the method of flow split calculations used.
<u>X</u>	☐	Normal depth street flow calculations and cross section diagrams for all interior and perimeter streets. Provide "d x v" products for the Q_{100} and Q_{10} flows representing the worst case for interior and all perimeter streets. $Q_{100} d \times v \leq 8$. $Q_{10} d \times v \leq 6$ and 12 foot dry lane for rights-of-way ≥ 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan.
<u>X</u>	☐	A summary table of interior and exterior street capacity calculations showing the street name, Q_{100} flow, slope, depth of flow, velocity and depth times velocity product and streets needing to meet 12 foot dry lane criteria.
☐	<u>N/A</u>	Appropriate hydraulic calculations for block wall openings assuming a 50 percent vertical clogging factor. (Assume the lower half of the opening is plugged.)
☐	<u>N/A</u>	Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set finish floor elevations. Hydraulic calculations must include submerged weir, superelevation and tee intersection losses, where appropriate.
☐	<u>N/A</u>	Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow or depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Buildings adjacent to drainage easements must always be provided with 18 inches of freeboard above the Q_{100} weir height or flow depth, whichever is greater.
☐	<u>N/A</u>	A complete water surface profile analysis (HEC-2, HEC-RAS, etc.) for channel flows and FEMA Zone A flood zones. • Field survey data. • Input and output information. • Plotted cross-sections based on survey with proper encroachments. • A map showing the location of the cross-sections. • Analysis of both sub and super-critical flow segments. • A summary table and a discussion of the results in the text of the report.
<u>X</u>	☐	Provide a 50 percent clogging factor in the capacity calculation for drop inlets.
<u>X</u>	☐	Hydraulic calculations for culverts and storm drains. D-Load calculations must be provided for storm drain pipes in public rights-of-way, including headwater pool inundation.
<u>X</u>	☐	The mitigation of nuisance water, both during construction and in the fully developed condition, must be addressed.
☐	<u>N/A</u>	Provide BMP type, size and supporting calculations for parking lots and LIDs (if required).

REFERENCE:

STANDARD FORM 2

Engineer's Certification

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

This letter certifies that all items in the **Technical Drainage Study for Flight Range Avenue (Street E): Desert Foothills Drive to Kettle Ridge Drive (Street J)** electronic submittal matches the paper version bound into the study.

Molly M. Anderson, PE (NV #24365)
Senior Engineer

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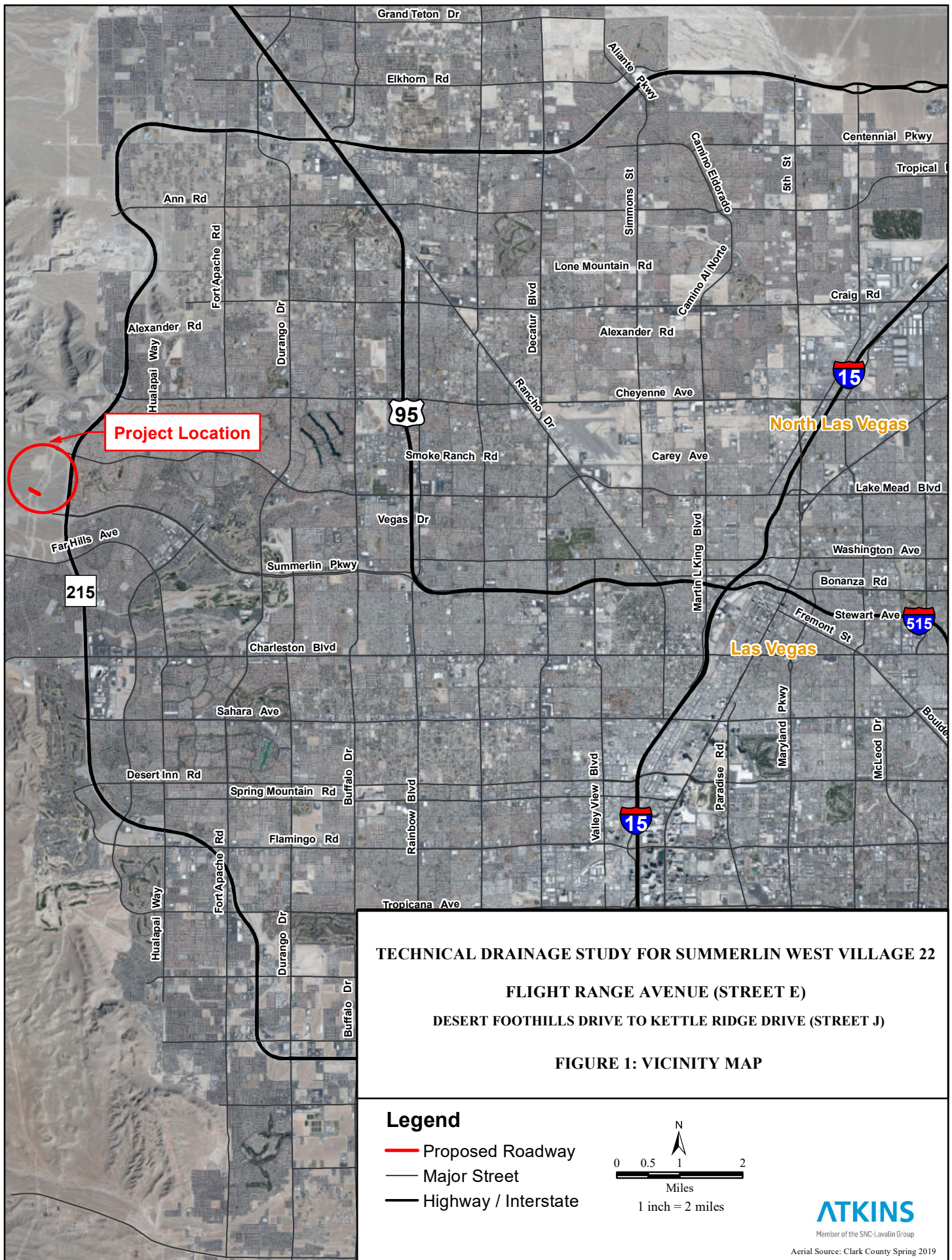
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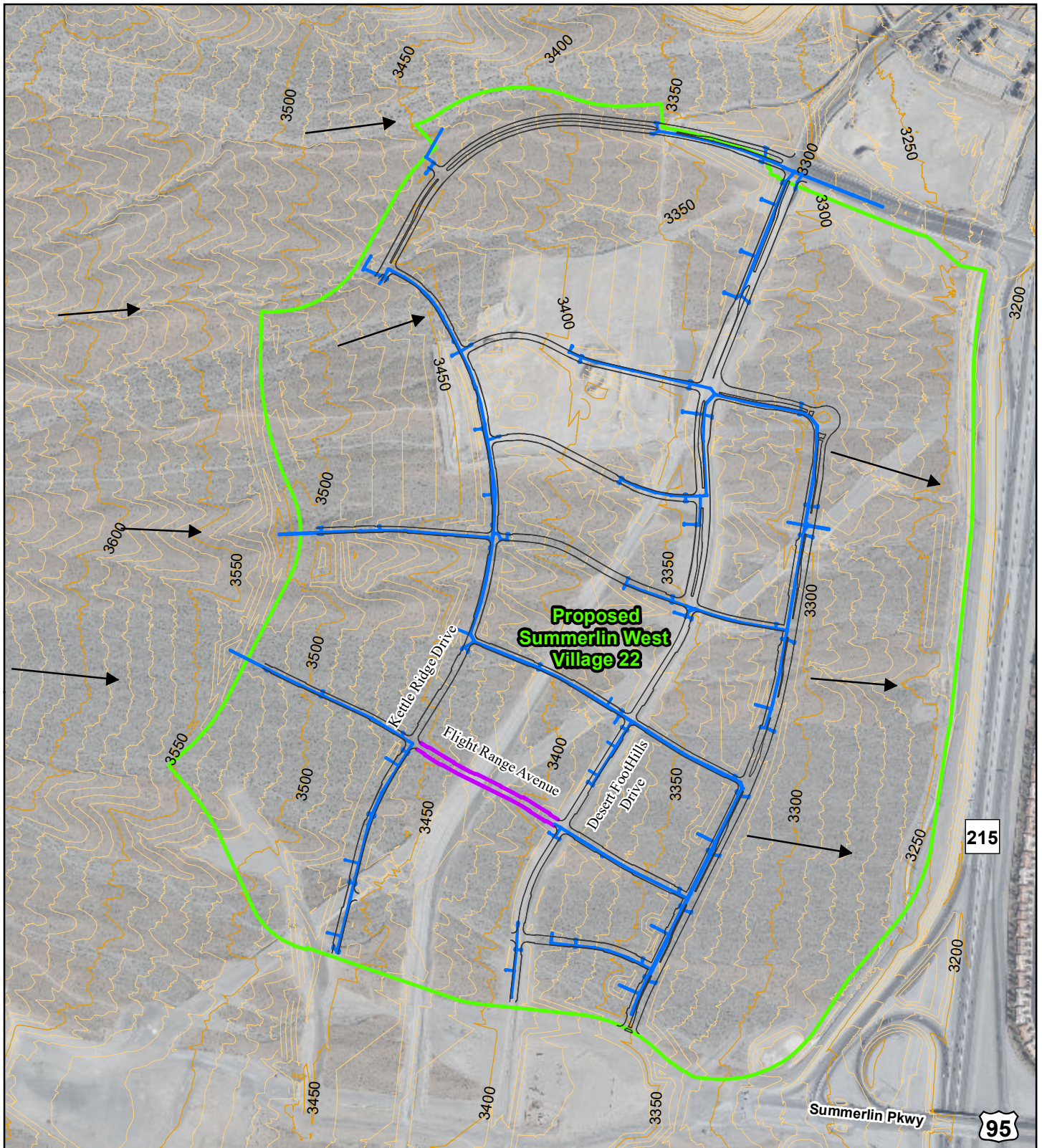
Executive Summary

This Technical Drainage Study (TDS), prepared on behalf of Howard Hughes Company, LLC represents the hydrologic and hydraulic analysis for the Flight Range Avenue (Kettle Ridge Drive to Desert Foothills Drive) roadway improvements of the Summerlin West Village 22 development. Summerlin West Village 22 is located in the northwest Las Vegas Valley west of the CC-215 beltway and is bounded by Lake Mead Boulevard and Summerlin Parkway. A vicinity map is provided in Figure 1. Flight Range Avenue roadway improvements are located between Kettle Ridge Drive and Desert Foothills Drive and are shown on the location map on Figure 2.

A Master Conceptual Drainage Study (MCDS) for Summerlin West Village 22 (W.O. 7861-3A) was approved November 28, 2018. Update #2 of the MCDS was approved January 23, 2020. Portions of this TDS are directly referenced from the MCDS and the relevant information is included in Appendix A.

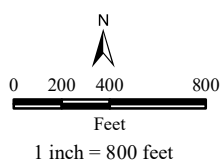






Legend

- Existing Roadway
- Existing Storm Water Facilities
- Proposed Roadway
- Summerlin Village 22 Boundary
- ➔ Existing Flow Direction
- Existing 50' Contours
- Existing 10' Contours



ATKINS
Member of the SNC-Lavalin Group

Aerial Source: Clark County Spring 2019

TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE (STREET E)

DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)

FIGURE 2: EXISTING CONDITIONS SITE MAP

1. Hydrologic Analysis

1.1. Existing Condition

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

In the existing condition, runoff generated by the project and the undeveloped areas west of the project drains east as sheet flow to the Western Beltway Channel. According to the 2002 Conceptual Drainage Study and Western Beltway Study, the existing channel has been designed to accept both the existing and ultimate condition flows from Village 22. The Village 22 site was included in the area previously analyzed in the Western Beltway Study. In addition, the allowable discharge flow rates for the project have been established in the 2017 Summerlin West Planning Area (SWPA) MPU study. Therefore, an additional existing condition hydrologic model was not required as part of this study.

1.2. Interim Condition

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

The proposed Flight Range Avenue improvements will be constructed prior to the development of adjacent onsite parcels (U, T, BB, CC and DD). As a result, an interim condition exists for the proposed improvements. Refer to Figure 3 to see the interim condition in the hydrology workmap.

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

Construction of Kettle Ridge Drive between Kindle Rise Way and Sunset Run Drive is to be completed prior to the interim condition of Flight Range Avenue presented here. Additionally, the construction of Desert Foothills Drive between Fleet Wing Avenue and Sunset Run Drive will also be completed prior to the interim of Flight Range Avenue. The Summerlin Parkway extension (DS#5159) and storm water facilities to the south of Desert Foothills Drive will be an existing condition.

In the interim condition, Subbasin OFF_1 will flow to a drop inlet on Desert Foothills Drive. This inlet has been designed to handle 17 cfs with 30” RCP storm drain in the ultimate condition of the previously approved Desert Foothills TDS (DS#5344). The street flows will be intercepted with six drop inlets in the storm drains along the proposed roadway. The interim hydrology was modeled using HEC-1. The results are summarized in Table 2 and Figure 3.

In the ultimate condition, in addition to the street flows, parcels T, BB and CC will flow into the Flight Range Avenue storm drain. Ultimate conditions hydrology was directly referenced from the approved Village 22 MCDS Update #2.

The proposed Flight Range Avenue storm drain discharges east to the existing 36” RCP storm drain in Desert Foothills Drive. The tailwater elevation for the hydraulic model was taken from the hydraulic grade line (HGL) at the end of stub at SDMH#4 in the Desert Foothills Drive TDS (DS#5159). The sheets that reference the HGL information are included in the reference information in Appendix A.

Table 1 – Village 22 MCDS and TDS Roadway Names

MCDS Street Name	TDS Street Name
Street E	Flight Range Avenue
Street EE	Flight Edge Way
Street F	Kindle Rise Way
Street FF	Hive Bluff Lane
Street G	Fleet Wing Avenue
Street H	Clowder Pass Way
Street I	Kestrel Creek Avenue
Street J	Kettle Ridge Drive
Street L	Bask Ridge Drive
Street N	Scurry Bend Drive
Summerlin Parkway WB/Street Q	Sunset Run Drive
Carriage Hill Drive	Kettle Bend Road

Table 2 – Interim Condition HEC-1 Model Results

Basin ID	Tributary Area (sq mi)	Tributary Area (ac)	100-year Flow (cfs)
OFF_1	0.0090	5.74	17
STE2A	0.0005	0.33	1
STE2B	0.0005	0.33	1
STE2C	0.0006	0.36	1
STE2D	0.0006	0.36	1
STE2E	0.0007	0.47	2
STE2F	0.0007	0.48	1

1.3. Ultimate Condition

The ultimate condition flows were directly referenced from the approved Village 22 MCDS Update #2 as shown in the HEC-1 output and in the Ultimate Condition Basin Map, Figure 6, of Appendix A. Table 3 and Figure 3 summarize the ultimate condition hydrology from the Village 22 MCDS.

Table 3 – Ultimate Condition MCDS Reference Information

Parcel ID	Tributary Area (sq mi)	Tributary Area (ac)	100-year Flow (cfs)
BB	0.0098	6.29	23
CC	0.0083	5.34	19
STE2	0.0028	1.78	8
STE2A	0.0005	0.29	1
STE2B	0.0005	0.29	1
STE2C	0.0005	0.31	1
STE2D	0.0005	0.31	1
STE2E	0.0006	0.42	2
STE2F	0.0006	0.41	2
T	0.0062	3.95	13

2. Hydraulic Analysis

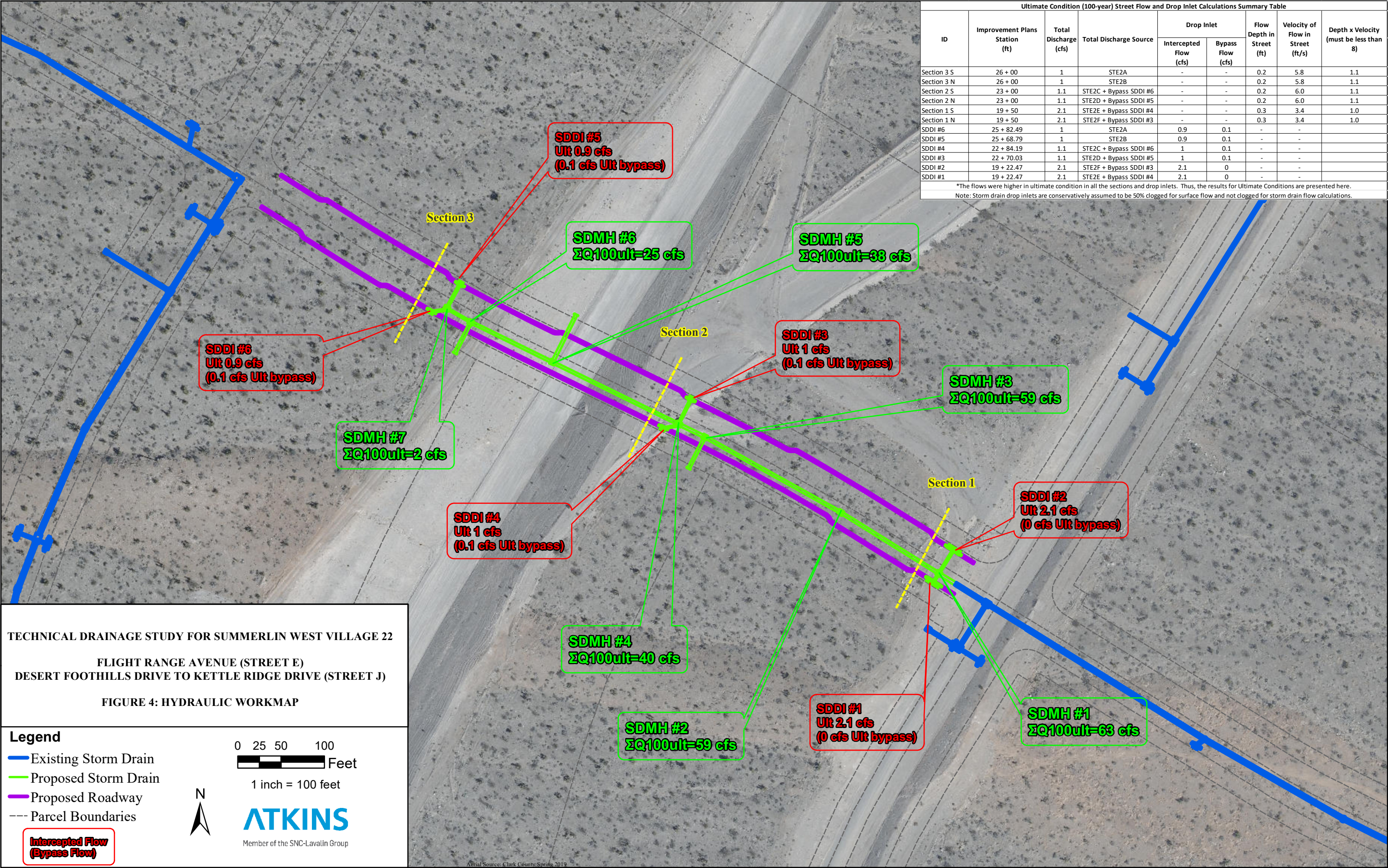
2.1. Drop Inlet Calculations

The computer program Bentley FlowMaster V10.2 was utilized to perform calculations for the proposed drop inlets along Flight Range Avenue. The storm drain SDDI's #1 to #6 are in the proposed roadway. Drop inlet calculations are provided in Appendix C. Table 4 provides a summary of the drop inlet calculations. Drop inlet locations and calculations are shown on Figure 4.

Table 4 – Drop Inlet Calculations

ID	Total Flow (cfs)	Intercepted Flows (cfs)	Bypass Flow (cfs)
100-year Interim Conditions			
SDDI #1	2.1	2.1	0.0
SDDI #2	2.1	2.1	0.0
SDDI #3	1.1	1.0	0.1
SDDI #4	1.1	1.0	0.1
SDDI #5	1	0.9	0.1
SDDI #6	1	0.9	0.1

Since, the flows are higher in the ultimate condition at all locations along the entire storm drain. The hydraulic calculations for only the ultimate flows are provided.



2.2. Normal Depth Calculations

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

Half-street cross-sections were analyzed as roadway flow and storm drain capture were at times different on west and east sides of the street. The cross-section locations were specified based on the flow patterns and utilized the worst-case slope or roadway width when applicable for the calculations.

Table 5 summarizes the normal depth calculations for the 100-year storm events. Depth*Velocity must be less than 8 for the 100-year event and less than 6 for the 10-year event. The 100-year D*V for all street cross-sections is less than 1.1. Therefore, the 10-year D*V is also less than 6. To minimize redundancy, the 10-year calculations are not included. Print-outs of all normal depth calculations for the ultimate condition are provided in Appendix C. Cross-section locations and calculation summaries are shown on Figure 4.

Table 5 – Normal Depth Calculations

ID	Total Flow (cfs)	Slope (%)	Flow Depth (ft)	Velocity (ft/s)	D* V
100-year Ultimate Condition					
Section 1 N	2.1	3	0.3	3.4	1.0
Section 1 S	2.1	3	0.3	3.4	1.0
Section 2 N	1.1	9.3	0.2	6.0	1.1
Section 2 S	1.1	9.3	0.2	6.0	1.1
Section 3 N	1.0	9.3	0.2	5.8	1.1

2.3. Storm Drain System Modeling

The proposed storm drain systems were modeled using Water Surface Pressure Gradient for Windows (WSPG-W). The flows were conservatively assumed to drain into the storm drain without clogging into the drop inlets. A print-out of the WSPG-W models are provided in Appendix C. Because the ultimate condition flows are higher than or equal to the interim condition flows in all areas, only the ultimate conditions were analyzed in the WSPG-W models. The Q_{100} and HGLs are shown on the improvement plans in Appendix D. Table 6 summarizes the WSPG-W model at the mainline manholes. All HGLs modeled including hydraulic jumps, are greater than 1 foot below existing and proposed surfaces.

Table 6 – WSPG-W Mainline Summary Table

SDMH#	WSPG-W Station	100-yr Ultimate Condition		
		Q ₁₀₀	ΣQ ₁₀₀	HGL (Ft)
Upstream	2643.07	1	1	3431.32
7	2607.14	1	2	3430.38
6	2569.99	23	25	3429.56
5	2458.21	13	38	3417.80
4	2290.08	2	40	3402.57
3	2250.42	19	59	3403.34
2	2067.89	0	59	3383.55
1	1925.61	4	63	3376.89
*DFD2-FRA-ULT-LAT4	1900.00	0	210	3433.55

* Referenced from Desert Foothills Drive TDS Addendum #1 – DS#5344

Appendices



Appendix A. Referenced Reports

- A.1. Summerlin West Village 22 Master Conceptual Drainage Study Update #2 Reference
- A.2. Summerlin West Village 22 Desert Foothills Drive: Sunset Run Drive to Fleet Wing Avenue (Street G) Reference

A. 1 Summerlin West Village 22 Master Conceptual Drainage Study Update #2

CITY OF LAS VEGAS			DATE:
INTER-OFFICE MEMORANDUM			January 23, 2020
TO: Land Development Services Department of Building & Safety			FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT: Drainage Study for: Master Conceptual Drainage Study for – Update #2 Summerlin West Village 22			COPIES TO: VTN Nevada
Cross Streets:	I-215 Western Beltway & Summerlin Parkway		Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5005H.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-14-401-006, 137-23-101-002		CCRFC
Zoning Action:	MDR-73901		CCPW
FEMA Flood Zone	YES	NO	X
Proposed Storm Drain	YES	X	NO

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	6/12/2018	6/28/2018 & 7/13/2018	Not Approved	\$400.00	49696: \$400
2 nd Submittal	7/31/2018	8/22/2018	Not Approved	\$400.00	497790: \$400
3 rd Submittal	11/5/2018	11/27/2018	Conditional Approval	\$400.00	500639: \$400
Memo Revision	12/3/2018	12/3/2018	Conditional Approval	N/C	N/C
CCRFC	1/10/2019	1/10/2019	Concurrence Recv'd	N/C	N/C
4 th Submittal	2/12/2019	3/6/2019	Not Approved	\$100.00	503164: \$100
5 th Submittal	3/21/2019	4/4/2019	Conditional Approval	\$400.00	3057847: \$400
CCPW & CCRFC	4/25/2019 & 5/23/2019	5/29/2019	Concurrence Received	N/C	N/C
6 th Submittal	11/13/2019	12/10/2019	Conditional Approval	\$100.00	3644006: \$100
Memo Revision	12/12/2019	12/12/2019	Conditional Approval	N/C	N/C
CCPW & CCRFC	1/13/2020 & 1/16/2020	1/23/2020	Concurrence Recv'd	N/C	N/C
			TOTAL FEES (LDDRS):	\$1,800.00	

REMARKS:

6th Submittal: Update #2 to address Village 22 Overall Development Plan changes

4th & 5th Submittals: Update #1 & Addendum #1 to revise Village 22 in accordance to the Update of the latest overall Summerlin West Master Plan Drainage Study

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

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

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

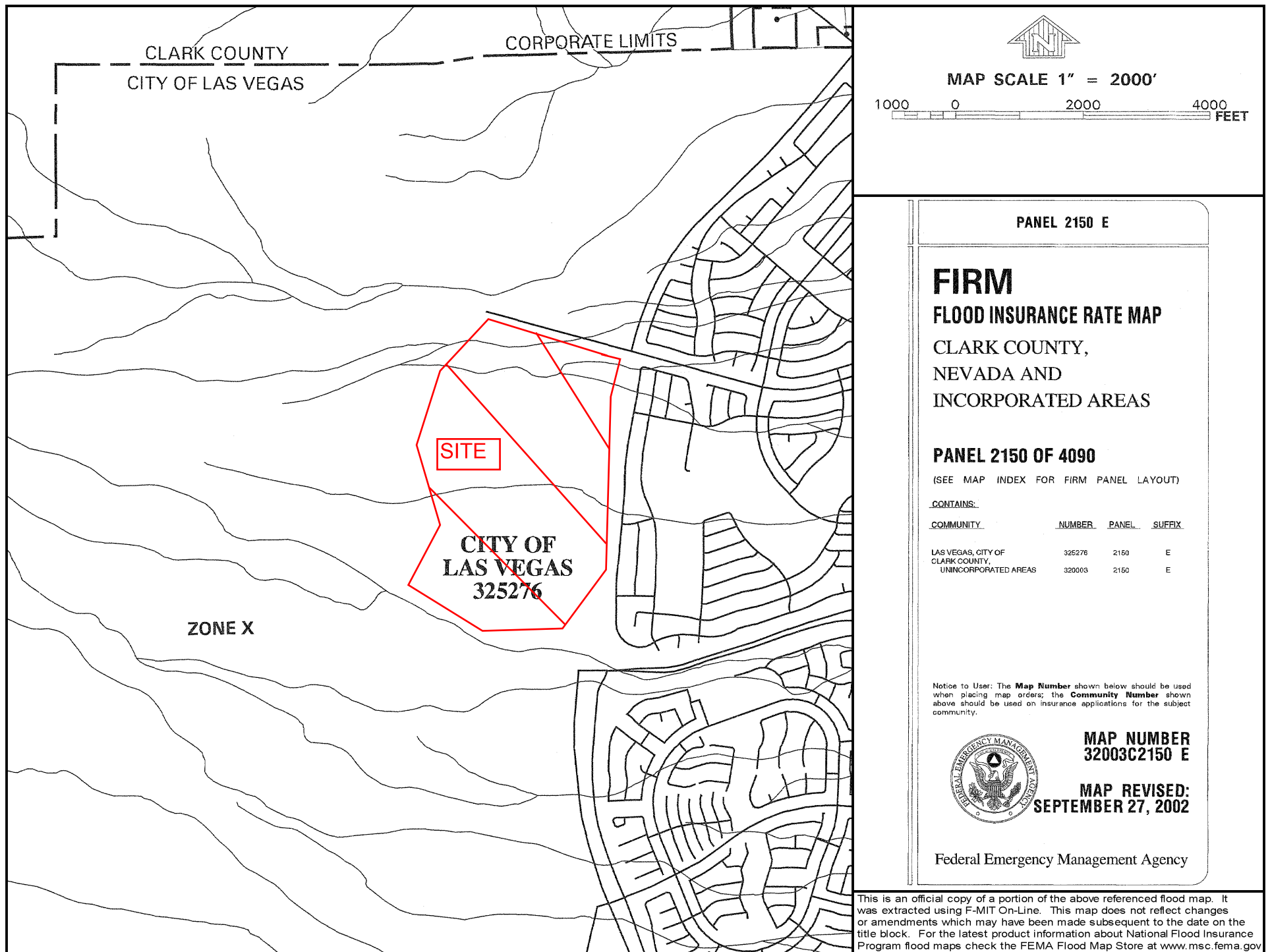
A technical drainage study for the analysis, design and construction plans for the *Grand Park Detention Basin* must be submitted and approved by the City prior to the individual onsite parcel developments.

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

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

END OF REMARKS
WSP/AYS

T/R/S: T20S/R59E/14
AREA K-14



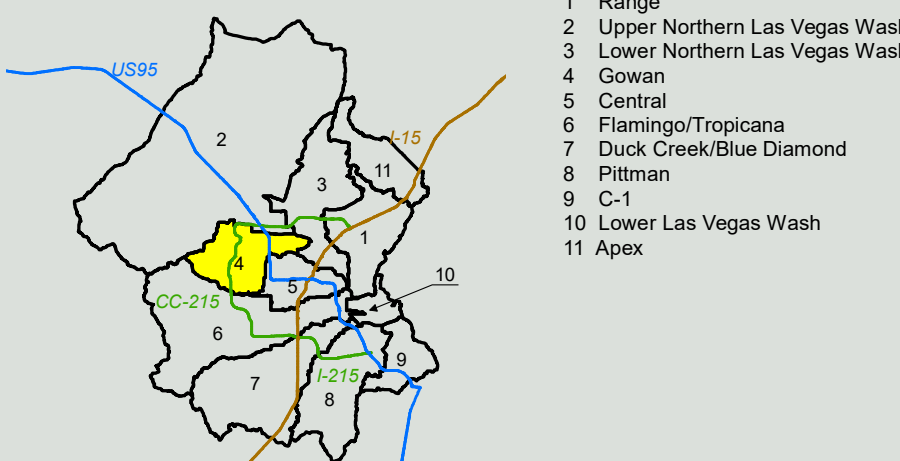


2018 Las Vegas Valley Master Plan Update

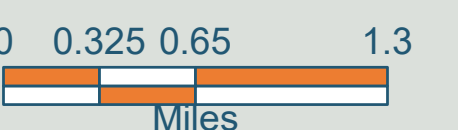
Figure W-4
Gowan Watershed

Legend

- Flow Arrows
- NodeID flow(cfs)
- Concentration Points
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Ultimate Development Boundary
- Watershed
- BasinID
- Subbasins
- Soils
- 1: Undeveloped Land, Open desert
- 2: Parks, Golf Courses
- 3: Rural, 0.5-1 units per acre (uses 1 unit/acre)
- 4: Low-Density Residential, 1-2 units per acre (uses 2 units/acre)
- 5: Medium-Density Residential, 2-4 units per acre (uses 3 units/acre)
- 6: High-Density Residential, 4-8 units per acre (uses 6 units/acre)
- 7: Public Facility and Residential, 8-12 units/acre
- 8: Very High-Density Residential, 12 units/acre or more
- 9: Commercial, Retail, Casino, High Rise Condominiums
- 10: Light Industrial
- 11: Heavy Industrial
- 12: Schools
- 13: Lakes

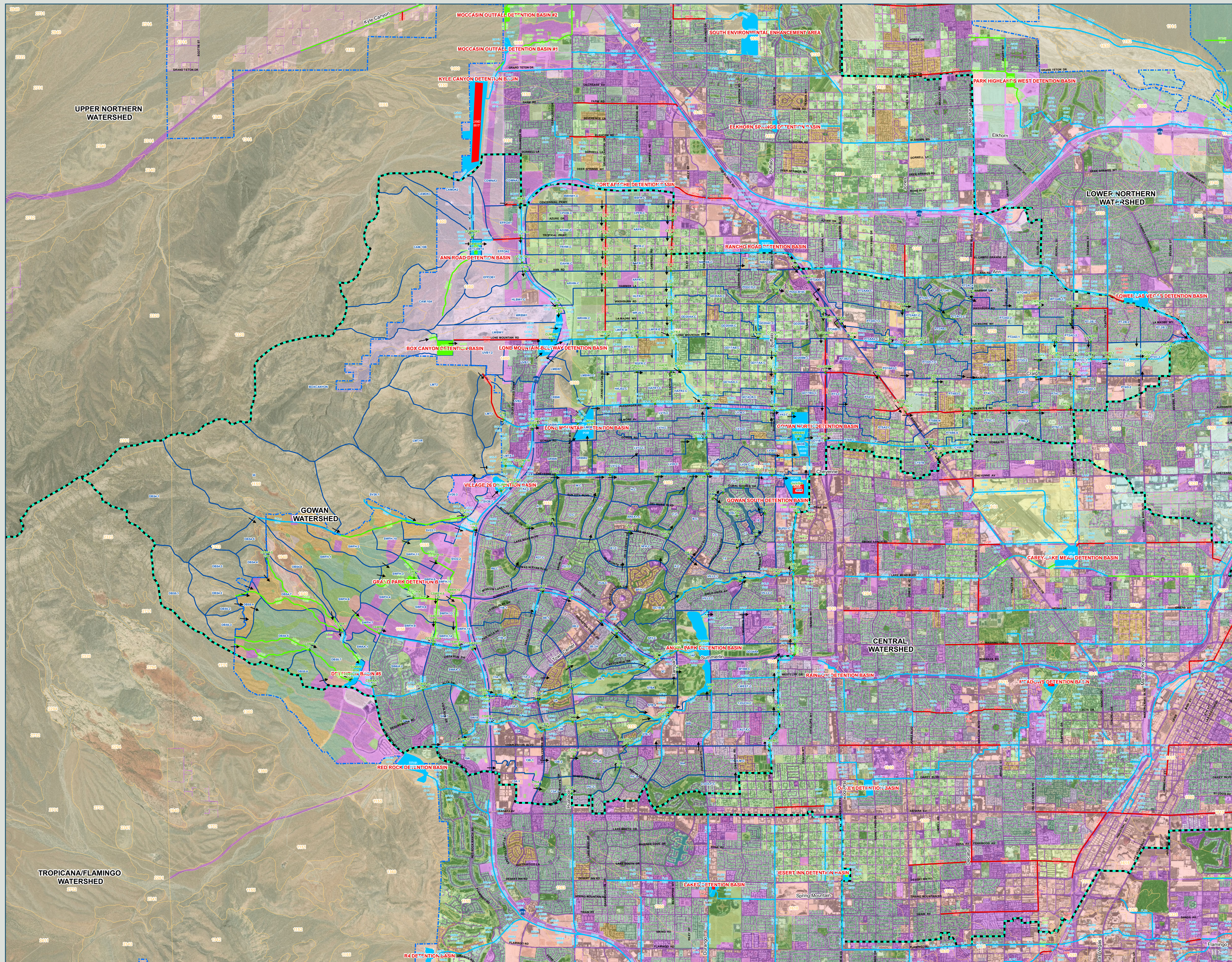


Scale: 1 inch = 0.65 mile



ATKINS
Member of the SNC-Lavalin Group

Louis Berger



ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
APAD 0203	E	ANGEL PARK - ALTA DRIVE BRANCH						
	E	2: 7' X 5.5' RCB	1104	2200	CSWAA-1	GOW3A	6.95	5.28
0225	E	2: 7' X 5.5' RCB OUTLET	360	2137	SUMSDB	GOW3A	6.73	3.40
APBE 0022	E	ANGEL PARK - BELTWAY BRANCH						
	E	CONC CHNL 20"W 7'D 2:1 SS	1556	3366	CCSWFH15	GOW3A	3.39	1.81
	E	CONC CHNL 20"W 7'D 2:1 SS	1583	3366	CCSWFH15	GOW3A	3.39	2.77
	E	8' X 8' RCBC @ FAR HILLS	777	1048	CSWFH-15	GOW3A	0.59	2.32
	E	CONC CHNL 10"W 5'D 2:1 SS	1465	1048	CSWFH-15	GOW3A	0.59	1.88
	E	CONC CHNL 10"W 4'D 2:1 SS	1685	1048	CSWFH-15	GOW3A	0.59	0.80
	P0	8' X 6' RCB	5012	781	CSWFH-12	GOW3A	0.41	1.30
	P0	6' X 5' RCB	2858	606	CSWFH-11	GOW3A	0.31	3.00
APCH 0000	E	ANGEL PARK - CARRIAGE HILL BRANCH						
	E	8' X 6' RCB	152	399	CSWFH-14	GOW3A	0.21	0.87
	P0	72" RCP	1685	399	CSWFH-14	GOW3A	0.21	2.00
0031	P0	60" RCP	2008	206	SWFH-13	GOW3A	0.10	1.38
APD2 0002	E	ANGEL PARK - DESERT FOOTHILLS 2 BRANCH						
	E	7' X 6' RCB	883	674	SWAA-2	GOW3A	0.68	1.08
APDF 0000	P0	ANGEL PARK - DESERT FOOTHILLS BRANCH						
	P0	10' X 6' RCB	1788	1428	CSWFH-9	GOW3B	0.80	3.55
	P0	8' X 6' RCB	1813	968	CSWFH-8	GOW3A	1.80	2.00
	P0	6' X 4' RCB	1922	486	CSWFH-4	GOW3A	1.52	4.40
	P0	42" RCP	1076	141	GPDB	GOW3A	1.29	6.00
	P0	130 AC-FT GRAND PARK DETENTION BASIN		1543	CSWFH-3	GOW3A	1.29	
	P0	6' X 6' RCB	2977	853	SWFH-1	GOW3A	0.69	3.80
	P0	5' X 4' RCB	2197	509	SWFH-2	GOW3A	0.37	5.70
APFH 0000	E	ANGEL PARK - FAR HILLS BRANCH						
	E	2: 8' X 8' RCB	1070	2494	CCSWFH14	GOW3B	1.51	3.50
	E	2: 8' X 8' RCB	250	2149	CCSWFH9	GOW3B	1.30	4.19
	E	16' X 8' RCAP	1951	2149	CCSWFH-9	GOW3B	1.30	5.10
	E	8' X 6' RCB	1435	839	CSWFH-7	GOW3A	0.50	2.00
	E	8' X 6' RCB	2946	839	CSWFH-7	GOW3A	0.50	2.00
	P0	5' X 4' RCB	2497	456	SWFH-6	GOW3A	0.28	5.50
APM5 0000	E	DETENTION BASIN #5						
	P0	384 AC-FT DETENTION BASIN #5		6856	SUM5IN	GOW3A	6.73	
	P0	CONC CHNL 50"W 4.5'D 2:1 SS	2102	3634	CCDB54-7	GOW3A	4.13	5.20
	P0	CONC CHNL 50"W 4'D 2:1 SS	4180	3495	CDB55-7	GOW3A	2.60	5.80
	E	DIVERSION BERM WITH GABION BANK PROTECTION	1000	3634	CCDB54-7	GOW3A	4.13	1.30
	P0	CONC CHNL 80"W 4'D 2:1 SS	264	3634	CCDB54-7	GOW3A	4.13	1.30
	P0	CONC CHNL 50"W 3'D 2:1 SS	9922	1664	CDB54-4	GOW3A	0.81	6.80
	P0	CONC CHNL 100"W 3'D 2:1 SS	9075	2606	CDB54-7	GOW3A	3.31	7.00
	P0	CONC CHNL 30"W 3'D 2:1 SS	6695	1092	DB55-1	GOW3A	0.64	7.50
	P0	CONC CHNL 50"W 3'D 2:1 SS	6522	1729	CDB55-5	GOW3A	1.30	7.30
APSP 0183	E	ANGEL PARK - SUMMERLIN PARKWAY						
	E	CONC CHNL 10"W 6'D 2:1 SS	1680	884	C11B-1	GOW3A	0.84	1.70
GOB3 0000	E	GOWAN LONE MOUNTAIN SYST. 3 BELTWAY						
	E	66" RCP	1370	341	SV22-1	GOW3A	0.18	4.50
GOBE 0000	E	GOWAN LONE MOUNTAIN SYST. BELTWAY						
	E	20' X 10' RCBC @ ACCESS RD	30	1044	CSV22	GOW3A	0.67	5.67
	E	CONC CHNL 20"W 5'D 2:1 SS	1100	1044	CSV22	GOW3A	0.67	6.50
	E	CONC CHNL 11"W 6.8'D 0:1 SS	2143	1044	CSV22	GOW3A	0.67	6.50
	E	CONC CHNL 15"W 7.5'D 0:1 SS	487	1044	CSV22	GOW3A	0.67	3.93
	E	CONC CHNL 17"W 7.5'D 0:1 SS	844	1044	CSV22	GOW3A	0.67	0.76
	E	2: 10' X 9' RCBC @ LAKE MEAD	400	782	SV22-2	GOW3A	0.49	0.50
	E	CONC CHNL 20"W 9'D 2:1 SS	627	782	SV22-2	GOW3A	0.49	0.50
	E	CONC CHNL 20"W 6'D 2:1 SS	1021	782	SV22-2	GOW3A	0.49	0.50
	E	CONC CHNL 20"W 6'D 2:1 SS	638	782	SV22-2	GOW3A	0.49	0.50
	E	CONC CHNL 10"W 5.5'D 2:1 SS	1500	782	SV22-2	GOW3A	0.49	1.02
GOL3 0010	E	GOWAN LONE MOUNTAIN SYSTEM-BRANCH 3						
	E	CONC CHNL 20"W 10'D 0:1 SS	3037	3277	CRCLMT1R	GOW3A	7.31	2.78
	E	TRANSITION STRUCTURE	100	3277	CRCLMT1R	GOW3A	7.31	3.50
	E	20' X 6' RCBC @ CLIFF SHADOWS	350	1271	CRCSV22	GOW3A	4.99	2.44
0077	E	CONC CHNL 20"W 6'D 0:1 SS	1229	1271	CRCSV22	GOW3A	4.99	6.11

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
GOL3 0100	E	GOWAN LONE MOUNTAIN SYSTEM-BRANCH 3						
	E	CONC CHNL 20"W 10'D 0:1 SS	200	1271	CRCSV22	GOW3A	4.99	5.67
	E	96" RCP OUTLET	670	666	DET26	GOW3A	4.31	0.29
	E	305 AC-FT VILLAGE 26 DETENTION BASIN		3615	VIL26IN	GOW3A	4.31	
	E	CONC CHNL 20"W 7.5'D 0:1 SS	2720	3615	VIL26IN	GOW3A	4.31	6.50
	E	CONC CHNL 20"W 8'D 0:1 SS	563	3615	VIL26IN	GOW3A	4.31	3.91
	E	14' X 14" RCB	890	3615	VIL26IN	GOW3A	4.31	0.88
	E	Dual 10' X 14" RCB	124	3615	VIL26IN	GOW3A	4.31	0.57
	P0	CONC CHNL 50"W 4'D 2:1 SS	4060	3524	CSV26-1	GOW3A	4.02	6.08
	P0	CONC CHNL 50"W 3.5'D 2:1 SS	6215	2281	30	GOW3A	2.44	7.95
	E	NATURAL WASH 363"W	4850	1410	SV26-1	GOW3A	1.59	22.50
	E	NATURAL WASH 450"W	7000	2281	30	GOW3A	2.44	8.50
GOL4 0000	E	GOWAN LONE MOUNTAIN SYSTEM-BRANCH 4						
	E	14' X 8' RCB	554	2243	CLMT1R	GOW3A	2.33	2.50
	E	2: 9' X 8' RCB	820	2243	CLMT1R	GOW3A	2.33	4.74
	E	SOIL CEMENT CHNL 60"W 8'D 3-4:1 SS	320	2243	CLMT1R	GOW3A	2.33	2.00
	E	SOIL CEMENT CHNL 42"W 6'D 3-4:1 SS	700	2243	CLMT1R	GOW3A	2.33	1.00

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

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

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



2018 LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FACILITY INVENTORY
FIGURE F-22

LEGEND	ID (Facility Identifier)	AABB	Construction Features											
	Parent Stream Name		Existing Facility.....E	Bottom Width..... W	Cast in Place Concrete Pipe..... CIPCP					Reinforced Concrete Arch Culvert..... RCAC				
	Stream Name		Proposed or Modified Facility..... P		Corrugated Metal Arch Pipe Culvert..... CMAP					Reinforced Concrete Box..... RCB				
	Mile	0000	Contingency Level	Depth..... D	Corrugated Metal Pipe Culvert..... CMPC					Reinforced Concrete Box Culvert..... RCBC				
	Distance Above Confluence with Parent Stream (Miles)		Category A.....P		High Density Polyethylene..... HDPE					Reinforced Concrete Pipe..... RCP				
	Miles in Hundredths		Category B.....P0	Side Slope, H:V..... SS	Horizontal Elliptical Reinforced Concrete Pipe..... HERCP					Reinforced Concrete Pipe Culvert..... RCPC				
					Reinforced Concrete Arch Pipe..... RCAP					Storm Sewer Pipe..... SSP				





FIGURE 4A - MPU Facilities

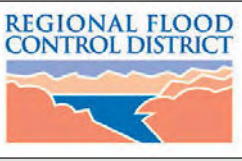
ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
APAD		ANGEL PARK - ALTA DRIVE BRANCH						
0044	E	11' X 8' RCAP	1565	3140	CSWAA-3	ALLGOW4	8.26	4.24
0073	E	11' X 8' RCAP	2220	2917	CSWAA-2	ALLGOW3	7.68	3.50
0146	E	10'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

