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Summerlin West Village 27

Technical Drainage Study for Park Drift Trail (Lake Mead Boulevard to Sunset Run Drive), Sunset Run Drive (Park Drift Trail to Lake Mead Boulevard) and Calico Bend Drive (Lake Mead Boulevard to Sunset)

Prepared for The Howard Hughes Company
September 2022

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Park Drift Trail, Sunset Run Drive and Calico Bend Drive Date: September 7, 2022

Location of Development: a) Descriptive (Cross Streets) North/South: _____

East/West: Calico Bend Drive/ Lake Mead Boulevard, Park Drift Trail/Lake Mead Boulevard, Sunset Run Drive/Lake Mead Boulevard

b) Section: 15 & 16 Township: 20S Range: 59E

c) APN : 137-22-101-005, 137-21-501-001 & 137-22-301-005

Name of Owner: Howard Hughes Company, LLC

Telephone No.: (702) 791-4201 Fax No.: (702) 791-4450 E-Mail Address: april.chapman@howardhughes.com

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

Contact Person-Name: Vance Skidmore, PE **Telephone No.:** (702) 551-0309

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

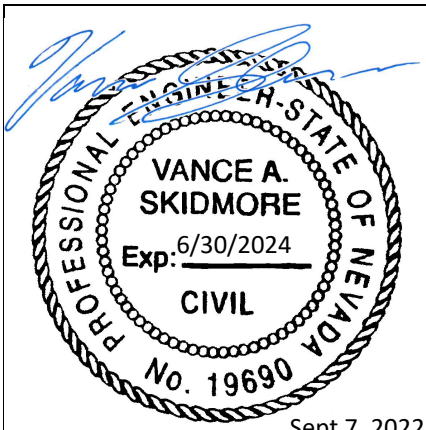
Firm: Atkins

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

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: +/- 518 acres Being Developed/Disturbed: 70 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: None
6. Has the site drainage been evaluated in the past? ✔ **YES** **NO** If yes, please identify documentation: Master Drainage Study for Tributary Area of the Grand Park Detention Basin Summerlin West Villages 27/30A/30
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Grand Park Detention Basin
8. Briefly describe your proposed schedule for the subject project: ASAP



Sept 7, 2022

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.**

Vance Skidmore Digitally signed by Vance Skidmore Date: 2022.09.07 16:51:18 -07'00'

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Park Drift Trail, Sunset Run Drive and Calico Bend Drive	Map ID:
Firm Name: Atkins	Engineer: Vance Skidmore
Address: 2270 Corporate Circle, Ste 200 City: Henderson	State: NV Zip: 89074
Phone Number: (702) 551-0309	Fax Number: (702) 263-7200
Property Owner: Howard Hughes Company, LLC	
Address: 10845 Griffith Peak Drive, Suite 160 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**

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

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

III. DRAINAGE PLAN

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

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
X		Streets with off-set crowns.
X		Proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns and slopes.
X		Property lines.
X		Right-of-way lines and widths, existing and proposed.
X		Existing improvements and their elevations.
X		Delineation of proposed on-site drainage basins indicating area and 10-year and 100-year storm peak flows at basin concentration points.
X		Concentration points and drainage flow direction with Q_{100} and V_{100} and D_{100} in streets.
X		Cumulative flows, velocity, and direction of flow at upstream and downstream ends of site for the 10-year and 100-year flows.
X		Location and cross-section of street capacity calculations.
X		Cross-sectional detail for channels, including cutoff wall locations.
X		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.
X		Existing and proposed drainage easements and widths shown with sufficient detail. A cross sectional detail must be provided that shows appropriate lining and reinforcement.
	N/A	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.
X		Location and detail of flood walls illustrating depth of flow, proposed grouting height, etc.
X		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.
X		Building and/or lot numbers.
X		Alignment of all existing, proposed, or future Regional Facilities adjacent to the site.
X		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**

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
X		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.
X		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.
X		Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.
X		Location and detail of best management practice (BMP) for parking lots and low impact development (LID) (if required).

IV. HYDROLOGIC ANALYSIS

Yes	No	
X		Appropriate soil information and Soils Map for existing and future conditions with subbasins and property delineated.
X		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.
X		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.
X		Use of correct precipitation values in and around the McCarran Airport rainfall area.
X		A discussion in the text of the hydrologic analysis justifying subbasin boundaries and cutoffs, supporting assumptions, and calculations.
X		A summary table of stormwater flows showing basin area, Q_{10} and Q_{100} for both individual basins and combined basin flows, where applicable.
X		Copies of supporting technical information referenced from a previously approved study and a statement accepting these results.
X		On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners in accordance with current Nevada Drainage Law.
	N/A	Calculation for impervious area for parking lots and LIDs (if required).

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes	No	
	N/A	Flow split calculations and supporting documentation or reference for the method of flow split calculations used.
X		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 x v $\leq$ 8. Q_{10} d x v $\leq$ 6 and 12 foot dry lane for rights-of-way $\geq$ 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan.
X		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.
	N/A	Appropriate hydraulic calculations for block wall openings assuming a 50 percent vertical clogging factor. (Assume the lower half of the opening is plugged.)
	N/A	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.
	N/A	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.
	N/A	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.
X		Provide a 50 percent clogging factor in the capacity calculation for drop inlets.
X		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.
X		The mitigation of nuisance water, both during construction and in the fully developed condition, must be addressed.
	N/A	Provide BMP type, size and supporting calculations for parking lots and LIDs (if required).

REFERENCE:	**STANDARD FORM 2**

CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA
STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 5/18/11)

The following checklist is intended as a supplemental guide for the engineer preparing a Technical Drainage Study submittal to the City of Las Vegas. This supplement focuses on requirements specific to the City of Las Vegas. The requirements presented are in addition to the Clark County Regional Flood Control District (CCRFCD) Manual Standard Form 2. The listed items are the minimum information required prior to the City performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the CCRFCD Hydrologic Criteria and Drainage Design Manual (Design Manual).

An appointment must be made to preview this checklist in conjunction with CCRFCD Standard Form 2 prior to the City accepting a new drainage study for review. The engineer must contact the Flood Control Section at (702) 229-6541 to schedule a submittal appointment.

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

I. GENERAL REQUIREMENT		
Yes	No	
	N/A	A notarized letter from the adjacent property owner(s) allowing off-site grading. (A copy of the letter must be received prior to final acceptance of the drainage study.)
X		Copies of all conditions of approval for development related to this property. (e.g. zoning, use permit, tentative map, etc.) Verify compliance with conditions.
X		An electronic copy of the complete submittal is required to be submitted with one original hard copy of the study. Electronic documents should be on a universal computer-readable digital output device replicating your submittal. An Indexed Portable Document Format (PDF) or Print Ready CAD file formats with a minimum of 300dpi are the desired formats. If figures are in color, they must be scanned in color and saved as a separate file. VS_____ by initial here, the engineer on record acknowledges that the electronic copy is an identical replicate of the original hard copy submitted to the City of Las Vegas.

II. GRADING PLAN INFORMATION		
Yes	No	
X		(1) 24" X 36" copy of the Grading Plan, (including all Detail Sheets) sealed by the engineer.
X		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. Note: Proposed top of curb elevations must be provided for both sides of roadways even if only half street construction is required.
X		Label existing topography at a minimum 5 foot elevation interval including adjacent developments, finished floor elevations of existing buildings and top of existing curbs extending 100 feet* around the perimeter of the site. (*Measured from the centerline of the adjacent roadway.)

II. GRADING PLAN INFORMATION		
Yes	No	
X		Proposed on-site and off-site storm drains and other flood control facilities with plan and profile sheets for public storm drains showing the class of pipe, (Class III, IV, V, etc.), design hydraulic grade line, (HGL) and 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying off-site flows. An overflow path must be provided over all storm drains.
X		All existing and "to be constructed" walls with cross-sections showing wall type, (e.g. block wall, retaining wall, flood wall, etc.), with limits clearly defined, adjacent ground elevations. Wall heights must meet current ordinances and in no case exceed 14 feet above the adjacent property.
X		Street slopes for both interior and perimeter streets. Note: The minimum slope for a roadway is 0.4 percent, a minimum 18-inch storm drain must be provided where minimum slopes cannot be met.
	N/A	Back of lot elevations and lot drainage pattern for all lots including common lots.
	N/A	Sites with a grade difference two feet above or below existing ground are required to have approval from City of Las Vegas Current Planning. Current Planning approval is required prior to final approval of the drainage study.
X		On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners. (The project must pass flows through the site every 600 feet where the project is blocking flow paths.)
X		This project uses a solid grouted stem wall (or approved alternate) at the back of sidewalk to provide erosion protection for landscaped areas where the depth of flow in the roadway exceeds the back of walk elevation. A corresponding cross-section detail is included.
X		Commercial and Common Lot Landscape areas are not allowed to drain over the sidewalk. The grading plans show flow lines with grades and sidewalk under drains for all landscape areas draining to the public ROW.

III. Local Entity Criteria - City of Las Vegas – Manual Section 1600		
Yes	No	
	N/A	Concrete valley gutters are required in parking lots with slopes less than 1 percent. Slopes through cul-de-sac must be at a 1 percent minimum where flow is drained through the cul-de-sac.
X		Ten-foot wide public drainage easements to be privately maintained are allowed for flow less than 20 cfs. The depth of flow entering the easement must be checked using the submerged weir calculation.
X		The limits of the flood zones and the base flood elevations (BFE) must be shown on all grading plans for all developments within a Special Flood Hazard Zone A, AO, AE, etc.
	N/A	Minimum finish floor elevation is 6 inches above highest adjacent top of curb. Finish floor calculations must include allowances for super elevations on curves and velocity head for tee intersections.
	N/A	Finished floor elevations for buildings adjacent to public drainage easements must be a minimum of 18 inches above the Q100 weir of submerged weir elevation, whichever is greater.

III. Local Entity Criteria - City of Las Vegas – Manual Section 1600		
Yes	No	
	N/A	Lots with “B and C Type Drainage” that drain from one lot to another through a drainage easement shall be required to install an underground nuisance drainage system or a 2-foot valley gutter. 16” x 24” minimum block wall openings are required for both options.
	N/A	Bubblers are required across 80 foot and greater ROW streets. When flows exceed 10 cfs, bubblers larger than 18 inches will be required up to a maximum of 36”. Inlets must be sized to match the pipe size provided.

- Contact the Flood Control Section regarding the drainage study review fee. These fees are payable at the time of submittal.
- The Drainage Study must be conditionally approved prior to submitting improvement plans to the Civil and Planning Development of the Department of Building and Safety for review.

This document is intended as an **aid** in preparing Technical Drainage Studies for the City of Las Vegas. 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.

Summerlin West Village 27

Technical Drainage Study for Park Drift Trail (Lake Mead Boulevard to Sunset Run Drive), Sunset Run Drive (Park Drift Trail to Lake Mead Boulevard) and Calico Bend Drive (Lake Mead Boulevard to Sunset Run Drive)

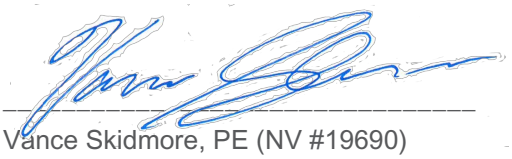
Prepared for Howard Hughes Company, LLC

September 2022

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 Village 27 - Park Drift Trail (Lake Mead Boulevard to Sunset Run Drive), Sunset Run Drive (Park Drift Trail to Lake Mead Boulevard) and Calico Bend Drive (Lake Mead Boulevard to Sunset Run Drive)** electronic submittal match the paper version bound into the study.



Vance Skidmore, PE (NV #19690)

Senior Engineer

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Appendix A. References
A.1. Master Drainage Study for Tributary Area of the Grand Park Detention Basin. Summerlin West Villages 27/30A/30 DS#5388
A.2. Summerlin West Grand Park Detention Basin – Inlet Pipe DS#5226
A.3. Village 25 Lake Mead Boulevard Improvements (Sunset Run Drive to Park Drift Trail) Update #2 DS#5423
A.4. Master Conceptual Drainage Study for Summerlin West Village 22 DS#5005
A.5. Village 27 Rough Grade Package DS#5464
A.6. Village 27 Lake Mead Boulevard (Scurry Bend Drive to Sunset Run Drive) DS#5488
A.7. Village 27 Lake Mead Boulevard (Park Drift Trail to Mountain Run Drive) DS#5455

Appendix B. Hydrology Appendix
B.1. Landuse, Soil and Rainfall Maps
B.2. Parameters
B.3. HEC-1 Model

Appendix C. Hydraulics Appendix
C.1. Interim and Ultimate Drop Inlet Calculations
C.2. Interim and Ultimate Normal Depth Calculations
C.3. Interim and Ultimate Condition WSPG-W Model

Appendix D. Proposed Improvement Plans

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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 Technical Drainage Study for Village 27 - Park Drift Trail (Lake Mead Boulevard to Sunset Run Drive), Sunset Run Drive (Park Drift Trail to Lake Mead Boulevard) and Calico Bend Drive (Lake Mead Boulevard to Sunset Run Drive) roadway improvements of the Summerlin West Village 27 development. Summerlin West Village 27 is located in northwest Las Vegas west of the CC-215 beltway and is bounded by Lake Mead Boulevard, to the south, and the Summerlin West Planning Area boundary, to the north. A vicinity map is provided in Figure 1. Park Drift Trail is located between Sunset Run Drive and Lake Mead Boulevard, Sunset Run Drive is located between Park Drift Trail and Lake Mead Boulevard and Calico Bend Drive is located between Sunset Run Drive and Lake Mead Boulevard as shown on the location map on Figure 2.

Two Master Drainage Studies are referenced in this TDS. The first is the Master Drainage Study for Summerlin West Villages 27, 30A and 31 for Tributary Area to the Grand Park Detention Basin (GPDB-MDS) (Update #1 Addendum #1) which was approved on January 31, 2022 (DS#5388). The second is the Summerlin West Village 22 Master Conceptual Drainage Study (V22-MCDS) (Update #2), approved on January 23, 2020 (DS#5005).

Portions of this TDS, such as parcel names, rainfall depths, facility locations and ultimate flows are directly referenced from the Master Drainage Studies.