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

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

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

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



2013 LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FACILITY INVENTORY
FIGURE F - 24

L
E
G
E
N
D

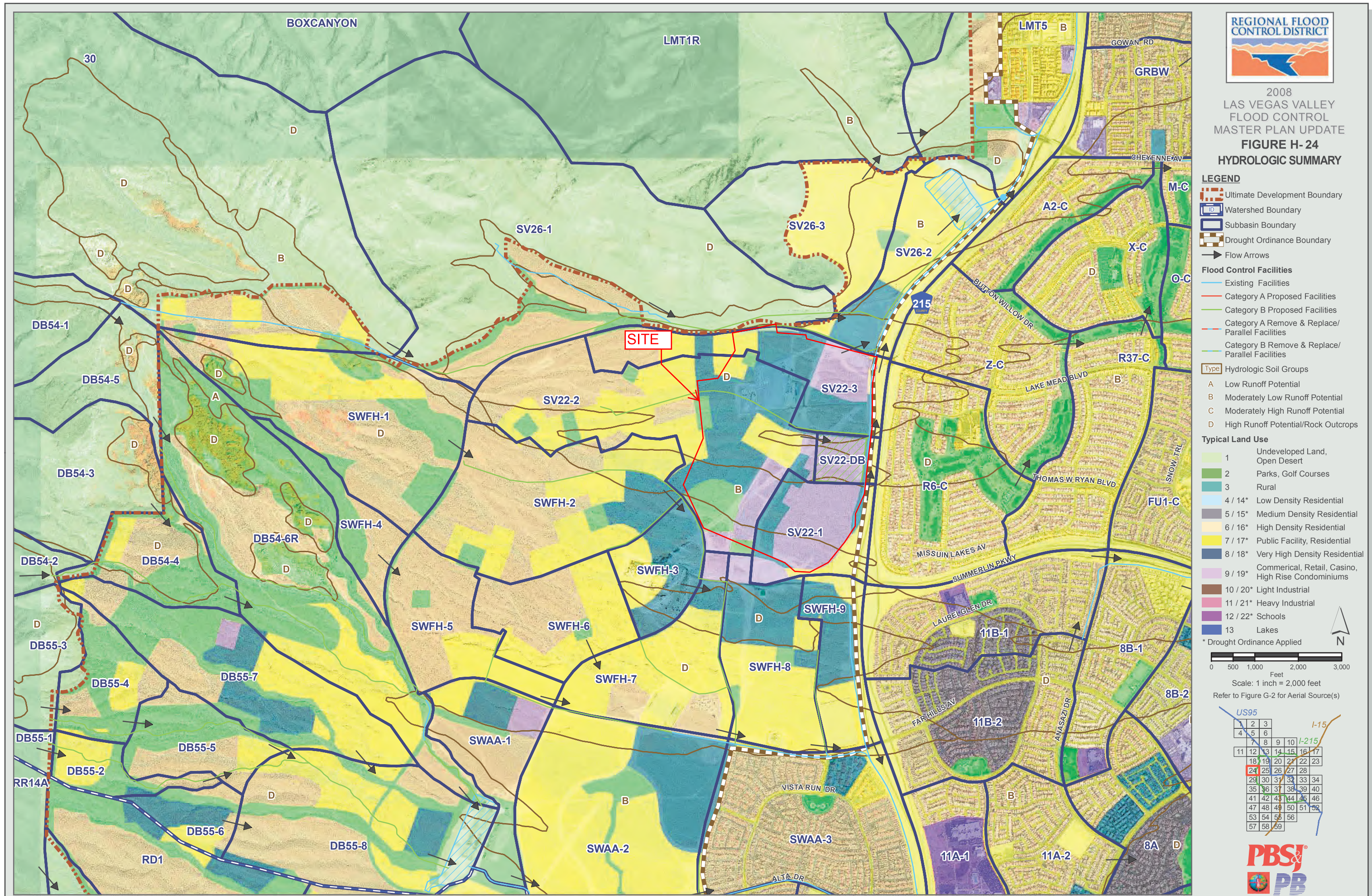
ID (Facility Identifier) AAB
Parent Stream Name
Stream Name
River Mile 0000
Distance Above Confluence
with Parent Stream (Miles)
Miles in Hundredths

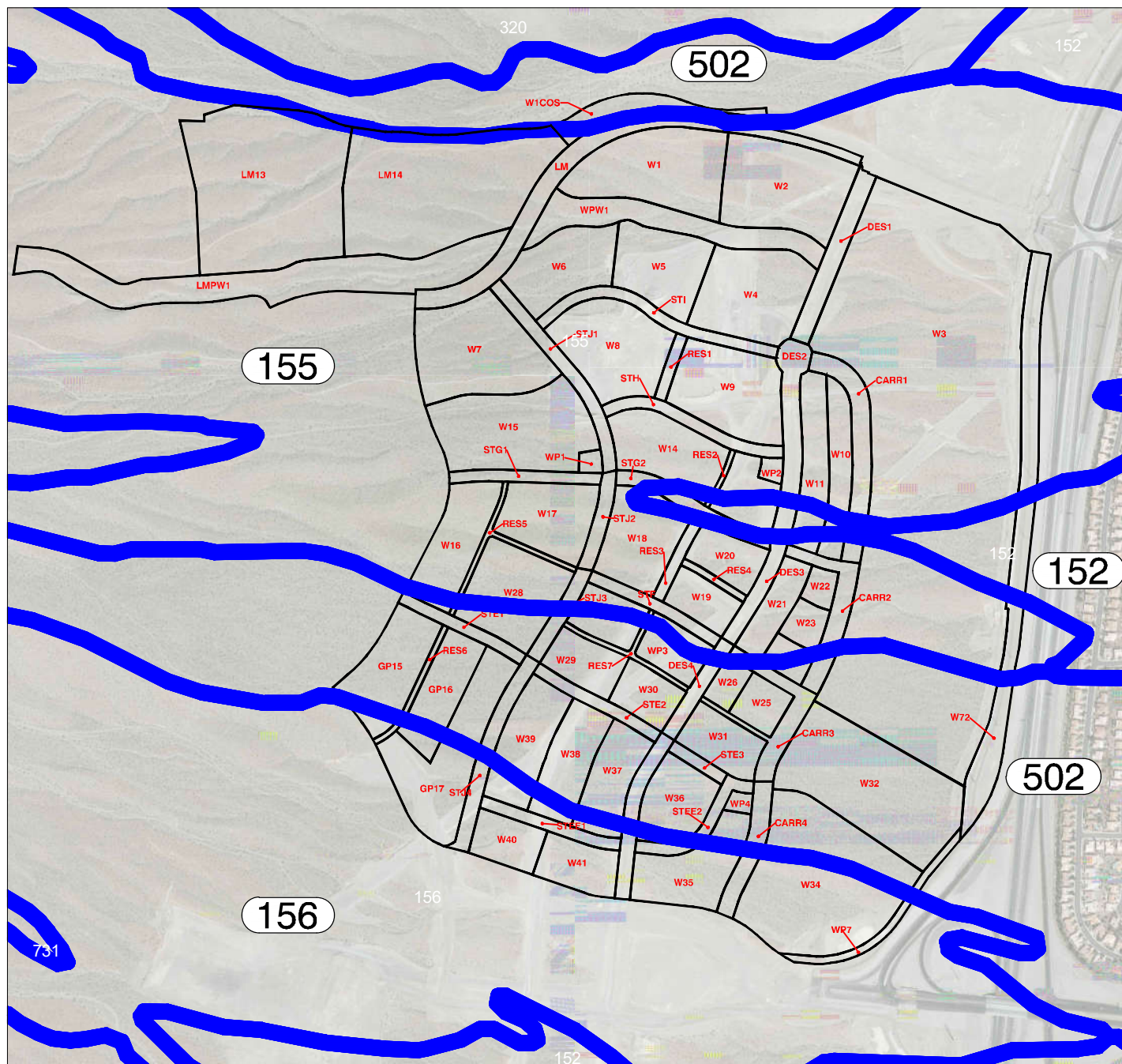
Existing Facility.....E
Proposed or Modified Facility.....P
Contingency Level
Category B.....P0
Master Plan.....P1
Preliminary Design.....P2
Design.....P3

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

Construction Features

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





LEGEND

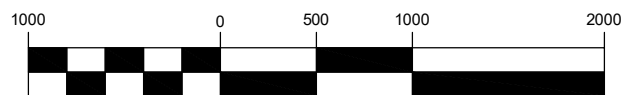
- SITE BOUNDARY
- 300** SOIL NUMBER
- SOIL BOUNDARY

NOTE:

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



GRAPHIC SCALE



1" = 1000'

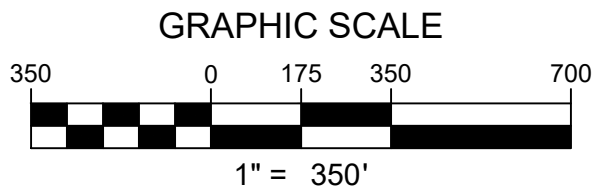
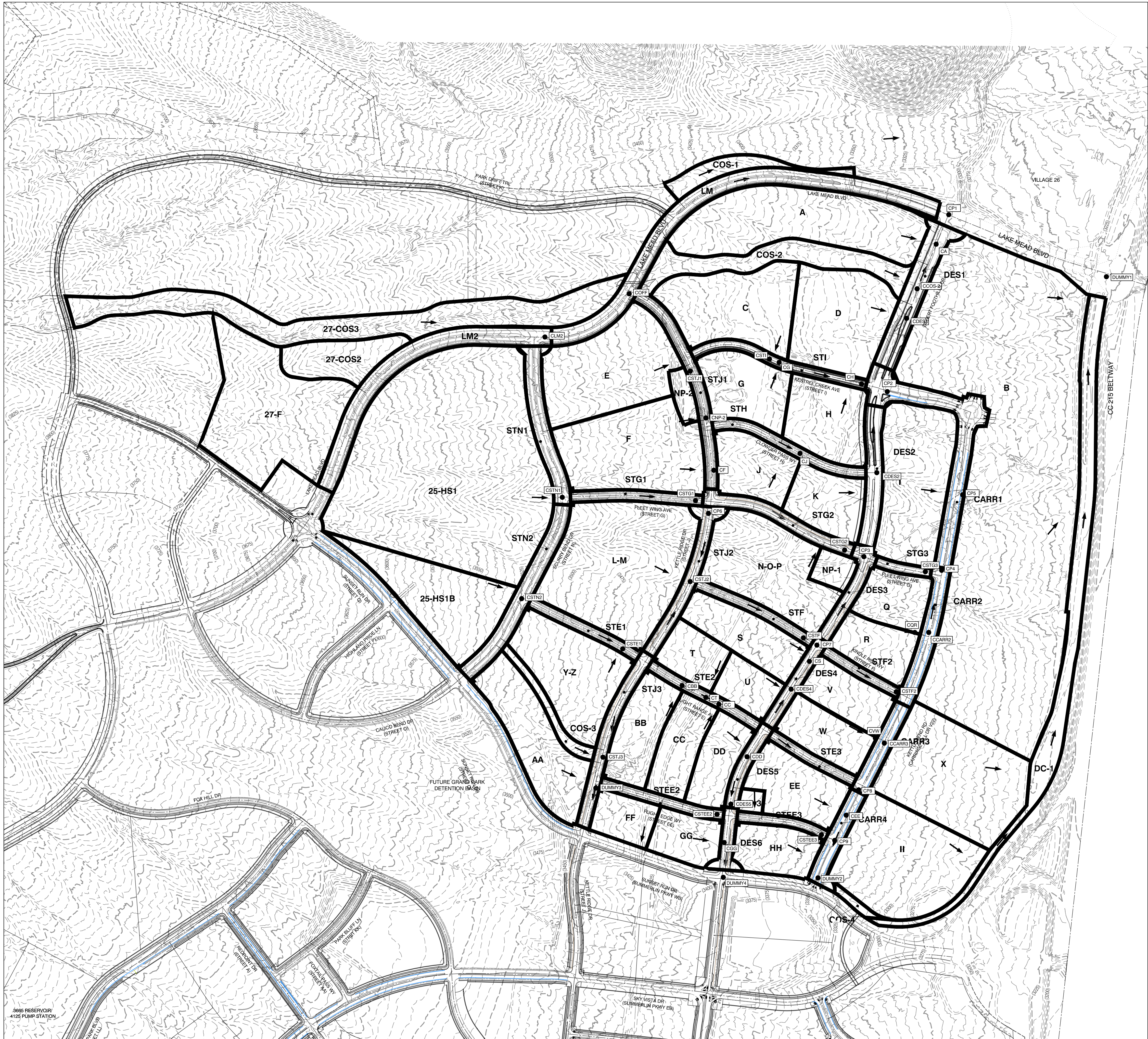
H:\7861\Village 22 Master\Drainage\A Figures\Figure 5A - Village 22 Soils Map.dwg

vtm
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NV 89146-5148

FIGURE 5: SOILS MAP

SUMMERLIN WEST VILLAGE 22

SCALE	HORZ. 1"=1000'
	VERT. n/a
W.O. NO.	7861
DRAWN BY:	AH
DATE:	MAY 2018
SHEET	OF



LEGEND

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

ULTIMATE CONDITION HEC-1 SUMMARY TABLE					
BASIN ID	AREA (ac)	Q100 (CFS)	BASIN ID	AREA (ac)	Q100 (CFS)
LM	10.04	36	STN1	3.61	13
D	11.96	50	CSTN1	-	244
DES1	4.46	20	STG1	1.85	8
CDES1	-	70	CSTG1	-	229
COS-2	7.51	22	CP6	-	532
CCOS-2	-	89	LM	21.14	81
A	17.39	68	STJ2	3.10	13
CA	-	156	CSTJ2	-	612
CP1	-	191	STF	1.84	8
STI	2.42	11	CSTF	-	610
C	12.05	51	U	3.49	11
CSTI	-	62	DES4	1.77	8
G	7.05	30	CDES4	-	19
CG	-	92	S	3.01	10
H	7.64	33	CS	-	29
CH	-	124	CP7	-	639
STH	2.29	10	STF2	1.21	5
J	5.93	24	CSTF2	-	637
CJ	-	34	V	5.01	17
K	5.28	22	W	5.28	19
DES2	3.09	13	CVW	-	36
CDES2	-	68	CARR3	2.14	8
CP2	-	189	CCARR3	-	667
CARR1	6.95	29	STE3	1.36	6
I	13.44	38	CP8	-	673
N-O-P	14.52	49	EE	6.80	25
NP-1	1.73	6	CEE	-	689
STG2	2.86	13	NP3	0.70	2
CSTG2	-	68	STEE3	1.23	5
DES3	2.00	9	CSTEE3	-	7
CP3	-	77	CP9	-	205
STG3	0.72	3	HH	4.85	20
CSTG3	-	79	CARR4	-	10
Q	4.58	17	25-HS1B	-	48
R	4.97	20	STN2	-	19
CQR	-	37	CSTN2	-	67
CARR2	3.58	15	Y-Z	11.28	42
CCARR2	-	52	STE1	1.75	8
CP4	-	131	CSTE1	-	115
CP5	-	379	COS-3	1.70	4
II	16.03	61	STJ3	3.22	14
X	17.45	60	CSTJ3	-	126
B	80.77	304	AA	10.13	33
DC-1	12.59	36	STE2	-	8
COS-4	0.57	2	BB	6.29	23
COS-1	2.87	6	CBB	-	31
V27-F	19.13	83	T	4.02	13
V27-COS2	5.25	20	CT	-	44
LM2	7.23	28	CC	5.34	19
CLM2	-	132	CCC	-	63
27-COS3	17.46	53	DD	4.76	17
COFF	-	185	DDD	-	77
E	13.91	58	DES5	1.57	7
STJ1	3.52	15	CDES5	-	81
CSTJ1	-	255	STEE2	1.79	8
NP-2	1.34	5	CSTEE2	-	88
CNP-2	-	255	GG	4.98	21
F	14.22	59	CGG	-	109
CF	-	309	FF	3.49	15
25-HS1	49.49	211			

THE HOWARD HUGHES COMPANY, LLC

FIGURE 6
ULTIMATE CONDITION BASIN MAP

DRAWN BY: JYA
DESIGNED BY: JYA
CHECKED BY: JYA
PROJECT NO: 2801

SHEET
OF SHEETS
DRAWING NO.

10801 WEST CHARLESTON BLVD, 3RD FLOOR
LAS VEGAS, NEVADA 89135

SUMMERLIN WEST VILLAGE 22

SCALE: 1" = 350' HORIZ.
N/A VERT.

REVISION
BY
DATE
REV

PLANNERS & LAND SURVEYORS


```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* JUN 1998 *
* VERSION 4.1 *
*
* RUN DATE 23OCT19 TIME 13:10:22 *
*
*****

```

```

*****
*
* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET *
* DAVIS, CALIFORNIA 95616 *
* (916) 756-1104 *
*
*****

```

```

      X  X  XXXXXX  XXXXX  X
      X  X  X      X  X  XX
      X  X  X      X  X  X
      XXXXXX XXXX  X      XXXXX X
      X  X  X      X  X  X
      X  X  X      X  X  X
      X  X  XXXXXX  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      ULTIMATE CONDITION HYDROLOGIC MODEL
2      ID      INPUT FILE DATE = OCTOBER 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      * UPDATE #2 - SUMMERLIN WEST VILLAGE 22 *
9      ID      *****
10     ID
11     ID
12     ID
13     ID
14     ID      JR CARD RATIOS REPRESENT DEPTH-AREA REDUCTION FACTORS (DARF'S)
15     ID
16     ID      100-YEAR, 6-HOUR STORM, SDN3
17     ID
18     IT      5      0      0      100
19     IO      5      0      0
20     IN      5      0      0
21     JR      PREC  1.00
*
22     KK      LM
23     BA      0.0157
24     PB      3.41
25     PC      0      0.020  0.057  0.070  0.087  0.108  0.124  0.130  0.130  0.130
26     PC      0.130  0.130  0.130  0.133  0.140  0.142  0.148  0.158  0.172  0.181
27     PC      0.190  0.197  0.199  0.200  0.201  0.204  0.214  0.229  0.241  0.249
28     PC      0.251  0.256  0.270  0.278  0.281  0.283  0.295  0.322  0.352  0.409
29     PC      0.499  0.590  0.710  0.744  0.781  0.812  0.819  0.835  0.851  0.856
30     PC      0.860  0.868  0.876  0.888  0.910  0.926  0.937  0.950  0.970  0.976
31     PC      0.982  0.985  0.987  0.989  0.990  0.993  0.993  0.994  0.995  0.998
32     PC      0.998  0.999      1
33     LS      0      98.0
34     UD      0.118
*
35     KK      D
36     BA      0.0187
37     PB      3.39
38     LS      0      95.0
39     UD      0.058
*
40     KK      DES1
41     BA      0.0070
42     PB      3.39
43     LS      0      98.0
44     UD      0.058
*

```


[illegible]

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
76	KK STI
77	KM KESTREL CREEK AVE
78	BA 0.0038
79	PB 3.41
80	LS 0 98.0
81	UD 0.050
	*
82	KK C
83	BA 0.0188
84	PB 3.41
85	LS 0 95.0
86	UD 0.054
	*
87	KK CSTI
88	KM COMBINE C AND STI
89	HC 2
	*
90	KK G
91	BA 0.0110
92	PB 3.41
93	LS 0 95.0
94	UD 0.056
	*
95	KK CG
96	KM COMBINE CSTI AND CG
97	HC 2
	*
98	KK RCG

99 KM ROUTE CG TO CH
100 RD 556 0.081 0.013 0 CIRC 3.5
*

101 KK H
102 BA 0.0119
103 PB 3.41
104 LS 0 95.0
105 UD 0.053
*

106 KK CH
107 KM COMBINE CG AND CH
108 HC 2
*

1

HEC-1 INPUT

PAGE 4

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

109 KK RCH
110 KM ROUTE CH TO CP2
111 RD 255 0.093 0.013 0 CIRC 3.5
*

112 KK STH
113 KM CLOWDER PASS WAY
114 BA 0.0036
115 PB 3.41
116 LS 0 98.0
117 UD 0.050
*

118 KK J
119 BA 0.0093
120 PB 3.41
121 LS 0 92.0
122 UD 0.058
*

123 KK CJ
124 KM COMBINE J AND STH
125 HC 2
*

126 KK RCJ
127 KM ROUTE CJ TO CDES2
128 RD 637 0.080 0.013 0 CIRC 2.5
*

129 KK K
130 BA 0.0081
131 PB 3.40
132 LS 0 95.0
133 UD 0.050
*

134 KK DES2
135 BA 0.0048
136 PB 3.38
137 LS 0 98.0
138 UD 0.071
*

139 KK CDES2
140 KM COMBINE DES2, CJ, AND K
141 HC 3
*

1

HEC-1 INPUT

PAGE 5

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

142 KK RCDES2
143 KM ROUTE CDES2 TO CP2
144 RD 643 0.014 0.013 0 CIRC 3.5
*

145 KK CP2
146 KM COMBINE CDES2 & CH
147 HC 2
*

148 KK RCP2
149 KM ROUTE CP2 TO CP5
150 RD 1226 0.039 0.013 0 CIRC 4.5
*

151 KK CARR1
152 BA 0.0109
153 PB 3.38

154 LS 0 98.0
155 UD 0.070
*

156 KK I
157 BA 0.0165
158 PB 3.38
159 LS 0 92.0
160 UD 0.083
*

161 KK N-O-P
162 BA 0.0227
163 PB 3.40
164 LS 0 90.3
165 UD 0.090
*

166 KK NP-1
167 BA 0.0027
168 PB 3.40
169 LS 0 89.0
170 UD 0.059
*

171 KK STG2
172 KM FLEET WING AVE
173 BA 0.0045
174 PB 3.40
175 LS 0 98.0
176 UD 0.050
*

1

HEC-1 INPUT

PAGE 6

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

177 KK CSTG2
178 KM COMBINE N-O-P, NP-1 AND STG2
179 HC 3
*

180 KK DES3
181 BA 0.0031
182 PB 3.38
183 LS 0 98.0
184 UD 0.050
*

185 KK CP3
186 KM COMBINES CSTG2 & DES3
187 HC 2
*

188 KK RCP3
189 KM ROUTE CP3 TO CSTG3
190 RD 513 0.080 0.013 0 CIRC 3.0
*

191 KK STG3
192 BA 0.0011
193 PB 3.38
194 LS 0 98.0
195 UD 0.050
*

196 KK CSTG3
197 KM COMBINES CP3 AND STG
198 HC 2
*

199 KK Q
200 BA 0.0072
201 PB 3.38
202 LS 0 92.2
203 UD 0.069
*

204 KK R
205 BA 0.0078
206 PB 3.37
207 LS 0 93.2
208 UD 0.065
*

209 KK CQR
210 KM COMBINE R AND Q
211 HC 2
*

1

HEC-1 INPUT

PAGE 7

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
212	KK CARR2
213	BA 0.0056
214	PB 3.37
215	LS 0 98.0
216	UD 0.064
	*
217	KK CCARR2
218	KM COMBINE CQR AND CARR2
219	HC 2
	*
220	KK RCCARR2
221	KM ROUTE CCARR2 TO CP4
222	RD 414 0.033 0.013 0 CIRC 2.5
	*
223	KK CP4
224	KM COMBINE CP3 AND CCARR2
225	HC 2
	*
226	KK RCP4
227	KM ROUTE CP4 TO CP5
228	RD 582 0.010 0.013 0 CIRC 3.5
	*
229	KK CP5
230	KM COMBINE CARR1, I, CP2 AND CP4
231	HC 4
	*
232	KK II
233	BA 0.0250
234	PB 3.37
235	LS 0 93.2
236	UD 0.072
	*
237	KK X
238	BA 0.0273
239	PB 3.37
240	LS 0 90.0
241	UD 0.080
	*
242	KK B
243	BA 0.1262
244	PB 3.36
245	LS 0 93.5
246	UD 0.077
	*

1

HEC-1 INPUT

PAGE 8

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
247	KK DC-1
248	BA 0.0197
249	PB 3.35
250	LS 0 98
251	UD 0.257
	*
252	KK COS-4
253	BA 0.0009
254	PB 3.35
255	LS 0 88.0
256	UD 0.077
	*
257	KK DUMMY1A
258	KM REGIONAL FACILITY - BELTWAY CHANNEL NORTH
259	KM COMBINE II, X, B, DC1, AND COS-4
260	HC 5
	*
261	KK COS-1
262	BA 0.0045
263	PB 3.41
264	LS 0 79.8
265	UD 0.118
	*
266	KK DUMMY1
267	KM REGIONAL FACILITY - BELTWAY CHANNEL NORTH
268	KM COMBINE CP1, CP5, DUMMY1A, AND COS-1
269	HC 4

*
 270 KK 27-F
 271 BA 0.0299
 272 PB 3.48
 273 LS 0 94.2
 274 UD 0.050
 *

275 KK 27-COS2
 276 BA 0.0082
 277 PB 3.46
 278 LS 0 89.0
 279 UD 0.052
 *

280 KK LM2
 281 BA 0.0113
 282 PB 3.41
 283 LS 0 98.0
 284 UD 0.093
 *

1

HEC-1 INPUT

PAGE 9

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

285 KK CLM2
 286 KM COMBINES OFFSITE V27 BASINS 27-F, V27-COS2, AND LM2
 287 HC 3
 *

288 KK 27-COS3
 289 BA 0.0273
 290 PB 3.47
 291 LS 0 89.0
 292 UD 0.113
 *

293 KK COFF
 294 KM COMBINES OFFSITE V27 BASINS
 295 KM COMBINE CLM2 AND V27-COS3
 296 HC 2
 *

297 KK RCOFF
 298 KM ROUTE COFF TO CSTJ1
 299 RD 744 0.058 0.013 0 CIRC 4.5
 *

300 KK E
 301 BA 0.0217
 302 PB 3.43
 303 LS 0 95.0
 304 UD 0.062
 *

305 KK STJ1
 306 KM KETTLE RIDGE
 307 BA 0.0055
 308 PB 3.43
 309 LS 0 98.0
 310 UD 0.069
 *

311 KK CSTJ1
 312 KM COMBINE COFF, E, AND STJ1
 313 HC 3
 *

314 KK RCSTJ1
 315 KM ROUTE COFF TO CSTJ1
 316 RD 380 0.005 0.013 0 CIRC 5
 *

317 KK NP-2
 318 BA 0.0021
 319 PB 3.43
 320 LS 0 89.0
 321 UD 0.058
 *

1

HEC-1 INPUT

PAGE 10

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

322 KK CNP-2
 323 KM COMBINE CSTJ1 AND CNP-2
 324 HC 2
 *

325 KK RCNP-2
 326 KM ROUTE CNP-2 TO CF
 327 RD 390 0.005 0.013 0 DEEP 6
 *

328 KK F
 329 BA 0.0222
 330 PB 3.43
 331 LS 0 95.0
 332 UD 0.063
 *

333 KK CF
 334 KM COMBINE CNP-1 AND CF
 335 HC 2
 *

336 KK RCF
 337 KM ROUTE CF TO CP6
 338 RD 320 0.005 0.013 0 DEEP 6
 *

339 KK 25-HS1
 340 BA 0.0773
 341 PB 3.44
 342 LS 0 94.8
 343 UD 0.056
 *

344 KK STN1
 345 KM SCURRY BEND
 346 BA 0.0056
 347 PB 3.44
 348 LS 0 98.0
 349 UD 0.125
 *

350 KK CSTN1
 351 KM COMBINE 25-HS1 AND STN1
 352 HC 2
 *

353 KK RCSTN1
 354 KM ROUTE CSTN1 TO CSTG1
 355 RD 1010 0.000 0.013 0 CIRC 4.5
 *

1

HEC-1 INPUT

PAGE 11

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

356 KK STG1
 357 BA 0.0029
 358 PB 3.42
 359 LS 0 98.0
 360 UD 0.050
 *

361 KK CSTG1
 362 KM COMBINE CSTN1 AND STG1
 363 HC 2
 *

364 KK CP6
 365 KM COMBINE CF AND CSTG1
 366 HC 2
 *

367 KK RCP6
 368 KM ROUTE CP6 TO CSTJ2
 369 RD 530 0.005 0.013 0 DEEP 6 0
 *

370 KK L-M
 371 BA 0.0330
 372 PB 3.42
 373 LS 0 94.4
 374 UD 0.084
 *

375 KK STJ2
 376 BA 0.0048
 377 PB 3.42
 378 LS 0 98.0
 379 UD 0.058
 *

380 KK CSTJ2
 381 KM COMBINE CP6, L-M AND STJ2
 382 HC 3
 *

383 KK RCSTJ2
 384 KM ROUTE CSTJ2 TO CSTF
 385 RD 1000 0.069 0.015 0 DEEP 6 0
 *
 386 KK STF
 387 BA 0.0029
 388 PB 3.40
 389 LS 0 98.0
 390 UD 0.050
 *

1

HEC-1 INPUT

PAGE 12

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

391 KK CSTF
 392 KM COMBINE CSTJ2 AND CSTF
 393 HC 2
 *

394 KK U
 395 BA 0.0055
 396 PB 3.40
 397 LS 0 86.3
 398 UD 0.069
 *

399 KK DES4
 400 BA 0.0028
 401 PB 3.40
 402 LS 0 98.0
 403 UD 0.050
 *

404 KK CDES4
 405 KM COMBINE U AND DES4
 406 HC 2
 *

407 KK S
 408 BA 0.0047
 409 PB 3.40
 410 LS 0 87.9
 411 UD 0.088
 *

412 KK CS
 413 KM CDES4 AND S
 414 HC 2
 *

415 KK CP7
 416 KM COMBINE CSTF AND CS
 417 HC 2
 *

418 KK RCP7
 419 KM ROUTE CP7 TO CSTF2
 420 RD 710 0.066 0.015 0 DEEP 6 0
 *

421 KK STF2
 422 BA 0.0019
 423 PB 3.37
 424 LS 0 98.0
 425 UD 0.050
 *

1

HEC-1 INPUT

PAGE 13

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

426 KK CSTF2
 427 KM COMBINE CP7 AND STF2
 428 HC 2
 *

429 KK RCSTF2
 430 KM ROUTE CSTF2 TO CCARR3
 431 RD 420 0.005 0.015 0 DEEP 8 0
 *

432 KK V
 433 BA 0.0078
 434 PB 3.37
 435 LS 0 90.0
 436 UD 0.075
 *

437 KK W
 438 BA 0.0083
 439 PB 3.40
 440 LS 0 90.0
 441 UD 0.074
 *
 442 KK CVW
 443 KM COMBINE W AND V
 444 HC 2
 *
 445 KK CARR3
 446 BA 0.0033
 447 PB 3.37
 448 LS 0 98.0
 449 UD 0.101
 *
 450 KK RCARR3
 451 KM ROUTE CCARR3 TO CP8
 452 RD 360 0.005 0.015 0 DEEP 8 0
 *
 453 KK CCARR3
 454 KM COMBINE STF2, CVW AND CARR3
 455 HC 3
 *
 456 KK STE3
 457 BA 0.0021
 458 PB 3.40
 459 LS 0 98.0
 460 UD 0.050
 *

1

HEC-1 INPUT

PAGE 14

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

461 KK CP8
 462 KM COMBINE STE3 AND CCARR3
 463 HC 2
 *
 464 KK RCP8
 465 KM ROUTE CP8 TO CEE
 466 RD 240 0.005 0.015 0 DEEP 8 0
 *
 467 KK EE
 468 BA 0.0106
 469 PB 3.39
 470 LS 0 90.2
 471 UD 0.068
 *
 472 KK CEE
 473 KM COMBINES CP8 AND EE
 474 HC 2
 *
 475 KK RCP8
 476 KM ROUTE CEE TO CP9
 477 RD 220 0.005 0.015 0 DEEP 8 0
 *
 478 KK NP-3
 479 BA 0.0011
 480 PB 3.39
 481 LS 0 80.5
 482 UD 0.080
 *
 483 KK STEE3
 484 BA 0.0019
 485 PB 3.39
 486 LS 0 98.0
 487 UD 0.050
 *
 488 KK CSTEE3
 489 KM COMBINES NP-3 AND CSTEE3
 490 HC 2
 *
 491 KK CP9
 492 KM COMBINES CSTEE3 AND CEE
 493 HC 2
 *

1

HEC-1 INPUT

PAGE 15

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

494 KK RCP9
495 KM ROUTE CP9 TO DUMMY2
496 RD 281 0.005 0.015 0 DEEP 8 0
*

497 KK HH
498 BA 0.0076
499 PB 3.39
500 LS 0 94.2
501 UD 0.058
*

502 KK CARR4
503 BA 0.0036
504 PB 3.37
505 LS 0 98.0
506 UD 0.059
*

507 KK DUMMY2
508 KM REGIONAL FACILITY - BELTWAY CHANNEL SOUTH
509 HC 3
*

510 KK 25-HS1B
511 BA 0.0182
512 PB 3.44
513 LS 0 92.2
514 UD 0.050
*

515 KK STN2
516 BA 0.0068
517 PB 3.44
518 LS 0 98.0
519 UD 0.065
*

520 KK CSTN2
521 KM COMBINE 25-HS1B AND STN2
522 HC 2
*

523 KK RCSTN2
524 KM ROUTE CSTN2 TO CSTE1
525 RD 1000 0.067 0.015 0 CIRC 3
*

526 KK Y-Z
527 BA 0.0176
528 PB 3.42
529 LS 0 92.2
530 UD 0.075
*

1

HEC-1 INPUT

PAGE 16

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

531 KK STE1
532 BA 0.0027
533 PB 3.42
534 LS 0 98.0
535 UD 0.050
*

536 KK CSTE1
537 KM COMBINE CSTN2, Y-Z AND STE1
538 HC 3
*

539 KK RCSTE1
540 KM ROUTE CSTE1 TO CSTJ3
541 RD 980 0.005 0.015 0 DEEP 5 0
*

542 KK COS-3
543 BA 0.0027
544 PB 3.42
545 LS 0 83.2
546 UD 0.105
*

547 KK STJ3
548 BA 0.0050
549 PB 3.42
550 LS 0 98.0

551 UD 0.059
 *
 552 KK CSTJ3
 553 KM COMBINE CSTE1, COS-3 AND STJ3
 554 HC 3
 *
 555 KK AA
 556 BA 0.0158
 557 PB 3.44
 558 LS 0 88.4
 559 UD 0.088
 *
 560 KK DUMMY3
 561 KM COMBINE CSTJ3 AND AA
 562 HC 2
 *
 563 KK STE2
 564 BA 0.0028
 565 PB 3.40
 566 LS 0 98.0
 567 UD 0.050
 *

1

HEC-1 INPUT

PAGE 17

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

568 KK BB
 569 BA 0.0098
 570 PB 3.42
 571 LS 0 91.1
 572 UD 0.074
 *
 573 KK CBB
 574 HC 2
 *
 575 KK T
 576 BA 0.0063
 577 PB 3.42
 578 LS 0 86.3
 579 UD 0.069
 *
 580 KK CT
 581 HC 2
 *
 582 KK CC
 583 BA 0.0083
 584 PB 3.42
 585 LS 0 90.7
 586 UD 0.079
 *
 587 KK CCC
 588 HC 2
 *
 589 KK RCCC
 590 KM ROUTE CCC TO CDD
 591 RD 570 0.005 0.015 0 CIRC 3
 *
 592 KK DD
 593 BA 0.0074
 594 PB 3.40
 595 LS 0 90.5
 596 UD 0.075
 *
 597 KK CDD
 598 HC 2
 *

1

HEC-1 INPUT

PAGE 18

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

599 KK RCDD
 600 KM ROUTE CCDD TO CDESS
 601 RD 390 0.005 0.015 0 CIRC 3.5
 *
 602 KK DESS
 603 BA 0.0025

604	PB	3.40							
605	LS	0	98.0						
606	UD	0.053							
	*								
607	KK	CDES5							
608	HC	2							
	*								
609	KK	RCDES5							
610	KM	ROUTE CDES5 TO CGG							
611	RD	280 0.005 0.015 0 CIRC 3.5							
	*								
612	KK	STEE2							
613	BA	0.0028							
614	PB	3.41							
615	LS	0	98.0						
616	UD	0.050							
	*								
617	KK	CSTEE2							
618	HC	2							
	*								
619	KK	GG							
620	BA	0.0078							
621	PB	3.41							
622	LS	0	94.2						
623	UD	0.055							
	*								
624	KK	CGG							
625	HC	2							
	*								
626	KK	FF							
627	BA	0.0055							
628	PB	3.41							
629	LS	0	94.2						
630	UD	0.050							
	*								

1

HEC-1 INPUT

PAGE 19

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

631	KK	DUMMY4
632	KM	COMBINE DUMMY3, FF, AND CGG
633	HC	3
	*	
634	ZZ	

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE	(V) ROUTING	(--->) DIVERSION OR PUMP FLOW
NO.	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW
22	LM	
	.	
35	.	D
	.	
40	.	DES1
	.	
	.	
45	.	CDES1.....
	.	V
	.	V
48	.	RCDES1
	.	
	.	
51	.	COS-2
	.	
	.	
56	.	CCOS-2.....
	.	V
	.	V
59	.	RCCOS-2
	.	
	.	
62	.	A
	.	
	.	
67	.	CA.....
	.	V
	.	V
70	.	RCA
	.	

[illegible]

196	.	.	.	.	.	CSTG3		.
199	.	.	.	.	.	.	.	Q
204	.	.	.	.	.	.	.	.
209	.	.	.	.	.	.	.	R
212	.	.	.	.	.	.	.	.
217	.	.	.	.	.	.	.	.
220	.	.	.	.	.	.	.	CARR2
223	.	.	.	.	.	.	.	.
226	.	.	.	.	.	.	.	.
229	.	.	.	.	.	.	.	.
232	.	.	.	.	.	.	.	.
237	.	.	.	.	.	.	.	.
242	.	.	.	.	.	.	.	.
247	.	.	.	.	.	.	.	.
252	.	.	.	.	.	.	.	.
257	.	.	.	.	.	.	.	.
261	.	.	.	.	.	.	.	.
266	.	.	.	.	.	.	.	.
270	.	.	.	.	.	.	.	.
275	.	.	.	.	.	.	.	.
280	.	.	.	.	.	.	.	.
285	.	.	.	.	.	.	.	.
288	.	.	.	.	.	.	.	.
293	.	.	.	.	.	.	.	.
297	.	.	.	.	.	.	.	.
300	.	.	.	.	.	.	.	.
305	.	.	.	.	.	.	.	.
311	.	.	.	.	.	.	.	.
314	.	.	.	.	.	.	.	.
317	.	.	.	.	.	.	.	.
322	.	.	.	.	.	.	.	.

	.	V	
	.	V	
325	.	RCNP-2	
	.	.	
	.	.	
328	.	.	F
	.	.	
	.	.	
333	.	CF.....	
	.	V	
	.	V	
336	.	RCF	
	.	.	
	.	.	
339	.	.	25-HS1
	.	.	
	.	.	
344	.	.	STN1
	.	.	
	.	.	
350	.	CSTN1.....	
	.	V	
	.	V	
353	.	RCSTN1	
	.	.	
	.	.	
356	.	.	STG1
	.	.	
	.	.	
361	.	CSTG1.....	
	.	.	
	.	.	
364	.	CP6.....	
	.	V	
	.	V	
367	.	RCP6	
	.	.	
	.	.	
370	.	.	L-M
	.	.	
	.	.	
375	.	.	STJ2
	.	.	
	.	.	
380	.	CSTJ2.....	
	.	V	
	.	V	
383	.	RCSTJ2	
	.	.	
	.	.	
386	.	.	STF
	.	.	
	.	.	
391	.	CSTF.....	
	.	.	
	.	.	
394	.	.	U
	.	.	
	.	.	
399	.	.	DES4
	.	.	
	.	.	
404	.	CDES4.....	
	.	.	
	.	.	
407	.	.	S
	.	.	
	.	.	
412	.	CS.....	
	.	.	
	.	.	
415	.	CP7.....	
	.	V	
	.	V	
418	.	RCP7	
	.	.	
	.	.	
421	.	.	STF2
	.	.	
	.	.	
426	.	CSTF2.....	
	.	V	
	.	V	
429	.	RCSTF2	
	.	.	
	.	.	
432	.	.	V
	.	.	
	.	.	
437	.	.	W
	.	.	

442	.	.	.	.	CVW.....
	.	.	.	.	
445	.	.	.	.	CARR3
	.	.	.	.	V
	.	.	.	.	V
450	.	.	.	.	RCARR3
	.	.	.	.	
	.	.	.	.	
453	.	CCARR3.....	.	.	
	.	.	.	.	
	.	.	.	.	
456	.	.	.	.	STE3
	.	.	.	.	
	.	.	.	.	
461	.	CP8.....	.	.	
	.	.	.	.	V
	.	.	.	.	V
464	.	RCP8	.	.	
	.	.	.	.	
	.	.	.	.	
467	.	.	.	.	EE
	.	.	.	.	
	.	.	.	.	
472	.	CEE.....	.	.	
	.	.	.	.	V
	.	.	.	.	V
475	.	RCP8	.	.	
	.	.	.	.	
	.	.	.	.	
478	.	.	.	.	NP-3
	.	.	.	.	
	.	.	.	.	
483	.	.	.	.	STEE3
	.	.	.	.	
	.	.	.	.	
488	.	.	.	.	CSTEE3.....
	.	.	.	.	
	.	.	.	.	
491	.	CP9.....	.	.	
	.	.	.	.	V
	.	.	.	.	V
494	.	RCP9	.	.	
	.	.	.	.	
	.	.	.	.	
497	.	.	.	.	HH
	.	.	.	.	
	.	.	.	.	
502	.	.	.	.	CARR4
	.	.	.	.	
	.	.	.	.	
507	.	DUMMY2.....	.	.	
	.	.	.	.	
	.	.	.	.	
510	.	.	.	.	25-HS1B
	.	.	.	.	
	.	.	.	.	
515	.	.	.	.	STN2
	.	.	.	.	
	.	.	.	.	
520	.	.	.	.	CSTN2.....
	.	.	.	.	V
	.	.	.	.	V
523	.	.	.	.	RCSTN2
	.	.	.	.	
	.	.	.	.	
526	.	.	.	.	Y-Z
	.	.	.	.	
	.	.	.	.	
531	.	.	.	.	STE1
	.	.	.	.	
	.	.	.	.	
536	.	.	.	.	CSTE1.....
	.	.	.	.	V
	.	.	.	.	V
539	.	.	.	.	RCSTE1
	.	.	.	.	
	.	.	.	.	
542	.	.	.	.	COS-3
	.	.	.	.	
	.	.	.	.	
547	.	.	.	.	STJ3
	.	.	.	.	
	.	.	.	.	
552	.	.	.	.	CSTJ3.....
	.	.	.	.	
	.	.	.	.	
555	.	.	.	.	AA
	.	.	.	.	
	.	.	.	.	


```

560      .      .      DUMMY3.....
      .      .      .
563      .      .      .      STE2
      .      .      .      .
568      .      .      .      .      BB
      .      .      .      .      .
573      .      .      .      CBB.....
      .      .      .      .
575      .      .      .      .      T
      .      .      .      .      .
580      .      .      .      CT.....
      .      .      .      .
582      .      .      .      .      CC
      .      .      .      .      .
587      .      .      .      CCC.....
      .      .      .      V
      .      .      .      V
589      .      .      .      RCCC
      .      .      .      .
592      .      .      .      .      DD
      .      .      .      .      .
597      .      .      .      CDD.....
      .      .      .      V
      .      .      .      V
599      .      .      .      RCDD
      .      .      .      .
602      .      .      .      .      DESS
      .      .      .      .      .
607      .      .      .      CDESS.....
      .      .      .      V
      .      .      .      V
609      .      .      .      RCDESS
      .      .      .      .
612      .      .      .      .      STEE2
      .      .      .      .      .
617      .      .      .      CSTEE2.....
      .      .      .      .
619      .      .      .      .      GG
      .      .      .      .      .
624      .      .      .      CGG.....
      .      .      .      .
626      .      .      .      .      FF
      .      .      .      .      .
631      .      .      DUMMY4.....

```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* JUN 1998 *
* VERSION 4.1 *
* RUN DATE 23OCT19 TIME 13:10:22 *
*
*****

```

```

*****
*
* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET *
* DAVIS, CALIFORNIA 95616 *
* (916) 756-1104 *
*
*****

```

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

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*****
* UPDATE #2 - SUMMERLIN WEST VILLAGE 22 *
*****

```

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

100-YEAR, 6-HOUR STORM, SDN3

19 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 100 NUMBER OF HYDROGRAPH ORDINATES
 NDDATE 1 0 ENDING DATE
 NDTIME 0815 ENDING TIME
 ICENT 19 CENTURY MARK

 COMPUTATION INTERVAL .08 HOURS
 TOTAL TIME BASE 8.25 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

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION	
				RATIO 1	
				1.00	
HYDROGRAPH AT					
+	LM	.02	1	FLOW	36.
				TIME	3.50
HYDROGRAPH AT					
+	D	.02	1	FLOW	50.
				TIME	3.50
HYDROGRAPH AT					
+	DES1	.01	1	FLOW	20.
				TIME	3.50
2 COMBINED AT					
+	CDES1	.03	1	FLOW	70.
				TIME	3.50
ROUTED TO					
+	RCDES1	.03	1	FLOW	69.
				TIME	3.50
HYDROGRAPH AT					
+	COS-2	.01	1	FLOW	22.
				TIME	3.58
2 COMBINED AT					
+	CCOS-2	.04	1	FLOW	89.
				TIME	3.50
ROUTED TO					
+	RCCOS-2	.04	1	FLOW	87.
				TIME	3.50
HYDROGRAPH AT					
+	A	.03	1	FLOW	68.
				TIME	3.50
2 COMBINED AT					
+	CA	.06	1	FLOW	156.
				TIME	3.50
ROUTED TO					
+	RCA	.06	1	FLOW	155.
				TIME	3.50

2 COMBINED AT					
+	CP1	.08	1	FLOW TIME	191. 3.50
HYDROGRAPH AT					
+	STI	.00	1	FLOW TIME	11. 3.50
HYDROGRAPH AT					
+	C	.02	1	FLOW TIME	51. 3.50
2 COMBINED AT					
+	CSTI	.02	1	FLOW TIME	62. 3.50
HYDROGRAPH AT					
+	G	.01	1	FLOW TIME	30. 3.50
2 COMBINED AT					
+	CG	.03	1	FLOW TIME	92. 3.50
ROUTED TO					
+	RCG	.03	1	FLOW TIME	91. 3.50
HYDROGRAPH AT					
+	H	.01	1	FLOW TIME	33. 3.50
2 COMBINED AT					
+	CH	.05	1	FLOW TIME	124. 3.50
ROUTED TO					
+	RCH	.05	1	FLOW TIME	123. 3.50
HYDROGRAPH AT					
+	STH	.00	1	FLOW TIME	10. 3.50
HYDROGRAPH AT					
+	J	.01	1	FLOW TIME	24. 3.50
2 COMBINED AT					
+	CJ	.01	1	FLOW TIME	34. 3.50
ROUTED TO					
+	RCJ	.01	1	FLOW TIME	33. 3.50
HYDROGRAPH AT					
+	K	.01	1	FLOW TIME	22. 3.50
HYDROGRAPH AT					
+	DES2	.00	1	FLOW TIME	13. 3.50
3 COMBINED AT					
+	CDES2	.03	1	FLOW TIME	68. 3.50
ROUTED TO					
+	RCDES2	.03	1	FLOW TIME	66. 3.50
2 COMBINED AT					
+	CP2	.07	1	FLOW TIME	189. 3.50
ROUTED TO					
+	RCP2	.07	1	FLOW TIME	184. 3.50
HYDROGRAPH AT					
+	CARR1	.01	1	FLOW TIME	29. 3.50
HYDROGRAPH AT					
+	I	.02	1	FLOW TIME	38. 3.50
HYDROGRAPH AT					
+	N-O-P	.02	1	FLOW TIME	49. 3.50

HYDROGRAPH AT +	NP-1	.00	1	FLOW TIME	6. 3.50
HYDROGRAPH AT +	STG2	.00	1	FLOW TIME	13. 3.50
3 COMBINED AT +	CSTG2	.03	1	FLOW TIME	68. 3.50
HYDROGRAPH AT +	DES3	.00	1	FLOW TIME	9. 3.50
2 COMBINED AT +	CP3	.03	1	FLOW TIME	77. 3.50
ROUTED TO +	RCP3	.03	1	FLOW TIME	76. 3.50
HYDROGRAPH AT +	STG3	.00	1	FLOW TIME	3. 3.50
2 COMBINED AT +	CSTG3	.03	1	FLOW TIME	79. 3.50
HYDROGRAPH AT +	Q	.01	1	FLOW TIME	17. 3.50
HYDROGRAPH AT +	R	.01	1	FLOW TIME	20. 3.50
2 COMBINED AT +	CQR	.01	1	FLOW TIME	37. 3.50
HYDROGRAPH AT +	CARR2	.01	1	FLOW TIME	15. 3.50
2 COMBINED AT +	CCARR2	.02	1	FLOW TIME	52. 3.50
ROUTED TO +	RCCARR2	.02	1	FLOW TIME	51. 3.50
2 COMBINED AT +	CP4	.05	1	FLOW TIME	131. 3.50
ROUTED TO +	RCP4	.05	1	FLOW TIME	127. 3.50
4 COMBINED AT +	CP5	.15	1	FLOW TIME	379. 3.50
HYDROGRAPH AT +	II	.03	1	FLOW TIME	61. 3.50
HYDROGRAPH AT +	X	.03	1	FLOW TIME	60. 3.50
HYDROGRAPH AT +	B	.13	1	FLOW TIME	304. 3.50
HYDROGRAPH AT +	DC-1	.02	1	FLOW TIME	36. 3.67
HYDROGRAPH AT +	COS-4	.00	1	FLOW TIME	2. 3.50
5 COMBINED AT +	DUMMY1A	.20	1	FLOW	454.

				TIME	3.50
HYDROGRAPH AT					
+	COS-1	.00	1	FLOW	6.
				TIME	3.58
4 COMBINED AT					
+	DUMMY1	.44	1	FLOW	1030.
				TIME	3.50
HYDROGRAPH AT					
+	27-F	.03	1	FLOW	83.
				TIME	3.50
HYDROGRAPH AT					
+	27-COS2	.01	1	FLOW	20.
				TIME	3.50
HYDROGRAPH AT					
+	LM2	.01	1	FLOW	28.
				TIME	3.50
3 COMBINED AT					
+	CLM2	.05	1	FLOW	132.
				TIME	3.50
HYDROGRAPH AT					
+	27-COS3	.03	1	FLOW	53.
				TIME	3.50
2 COMBINED AT					
+	COFF	.08	1	FLOW	185.
				TIME	3.50
ROUTED TO					
+	RCOFF	.08	1	FLOW	182.
				TIME	3.50
HYDROGRAPH AT					
+	E	.02	1	FLOW	58.
				TIME	3.50
HYDROGRAPH AT					
+	STJ1	.01	1	FLOW	15.
				TIME	3.50
3 COMBINED AT					
+	CSTJ1	.10	1	FLOW	255.
				TIME	3.50
ROUTED TO					
+	RCSTJ1	.10	1	FLOW	250.
				TIME	3.50
HYDROGRAPH AT					
+	NP-2	.00	1	FLOW	5.
				TIME	3.50
2 COMBINED AT					
+	CNP-2	.11	1	FLOW	255.
				TIME	3.50
ROUTED TO					
+	RCNP-2	.11	1	FLOW	250.
				TIME	3.50
HYDROGRAPH AT					
+	F	.02	1	FLOW	59.
				TIME	3.50
2 COMBINED AT					
+	CF	.13	1	FLOW	309.
				TIME	3.50
ROUTED TO					
+	RCF	.13	1	FLOW	303.
				TIME	3.50
HYDROGRAPH AT					
+	25-HS1	.08	1	FLOW	211.
				TIME	3.50
HYDROGRAPH AT					
+	STN1	.01	1	FLOW	13.
				TIME	3.58
2 COMBINED AT					
+	CSTN1	.08	1	FLOW	224.
				TIME	3.50
ROUTED TO					

+	RCSTN1	.08	1	FLOW TIME	220. 3.50
HYDROGRAPH AT +	STG1	.00	1	FLOW TIME	8. 3.50
2 COMBINED AT +	CSTG1	.09	1	FLOW TIME	229. 3.50
2 COMBINED AT +	CP6	.21	1	FLOW TIME	532. 3.50
ROUTED TO +	RCP6	.21	1	FLOW TIME	518. 3.50
HYDROGRAPH AT +	L-M	.03	1	FLOW TIME	81. 3.50
HYDROGRAPH AT +	STJ2	.00	1	FLOW TIME	13. 3.50
3 COMBINED AT +	CSTJ2	.25	1	FLOW TIME	612. 3.50
ROUTED TO +	RCSTJ2	.25	1	FLOW TIME	602. 3.50
HYDROGRAPH AT +	STF	.00	1	FLOW TIME	8. 3.50
2 COMBINED AT +	CSTF	.25	1	FLOW TIME	610. 3.50
HYDROGRAPH AT +	U	.01	1	FLOW TIME	11. 3.50
HYDROGRAPH AT +	DES4	.00	1	FLOW TIME	8. 3.50
2 COMBINED AT +	CDES4	.01	1	FLOW TIME	19. 3.50
HYDROGRAPH AT +	S	.00	1	FLOW TIME	10. 3.50
2 COMBINED AT +	CS	.01	1	FLOW TIME	29. 3.50
2 COMBINED AT +	CP7	.27	1	FLOW TIME	639. 3.50
ROUTED TO +	RCP7	.27	1	FLOW TIME	632. 3.50
HYDROGRAPH AT +	STF2	.00	1	FLOW TIME	5. 3.50
2 COMBINED AT +	CSTF2	.27	1	FLOW TIME	637. 3.50
ROUTED TO +	RCSTF2	.27	1	FLOW TIME	623. 3.50
HYDROGRAPH AT +	V	.01	1	FLOW TIME	17. 3.50
HYDROGRAPH AT +	W	.01	1	FLOW TIME	19. 3.50

2 COMBINED AT					
+	CVW	.02	1	FLOW TIME	36. 3.50
HYDROGRAPH AT					
+	CARR3	.00	1	FLOW TIME	8. 3.50
ROUTED TO					
+	RCARR3	.00	1	FLOW TIME	8. 3.50
3 COMBINED AT					
+	CCARR3	.29	1	FLOW TIME	667. 3.50
HYDROGRAPH AT					
+	STE3	.00	1	FLOW TIME	6. 3.50
2 COMBINED AT					
+	CP8	.29	1	FLOW TIME	673. 3.50
ROUTED TO					
+	RCP8	.29	1	FLOW TIME	664. 3.50
HYDROGRAPH AT					
+	EE	.01	1	FLOW TIME	25. 3.50
2 COMBINED AT					
+	CEE	.30	1	FLOW TIME	689. 3.50
ROUTED TO					
+	RCP8	.30	1	FLOW TIME	680. 3.50
HYDROGRAPH AT					
+	NP-3	.00	1	FLOW TIME	2. 3.50
HYDROGRAPH AT					
+	STEE3	.00	1	FLOW TIME	5. 3.50
2 COMBINED AT					
+	CSTEE3	.00	1	FLOW TIME	7. 3.50
2 COMBINED AT					
+	CP9	.30	1	FLOW TIME	688. 3.50
ROUTED TO					
+	RCP9	.30	1	FLOW TIME	678. 3.50
HYDROGRAPH AT					
+	HH	.01	1	FLOW TIME	20. 3.50
HYDROGRAPH AT					
+	CARR4	.00	1	FLOW TIME	10. 3.50
3 COMBINED AT					
+	DUMMY2	.32	1	FLOW TIME	708. 3.50
HYDROGRAPH AT					
+	25-HS1B	.02	1	FLOW TIME	48. 3.50
HYDROGRAPH AT					
+	STN2	.01	1	FLOW TIME	19. 3.50
2 COMBINED AT					
+	CSTN2	.03	1	FLOW TIME	67. 3.50
ROUTED TO					
+	RCSTN2	.03	1	FLOW TIME	65. 3.50
HYDROGRAPH AT					
+	Y-Z	.02	1	FLOW TIME	42. 3.50

HYDROGRAPH AT +	STE1	.00	1	FLOW TIME	8. 3.50
3 COMBINED AT +	CSTE1	.05	1	FLOW TIME	115. 3.50
ROUTED TO +	RCSTE1	.05	1	FLOW TIME	107. 3.50
HYDROGRAPH AT +	COS-3	.00	1	FLOW TIME	4. 3.50
HYDROGRAPH AT +	STJ3	.00	1	FLOW TIME	14. 3.50
3 COMBINED AT +	CSTJ3	.05	1	FLOW TIME	126. 3.50
HYDROGRAPH AT +	AA	.02	1	FLOW TIME	33. 3.50
2 COMBINED AT +	DUMMY3	.07	1	FLOW TIME	159. 3.50
HYDROGRAPH AT +	STE2	.00	1	FLOW TIME	8. 3.50
HYDROGRAPH AT +	BB	.01	1	FLOW TIME	23. 3.50
2 COMBINED AT +	CBB	.01	1	FLOW TIME	31. 3.50
HYDROGRAPH AT +	T	.01	1	FLOW TIME	13. 3.50
2 COMBINED AT +	CT	.02	1	FLOW TIME	44. 3.50
HYDROGRAPH AT +	CC	.01	1	FLOW TIME	19. 3.50
2 COMBINED AT +	CCC	.03	1	FLOW TIME	63. 3.50
ROUTED TO +	RCCC	.03	1	FLOW TIME	60. 3.50
HYDROGRAPH AT +	DD	.01	1	FLOW TIME	17. 3.50
2 COMBINED AT +	CDD	.03	1	FLOW TIME	77. 3.50
ROUTED TO +	RCDD	.03	1	FLOW TIME	74. 3.50
HYDROGRAPH AT +	DESS	.00	1	FLOW TIME	7. 3.50
2 COMBINED AT +	CDESS	.04	1	FLOW TIME	81. 3.50
ROUTED TO +	RCDESS	.04	1	FLOW TIME	80. 3.50
HYDROGRAPH AT +	STEE2	.00	1	FLOW	8.

				TIME	3.50
2 COMBINED AT					
+	CSTEE2	.04	1	FLOW TIME	88.3.50
HYDROGRAPH AT					
+	GG	.01	1	FLOW TIME	21.3.50
2 COMBINED AT					
+	CGG	.05	1	FLOW TIME	109.3.50
HYDROGRAPH AT					
+	FF	.01	1	FLOW TIME	15.3.50
3 COMBINED AT					
+	DUMMY4	.12	1	FLOW TIME	282.3.50

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	INTERPOLATED TO COMPUTATION PEAK	INTERVAL TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1	RATIO=	.00							
RCDES1	MANE	.22	69.31	210.22	2.92	5.00	69.07	210.00	2.92
CONTINUITY SUMMARY (AC-FT) - INFLOW= .4002E+01 EXCESS= .0000E+00 OUTFLOW= .4002E+01 BASIN STORAGE= .1969E-04 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCCOS-2	MANE	.47	87.71	210.20	2.72	5.00	87.19	210.00	2.72
CONTINUITY SUMMARY (AC-FT) - INFLOW= .5425E+01 EXCESS= .0000E+00 OUTFLOW= .5424E+01 BASIN STORAGE= .4464E-04 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCA	MANE	.19	155.37	210.19	2.77	5.00	154.65	210.00	2.78
CONTINUITY SUMMARY (AC-FT) - INFLOW= .9561E+01 EXCESS= .0000E+00 OUTFLOW= .9561E+01 BASIN STORAGE= .1942E-04 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCG	MANE	.29	91.58	210.20	2.89	5.00	91.06	210.00	2.89
CONTINUITY SUMMARY (AC-FT) - INFLOW= .5175E+01 EXCESS= .0000E+00 OUTFLOW= .5175E+01 BASIN STORAGE= .2873E-04 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCH	MANE	.12	123.23	210.04	2.88	5.00	123.08	210.00	2.88
CONTINUITY SUMMARY (AC-FT) - INFLOW= .6989E+01 EXCESS= .0000E+00 OUTFLOW= .6989E+01 BASIN STORAGE= .1204E-04 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCJ	MANE	.43	33.61	210.51	2.73	5.00	33.37	210.00	2.73
CONTINUITY SUMMARY (AC-FT) - INFLOW= .1875E+01 EXCESS= .0000E+00 OUTFLOW= .1875E+01 BASIN STORAGE= .3567E-04 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCDES2	MANE	.73	67.25	210.43	2.84	5.00	66.40	210.00	2.85
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3910E+01 EXCESS= .0000E+00 OUTFLOW= .3910E+01 BASIN STORAGE= .7532E-04 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCP2	MANE	.73	186.67	210.84	2.87	5.00	184.26	210.00	2.87
CONTINUITY SUMMARY (AC-FT) - INFLOW= .1091E+02 EXCESS= .0000E+00 OUTFLOW= .1091E+02 BASIN STORAGE= .8878E-04 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCP3	MANE	.29	76.78	210.29	2.55	5.00	76.14	210.00	2.55

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4490E+01 EXCESS= .0000E+00 OUTFLOW= .4490E+01 BASIN STORAGE= .2690E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCCARR2 MANE .37 51.68 210.13 2.74 5.00 51.44 210.00 2.74

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3006E+01 EXCESS= .0000E+00 OUTFLOW= .3006E+01 BASIN STORAGE= .3196E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCP4 MANE .66 129.07 210.69 2.64 5.00 127.48 210.00 2.64

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7688E+01 EXCESS= .0000E+00 OUTFLOW= .7688E+01 BASIN STORAGE= .6725E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCOFF MANE .38 183.88 210.27 2.65 5.00 182.24 210.00 2.65

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1084E+02 EXCESS= .0000E+00 OUTFLOW= .1084E+02 BASIN STORAGE= .4273E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCSTJ1 MANE .48 250.37 210.43 2.73 5.00 250.31 210.00 2.73

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1511E+02 EXCESS= .0000E+00 OUTFLOW= .1511E+02 BASIN STORAGE= .5607E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCNP-2 MANE .52 250.86 210.48 2.72 5.00 250.12 210.00 2.72

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1538E+02 EXCESS= .0000E+00 OUTFLOW= .1538E+02 BASIN STORAGE= .1047E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCF MANE .41 304.65 210.23 2.75 5.00 303.48 210.00 2.75

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1879E+02 EXCESS= .0000E+00 OUTFLOW= .1878E+02 BASIN STORAGE= .8389E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCSTN1 MANE .41 221.54 210.18 2.88 5.00 220.20 210.00 2.89

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1275E+02 EXCESS= .0000E+00 OUTFLOW= .1275E+02 BASIN STORAGE= .5014E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCP6 MANE .59 520.09 210.36 2.81 5.00 517.62 210.00 2.81

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3204E+02 EXCESS= .0000E+00 OUTFLOW= .3203E+02 BASIN STORAGE= .1553E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCSTJ2 MANE .45 608.79 210.39 2.81 5.00 602.17 210.00 2.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3779E+02 EXCESS= .0000E+00 OUTFLOW= .3779E+02 BASIN STORAGE= .1206E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCP7 MANE .32 635.65 210.19 2.80 5.00 631.67 210.00 2.80

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3994E+02 EXCESS= .0000E+00 OUTFLOW= .3994E+02 BASIN STORAGE= .8070E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCSTF2 MANE .50 626.08 210.22 2.80 5.00 622.83 210.00 2.80

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4028E+02 EXCESS= .0000E+00 OUTFLOW= .4027E+02 BASIN STORAGE= .1270E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCARR3 MANE 1.27 7.90 211.47 3.14 5.00 7.63 210.00 3.14

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5521E+00 EXCESS= .0000E+00 OUTFLOW= .5521E+00 BASIN STORAGE= .1050E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCP8 MANE .28 665.68 210.11 2.78 5.00 664.00 210.00 2.78

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4321E+02 EXCESS= .0000E+00 OUTFLOW= .4320E+02 BASIN STORAGE= .7574E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCP8 MANE .26 681.97 210.12 2.77 5.00 680.39 210.00 2.77

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4455E+02 EXCESS= .0000E+00 OUTFLOW= .4454E+02 BASIN STORAGE= .6454E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCP9 MANE .33 679.63 210.08 2.77 5.00 677.90 210.00 2.77

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4497E+02 EXCESS= .0000E+00 OUTFLOW= .4496E+02 BASIN STORAGE= .8376E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCSTN2 MANE .70 65.57 210.88 2.76 5.00 65.03 210.00 2.77

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3685E+01 EXCESS= .0000E+00 OUTFLOW= .3685E+01 BASIN STORAGE= .6612E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCSTE1 MANE 1.78 110.49 211.63 2.72 5.00 107.44 210.00 2.72

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6575E+01 EXCESS= .0000E+00 OUTFLOW= .6571E+01 BASIN STORAGE= .3348E-03 PERCENT ERROR= .1

FOR PLAN = 1 RATIO= .00
RCCC MANE 1.13 61.16 210.84 2.44 5.00 59.99 210.00 2.44

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3534E+01 EXCESS= .0000E+00 OUTFLOW= .3533E+01 BASIN STORAGE= .1137E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCDD MANE .73 75.16 210.34 2.43 5.00 74.39 210.00 2.43

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4482E+01 EXCESS= .0000E+00 OUTFLOW= .4481E+01 BASIN STORAGE= .7532E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
RCDESS MANE .52 80.22 210.45 2.48 5.00 79.73 210.00 2.48

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4905E+01 EXCESS= .0000E+00 OUTFLOW= .4903E+01 BASIN STORAGE= .5246E-04 PERCENT ERROR= .0

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

A.2. Summerlin West Village 22 Desert Foothills Drive: Sunset Run
Drive to Fleet Wing Avenue (Street G) Reference

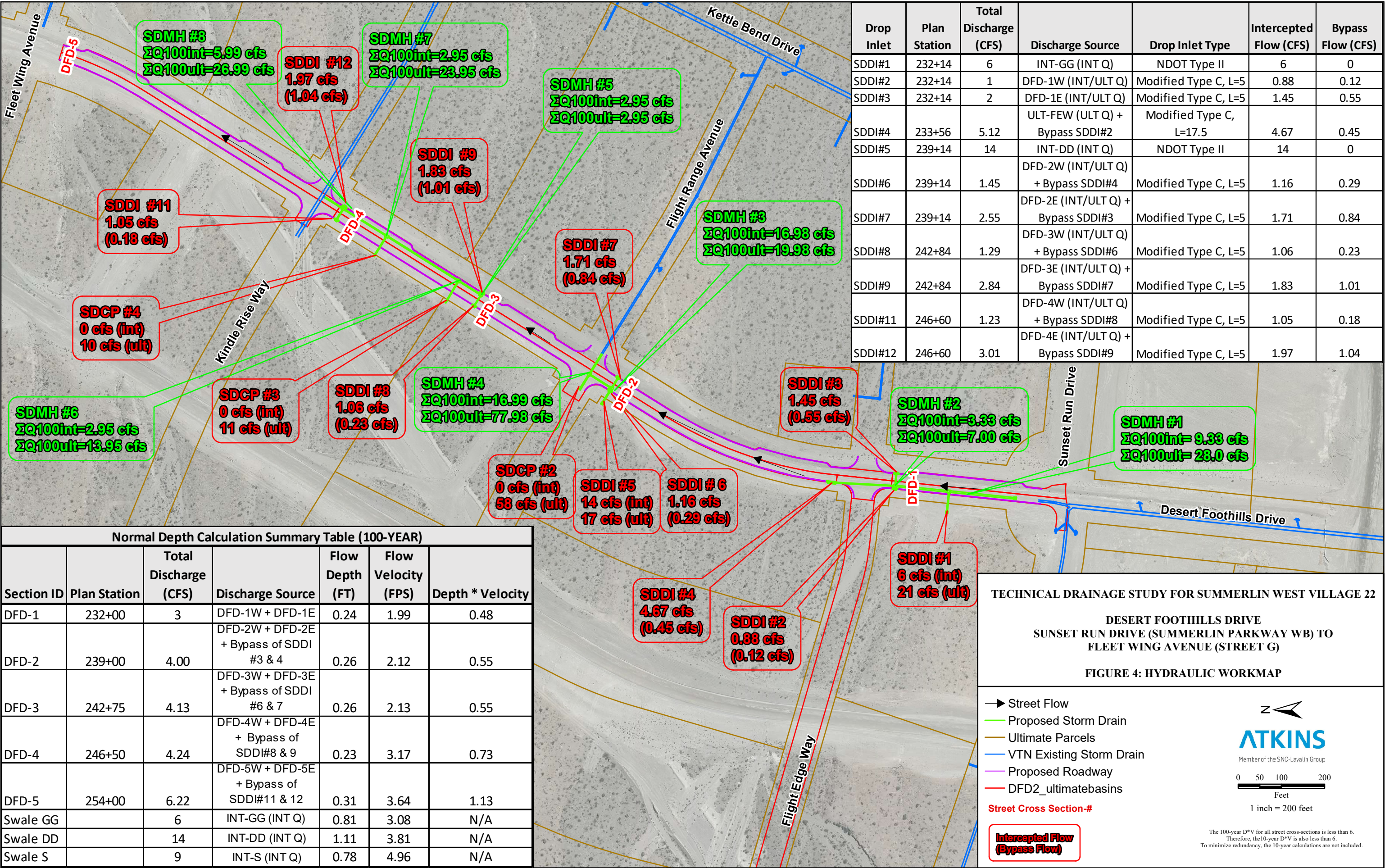


Summerlin West Village 22

Desert Foothills Drive: Sunset Run Drive to
Fleet Wing Avenue (Street G)

Prepared for Howard Hughes Company, LLC

October 2020



DFD2-FRA-ULT-LAT4.OUT

FILE: DFD2-FRA-ULT-LAT4.WSW

W S P G W - CIVILDESIGN Version 14.08

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:10-15-2020 Time: 9:35:10

SUMMERLIN WEST VILLAGE 22

DESERT FOOTHILLS DRIVE - FLIGHT RANGE AVENUE

ULTIMATE CONDITION 100-YEAR, 6-HOUR STORM EVENT

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/ 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			
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****		
885.123	3372.780	2.046	3374.825	58.00	11.30	1.98	3376.81	.00	2.47	2.79	3.000	.000	.00	1	.0		
	.893	.1109				.0109	.01	2.05	1.47	1.05	.013	.00	.00	PIPE			
886.015	3372.879	2.137	3375.015	58.00	10.77	1.80	3376.82	.00	2.47	2.72	3.000	.000	.00	1	.0		
	.645	.1109				.0098	.01	2.14	1.35	1.05	.013	.00	.00	PIPE			
886.661	3372.950	2.235	3375.185	58.00	10.27	1.64	3376.82	.00	2.47	2.62	3.000	.000	.00	1	.0		
	.399	.1109				.0088	.00	2.24	1.23	1.05	.013	.00	.00	PIPE			
887.060	3372.994	2.343	3375.337	58.00	9.79	1.49	3376.83	.00	2.47	2.48	3.000	.000	.00	1	.0		
	.140	.1109				.0079	.00	2.34	1.12	1.05	.013	.00	.00	PIPE			
887.200	3373.010	2.465	3375.475	58.00	9.33	1.35	3376.83	.00	2.47	2.30	3.000	.000	.00	1	.0		

Appendix B. Hydrology Appendix

B.1. Parameters

B.2. HEC-1 Model

B.1 Parameters

CN CALCULATIONS FOR SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE (STREET E) DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)

BASIN ID	LAND USE INDEX NUMBER	LAND USE DESCRIPTION	SOIL MAP UNIT #	SUBREGION CN	SUBREGION AREA (SQ FT)	SUBBASIN AREA (SQ FT)	PERCENT OF SUBBASIN	CUMULATIVE PERCENT	AREAL WEIGHTED CN	CUMULATIVE CN	COMPOSITE CN
OFF_1	1	Undeveloped Land, Open Desert	1502	73	250099	250234	99.9%	99.9%	72.96	72.96	73.0
STE2A	7	Public Facility and Residential, 8-12 units/acre	1502	88	14427	14461	99.8%	99.8%	87.79	87.79	87.8
STE2B	7	Public Facility and Residential, 8-12 units/acre	1502	88	14215	14195	100.1%	100.1%	88.12	88.12	88.1
STE2C	7	Public Facility and Residential, 8-12 units/acre	1502	88	15650	15634	100.1%	100.1%	88.09	88.09	88.1
STE2D	7	Public Facility and Residential, 8-12 units/acre	1502	88	15645	15655	99.9%	99.9%	87.94	87.94	87.9
STE2E	7	Public Facility and Residential, 8-12 units/acre	1502	88	20531	20528	100.0%	100.0%	88.01	88.01	88.0
STE2F	7	Public Facility and Residential, 8-12 units/acre	1502	88	20731	20754	99.9%	99.9%	87.90	87.90	87.9

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL																	
TIME OF CONCENTRATION																	
Atkins File: FORM4.XLS Member of the SNC-Lavalin Group		TDS for Summerlin Village 22 West FLIGHT RANGE EAST AVENUE (STREET E) DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)										BY: SS QC: DATE: 1/13/21					
Interim Condition																	
DESIG: (1)	DEV./EX. (D or E)	CN	K (2)	AREA Ac (3)	AREA Mi^2	INITIAL LENGTH Feet (4)	SLOPE % (5)	Ti Min (6)	TRAVEL LENGTH Feet (7)	SLOPE % (8)	V1 VELOCITY FPS (9a)	V2 VELOCITY FPS (9b)	Tt Min (10)	Tc Min (13)	Tc Check Min (14)	Tlag= 0.6Tc/60 Hours	RAINFALL Q100/Q10 Inches
OFF_1	E	73.0	0.5736	5.745	0.00898	100	8.0	4.7	950	8.0	4.2	8.3	2.9	7.6	N/A	0.10**	3.42
STE2A	D	87.8	0.7690	0.332	0.00052	22.5	2.0	2.2	260	9.3	6.2	9.3	0.7	2.9	11.6	0.05*	3.43
STE2B	D	88.1	0.7732	0.326	0.00051	22.5	2.0	2.2	260	9.3	6.2	9.3	0.7	2.9	11.6	0.05*	3.43
STE2C	D	88.1	0.7729	0.359	0.00056	22.5	2.0	2.2	290	9.3	6.2	9.3	0.8	3.0	11.7	0.05*	3.42
STE2D	D	87.9	0.7708	0.359	0.00056	22.5	2.0	2.2	292	9.3	6.2	9.3	0.8	3.0	11.7	0.05*	3.42
STE2E	D	88.0	0.7718	0.471	0.00074	22.5	2.0	2.2	380	9.3	6.2	9.3	1.0	3.3	12.2	0.05*	3.40
STE2F	D	87.9	0.7703	0.476	0.00074	22.5	2.0	2.2	380	9.3	6.2	9.3	1.0	3.3	12.2	0.05*	3.40
Tc = Ti + Tt Tlag = 0.6 Tc Ti = 1.8 (1.1 - K) L^1/2 / S^1/3 K = 0.0132 (CN) - 0.39 Tc Check = L/180+10 For the travel time (Ti) calculations, V1 applies to the first 500 feet of travel distance; V2 applies to the remaining travel distance. V1 = 14.8*(S/100)^1/2 V2 = 29.4*(S/100)^1/2 Developed Developed V1 = 20.2*(S/100)^1/2 V2 = 30.6*(S/100)^1/2																	
REFERENCE :												STANDARD FORM 4					

Tlag= 0.6Tc/60 Hours RAW
0.076
0.029
0.029
0.030
0.030
0.033
0.033

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

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

B.2 HEC-1 Model

```

1*****
*
*   FLOOD HYDROGRAPH PACKAGE   (HEC-1)
*       JUN   1998
*       VERSION 4.1
*
*   RUN DATE   13JAN21   TIME   13:31:17
*
*****

```

```

*****
*
*   U.S. ARMY CORPS OF ENGINEERS
*   HYDROLOGIC ENGINEERING CENTER
*   609 SECOND STREET
*   DAVIS, CALIFORNIA 95616
*   (916) 756-1104
*
*****

```

```

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

```

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

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

1 HEC-1 INPUT PAGE 1

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

*DIAGRAM

*** FREE ***

```

1   ID  TECHNICAL DRAINAGE STUDY
2   ID  SUMMERLIN VILLAGE 22
3   ID  FLIGHT RANGE AVENUE (STREET E)
4   ID  DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)
5   ID  NOVEMBER 2020
6   ID
7   ID  JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES
8   ID
9   ID      AREA (SQUARE MILES)          DARF
10  ID
11  ID      0 - 0.5                      0.99
12  ID      Estimated 10-year            0.57
13  ID
14  IT      5      0      0      300
15  IO      5      0      0
16  IN      5      0      0
17  JR      PREC   0.99   0.57
18
19  KK  OFF_1
20  BA  0.00898
21  PB  3.42
22  PC  0.000  0.020  0.057  0.070  0.087  0.108  0.124  0.130  0.130  0.130
23  PC  0.130  0.130  0.130  0.133  0.140  0.142  0.148  0.158  0.172  0.181
24  PC  0.190  0.197  0.199  0.200  0.201  0.204  0.214  0.229  0.241  0.249
25  PC  0.251  0.256  0.270  0.278  0.281  0.283  0.295  0.322  0.352  0.409
26  PC  0.499  0.590  0.710  0.744  0.781  0.812  0.819  0.835  0.851  0.856
27  PC  0.860  0.868  0.876  0.888  0.910  0.926  0.937  0.950  0.970  0.976
28  PC  0.982  0.985  0.987  0.989  0.990  0.993  0.993  0.994  0.995  0.998
29  PC  0.998  0.999  1.000
30  LS      0      73.0
31  UD  0.100
32
33  KK  STE2A
34  BA  0.00052
35  PB  3.43
36  LS      0      87.8
37  UD  0.05
38
39  KK  STE2B
40  BA  0.00051
41  PB  3.43
42  LS      0      88.1
43  UD  0.05
44

```

1 HEC-1 INPUT PAGE 2

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

41	KK	STE2C		
42	BA	0.00056		
43	PB	3.42		
44	LS	0	88.1	
45	UD	0.05		
	*			
46	KK	STE2D		
47	BA	0.00056		
48	PB	3.42		
49	LS	0	87.9	
50	UD	0.05		
	*			
51	KK	STE2E		
52	BA	0.00074		
53	PB	3.4		
54	LS	0	88.0	
55	UD	0.05		
	*			
56	KK	STE2F		
57	BA	0.00074		
58	PB	3.4		
59	LS	0	87.9	
60	UD	0.05		
	*			
61	ZZ			

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE	(V) ROUTING	(--->) DIVERSION OR PUMP FLOW
NO.	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW
18	OFF_1	
	.	
31	STE2A	
	.	
36	STE2B	
	.	
41	STE2C	
	.	
46	STE2D	
	.	
51	STE2E	
	.	
56	STE2F	
	.	

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
*
* RUN DATE 13JAN21 TIME 13:31:17
*
*****

```