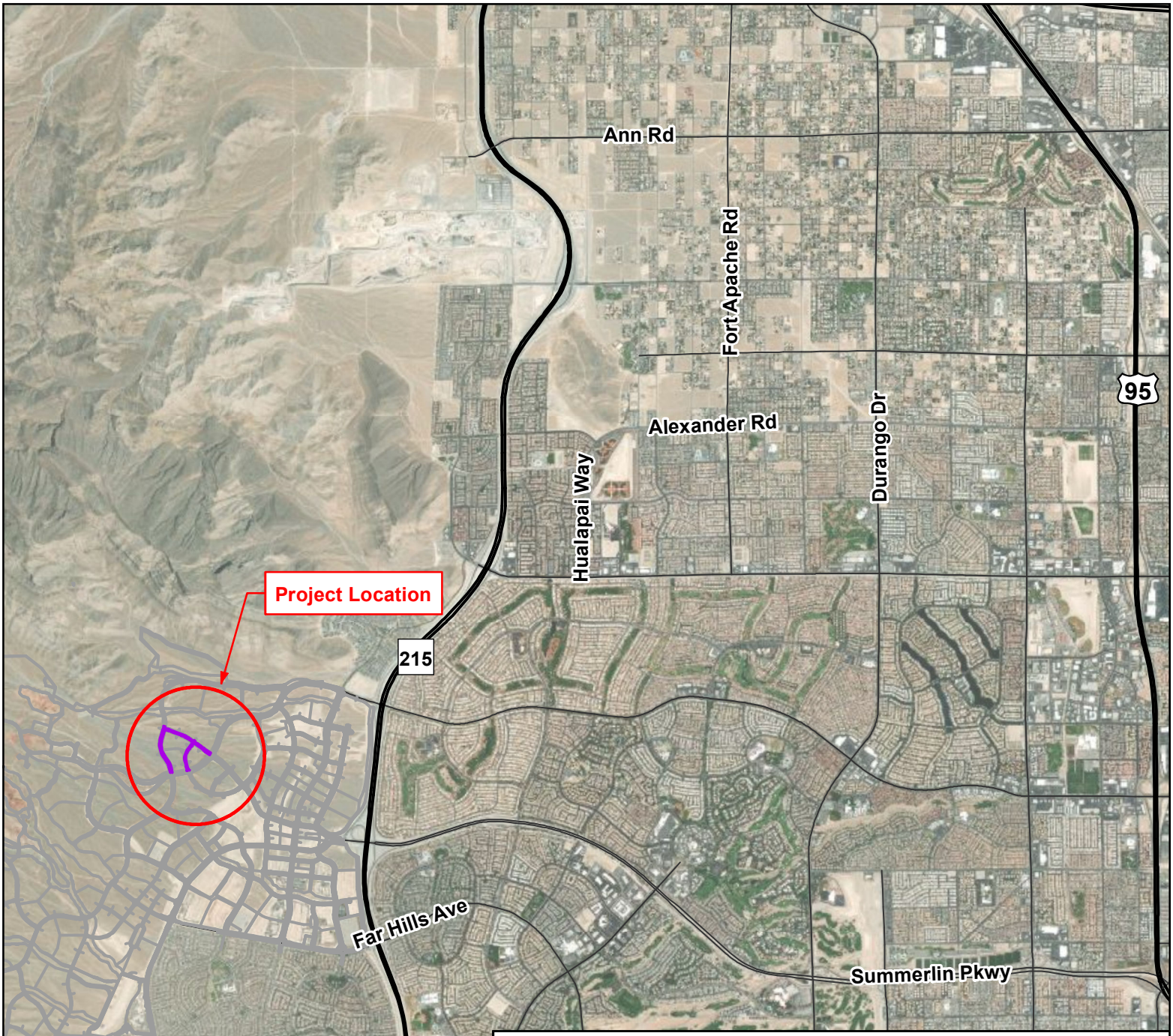

Figure 1 - Vicinity Map

Summerlin West Village 27
Park Drift Trl (Lake Mead Blvd to Sunset Run Dr)
Sunset Run Dr (Park Drift Trl to Lake Mead Blvd)
Calico Bend Dr (Lake Mead Blvd to Sunset Run Dr)

Legend

- Proposed Roadway
- Major Street
- Highway / Interstate

N
W E
S

1 0.5 0 1 Miles

1 in = 1 miles

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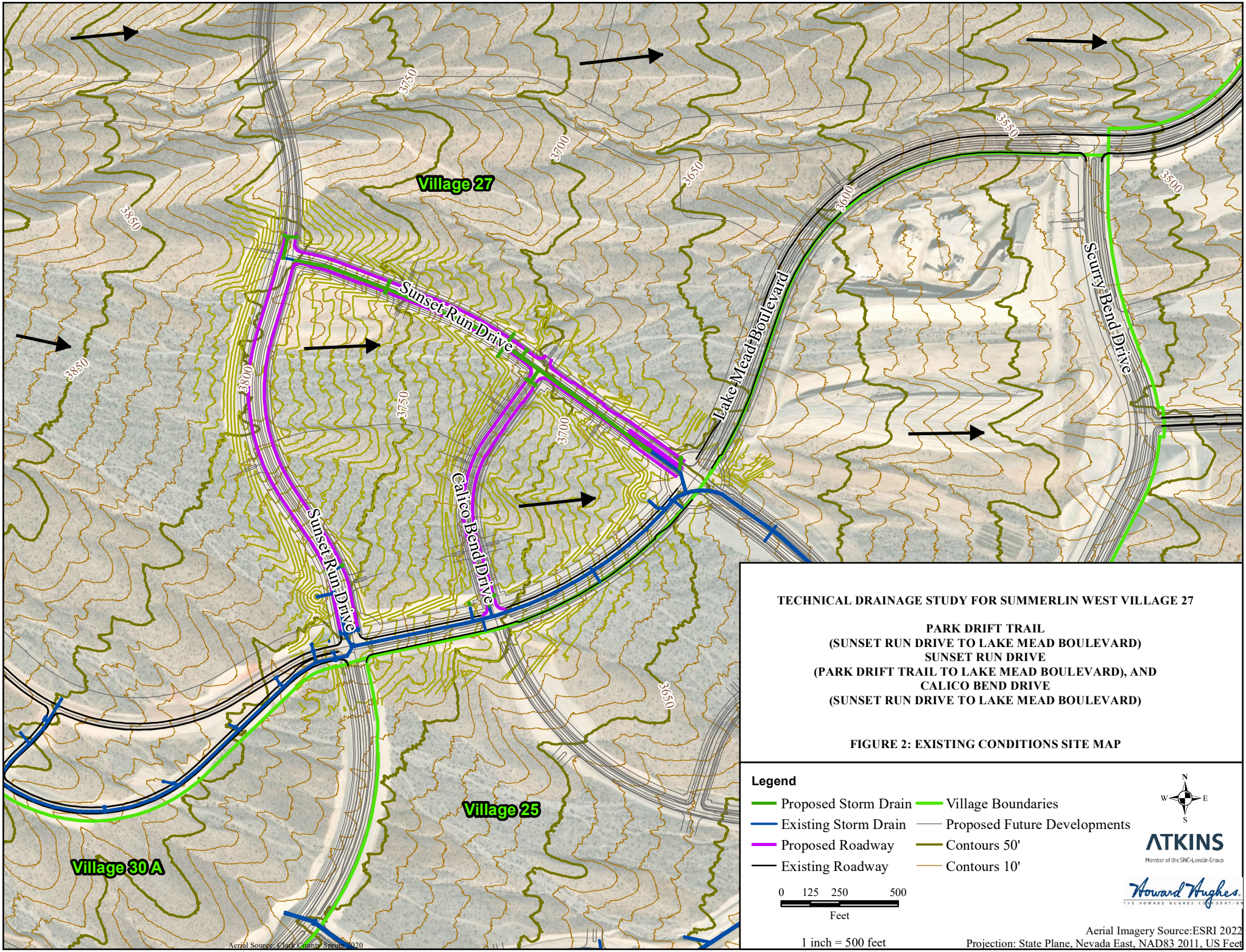
Aerial Source: ESRI, 2022



TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 27

PARK DRIFT TRAIL
(SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)
SUNSET RUN DRIVE
(PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND
CALICO BEND DRIVE
(SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

FIGURE 2: EXISTING CONDITIONS SITE MAP

Legend

- Proposed Storm Drain
- Existing Storm Drain
- Proposed Roadway
- Existing Roadway
- Village Boundaries
- Proposed Future Developments
- Contours 50'
- Contours 10'

0 125 250 500
Feet

1 inch = 500 feet

N W E S

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Aerial Imagery Source:ESRI 2022
Projection: State Plane, Nevada East, NAD83 2011, US Feet

1. Hydrologic Analysis

1.1. Existing Condition

The existing site condition has been rough graded per Village 27 Rough Grade Package (DS#5464). The proposed roadways tie into the existing roads, Park Drift Trail and Lake Mead Boulevard. **Figure 2** shows the existing condition for the site., The allowable discharge flow rates for the project have been established in the 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

In the interim condition the parcels adjacent to the roadway will not be developed. As a result, an interim condition exists for the proposed improvements. Refer to **Figure 3** for the interim condition Hydrology Workmap. The interim subbasins were modeled using HEC-1. The results are summarized in **Table 1** and in **Figure 3**.

Table 1 – Interim Condition HEC-1 Model Results

HEC-1 Node	Type	Tributary Area (sq mi)	DARF	100-Year Discharge (cfs)
ST13A	Sub	0.0017	0.99	4
ST13B	Sub	0.0043	0.99	11
INT-I	Sub	0.0188	0.99	22
ST16	CP	0.0021	0.99	5
CP1	Sub	0.0300	0.99	43
ST13C	Sub	0.0033	0.99	9
CP2	CP	0.0300	0.99	52
ST14	Sub	0.0082	0.99	19
INT-K	Sub	0.0173	0.99	23
ST17	Sub	0.0017	0.99	4

Type: Sub = Subbasin. CP = Concentration Point

1.3. Ultimate Condition

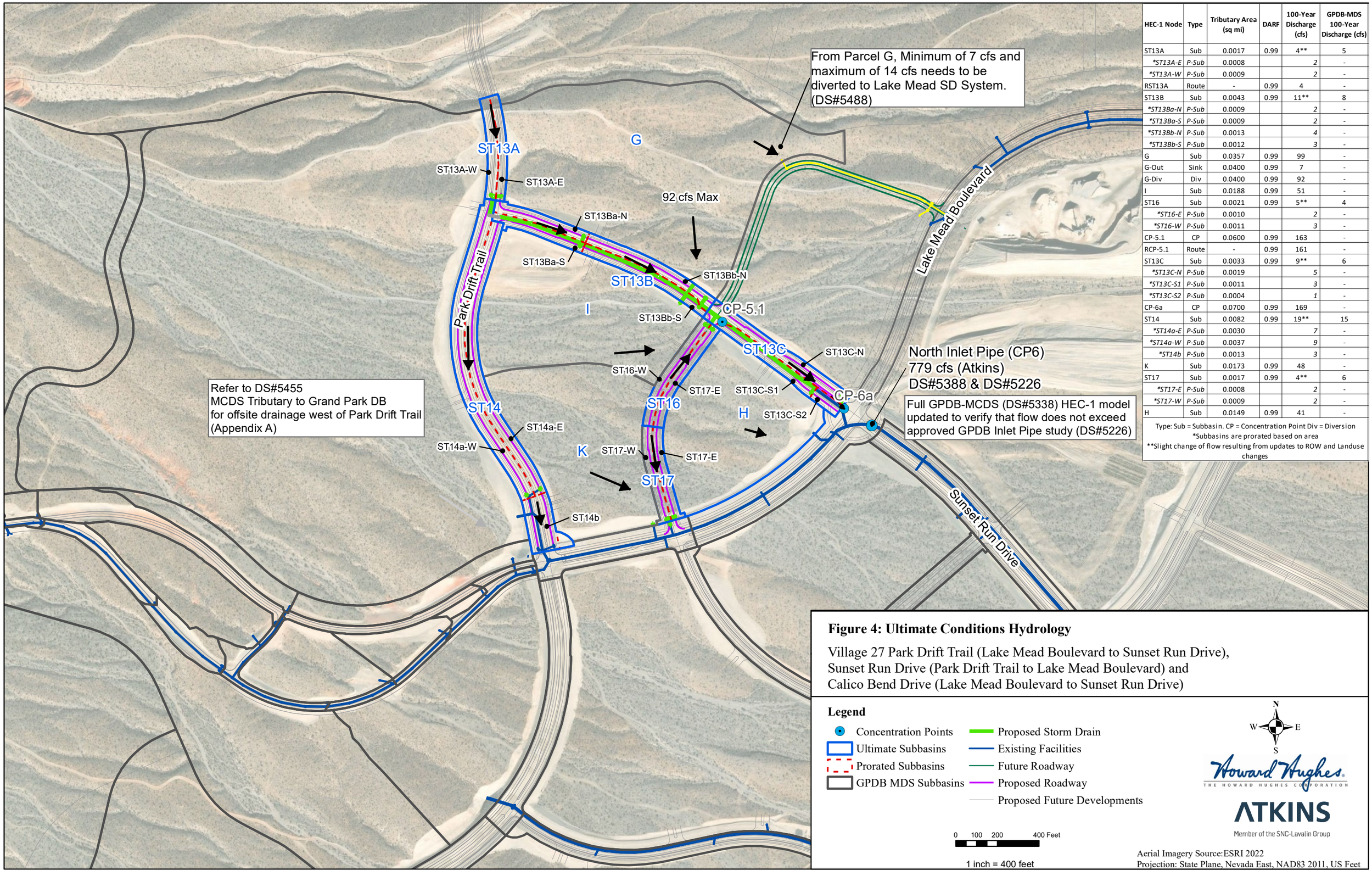
The ultimate condition flows are calculated using ultimate development plan for the parcels. The flows in parcels G, H, I and K remain the same as in the approved GPDB-MDS. The flows from the roadway subbasins ST13B, ST13C, and ST14 have increased slightly due to modification of the ROW widths. Subbasins ST13A, ST16 and ST17 have been re-delineated due to profile changes of the roadway. These changes in the ultimate hydrology calculations now supersede the GPDB-MDS. However, the downstream flow rates are still all within the allowable limits established by the GPDB-MDS and V22-MCDS Update #3. The full GPDB-MDS HEC-1 model has been updated with the aforementioned changes and is included with the hydrology calculations in Appendix B.

A summary of the Ultimate condition hydrology is provided in **Table 2** and **Figure 4**. All additional hydrology calculations and references can be found in Appendix B.