```

*****
*
* U.S. ARMY CORPS OF ENGINEERS
* HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
*****

```

TECHNICAL DRAINAGE STUDY
SUMMERLIN VILLAGE 22
FLIGHT RANGE AVENUE (STREET E)
DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)
NOVEMBER 2020

JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES

AREA (SQUARE MILES)	DARF
0 - 0.5	0.99
Estimated 10-year	0.57

15 IO

OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

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

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS

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

JP MULTI-PLAN OPTION

NPLAN	1	NUMBER OF PLANS
-------	---	-----------------

JR MULTI-RATIO OPTION

RATIOS OF PRECIPITATION	
.99	.57

1

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

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION	
				RATIO 1	RATIO 2
				.99	.57
HYDROGRAPH AT					
+	OFF_1	.01	1 FLOW	9.	2.
			TIME	3.58	3.58
HYDROGRAPH AT					
+	STE2A	.00	1 FLOW	1.	1.
			TIME	3.50	3.50
HYDROGRAPH AT					
+	STE2B	.00	1 FLOW	1.	1.
			TIME	3.50	3.50
HYDROGRAPH AT					
+	STE2C	.00	1 FLOW	1.	1.
			TIME	3.50	3.50
HYDROGRAPH AT					
+	STE2D	.00	1 FLOW	1.	1.
			TIME	3.50	3.50
HYDROGRAPH AT					
+	STE2E	.00	1 FLOW	2.	1.
			TIME	3.50	3.50
HYDROGRAPH AT					
+	STE2F	.00	1 FLOW	2.	1.
			TIME	3.50	3.50

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

Appendix C. Hydraulics Appendix

- C.1. Drop Inlet Calculations
- C.2. Normal Depth Calculations
- C.3. Ultimate Condition WSPG-W Model
- C.4. Riprap Calculations

C.1 Drop Inlet Calculations

Worksheet for Combination Inlet On Grade - SDDI #1

Project Description	
Solve For	Efficiency
Input Data	
Discharge	2.1 cfs
Slope	0.030 ft/ft
Gutter Width	1.50 ft
Gutter Cross Slope	0.086 ft/ft
Road Cross Slope	0.020 ft/ft
Roughness Coefficient	0.016
Local Depression	4.0 in
Local Depression Width	26.0 in
Grate Width	1.50 ft
Grate Length	7.50 ft
Grate Type	P-50 mm x 100 mm (P-1- 7/8"-4")
Clogging	50.0 %
Curb Opening Length	10.00 ft
Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None
Results	
Efficiency	99.64 %
Intercepted Flow	2.1 cfs
Bypass Flow	0.0 cfs
Spread	6.87 ft
Depth	0.24 ft
Flow Area	0.5 ft ²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	3.85 ft/s
Splash Over Velocity	7.09 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.198
Grate Flow Ratio	0.626
Equivalent Cross Slope	0.145 ft/ft
Active Grate Length	3.75 ft
Length Factor	0.573
Total Interception Length	10.90 ft
Messages	

Worksheet for Combination Inlet On Grade - SDDI #1

Messages

Messages

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

Worksheet for Combination Inlet On Grade - SDDI #2

Project Description	
Solve For	Efficiency
Input Data	
Discharge	2.1 cfs
Slope	0.030 ft/ft
Gutter Width	1.50 ft
Gutter Cross Slope	0.086 ft/ft
Road Cross Slope	0.020 ft/ft
Roughness Coefficient	0.016
Local Depression	4.0 in
Local Depression Width	26.0 in
Grate Width	1.50 ft
Grate Length	7.50 ft
Grate Type	P-50 mm x 100 mm (P-1- 7/8"-4")
Clogging	50.0 %
Curb Opening Length	10.00 ft
Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None
Results	
Efficiency	99.64 %
Intercepted Flow	2.1 cfs
Bypass Flow	0.0 cfs
Spread	6.87 ft
Depth	0.24 ft
Flow Area	0.5 ft ²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	3.85 ft/s
Splash Over Velocity	7.09 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.198
Grate Flow Ratio	0.626
Equivalent Cross Slope	0.145 ft/ft
Active Grate Length	3.75 ft
Length Factor	0.573
Total Interception Length	10.90 ft
Messages	

Worksheet for Combination Inlet On Grade - SDDI #2

Messages

Messages

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

Worksheet for Combination Inlet On Grade - SDDI #3

Project Description	
Solve For	Efficiency
Input Data	
Discharge	1.1 cfs
Slope	0.093 ft/ft
Gutter Width	1.50 ft
Gutter Cross Slope	0.086 ft/ft
Road Cross Slope	0.020 ft/ft
Roughness Coefficient	0.016
Local Depression	4.0 in
Local Depression Width	26.0 in
Grate Width	1.50 ft
Grate Length	2.50 ft
Grate Type	P-50 mm x 100 mm (P-1- 7/8"-4")
Clogging	50.0 %
Curb Opening Length	5.00 ft
Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None
Results	
Efficiency	93.46 %
Intercepted Flow	1.0 cfs
Bypass Flow	0.1 cfs
Spread	3.38 ft
Depth	0.17 ft
Flow Area	0.2 ft ²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	5.84 ft/s
Splash Over Velocity	3.40 ft/s
Frontal Flow Factor	0.780
Side Flow Factor	0.009
Grate Flow Ratio	0.924
Equivalent Cross Slope	0.204 ft/ft
Active Grate Length	1.25 ft
Length Factor	0.395
Total Interception Length	9.49 ft
Messages	

Worksheet for Combination Inlet On Grade - SDDI #3

Messages

Messages

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

Worksheet for Combination Inlet On Grade - SDDI #4

Project Description	
Solve For	Efficiency
Input Data	
Discharge	1.1 cfs
Slope	0.093 ft/ft
Gutter Width	1.50 ft
Gutter Cross Slope	0.086 ft/ft
Road Cross Slope	0.020 ft/ft
Roughness Coefficient	0.016
Local Depression	4.0 in
Local Depression Width	26.0 in
Grate Width	1.50 ft
Grate Length	2.50 ft
Grate Type	P-50 mm x 100 mm (P-1- 7/8"-4")
Clogging	50.0 %
Curb Opening Length	5.00 ft
Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None
Results	
Efficiency	93.46 %
Intercepted Flow	1.0 cfs
Bypass Flow	0.1 cfs
Spread	3.38 ft
Depth	0.17 ft
Flow Area	0.2 ft ²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	5.84 ft/s
Splash Over Velocity	3.40 ft/s
Frontal Flow Factor	0.780
Side Flow Factor	0.009
Grate Flow Ratio	0.924
Equivalent Cross Slope	0.204 ft/ft
Active Grate Length	1.25 ft
Length Factor	0.395
Total Interception Length	9.49 ft
Messages	

Worksheet for Combination Inlet On Grade - SDDI #4

Messages

Messages

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

Worksheet for Combination Inlet On Grade - SDDI #5

Project Description	
Solve For	Efficiency
Input Data	
Discharge	1.0 cfs
Slope	0.093 ft/ft
Gutter Width	1.50 ft
Gutter Cross Slope	0.086 ft/ft
Road Cross Slope	0.020 ft/ft
Roughness Coefficient	0.016
Local Depression	4.0 in
Local Depression Width	26.0 in
Grate Width	1.50 ft
Grate Length	2.50 ft
Grate Type	P-50 mm x 100 mm (P-1- 7/8"-4")
Clogging	50.0 %
Curb Opening Length	5.00 ft
Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None
Results	
Efficiency	94.55 %
Intercepted Flow	0.9 cfs
Bypass Flow	0.1 cfs
Spread	3.13 ft
Depth	0.16 ft
Flow Area	0.2 ft ²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	5.80 ft/s
Splash Over Velocity	3.40 ft/s
Frontal Flow Factor	0.784
Side Flow Factor	0.009
Grate Flow Ratio	0.942
Equivalent Cross Slope	0.208 ft/ft
Active Grate Length	1.25 ft
Length Factor	0.416
Total Interception Length	9.02 ft
Messages	

Worksheet for Combination Inlet On Grade - SDDI #5

Messages

Messages

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

Worksheet for Combination Inlet On Grade - SDDI #6

Project Description	
Solve For	Efficiency
Input Data	
Discharge	1.0 cfs
Slope	0.093 ft/ft
Gutter Width	1.50 ft
Gutter Cross Slope	0.086 ft/ft
Road Cross Slope	0.020 ft/ft
Roughness Coefficient	0.016
Local Depression	4.0 in
Local Depression Width	26.0 in
Grate Width	1.50 ft
Grate Length	2.50 ft
Grate Type	P-50 mm x 100 mm (P-1- 7/8"-4")
Clogging	50.0 %
Curb Opening Length	5.00 ft
Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None
Results	
Efficiency	94.55 %
Intercepted Flow	0.9 cfs
Bypass Flow	0.1 cfs
Spread	3.13 ft
Depth	0.16 ft
Flow Area	0.2 ft ²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	5.80 ft/s
Splash Over Velocity	3.40 ft/s
Frontal Flow Factor	0.784
Side Flow Factor	0.009
Grate Flow Ratio	0.942
Equivalent Cross Slope	0.208 ft/ft
Active Grate Length	1.25 ft
Length Factor	0.416
Total Interception Length	9.02 ft
Messages	

Worksheet for Combination Inlet On Grade - SDDI #6

Messages

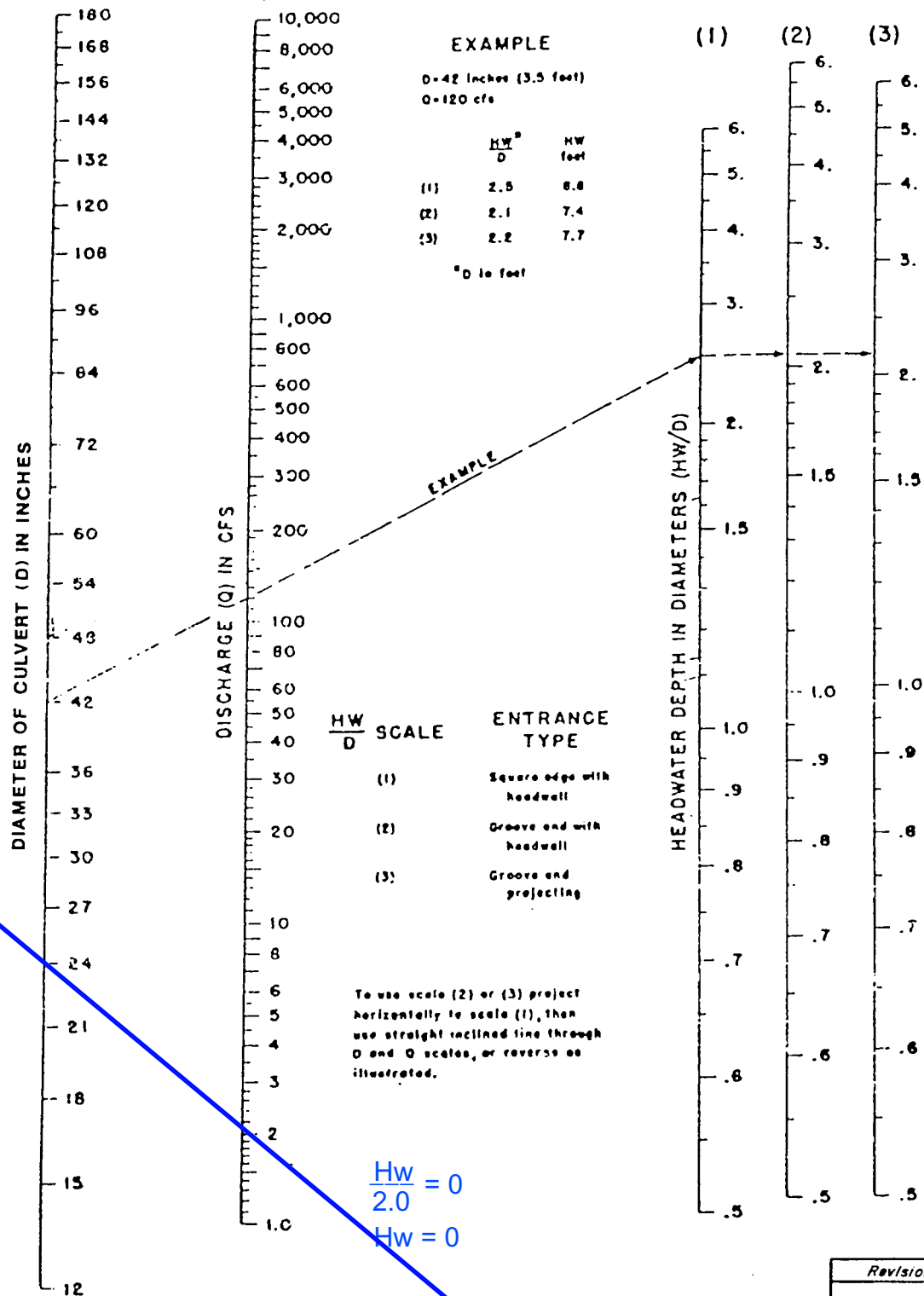
Messages

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

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

NOMOGRAPH - INLET CONTROL RCP

DROP INLET (SDDI) #1 / Street E

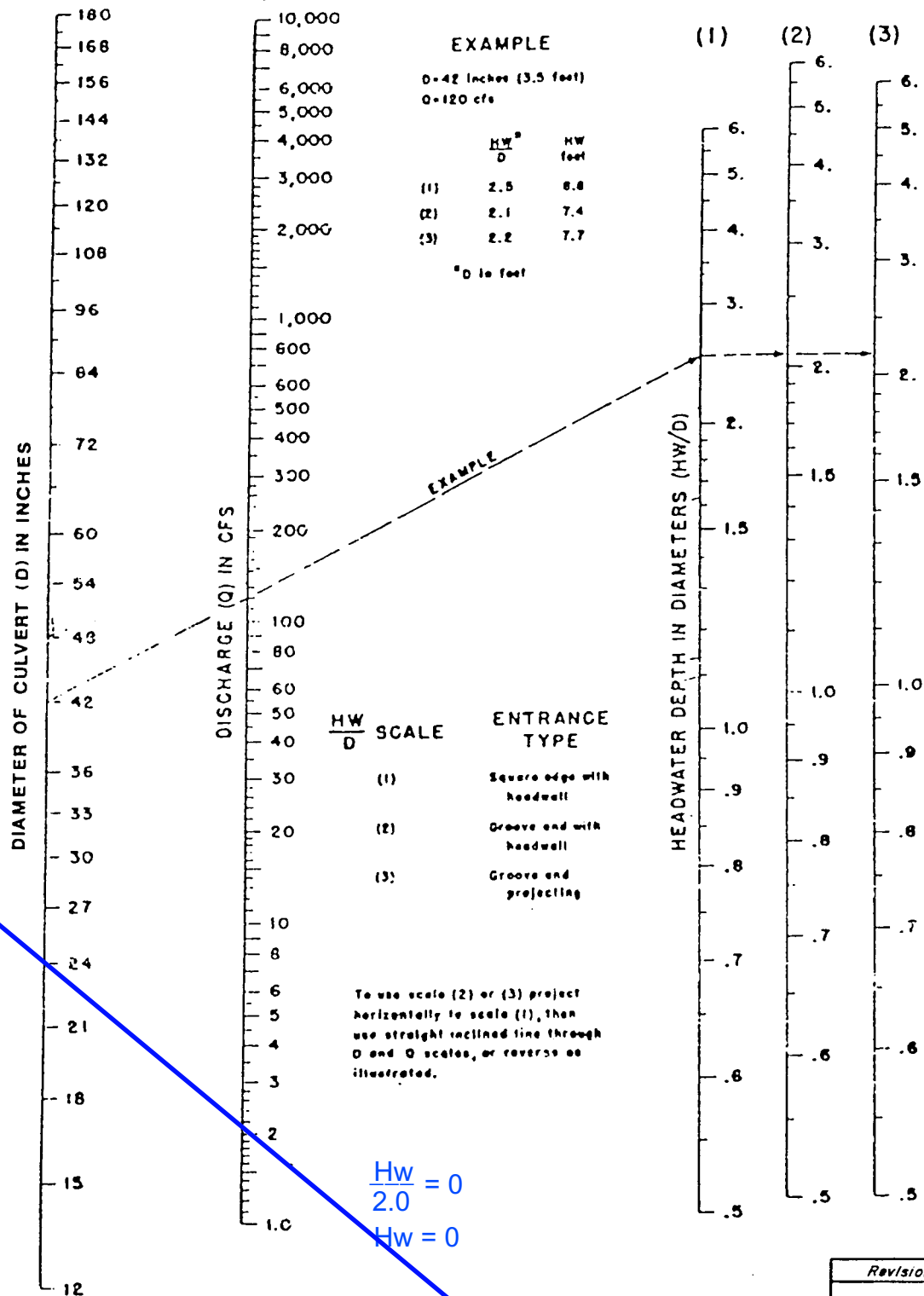


Revision	Date

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

NOMOGRAPH - INLET CONTROL RCP

DROP INLET (SDDI) #2 / Street E

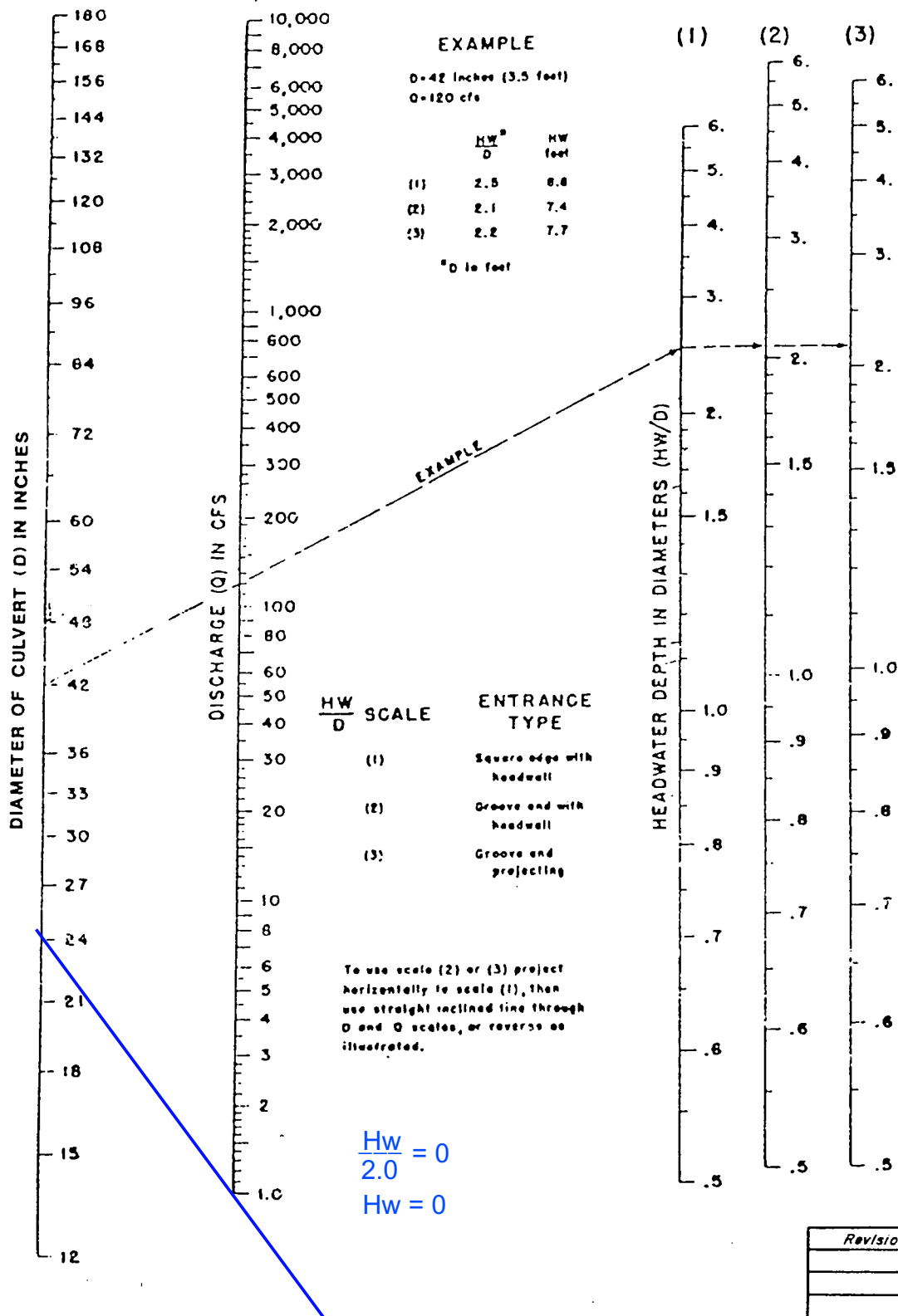


Revision	Date

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

NOMOGRAPH - INLET CONTROL RCP

DROP INLET (SDDI) #3 / Street E



Revision	Date

WRC
ENGINEERING

REFERENCE:

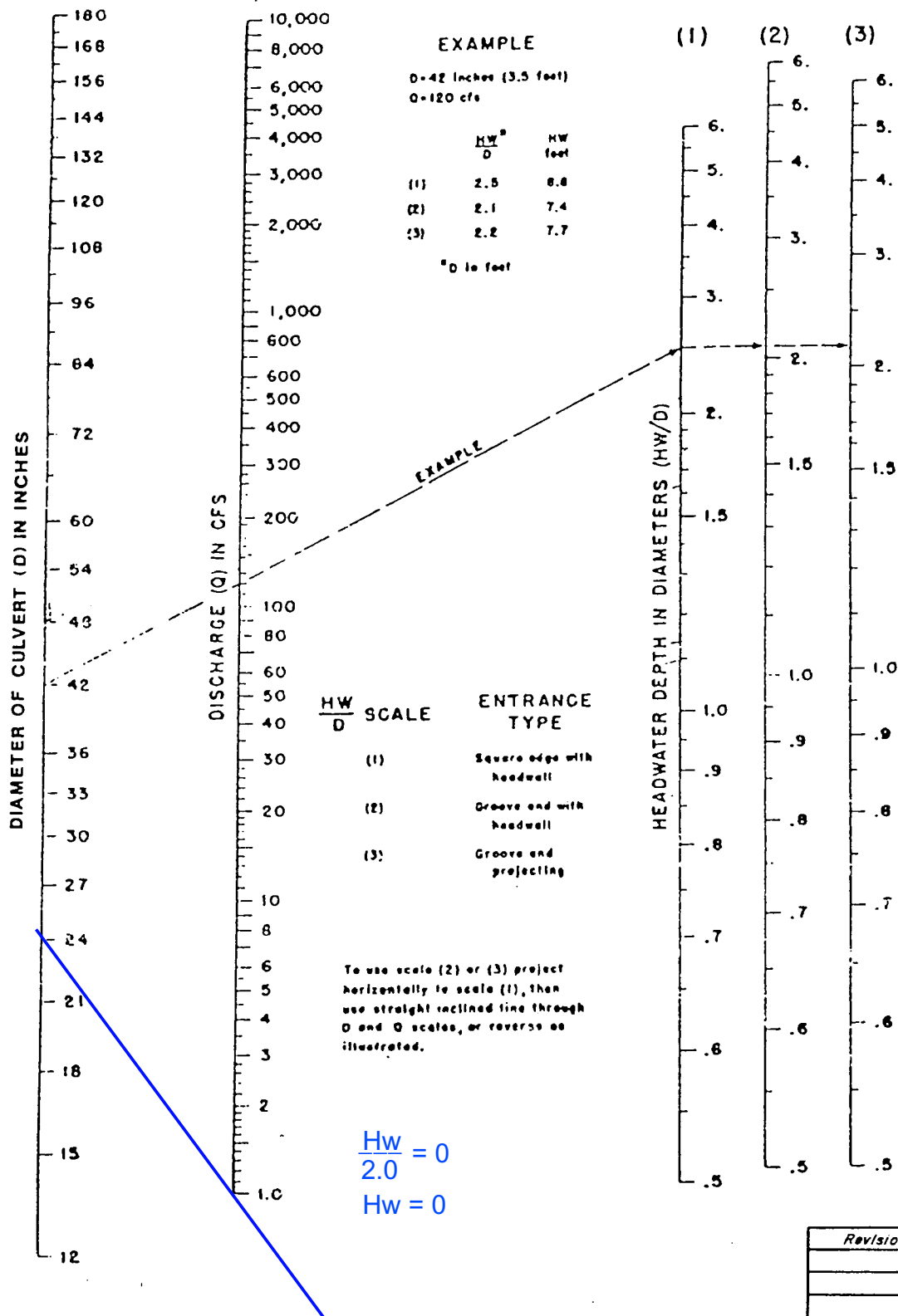
USDOT, FHWA, HDS, No. 5, 1985

FIGURE 1005

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

NOMOGRAPH - INLET CONTROL RCP

DROP INLET (SDDI) #4 / Street E



Revision	Date

WRC
ENGINEERING

REFERENCE:

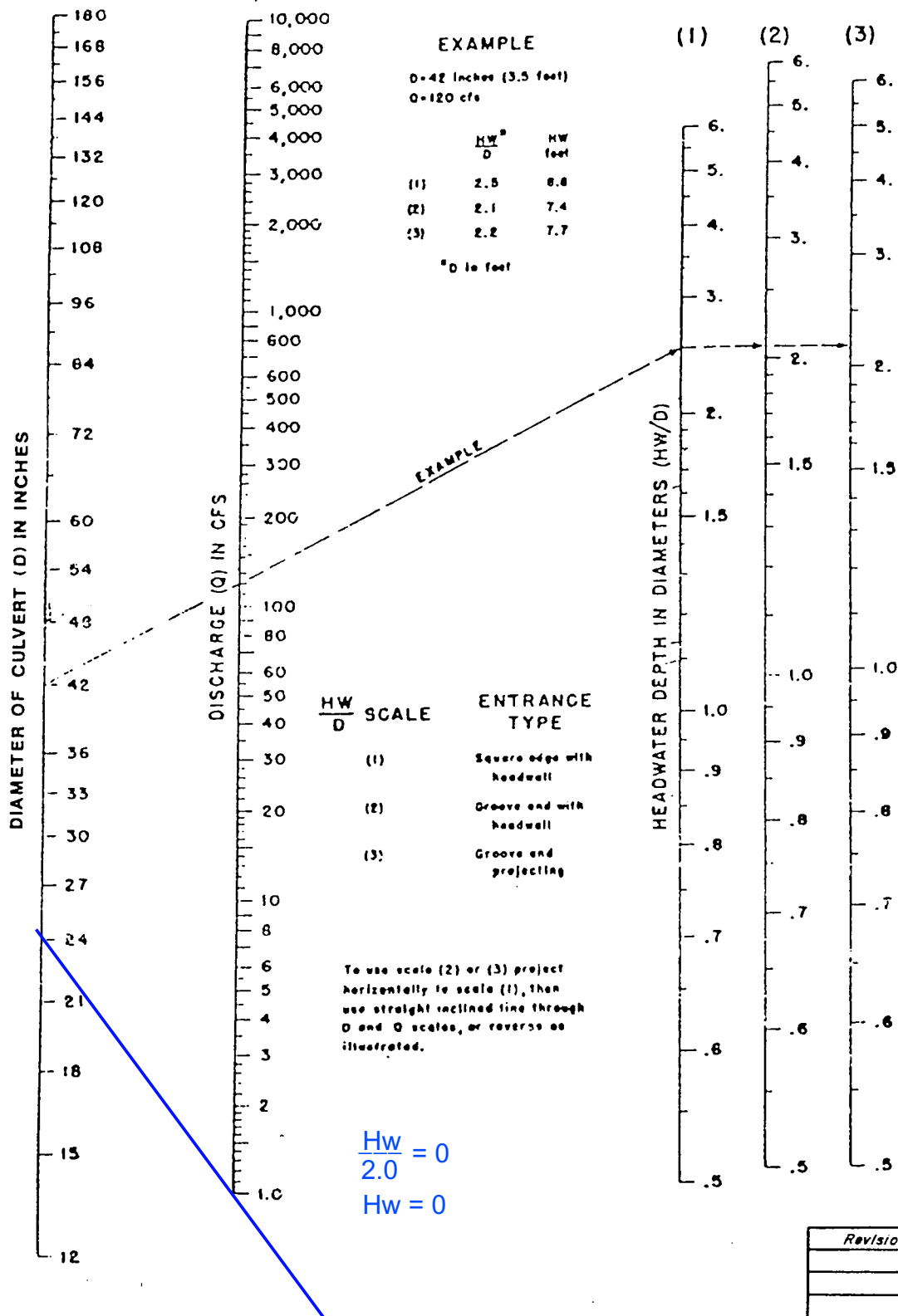
USDOT, FHWA, HDS, No. 5, 1985

FIGURE 1005

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

NOMOGRAPH - INLET CONTROL RCP

DROP INLET (SDDI) #5 / Street E



Revision	Date

WRC
ENGINEERING

REFERENCE:

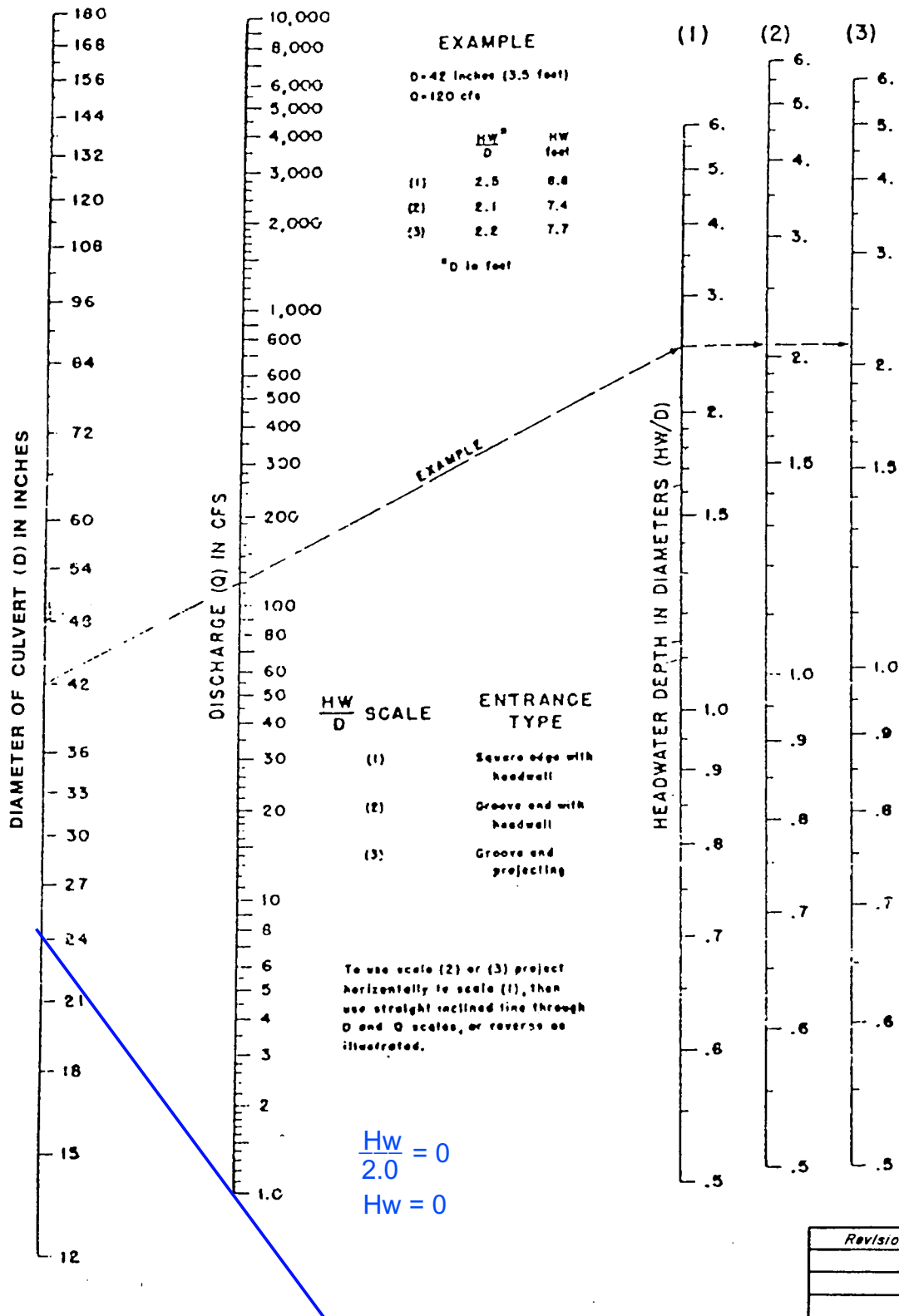
USDOT, FHWA, HDS, No. 5, 1985

FIGURE 1005

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

NOMOGRAPH - INLET CONTROL RCP

DROP INLET (SDDI) #6 / Street E



Total Discharge
Q = 0.9-CFS
24" RCP
LATERAL

Revision	Date

WRC
ENGINEERING

REFERENCE:

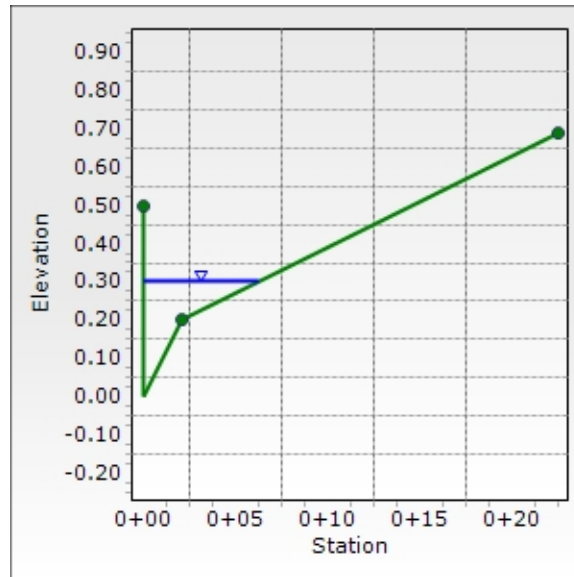
USDOT, FHWA, HDS, No. 5, 1985

FIGURE 1005

C.2 Normal Depth Calculations

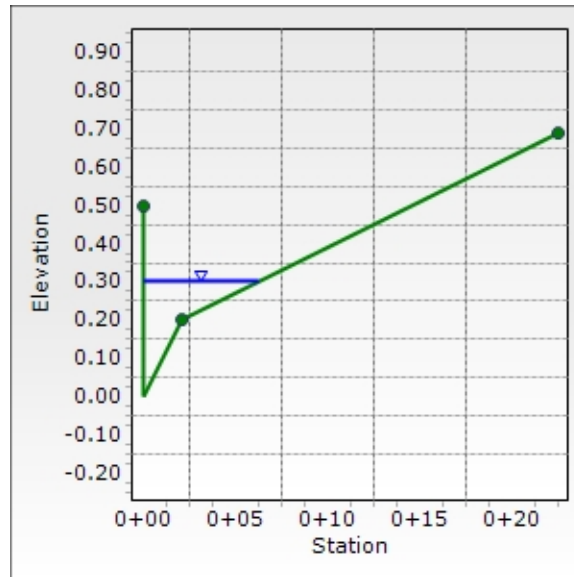
Cross Section for Section1S

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.030 ft/ft
Normal Depth	0.30 ft
Discharge	2.1 cfs



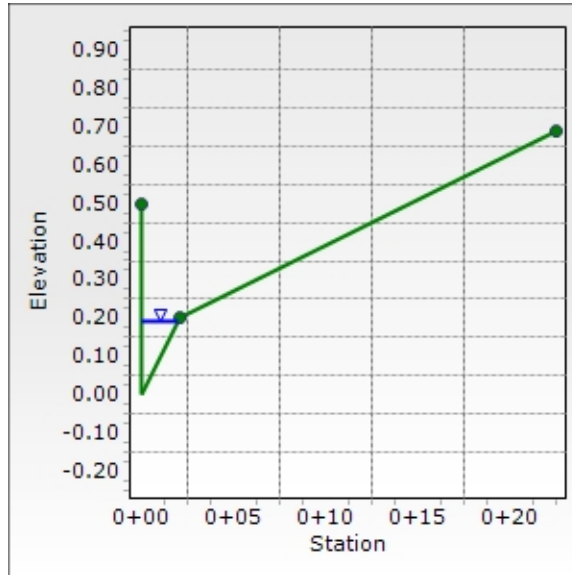
Cross Section for Section1N

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.030 ft/ft
Normal Depth	0.30 ft
Discharge	2.1 cfs



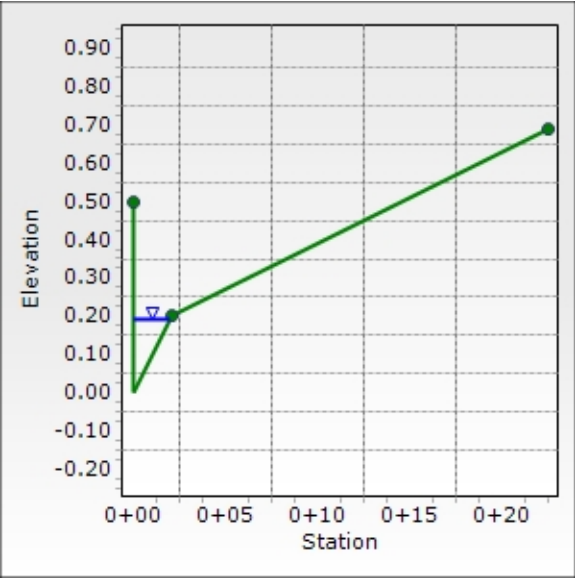
Cross Section for Section 2S

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.093 ft/ft
Normal Depth	0.19 ft
Discharge	1.1 cfs



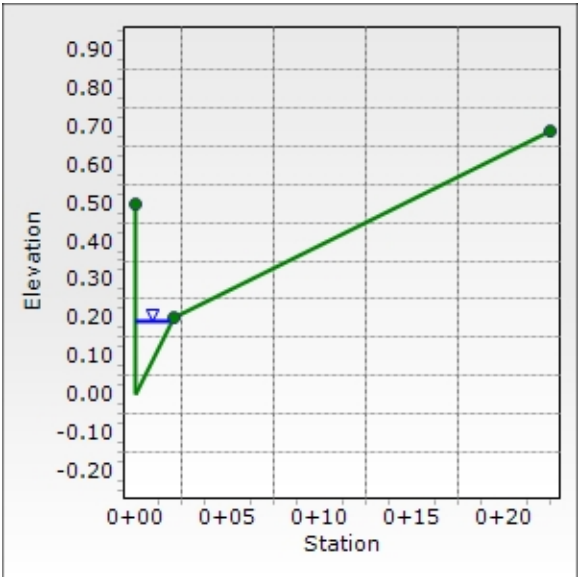
Cross Section for Section 2N

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Channel Slope	0.093 ft/ft
Normal Depth	0.19 ft
Discharge	1.1 cfs



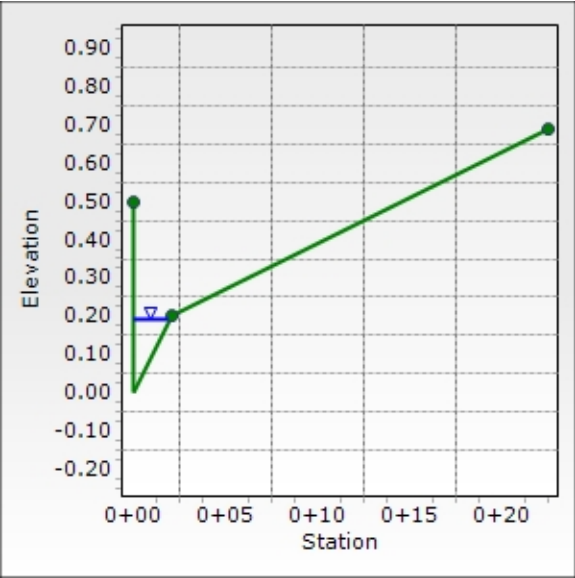
Cross Section for Section 3S

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Channel Slope	0.093 ft/ft
Normal Depth	0.19 ft
Discharge	1.0 cfs



Cross Section for Section 3N

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.093 ft/ft
Normal Depth	0.19 ft
Discharge	1.0 cfs



C.3 Ultimate Condition WSPG-W Model

FR_Main_U.OUT

FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

```

*****
| 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 |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
1900.000 | 3373.010 | 1.309 | 3374.320 | 63.00 | 21.26 | 7.02 | 3381.34 | .00 | 2.55 | 2.98 | 3.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
5.879 | .1106 | | | | | .0554 | .33 | 1.31 | 3.75 | 1.09 | .013 | .00 | .00 | PIPE |
1905.879 | 3373.660 | 1.335 | 3374.995 | 63.00 | 20.72 | 6.66 | 3381.66 | .00 | 2.55 | 2.98 | 3.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
9.219 | .1106 | | | | | .0502 | .46 | 1.34 | 3.62 | 1.09 | .013 | .00 | .00 | PIPE |
1915.098 | 3374.679 | 1.385 | 3376.064 | 63.00 | 19.75 | 6.06 | 3382.12 | .00 | 2.55 | 2.99 | 3.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
7.512 | .1106 | | | | | .0442 | .33 | 1.38 | 3.37 | 1.09 | .013 | .00 | .00 | PIPE |
1922.610 | 3375.510 | 1.437 | 3376.947 | 63.00 | 18.83 | 5.51 | 3382.46 | .00 | 2.55 | 3.00 | 3.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0400 | | | | | .0414 | .04 | 1.44 | 3.14 | 1.45 | .013 | .00 | .00 | PIPE |
1923.610 | 3375.550 | 1.437 | 3376.987 | 63.00 | 18.84 | 5.51 | 3382.50 | .00 | 2.55 | 3.00 | 3.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0300 | | | | | .0414 | .04 | 1.44 | 3.14 | 1.58 | .013 | .00 | .00 | PIPE |
1924.610 | 3375.580 | 1.435 | 3377.015 | 63.00 | 18.86 | 5.52 | 3382.54 | .00 | 2.55 | 3.00 | 3.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
JUNCT STR | .0300 | | | | | .0477 | .05 | 1.44 | 3.15 | | | .013 | .00 | .00 | PIPE |
1925.610 | 3375.610 | 1.284 | 3376.894 | 59.00 | 20.42 | 6.48 | 3383.37 | .00 | 2.48 | 2.97 | 3.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
TRANS STR | .0298 | | | | | .0534 | .05 | 1.28 | 3.65 | | | .013 | .00 | .00 | PIPE |
1926.610 | 3375.640 | 1.432 | 3377.072 | 59.00 | 20.29 | 6.39 | 3383.46 | .00 | 2.39 | 2.47 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0300 | | | | | .0531 | .05 | 1.43 | 3.30 | 1.74 | .013 | .00 | .00 | PIPE |
1927.610 | 3375.670 | 1.430 | 3377.100 | 59.00 | 20.33 | 6.42 | 3383.52 | .00 | 2.39 | 2.47 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0400 | | | | | .0533 | .05 | 1.43 | 3.31 | 1.57 | .013 | .00 | .00 | PIPE |

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FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

```

*****
| 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 |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
1928.610 | 3375.710 | 1.428 | 3377.139 | 59.00 | 20.35 | 6.43 | 3383.57 | .00 | 2.39 | 2.47 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
64.692 | .0479 | | | | | .0569 | 3.68 | 1.43 | 3.31 | 1.48 | .013 | .00 | .00 | PIPE |
1993.302 | 3378.807 | 1.375 | 3380.181 | 59.00 | 21.34 | 7.07 | 3387.25 | .00 | 2.39 | 2.49 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
39.643 | .0479 | | | | | .0644 | 2.55 | 1.37 | 3.57 | 1.48 | .013 | .00 | .00 | PIPE |
2032.945 | 3380.705 | 1.323 | 3382.028 | 59.00 | 22.38 | 7.78 | 3389.80 | .00 | 2.39 | 2.50 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
28.945 | .0479 | | | | | .0730 | 2.11 | 1.32 | 3.84 | 1.48 | .013 | .00 | .00 | PIPE |
2061.890 | 3382.090 | 1.274 | 3383.364 | 59.00 | 23.47 | 8.55 | 3391.92 | .00 | 2.39 | 2.50 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0398 | | | | | .0779 | .08 | 1.27 | 4.12 | 1.57 | .013 | .00 | .00 | PIPE |
2062.890 | 3382.130 | 1.271 | 3383.401 | 59.00 | 23.53 | 8.59 | 3392.00 | .00 | 2.39 | 2.50 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0300 | | | | | .0785 | .08 | 1.27 | 4.14 | 1.74 | .013 | .00 | .00 | PIPE |
2063.890 | 3382.160 | 1.268 | 3383.428 | 59.00 | 23.60 | 8.65 | 3392.08 | .00 | 2.39 | 2.50 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0300 | | | | | .0792 | .08 | 1.27 | 4.16 | 1.74 | .013 | .00 | .00 | PIPE |
2064.890 | 3382.190 | 1.265 | 3383.455 | 59.00 | 23.68 | 8.71 | 3392.16 | .00 | 2.39 | 2.50 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0300 | | | | | .0799 | .08 | 1.26 | 4.18 | 1.74 | .013 | .00 | .00 | PIPE |
2065.890 | 3382.220 | 1.261 | 3383.481 | 59.00 | 23.76 | 8.77 | 3392.25 | .00 | 2.39 | 2.50 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0300 | | | | | .0806 | .08 | 1.26 | 4.20 | 1.74 | .013 | .00 | .00 | PIPE |
2066.890 | 3382.250 | 1.258 | 3383.508 | 59.00 | 23.84 | 8.83 | 3392.33 | .00 | 2.39 | 2.50 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0400 | | | | | .0812 | .08 | 1.26 | 4.22 | 1.57 | .013 | .00 | .00 | PIPE |

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FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
L/Elem | Ch Slope | | | | | | | | | | | | | | |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
2067.890 | 3382.290 | 1.256 | 3383.546 | 59.00 | 23.90 | 8.87 | 3392.42 | .00 | 2.39 | 2.50 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
32.032 | .0895 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2099.923 | 3385.156 | 1.275 | 3386.430 | 59.00 | 23.45 | 8.54 | 3394.97 | .00 | 2.39 | 2.50 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
43.896 | .0895 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2143.819 | 3389.082 | 1.324 | 3390.406 | 59.00 | 22.36 | 7.76 | 3398.17 | .00 | 2.39 | 2.50 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
25.969 | .0895 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2169.788 | 3391.405 | 1.375 | 3392.781 | 59.00 | 21.32 | 7.06 | 3399.84 | .00 | 2.39 | 2.49 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
17.941 | .0895 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2187.729 | 3393.010 | 1.430 | 3394.440 | 59.00 | 20.33 | 6.42 | 3400.86 | .00 | 2.39 | 2.47 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
13.368 | .0895 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2201.096 | 3394.206 | 1.487 | 3395.693 | 59.00 | 19.38 | 5.83 | 3401.53 | .00 | 2.39 | 2.45 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
10.406 | .0895 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2211.502 | 3395.137 | 1.548 | 3396.685 | 59.00 | 18.48 | 5.30 | 3401.99 | .00 | 2.39 | 2.43 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
8.323 | .0895 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2219.825 | 3395.882 | 1.613 | 3397.494 | 59.00 | 17.62 | 4.82 | 3402.31 | .00 | 2.39 | 2.39 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
6.767 | .0895 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2226.592 | 3396.487 | 1.682 | 3398.169 | 59.00 | 16.80 | 4.38 | 3402.55 | .00 | 2.39 | 2.35 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
5.554 | .0895 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

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FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 4

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

```

*****
| 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 |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
2232.146 | 3396.984 | 1.756 | 3398.740 | 59.00 | 16.02 | 3.98 | 3402.72 | .00 | 2.39 | 2.29 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
4.572 | .0895 | | | | | .0277 | .13 | 1.76 | 2.22 | 1.22 | .013 | .00 | .00 | PIPE |
2236.718 | 3397.393 | 1.836 | 3399.228 | 59.00 | 15.27 | 3.62 | 3402.85 | .00 | 2.39 | 2.21 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
3.744 | .0895 | | | | | .0248 | .09 | 1.84 | 2.03 | 1.22 | .013 | .00 | .00 | PIPE |
2240.461 | 3397.728 | 1.923 | 3399.651 | 59.00 | 14.56 | 3.29 | 3402.94 | .00 | 2.39 | 2.11 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
3.016 | .0895 | | | | | .0224 | .07 | 1.92 | 1.85 | 1.22 | .013 | .00 | .00 | PIPE |
2243.477 | 3397.997 | 2.020 | 3400.017 | 59.00 | 13.88 | 2.99 | 3403.01 | .00 | 2.39 | 1.97 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2.336 | .0895 | | | | | .0203 | .05 | 2.02 | 1.67 | 1.22 | .013 | .00 | .00 | PIPE |
2245.813 | 3398.206 | 2.131 | 3400.337 | 59.00 | 13.24 | 2.72 | 3403.06 | .00 | 2.39 | 1.77 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.607 | .0895 | | | | | .0188 | .03 | 2.13 | 1.47 | 1.22 | .013 | .00 | .00 | PIPE |
2247.420 | 3398.350 | 2.264 | 3400.615 | 59.00 | 12.62 | 2.47 | 3403.09 | .00 | 2.39 | 1.46 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0398 | | | | | .0180 | .02 | 2.26 | 1.24 | 1.57 | .013 | .00 | .00 | PIPE |
2248.420 | 3398.390 | 2.314 | 3400.704 | 59.00 | 12.44 | 2.40 | 3403.11 | .00 | 2.39 | 1.31 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0300 | | | | | .0179 | .02 | 2.31 | 1.15 | 1.74 | .013 | .00 | .00 | PIPE |
2249.420 | 3398.420 | 2.386 | 3400.806 | 59.00 | 12.22 | 2.32 | 3403.12 | .00 | 2.39 | 1.04 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
JUNCT STR | .0300 | | | | | .0137 | .01 | 2.39 | 1.00 | .013 | .00 | .00 | PIPE |
2250.420 | 3398.450 | 4.889 | 3403.339 | 40.00 | 8.15 | 1.03 | 3404.37 | .00 | 2.13 | .00 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0300 | | | | | .0095 | .01 | 4.89 | .00 | 1.34 | .013 | .00 | .00 | PIPE |

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FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 5

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
L/Elem | Ch Slope | | | | | | | | | | | | | | |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
2251.420 | 3398.480 | 4.874 | 3403.354 | 40.00 | 8.15 | 1.03 | 3404.38 | .00 | 2.13 | .00 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 1.000 | .0300 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2252.420 | 3398.510 | 4.853 | 3403.363 | 40.00 | 8.15 | 1.03 | 3404.39 | .00 | 2.13 | .00 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 1.000 | .0400 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2253.420 | 3398.550 | 4.822 | 3403.373 | 40.00 | 8.15 | 1.03 | 3404.40 | .00 | 2.13 | .00 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 1.772 | .0876 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2255.192 | 3398.705 | 4.683 | 3403.389 | 40.00 | 8.15 | 1.03 | 3404.42 | .00 | 2.13 | .00 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | | | | | | | | | | | | | | | | |
HYDRAULIC JUMP
2255.192 | 3398.705 | 1.025 | 3399.731 | 40.00 | 21.10 | 6.91 | 3406.64 | .00 | 2.13 | 2.46 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 31.888 | .0876 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2287.080 | 3401.500 | 1.057 | 3402.557 | 40.00 | 20.26 | 6.38 | 3408.93 | .00 | 2.13 | 2.47 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 1.000 | .0400 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2288.080 | 3401.540 | 1.055 | 3402.595 | 40.00 | 20.31 | 6.41 | 3409.00 | .00 | 2.13 | 2.47 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 1.000 | .0300 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2289.080 | 3401.570 | 1.052 | 3402.623 | 40.00 | 20.38 | 6.45 | 3409.07 | .00 | 2.13 | 2.47 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | | | | | | | | | | | | | | | | |
JUNCT STR | .0300 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2290.080 | 3401.600 | .968 | 3402.568 | 38.00 | 21.64 | 7.27 | 3409.84 | .00 | 2.08 | 2.44 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 1.000 | .0298 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |

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FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 6

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
L/Elem | Ch Slope | | | | | | | | | | | | | | |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
2291.080 | 3401.630 | .965 | 3402.595 | 38.00 | 21.73 | 7.34 | 3409.93 | .00 | 2.08 | 2.43 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0300 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2292.080 | 3401.660 | .962 | 3402.622 | 38.00 | 21.83 | 7.40 | 3410.02 | .00 | 2.08 | 2.43 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0400 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2293.081 | 3401.700 | .959 | 3402.659 | 38.00 | 21.91 | 7.45 | 3410.11 | .00 | 2.08 | 2.43 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
56.390 | .0938 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2349.470 | 3406.987 | .993 | 3407.979 | 38.00 | 20.93 | 6.80 | 3414.78 | .00 | 2.08 | 2.45 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
27.979 | .0938 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2377.449 | 3409.610 | 1.029 | 3410.638 | 38.00 | 19.96 | 6.19 | 3416.82 | .00 | 2.08 | 2.46 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
17.653 | .0938 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2395.102 | 3411.265 | 1.066 | 3412.331 | 38.00 | 19.03 | 5.62 | 3417.95 | .00 | 2.08 | 2.47 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
12.582 | .0938 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2407.684 | 3412.444 | 1.106 | 3413.550 | 38.00 | 18.14 | 5.11 | 3418.66 | .00 | 2.08 | 2.48 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
9.558 | .0938 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2417.241 | 3413.340 | 1.147 | 3414.487 | 38.00 | 17.30 | 4.65 | 3419.13 | .00 | 2.08 | 2.49 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
7.546 | .0938 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2424.787 | 3414.048 | 1.190 | 3415.237 | 38.00 | 16.50 | 4.22 | 3419.46 | .00 | 2.08 | 2.50 | 2.500 | .000 | .00 | 1 .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
6.108 | .0938 | | | | | | | | | | | | | | |
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
0.382 | .23 | 1.19 | 3.03 | .94 | .013 | .00 | .00 | PIPE

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FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 7

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

```

*****
| 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 |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
2430.896 | 3414.620 | 1.235 | 3415.855 | 38.00 | 15.73 | 3.84 | 3419.70 | .00 | 2.08 | 2.50 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
5.027 | .0938 | | | | | .0337 | .17 | 1.23 | 2.82 | .94 | .013 | .00 | .00 | PIPE |
2435.923 | 3415.092 | 1.282 | 3416.374 | 38.00 | 15.00 | 3.49 | 3419.87 | .00 | 2.08 | 2.50 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
4.179 | .0938 | | | | | .0297 | .12 | 1.28 | 2.62 | .94 | .013 | .00 | .00 | PIPE |
2440.102 | 3415.484 | 1.331 | 3416.815 | 38.00 | 14.30 | 3.17 | 3419.99 | .00 | 2.08 | 2.49 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
3.499 | .0938 | | | | | .0262 | .09 | 1.33 | 2.44 | .94 | .013 | .00 | .00 | PIPE |
2443.600 | 3415.812 | 1.384 | 3417.195 | 38.00 | 13.63 | 2.89 | 3420.08 | .00 | 2.08 | 2.49 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2.937 | .0938 | | | | | .0231 | .07 | 1.38 | 2.27 | .94 | .013 | .00 | .00 | PIPE |
2446.538 | 3416.087 | 1.438 | 3417.525 | 38.00 | 13.00 | 2.62 | 3420.15 | .00 | 2.08 | 2.47 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2.461 | .0938 | | | | | .0204 | .05 | 1.44 | 2.11 | .94 | .013 | .00 | .00 | PIPE |
2448.999 | 3416.318 | 1.496 | 3417.814 | 38.00 | 12.39 | 2.38 | 3420.20 | .00 | 2.08 | 2.45 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2.053 | .0938 | | | | | .0181 | .04 | 1.50 | 1.95 | .94 | .013 | .00 | .00 | PIPE |
2451.052 | 3416.510 | 1.558 | 3418.068 | 38.00 | 11.82 | 2.17 | 3420.24 | .00 | 2.08 | 2.42 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.695 | .0938 | | | | | .0160 | .03 | 1.56 | 1.81 | .94 | .013 | .00 | .00 | PIPE |
2452.747 | 3416.669 | 1.623 | 3418.292 | 38.00 | 11.27 | 1.97 | 3420.26 | .00 | 2.08 | 2.39 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.378 | .0938 | | | | | .0142 | .02 | 1.62 | 1.67 | .94 | .013 | .00 | .00 | PIPE |
2454.125 | 3416.798 | 1.693 | 3418.491 | 38.00 | 10.74 | 1.79 | 3420.28 | .00 | 2.08 | 2.34 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.085 | .0938 | | | | | .0127 | .01 | 1.69 | 1.54 | .94 | .013 | .00 | .00 | PIPE |

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FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 8

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

```

*****
| 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 |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
2455.210 | 3416.900 | 1.768 | 3418.667 | 38.00 | 10.24 | 1.63 | 3420.30 | .00 | 2.08 | 2.28 | 2.500 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
1.000 | .0400 | | | | | .0117 | .01 | 1.77 | 1.41 | 1.20 | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2456.210 | 3416.940 | 1.798 | 3418.738 | 38.00 | 10.06 | 1.57 | 3420.31 | .00 | 2.08 | 2.25 | 2.500 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
1.000 | .0300 | | | | | .0113 | .01 | 1.80 | 1.37 | 1.30 | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2457.210 | 3416.970 | 1.820 | 3418.790 | 38.00 | 9.93 | 1.53 | 3420.32 | .00 | 2.08 | 2.23 | 2.500 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
JUNCT STR | .0300 | | | | | .0438 | .04 | 1.82 | 1.33 | | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2458.210 | 3417.000 | .797 | 3417.797 | 25.00 | 18.54 | 5.34 | 3423.14 | .00 | 1.70 | 2.33 | 2.500 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
1.000 | .0300 | | | | | .0770 | .08 | .80 | 4.30 | 1.02 | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2459.210 | 3417.030 | .795 | 3417.825 | 25.00 | 18.63 | 5.39 | 3423.21 | .00 | 1.70 | 2.33 | 2.500 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
1.000 | .0300 | | | | | .0780 | .08 | .79 | 4.32 | 1.02 | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2460.210 | 3417.060 | .792 | 3417.852 | 25.00 | 18.72 | 5.44 | 3423.29 | .00 | 1.70 | 2.33 | 2.500 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
1.000 | .0400 | | | | | .0790 | .08 | .79 | 4.35 | .95 | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2461.210 | 3417.100 | .790 | 3417.890 | 25.00 | 18.79 | 5.48 | 3423.37 | .00 | 1.70 | 2.32 | 2.500 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
27.134 | .0895 | | | | | .0753 | 2.04 | .79 | 4.38 | .77 | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2488.344 | 3419.529 | .812 | 3420.342 | 25.00 | 18.08 | 5.08 | 3425.42 | .00 | 1.70 | 2.34 | 2.500 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
19.077 | .0895 | | | | | .0669 | 1.28 | .81 | 4.15 | .77 | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2507.421 | 3421.237 | .841 | 3422.078 | 25.00 | 17.24 | 4.61 | 3426.69 | .00 | 1.70 | 2.36 | 2.500 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
12.584 | .0895 | | | | | .0586 | .74 | .84 | 3.88 | .77 | .013 | .00 | .00 | PIPE |

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FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 9

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

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*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
L/Elem | Ch Slope | | | | | | | | | | | | | | |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
2520.005 | 3422.364 | .871 | 3423.235 | 25.00 | 16.44 | 4.19 | 3427.43 | .00 | 1.70 | 2.38 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 9.172 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2529.178 | 3423.185 | .902 | 3424.087 | 25.00 | 15.67 | 3.81 | 3427.90 | .00 | 1.70 | 2.40 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 7.060 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2536.238 | 3423.817 | .934 | 3424.751 | 25.00 | 14.94 | 3.47 | 3428.22 | .00 | 1.70 | 2.42 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 5.624 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2541.862 | 3424.321 | .968 | 3425.289 | 25.00 | 14.25 | 3.15 | 3428.44 | .00 | 1.70 | 2.44 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 4.579 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2546.441 | 3424.731 | 1.003 | 3425.734 | 25.00 | 13.58 | 2.86 | 3428.60 | .00 | 1.70 | 2.45 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 3.785 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2550.226 | 3425.070 | 1.039 | 3426.109 | 25.00 | 12.95 | 2.60 | 3428.71 | .00 | 1.70 | 2.46 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 3.161 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2553.387 | 3425.353 | 1.078 | 3426.430 | 25.00 | 12.35 | 2.37 | 3428.80 | .00 | 1.70 | 2.48 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 2.655 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2556.042 | 3425.590 | 1.117 | 3426.708 | 25.00 | 11.77 | 2.15 | 3428.86 | .00 | 1.70 | 2.49 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 2.235 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |
2558.278 | 3425.791 | 1.159 | 3426.949 | 25.00 | 11.23 | 1.96 | 3428.91 | .00 | 1.70 | 2.49 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 1.881 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | | |

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FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 10

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

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*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
L/Elem | Ch Slope | | | | | | | | | | | | | | |
***** |*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
2560.158 | 3425.959 | 1.203 | 3427.161 | 25.00 | 10.70 | 1.78 | 3428.94 | .00 | 1.70 | 2.50 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 1.578 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | |
2561.736 | 3426.100 | 1.248 | 3427.348 | 25.00 | 10.21 | 1.62 | 3428.97 | .00 | 1.70 | 2.50 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 1.313 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | |
2563.049 | 3426.218 | 1.296 | 3427.514 | 25.00 | 9.73 | 1.47 | 3428.98 | .00 | 1.70 | 2.50 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 1.082 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | |
2564.131 | 3426.315 | 1.346 | 3427.661 | 25.00 | 9.28 | 1.34 | 3429.00 | .00 | 1.70 | 2.49 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | .873 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | |
2565.003 | 3426.393 | 1.399 | 3427.792 | 25.00 | 8.85 | 1.21 | 3429.01 | .00 | 1.70 | 2.48 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | .685 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | |
2565.688 | 3426.454 | 1.455 | 3427.909 | 25.00 | 8.43 | 1.10 | 3429.01 | .00 | 1.70 | 2.47 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | .511 | .0895 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | |
2566.200 | 3426.500 | 1.514 | 3428.014 | 25.00 | 8.04 | 1.00 | 3429.02 | .00 | 1.70 | 2.44 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | 1.780 | .0225 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | |
2567.980 | 3426.540 | 1.569 | 3428.109 | 25.00 | 7.71 | .92 | 3429.03 | .00 | 1.70 | 2.42 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | .743 | .0300 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | |
2568.723 | 3426.562 | 1.632 | 3428.194 | 25.00 | 7.36 | .84 | 3429.04 | .00 | 1.70 | 2.38 | 2.500 | .000 | .00 | 1 | .0
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
      | .257 | .0300 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | | |

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FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 11

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

```

*****
| 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 |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
2568.980 | 3426.570 | 1.704 | 3428.274 | 25.00 | 7.02 | .76 | 3429.04 | .00 | 1.70 | 2.33 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
JUNCT STR .0297 | | | | | .0029 | .00 | 1.70 | 1.00 | | | .013 | .00 | .00 | PIPE |
2569.990 | 3426.600 | 2.957 | 3429.557 | 2.00 | .41 | .00 | 3429.56 | .00 | .46 | .00 | 2.500 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
TRANS STR .0301 | | | | | .0001 | .00 | 2.96 | .00 | | | .013 | .00 | .00 | PIPE |
2570.980 | 3426.630 | 2.925 | 3429.555 | 2.00 | .64 | .01 | 3429.56 | .00 | .49 | .00 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.000 | .0300 | | | | .0001 | .00 | 2.92 | .00 | .31 | .013 | .00 | .00 | PIPE |
2571.980 | 3426.660 | 2.895 | 3429.555 | 2.00 | .64 | .01 | 3429.56 | .00 | .49 | .00 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
.220 | .1820 | | | | .0001 | .00 | 2.90 | .00 | .20 | .013 | .00 | .00 | PIPE |
2572.200 | 3426.700 | 2.855 | 3429.555 | 2.00 | .64 | .01 | 3429.56 | .00 | .49 | .00 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
8.266 | .1035 | | | | .0001 | .00 | 2.85 | .00 | .23 | .013 | .00 | .00 | PIPE |
2580.466 | 3427.556 | 2.000 | 3429.556 | 2.00 | .64 | .01 | 3429.56 | .00 | .49 | .00 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.776 | .1035 | | | | .0001 | .00 | 2.00 | .00 | .23 | .013 | .00 | .00 | PIPE |
2582.242 | 3427.740 | 1.815 | 3429.554 | 2.00 | .67 | .01 | 3429.56 | .00 | .49 | 1.16 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1.034 | .1035 | | | | .0001 | .00 | 1.81 | .07 | .23 | .013 | .00 | .00 | PIPE |
2583.276 | 3427.847 | 1.707 | 3429.554 | 2.00 | .70 | .01 | 3429.56 | .00 | .49 | 1.41 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
.851 | .1035 | | | | .0001 | .00 | 1.71 | .09 | .23 | .013 | .00 | .00 | PIPE |
2584.127 | 3427.935 | 1.618 | 3429.553 | 2.00 | .73 | .01 | 3429.56 | .00 | .49 | 1.57 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
.744 | .1035 | | | | .0001 | .00 | 1.62 | .10 | .23 | .013 | .00 | .00 | PIPE |

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FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 12

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

```

*****
| 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 |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
2584.871 | 3428.012 | 1.540 | 3429.552 | 2.00 | .77 | .01 | 3429.56 | .00 | .49 | 1.68 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.668 | .1035 | | | | | .0001 | .00 | 1.54 | .11 | .23 | .013 | .00 | .00 | PIPE |
2585.539 | 3428.081 | 1.470 | 3429.551 | 2.00 | .81 | .01 | 3429.56 | .00 | .49 | 1.77 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.610 | .1035 | | | | | .0001 | .00 | 1.47 | .12 | .23 | .013 | .00 | .00 | PIPE |
2586.149 | 3428.144 | 1.406 | 3429.551 | 2.00 | .85 | .01 | 3429.56 | .00 | .49 | 1.83 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.563 | .1035 | | | | | .0001 | .00 | 1.41 | .13 | .23 | .013 | .00 | .00 | PIPE |
2586.711 | 3428.203 | 1.347 | 3429.550 | 2.00 | .89 | .01 | 3429.56 | .00 | .49 | 1.88 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.523 | .1035 | | | | | .0001 | .00 | 1.35 | .14 | .23 | .013 | .00 | .00 | PIPE |
2587.234 | 3428.257 | 1.292 | 3429.548 | 2.00 | .93 | .01 | 3429.56 | .00 | .49 | 1.91 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.488 | .1035 | | | | | .0001 | .00 | 1.29 | .16 | .23 | .013 | .00 | .00 | PIPE |
2587.722 | 3428.307 | 1.240 | 3429.547 | 2.00 | .98 | .01 | 3429.56 | .00 | .49 | 1.94 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.458 | .1035 | | | | | .0002 | .00 | 1.24 | .17 | .23 | .013 | .00 | .00 | PIPE |
2588.180 | 3428.355 | 1.191 | 3429.546 | 2.00 | 1.03 | .02 | 3429.56 | .00 | .49 | 1.96 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.429 | .1035 | | | | | .0002 | .00 | 1.19 | .18 | .23 | .013 | .00 | .00 | PIPE |
2588.609 | 3428.399 | 1.145 | 3429.544 | 2.00 | 1.08 | .02 | 3429.56 | .00 | .49 | 1.98 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.405 | .1035 | | | | | .0002 | .00 | 1.15 | .20 | .23 | .013 | .00 | .00 | PIPE |
2589.014 | 3428.441 | 1.101 | 3429.542 | 2.00 | 1.13 | .02 | 3429.56 | .00 | .49 | 1.99 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.382 | .1035 | | | | | .0002 | .00 | 1.10 | .21 | .23 | .013 | .00 | .00 | PIPE |

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FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 13

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

```

*****
| 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 |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
2589.395 | 3428.481 | 1.060 | 3429.541 | 2.00 | 1.18 | .02 | 3429.56 | .00 | .49 | 2.00 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.361 | .1035 | | | | | .0003 | .00 | 1.06 | .23 | .23 | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2589.756 | 3428.518 | 1.021 | 3429.539 | 2.00 | 1.24 | .02 | 3429.56 | .00 | .49 | 2.00 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.340 | .1035 | | | | | .0003 | .00 | 1.02 | .24 | .23 | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2590.096 | 3428.553 | .983 | 3429.536 | 2.00 | 1.30 | .03 | 3429.56 | .00 | .49 | 2.00 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.322 | .1035 | | | | | .0004 | .00 | .98 | .26 | .23 | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2590.417 | 3428.586 | .947 | 3429.534 | 2.00 | 1.36 | .03 | 3429.56 | .00 | .49 | 2.00 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.303 | .1035 | | | | | .0004 | .00 | .95 | .28 | .23 | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2590.721 | 3428.618 | .913 | 3429.531 | 2.00 | 1.43 | .03 | 3429.56 | .00 | .49 | 1.99 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.286 | .1035 | | | | | .0005 | .00 | .91 | .30 | .23 | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2591.007 | 3428.647 | .880 | 3429.528 | 2.00 | 1.50 | .03 | 3429.56 | .00 | .49 | 1.99 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
.065 | .1035 | | | | | .0005 | .00 | .88 | .32 | .23 | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2591.073 | 3428.654 | .849 | 3429.503 | 2.00 | 1.57 | .04 | 3429.54 | .00 | .49 | 1.98 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
HYDRAULIC JUMP
| | | | | | | | | | | | | | | | |
2591.073 | 3428.654 | .244 | 3428.899 | 2.00 | 9.13 | 1.29 | 3430.19 | .00 | .49 | 1.31 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
1.967 | .1035 | | | | | .0726 | .14 | .24 | 3.93 | .23 | .013 | .00 | .00 | PIPE |
| | | | | | | | | | | | | | | | |
2593.040 | 3428.858 | .252 | 3429.111 | 2.00 | 8.70 | 1.17 | 3430.29 | .00 | .49 | 1.33 | 2.000 | .000 | .00 | 1 | .0 |
| | | | | | | | | | | | | | | | |
2.448 | .1035 | | | | | .0633 | .16 | .25 | 3.68 | .23 | .013 | .00 | .00 | PIPE |

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR 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 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	
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	
2595.488	3429.112	.261	3429.373	2.00	8.29	1.07	3430.44	.00	.49	1.35	2.000	.000	.00	1 .0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1.832	.1035					.0553	.10	.26	3.45	.23	.013	.00	.00	PIPE	
2597.320	3429.302	.270	3429.571	2.00	7.91	.97	3430.54	.00	.49	1.37	2.000	.000	.00	1 .0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1.434	.1035					.0483	.07	.27	3.24	.23	.013	.00	.00	PIPE	
2598.754	3429.450	.279	3429.729	2.00	7.54	.88	3430.61	.00	.49	1.38	2.000	.000	.00	1 .0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1.157	.1035					.0421	.05	.28	3.04	.23	.013	.00	.00	PIPE	
2599.911	3429.570	.288	3429.857	2.00	7.19	.80	3430.66	.00	.49	1.40	2.000	.000	.00	1 .0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
.949	.1035					.0368	.03	.29	2.85	.23	.013	.00	.00	PIPE	
2600.860	3429.668	.297	3429.965	2.00	6.85	.73	3430.69	.00	.49	1.42	2.000	.000	.00	1 .0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
.789	.1035					.0321	.03	.30	2.67	.23	.013	.00	.00	PIPE	
2601.648	3429.750	.307	3430.057	2.00	6.54	.66	3430.72	.00	.49	1.44	2.000	.000	.00	1 .0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
.662	.1035					.0280	.02	.31	2.50	.23	.013	.00	.00	PIPE	
2602.310	3429.818	.318	3430.136	2.00	6.23	.60	3430.74	.00	.49	1.46	2.000	.000	.00	1 .0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
.559	.1035					.0245	.01	.32	2.34	.23	.013	.00	.00	PIPE	
2602.870	3429.876	.328	3430.204	2.00	5.94	.55	3430.75	.00	.49	1.48	2.000	.000	.00	1 .0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
.473	.1035					.0214	.01	.33	2.20	.23	.013	.00	.00	PIPE	
2603.342	3429.925	.339	3430.264	2.00	5.66	.50	3430.76	.00	.49	1.50	2.000	.000	.00	1 .0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
.399	.1035					.0187	.01	.34	2.06	.23	.013	.00	.00	PIPE	

FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

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*****
| 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 |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
2603.742 | 3429.966 | .351 | 3430.317 | 2.00 | 5.40 | .45 | 3430.77 | .00 | .49 | 1.52 | 2.000 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
.337 | .1035 | | | | | .0163 | .01 | .35 | 1.93 | .23 | .013 | .00 | .00 | PIPE |
2604.079 | 3430.001 | .362 | 3430.363 | 2.00 | 5.15 | .41 | 3430.78 | .00 | .49 | 1.54 | 2.000 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
.281 | .1035 | | | | | .0142 | .00 | .36 | 1.81 | .23 | .013 | .00 | .00 | PIPE |
2604.360 | 3430.030 | .375 | 3430.405 | 2.00 | 4.91 | .37 | 3430.78 | .00 | .49 | 1.56 | 2.000 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
.048 | .0642 | | | | | .0132 | .00 | .37 | 1.69 | .26 | .013 | .00 | .00 | PIPE |
2604.408 | 3430.033 | .376 | 3430.409 | 2.00 | 4.89 | .37 | 3430.78 | .00 | .49 | 1.56 | 2.000 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
.405 | .0642 | | | | | .0123 | .00 | .38 | 1.68 | .26 | .013 | .00 | .00 | PIPE |
2604.813 | 3430.059 | .389 | 3430.448 | 2.00 | 4.66 | .34 | 3430.78 | .00 | .49 | 1.58 | 2.000 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
.327 | .0642 | | | | | .0107 | .00 | .39 | 1.58 | .26 | .013 | .00 | .00 | PIPE |
2605.140 | 3430.080 | .402 | 3430.482 | 2.00 | 4.44 | .31 | 3430.79 | .00 | .49 | 1.60 | 2.000 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
.208 | .0498 | | | | | .0096 | .00 | .40 | 1.48 | .27 | .013 | .00 | .00 | PIPE |
2605.348 | 3430.090 | .409 | 3430.500 | 2.00 | 4.33 | .29 | 3430.79 | .00 | .49 | 1.61 | 2.000 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
.305 | .0498 | | | | | .0087 | .00 | .41 | 1.42 | .27 | .013 | .00 | .00 | PIPE |
2605.653 | 3430.105 | .423 | 3430.529 | 2.00 | 4.13 | .26 | 3430.79 | .00 | .49 | 1.63 | 2.000 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
.228 | .0498 | | | | | .0076 | .00 | .42 | 1.33 | .27 | .013 | .00 | .00 | PIPE |
2605.881 | 3430.117 | .438 | 3430.554 | 2.00 | 3.93 | .24 | 3430.79 | .00 | .49 | 1.65 | 2.000 | .000 | .00 | 1 .0 |
| | | | | | | | | | | | | | | | |
.161 | .0498 | | | | | .0066 | .00 | .44 | 1.25 | .27 | .013 | .00 | .00 | PIPE |

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FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 16

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

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*****
| 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 |
*****
2606.042 | 3430.125 | .452 | 3430.577 | 2.00 | 3.75 | .22 | 3430.80 | .00 | .49 | 1.67 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|.098 | .0498 | | | | | .0058 | .00 | .45 | 1.17 | .27 | .013 | .00 | .00 | PIPE |
2606.140 | 3430.130 | .468 | 3430.598 | 2.00 | 3.58 | .20 | 3430.80 | .00 | .49 | 1.69 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| JUNCT STR | .0300 | | | | | .0174 | .02 | .47 | 1.10 | .013 | .00 | .00 | PIPE |
2607.140 | 3430.160 | .221 | 3430.381 | 1.00 | 5.28 | .43 | 3430.81 | .00 | .34 | 1.25 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| TRANS STR | .0701 | | | | | .0274 | .03 | .22 | 2.39 | .013 | .00 | .00 | PIPE |
2608.140 | 3430.230 | .229 | 3430.459 | 1.00 | 5.02 | .39 | 3430.85 | .00 | .34 | 1.27 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1.000 | .0500 | | | | | .0239 | .02 | .23 | 2.24 | .19 | .013 | .00 | .00 | PIPE |
2609.140 | 3430.280 | .236 | 3430.516 | 1.00 | 4.80 | .36 | 3430.87 | .00 | .34 | 1.29 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1.220 | .0410 | | | | | .0211 | .03 | .24 | 2.11 | .20 | .013 | .00 | .00 | PIPE |
2610.360 | 3430.330 | .243 | 3430.573 | 1.00 | 4.59 | .33 | 3430.90 | .00 | .34 | 1.31 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 14.859 | .0199 | | | | | .0191 | .28 | .24 | 1.98 | .24 | .013 | .00 | .00 | PIPE |
2625.219 | 3430.625 | .247 | 3430.872 | 1.00 | 4.48 | .31 | 3431.18 | .00 | .34 | 1.32 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 7.811 | .0199 | | | | | .0173 | .14 | .25 | 1.92 | .24 | .013 | .00 | .00 | PIPE |
2633.031 | 3430.780 | .255 | 3431.036 | 1.00 | 4.28 | .28 | 3431.32 | .00 | .34 | 1.34 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 3.619 | .0199 | | | | | .0151 | .05 | .26 | 1.80 | .24 | .013 | .00 | .00 | PIPE |
2636.649 | 3430.852 | .264 | 3431.116 | 1.00 | 4.08 | .26 | 3431.37 | .00 | .34 | 1.35 | 2.000 | .000 | .00 | 1 .0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2.188 | .0199 | | | | | .0132 | .03 | .26 | 1.69 | .24 | .013 | .00 | .00 | PIPE |

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FR_Main_U.OUT

FILE: FR_Main_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 17

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date:12-29-2020 Time: 3:12:40

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | Dia.-FT | or I.D. | ZL | Prs/Pip
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
L/Elem | Ch Slope | | | | | | | | | | | | | | |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
2638.838 | 3430.896 | .273 | 3431.168 | 1.00 | 3.89 | .23 | 3431.40 | .00 | .34 | 1.37 | 2.000 | .000 | .00 | 1 | .0
      | | | | | | | | | | | | | | | | |
      | 1.472 | .0199 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
2640.310 | 3430.925 | .282 | 3431.207 | 1.00 | 3.71 | .21 | 3431.42 | .00 | .34 | 1.39 | 2.000 | .000 | .00 | 1 | .0
      | | | | | | | | | | | | | | | | |
      | 1.016 | .0199 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
2641.325 | 3430.945 | .291 | 3431.236 | 1.00 | 3.53 | .19 | 3431.43 | .00 | .34 | 1.41 | 2.000 | .000 | .00 | 1 | .0
      | | | | | | | | | | | | | | | | |
      | .705 | .0199 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
2642.030 | 3430.959 | .301 | 3431.260 | 1.00 | 3.37 | .18 | 3431.44 | .00 | .34 | 1.43 | 2.000 | .000 | .00 | 1 | .0
      | | | | | | | | | | | | | | | | |
      | .493 | .0199 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
2642.523 | 3430.969 | .311 | 3431.280 | 1.00 | 3.21 | .16 | 3431.44 | .00 | .34 | 1.45 | 2.000 | .000 | .00 | 1 | .0
      | | | | | | | | | | | | | | | | |
      | .316 | .0199 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
2642.839 | 3430.975 | .321 | 3431.297 | 1.00 | 3.06 | .15 | 3431.44 | .00 | .34 | 1.47 | 2.000 | .000 | .00 | 1 | .0
      | | | | | | | | | | | | | | | | |
      | .174 | .0199 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
2643.013 | 3430.979 | .332 | 3431.311 | 1.00 | 2.92 | .13 | 3431.44 | .00 | .34 | 1.49 | 2.000 | .000 | .00 | 1 | .0
      | | | | | | | | | | | | | | | | |
      | .057 | .0199 | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |
2643.070 | 3430.980 | .344 | 3431.324 | 1.00 | 2.77 | .12 | 3431.44 | .00 | .34 | 1.51 | 2.000 | .000 | .00 | 1 | .0
      | | | | | | | | | | | | | | |
      | | | | | | | | | | | | | | |

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FR_Main_U.OUT

FR_Main_U.OUT

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION

1900.00	. I W CH	E	.	R
1902.45	.		.	
1904.90	.		.	
1907.36	. I W CH	E	.	R
1909.81	.		.	
1912.26	.		.	
1914.71	.		.	
1917.17	. I W H	E	.	R
1919.62	.		.	
1922.07	.		.	
1924.52	. I W CH	E	.	R
1926.98	. I W CH	E	.	R
1929.43	. I W CH	E	.	JX
1931.88	. I W CH	E	.	TX
1934.33	. I W H	E	.	R
1936.79	. I W H	E	.	R
1939.24	. I W H	E	.	R

FR_Main_U.OUT

1941.69	.	.
1944.14	.	.
1946.60	.	.
1949.05	.	.
1951.50	.	.
1953.95	.	.
1956.40	.	.
1958.86	.	.
1961.31	.	.
1963.76	.	.
1966.21	.	.
1968.67	.	.
1971.12	.	.
1973.57	.	.
1976.02	.	.
1978.48	.	.
1980.93	.	.
1983.38	.	.
1985.83	.	.
1988.29	.	.
1990.74	.	.

FR_Main_U.OUT

1993.19	.					.
1995.64	.	I	W	H	E	. R
1998.10	.					.
2000.55	.					.
2003.00	.					.
2005.45	.					.
2007.90	.					.
2010.36	.					.
2012.81	.					.
2015.26	.					.
2017.71	.					.
2020.17	.					.
2022.62	.					.
2025.07	.					.
2027.52	.					.
2029.98	.					.
2032.43	.					.
2034.88	.	I	W	C	H	. R
2037.33	.					.
2039.79	.					.
2042.24	.					.
2044.69	.					.

FR_Main_U.OUT

2047.14	.				.	
2049.59	.				.	
2052.05	.				.	
2054.50	.				.	
2056.95	.				.	
2059.40	.				.	
2061.86	.				.	
2064.31	.	I	W	H	E	R
2066.76	.	I	W	H	E	R
2069.21	.	I	W	H	E	R
2071.67	.	I	W	H	E	R
2074.12	.	I	W	H	E	R
2076.57	.	I	W	H	E	R
2079.02	.	I	W	H	E	R
2081.48	.				.	
2083.93	.				.	
2086.38	.				.	
2088.83	.				.	
2091.29	.				.	
2093.74	.				.	
2096.19	.				.	

FR_Main_U.OUT

2098.64	.					.
2101.09	.	I	W	H	E	. R
2103.55	.					.
2106.00	.					.
2108.45	.					.
2110.90	.					.
2113.36	.					.
2115.81	.					.
2118.26	.					.
2120.71	.					.
2123.17	.					.
2125.62	.					.
2128.07	.					.
2130.52	.					.
2132.98	.					.
2135.43	.					.
2137.88	.					.
2140.33	.					.
2142.79	.					.
2145.24	.	I	W	H	E	. R
2147.69	.					.

FR_Main_U.OUT

FR_Main_U.OUT

2204.09	.				.	
2206.55	.				.	
2209.00	.				.	
2211.45	.				.	
2213.90	.	I	WCH	E	.	R
2216.36	.				.	
2218.81	.				.	
2221.26	.	I	W H	E	.	R
2223.71	.				.	
2226.17	.				.	
2228.62	.	I	W H	E	.	R
2231.07	.				.	
2233.52	.	I	WCH	E	.	R
2235.98	.				.	
2238.43	.	I	WH	E	.	R
2240.88	.	I	WH	E	.	R
2243.33	.				.	
2245.79	.	I	H	E	.	R
2248.24	.	I	WH	E	.	R
2250.69	.	I	H	E	.	R
2253.14	.	I	H	E	.	R

FR_Main_U.OUT

2255.59	.	I	H	E	.	JX
2258.05	.	I	CH	W E	.	R
2260.50	.	I	H	W E	.	R
2262.95	.	I	H	W E	.	R
2265.40	.	I	H	W E	.	R
2267.86	.	I	CH	W E	.	R
2270.31	.	I	W CH	E	.	R
2272.76	.				.	
2275.21	.				.	
2277.67	.				.	
2280.12	.				.	
2282.57	.				.	
2285.02	.				.	
2287.48	.	I	W H	E	.	R
2289.93	.	I	W H	E	.	R
2292.38	.	I	W H	E	.	JX
2294.83	.	I	W H	E	.	R
2297.28	.	I	W H	E	.	R
2299.74	.	I	W H	E	.	R
2302.19	.	I	W CH	E	.	R
2304.64	.				.	

FR_Main_U.OUT

2307.09	.	.
2309.55	.	.
2312.00	.	.
2314.45	.	.
2316.90	.	.
2319.36	.	.
2321.81	.	.
2324.26	.	.
2326.71	.	.
2329.17	.	.
2331.62	.	.
2334.07	.	.
2336.52	.	.
2338.98	.	.
2341.43	.	.
2343.88	.	.
2346.33	.	.
2348.78	.	.
2351.24	.	.
2353.69	.	.
2356.14	.	.
2358.59	.	.

I W H E . R

FR_Main_U.OUT

2361.05	.				.
2363.50	.				.
2365.95	.				.
2368.40	.				.
2370.86	.				.
2373.31	.				.
2375.76	.				.
2378.21	.	IW	CH	E	. R
2380.67	.				.
2383.12	.				.
2385.57	.				.
2388.02	.				.
2390.48	.				.
2392.93	.				.
2395.38	.	I	W	H E	. R
2397.83	.				.
2400.28	.				.
2402.74	.				.
2405.19	.				.
2407.64	.				.
2410.09	.	I	W	H E	. R

FR_Main_U.OUT

2412.55	.				.	
2415.00	.				.	
2417.45	.		I	WCH	E	R
2419.90	.				.	
2422.36	.				.	
2424.81	.		I	WCH	E	R
2427.26	.				.	
2429.71	.				.	
2432.17	.		I	WCH	E	R
2434.62	.				.	
2437.07	.		I	WCH	E	R
2439.52	.				.	
2441.98	.		I	WH	E	R
2444.43	.		I	WCH	E	R
2446.88	.		I	WH	E	R
2449.33	.		I	WCH	E	R
2451.78	.		I	WH	E	R
2454.24	.		I	WH	E	R
2456.69	.		I	WCHE		R
2459.14	.		I	WHE		R
2461.59	.		I	WHE		R

FR_Main_U.OUT

2464.05	.	I WHE	.	JX
2466.50	.	IW CH E	.	R
2468.95	.	IW CH E	.	R
2471.40	.	IW CH E	.	R
2473.86	.	IW CH E	.	R
2476.31	.		.	
2478.76	.		.	
2481.21	.		.	
2483.67	.		.	
2486.12	.		.	
2488.57	.	IW CH E	.	R
2491.02	.		.	
2493.48	.		.	
2495.93	.		.	
2498.38	.		.	
2500.83	.		.	
2503.28	.		.	
2505.74	.		.	
2508.19	.	IW CH E	.	R
2510.64	.		.	
2513.09	.		.	
2515.55	.		.	

FR_Main_U.OUT

2518.00	.			.	
2520.45	.		IW CH E	.	R
2522.90	.			.	
2525.36	.			.	
2527.81	.			.	
2530.26	.		I WCH E	.	R
2532.71	.			.	
2535.17	.			.	
2537.62	.		I WCH E	.	R
2540.07	.			.	
2542.52	.		I WCH E	.	R
2544.98	.			.	
2547.43	.		IW CH E	.	R
2549.88	.			.	
2552.33	.		I WCH E	.	R
2554.78	.		I WCH E	.	R
2557.24	.		I WCH E	.	R
2559.69	.		IWC HE	.	R
2562.14	.		I WCHE	.	R
2564.59	.		I WCHE	.	R
2567.05	.		I WCHE	.	R

FR_Main_U.OUT

2569.50	.	I	W	H	.	R
2571.95	.	I	W	H	.	R
2574.40	.	I	W	H	.	R
2576.86	.	I	W	C	H	R
2579.31	.	I	W	C	H	R
2581.76	.	I	W	H	.	R
2584.21	.	I	W	H	.	JX
2586.67	.	I	C	H	W	TX
2589.12	.	I	C	H	W	R
2591.57	.	I	C	H	W	R
2594.02	.	I	C	H	W	R
2596.47	.	I	C	H	.	R
2598.93	.	I	C	H	.	R
2601.38	.	I	C	H	.	R
2603.83	.	I	C	H	.	R
2606.28	.	I	C	W	H	R
2608.74	.	I	C	W	H	R
2611.19	.	I	C	W	H	R
2613.64	.	I	W	H	.	R
2616.09	.	I	W	H	.	R
2618.55	.	I	C	W	H	R

FR_Main_U.OUT

2621.00	.	ICWH	.	R
2623.45	.	ICWH	.	R
2625.90	.	ICWH	.	R
2628.36	.	ICWH	.	R
2630.81	.	ICWH	.	R
2633.26	.	ICWH	.	R
2635.71	.	ICW H	.	R
2638.17	.	ICW H	.	R
2640.62	.	ICW H	.	R
2643.07	.	ICW H	.	R

3373.010 3379.007 3385.004 3391.001 3396.998 3402.995 3408.992 3414.990 3420.987 3426.984 3432.980

N O T E S

1. GLOSSARY

I = INVERT ELEVATION
C = CRITICAL DEPTH
W = WATER SURFACE ELEVATION
S = SUPER-ELEVATION
H = HEIGHT OF CHANNEL
E = ENERGY GRADE LINE
X = CURVES CROSSING OVER
B = BRIDGE ENTRANCE OR EXIT
Y = WALL ENTRANCE OR EXIT

2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

SDMH6_L2_U.OUT

SDMH6_L2_U.OUT

FILE: SDMH6_L2_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date: 1- 5-2021 Time: 2:25:51

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION (Lateral 2)

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*****
| 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
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****
| | | | | | | | | | | | | | | |
2536.820 | 3426.700 | 2.370 | 3429.070 | 23.00 | 4.78 | .35 | 3429.42 | .00 | 1.63 | 1.11 | 2.500 | .000 | .00 | 1 | .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
| | | | | | | | | | | | | | | |
2536.820 | 3426.700 | 2.370 | 3429.070 | 23.00 | 4.78 | .35 | 3429.43 | .00 | 1.63 | 1.11 | 2.500 | .000 | .00 | 1 | .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
40.410 | .0000 | | | | | .0014 | 3.45 | 2.37 | .40 | .00 | .013 | .00 | .00 | PIPE
| | | | | | | | | | | | | | | |
2577.230 | 3427.100 | 2.370 | 3429.470 | 23.00 | 4.78 | .35 | 3429.83 | .00 | 1.63 | 1.11 | 2.500 | .000 | .00 | 1 | .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-

```


SDMH6_L2_U.OUT

SDMH6_L2_U.OUT

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION (Lateral 2)

2536.82	.I	C	W	H	E	.	R
2537.64	.I	C	W	H	E	.	R
2538.47	.					.	
2539.29	.					.	
2540.12	.					.	
2540.94	.					.	
2541.77	.					.	
2542.59	.					.	
2543.42	.					.	
2544.24	.					.	
2545.07	.					.	
2545.89	.					.	
2546.72	.					.	
2547.54	.					.	
2548.37	.					.	
2549.19	.					.	
2550.02	.					.	

SDMH6_L2_U.OUT

2550.84	.	.
2551.66	.	.
2552.49	.	.
2553.31	.	.
2554.14	.	.
2554.96	.	.
2555.79	.	.
2556.61	.	.
2557.44	.	.
2558.26	.	.
2559.09	.	.
2559.91	.	.
2560.74	.	.
2561.56	.	.
2562.39	.	.
2563.21	.	.
2564.03	.	.
2564.86	.	.
2565.68	.	.
2566.51	.	.
2567.33	.	.

SDMH6_L2_U.OUT

[illegible]

NOTES

1. GLOSSARY

I = INVERT ELEVATION
C = CRITICAL DEPTH
W = WATER SURFACE ELEVATION
S = SUPER-ELEVATION
H = HEIGHT OF CHANNEL
E = ENERGY GRADE LINE
X = CURVES CROSSING OVER
B = BRIDGE ENTRANCE OR EXIT
Y = WALL ENTRANCE OR EXIT

2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

SDMH7_SDDI5_U.OUT

SDMH7_SDDI5_U.OUT

FILE: SDMH7_SDDI5_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date: 1- 5-2021 Time: 2:36:51

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION (Lateral 1 from SDDI#5 to SDMH#7)

```

*****
| 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
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****
| | | | | | | | | | | | | | | |
2568.790 3430.330 1.800 3432.130 1.00 .34 .00 3432.13 .00 .34 1.20 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
| | | | | | | | | | | | | | | |
2568.790 3430.330 1.800 3432.130 1.00 .34 .00 3432.13 .00 .34 1.20 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
32.710 .0000 | | | | | .0000 .02 1.80 .04 .00 .013 .00 .00 PIPE
| | | | | | | | | | | | | | | |
2601.500 3430.980 1.800 3432.780 1.00 .34 .00 3432.78 .00 .34 1.20 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-

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SDMH7_SDDI5_U.OUT

SDMH7_SDDI5_U.OUT

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION (Lateral 1 from SDDI#5 to SDMH#7)

2568.79	.I	C	WE	H	.	R
2569.46	.I	C	WE	H	.	R
2570.13	.				.	
2570.79	.				.	
2571.46	.				.	
2572.13	.				.	
2572.80	.				.	
2573.46	.				.	
2574.13	.				.	
2574.80	.				.	
2575.47	.				.	
2576.13	.				.	
2576.80	.				.	
2577.47	.				.	
2578.14	.				.	
2578.80	.				.	
2579.47	.				.	

SDMH7_SDDI5_U.OUT

2580.14	.	.
2580.81	.	.
2581.47	.	.
2582.14	.	.
2582.81	.	.
2583.48	.	.
2584.14	.	.
2584.81	.	.
2585.48	.	.
2586.15	.	.
2586.81	.	.
2587.48	.	.
2588.15	.	.
2588.82	.	.
2589.48	.	.
2590.15	.	.
2590.82	.	.
2591.49	.	.
2592.15	.	.
2592.82	.	.
2593.49	.	.

I = INVER

- C = CRITICAL DEPTH
W = WATER SURFACE ELEVATION
S = SUPER-ELEVATION
H = HEIGHT OF CHANNEL
E = ENERGY GRADE LINE
X = CURVES CROSSING OVER
B = BRIDGE ENTRANCE OR EXIT
Y = WALL ENTRANCE OR EXIT

SDMH7_SDDI6_U.OUT

SDMH7_SDDI6_U.OUT

FILE: SDMH7_SDDI6_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date: 1- 5-2021 Time: 2:45:59

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION (Lateral 1 from SDDI#6 to SDMH#7)

```

*****
| 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
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****
| | | | | | | | | | | | | | | |
2568.790 3430.330 1.800 3432.130 1.00 .34 .00 3432.13 .00 .34 1.20 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
| | | | | | | | | | | | | | | |
2568.790 3430.330 1.800 3432.130 1.00 .34 .00 3432.13 .00 .34 1.20 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
20.610 .0000 | | | | | .0000 .02 1.80 .04 .00 .013 .00 .00 PIPE
| | | | | | | | | | | | | | | |
2589.400 3432.370 1.800 3434.170 1.00 .34 .00 3434.17 .00 .34 1.20 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-

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SDMH7_SDDI6_U.OUT

SDMH7_SDDI6_U.OUT

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION (Lateral 1 from SDDI#6 to SDMH#7)

2568.79	.I	C	W	H	.	R
2569.21	.I	C	W	H	.	R
2569.63	.				.	
2570.05	.				.	
2570.47	.				.	
2570.89	.				.	
2571.31	.				.	
2571.73	.				.	
2572.16	.				.	
2572.58	.				.	
2573.00	.				.	
2573.42	.				.	
2573.84	.				.	
2574.26	.				.	
2574.68	.				.	
2575.10	.				.	
2575.52	.				.	

SDMH7_SDDI6_U.OUT

2575.94	.	.
2576.36	.	.
2576.78	.	.
2577.20	.	.
2577.62	.	.
2578.04	.	.
2578.46	.	.
2578.88	.	.
2579.31	.	.
2579.73	.	.
2580.15	.	.
2580.57	.	.
2580.99	.	.
2581.41	.	.
2581.83	.	.
2582.25	.	.
2582.67	.	.
2583.09	.	.
2583.51	.	.
2583.93	.	.
2584.35	.	.

SDMH7_SDDI6_U.OUT

2584.77	.	.
2585.19	.	.
2585.61	.	.
2586.03	.	.
2586.46	.	.
2586.88	.	.
2587.30	.	.
2587.72	.	.
2588.14	.	.
2588.56	.	.
2588.98	.	.

SDMH1_SDDI1_U.OUT

SDMH1_SDDI1_U.OUT

FILE: SDMH1_SDDI1_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date: 1- 5-2021 Time:11:29:48

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION (Lateral from SDDI#1 to SDMH#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
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****
| | | | | | | | | | | | | | | |
1922.470 3375.710 1.305 3377.015 2.00 .92 .01 3377.03 .00 .49 1.90 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
| | | | | | | | | | | | | | | |
1922.470 3375.710 1.306 3377.016 2.00 .92 .01 3377.03 .00 .49 1.90 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
12.330 .0000 | | | | | .0001 .13 1.31 .15 .00 .013 .00 .00 PIPE
| | | | | | | | | | | | | | | |
1934.800 3377.700 1.306 3379.006 2.00 .92 .01 3379.02 .00 .49 1.90 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-

```

SDMH1_SDDI1_U.OUT

SDMH1_SDDI1_U.OUT

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION (Lateral from SDDI#1 to SDMH#1)

1922.47	.I	C	WE	H	.	R
1922.72	.I	C	WE	H	.	R
1922.97	.				.	
1923.22	.				.	
1923.48	.				.	
1923.73	.				.	
1923.98	.				.	
1924.23	.				.	
1924.48	.				.	
1924.73	.				.	
1924.99	.				.	
1925.24	.				.	
1925.49	.				.	
1925.74	.				.	
1925.99	.				.	
1926.24	.				.	
1926.50	.				.	

SDMH1_SDDI1_U.OUT

1926.75	.	.
1927.00	.	.
1927.25	.	.
1927.50	.	.
1927.75	.	.
1928.01	.	.
1928.26	.	.
1928.51	.	.
1928.76	.	.
1929.01	.	.
1929.26	.	.
1929.52	.	.
1929.77	.	.
1930.02	.	.
1930.27	.	.
1930.52	.	.
1930.77	.	.
1931.03	.	.
1931.28	.	.
1931.53	.	.
1931.78	.	.

I = INVER

- C = CRITICAL DEPTH
W = WATER SURFACE ELEVATION
S = SUPER-ELEVATION
H = HEIGHT OF CHANNEL
E = ENERGY GRADE LINE
X = CURVES CROSSING OVER
B = BRIDGE ENTRANCE OR EXIT
Y = WALL ENTRANCE OR EXIT

SDMH1_SDDI2_U.OUT

SDMH1_SDDI2_U.OUT

FILE: SDMH1_SDDI2_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date: 1- 5-2021 Time: 1:53:21

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION (Lateral 6 from SDDI#2 to SDMH#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
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****
| | | | | | | | | | | | | | | |
1922.470 3375.710 1.305 3377.015 2.00 .92 .01 3377.03 .00 .49 1.90 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
| | | | | | | | | | | | | | | |
1922.470 3375.710 1.306 3377.016 2.00 .92 .01 3377.03 .00 .49 1.90 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
32.670 .0000 | | | | | .0001 .13 1.31 .15 .00 .013 .00 .00 PIPE
| | | | | | | | | | | | | | | |
1955.140 3377.110 1.306 3378.416 2.00 .92 .01 3378.43 .00 .49 1.90 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-

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SDMH1_SDDI2_U.OUT

SDMH1_SDDI2_U.OUT

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION (Lateral 6 from SDDI#2 to SDMH#1)

1922.47	.I	C	W	H	.	R
1923.14	.I	C	W	H	.	R
1923.80	.				.	
1924.47	.				.	
1925.14	.				.	
1925.80	.				.	
1926.47	.				.	
1927.14	.				.	
1927.80	.				.	
1928.47	.				.	
1929.14	.				.	
1929.80	.				.	
1930.47	.				.	
1931.14	.				.	
1931.80	.				.	
1932.47	.				.	
1933.14	.				.	

SDMH1_SDDI2_U.OUT

1933.80	.	.
1934.47	.	.
1935.14	.	.
1935.80	.	.
1936.47	.	.
1937.14	.	.
1937.80	.	.
1938.47	.	.
1939.14	.	.
1939.81	.	.
1940.47	.	.
1941.14	.	.
1941.81	.	.
1942.47	.	.
1943.14	.	.
1943.81	.	.
1944.47	.	.
1945.14	.	.
1945.81	.	.
1946.47	.	.
1947.14	.	.

I = INVER

- C = CRITICAL DEPTH
W = WATER SURFACE ELEVATION
S = SUPER-ELEVATION
H = HEIGHT OF CHANNEL
E = ENERGY GRADE LINE
X = CURVES CROSSING OVER
B = BRIDGE ENTRANCE OR EXIT
Y = WALL ENTRANCE OR EXIT

SDMH2_L5_U.OUT

SDMH2_L5_U.OUT

FILE: SDMH2_L5_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date: 1- 5-2021 Time:11:58:46

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION (Lateral 5)

```

*****
| 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
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****
| | | | | | | | | | | | | | | |
2236.300 3398.550 2.370 3400.920 19.00 3.95 .24 3401.16 .00 1.48 1.11 2.500 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
| | | | | | | | | | | | | | | |
2236.300 3398.550 2.370 3400.920 19.00 3.95 .24 3401.16 .00 1.48 1.11 2.500 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
41.330 .0000 | | | | | .0009 2.08 2.37 .33 .00 .013 .00 .00 PIPE
| | | | | | | | | | | | | | | |
2277.630 3398.960 2.370 3401.330 19.00 3.95 .24 3401.57 .00 1.48 1.11 2.500 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-

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SDMH2_L5_U.OUT

SDMH2_L5_U.OUT

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION (Lateral 5)

2236.30	.I	C	W	H	E	.	R
2237.14	.I	C	W	H	E	.	R
2237.99	.					.	
2238.83	.					.	
2239.67	.					.	
2240.52	.					.	
2241.36	.					.	
2242.20	.					.	
2243.05	.					.	
2243.89	.					.	
2244.73	.					.	
2245.58	.					.	
2246.42	.					.	
2247.27	.					.	
2248.11	.					.	
2248.95	.					.	
2249.80	.					.	

SDMH2_L5_U.OUT

2250.64	.	.
2251.48	.	.
2252.33	.	.
2253.17	.	.
2254.01	.	.
2254.86	.	.
2255.70	.	.
2256.54	.	.
2257.39	.	.
2258.23	.	.
2259.07	.	.
2259.92	.	.
2260.76	.	.
2261.60	.	.
2262.45	.	.
2263.29	.	.
2264.13	.	.
2264.98	.	.
2265.82	.	.
2266.66	.	.
2267.51	.	.

SDMH2_L5_U.OUT

[illegible]

NOTES

1. GLOSSARY

I = INVERT ELEVATION
C = CRITICAL DEPTH
W = WATER SURFACE ELEVATION
S = SUPER-ELEVATION
H = HEIGHT OF CHANNEL
E = ENERGY GRADE LINE
X = CURVES CROSSING OVER
B = BRIDGE ENTRANCE OR EXIT
Y = WALL ENTRANCE OR EXIT

2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

SDMH4_SDDI3_U.OUT

SDMH4_SDDI3_U.OUT

FILE: SDMH4_SDDI3_U.WSW

W S P G W - CIVILDESIGN Version 14.08

PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING

Date: 1- 5-2021 Time: 2: 2: 0

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION (Lateral 4 from SDDI#3 to SDMH#4)

```

*****
| 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
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****
| | | | | | | | | | | | | | | |
2270.030 3401.700 2.370 3404.070 1.00 .32 .00 3404.07 .00 .34 .00 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
| | | | | | | | | | | | | | | |
2270.030 3401.700 2.370 3404.070 1.00 .32 .00 3404.07 .00 .34 .00 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
32.700 .0000 | | | | | .0000 .02 2.37 .00 .00 .013 .00 .00 PIPE
| | | | | | | | | | | | | | | |
2302.730 3403.430 2.370 3405.800 1.00 .32 .00 3405.80 .00 .34 .00 2.000 .000 .00 1 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-

```

SDMH4_SDDI3_U.OUT

SDMH4_SDDI3_U.OUT

SUMMERLIN WEST VILLAGE 22

FLIGHT RANGE AVENUE EAST (KETTLE RIDGE DRIVE TO DESERT FOOTHILLS DRIVE)

ATKINS - 100 YEAR ULTIMATE CONDITION (Lateral 4 from SDDI#3 to SDMH#4)

2270.03	.I	C	H	W	.	R
2270.70	.I	C	H	W	.	R
2271.36	.				.	
2272.03	.				.	
2272.70	.				.	
2273.37	.				.	
2274.03	.				.	
2274.70	.				.	
2275.37	.				.	
2276.04	.				.	
2276.70	.				.	
2277.37	.				.	
2278.04	.				.	
2278.71	.				.	
2279.37	.				.	
2280.04	.				.	
2280.71	.				.	

SDMH4_SDDI3_U.OUT

2281.38	.	.
2282.04	.	.
2282.71	.	.
2283.38	.	.
2284.04	.	.
2284.71	.	.
2285.38	.	.
2286.05	.	.
2286.71	.	.
2287.38	.	.
2288.05	.	.
2288.72	.	.
2289.38	.	.
2290.05	.	.
2290.72	.	.
2291.39	.	.
2292.05	.	.
2292.72	.	.
2293.39	.	.
2294.05	.	.
2294.72	.	.

SDMH4_SDDI3_U.OUT

[illegible]

NOTES

1. GLOSSARY

I = INVERT ELEVATION
C = CRITICAL DEPTH
W = WATER SURFACE ELEVATION
S = SUPER-ELEVATION
H = HEIGHT OF CHANNEL
E = ENERGY GRADE LINE
X = CURVES CROSSING OVER
B = BRIDGE ENTRANCE OR EXIT
Y = WALL ENTRANCE OR EXIT

2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

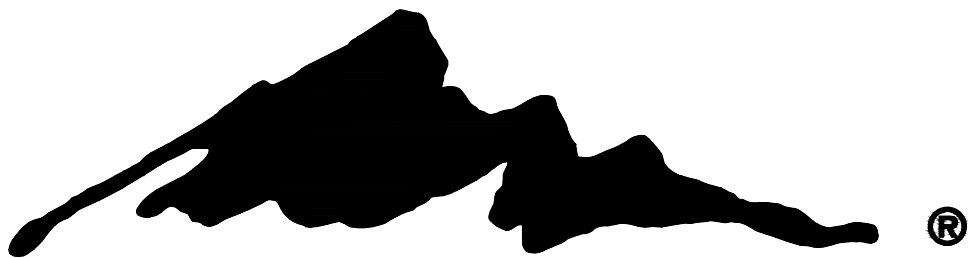
Appendix D. CD-ROM



2270 Corporate Circle
Suite 200
Henderson NV 89074-7755
Tel: 702.263.7275
www.atkinsglobal.com/northamerica

SHEET INDEX		
1	COVER SHEET	
2	LEGEND AND ABBREVIATIONS	
3	GENERAL NOTES	
4	HORIZONTAL CONTROL PLAN	
5	MASTER DRAINAGE PLAN	
6	MASTER WATER PLAN	
7	MASTER SEWER PLAN	
8	ROADWAY GRADING PLAN	STA. 26+00 TO END
9	ROADWAY PLAN AND PROFILE	STA. 26+00 TO END
10	ROADWAY GRADING PLAN	STA. 23+00 TO 26+00
11	ROADWAY PLAN AND PROFILE	STA. 23+00 TO 26+00
12	ROADWAY GRADING PLAN	STA. 20+00 TO 23+00
13	ROADWAY PLAN AND PROFILE	STA. 20+00 TO 23+00
14	ROADWAY GRADING PLAN	BEGIN TO STA. 20+00
15	ROADWAY PLAN AND PROFILE	BEGIN TO STA. 20+00
16	STORM DRAIN LATERALS	
17	WATER LATERAL PROFILES	
18	SEWER LATERAL PROFILES	
19	STREETLIGHT PLAN	
20	SIGNAGE AND STRIPING PLAN	
21	TYPICAL SECTIONS	
22	STORM DRAIN DETAILS	
23	WATER DETAILS	
24	STREETLIGHT DETAILS	

SUMMERLIN VILLAGE 22
IMPROVEMENT PLANS FOR:
FLIGHT RANGE AVENUE (STREET E)
DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)
FUTURE SID PROJECT



SUMMERLIN®

UTILITY NOTE

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

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

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

NOTICE OF INTENT NOTE

NOTE: ALL LAND SURFACE AREA DISTURBANCES OVER 1 ACRE REQUIRE A STORMWATER DISCHARGE PERMIT ISSUED BY THE NEVADA DIVISION OF ENVIRONMENTAL PROTECTION (NDEP). A PHASED CONSTRUCTION UNIT IN A CONTIGUOUS SUBDIVISION IS CONSIDERED UNDER CONSTRUCTION UNTIL ALL STRIPPED SURFACE AREAS HAVE BEEN COVERED BY PAVING, BUILDING CONSTRUCTION OR PLANTING. A STORMWATER DISCHARGE PERMIT APPLICATION AND ASSOCIATED INFORMATION MAY BE DOWNLOADED FROM THE WEB SITE: [HTTP://WWW.STATE.NV.US/BWPC/STORM01.HTM](http://www.state.nv.us/bwpc/storm01.htm) PROJECTS THAT DISTURB MORE THAN ONE ACRE OF LAND MUST SUBMIT TO NDEP A "NOTICE OF INTENT" FOR INCLUSION UNDER STORMWATER PERMIT NO. NVR100000 ALONG WITH APPROPRIATE FILLING FEE.

NPDES PERMIT NOTE

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

DISCLAIMER NOTE

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

FEMA FLOOD ZONE INFORMATION

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

PROPOSED RIGHT-OF-WAY ACREAGE 2.09 AC. PROPOSED DISTURBED AREA ACREAGE 5.26 AC.

GEOTECHNICAL ENGINEER
PREPARED BY: NOVA GEOTECHNICAL & INSPECTION SERVICES
4480 W. HACIENDA AVENUE, SUITE 104, LAS VEGAS, NV 89118
PHONE: 702-873-3478
PROJECT NO.: G-18-176
DATED: DECEMBER 3, 2018 AND SUBSEQUENT UPDATE LETTERS
DATED ON DECEMBER 30, 2019 AND DECEMBER 2, 2020

OWNER /DEVELOPER

OWNER

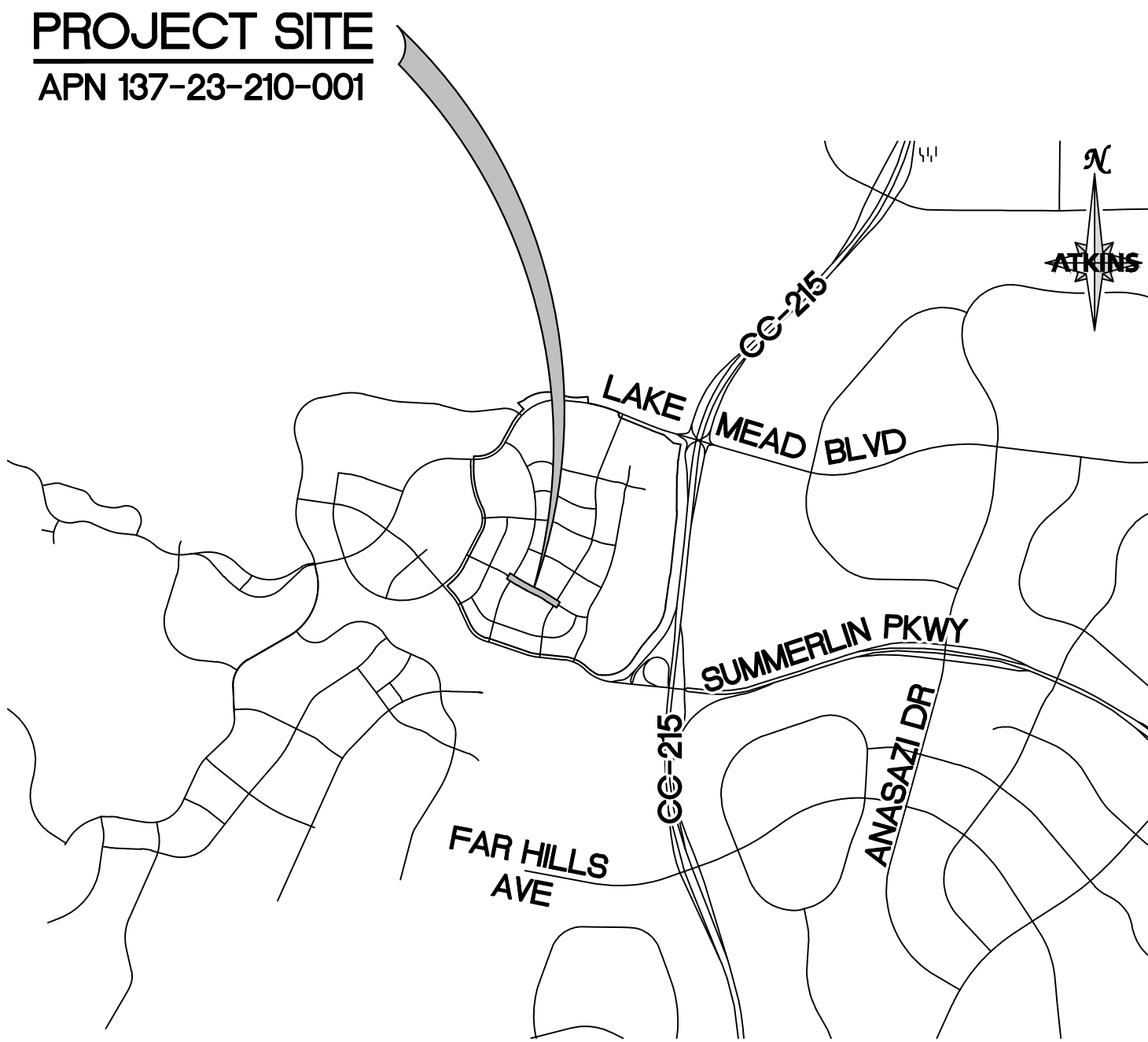
CONTACT: KEVIN ORROCK
HOWARD HUGHES COMPANY LLC, A DELAWARE LIMITED LIABILITY COMPANY
10845 GRIFFITH PEAK DRIVE, SUITE 160
LAS VEGAS, NEVADA 89135

ENGINEER / CONSULTANT

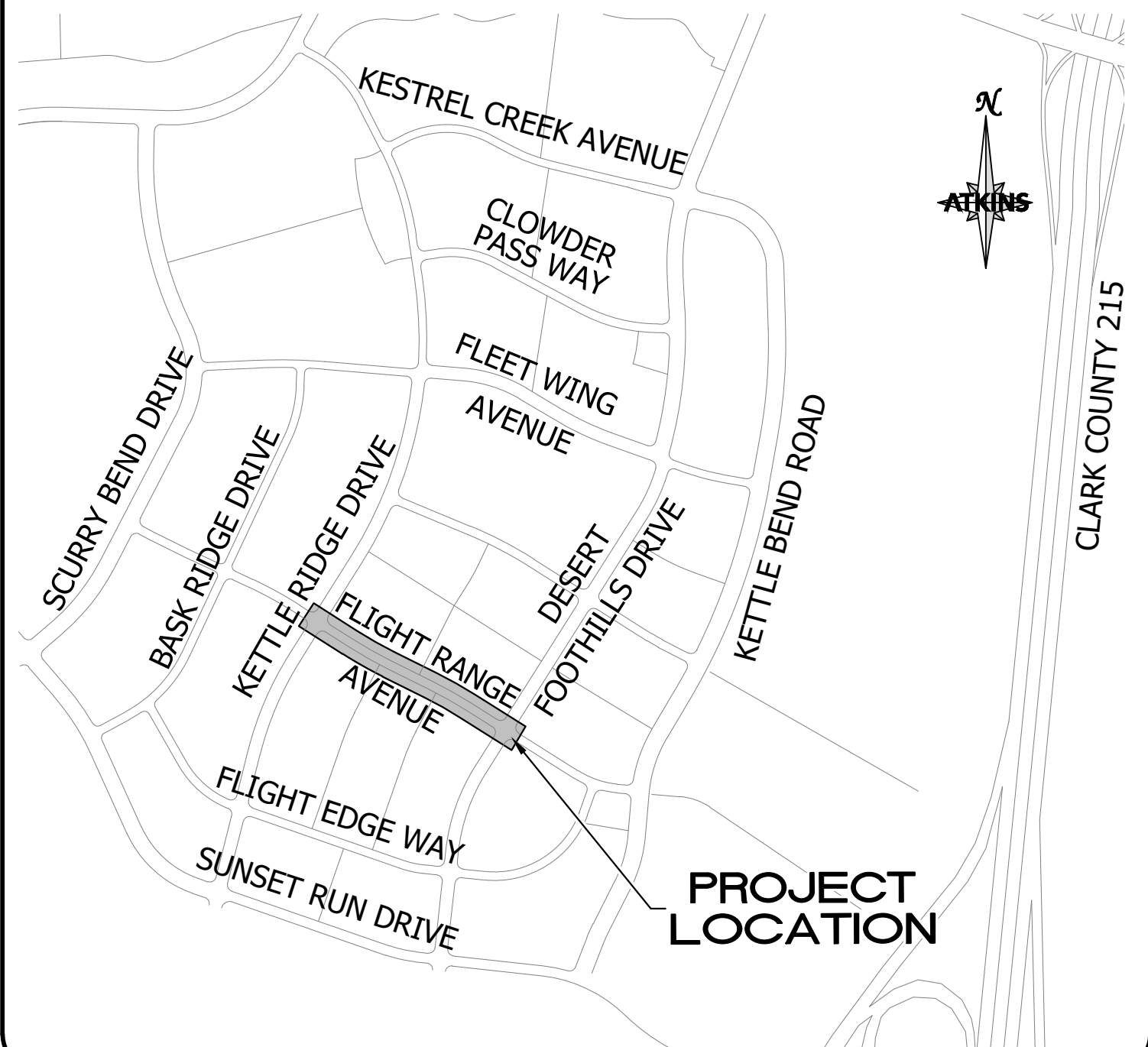
CIVIL

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

LOCATION MAP



VICINITY MAP



APPROVALS

HOWARD HUGHES COMPANY LLC, A DELAWARE LIMITED LIABILITY COMPANY

KEVIN T. ORROCK, VICE PRESIDENT DATE

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

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

CITY OF LAS VEGAS PLANNING DEPARTMENT DATE

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

LAS VEGAS FIRE AND RESCUE DATE

CENTRAL TELEPHONE COMPANY d/b/a CENTURYLINK DATE

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

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING & ENGINEERING SERVICES

PROJECT NO. 0000 FIRST APPROVED DATE:

SHEETS:

NV ENERGY DATE

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

SOUTHWEST GAS CORPORATION DATE

COX COMMUNICATIONS OF LAS VEGAS, INC DATE

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.
LINEAR UNIT: US SURVEY FOOT (FTUS)
DATUM (REFERENCE FRAME): NAD 83 (2011) EPOCH 2010.00
SYSTEM: NEVADA COORDINATE REFERENCE SYSTEM (NCRS)
ZONE: LAS VEGAS HIGH ELEVATION ZONE
PROJECTION: TRANSVERSE MERCATOR STANDARD PARALLEL (AND LATITUDE OF GRID ORIGIN): 36°15'00"N
LONGITUDE OF CENTRAL MERIDIAN: 114°58'00"W
NORTHING AT GRID OF ORIGIN: 400,000.00 M (1,312,333.3333 FTUS)
EASTING AT CENTRAL MERIDIAN: 300,000 M (984,250.0000 FTUS)
SCALE FACTOR ON CENTRAL MERIDIAN: 1.000135 (EXACT)

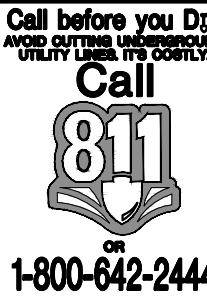
- NOTES:
- ALL DISTANCES AND BEARINGS SHOWN HEREON ARE PROJECTED (GRID) VALUES BASED ON THE PRECEDING PROJECTION DEFINITION. THE PROJECTION WAS DEFINED SUCH THAT PROJECTED (GRID) DISTANCES ARE EQUIVALENT TO "GROUND" DISTANCES IN THE PROJECTED AREA
 - GRID BEARINGS SHOWN HEREON (OR IMPLIED BY GRID COORDINATES)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

BENCHMARK

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

LEGAL DESCRIPTION

BEING A PORTION OF LOT 1 AS SHOWN ON THE MAP THEREOF IN BOOK 161 OF PLATS, PAGE 68, OFFICIAL RECORDS, CITY OF LAS VEGAS CLARK COUNTY, NEVADA



NOT FOR CONSTRUCTION
TDS SUBMITTAL

DESIGNED BY: N. BARCOS
DRAWN BY: L. MAMACLAY
CHECKED BY: P. BATES
HORIZ: NONE
VERT: NONE
XXXXXX
LXX-XXXX
DATE: JANUARY, 2021
DRAWING NO.
1 /18
JOB NO. 100068107

SUMMERLIN WEST VILLAGE 22
FLIGHT RANGE AVENUE (STREET E)
DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)

COVER SHEET

REVISIONS

ATKINS

SUMMERLIN®

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

REV.	DESCRIPTION	DATE	APPROVAL

② AT		FF FINISHED FLOOR ELEVATION		PVC POLYVINYL CHLORIDE		W/ WITH	
# NUMBER		FH FIRE HYDRANT		PVI POINT OF VERTICAL INTERSECTION		WB WEST BOUND	
AB ABANDONED		FL FLOW LINE		PVMT PAVEMENT		WL WATER LINE	
AC ASPHALTIC CONCRETE		FO FIBER OPTIC		QTY QUANTITY		WM WATER METER	
ACP ASBESTOS CEMENT PIPE		FT FOOT OR FEET		(R) RADIAL		W/O WITHOUT	
AGG AGGREGATE		G GAS LINE		R/W,ROW RIGHT OF WAY		WPJ WEAKENED PLANE JOINT	
AIP ABANDON IN PLACE		GALV GALVANIZED		R RADIUS		WV WATER VALVE	
ALT ALTERNATE		GB GRADE BREAK		RC REINFORCED CONCRETE		WW WING WALL	
AP ANGLE POINT		GL GRATE LENGTH		RCB REINFORCED CONCRETE BOX		YD YARD(S)	
APPROX APPROXIMATE		GM GAS METER		RCC ROLLER COMPACTED CONCRETE			
ASTM AMERICAN SOCIETY FOR TESTING AND MATERIALS INTERNATIONAL		GUT GUTTER		RCP REINFORCED CONCRETE PIPE			
		GV GATE VALVE		RD ROAD			
AV/AR AIR VACUUM AIR RELIEF VALVE		H HEIGHT		REINF REINFORCED OR REINFORCEMENT			
BC BACK OF CURB		HDPE HIGH DENSITY POLYETHYLENE PIPE		RELOC RELOCATE			
BCR BACK OF CURB RETURN		HDWL HEADWALL		REV REVISION			
BLK BLOCK		HE HORIZONTAL ELLIPTICAL		RG ROUGH GRADE			
BLVD BOULEVARD		HGL HYDRAULIC GRADE LINE		RP RADIUS POINT			
BM BENCHMARK		HOA HOMEOWNER'S ASSOCIATION		RPM RAISED PAVEMENT MARKER			
BO BLOW OFF		HOR HORIZONTAL		RR RAILROAD			
BP BOTTOM OF PIPE		HP HIGH POINT		RT RIGHT			
BSW BACK OF SIDEWALK		ID INSIDE DIAMETER		SCHED SCHEDULE			
BVC BEGIN VERTICAL CURVE		IN INCH(ES)		SD STORM DRAIN			
BVCE BEGINNING OF VERTICAL CURVE ELEVATION		INT INTERSECTION		SDMH STORM DRAIN MANHOLE			
BVCS BEGINNING OF VERTICAL CURVE STATION		INV INVERT		SF SQUARE FOOT/SQUARE FEET			
BW BOTTOM WIDTH		IQAC INTERAGENCY QUALITY ASSURANCE COMMITTEE		SHLD SHOULDER			
C&G CURB AND GUTTER		IRR IRRIGATION		SHT SHEET			
C-C CENTER TO CENTER		ISL ISLAND		SHP STEEL HIGH PRESSURE PIPE			
CATV CABLE TELEVISION		JB JUNCTION BOX		SMFO SINGLE MODE FIBER OPTIC			
CCAUSD CLARK COUNTY AREA UNIFORM STANDARD DRAWING		JCT JUNCTION		SNWA SOUTHERN NEVADA WATER AUTHORITY			
CCRFGD CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT		JT JOINT		SQ SQUARE			
CCWRD CLARK COUNTY WATER RECLAMATION DISTRICT		K VERTICAL CURVE K VALUE		SS SANITARY SEWER OR SIDE SLOPE			
CF CUBIC FOOT		L LENGTH		SSD SUMMERLIN STANDARD DRAWING			
CIP CAST IRON PIPE OR CAST IN PLACE		LB POUND(S)		SST STAINLESS STEEL			
CL CENTERLINE		LF LINEAR FEET		ST STREET			
CLR CLEAR		LIN LINEAR		STA STATION			
CLV CITY OF LAS VEGAS		LIN # CCWRD MANHOLE NUMBER		STD STANDARD			
CM CONSTRUCTION MANAGER		LOC LENGTH OF CURVE		STL STEEL			
CMP CORRUGATED METAL PIPE		LOL LAYOUT LINE		STLT STREETLIGHT			
CMU CONCRETE MASONRY UNIT		LP LOW POINT		SDHW STORM DRAIN HEADWALL			
CNDT CONDUIT		LS LANDSCAPE		STRUCT STRUCTURAL OR STRUCTURE			
CNLV CITY OF NORTH LAS VEGAS		LT LEFT		SUM # CCWRD MANHOLE NUMBER			
CO CLEANOUT		LVC LENGTH OF VERTICAL CURVE		SURV SURVEY			
COH CITY OF HENDERSON		LVVWD LAS VEGAS VALLEY WATER DISTRICT		SVZ SIGHT VISIBILITY ZONE			
COL COLUMN		MAS MASONRY		SW SIDEWALK			
CON'T CONTINUATION		MAX MAXIMUM		SY SQUARE YARD			
CONC CONCRETE		MH MANHOLE		T TELEPHONE LINE			
CONST CONSTRUCT OR CONSTRUCTION		MIN MINIMUM		TAN TANGENT			
COR CORNER		MON MONOLITHIC, MONUMENT		TB TOP OF BOX			
COS COMMUNITY OPEN SPACE		MTL MATERIAL		TBA TO BE ADJUSTED			
CPP CORRUGATED PLASTIC PIPE		ME MATCH EXISTING		TBC TOP OF BACK OF CURB			
CSP CORRUGATED STEEL PIPE		MUE MUNICIPAL UTILITY EASEMENT		TBR TO BE REMOVED			
CU CUBIC		N NORTH		TC TOP OF CURB			
CULV CULVERT		NAP NOT A PART		TCD TRAFFIC CONTROL DEVICE			
CY CUBIC YARD		NDOT NEVADA DEPARTMENT OF TRANSPORTATION		TDS TECHNICAL DRAINAGE STUDY			
D DEPTH		NF NEAR FACE		TEL TELEPHONE			
DCSWCS DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS		NG NUMBER OF GRATES, NATURAL GRADE		TEMP TEMPORARY			
		NIC NOT IN CONTRACT		TF TOP OF FOOTING			
DET, DTL DETAIL		No. NUMBER		THK THICK			
DEPT DEPARTMENT		NTS NOT TO SCALE		THR THRUST			
DG DESIGN GRADE		NVE NV ENERGY		THW TOP OF HEADWALL			
DI DROP INLET		OC ON CENTER		TOF TOP OF FACE			
DIA DIAMETER		OD OUTSIDE DIAMETER		TOP TOP OF BANK			
DIAG DIAGONAL		OG OPEN GRADE		TW/TOW TOP OF WALL			
DIP DUCTILE IRON PIPE		OH OVERHEAD		TP TOP OF PIPE			
DOC DOCUMENT		OHP OVERHEAD POWER		TRANS TRANSITION			
DW DRIVEWAY		OS OFFSET		TS TRAFFIC SIGNAL			
DWG DRAWING		P POWER		TSI TRAFFIC SIGNAL INTERCONNECT			
E EAST		PB PULL BOX		TW TOP OF WALL			
EA EACH		PBS PLANTMIX BITUMINOUS SURFACE		TYP TYPICAL			
EB EASTBOUND		PC POINT OF CURVATURE		UDACS UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR WATER DISTRIBUTION SYSTEMS			
EC END OF CURVE		PCC PORTLAND CEMENT CONCRETE OR POINT OF COMPOUND CURVATURE					
ECR END CURB RETURN				UG UNDERGROUND			
EF EACH FACE				UGP UNDERGROUND POWER			
EG EXISTING GROUND				UIE UPPER INVERT ELEVATION			
ELEC ELECTRICAL				UNO UNLESS NOTED OTHERWISE			
ELEV ELEVATION				UPRR UNION PACIFIC RAILROAD			
EMBK EMBANKMENT				USD UNIFORM STANDARD DRAWING			
EOP EDGE OF PAVEMENT				UTACS ULTRA THIN ASPHALT CONCRETE SURFACE			
EP EDGE OF PAVEMENT ALIGNMENT END				USTODE UTILITY, STREETLIGHT, TRAFFIC CONTROL DEVICE EASEMENT			
EQ EQUAL							
ESMT EASEMENT							
EVC END VERTICAL CURVE							
EVCS END VERTICAL CURVE STATION							
EW EACH WAY							
EX, EXST EXISTING							
EXP, JT EXPANSION JOINT							
FA FIRE ALARM							
FC FACE OF CURB							

ROADWAY ALIGNMENT DESIGNATIONS

"FRA" = FLIGHT RANGE AVENUE
"DFD" = DESERT FOOTHILLS DRIVE
"KRD" = KETTLE RIDGE DRIVE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. 0000 FIRST APPROVED DATE: _____
LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

BASIS OF BEARING

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

BENCHMARK

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

FAST

Call before you Dig
1-702-432-5300

Call before you Dig
1-800-642-2444

CALL BEFORE YOU DIG
1-702-227-2929

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

NOT FOR CONSTRUCTION
TDS SUBMITTAL

DESIGNED BY: N. BARCOS
DRAWN BY: L. MAMACLAY
CHECKED BY: P. BATES
HORIZ.: NONE
VERT.: NONE

XXXXXX
LXX-XXXX
DATE: JANUARY, 2021
DRAWING NO.
2 /18

ATKINS

2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1702.263.7755
Fax: +1702.263.7200

SUMMERLIN

SUMMERLIN WEST VILLAGE 22
FLIGHT RANGE AVENUE (STREET E)
DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)

LEGEND AND ABBREVIATIONS

100068107

CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA". LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA". LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY, THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CITY PLANS, LITERATURE AND OTHERWISE 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 PLAN. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE S' WITHIN THE PROJECT AREA AND 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, PIPES, OR STRUCTURES AND STREETS 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 UP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS.
9. CURB AND GUTTER FLOW 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 SURFACE FOR PROPER DRAINAGE AND TO PREVENT 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 REPORTS AS PREPARED BY THE (NOVA, G-18-176, 12/03/18) APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY EDGINGS, FLOWLINES AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY'S 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 THE PROJECT AREA.
18. CONTRACTOR SHALL ADJUST ALL NEW EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS INDICABLE, 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 PLAN 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 CONTROL NETWORKS, STORM DRAIN 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 LATERAL EXIT THE PUBLIC RIGHT-OF-WAY, SEWER AND STORM DRAIN MAIN ALIGNMENT, INCLUDING DRAINAGE 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. PLAN LOCATION MAPS MUST BE SEALED AND CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINITIES OF BETTER THAN 1/4" PER 100' TO VERIFY THE LOCATION. A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN PLAN 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.

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CITY OF LAS VEGAS GRADING NOTES

1. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATIONS, THE OWNER/ENGINEER SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL NECESSARY CUTS AND FILLS WITHIN THE LIMITS OF THIS PROJECT AND THE RELATED OFF-SITE WORK, SO AS TO GENERATE THE DESIRED SUBGRADE, FINISH GRADES AND SLOPES SHOWN.
3. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ALL EXCAVATION, ADEQUATE SHORING SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR TO PREVENT UNDERMINING OF ANY ADJACENT FEATURES OR FACILITIES AND/OR CAUSING OF THE EXCAVATION.
4. THE CONTRACTOR IS WARNED THAT AN EARTHWORK BALANCE WAS NOT NECESSARILY THE INTENT OF THIS PROJECT. ANY EXCESS MATERIAL ACQUIRED OR LEFTOVER MATERIAL FOLLOWING EARTHWORK OPERATIONS BECOMES THE RESPONSIBILITY OF THE CONTRACTOR.
5. THE GRADING CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE OWNER TO PROVIDE FOR THE REQUIREMENTS OF THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND ASSOCIATED PERMIT.
6. CONTRACTOR SHALL GRADE TO THE LINES AND ELEVATIONS SHOWN ON THE PLANS WITHIN THE FOLLOWING HORIZONTAL AND VERTICAL TOLERANCES AND DEGREES OF COMPACTION, IN THE AREAS INDICATED:

	HORIZONTAL	VERTICAL	COMPACTION
A. PAVEMENT AREA SUBGRADE	0.1' +	+0.0' TO -0.1'	SEE SLOIS REPORT
B. ENGINEERED FILL	0.5' +	+0.1' TO -0.1'	SEE SLOIS REPORT
7. COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE.
8. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.
9. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.
10. THE CONTRACTOR SHALL MAINTAIN THE STREETS, SIDEWALKS AND ALL OTHER PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE AND USABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE PUBLICLY OWNED PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. ALL ADJACENT PROPERTY, PRIVATE OR PUBLIC SHALL BE MAINTAINED IN A CLEAN, SAFE AND USABLE CONDITION.
11. IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED THAT IS NOT SHOWN ON THESE DRAWINGS, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIS OWN EXPENSE AND AT THE DIRECTION OF THE CITY ENGINEER. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

REVISÉ 04/15/10

CONSTRUCTION CONCURRENCY NOTE

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

1. KETTLE RIDGE DRIVE ((ONE-WAY) FLEET WING AVENUE TO SUNSET RUN DRIVE)
2. DESERT FOOTHILLS DRIVE ((ONE-WAY) SUNSET RUN DRIVE TO FLEET WING AVENUE)

DEVIATIONS FROM STANDARDS

NONE.

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 #63326 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS.
2. ONLY FIRE HYDRANTS THAT ARE ON THE LAS VEGAS VALLEY WATER DISTRICT'S APPROVED PRODUCTS LIST ARE ALLOWED TO BE INSTALLED.
3. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK. IFC § 107.5.1.2.
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 FLOW OF 100 GPM AT 150 PSI.
5. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. IFC § 507.5.7.3
6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH THE PROHIBITION OF THE USE OF AIR OR COMBUSTIBLE GASES.
7. ALL ONE-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. EXISTING 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 UNEXPANDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT INSTALLED AT THE CORNER SECTION 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 § 507.5.7.2
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-TO TWO-FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. IFC § 102.4
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. IFC § C102.7
17. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. IFC § C102.6
18. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER RISERS 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 DEPART SHALL NOT EXCEED 15% ANGLES OF APPROACH. 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 § 503.2.5
23. FIRE DEPARTMENT ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 10 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 10 FT FLOW LINE TO FLOW LINE. WHERE NO PARKING IS PERMITTED ON EITHER SIDE OF THE FIRE LINES 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, ROADS(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 § 503.2.1
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 § 503.1
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. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE MARKED WITH SIGNS AT INTERVALS OF 100 FT. SIGNS 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.

REVISÉ MARCH 1, 2016

CITY OF LAS VEGAS TRAFFIC NOTES

1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.
2. THE STREET SIGN CONTRACTOR SHALL OBTAIN SCURRY BEND DRIVEWAYS 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 ENDOACHMENTS 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 ENCRACHED 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 EXISTING TRAFFIC SIGNS, EXISTING SIGNS 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 CCAUSG 627 AND 716 AND SHALL HAVE AN ANTI-GRAFFITI PROTECTIVE OVERLAY FILM THAT IS A MATCHING COMPONENT TO, AND OF THE SAME MAKE AND COLOR AS THE EXISTING SHEETING TO WHICH IS APPLIED. SCURRY BEND DRIVEWAY 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 SCURRY BEND DRIVEWAYS SIGNS.
10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR USA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT OF WAY.
11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA (RTC) IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.
13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF OFFICERS SIGNING AND TRAFFIC CONTROL SHALL 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 SIGNAGE THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPENDING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ALTERING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

REVISÉ JUNE 4, 2018

CITY OF LAS VEGAS SEWER NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR WASTEWATER COLLECTION IMPROVEMENTS, CLARK COUNTY AREA, WASHOE, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS. ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEER.
3. CHISEL "S" OR "G" IN CURBS WHERE SEWER OR GAS LATERALS PASS UNDER THE CURB.
4. POLYVINYL (PVC) SEWER PIPE SHALL MEET ASTM D-3034 SR-35 SPECIFICATIONS, INSTALLED WITH SAND BEDDING AND BACKFILL OF TYPE II AGGREGATE BASE.
5. ALL MANHOLES PAVED IN STREETS EIGHTY (80) FOOT R/W AND LARGER SHALL HAVE CONCRETE COLLARS. STREETS LESS THAN EIGHTY (80) FOOT R/W WILL REQUIRE RETROFIT IF PAVING DOES NOT CONFORM TO CITY STANDARDS AT THE MANHOLE.
6. TEE SADDLES SHALL BE USED TO CONNECT SEWER LATERALS TO EXISTING MAIN LINES UP TO TWELVE INCH (12") DIAMETER. CONNECTIONS TO FIFTEEN INCH (15") OR LARGER MAINS SHALL REQUIRE SPECIAL PROCEDURES. IN LINE "Y" S SHALL BE USED ON LINES TWELVE INCHES (12") OR ABOVE.
7. WATER MAINS SHALL BE PROTECTED IN ACCORDANCE WITH LVWD STANDARDS WHENEVER A SEWER MAIN CROSSES OVER A WATER MAIN OR THE SEWER IS LESS THAN EIGHTEEN INCH (18") UNDER A WATER MAIN.
8. ALL CONTRACTORS INSTALLING SEWER MAINS THAT WILL BE UNDER THE JURISDICTION OF THE CITY OF LAS VEGAS MUST BE STATE OF NEVADA CLASS "A" CONTRACTORS.
9. THE CITY OF LAS VEGAS WILL NOT ACCEPT ANY SEWER MAINS WHICH HAVE A VERTICAL DEFLECTION OF MORE THAN ONE TENTH (0.1) OF A FOOT FROM THE APPROVED CONSTRUCTION PLANS AT ANY LOCATION. SEWER MAINS FOUND TO BE DEFECTIVE THIS WAY SHALL BE REPAIRED OR REMOVED OR REPLACED TO THE SATISFACTION OF THE CITY ENGINEER PRIOR TO ACCEPTANCE BY THE CITY OF LAS VEGAS.

REVISED 04/15/10

CITY OF LAS VEGAS STREET LIGHT NOTES

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" (LATEST REVISION), AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" (USD) (LATEST REVISION).
2. DESIGN PROFESSIONAL AND CONTRACTOR SHALL VERIFY CITY'S LATEST LED FIXTURE SPECIFICATIONS AND APPROVED FIXTURES PER CLV WEBSITE, UNDER BUILDING AND SAFETY FORMS, PRIOR TO ORDERING MATERIALS.
3. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS, ETC., LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE TRAFFIC AND CITY ENGINEER. ANY DEVIATION FROM THE PLAN LOCATION WILL REQUIRE COMPLIANCE WITH SECTION 623 OF THE USS.
4. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION IN ACCORDANCE WITH SECTION 623 6.03.01 OF THE USS.
5. ALL EMPTY CONDUIT SHALL HAVE AT LEAST ONE GREEN NO. 8B AWG WIRE INSTALLED AS TRACER WIRE IN ACCORDANCE WITH SECTION 623 6.02.01 OF THE USS PRIOR TO BACKFILLING AND FINAL INSPECTION.
6. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, 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.
7. 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.
8. 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.
9. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREETLIGHTING, THE CONTRACTOR SHALL ADVISE THE CITY OF LAS VEGAS OF THE LOCATION OF THE DEVELOPER AND THE UTILITIES INVOLVED BEFORE STREETLIGHT BASES ARE INSTALLED, AT NO EXPENSE TO THE CITY OF LAS VEGAS.
10. THE CONTRACTOR SHALL FURNISH COMPLETE CONDUIT, WIRE, ETC. FROM SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON THE PLANS.

REVISED 6/4/2018 (LD VERSION)

LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDELINES

1. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO OR ACCUMULATED IN THE PUBLIC RIGHTS OF WAY OF CLARK COUNTY AS A RESULT OF CONSTRUCTION ACTIVITIES AND SHALL WITHIN 24 HOURS REMOVE SUCH MATERIALS FROM THE CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN CLARK COUNTY TITLE 24.40 AND IN THE LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDANCE MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY, SUCH AS TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVRI000000, SECTION III.4.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS, AND AREAS WHERE MATERIALS ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS, AND ALL BMPs WEEKLY, AND WITHIN 24 HOURS AFTER ANY RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY, SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVRI000000, SECTION III.4.12.
5. ACCUMULATED SEDIMENT IN BMPs SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

SOUTHWEST NEVADA - SOUTHWEST GAS CORPORATION

GENERAL NOTES

1. IN THE EVENT OF NATURAL GAS EMERGENCIES CALL 911 AND 1-877-860-8020.
2. MINIMUM HORIZONTAL AND VERTICAL CLEARANCES BETWEEN NATURAL GAS FACILITIES AND ANY UNDERGROUND UTILITIES AND/OR STRUCTURES, INCLUDING BUT NOT LIMITED TO WATER, SEWER, STORM DRAIN, COMMUNICATIONS, AND ELECTRIC SHALL BE AT LEAST 12-INCHES OR GREATER AS DICTATED BY LOCAL CODES AND STANDARDS.
 - a) ANY DEVIATION FROM SPECIFIED MINIMUM CLEARANCES MUST BE APPROVED BY ALL AFFECTED UTILITIES AND/OR MUNICIPAL GOVERNMENTS.
3. FOR VALVE ADJUSTMENT CONTACT 702-528-7881 14 DAYS PRIOR TO CONSTRUCTION.
4. IN THE EVENT OF A NATURAL GAS CONFLICT WITH PROPOSED UTILITIES AND/OR STRUCTURES CONTACT 702-365-2099.

ALL CIVIL IMPROVEMENT PLANS MUST INCLUDE SOUTHWEST GAS CORPORATION HIGH PRESSURE NOTES ON THE NOTES SHEET AND ALL SHEETS DEPICTING HIGH PRESSURE NATURAL GAS MAINS AS INDICATED BELOW:

CAUTION: HIGH PRESSURE GAS!
CALL SOUTHWEST GAS AT 702-278-8451 FOR STANDBY WHEN EXCAVATING OVER OR
NEAR HIGH PRESSURE GAS LINES 48 HOURS PRIOR TO CONSTRUCTION

SOUTHWEST GAS CORPORATION DATE

GRADING NOTES

1. INDICATED GRADES OTHER THAN TO, FG & GUTTER FL ARE ROUGH GRADES.
2. THE ROUGH GRADING PLANS SHALL BE ON THE JOB SITE AT ALL TIMES. THE ROUGH GRADING SHALL BE FINISHED IN CONFORMANCE WITH THE LINES AND GRADES SHOWN ON THE PLANS. THE GRADING QUANTITIES ARE BASED ON THE ELEVATION AND DETAILS SHOWN ON THE PLANS. ANY DEVIATIONS FROM THE PLAN WILL RESULT IN QUANTITY CHANGES.
3. SOL'S REPORT PREPARED BY: NOVA GEOTECHNICAL & INSPECTION SERVICES 4480 W. HACIENDA AVENUE, SUITE 100, AUSTIN, TEXAS 78745. PHONE 702-572-3478. PROJECT NO. C-19-176. DATED: DECEMBER 3, 2019. AND SUBSEQUENT UPDATE LETTERS DATED ON DECEMBER 30, 2019 AND DECEMBER 2, 2020.
4. EARTHWORK QUANTITIES (RAW):
 - CUT = 14,600 CUBIC YARDS
 - FILL = 28,400 CUBIC YARDS
 - A. THE ABOVE QUANTITIES DO NOT REFLECT LOSSES DUE TO SUBSIDENCE OR SHRINKAGE.
 - B. THE ABOVE QUANTITIES DO REFLECT USING NATIVE MATERIAL IN LIEU OF TYPE 1 GRAVEL BASE MATERIAL FOR STREET SECTIONS.
 - C. THE ABOVE QUANTITIES DO NOT REFLECT ANY EARTHWORK WHICH MAY BE REQUIRED BY THE ENGINEER TO CONSTRUCT ADDITIONAL PROTECTIVE DITCHES OR BERMS NOT SHOWN ON THESE DRAWINGS.

GENERAL NOTES

1. THE CONTRACTOR SHALL TIFY ALL AFFECTED PUBLIC ENTITIES, THE PROJECT ENGINEER AND CLARK COUNTY AT LEAST 48 HOURS PRIOR TO THE COMMENCEMENT OF WORK.
2. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE CONTRACT DRAWINGS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE PROJECT ENGINEER.
3. 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 ISSUE; AND ALL APPLICABLE ORDINANCES AND ORDINANCES BY THE COUNTY, THE CONTROLLING AGENCY, THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE.
4. LOCATIONS OF UNDERGROUND UTILITIES SHOWN ON THE DRAWINGS WERE OBTAINED FROM INFORMATION RECEIVED FROM THE APPLICABLE UTILITY COMPANIES. NEITHER THE OWNER NOR ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES OR STRUCTURES NOT SHOWN, OR NOT IN THE LOCATION SHOWN ON THE DRAWINGS. CONTRACTOR TO VERIFY EXACT LOCATION OF UTILITIES PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR'S RESPONSIBILITY REGARDING UTILITIES SHALL BE AS REQUIRED UNDER SECTION 107.17 OF THE "UNIFORM STANDARD SPECIFICATIONS FOR CLARK COUNTY AREA, NEVADA" AND AS PROVIDED IN THE SPECIFICATIONS.
5. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES TO PROTECT EXISTING UTILITY LINES, STRUCTURES, AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE. ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE COUNTY ENGINEER OR OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
6. THE CONTRACTOR SHALL NOT REMOVE TREES, SHRUBS, LAWNS, WALLS, FENCES, SIGNS, STRUCTURES, LIGHTS, OR ANY OTHER EXISTING IMPROVEMENTS OUTSIDE OF STREET RIGHT-OF-WAY, EXCEPT WHERE REQUIRED TO DO SO BY THE PROJECT ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION, RELOCATION OR RECONSTRUCTION OF ALL EXISTING IMPROVEMENTS INCLUDING SPRINKLER SYSTEMS, LAWNS, FENCES, WALLS, SIGNS, STEPS, SIDEWALKS, DRIVEWAYS, LAWN LIGHTS, AND ALL OTHER ITEMS APPLICABLE TO THIS CONTRACT SHALL BE REQUIRED BY THE PROJECT ENGINEER.
7. THE CONTRACTOR SHALL BACKFILL AND FINE GRADE ALL CUT OR FILL SLOPES TO MATCH EXISTING CONDITIONS TO THE SATISFACTION OF THE PROJECT ENGINEER. WHERE EXISTING LAWNS ARE DAMAGED BY THE CONTRACTOR'S OPERATIONS, THE CONTRACTOR SHALL RESTORE THE AFFECTED AREA TO A CONDITION EQUAL TO OR BETTER THAN THAT WHICH EXISTED PRIOR TO CONSTRUCTION.
8. THE 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 TRANSITIONS TO BE AS SHOWN PER CONTRACT DRAWINGS.
9. 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.E.S. STATUTE NO. 628.550.
10. THE ACTUAL LOCATIONS OF SAW CUT LINES, LIMITS OF COLD MILLING, LIMITS OF DRIVEWAY TRANSITIONS, AND LANDSCAPE REPAIR SHALL BE DETERMINED IN THE FIELD BY THE RESIDENT PROJECT REPRESENTATIVE.
11. THE ACTUAL LIMITS OF EXISTING OPEN GRADE REMOVAL AND UDACS APPLICATION SHALL BE DETERMINED IN THE FIELD BY THE RESIDENT PROJECT REPRESENTATIVE.
12. ALL STANDARD DRAWINGS REFERENCED IN THIS SET ARE BASED ON THE CURRENT "UNIFORM STANDARD DRAWINGS REVISION SET II-1997 RELEASE".
13. UNLESS OTHERWISE SHOWN ON THE CONTRACT DRAWINGS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND RELOCATION OF ALL WATER SERVICES AND METERS WHICH INTERFERE WITH IMPROVEMENTS SHOWN ON THE CONTRACT DRAWINGS.
14. THE CONTRACTOR SHALL MAINTAIN AN ONGOING REMOVAL PROCESS OF ALL SPILLAGE OF EXCAVATION MATERIAL ON ALL PAVED STREETS.
15. CURB AND GUTTER OF A GRADE OF LESS THAN 4/10 OF ONE PERCENT SHALL BE CONSTRUCTED BY FORMING. EACH JOINT SHALL BE CHECKED FOR GRADE PRIOR TO CONSTRUCTION AND WATER TESTED AS SOON AS POSSIBLE AFTER CONSTRUCTION.
16. THE CONTRACTOR SHALL VERIFY IN THE FIELD ALL DIMENSIONS, EXISTING CONDITIONS AND POINTS OF CONNECTION WITH ADJOINING PROPERTY (PUBLIC AND PRIVATE). ANY DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE PROJECT ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
17. REMOVAL OR RELOCATION OF POWER POLES, TELEPHONE POLES, JOINTLY-OWNED POLES, AND APPURTENANCES WHICH INTERFERE WITH IMPROVEMENTS REQUIRED TO BE CONSTRUCTED UNDER THIS CONTRACT, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE UTILITY COMPANIES FAR ENOUGH IN ADVANCE SO AS TO NOT IMPACT THE SCHEDULE.
18. COX COMMUNICATIONS SHALL BE RESPONSIBLE FOR THE VERTICAL OR HORIZONTAL ADJUSTMENT OF ALL CATV FACILITIES WHICH INTERFERE WITH IMPROVEMENTS SHOWN ON THE CONTRACT DRAWINGS, UNLESS NOTED OTHERWISE.
19. NV ENERGY SHALL BE RESPONSIBLE FOR THE RELOCATION OF UNDERGROUND OR OVERHEAD POWER LINES THAT INTERFERE WITH THE REQUIRED IMPROVEMENTS AS SHOWN ON THE CONTRACT DRAWINGS.
20. EMBARO SHALL BE RESPONSIBLE FOR THE VERTICAL OR HORIZONTAL ADJUSTMENT OF ALL TELEPHONE FACILITIES WHICH INTERFERE WITH IMPROVEMENTS SHOWN ON CONTRACT DRAWINGS, UNLESS NOTED OTHERWISE.