Table 2 – Ultimate Condition Model Results

HEC-1 Node	Type	Tributary Area (sq mi)	DARF	100-Year Discharge (cfs)	GPDB-MDS 100-Year Discharge (cfs)
ST13A	Sub	0.0017	0.99	4*	5
RST13A	Route	-	0.99	4	-
ST13B	Sub	0.0043	0.99	11*	8
G	Sub	0.0357	0.99	99	-
G-Out	Sink	0.0400	0.99	7	-
G-Div	Div	0.0400	0.99	92	-
I	Sub	0.0188	0.99	51	-
ST16	Sub	0.0021	0.99	5*	4
CP-5.1	CP	0.0600	0.99	163	-
RCP-5.1	Route	-	0.99	161	-
ST13C	Sub	0.0033	0.99	9*	6
CP-6a	CP	0.0700	0.99	169	-
ST14	Sub	0.0082	0.99	19*	15
K	Sub	0.0173	0.99	48	-
ST17	Sub	0.0017	0.99	4*	6
H	Sub	0.0149	0.99	41	-

Type: Sub = Subbasin. CP = Concentration Point. Div = Diversion
*Slight change of flow resulting from updates to ROW and Landuse changes



HEC-1 Node	Type	Tributary Area (sq mi)	DARF	100-Year Discharge (cfs)	GPDB-MDS 100-Year Discharge (cfs)
ST13A	Sub	0.0017	0.99	4**	5
ST13A-E	*P-Sub*	0.0008		*2*	-
ST13A-W	*P-Sub*	0.0009		*2*	-
RST13A	Route	-	0.99	4	-
ST13B	Sub	0.0043	0.99	11**	8
ST13Ba-N	*P-Sub*	0.0009		*2*	-
ST13Ba-S	*P-Sub*	0.0009		*2*	-
ST13Bb-N	*P-Sub*	0.0013		*4*	-
ST13Bb-S	*P-Sub*	0.0012		*3*	-
G	Sub	0.0357	0.99	99	-
G-Out	Sink	0.0400	0.99	7	-
G-Div	Div	0.0400	0.99	92	-
I	Sub	0.0188	0.99	51	-
ST16	Sub	0.0021	0.99	5**	4
ST16-E	*P-Sub*	0.0010		*2*	-
ST16-W	*P-Sub*	0.0011		*3*	-
CP-5.1	CP	0.0600	0.99	163	-
RCP-5.1	Route	-	0.99	161	-
ST13C	Sub	0.0033	0.99	9**	6
ST13C-N	*P-Sub*	0.0019		*5*	-
ST13C-S1	*P-Sub*	0.0011		*3*	-
ST13C-S2	*P-Sub*	0.0004		*1*	-
CP-6a	CP	0.0700	0.99	169	-
ST14	Sub	0.0082	0.99	19**	15
ST14a-E	*P-Sub*	0.0030		*7*	-
ST14a-W	*P-Sub*	0.0037		*9*	-
ST14b	*P-Sub*	0.0013		*3*	-
K	Sub	0.0173	0.99	48	-
ST17	Sub	0.0017	0.99	4**	6
ST17-E	*P-Sub*	0.0008		*2*	-
ST17-W	*P-Sub*	0.0009		*2*	-
H	Sub	0.0149	0.99	41	-

Type: Sub = Subbasin. CP = Concentration Point Div = Diversion
*Subbasins are prorated based on area
**Slight change of flow resulting from updates to ROW and Landuse changes

Figure 4: Ultimate Conditions Hydrology

Village 27 Park Drift Trail (Lake Mead Boulevard to Sunset Run Drive),
Sunset Run Drive (Park Drift Trail to Lake Mead Boulevard) and
Calico Bend Drive (Lake Mead Boulevard to Sunset Run Drive)

Legend

- Concentration Points
- Ultimate Subbasins
- Prorated Subbasins
- GPDB MDS Subbasins
- Proposed Storm Drain
- Existing Facilities
- Future Roadway
- Proposed Roadway
- Proposed Future Developments

N W E S

0 100 200 400 Feet

1 inch = 400 feet

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Member of the SNC-Lavalin Group

Aerial Imagery Source:ESRI 2022
Projection: State Plane, Nevada East, NAD83 2011, US Feet

HEC-1 Node	Type	Tributary Area (sq mi)	DARF	100-Year Discharge (cfs)
ST13A	Sub	0.0017	0.99	4
ST13B	Sub	0.0043	0.99	11
INT-I	Sub	0.0188	0.99	22
ST16	CP	0.0021	0.99	5
CP1	Sub	0.0300	0.99	43
ST13C	Sub	0.0033	0.99	9
CP2	CP	0.0300	0.99	52
ST14	Sub	0.0082	0.99	19
INT-K	Sub	0.0173	0.99	23
ST17	Sub	0.0017	0.99	4

Type: Sub = Subbasin. CP = Concentration Point

Refer to DS#5455 for offsite drainage west of Park Drift Trail (Appendix A)

Refer to DS#5226 for Grand Park Detention Basin Inlet Pipe (Appendix A)

Figure 3: Interim Conditions Hydrology

Village 27 Park Drift Trail (Lake Mead Boulevard to Sunset Run Drive), Sunset Run Drive (Park Drift Trail to Lake Mead Boulevard) and Calico Bend Drive (Lake Mead Boulevard to Sunset Run Drive)

Legend

- Concentration Points
- Interim Subbasins
- Flow Arrows
- Proposed Storm Drain
- Proposed Roadway
- Contours 50'
- Contours 4'

0 62.5 125 250 Feet

1 inch = 250 feet

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Aerial Imagery Source:ESRI 2022
Projection: State Plane, Nevada East, NAD83 2011, US Feet

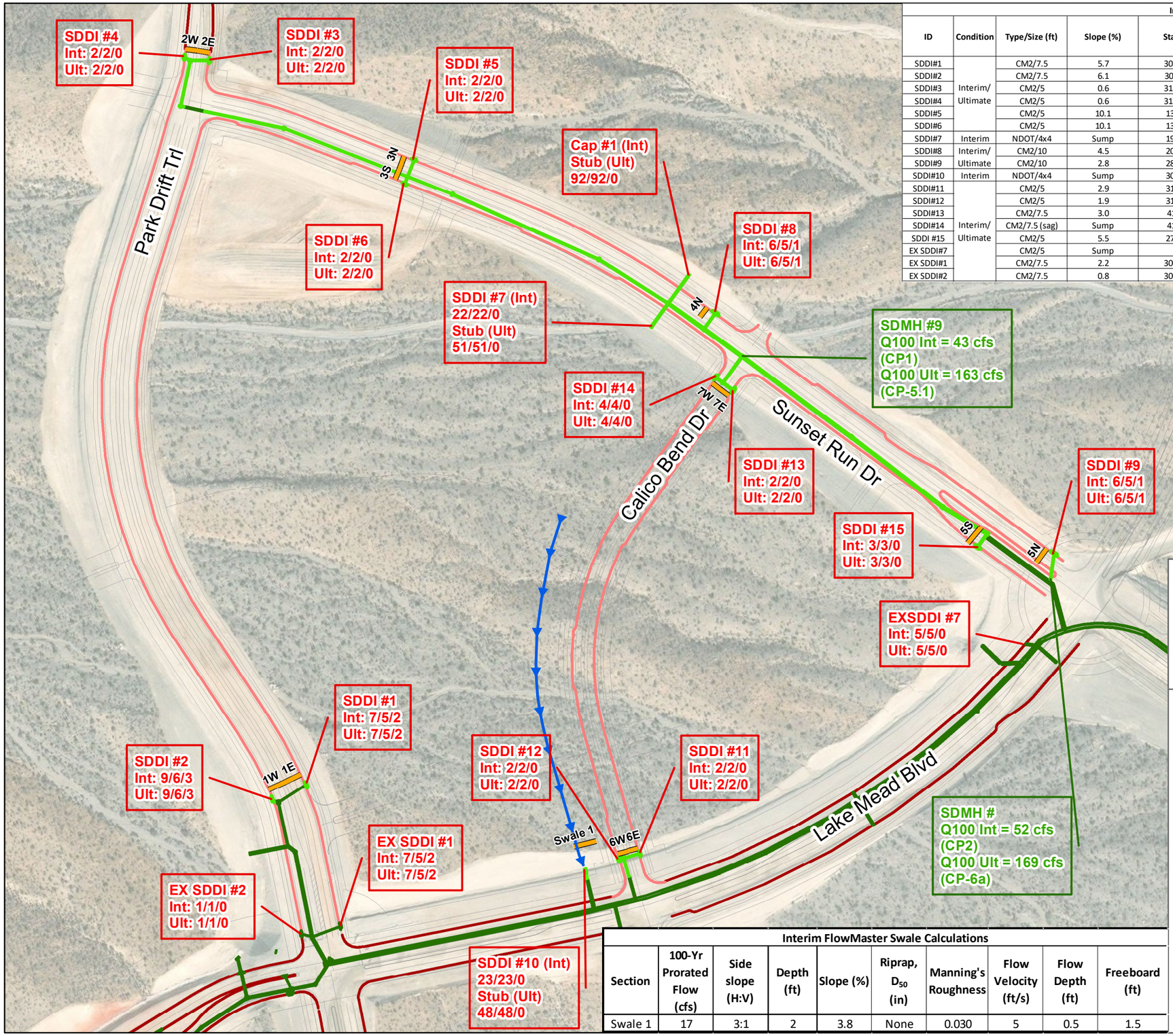
2. Hydraulic Analysis

2.1. Drop Inlet Calculations

The computer program Bentley FlowMaster was utilized to perform calculations for the proposed drop inlets and ditch inlets along the roadways. Drop inlet calculations are provided in Appendix C. Table 3 provides summaries of the drop inlets for the higher flow between the interim and ultimate conditions. Drop inlet locations and calculation summaries for the interim and ultimate condition are shown in Figure 5 respectively.

Table 3 – Interim and Ultimate Drop Inlet Calculations

ID	Type/Size (ft)	Station (ft)	Total Flow (cfs)	Condition	Discharge Source	Intercepted Flow (cfs)	Bypass Flow (cfs)
100-year							
SDDI#1	CM2/7.5	303 + 57.42	7	Interim/ Ultimate	ST14a-E	5	2
SDDI#2	CM2/7.5	303 +56.71	9		ST14a-W	6	3
SDDI#3	CM2/7.5	318 + 83.70	2		ST13A-E	2	0
SDDI#4	CM2/7.5	318 + 83.70	2		ST13A-W	2	0
SDDI#5	CM2/7.5	13 + 85.88	2		ST13Ba-N	2	0
SDDI#6	CM2/7.5	13 + 85.88	2		ST13Ba-S	2	0
SDDI#7	NDOT/4x4	19 + 52.09	22	Interim	INT-I	22	0
SDDI#8	CM2/10	20 + 38.46	6	Interim/ Ultimate	ST13Bb-N + 2 cfs from ST13Bb-S	5	1
SDDI#9	CM2/10	28 + 44.41	6		ST13C-N + DI #8 Bypass	5	1
SDDI#10	NDOT/4x4	30 + 98.17	23	Interim	INT-K	23	0
SDDI#11	CM2/7.5	31 + 00.00	2	Interim/ Ultimate	ST17-E	2	0
SDDI#12	CM2/7.5	31 + 00.00	2		ST17-W	2	0
SDDI#13	CM2/7.5	41 +07.45	2		ST16-E	2	0
SDDI#14	CM2/7.5 (sag)	41 +07.46	4		ST16-W + 1 cfs from ST13Bb-S	4	0
SDDI #15	CM2/5	27 + 17.21	4		ST13C-S1	3	0
Ex SDDI#7	CM2/5	NA	5		Lake Mead + SDDI#15 bypass	5	0
EX SDDI#1	CM2/7.5	300 + 81.43	7		ST14b + DI#1 Bypass + 2 cfs DI#2 Bypass	5	2
EX SDDI#2	CM2/7.5	300 + 81.42	1		1 cfs of DI#2 Bypass	1	0



Interim/Ultimate FlowMaster Inlet Calculations (100-Yr)

ID	Condition	Type/Size (ft)	Slope (%)	Station (ft)	Total Flow (cfs)	Subbasin/Discharge Source	Intercepted Flow (cfs)	Bypass Flow (cfs)	Ponding at Inlet (ft)	Depression at Inlet (ft)	Freeboard at Inlet (ft)
SDDI#1	Interim/ Ultimate	CM2/7.5	5.7	303 + 57.42	7	ST14a-E	5	2	NA		
SDDI#2		CM2/7.5	6.1	303 +56.71	9	ST14a-W	6	3			
SDDI#3		CM2/5	0.6	318 + 83.70	2	ST13A-E	2	0			
SDDI#4		CM2/5	0.6	318 + 83.70	2	ST13A-W	2	0			
SDDI#5		CM2/5	10.1	13 + 85.88	2	ST13Ba-N	2	0			
SDDI#6		CM2/5	10.1	13 + 85.88	2	ST13Ba-S	2	0			
SDDI#7	Interim	NDOT/4x4	Sump	19 + 52.09	22	INT-I	22	0	0.7	1.8	1.1
SDDI#8	Interim/ Ultimate	CM2/10	4.5	20 + 38.46	6	ST13Bb-N + 2 cfs from ST13Bb-S	5	1	NA		
SDDI#9		CM2/10	2.8	28 + 44.41	6	ST13C-N + DI #8 Bypass	5	1			
SDDI#10	Interim	NDOT/4x4	Sump	30 + 98.17	23	INT-K	23	0	0.7	1.9	1.2
SDDI#11	Interim/ Ultimate	CM2/5	2.9	31 + 00.00	2	ST17-E	2	0	NA		
SDDI#12		CM2/5	1.9	31 + 00.00	2	ST17-W	2	0			
SDDI#13		CM2/7.5	3.0	41 +07.45	2	ST16-E	2	0			
SDDI#14		CM2/7.5 (sag)	Sump	41 +07.46	4	ST16-W + 1 cfs from ST13Bb-S	4	0	0.2	NA	
SDDI #15		CM2/5	5.5	27 + 17.21	3	ST13C-S1	3	0	0.4	NA	
EX SDDI#7		CM2/5	Sump	NA	5	Lake Mead + Sunset Run Bypass	5	0			
EX SDDI#1		CM2/7.5	2.2	300 + 81.43	7	ST14b + DI#1 Bypass + 2 cfs DI#2 Bypass	5	2	NA		
EX SDDI#2		CM2/7.5	0.8	300 + 81.42	1	1 cfs of DI#2 Bypass	1	0			

Interim/Ultimate FlowMaster Normal Depth Calculations (100-Yr)

Section ID	Condition	Total Flow (cfs)	Slope (%)	Flow Depth (ft)	Velocity (ft/s)	D*V
1E	Interim/ Ultimate	7	6.3	0.37	5.6	2.1
1W		9	6.7	0.39	6.1	2.4
2E		2	0.6	0.36	1.7	0.6
2W		2	0.5	0.37	1.6	0.6
3N		2	10.1	0.25	5.5	1.4
3S		2	10.1	0.25	5.5	1.4
4N		6	5.2	0.36	5.0	1.8
5N		6	3.1	0.39	4.1	1.6
5S		3	5.5	0.30	4.4	1.3
6E		2	3.2	0.29	3.3	1.0
6W		2	2.9	0.29	3.0	0.9
7E		2	3.0	0.30	3.2	0.9
7W		4	2.9	0.35	3.7	1.3

Interim FlowMaster Swale Calculations

Section	100-Yr Prorated Flow (cfs)	Side slope (H:V)	Depth (ft)	Slope (%)	Riprap, D_{50} (in)	Manning's Roughness	Flow Velocity (ft/s)	Flow Depth (ft)	Freeboard (ft)
Swale 1	17	3:1	2	3.8	None	0.030	5	0.5	1.5

Figure 5 - Hydraulic Workmap

Summerlin West Village 27
Park Drift Trl (Lake Mead Blvd to Sunset Run Dr)
Sunset Run Dr (Park Drift Trl to Lake Mead Blvd)
Calico Bend Dr (Lake Mead Blvd to Sunset Run Dr)

Legend

- Swales
- Sections
- Proposed Storm Drain Facilities
- Existing Storm Drain Facilities
- Proposed Roadway
- Existing Roadway
- Proposed Developments

Approach/Intercepted/ Bypass Flows (All Flows in CFS)

N W E S

0 100 200 400 Feet

1 inch = 200 feet

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ATKINS Member of the SNC-Lavalin Group

Source of Aerial Images: ESRI, 2022

2.2. Normal Depth Calculations

The computer program Bentley FlowMaster 10.2 was utilized to perform normal depth calculations for the proposed roadway. These normal depth calculations were utilized to ensure that the proposed drop inlets are adequately designed and that all local street flow criteria are met.