LAS VEGAS VALLEY WATER DISTRICT (LVVWD) NOTES

LVVWD PROJECT #0000
(REVISED 08/01/2017)

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVVMD. FOLLOW WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVMD COMMUNICATION SUPPORT CENTER (258-7171) THE WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. FOR FUTURE INSPECTIONS, NOTICE MUST BE GIVEN BY 2:30 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED LVVMD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.
 2. ALL WORK SHALL CONFORM TO LVVMD 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 SUPERCEDE 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 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 LVVMD.
 5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVVMD 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 LVVMD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802 TWO (2) WORKING DAYS PRIOR TO METER PICKUP.
 11. ANY INTERRUPTION OF SERVICE MUST BE PERFORMED IN ACCORDANCE WITH UDACS SECTION 3.14.01 AND APPROVED THE LVVMD INSPECTION DIVISION PRIOR TO SHUTDOWN. PROPER WRITTEN NOTIFICATION MUST BE GIVEN TO ALL AFFECTED CUSTOMERS.
 12. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE AS LISTED ON THE LVVMD APPROVED PRODUCT LIST FOR NEW FACILITIES, LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS BY SUBMITTING SHOP DRAWINGS.
 13. TELEPHONE "CALL BEFORE YOU DIG" AT "811" OR 1-800-227-2600.
 14. THE INSTALLATION OF LAS VEGAS VALLEY WATER DISTRICT (LVVWD) MUNICIPAL WATER FACILITIES WITHIN ALL STREET RIGHT-OF-WAY SHALL BE IN COMPLIANCE WITH THE UNIFORM STANDARD, INCLUDING THE PLACEMENT OF ASPHALT PAVING SURFACES. ANY REPAIR WORK DONE BY THE LVVMD TO THE MUNICIPAL WATER FACILITIES WILL INCLUDE THE PLACEMENT OF AN APPROPRIATELY SIZED ASPHALT REPAIR PATCH ON THE STREET SURFACE.
- ANY DECORATIVE PAVING SURFACE WITHIN THE STREET IS THE RESPONSIBILITY OF THE OWNER'S ASSOCIATION, OR INDIVIDUAL PROPERTY OWNERS IF NO OWNER'S ASSOCIATION IS IN EXISTENCE, OR THE AGENCY HAVING JURISDICTION OVER DECORATIVE SURFACE MATERIALS PLACED WITHIN THE TEN FOOT EASEMENT ABUTTING A PUBLIC OR PRIVATE STREET. DISTURBED BY THE LVVMD DURING THE REPAIR OR OPERATION OF ITS FACILITIES, WILL BE REPLACED BY LVVMD WITH AN APPROPRIATELY SIZED PLAIN FINISH CONCRETE PATCH. THE LVVMD WILL NOT RESTORE, AND WILL NOT BE RESPONSIBLE FOR THE RESTORATION OF, ANY DECORATIVE PAVING SURFACE WITHIN THE STREET. THE LVVMD WILL NOT ATTEMPT TO MATCH COLOR OR FINISH OF ANY ADJACENT MATERIALS.
15. NO LEAD COMPLIANCE NOTE:
TO COMPLY WITH THE FEDERAL SAFE DRINKING WATER ACT, ALL WATER WORKS BRASS PRODUCTS PROPOSED TO BE INSTALLED OR INSTALLED NEW MUST BE INSTALLED WITH THE LEAD FREE APPROVED PRODUCT. THE OLD LEAD PRODUCT MAY NOT BE REUSED.

APPROVED FOR CONSTRUCTION

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

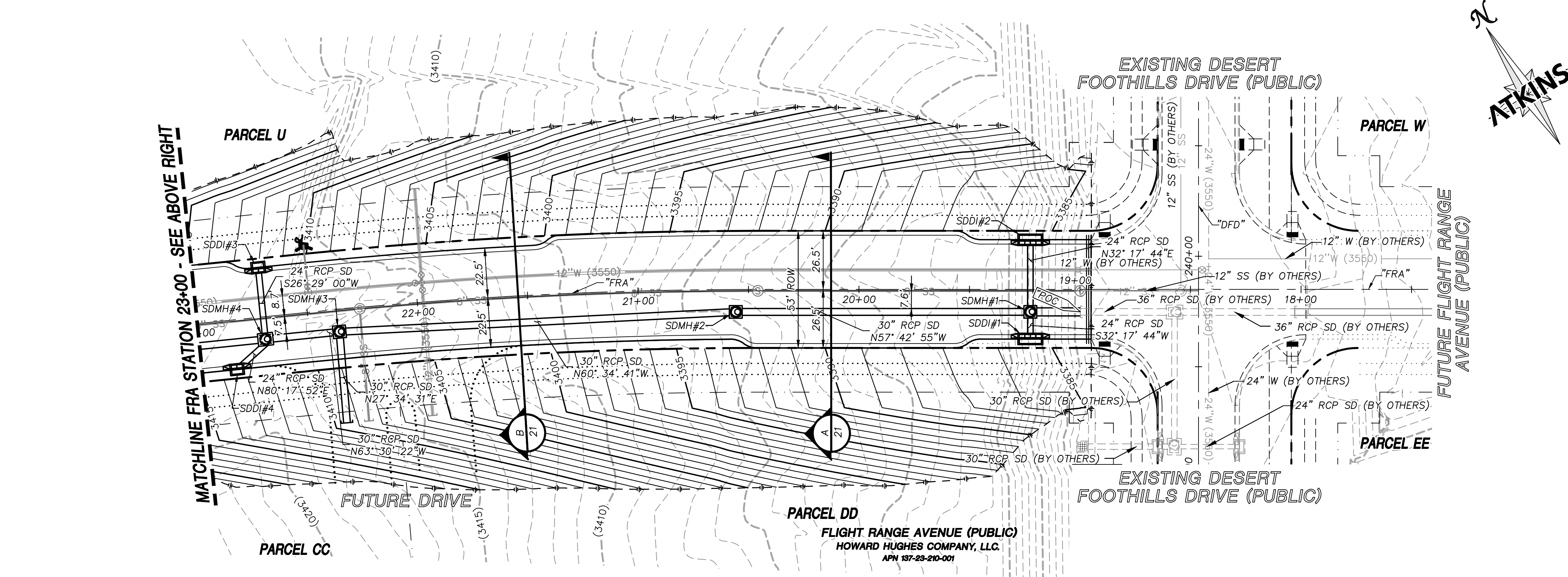
PROJECT NO. 0000 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

NOT FOR CONSTRUCTION
SUBMITTAL

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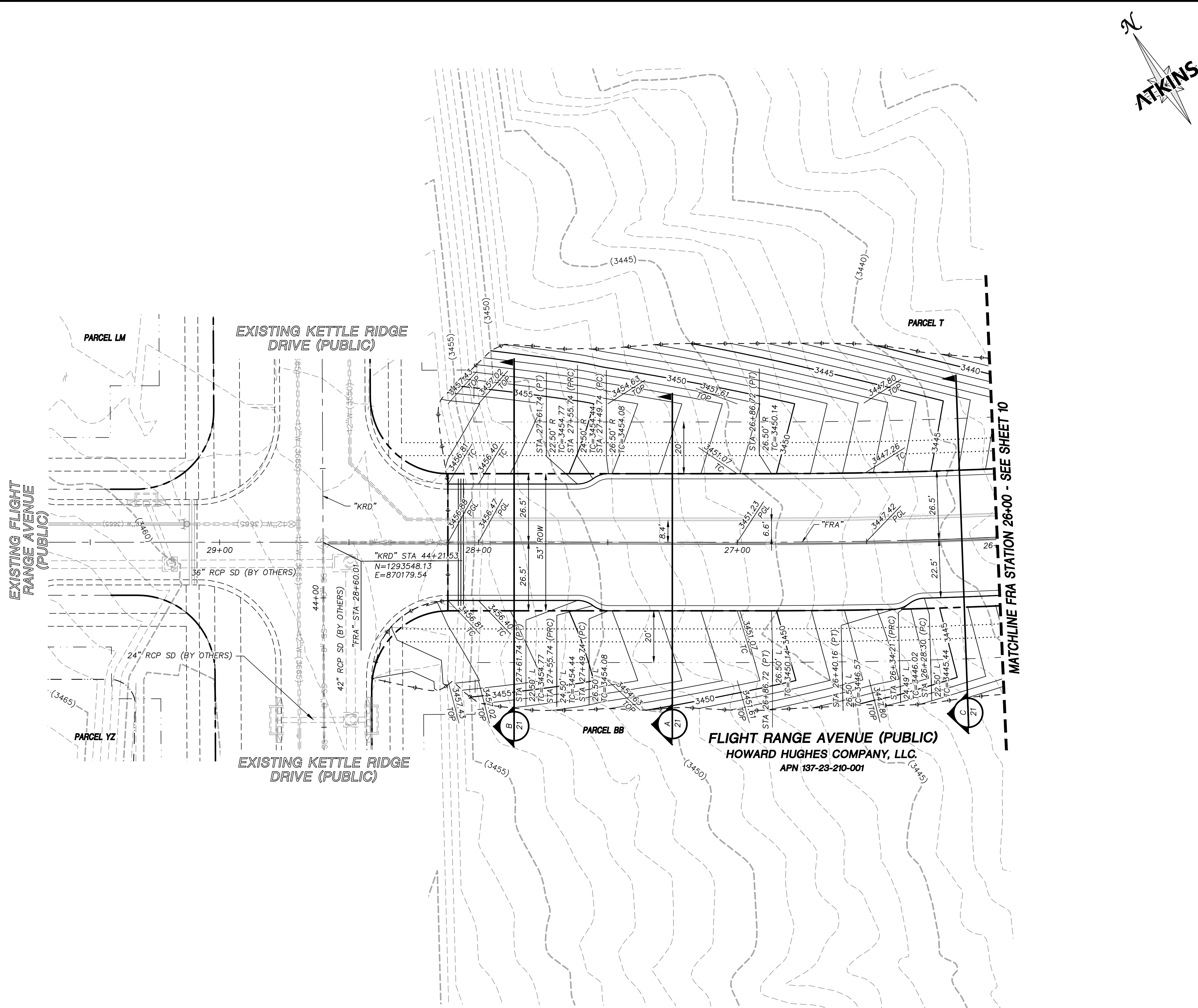
C:\ow work\atknanv01\magma6066\dms56082\68107-03-NOTE-C3.dwg LAYOUT: C-3 Jan 28, 2021 - 5:05PM



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

NOT FOR CONSTRUCTION
TDS SUBMITTAL

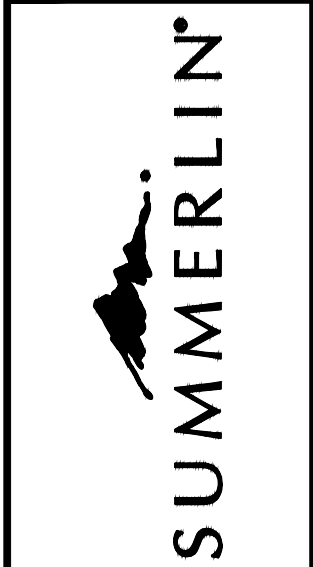
DESIGNED BY: N. BARCOS DRAWN BY: L. MAMAGLAY CHECKED BY: P. BATES DATE: JANUARY, 2021 DRAWING NO.	SUMMERLIN WEST VILLAGE 22 FLIGHT RANGE AVENUE (STREET E) DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)	 SUMMERLIN®	 2270 Corporate Circle, Suite 200 Henderson, Nevada 89074 Telephone: +1/702.263.7275 Fax: +1/702.263.7200	REV.	DESCRIPTION	BY	DATE	APPROVAL
XXXVXXXX LX-XXXXX 5 / 18 1"=30' VERT: NONE	MASTER DRAINAGE PLAN							



- STORM DRAIN CONSTRUCTION NOTES**
- 1. INSTALL STORM DRAIN. SEE SHEET ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
 - 2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
 - 3. INSTALL NDOT TYPE II DROP INLET PER NDOT R-4.2.1 (SEE SHEET 21)
 - 4. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
 - 5. INSTALL TYPE II SD MANHOLE PER CCAUSD #405.2
 - 6. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
 - 7. INSTALL TYPE "A" DROP INLET PER CCAUSD #411 & #421
 - 8. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
 - 9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
 - 10. INSTALL RIP-RAP (D50=8", THICKNESS=24")

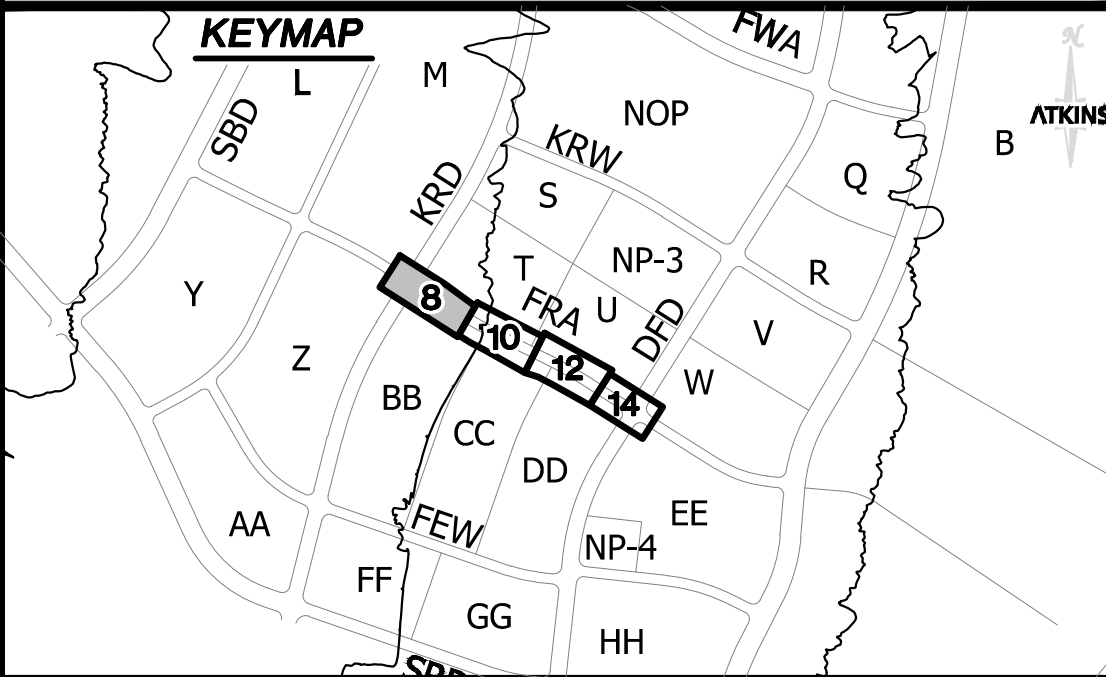
REVISIONS	
REV.	DESCRIPTION

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1702.263.7755
Fax: +1702.263.7200



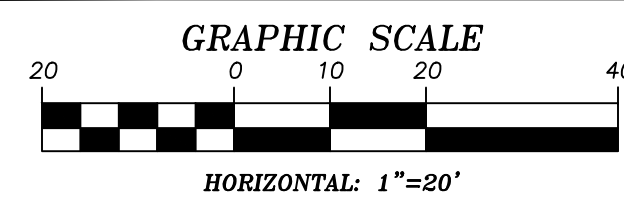
SUMMERLIN WEST VILLAGE 22
FLIGHT RANGE AVENUE (STREET E)
DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)

ROADWAY GRADING PLAN
STA. 26+00 TO END



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NOT FOR CONSTRUCTION
TDS SUBMITTAL



GRADING PLAN CERTIFICATION

NIC BARCOS PE#25673 DATE _____

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

DS# _____

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

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

Call before you Dig
and/or the underground
utilities are shown.

Call
before you
UnderGround

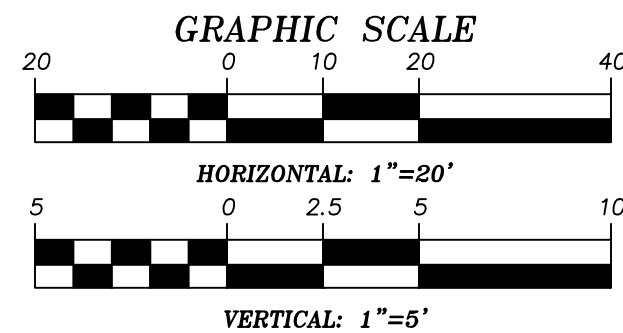
1-702-432-5300

1-800-642-2444

CALL BEFORE YOU DIG
UNDERGROUND UTILITIES

1-702-227-2929

DESIGNED BY: N. BARCOS	XXXXXX
DRAWN BY: L. MAMACLAY	LXX-XXXX
CHECKED BY: P. BATES	JANUARY, 2021
HORIZ.: 1"=20'	DRAWING NO.
VERT.: NONE	8 / 18



LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES
PROJECT NO. 0000 FIRST APPROVED DATE: _____
LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

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.

CITY OF LAS VEGAS BENCHMARK: D368
(REVISED 2008)
NAVDS8 ELEVATION: 989.574 METERS
(3,246.63 FEET)
FIND USC&GS DISC SET IN ROCK RIDGE 150
SOUTH OF CHARLESTON BLVD. & WEST OF
DETENTION BASIN.
T21S,R59E,S03



AVOID HITTING OVERHEAD
POWER LINES. IT'S COSTLY.

CALL BEFORE
YOU DO
OVERHEAD

1-702-227-2929

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NOT FOR CONSTRUCTION
TDS SUBMITTAL

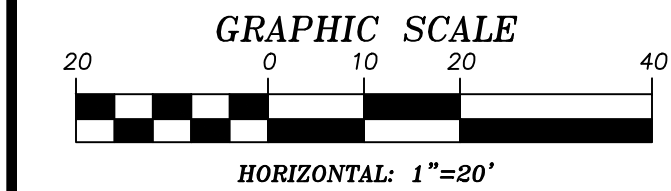
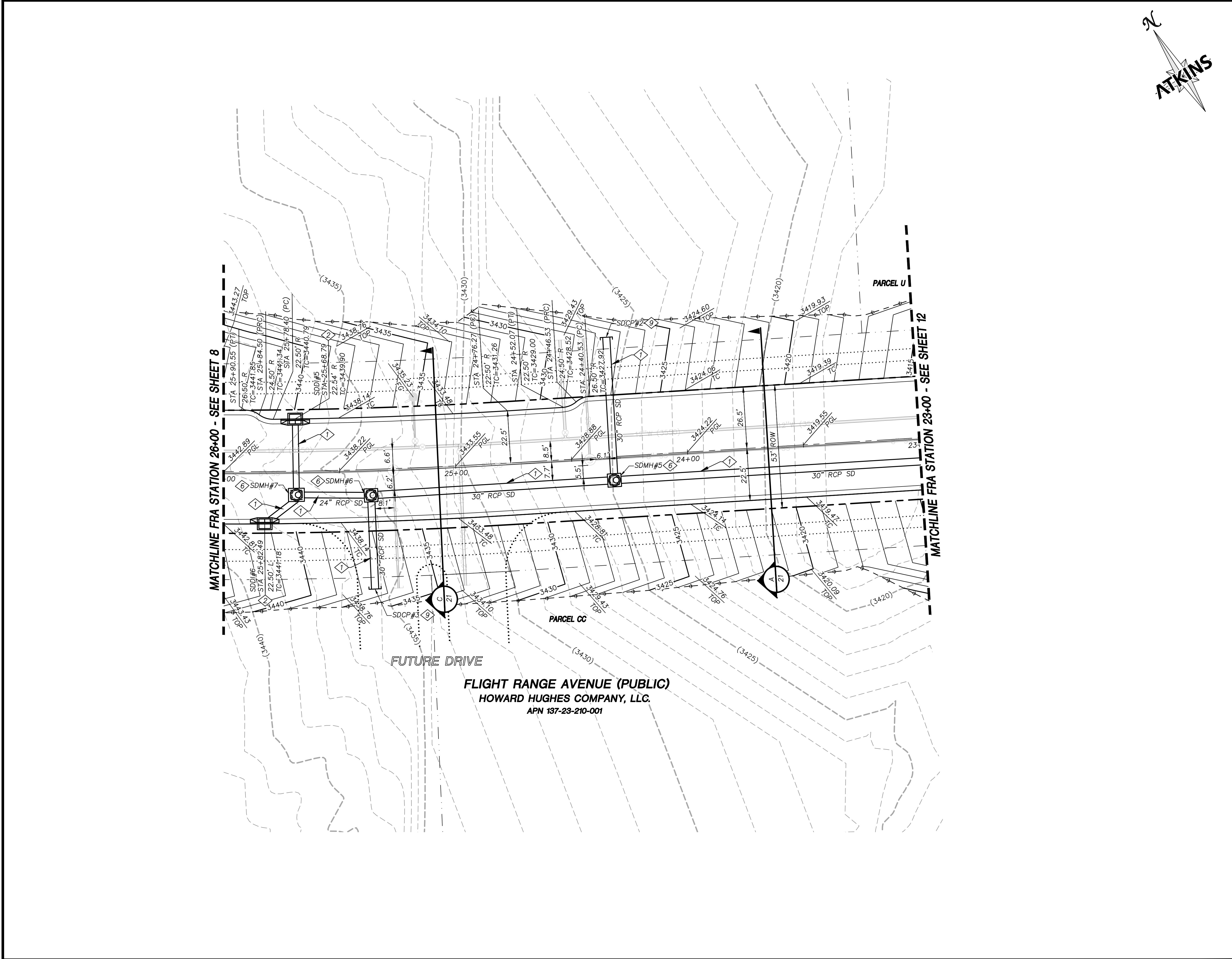
XXXXVXXXXX LXX-XXXXXX	DATE: JANUARY, 2021	DRAWING NO. 9 /18
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JOB NO. 100068107

WAY PLAN AND PROFILE
STA. 26+00 TO END



ATKINS
22270 Corporate Circle Suite 200
Henderson, Nevada 89074
telephone: +1.702.263.7275
fax: +1.702.263.7200



GRADING PLAN CERTIFICATION

NIC BARCOS PE#25673 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

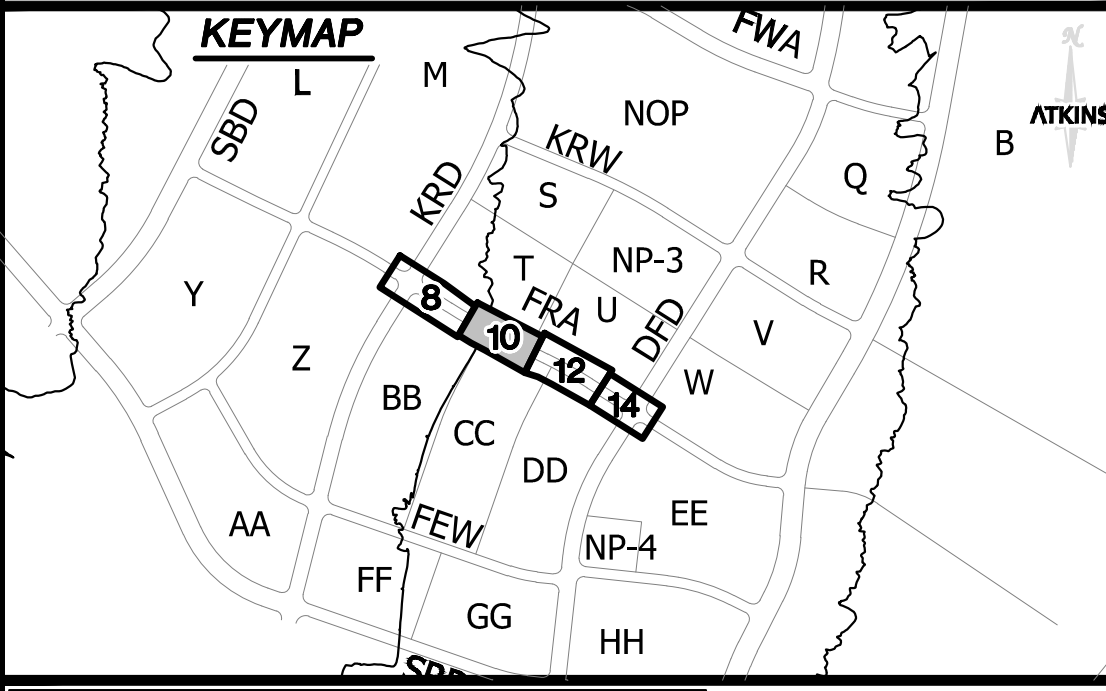
DS#----

BASIS OF BEARING

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

BENCHMARK

CITY OF LAS VEGAS BENCHMARK: D368 (REVISED 2008)
NAV088 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



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

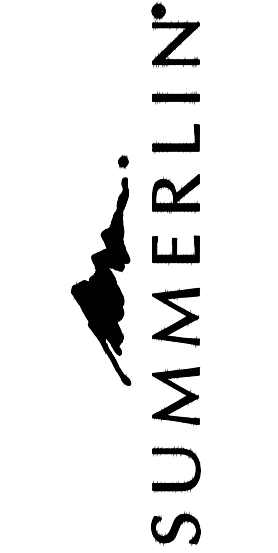
**NOT FOR CONSTRUCTION
TDS SUBMITTAL**

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. INSTALL NDOT TYPE II DROP INLET PER NDOT R-4.2.1 (SEE SHEET 21)
4. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
5. INSTALL TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
7. INSTALL TYPE "A" DROP INLET PER CCAUSD #411 & #421
8. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
10. INSTALL RIP-RAP (D50=8", THICKNESS=24")

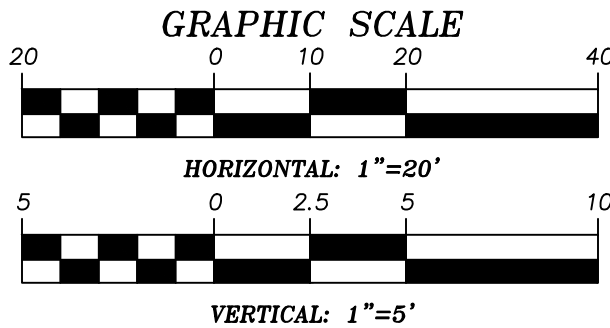
REV.	DESCRIPTION	BY	DATE	APPROVAL

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



SUMMERLIN WEST VILLAGE 22
FLIGHT RANGE AVENUE (STREET E)
DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)
ROADWAY GRADING PLAN
STA 23+00 TO 26+00

DESIGNED BY: N. BARCOS
DRAWN BY: L. MAMACLAY
CHECKED BY: P. BATES
HORIZ.: 1"=20'
VERT.: NONE
DRAWING NO. **10/18**
JOB NO. 100068107



LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES
PROJECT NO. 0000 FIRST APPROVED DATE: _____
LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

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.

CITY OF LAS VEGAS BENCHMARK: D368
(REVISED 2008)
NAVDS8 ELEVATION: 989.574 METERS
(3,246.63 FEET)
FIND USC&GS DISC SET IN ROCK RIDGE 150
SOUTH OF CHARLESTON BLVD. & WEST OF
DETENTION BASIN.
T21S,R59E,S03



Call before you Dig
AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.

Call
811
 OR
1-800-642-2444



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NOT FOR CONSTRUCTION
TDS SUBMITTAL

XXXXXX LXX-XXXX	DESIGNED BY: N. BARCOS
DATE: JANUARY, 2021	DRAWN BY: L. MAMACLAY
DRAWING NO.	CHECKED BY: P. BATES
11 / 18	HORIZ.: 1"=20' VERT.: 1"=5'

SUMMERLIN WEST VILLAGE 22
FLIGHT RANGE AVENUE (STREET E)

ROADWAY PLAN AND PROFILE
STA. 23+00 TO 26+00

C:\pw\work\atkngrv01\mama6066\dms56082\68107-08-PLAN-P1.dwg LAYOUT: P2 Jan 28 2021 - 5:25PM



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

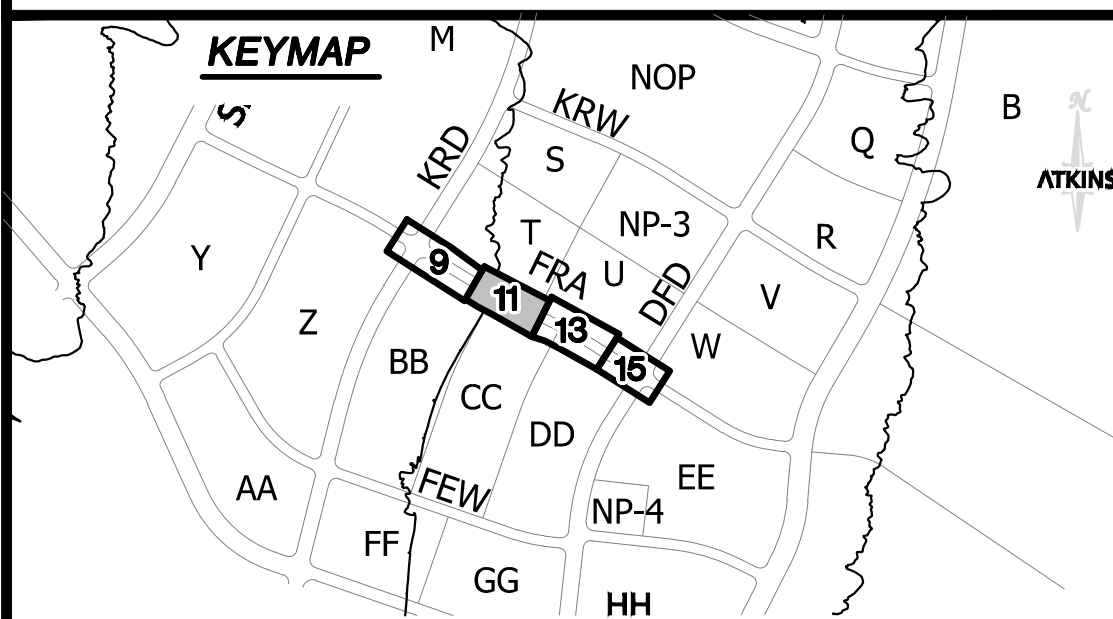
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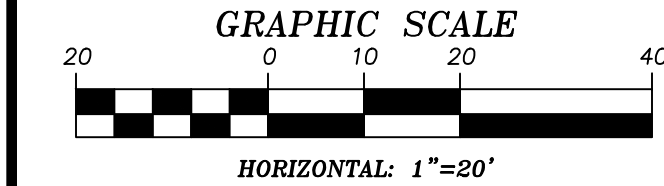
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- 6 INSTALL TYPE III SD MANHOLE PER CCAUSD #406
- 7 INSTALL TYPE "A" DROP INLET PER CCAUSD #411 & #421
- 8 REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
- 9 STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
- 10 INSTALL RIP-RAP (D50=8", THICKNESS=24")

- ① INSTALL SEWER MANHOLE PER DCSWCS SD-1, AND SD-4
- ② INSTALL SEWER MAIN PER DCSWCS SD-17
- ③ STUB AND CAP SEWER PIPE, PLACE MARKER BALL AND 4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRE BLOCK (1 CUBIC FT. MINIMUM).
- ④ REMOVE CAP AND CONNECT TO EXISTING SEWER STUB
- ⑤ ADJUST EXISTING MANHOLE TO GRADE PER DCSWCS SD-5.
- ⑥ PROTECT SEWER AT UTILITY CROSSING PER DCSWCS SD-15
- ⑦ SEWER MANHOLE BY OTHERS

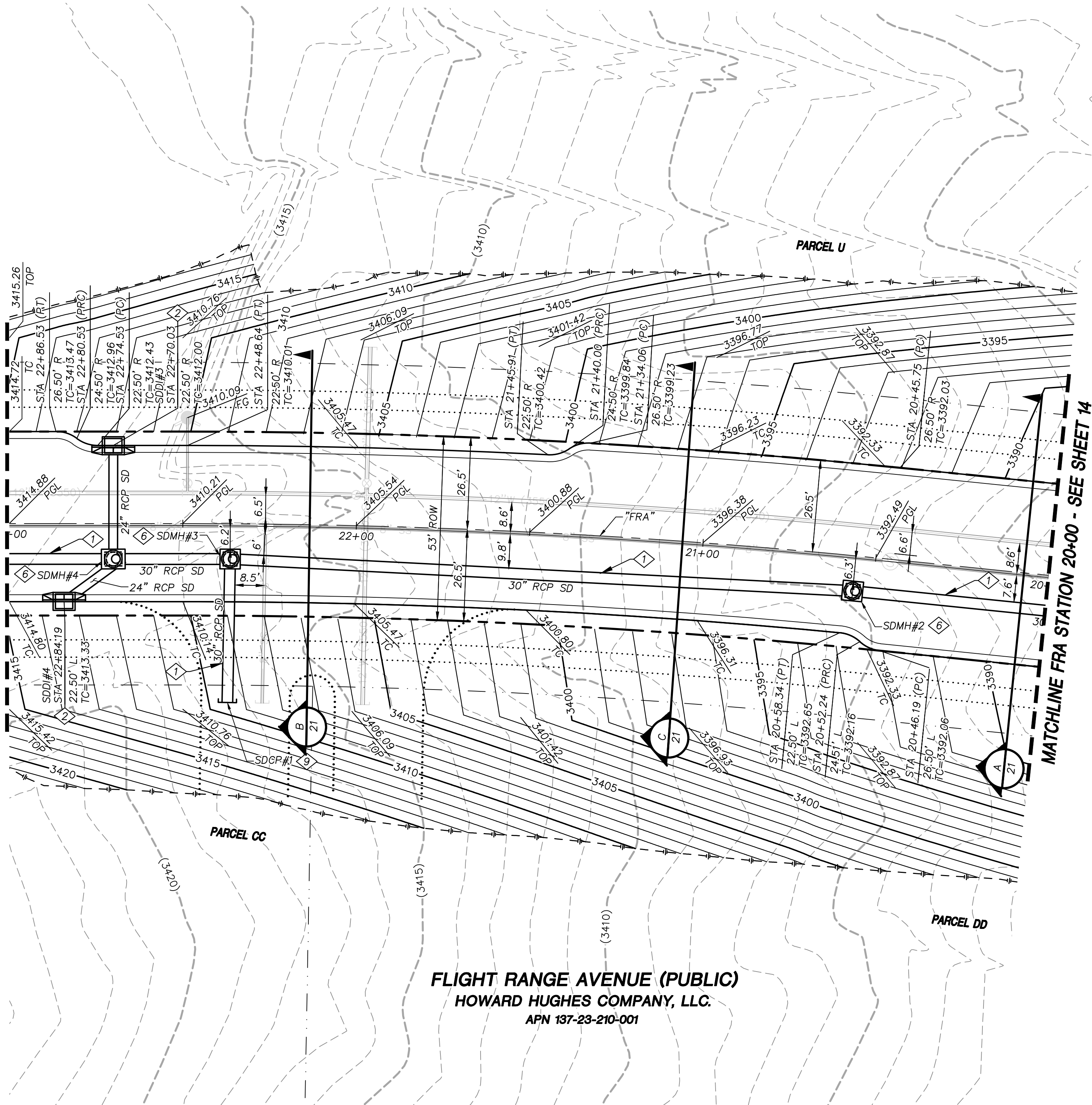
- 1 INSTALL WATER MAIN PER UDACS PLATES #17 AND PLATE #19
- 2 INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
- 3 INSTALL CROSS PER UDACS PLATE #31
- 4 INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
- 5 INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
- 6 INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
- 7 REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
- 8 INSTALL DEFLECTION AT PIPE JOINTS (MAXIMUM OF 1")

- (1) SAWCUT AND MATCH EXISTING
- (2) CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
- (3) FUTURE SIDEWALK BY OTHERS
- (4) FUTURE SIDEWALK BY OTHERS
- (5) CONSTRUCT CONCRETE SIDEWALK PER CCAUSD #234
- (6) CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN R-5.2.1 (A=B=6.5').
- (7) CONSTRUCT 0" FLUSH CURB
- (8) TRANSITION CURB FROM FILL HEIGHT (6") TO FLUSH (0")
- (9) CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 21 FOR TYPICAL PAVEMENT SECTION.
- (10) INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL ON SHEET XX





MATCHLINE FRA STATION 23+00 - SEE SHEET 10



FLIGHT RANGE AVENUE (PUBLIC)
HOWARD HUGHES COMPANY, LLC.
APN 137-23-210-001

GRADING PLAN CERTIFICATION

NIC BARCOS PE#25673 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

DS#----

BASIS OF BEARING

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

BENCHMARK

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

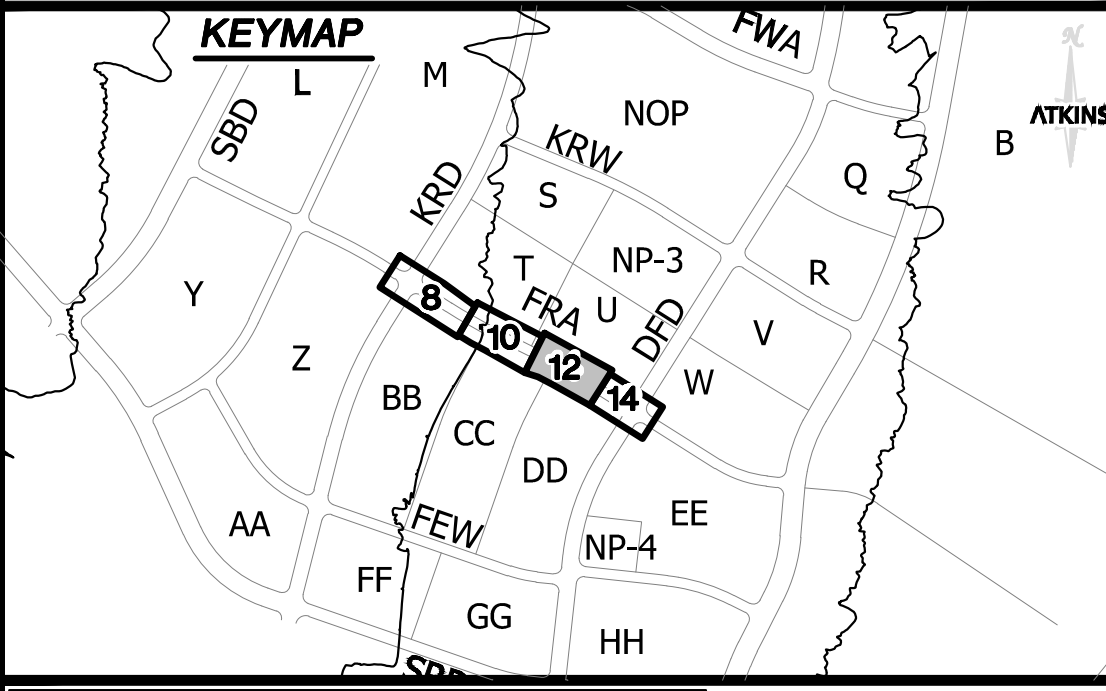


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NOT FOR CONSTRUCTION
TDS SUBMITTAL

STORM DRAIN CONSTRUCTION NOTES

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10. INSTALL RIP-RAP (D50=8", THICKNESS=24")



SUMMERLIN WEST VILLAGE 22
FLIGHT RANGE AVENUE (STREET E)
DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)

ROADWAY GRADING PLAN
STA 20+00 TO 23+00

DESIGNED BY: N. BARCOS
DRAWN BY: L. MAMACLAY
CHECKED BY: P. BATES
HORIZ.: 1"=20'
VERT.: NONE

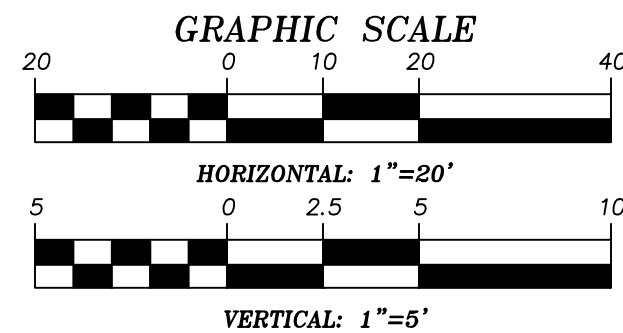
JOB NO. 100068107

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1702.263.7755
Fax: +1702.263.7200

SUMMERLIN
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1702.263.7755
Fax: +1702.263.7200

REV.	DESCRIPTION	BY	DATE	APPROVAL

REVISIONS



LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. 0000 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL _____

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

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FND USC&GS DISC SET IN ROCK RIDGE 150
SOUTH OF CHARLESTON BLVD. & WEST OF
DETENTION BASIN.
T21S,R59E,S03



Call before you Dig
AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.

Call
811
 OR
1-800-642-2444



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NOT FOR CONSTRUCTION
TDS SUBMITTAL

XXXXXXX LXX-XXXXX	DESIGNED BY: N. BARCOS
	DRAWN BY: L. MAMACLAY
	CHECKED BY: P. BATES
	HORIZ.: 1"=20'
	VERT.: 1"=5'
DATE: JANUARY, 2021	
DRAWING NO. 13 / 18	

SUMMERLIN WEST VILLAGE 22
FLIGHT RANGE AVENUE (STREET E)
DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)

ROADWAY PLAN AND PROFILE
STA. 20+00 TO 23+00



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Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

REVISIONS

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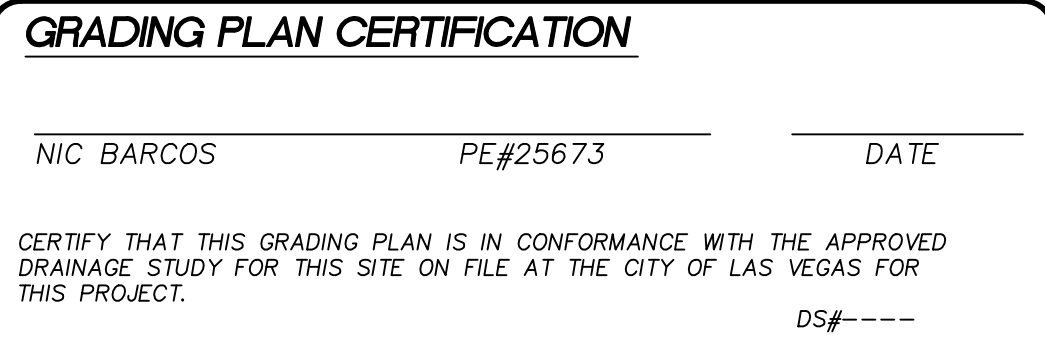
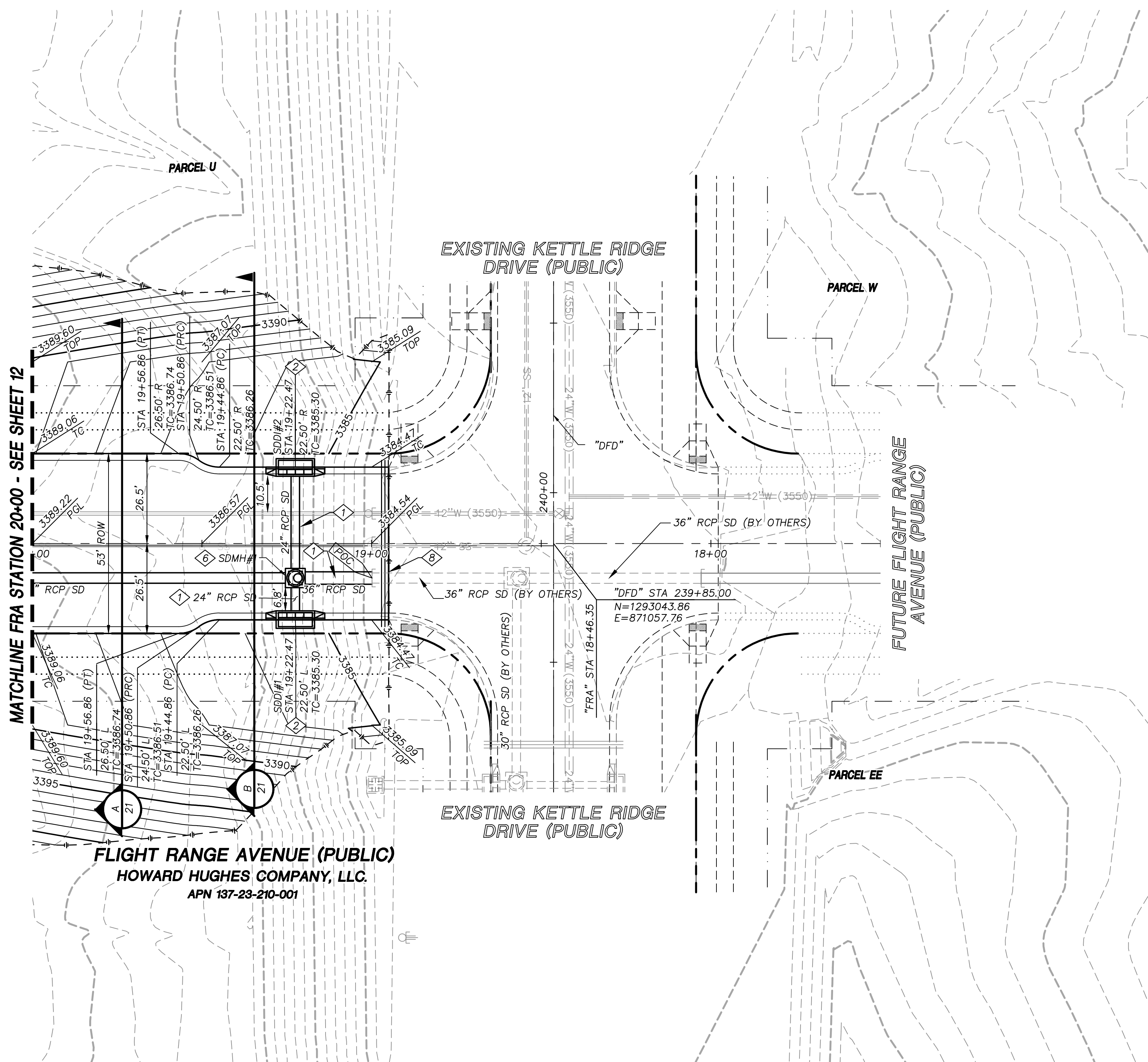
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DB NO. 100068107

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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.

CITY OF LAS VEGAS BENCHMARK: D368
(REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS
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SOUTH OF CHARLESTON BLVD. & WEST OF
DETENTION BASIN.
T21S,R59E,S03



Call before you Dig
AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.