Roadway cross-sections analyzed along the roadways are presented in Figure 5. The cross-section locations were specified based on the flow patterns and were placed just upstream of subbasin collection points (drop inlets) to represent worst case scenario flow conditions. The narrowest roadway cross-sections were also utilized for the calculations.

Tables 5 summarizes the normal depth calculations for the 100-year storm event for interim and ultimate conditions. Depth multiplied by Velocity (D*V) must be less than 8 for the 100-year rainfall event and less than 6 for the 10-year event. The 100-year D*V values for all street cross-sections are less than 6. Therefore, the10-year D*V is also less than 6. To minimize redundancy, the 10-year calculations are not included. Printouts of all normal depth calculations for the ultimate condition are provided in Appendix C.4 and those for the interim condition, in Appendix C2. Cross-section locations for both conditions and calculation summaries for the ultimate condition are shown on Figure 5 and 6.

Table 4 – Interim and Ultimate Normal Depth Calculations

ID	Total Flow (cfs)	Slope (%)	Flow Depth (ft)	Velocity (ft/s)	D* V
100-year					
1E	7	6.3	0.37	5.6	2.1
1W	9	6.7	0.39	6.1	2.4
2E	2	0.6	0.36	1.7	0.6
2W	2	0.5	0.37	1.6	0.6
3N	2	10.1	0.25	5.5	1.4
3S	2	10.1	0.25	5.5	1.4
4N	6	5.2	0.36	5.0	1.8
5N	6	3.1	0.39	4.1	1.6
5S	3	5.5	0.30	4.4	1.3
6E	2	3.2	0.29	3.3	1.0
6W	2	2.9	0.29	3.0	0.9
7E	2	3.0	0.30	3.2	0.9
7W	4	2.9	0.35	3.7	1.3

Normal depth and velocity for existing swale on Parcel K flowing south along the Calico Bend Drive was checked not to exceed a velocity of 5 fps due to slight increase in the area draining. Calculations are added in Appendix C.

2.3. Storm Drain System Modeling

The proposed storm drain systems were modeled using Water Surface Pressure Gradient (WSPG-W). Printouts of the WSPG-W models are provided in Appendix C. Both the interim condition and ultimate condition flows are modeled. The Q_{100} and hydraulic grade lines for interim and ultimate conditions are shown on the improvement plans in Appendix D.

Appendices

Appendix A. References

A.1. Master Drainage Study for Tributary Area of the Grand Park Detention Basin. Summerlin West Villages 27/30A/30 DS#5388

A.2. Summerlin West Grand Park Detention Basin – Inlet Pipe DS#5226

A.3. Village 25 Lake Mead Boulevard Improvements (Sunset Run Drive to Park Drift Trail) Update #2 DS#5423

A.4. Master Conceptual Drainage Study for Summerlin West Village 22 DS#5005

A.5. Village 27 Rough Grade Package DS#5464

A.6. Village 27 Lake Mead Boulevard (Scurry Bend Drive to Sunset Run Drive) DS#5488

A.7. Village 27 Lake Mead Boulevard (Park Drift Trail to Mountain Run Drive) DS#5455

A.1. Master Drainage Study for Tributary Area of the Grand Park Detention Basin.Summerlin West Villages 27/30A/30 DS#5388

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: January 31, 2022
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:**
Master Drainage Study - Summerlin West Villages 27, 30A & 31 for the Tributary Area of the Grand Park Detention Basin			Atkins VTN, Nevada
Cross Streets:	Desert Foothills Drive and Kestrel Creek Avenue		Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5388E.doc		Bart Anderson, P.E., DevCo
Parcel Number:	Various		CCRFCD
Zoning Action:	N/A		
FEMA Flood Zone	YES	NO X	
Proposed Storm Drain	YES X	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	11/23/2021	1/19/2021	Not Approved	$400.00	4073600: $400
2nd Submittal	2/24/2021	3/16/2021	Conditional Approval	$400.00	4180577: $400
CCRFCD	4/22/2021	5/6/2021	Concurrence Recv'd	N/C	N/C
4th Submittal Update #1	11/2/2021 & 11/22/2021	11/24/2021	Not Approved	$100.00	4523754: $100
5th Submittal	1/6/2022 & 1/10/2022	1/31/2022	Approved	$400.00	4601524: $400
			TOTAL FEES (LDDRS):	**$1,300.00**	**----**

REMARKS: 5th Submittal; Addendum #1 to Update #1, response to comments.

4th Submittal; Update #1. Revised hydrology to incorporate sub-basin changes and the routing of flows to Grand Park Detention Basin and Summerlin Detention Basin #5 Modifications to provide a more cohesive integration of the overall drainage impacts. With the development and integration of Parcels for these Village Developments, it is important that the Parcels, Parcel Boundaries, Areas, CN values, Hydrology, and Facility Hydraulics match.

Flood Control understands that with the more detailed layouts of Parcels associated with this portion of the Summerlin West Planning Area (SWPA), this Study is functioning as a full Master Drainage Study for Summerlin West Villages 27, 30A & 31 for the Tributary Area to the Grand Park Detention Basin (GPDB). This report will now supersede that portion of the SWPA that affects the GPDB Tributary Area and therefore is no longer *Conceptual* in nature.

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

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

The following Studies now show a coordinated approach to the Parcel Names, Parcel Boundaries, Areas, CN values, Hydrology, and Facility Hydraulics for seamless transitions between these multiple and separate Master Drainage Studies for the Summerlin Village Development.

DS 5225 – Summerlin Detention Basin #5 Modifications

DS 5388 - Master Drainage Study - Summerlin West Villages 27, 30A & 31 for Tributary Area of the Grand Park Detention Basin

DS 5410 – Master Drainage Study – Summerlin West V29

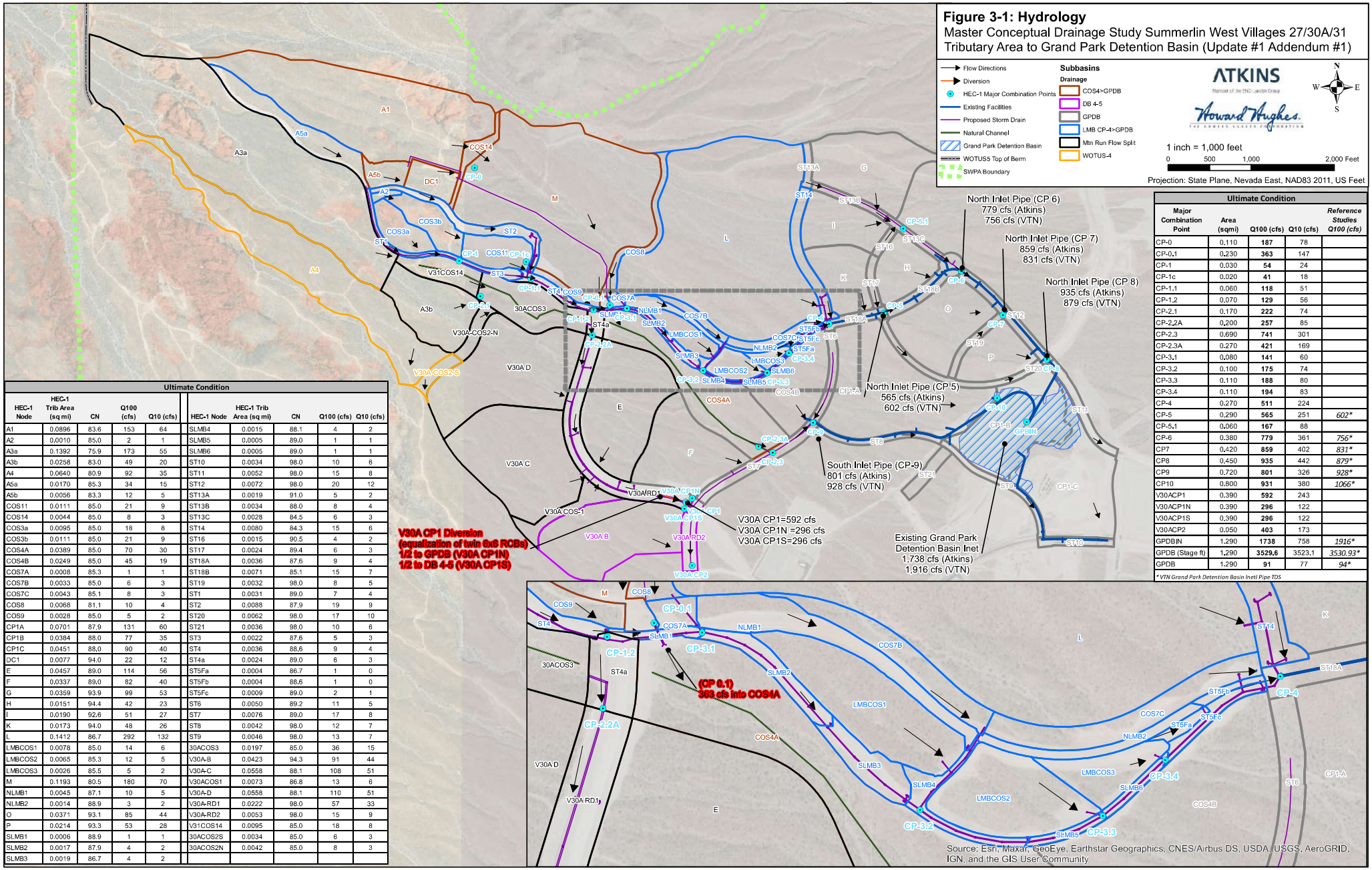
1. The approval of this *Master Drainage Study* sets the parameters for the detailed Technical Drainage Studies for the associated Village Infrastructure and Parcel development. The drainage facilities identified in this Master Study require detailed hydraulic analysis with the associated Village Infrastructure studies to verify the proposed facilities provide the capacity to intercept and convey the design flows as stated in the study.
2. The Provided Phasing Plan identifies the sequence of the roadway facility packages necessary for the Village developments. Include the infrastructure improvements and any necessary interim facilities that are needed to protect the Village Developments with each Phase.
3. The Report includes an updated WSPG Model for the north lateral of the Grand Park Detention Basin Inlet Pipe Study (DS 5226) prepared by VTN Nevada. The City takes no exception to the minor modifications to the flow rates showing a slightly higher flow rate. Based upon the proposed revised flows, the facility parameters are maintained within the RCB and that the approved design will function as intended.
4. The approved plans for **L20-01355 shall be revised** to reflect the higher flow rates within the RCB system. Coordinate the revision process and **Updated the Grand Park Detention Basin Inlet Pipe Study (DS 5226)** to reflect these changes.

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

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

END OF REMARKS
AYS/PBJ

T/R/S: T21S/R59E/S03
AREA K-22



Ultimate Condition									
HEC-1 Node	HEC-1 Trib Area (sq mi)	CN	Q100 (cfs)	Q10 (cfs)	HEC-1 Node	HEC-1 Trib Area (sq mi)	CN	Q100 (cfs)	Q10 (cfs)
A1	0.0896	83.6	153	64	SLMB4	0.0015	88.1	4	2
A2	0.0010	85.0	2	1	SLMB5	0.0005	89.0	1	1
A3a	0.1392	75.9	173	55	SLMB6	0.0005	89.0	1	1
A3b	0.0258	83.0	49	20	ST10	0.0034	98.0	10	6
A4	0.0640	80.9	92	35	ST11	0.0052	98.0	15	8
A5a	0.0170	85.3	34	15	ST12	0.0072	98.0	20	12
A5b	0.0056	83.3	12	5	ST13A	0.0019	91.0	5	2
COS11	0.0111	85.0	21	9	ST13B	0.0034	88.0	8	4
COS14	0.0044	85.0	8	3	ST13C	0.0028	84.5	6	3
COS3a	0.0095	85.0	18	8	ST14	0.0080	84.3	15	6
COS3b	0.0111	85.0	21	9	ST16	0.0015	90.5	4	2
COS4A	0.0389	85.0	70	30	ST17	0.0024	89.4	6	3
COS4B	0.0249	85.0	45	19	ST18A	0.0036	87.6	9	4
COS7A	0.0008	85.3	1	1	ST18B	0.0071	85.1	15	7
COS7B	0.0033	85.0	6	3	ST19	0.0032	98.0	8	5
COS7C	0.0043	85.1	8	3	ST1	0.0031	89.0	7	4
COS8	0.0068	81.1	10	4	ST2	0.0088	87.9	19	9
COS9	0.0028	85.0	5	2	ST20	0.0062	98.0	17	10
CP1A	0.0701	87.9	131	60	ST21	0.0036	98.0	10	6
CP1B	0.0384	88.0	77	35	ST3	0.0022	87.6	5	3
CP1C	0.0451	88.0	90	40	ST4	0.0036	88.6	9	4
DC1	0.0077	94.0	22	12	ST4a	0.0024	89.0	6	3
E	0.0457	89.0	114	56	ST5Fa	0.0004	86.7	1	0
F	0.0337	89.0	82	40	ST5Fb	0.0004	88.6	1	0
G	0.0359	93.9	99	53	ST5Fc	0.0009	89.0	2	1
H	0.0151	94.4	42	23	ST6	0.0050	89.2	11	5
I	0.0190	92.6	51	27	ST7	0.0076	89.0	17	8
K	0.0173	94.0	48	26	ST8	0.0042	98.0	12	7
L	0.1412	86.7	292	132	ST9	0.0046	98.0	13	7
LMBCOS1	0.0078	85.0	14	6	30ACOS3	0.0197	85.0	36	15
LMBCOS2	0.0065	85.3	12	5	V30A-B	0.0423	94.3	91	44
LMBCOS3	0.0026	85.5	5	2	V30A-C	0.0558	88.1	108	51
M	0.1193	80.5	180	70	V30ACOS1	0.0073	86.8	13	6
NLMB1	0.0045	87.1	10	5	V30A-D	0.0558	88.1	110	51
NLMB2	0.0014	88.9	3	2	V30A-RD1	0.0222	98.0	57	33
O	0.0371	93.1	85	44	V30A-RD2	0.0053	98.0	15	9
P	0.0214	93.3	53	28	V31COS14	0.0095	85.0	18	8
SLMB1	0.0006	88.9	1	1	30ACOS2S	0.0034	85.0	6	3
SLMB2	0.0017	87.9	4	2	30ACOS2N	0.0042	85.0	8	3
SLMB3	0.0019	86.7	4	2					

Ultimate Condition				
Major Combination Point	Area (sqmi)	Q100 (cfs)	Q10 (cfs)	*Reference Studies Q100 (cfs)*
CP-0	0.110	**187**	78	
CP-0.1	0.230	**363**	147	
CP-1	0.030	**54**	24	
CP-1c	0.020	**41**	18	
CP-1.1	0.060	**118**	51	
CP-1.2	0.070	**129**	56	
CP-2.1	0.170	**222**	74	
CP-2.2A	0.200	**257**	85	
CP-2.3	0.690	**741**	301	
CP-2.3A	0.270	**421**	169	
CP-3.1	0.080	**141**	60	
CP-3.2	0.100	**175**	74	
CP-3.3	0.110	**188**	80	
CP-3.4	0.110	**194**	83	
CP-4	0.270	**511**	224	
CP-5	0.290	**565**	251	*602**
CP-5.1	0.060	**167**	88	
CP-6	0.380	**779**	361	*756**
CP7	0.420	**859**	402	*831**
CP8	0.450	**935**	442	*879**
CP9	0.720	**801**	326	*928**
CP10	0.800	**931**	380	*1066**
V30ACP1	0.390	**592**	243	
V30ACP1N	0.390	**296**	122	
V30ACP1S	0.390	**296**	122	
V30ACP2	0.050	**403**	173	
GPDBIN	1.290	**1738**	758	*1916**
GPDB (Stage ft)	1.290	**3529.6**	3523.1	*3530.93**
GPDB	1.290	**91**	77	*94**

** VTN Grand Park Detention Basin Inetl Pipe TDS*

A.2. Summerlin West Grand Park Detention Basin - Inlet Pipe DS#5226

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: April 5, 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 Grand Park Detention Basin - Inlet Pipe - Update #4				VTN Nevada
Cross Streets:	I-215 and Summerlin Parkway			The Howard Hughes Corporation
File Number:	F:\Depot\DSMemos\DS5226H.doc			Bart Anderson, P.E., DevCo
Parcel Number:	137-22-301-001			CCRFCD
Zoning Action:	N/A			
FEMA Flood Zone	YES	NO **X**		
Proposed Storm Drain	YES **X**	NO		

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	11/27/2019	12/20/2019 & 12/30/2019	Not Approved	$400.00	3658677: $400
2nd Submittal	2/18/2020	3/26/2020	Not Approved	$400.00	3747241: $400
3rd Submittal	4/20/2020	5/11/2020	Conditional Approval	$400.00	3820204: $400
CCRFCD	6/23/2020	7/1/2020	Concurrence Recv'd	N/C	N/C
4th Submittal	8/17/2020	9/2/2020	Approved	$100.00	3955863: $100
5th Submittal	1/20/2021	2/3/2021	Approved	$100.00	4157421: $100
6th Submittal	2/25/2021	3/8/2021	Approved	$100.00	4180877: $100
7th Submittal & Supplement	3/14/2022 & 4/4/2022	4/5/2022	See Comments Below	$100.00	4687560: $100
			TOTAL FEES (LDDRS):	**$1,600.00**	**----**

REMARKS:

7th Submittal & Supplement: Update #4 for minor flow revision

6th Submittal: Update #3 to correct a typo in a detail callout

5th Submittal: Update #2 to revise a lateral pipe material from RCP to PVC

4th Submittal: Update #1 for storm drain laterals revision

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 project proposed to construct temporary drainage facilities including drainage berms/ditches along the west side of various perimeter streets. 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.

2. Previous comment for Sheet PP4 to Sheet PP6 to extend the 30"-RCP stub from *Sunset Run Drive* to Station 25+00 in *Calico Bend Drive* for future inlets connection will be required upon future *Calico Bend Drive Street Improvement Project*.

3. Previous comment for Sheet PP7 to Sheet PP10 to provide extension of storm drain and inlets in *Park Drift Trail* from Station 236+00 to the intersection with *Lake Mead Boulevard* will be required upon future *Park Drift Trail Street Improvement Project*.

4. Previous comment for Sheet PP11 to Sheet PP13 to provide extension of storm drain and inlets in *Park Drift Trail* between *Lake Mead Boulevard* and *Sunset Run Drive* will be required upon future *Park Drift Trail Street Improvement Project*.

5. Previous comment for Sheet PP17 to Sheet PP19 to extend the 54"-RCP stub in *Sunset Run Drive* to provide future drop inlets will be required upon future *Sunset Run Drive Street Improvement Project*.

6. All offsite interim flood control facilities such as but not limited to berms/ditches, temporary sump and temporary sediment basins are privately owned and to be privately maintained by the *Howard Hughes Company*. Provide a note as such on the grading plans.

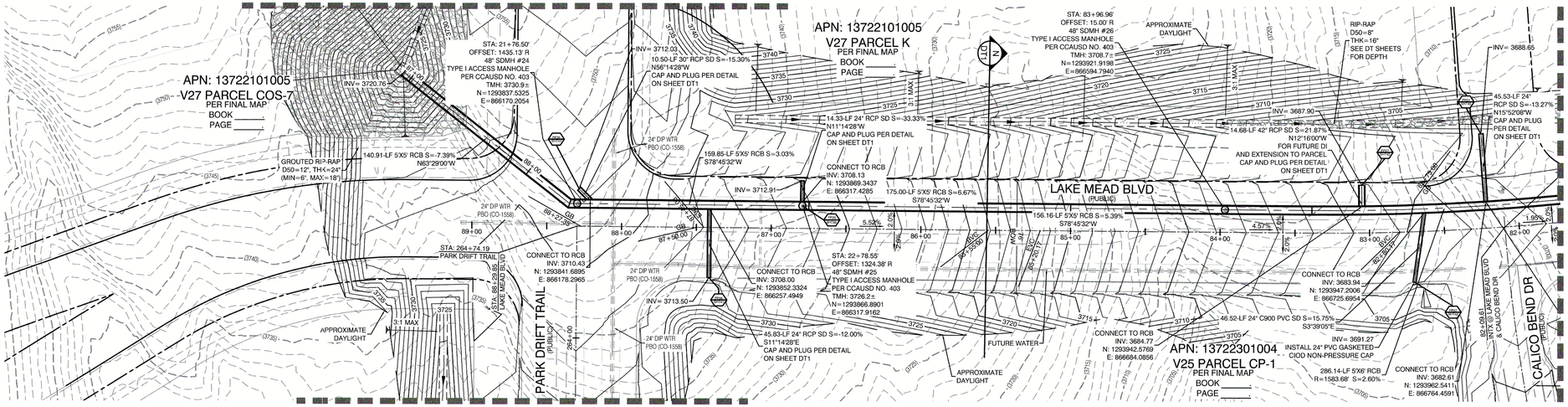
NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Update and accepted by the *City of Las Vegas Flood Control Section*. Additionally, conditional 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.

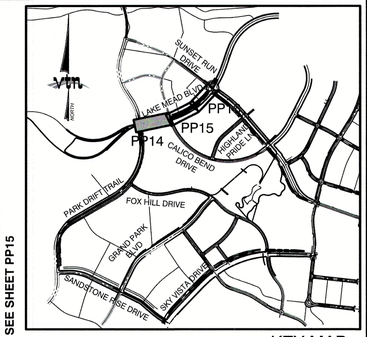
END OF REMARKS
HDR/AYS

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

MATCHLINE - SEE SHEET PP11



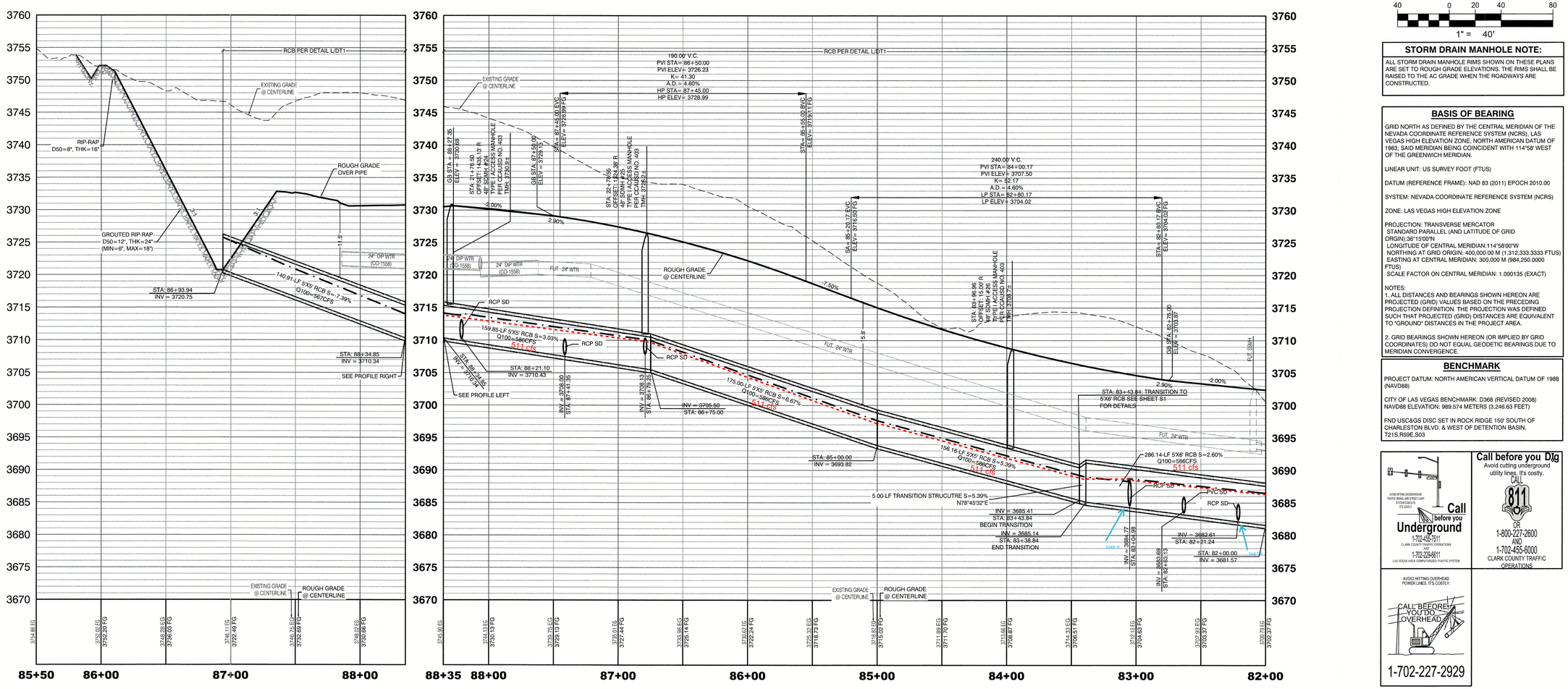
MATCHLINE - SEE SHEET PP10



KEY MAP
N.T.S

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

PROFILE SCALES:
HORIZ. = 1" = 40'
VERT. = 1" = 8'



LAKE MEAD BLVD
(PUBLIC)

STORM DRAIN MANHOLE NOTE:

ALL STORM DRAIN MANHOLE RIMS SHOWN ON THESE PLANS ARE SET TO ROUGH GRADE ELEVATIONS. THE RIMS SHALL BE RAISED TO THE AC GRADE WHEN THE ROADWAYS ARE CONSTRUCTED.

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 ORGIN):36°15'00"N
LONGITUDE OF CENTRAL MERIDIAN:114°58'00"W
NORTHING AT GRID ORIGIN: 400,000.00 M (1,312,333.3333 FTUS)
EASTING AT CENTRAL MERIDIAN: 300,000 M (984,250.0000 FTUS)
SCALE FACTOR ON CENTRAL MERIDIAN: 1.000135 (EXACT)

NOTES:
1. ALL DISTANCES AND BEARINGS SHOWN HEREON ARE PROJECTED (GRID) VALUES BASED ON THE PRECEDING PROJECTION DEFINITION. THE PROJECTION WAS DEFINED SUCH THAT PROJECTED (GRID) DISTANCES ARE EQUIVALENT TO "GROUND" DISTANCES IN THE PROJECT AREA.

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

BENCHMARK

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

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

DROP INLET SEPARATION NOTE

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

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT: 137479 FIRST APPROVED DATE: 02/11/2021

REV	DATE	BY	REVISION

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10845 GRIFFITH PEAK DRIVE, SUITE 160
LAS VEGAS, NEVADA 89135
702-791-4000

CITY OF LAS VEGAS

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

STREET PROFILE 14
LAKE MEAD BLVD
89+00.00 TO 82+00.00
SUMMERLIN WEST VILLAGE 25
GRAND PARK DETENTION BASIN
INLET PIPE

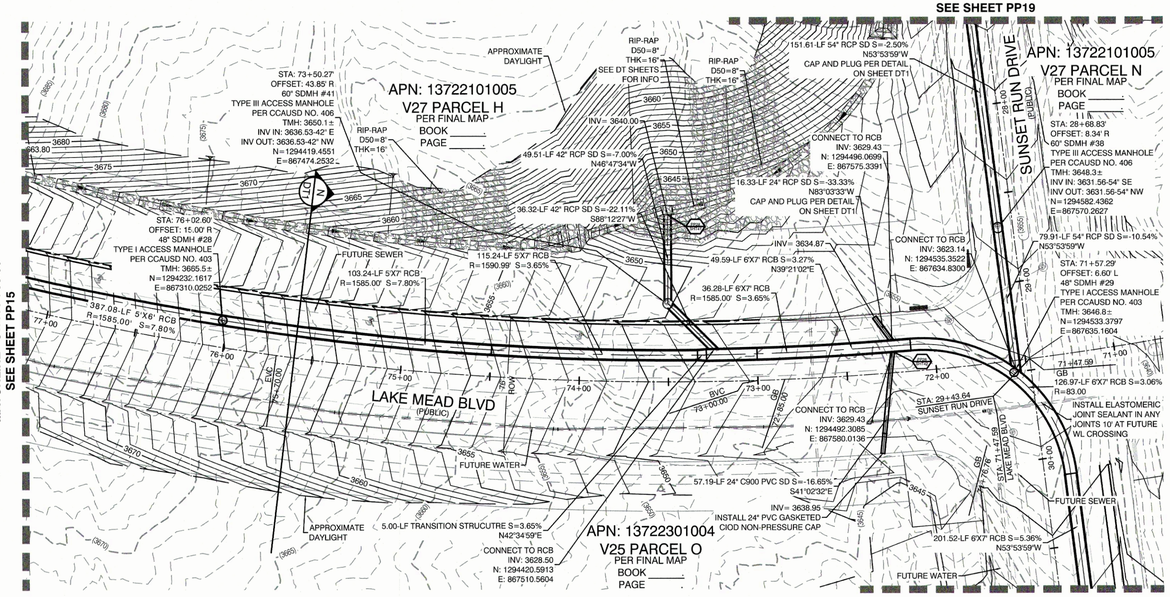
DRAWN BY: RC — MAR 2019
DESIGNED BY: DMO — MAR 2019
CHECKED BY: BR — 09/02/2019
PROJECT NO: 7809
SCALE: HORIZ. 1" = 40' VERT. 1" = 8'