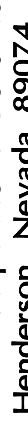
Call
811

OR
1-800-642-2444

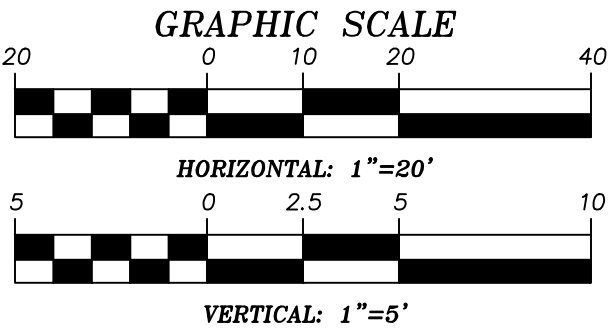
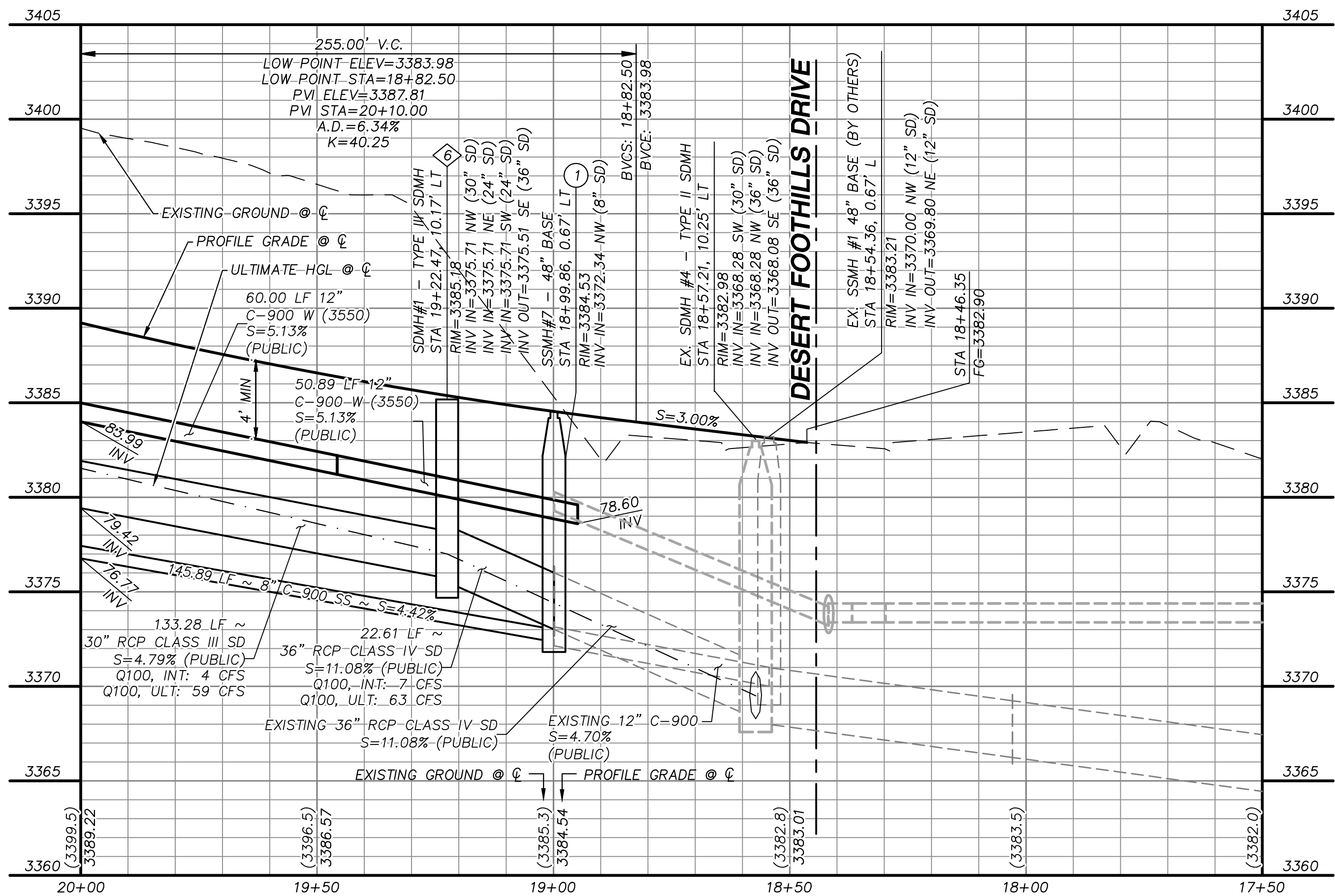
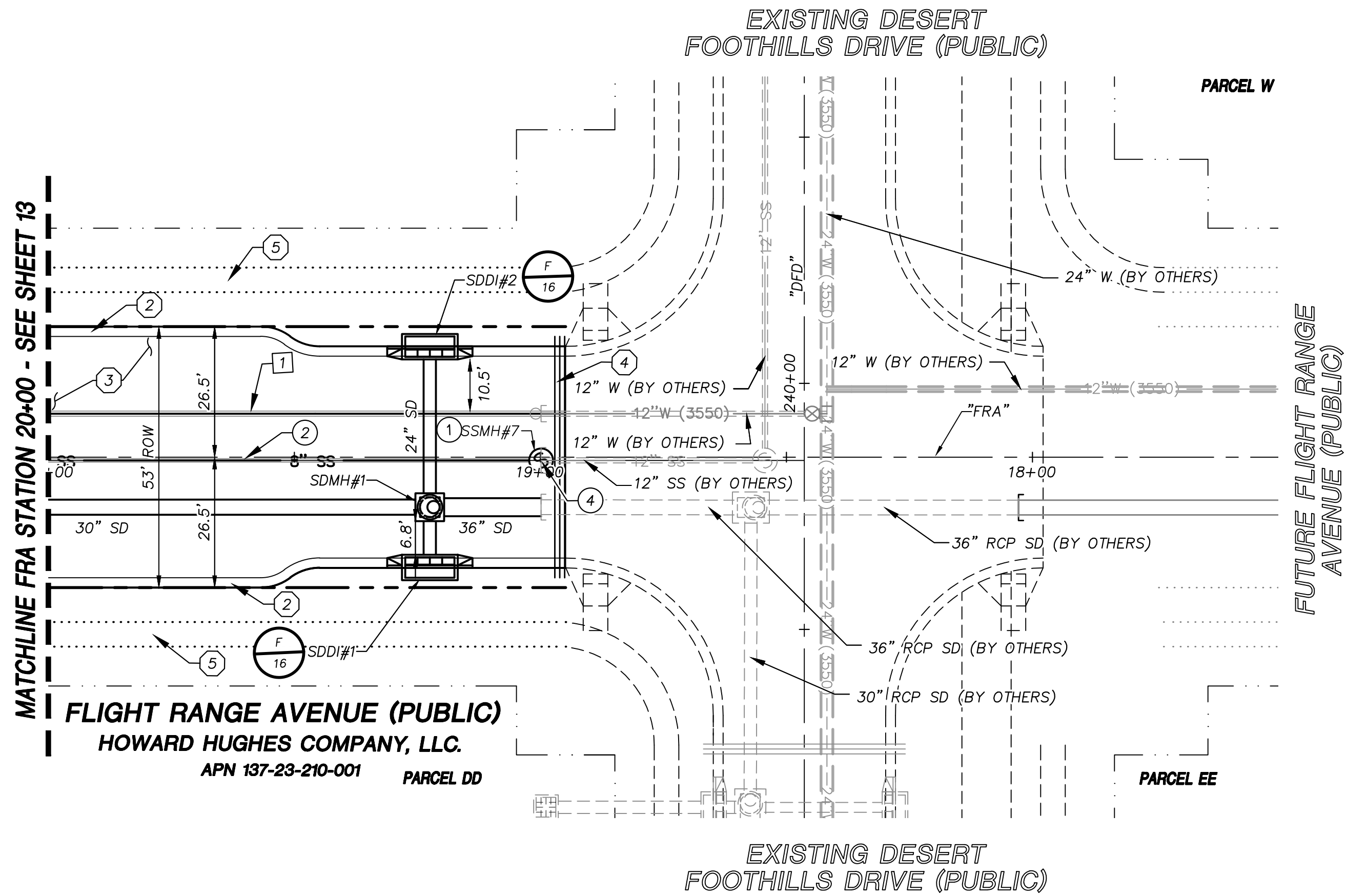


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NOT FOR CONSTRUCTION
TDS SUBMITTAL

DESIGNED BY: LAX-XXXXX		SUMMERLIN WEST VILLAGE 22 FLIGHT RANGE AVENUE (STREET E) DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J) ROADWAY GRADING PLAN STA BEGIN TO 20+00	 SUMMERLIN®	 2270 Corporate Circle Suite 200 Henderson, Nevada 89074 Telephone: +1702.263.7275 Fax: +1702.263.7200	REVISIONS				
DRAWN BY: L. MAMA CLAY	REV.				DESCRIPTION	BY	DATE	APPROVAL	
CHECKED BY: P. BATES									
DRAWING NO. 14 / 18									
HORIZ: 1"=20' VERT: NONE									

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APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. 0000 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

BASIS OF BEARING

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

BENCHMARK

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



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TDS SUBMITTAL**

STORM DRAIN CONSTRUCTION NOTES

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10. INSTALL RIP-RAP (D50=8", THICKNESS=24")

SEWER CONSTRUCTION NOTES

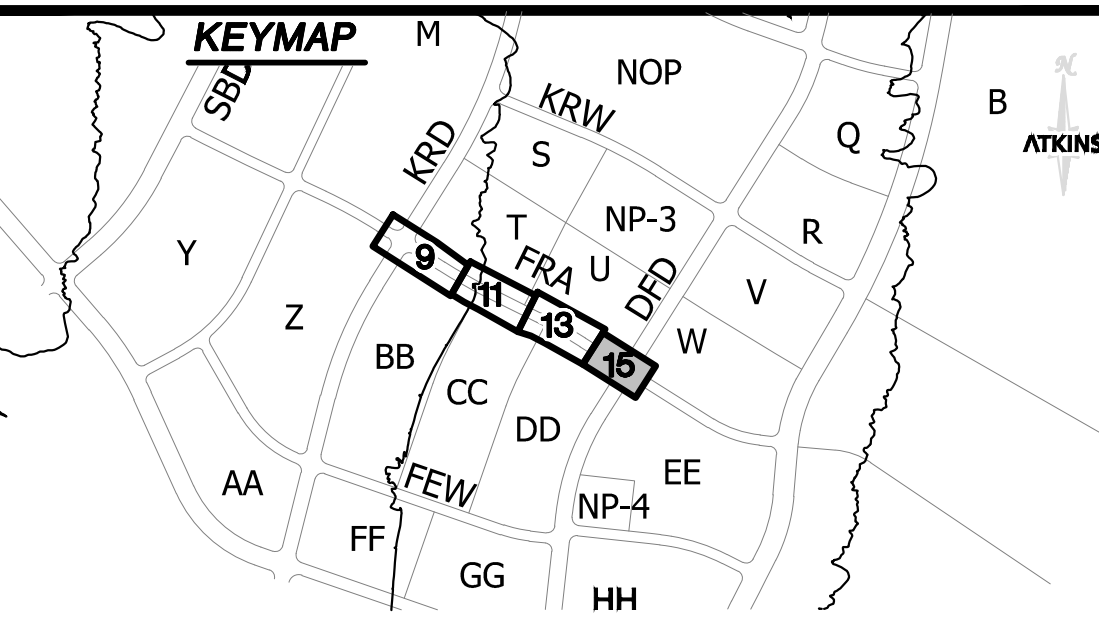
1. INSTALL SEWER MANHOLE PER DCSWCS SD-1, AND SD-4
2. INSTALL SEWER MAIN PER DCSWCS SD-17
3. STUB AND CAP SEWER PIPE. PLACE MARKER BALL AND 4"x4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).
4. REMOVE CAP AND CONNECT TO EXISTING SEWER STUB
5. ADJUST EXISTING MANHOLE TO GRADE PER DCSWCS SD-5.
6. PROTECT SEWER AT UTILITY CROSSING PER DCSWCS SD-19
7. SEWER MANHOLE BY OTHERS

WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN PER UDACS PLATES #17 AND PLATE #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL CROSS PER UDACS PLATE #31
4. INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
5. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
6. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
7. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
8. INSTALL DEFLECTION AT PIPE JOINTS (MAXIMUM OF 1")

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. FUTURE SIDEWALK BY OTHERS
5. CONSTRUCT CONCRETE SIDEWALK PER CCAUSD #234
6. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN R-5.2.1 (A=B=6.5').
7. CONSTRUCT 0" FLUSH CURB
8. TRANSITION CURB FROM FULL HEIGHT (6") TO FLUSH (0")
9. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 21 FOR TYPICAL PAVEMENT SECTION.
10. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL ON SHEET XX



REV.	DESCRIPTION	BY	DATE	APPROVAL

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

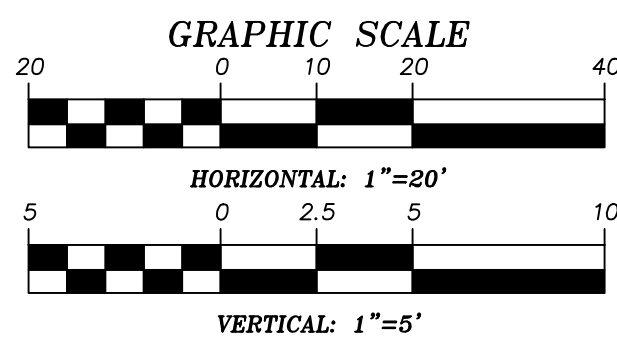
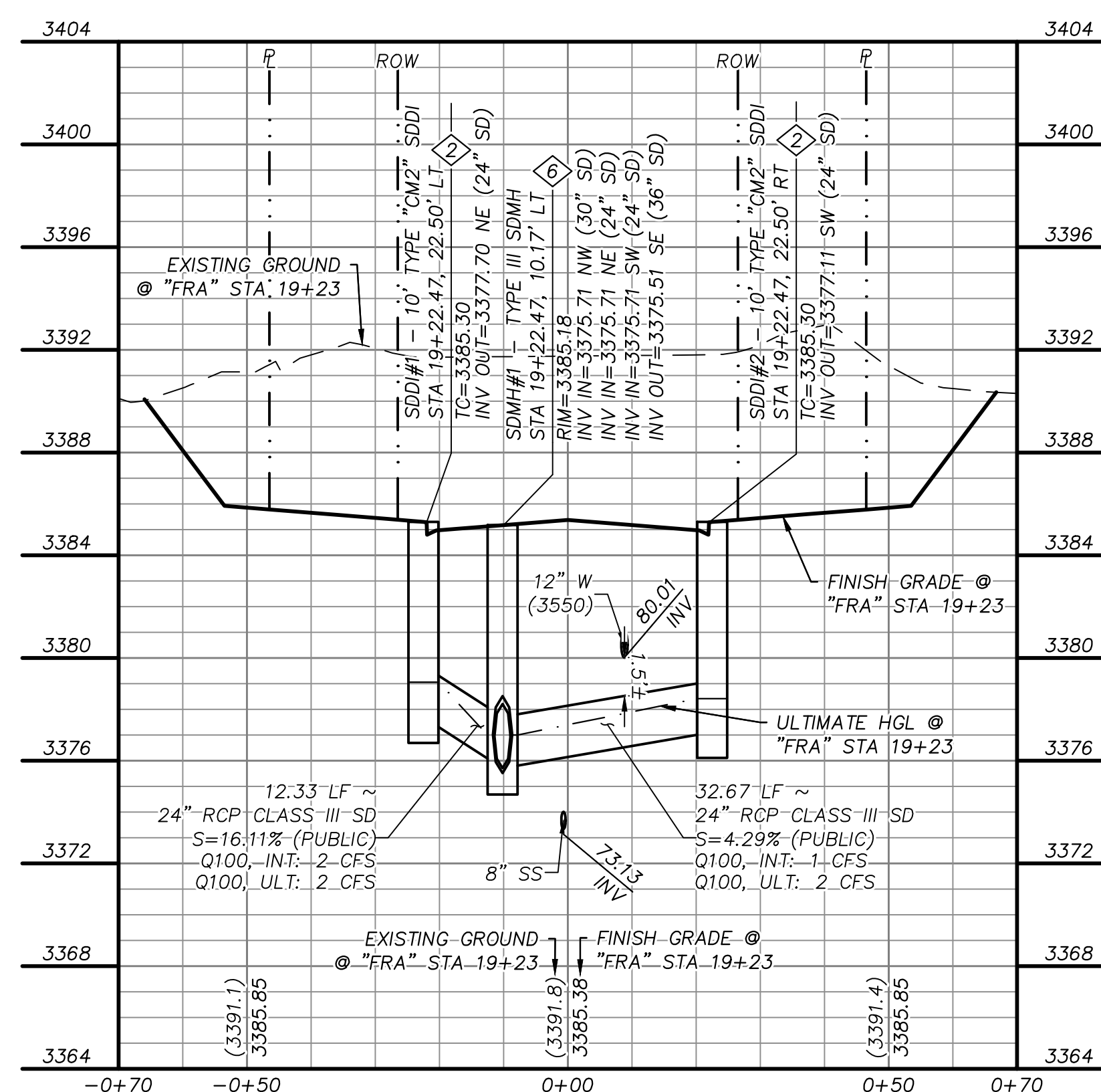
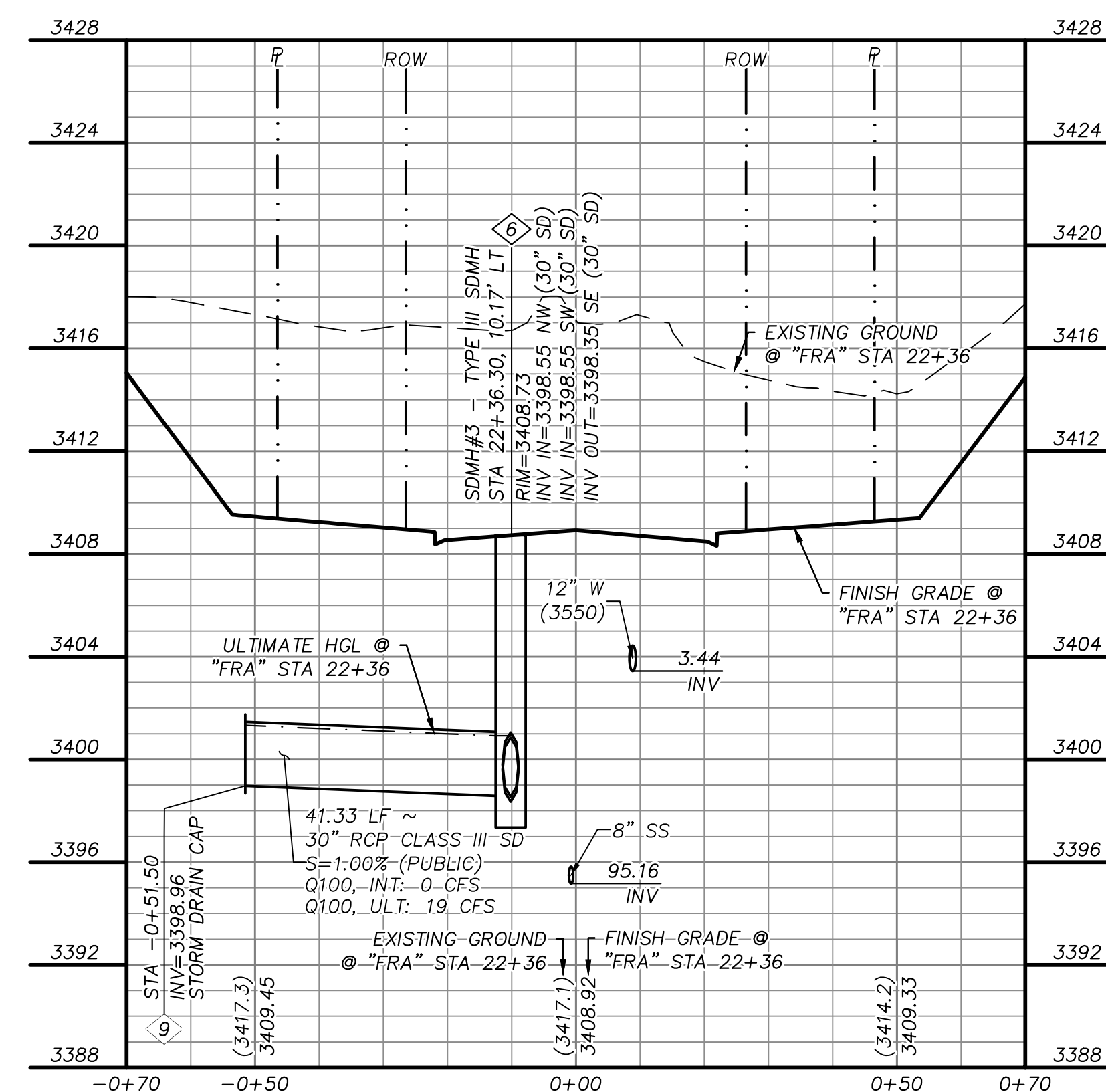
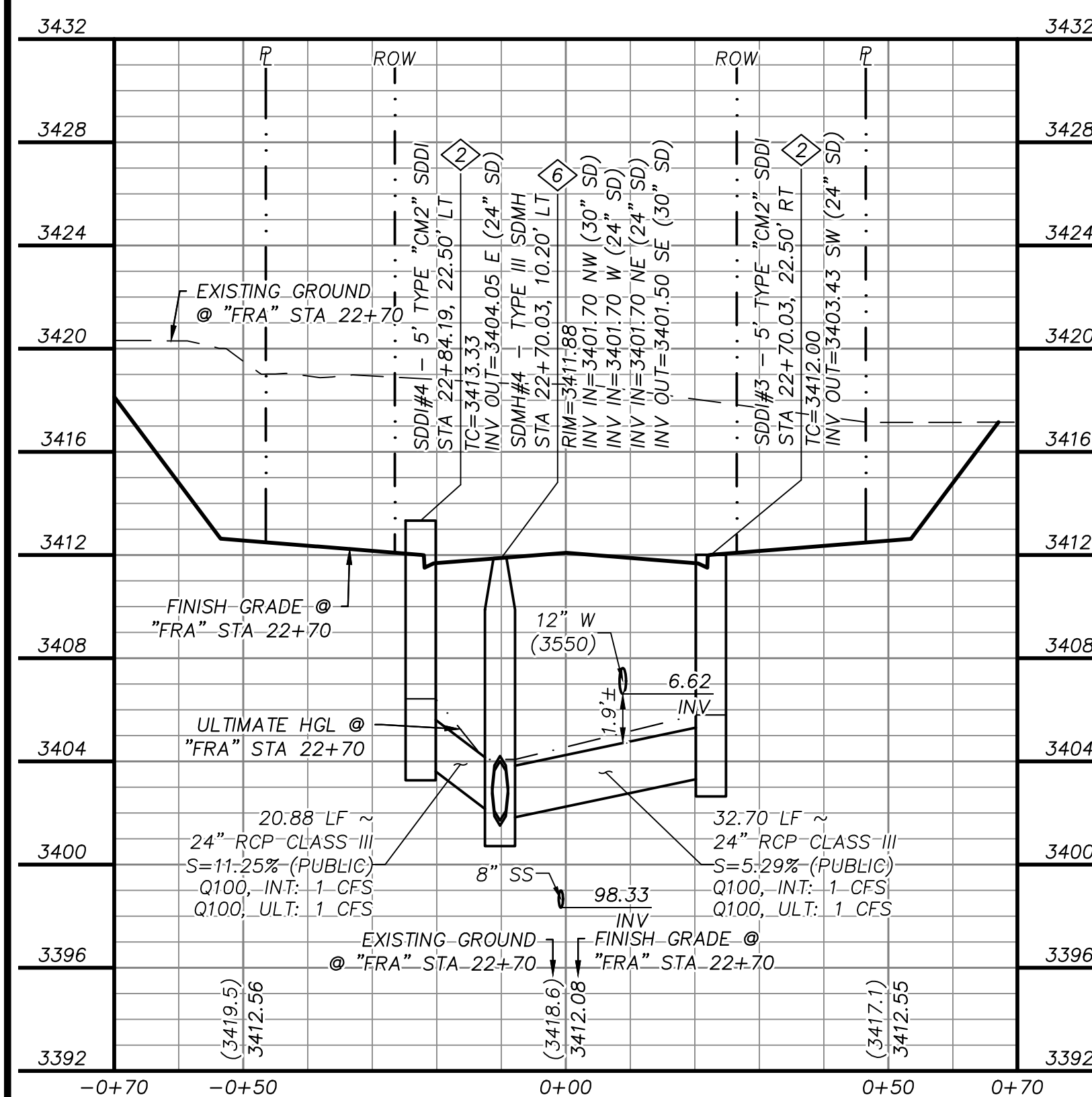
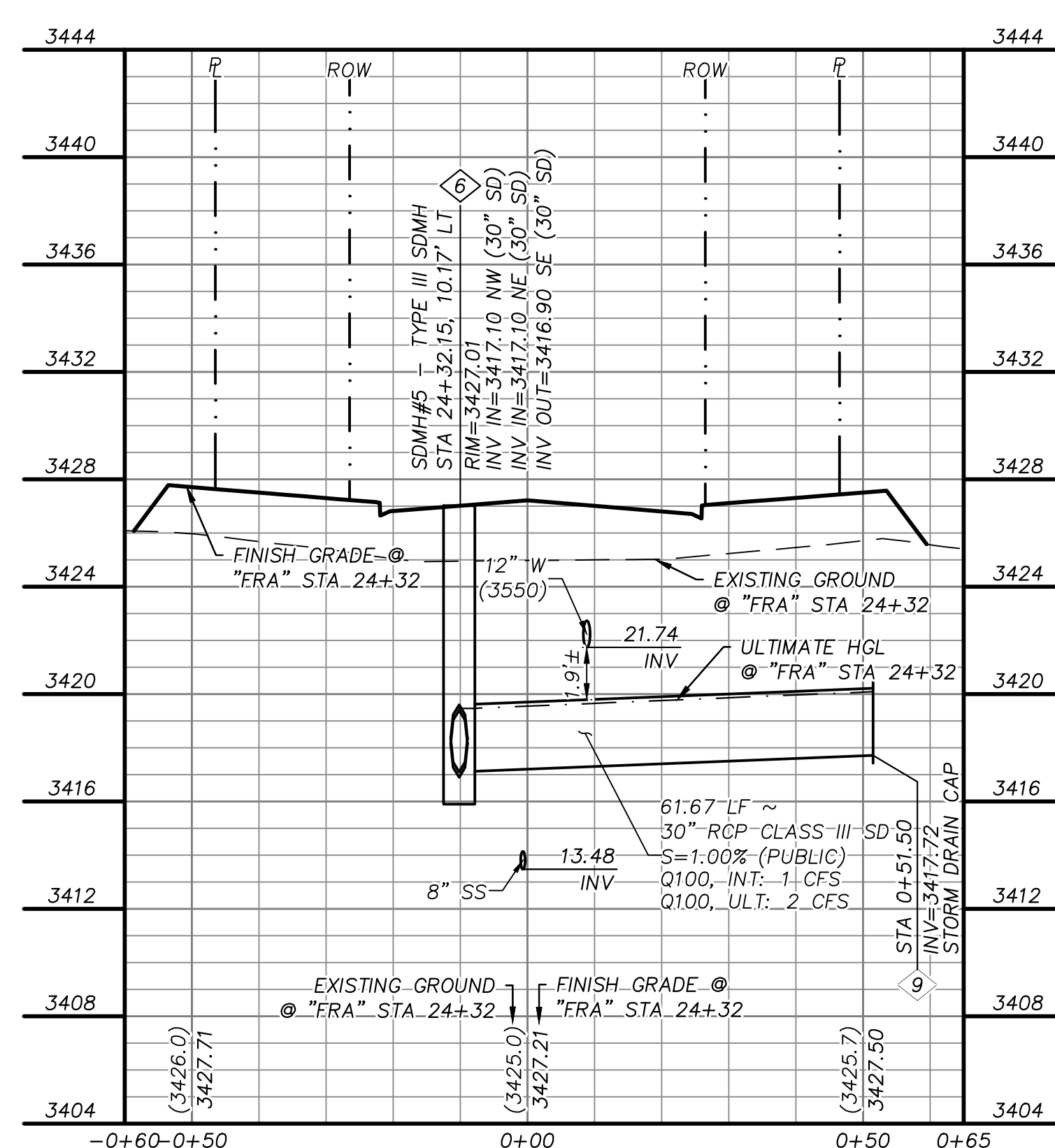
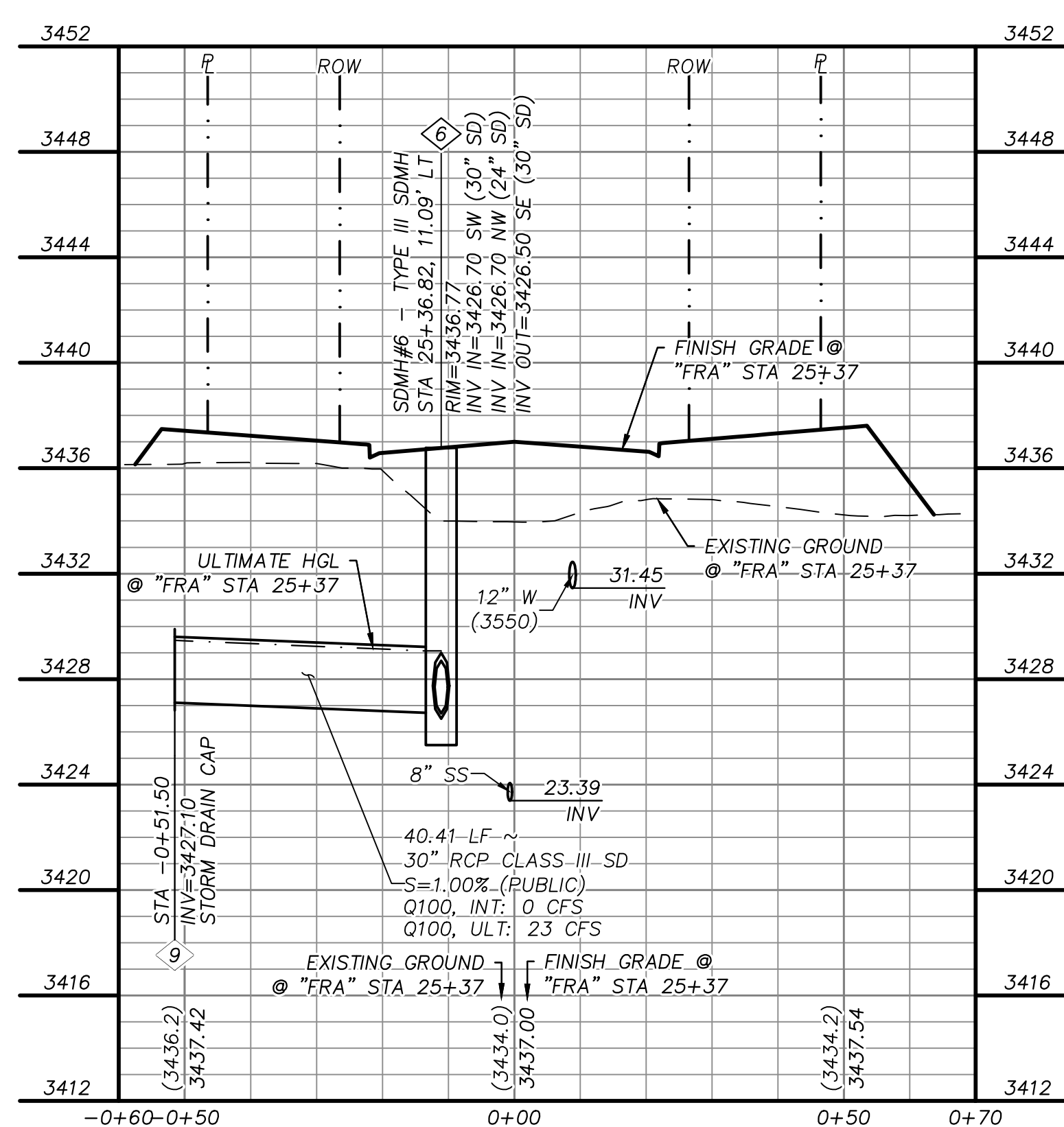
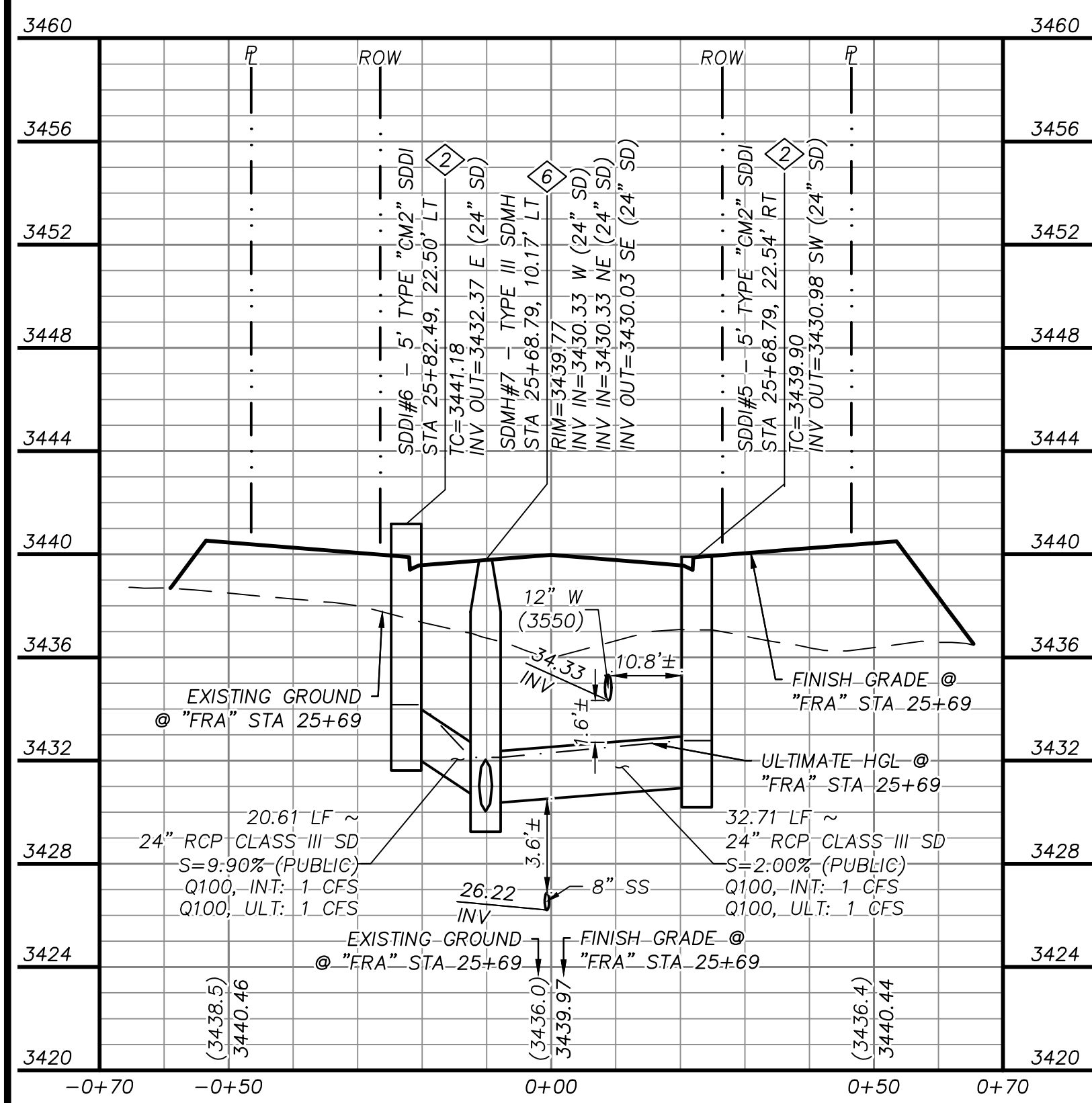
SUMMERLIN

SUMMERLIN WEST VILLAGE 22
FLIGHT RANGE AVENUE (STREET E)
DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)
ROADWAY PLAN AND PROFILE
STA. BEGIN TO 20+00

DESIGNED BY: N. BARCOS
DRAWN BY: L. MAMACLAY
CHECKED BY: P. BATELLE
DATE: JANUARY, 2021
HORIZ.: 1"=20'
VERT.: 1"=5'

XXXXXX
LXX-XXXX
DATE: JANUARY, 2021
DRAWING NO. 15 /18
JOB NO. 100068107

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APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. 0000 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

NIC BARCOS	PE#25673	DATE
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CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

BASIS OF BEARING

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

BENCHMARK

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



STORM DRAIN CONSTRUCTION NOTES

- 1 INSTALL STORM DRAIN. SEE SHEET ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
- 2 INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
- 3 INSTALL NDOT TYPE II DROP INLET PER NDOT R-4.2.1 (SEE SHEET 21)
- 4 INSTALL TYPE I SD MANHOLE PER CCAUSD #403
- 5 INSTALL TYPE II SD MANHOLE PER CCAUSD #405.2
- 6 INSTALL TYPE III SD MANHOLE PER CCAUSD #406
- 7 INSTALL TYPE "A" DROP INLET PER CCAUSD #411 & #421
- 8 REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
- 9 STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
- 10 INSTALL RIP-RAP (D50=8", THICKNESS=24")

SEWER CONSTRUCTION NOTES

- (1) INSTALL SEWER MANHOLE PER DCSWCS SD-1, AND SD-4
- (2) INSTALL SEWER MAIN PER DCSWCS SD-17
- (3) STUB AND CAP SEWER PIPE. PLACE MARKER BALL AND 4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRO BLOCK (1 CUBIC FT. MINIMUM).
- (4) REMOVE CAP AND CONNECT TO EXISTING SEWER STUB
- (5) ADJUST EXISTING MANHOLE TO GRADE PER DCSWCS SD-5.
- (6) PROTECT SEWER AT UTILITY CROSSING PER DCSWCS SD-15
- (7) SEWER MANHOLE BY OTHERS

WATERLINE CONSTRUCTION NOTES

- 1 INSTALL WATER MAIN PER UDACS PLATES #17 AND PLATE #19
- 2 INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
- 3 INSTALL CROSS PER UDACS PLATE #31
- 4 INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
- 5 INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
- 6 INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
- 7 REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
- 8 INSTALL DEFLECTION AT PIPE JOINTS (MAXIMUM OF 1")

ROADWAY CONSTRUCTION NOTES

- (1) SAWCUT AND MATCH EXISTING
- (2) CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
- (3) FUTURE SIDEWALK BY OTHERS
- (4) FUTURE SIDEWALK BY OTHERS
- (5) CONSTRUCT CONCRETE SIDEWALK PER CCAUSD #234
- (6) CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN R-5.2.1 (A=B=6.5').
- (7) CONSTRUCT 0" FLUSH CURB
- (8) TRANSITION CURB FROM FLAT HEIGHT (6") TO FLUSH (0")
- (9) CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 21 FOR TYPICAL PAVEMENT SECTION.
- (10) INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL ON SHEET XX

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

NOT FOR CONSTRUCTION
TDS SUBMITTAL

DESIGNED BY:
N. BARCOS
DRAWN BY:
L. MAMACLAY
CHECKED BY:
P. BATES
HORIZ.: 1"=20'
VERT.: 1"=5'

X			
XX			
	2021		

JANUARY, 1966 NO. 16 / 18

JOB NO. 10006810

REVISIONS

DESCRIPTION

REV.

BY	DATE	APPROVAL
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ATKINS

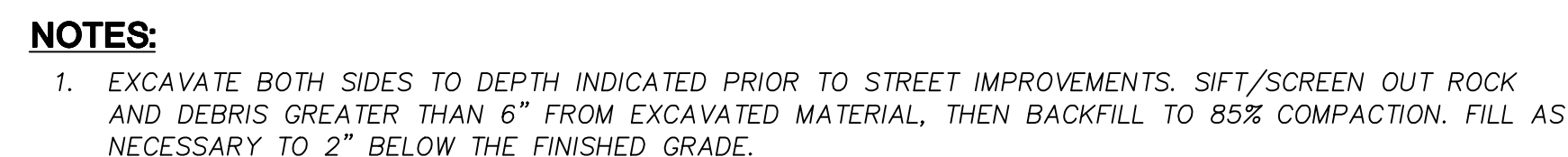


SUMMERLIN.

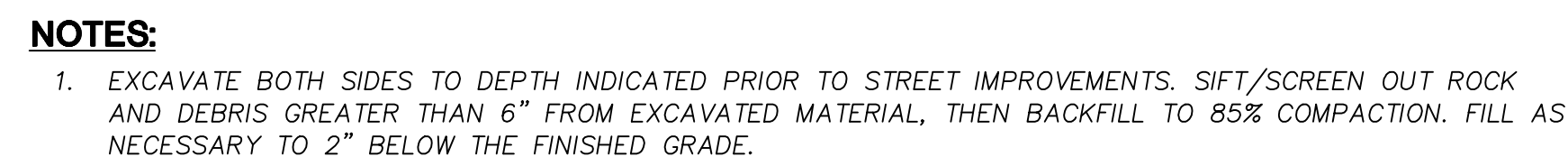
SUMMERLIN WEST VILLAGE 22
LIGHT RANGE AVENUE (STREET E)

STORM DRAIN / ATERRAS

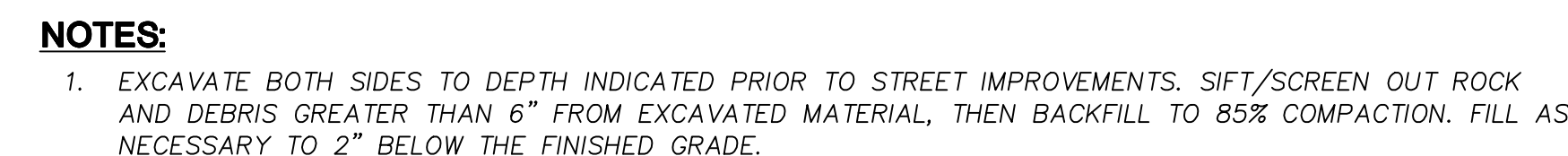
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FLIGHT RANGE AVENUE - TYPICAL SECTION WITH PARKING BOTH SIDES



FLIGHT RANGE AVENUE - TYPICAL SECTION WITHOUT PARKING

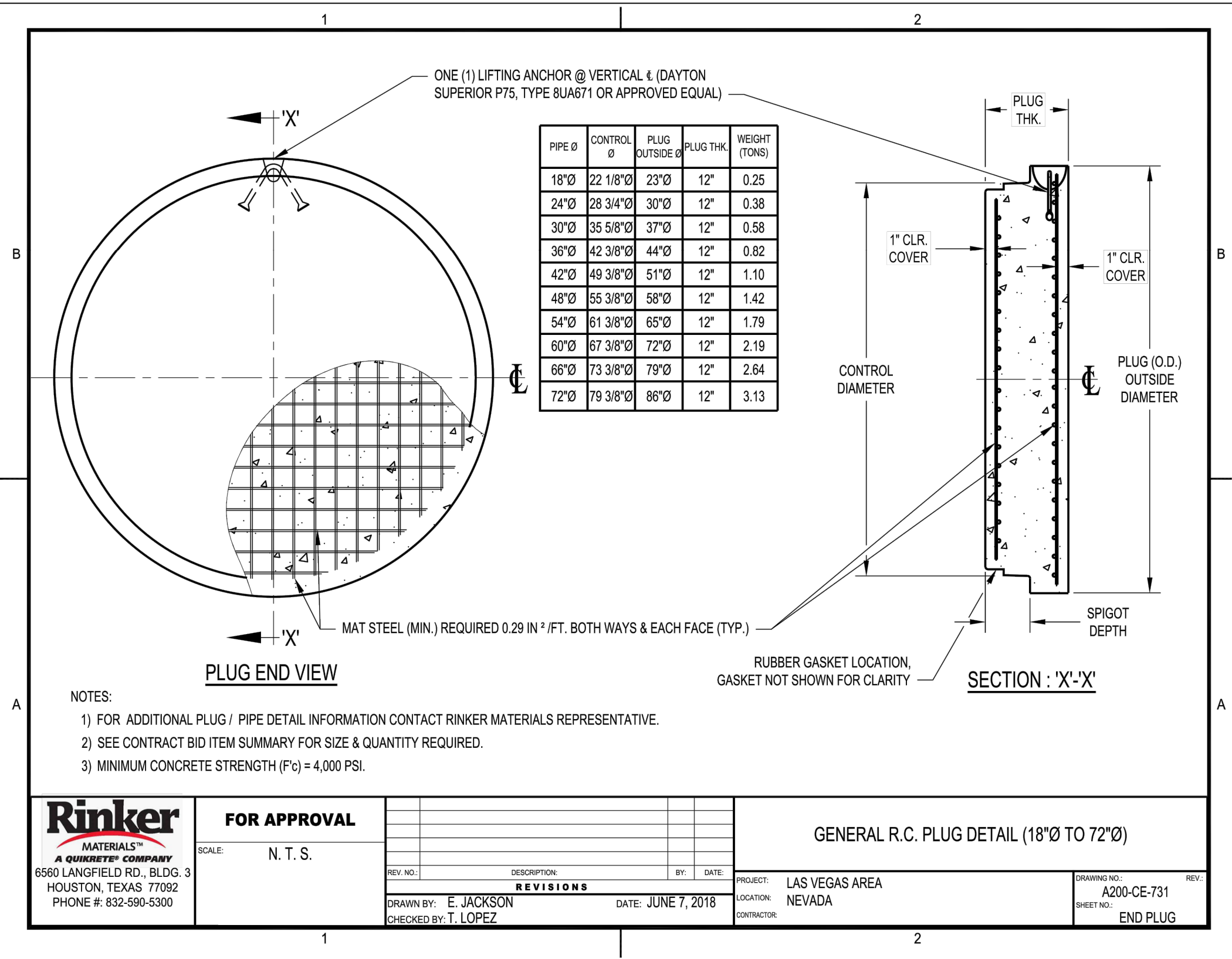


FLIGHT RANGE AVENUE - TYPICAL SECTION WITH PARKING ONE-SIDE PARKING

NOT FOR CONSTRUCTION
TDS SUBMITTAL

DESIGNED BY: LXX-XXXXX N. BARCOS DRAWN BY: MAMA MAMA CHECKED BY: P. BATES DATE: JANUARY, 2021 DRAWING NO.	SUMMERLIN WEST VILLAGE 22 FLIGHT RANGE AVENUE (STREET E) DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)	 SUMMERLIN®	 2270 Corporate Circle, Suite 200 Henderson, Nevada 89074 Telephone: +1702.263.7275 Fax: +1702.263.7200	REVISIONS <table border="1"> <thead> <tr> <th>REV.</th> <th>DESCRIPTION</th> <th>BY</th> <th>DATE</th> <th>APPROVAL</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	REV.	DESCRIPTION	BY	DATE	APPROVAL																																													
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JOB NO. 100068107	TYPICAL SECTIONS	21 / 18	HORIZ.: NONE VERT.: NONE																																																			

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TYPICAL STORM DRAIN CAP

N. T. S.

A
22

BASIS OF BEARING

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

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NOT FOR CONSTRUCTION
TDS SUBMITTAL

DESIGNED BY: N. BARCOS
DRAWN BY: L. MAMACLAY
CHECKED BY: L. MAMACLAY
DATE: JANUARY, 2021
DRAWING NO. 22/18
JOB NO. 100068107

SUMMERLIN WEST VILLAGE 22
FLIGHT RANGE AVENUE (STREET E)
DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J)

STORM DRAIN DETAILS



ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1702.263.7755
Fax: +1702.263.7200

REVISIONS

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