BRIAN TROY FRIIZ
EXP: 12/31/21
CIVIL
STATE OF NEVADA
PROFESSIONAL ENGINEER
No. 15967
2/5/21

SHEET
PP14
29 OF 49 SHEETS

DRAWING NO.
L20-01355
107V8420

H:\7809-GP Basin\Sheet Set\DWG\7809-GPDB-INLET7809-GPDB-PP-LAMD.dwg,1/5/2021 8:53 AM,chrisp


MATCHLINE - SEE SHEET PP19
MATCHLINE - STA 77+00.00 SEE SHEET PP15
MATCHLINE - SEE SHEET PP20
APN: 13722101005
V27 PARCEL H
PER FINAL MAP
BOOK _____
PAGE _____
APN: 13722101005
V27 PARCEL N
PER FINAL MAP
BOOK _____
PAGE _____
APN: 13722301004
V25 PARCEL O
PER FINAL MAP
BOOK _____
PAGE _____
LAKE MEAD BLVD
(PUBLIC)
SUNSET RUN DRIVE
STA: 73+50.27'
OFFSET: 43.85' R
60" SDMH #41
TYPE III ACCESS MANHOLE
PER CCAUSD NO. 406
TMH: 3650.1±
INV IN: 3636.53-42" E
INV OUT: 3636.53-42" NW
N=1294419.4551
E=867474.2532
STA: 76+02.60'
OFFSET: 15.00' R
48" SDMH #28
TYPE I ACCESS MANHOLE
PER CCAUSD NO. 403
TMH: 3665.5±
N=1294232.1617
E=867310.0252
STA: 28+68.83'
OFFSET: 8.34' R
60" SDMH #38
TYPE III ACCESS MANHOLE
PER CCAUSD NO. 406
TMH: 3648.3±
INV IN: 3631.56-54" SE
INV OUT: 3631.56-54" NW
N=1294582.4362
E=867570.2627
STA: 71+57.29'
OFFSET: 6.60' L
48" SDMH #29
TYPE I ACCESS MANHOLE
PER CCAUSD NO. 403
TMH: 3646.8±
N=1294533.3797
E=867635.1604
STA: 29+43.64
SUNSET RUN DRIVE
CONNECT TO RCB
INV: 3629.43
N: 1294492.3085
E: 867580.0136
CONNECT TO RCB
INV: 3634.87
N: 1294486.0699
E: 867575.3391
CONNECT TO RCB
INV: 3623.14
N: 1294535.3522
E: 867634.8300
CONNECT TO RCB
INV: 3629.43
N: 1294496.5604
E: 867585.4300
CONNECT TO RCB
INV: 3628.50
N: 1294420.5913
E: 867510.5604
INSTALL ELASTOMERIC JOINT SEALANT IN ANY JOINTS 10' AT FUTURE WL CROSSING
INSTALL 24" PVC GASKETED CIOD NON-PRESSURE CAP
FUTURE SEWER
FUTURE WATER
APPROXIMATE DAYLIGHT
RIP-RAP D50=8" THK=16'
SEE DT SHEETS FOR INFO
151.61-LF 54" RCP SD S=-2.50% N53°53'59"W
CAP AND PLUG PER DETAIL ON SHEET DT1
49.51-LF 42" RCP SD S=-7.00% N46°47'34"W
36.32-LF 42" RCP SD S=-22.11% S88°12'27"W
16.33-LF 24" RCP SD S=-33.33% N83°03'33"W
CAP AND PLUG PER DETAIL ON SHEET DT1
79.91-LF 54" RCP SD S=-10.54% N53°53'59"W
115.24-LF 5'X7' RCB R=1590.99' S=3.65%
103.24-LF 5'X7' RCB R=1585.00' S=7.80%
387.08-LF 5'X6' RCB R=1585.00' S=7.80%
36.28-LF 6'X7' RCB R=1585.00' S=3.65%
49.59-LF 6'X7' RCB S=3.27% N39°21'02"E
57.19-LF 24" C900 PVC SD S=-16.65% S41°02'32"E
201.52-LF 6'X7' RCB S=-5.36% N53°53'59"W
126.97-LF 6'X7' RCB S=3.06%
5.00-LF TRANSITION STRUCUTRE S=3.65% N42°34'59"E
5.00-LF TRANSITION STRUCUTRE S=7.80% N50°45'07"E
INSTALL 10' PARALLEL SEPARATION
INSTALL STORM DRAIN MANHOLE
INSTALL 48" SDMH
INSTALL TYPE I ACCESS MANHOLE
INSTALL TYPE III ACCESS MANHOLE
INSTALL 60" SDMH

A.3. Village 25 Lake Mead Boulevard Improvements (Sunset Run Drive to Park Drift Trail) Update#2 DS#5423

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: March 29, 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: **Summerlin West Village 25 - Lake Mead Boulevard (Sunset Run Dr. to Park Drift Trail)**		**COPIES TO:** GCW, Inc.
Cross Streets:	Park Drift Trail and Sunset Run Drive		Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5423B.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-22-101-005, 137-22-301-006		CCRFCD
Zoning Action:	N/A		
FEMA Flood Zone	YES	NO **X**	
Proposed Storm Drain	YES **X**	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	2/9/2021	3/2/2021	Not Approved	$400.00	4162512: $400
2nd Submittal	3/11/2021	3/29/2021	See Comments Below	$400.00	4200368: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

REMARKS:

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

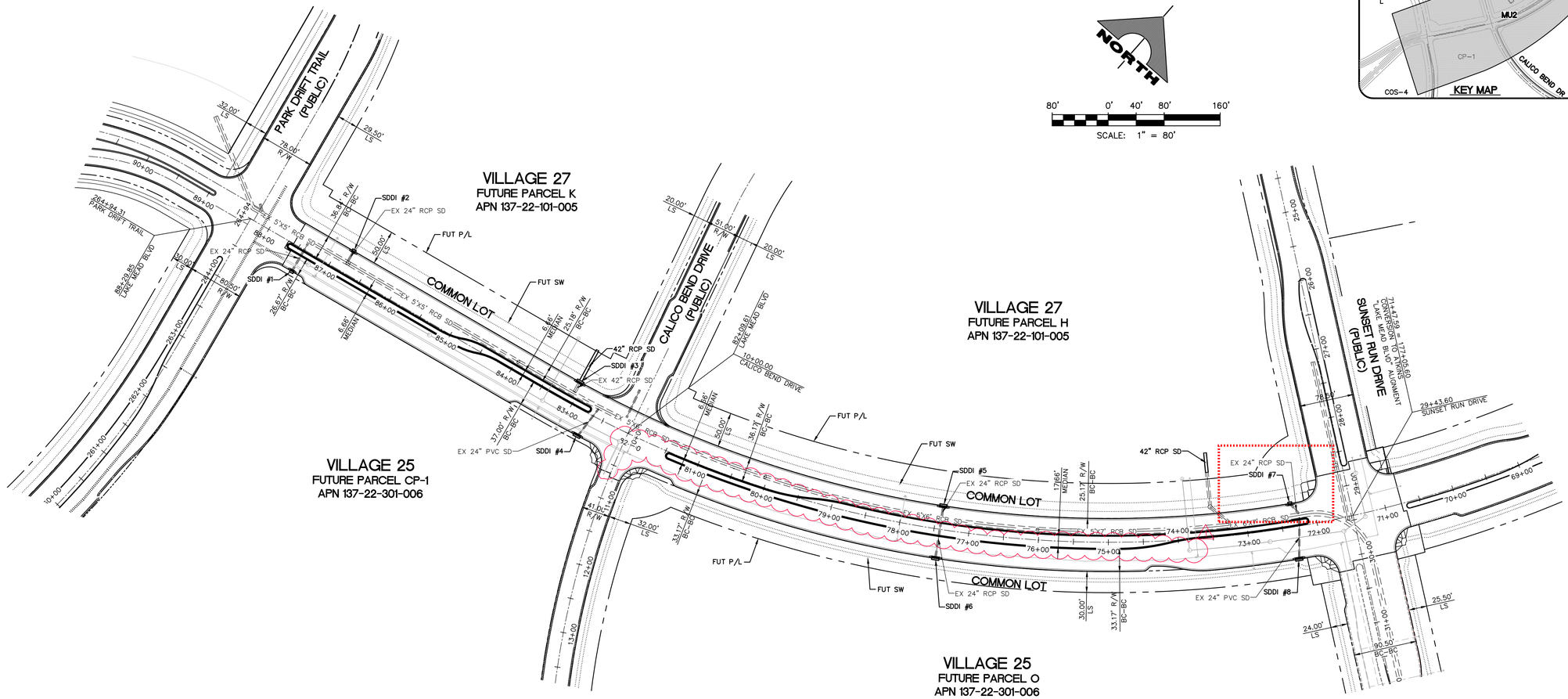
	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
X	is conditionally approved subject to City Building & Safety Department approval for the structural design of deep drop inlets

1. The subject drainage study is premised on the *Summerlin West Grand Park Detention Basin Inlet Pipe* being installed within the subject roadway. The subject improvement plans will not be approved prior to the execution of the construction bond of the *Summerlin West Grand Park Detention Inlet Pipe Project* and the associated facilities.
2. Some of the proposed drop inlets are more than 10' in depth. Submit structural design and calculations to *City Building & Safety Department* for review and approval prior to the final approval of the subject study.

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

END OF REMARKS
HDR/AYS

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



LAKE MEAD BLVD

(PUBLIC)
SCALE: HORIZ 1" = 80'

APPROVED FOR CONSTRUCTION

Mao Fang

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT NO. 139251 FIRST APPROVAL DATE: 11/22/2021

LVVWD APPROVED FIRE FLOW 1,500 GPM AT 20 PSI RESIDUAL

STORM DRAIN STRUCTURE SCHEDULE

STRUCT. #	STREET NAME	STATION & OFFSET	TC	INV IN	INV OUT	NORTHING	EASTING	SIZE
SDDI #1	LAKE MEAD BLVD	87+41.35, 35.50' LT	3729.2±		3713.50	1293805.25	866266.85	5'
SDDI #2	LAKE MEAD BLVD	86+79.25, 34.00' RT	3726.8±		3712.91	1293885.53	866314.21	5'
SDDI #3	LAKE MEAD BLVD	83+04.93, 34.01' RT	3705.2±	3687.90	3687.90	1293958.71	866680.57	10'
SDDI #4	LAKE MEAD BLVD	82+72.85, 35.46' LT	3704.1±		3691.27	1293898.26	866727.50	10'
SDDI #5	LAKE MEAD BLVD	77+41.83, 34.01' RT	3676.9±		3663.80	1294168.87	867186.99	10'
SDDI #6	LAKE MEAD BLVD	77+41.76, 41.99' LT	3676.7±		3668.98	1294104.89	867228.01	10'
SDDI #7	LAKE MEAD BLVD	72+33.80, 34.00' RT	3647.9±		3634.87	1294498.35	867556.60	5'
SDDI #8	LAKE MEAD BLVD	72+33.76, 46.50' LT	3646.6±		3638.95	1294447.51	867619.01	10'

BASIS OF BEARING AND COORDINATES

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

LINEAR UNIT: US SURVEY FOOT (FTUS)
DATUM (REFERENCE FRAME): NAD 83 (2011) EPOCH 2010.00
SYSTEM: NEVADA COORDINATE REFERENCE SYSTEM (NCRS)
ZONE: LAS VEGAS HIGH ELEVATION ZONE

PROJECTION: TRANSVERSE MERCATOR
STANDARD PARALLEL (AND LATITUDE OF GRID ORIGIN): 36°15'00"N
LONGITUDE OF CENTRAL MERIDIAN: 114°58'00"W
NORTHING AT GRID ORIGIN: 400,000.00 M (1,312,333.3333 FTUS)
EASTING AT CENTRAL MERIDIAN: 300,000 M (984,250.0000 FTUS)
SCALE FACTOR ON CENTRAL MERIDIAN: 1.000135 (EXACT)

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

BENCHMARK

BM#	DESCRIPTION	NAVD 88 DATUM	NAVD 88 DATUM
CLV BM No. 7LV0934SW6	FIND RIVET AND PLATE IN TOP OF CURB SE CORNER OF DESERT MOON RD. AND SKY VISTA DR. T20S,R59E,S34	3318.31 (FEET)	1,011.422 (METERS)

Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call 811 OR 1-800-642-2444

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

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

L#: L21-01509 CLV#: 107V9291

STATE OF NEVADA PROFESSIONAL ENGINEER
MLADJAN GRUJICIC
No. 17107
Exp. 06/30/2023
CIVIL
DATE: 06/02/2022

REV	DATE	DESCRIPTION	AGEN APP	DATE	GCW APP
A1	10/17/22	REMOVED SANITARY SEWER, REVISED SS LAYOUT			

PROJECT NO. 62025-220
DESIGN: APM
DRAWN: APM
CHECK: MG/LG
PLOT DATE: 06-02-22
PLOT TIME: 08:30:35

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com
F:\PROJECTS\600\62025-220\DWG\PRODUCTION\62025-220_MU2.DWG
JEANETTE ROSS

THE HOWARD HUGHES COMPANY. LLC

VILLAGE 25 LAKE MEAD BLVD IMPROVEMENTS
(SUNSET RUN DRIVE TO PARK DRIFT TRAIL)

MASTER UTILITY PLAN - STORM DRAIN

DRAWING
MU2
6 OF 26 SHTS

ENGINEERS \ SURVEYORS

Drop Inlet Sizing Calculation

Project Name: Village 25 Lake Mead Blvd Improvements
By: Masih Edalat
Date: 01/27/2021

Drop Inlet Sizing in Sump

5' DI TYPE CM2
DI#7

Known:

$Q=$	Design Flow	4.0	cfs
$D_p=$	Ponding Depth at Inlet	0.83	ft
$W=$	Grate Width	1.5	ft
$L_g=$	Length of Grate	2.5	ft
$L_c=$	Length of Curb Opening	5.0	ft
$H_c=$	Curb Opening Height	0.5	ft
$C_{wc}=$	Weir coefficient for curb opening	2.3	
$C_{wg}=$	Weir coefficient for grate	3.0	
$C_o=$	Orifice coefficient	0.67	
$R_o=$	Grate opening factor	0.60	
$C_{fg}=$	Clogging Factor for Grate	50	%
$C_{fc}=$	Clogging Factor for Curb Opening	50	%

Grate Capacity Calculations:

$P_g=$	Active grate weir length (agwl) = 2*W+Lg	5.50	ft
P_{agl}	Adjusted agwl = 2*(1-Cfg/100)*W+Lg	4.00	ft
$A_g=$	Grate area = $W*L_g$	3.75	ft^2
$A_{aga}=$	Adjusted open grate area = Ag*Ro*(1-Cfg/100)	1.13	ft^2
	check - If Dp<1.792*Aaga/Pagl; weir; else orifice	orifice	
$Q_{ig}=$	Flow intercepted by grate If "weir" controls Qig=Cwg*Pagl*$Dp^{1.5}$ If "orifice" controls Qig=Co*Aaga*$(64.4*Dp)^{0.5}$	5.5	cfs

Curb Opening Capacity Calculations

Pc =	Active curb opening weir length (acowl) = Lc+1.8*W	7.70	ft
Pacl	Adjusted acowl = Lc+1.8*(1-Cfc/100)*W	6.35	ft
Ac=	curb opening area (coa) = Lc*Hc	2.50	ft^2
$A_{aca}=$	Adjusted coa = Ac*(1-Cfc/100)	1.25	ft^2
	check - If Dp<Hc; weir; else orifice	orifice	
Qic=	Flow intercepted by curb opening If "weir" controls Qic=Cwc*Pacl*Dp1.5 If "orifice" controls Qic=Co*Aaca*(64.4*Dp-Hc/2)0.5	6.1	cfs

Total Inlet Calculations

Qti =	Flow Interception Capacity = Qig+Qic	11.6	cfs
q =	Interception per unit ratio = Q_{ti}/L_g	2.32	cfs/ft

Actual Flow Collected by Drop Inlet 4 cfs

A.4. Master Conceptual Drainage Study for Summerlin West Village 22 DS#5005

CITY OF LAS VEGAS
INTER-OFFICE MEMORANDUM

DATE: 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
Howard Hughes Company, LLC
Bart Anderson, P.E., DevCo
CCRFCD
CCPW

Cross Streets:	I-215 Western Beltway & Summerlin Parkway	
File Number:	F:\Depot\DSMemos\DS5005H.doc	
Parcel Number:	137-14-401-006, 137-23-101-002	
Zoning Action:	MDR-73901	
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES X	NO

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	6/12/2018	6/28/2018 & 7/13/2018	Not Approved	$400.00	49696: $400
2nd Submittal	7/31/2018	8/22/2018	Not Approved	$400.00	497790: $400
3rd 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
CCRFCD	1/10/2019	1/10/2019	Concurrence Recv'd	N/C	N/C
4th Submittal	2/12/2019	3/6/2019	Not Approved	$100.00	503164: $100
5th Submittal	3/21/2019	4/4/2019	Conditional Approval	$400.00	3057847: $400
CCPW & CCRFCD	4/25/2019 & 5/23/2019	5/29/2019	Concurrence Received	N/C	N/C
6th 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 & CCRFCD	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

A.5. Village 27 Rough Grade Package Update#1 DS#5464

CITY OF LAS VEGAS **INTER-OFFICE MEMORANDUM**				**DATE:** **May 3, 2022**
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 27 – Rough Grading – Update #1				Atkins
Cross Streets:	Lake Mead Blvd. & Park Drift Trail			Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5464C.doc			Bart Anderson, P.E., DevCo
Parcel Number:	137-21-501-001 & More			
Zoning Action:	N/A			
FEMA Flood Zone	YES	NO	**X**	
Proposed Storm Drain	YES	NO	**X**	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	6/24/2021	7/7/2021	Not Approved	$400.00	4345199: $400
2nd Submittal	9/1/2021	9/15/2021	Approved	$400.00	4435303: $400
3rd Submittal & Supplement	4/12/2022 & 5/2/2022	5/3/2022	See Comments Below	$400.00	4736267: $400
			TOTAL FEES (LDDRS):	**$1,200.00**	**----**

REMARKS:

3rd Submittal & Supplement: Update #1 for grading revision and addition of berm

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 project proposes to construct temporary drainage facility such as berms / swales along the sides of the rough graded roadways for flow perpetuation. Prior to final plan approval the developer must complete a maintenance and liability agreement for the interim drainage improvements and post a minimum maintenance bond of $50,000 or 50-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for constructing the facility and an exhibit that adequately shows the location and limits of the drainage facility to *City of Las Vegas Flood Control* for approval. Once the drainage study is conditionally approved, the engineer should contact the City's Land Development Section (229-6371) to begin the agreement process.

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

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
AYS

T/R/S: T20S/R59E/15
AREA K-15

HEC-1 Node	Type	Tributary Area (sq mi)	DARF	100-Year Discharge (cfs)
EX-1	Sub	1.2	0.95	1292
EX-2	Sub	0.91	0.98	1025
EX-0	Sub	2.23	0.93	2240
CP1.1a	CP	4.34	0.91	2352
EX-3	Sub	0.37	0.99	583
CP1.1b	CP	4.71	0.91	2457
COS-8b	Sub	0.03	0.99	37
C-a	Sub	0.03	0.99	51
C-b	Sub	0.02	0.99	39
CP1.1c	CP	4.78	0.91	2468
E	Sub	0.08	0.99	156
PD1	Sub	0.01	0.99	17
PD2	Sub	0.001	0.99	4
CP1.1d	CP	4.87	0.91	2500
B	Sub	0.04	0.99	83
PD3	Sub	0.01	0.99	19
A-b	Sub	0.004	0.99	10
CP1.1e	CP	0.05	0.99	111
A-a	Sub	0.02	0.99	35
A-c	Sub	0.01	0.99	19
PD4	Sub	0.005	0.99	13
CP1.1f	CP	0.03	0.99	61
COS-3	Sub	0.05	0.99	87
G	Sub	0.02	0.99	34
F	Sub	0.04	0.99	73
LM1	Sub	0.01	0.99	17
LM2	Sub	0.01	0.99	18
CP3	CP	0.07	0.99	142
I-a	Sub	0.01	0.99	14
I-b	Sub	0.01	0.99	14
CB1	Sub	0.003	0.99	6
CPIB	CP	0.02	0.99	35
H-b	Sub	0.003	0.99	5
H-a	Sub	0.01	0.99	20
CPH	CP	0.02	0.99	26
SR1	Sub	0.01	0.99	20
CP4	CP	0.05	0.99	81
CB2	Sub	0.002	0.99	5
K	Sub	0.01	0.99	19
CP5	CP	0.02	0.99	23
COS-8c*	Sub	0.02	0.99	41

Type: Sub = Subbasin. CP = Concentration Point
*Flow referenced from approved first submittal DS#5464B

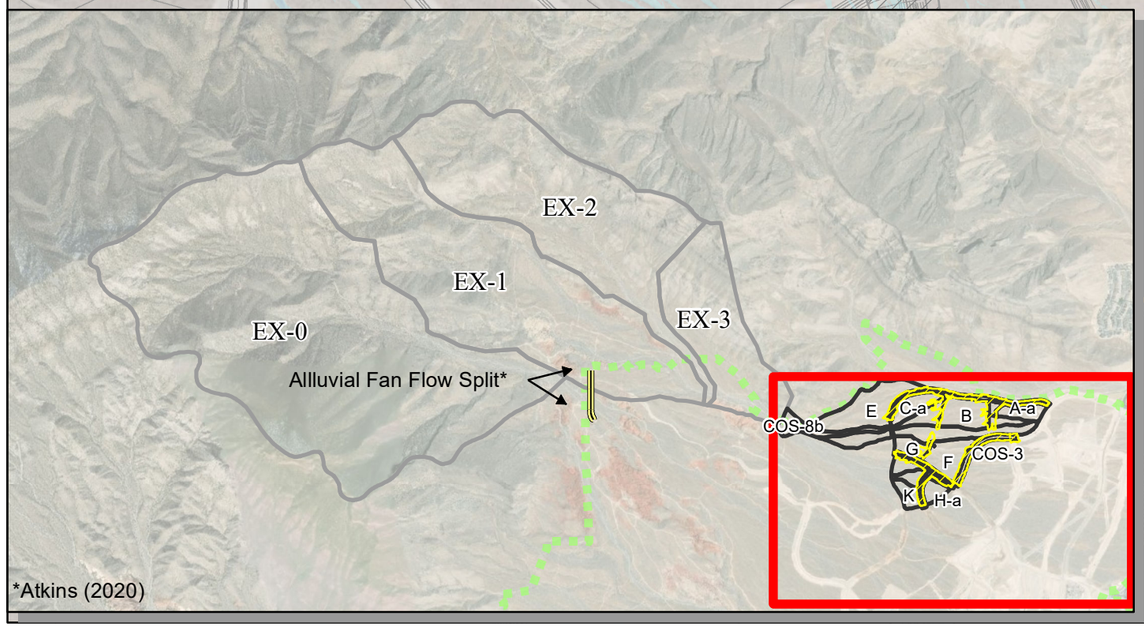


Figure 1: Hydrologic Map
Summerlin West Villlage 27 Rough Grade (Update 1)

Legend

- Rough Graded by Others
- WOTUS5 Berm
- Existing Facilities
- Additional Proposed RG Areas (Update 1)
- Previously Proposed RG Areas

Subbasins

- Off Site
- On Site
- Concentration Points

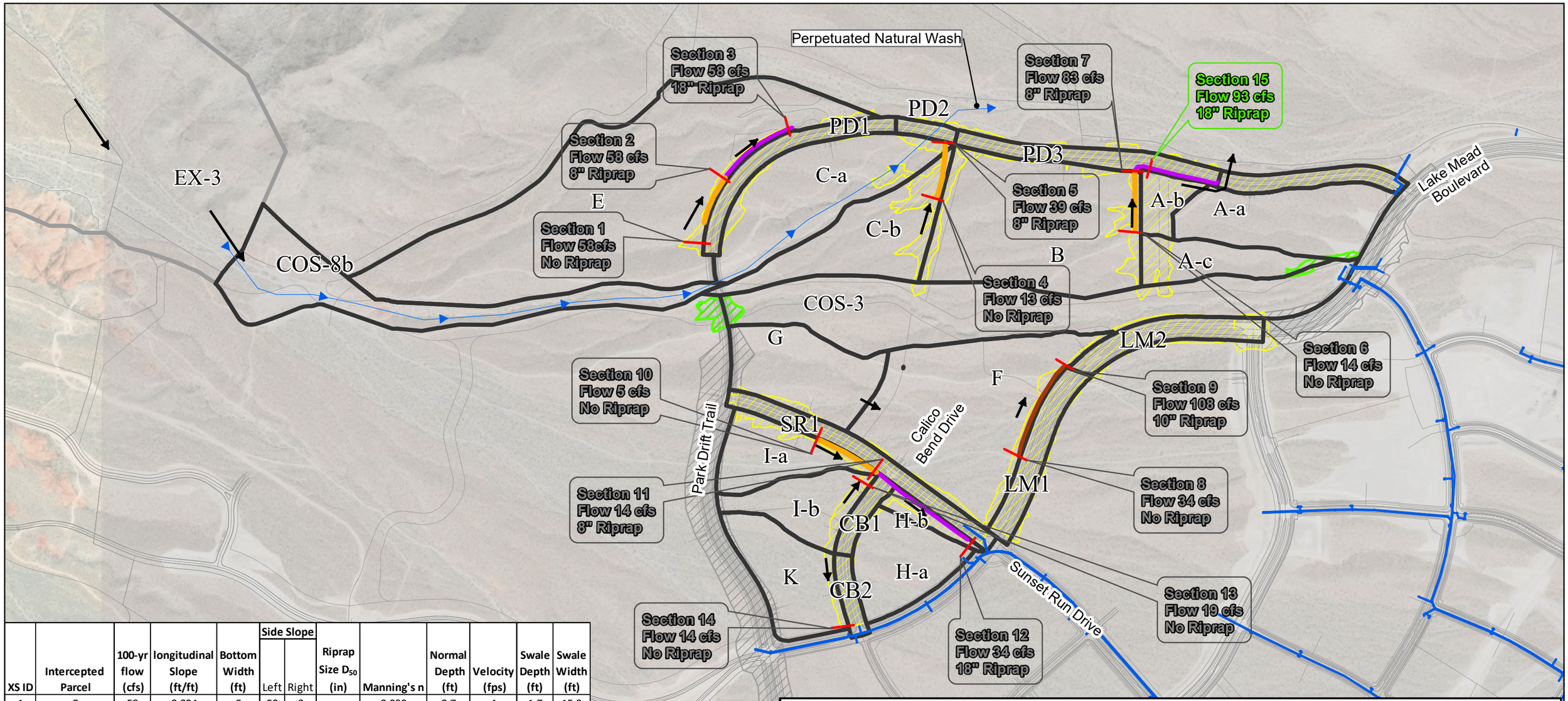
0 312.5 625 1,250 Feet
1 inch = 625 feet

N W E S

Howard Hughes THE HOWARD HUGHES CORPORATION

ATKINS Member of the SNC-Lavalin Group

Aerial Imagery Source:ESRI 2022
Projection: State Plane, Nevada East, NAD83 2011, US Feet



XS ID	Intercepted Parcel	100-yr flow (cfs)	longitudinal Slope (ft/ft)	Bottom Width (ft)	Side Slope		Riprap Size D_{50} (in)	Manning's n	Normal Depth (ft)	Velocity (fps)	Swale Depth (ft)	Swale Width (ft)
					Left	Right						
1	E	58	0.024	5	50	3	-	0.030	0.7	4	1.7	15.2
2	E	58	0.024	5	3	3	8	0.037	1.2	6	2.2	18.2
3	E	58	0.085	5	3	3	18	0.042	1.6	10	2.6	20.6
4	C-b*	13	0.044	5	3	3	-	0.030	0.2	3	1.2	12.2
5	C-b	39	0.044	5	3	3	8	0.037	0.9	6	1.9	16.4
6	B*	14	0.014	5	3	3	-	0.030	0.6	3	1.6	14.6
7	B	83	0.014	5	3	3	8	0.037	1.7	5	2.7	21.2
8	F*	13	0.042	5	3	3	-	0.030	0.4	5	1.4	13.4
9	F + G	108	0.042	5	3	3	10	0.038	1.5	8	2.5	20
10	I-a*	5	0.109	5	3	3	-	0.030	0.2	5	1.2	12.2
11	I-a	14	0.109	5	3	3	8	0.037	0.4	6	1.4	13.4
12	I-a, I-b, H-b & CB1	39	0.109	5	3	3	18	0.042	0.7	8	1.7	15.2
13	I-b	14	0.049	5	3	3	-	0.030	0.4	5	1.4	13.4
14	K	19	0.038	5	3	3	-	0.030	0.5	5	1.5	14
15	B+PD3	92.5	0.061	5	3	3	18	0.042	1.2	9	2.2	12.17

*Flows are prorated based on contributing areas.
Riprap details are shown in greater detail in the plans.

Figure 2: Hydraulic Map
Summerlin West Village 27 Rough Grade (Update 1)

Legend

- Riprap 8"
- Riprap 10"
- Riprap 18"
- Existing Facilities
- Proposed Rough Grade Area
- Additional Proposed RG Areas (Update 1)
- Rough Graded By Others
- Additional Swales

Subbasins

- Off Site
- On Site

0 625 1,250 Feet

1 inch = 625 feet

N W E S

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Aerial Imagery Source:ESRI 2019
Projection: State Plane, Nevada East, NAD83 2011, US Feet

A.6. Village 27 Lake Mead Boulevard (Scurry Bend Drive to Sunset Run Drive) Update#1 DS#5488

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: July 11, 2022
TO: **Land Development Services** Department of Building & Safety			**FROM:** Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Summerlin Village 27 Lake Mead Boulevard – Update #1 – Scurry Bend Drive to Sunset Run Drive**		**COPIES TO:** Atkins
Cross Streets:	Lake Mead Boulevard (from Scurry Bend to Sunset Run)		Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5488D.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-15-811-001, 137-15-801-002		
Zoning Action:	N/A		
FEMA Flood Zone	YES	NO **X**	
Proposed Storm Drain	YES **X**	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	8/25/2021	9/13/2021	Not Approved	$400.00	4424030: $400
2nd Submittal	11/18/2021	12/16/2021	Not Approved	$400.00	4542754: $400
3rd Submittal	2/15/2022	3/3/2022	Conditional Approval	$400.00	4652485: $400
4th Submittal (Paid on 6/28/2022)	6/22/2022 & 6/28/2022	7/11/2022	See Comments Below	$100.00	4844570: $100
			TOTAL FEES (LDDRS):	**$1,300.00**	**----**

REMARKS:

4th Submittal: Update #1 to add a stub at the intersection with future *Street F*

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

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

1. **Second Request**: *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.*

   Provide proof of approval such as an email from the *City Building & Safety Department* prior to the final approval of the subject improvement plans.

2. The subject project is based on the premise that the downstream *Scurry Bend Drive* and the associated storm drain facilities are in place for flood flow perpetuation. The subject drainage study will not be finally approved prior to the posting of the construction bonds of the *Summerlin West Village 22 – Lake Mead Boulevard (Kettle Ridge to Scurry Bend)* street improvements project.

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

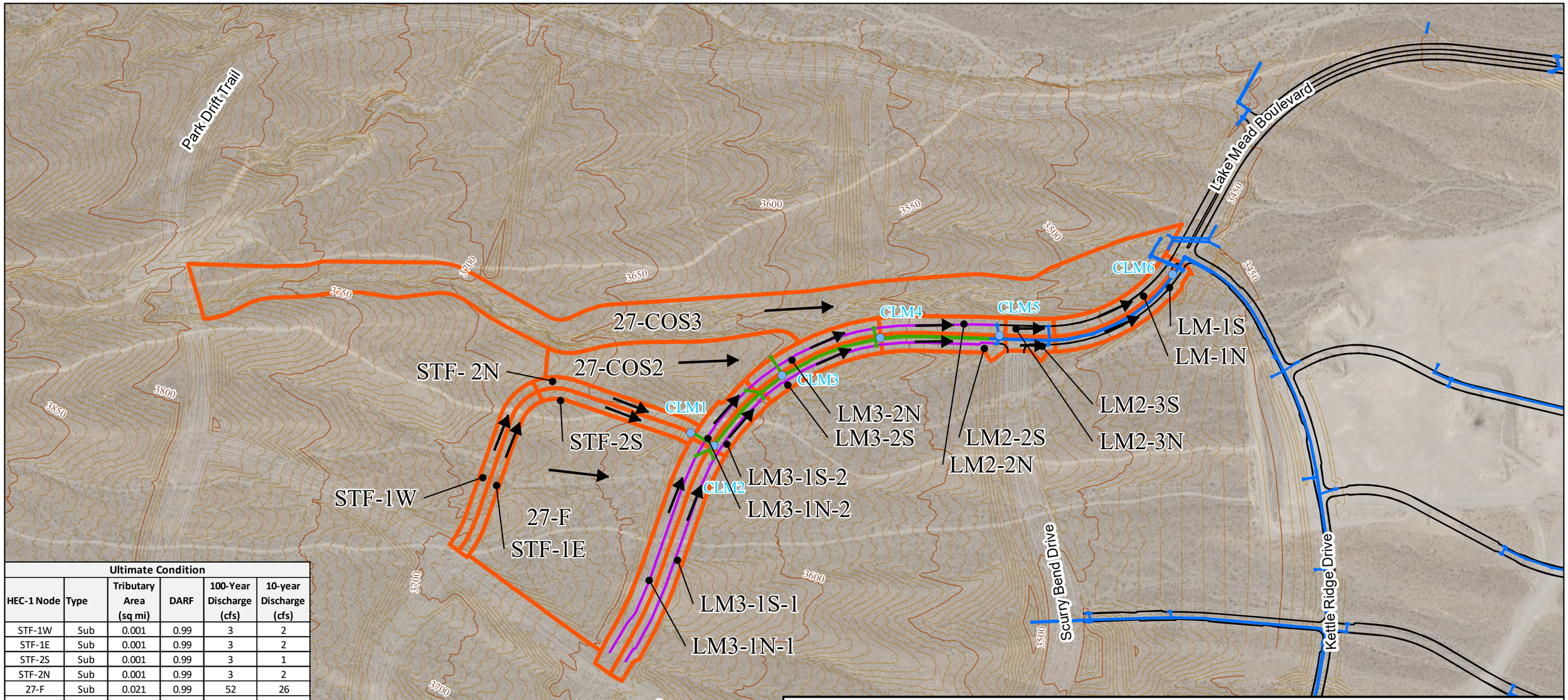
   In order for the maintenance bond to be released in the future, a drainage update / letter will be required to justify that the offsite berms / channels are no longer necessary and can be removed.

4. All interim flood control facilities such as but not limited to berms/ditches and temporary sump are privately owned and to be privately maintained by the *Howard Hughes Company.*

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/15
AREA K-15



Ultimate Condition					
HEC-1 Node	Type	Tributary Area (sq mi)	DARF	100-Year Discharge (cfs)	10-year Discharge (cfs)
STF-1W	Sub	0.001	0.99	3	2
STF-1E	Sub	0.001	0.99	3	2
STF-2S	Sub	0.001	0.99	3	1
STF-2N	Sub	0.001	0.99	3	2
27-F	Sub	0.021	0.99	52	26
CLM1	**CP**	0.0300	0.99	**64**	**32**
LM3-1N-1	Sub	0.003	0.99	8	4
LM3-1S-1	Sub	0.003	0.99	7	4
CLM2	**CP**	0.0300	0.99	**79**	**40**
LM3-1N-2	Sub	0.001	0.99	2	1
LM3-1S-2	Sub	0.001	0.99	**2**	**1**
27-COS2	Sub	0.008	0.99	16	7
CLM3	**CP**	0.0400	0.99	**100**	**50**
LM3-2N	Sub	0.002	0.99	4	2
LM3-2S	Sub	0.001	0.99	4	2
CLM4	**CP**	0.0400	0.99	**108**	**54**
LM2-2N	Sub	0.001	0.99	4	2
LM2-2S	Sub	0.001	0.99	4	2
CLM5	**CP**	0.0500	0.99	**115**	**58**
LM2-3N	Sub	0.001	0.99	1	1
LM2-3S	Sub	0.001	0.99	1	1
LM-1N	Sub	0.002	0.99	4	2
LM-1S	Sub	0.002	0.99	4	2
CLM6	**CP**	0.05	0.99	**126**	**64**
27-COS3	Sub	0.025	0.99	47	22

Figure 4: Ultimate Conditions Hydrology - Update 1

Village 27 Lake Mead Boulevard (Scurry Bend to Sunset Run)

Legend

- Concentration Points
- Proposed Storm Drain
- Existing Storm Water Facilities
- Proposed Roadway
- Existing Roadway
- Ultimate Subbasins
- Contours 50ft
- Contours 5ft
- Proposed Future Developments

0 175 350 Feet

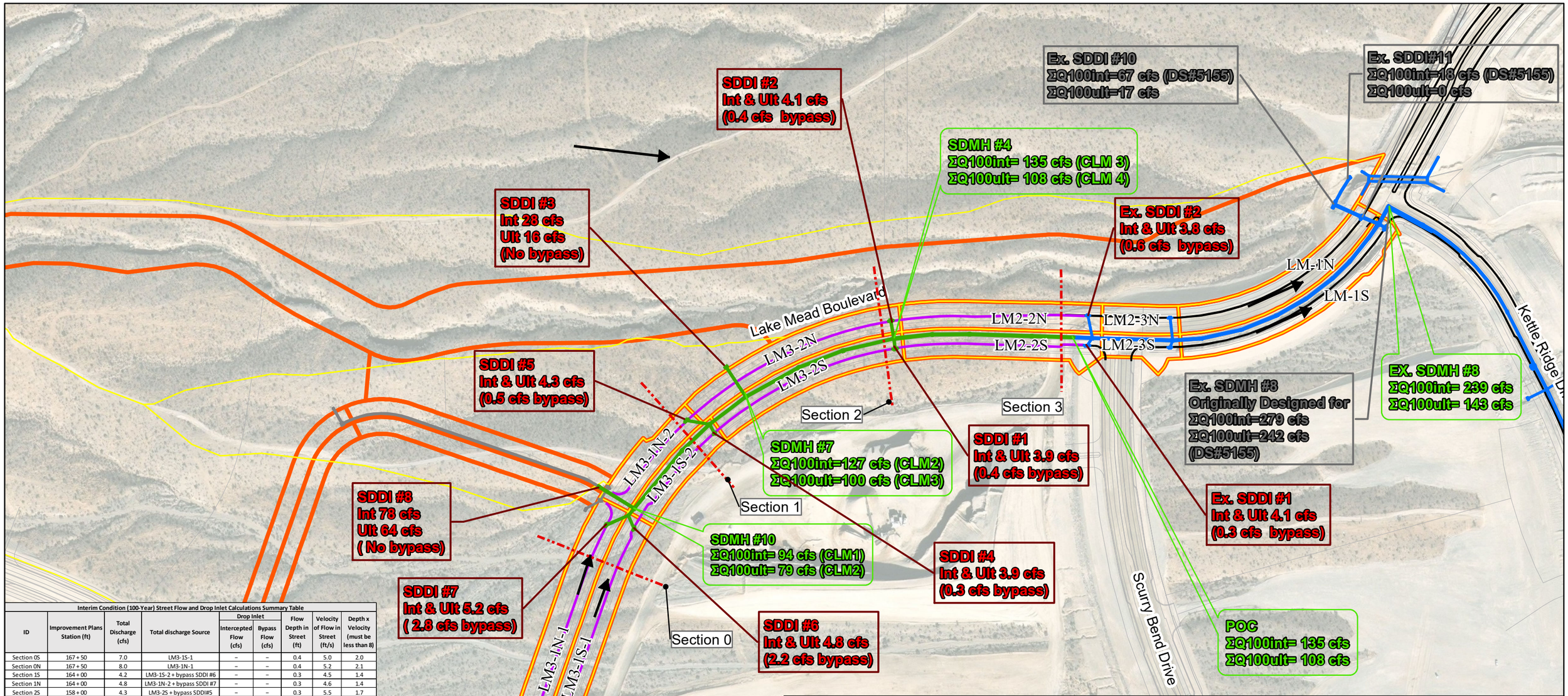
1 inch = 400 feet

N W E S

Howard Hughes
THE HOWARD HUGHES CORPORATION

ATKINS
Member of the SNC-Lavalin Group

Aerial Imagery Source:Clark County Aerials 2020
Projection: State Plane, Nevada East, NAD83 2011, US Feet



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

ID	Improvement Plans Station (ft)	Total Discharge (cfs)	Total discharge Source	Drop Inlet		Flow Depth in Street (ft)	Velocity of Flow in Street (ft/s)	Depth x Velocity (must be less than 8)
				Intercepted Flow (cfs)	Bypass Flow (cfs)			
Section 0S	167 + 50	7.0	LM3-1S-1	–	–	0.4	5.0	2.0
Section 0N	167 + 50	8.0	LM3-1N-1	–	–	0.4	5.2	2.1
Section 1S	164 + 00	4.2	LM3-1S-2 + bypass SDDI #6	–	–	0.3	4.5	1.4
Section 1N	164 + 00	4.8	LM3-1N-2 + bypass SDDI #7	–	–	0.3	4.6	1.4
Section 2S	158 + 00	4.3	LM3-2S + bypass SDDI#5	–	–	0.3	5.5	1.7
Section 2N	158 + 00	4.5	LM3-2N + bypass SDDI#4	–	–	0.3	5.6	1.7
Section 3S	153 + 50	4.4	LM2-2S + bypass SDDI#2	–	–	0.4	3.9	1.6
Section 3N	153 + 50	4.4	LM2-2N + bypass SDDI#1	–	–	0.4	3.9	1.6
SDDI #8	166 + 47.03	78.0	INT-F_G	78	0.0	–	–	–
SDDI #7	167 + 19.32	8.0	LM3-1N-1	5.2	2.8	–	–	–
SDDI #6	166 + 93.35	7.0	LM3-1S-1	4.8	2.2	–	–	–
SDDI #5	163 + 83.32	4.8	LM3-1N-2 + bypass SDDI #7	4.3	0.5	–	–	–
SDDI #4	163 + 50.92	4.2	LM3-1S-2 + bypass SDDI #6	3.9	0.3	–	–	–
SDDI #3	162 + 23.09	28.0	I-27 COS2	28	0.0	–	–	–
SDDI #2	157 + 96.09	4.5	LM3-2N + bypass SDDI#4	4.1	0.4	–	–	–
SDDI #1	157 + 96.87	4.3	LM3-2S + bypass SDDI#5	3.9	0.4	–	–	–

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

ID	Improvement Plans Station (ft)	Total Discharge (cfs)	Total discharge Source	Drop Inlet		Flow Depth in Street (ft)	Velocity of Flow in Street (ft/s)	Depth x Velocity (must be less than 8)
				Intercepted Flow (cfs)	Bypass Flow (cfs)			
Section 0S	167 + 50	7.0	LM3-1S-1	–	–	0.4	5.0	2.0
Section 0N	167 + 50	8.0	LM3-1N-1	–	–	0.4	5.2	2.1
Section 1S	164 + 00	4.2	LM3-1S-2 + bypass SDDI #6	–	–	0.3	4.5	1.4
Section 1N	164 + 00	4.8	LM3-1N-2 + bypass SDDI #7	–	–	0.3	4.6	1.4
Section 2S	158 + 00	4.3	LM3-2S + bypass SDDI#5	–	–	0.3	5.5	1.7
Section 2N	158 + 00	4.5	LM3-2N + bypass SDDI#4	–	–	0.3	5.6	1.7
Section 3S	153 + 50	4.4	LM2-2S + bypass SDDI#2	–	–	0.4	3.9	1.6
Section 3N	153 + 50	4.4	LM2-2N + bypass SDDI#1	–	–	0.4	3.9	1.6
SDDI #8	166 + 47.03	64.0	CLM1	64	0.0	–	–	–
SDDI #7	167 + 19.32	8.0	LM3-1N-1	5.2	2.8	–	–	–
SDDI #6	166 + 93.35	7.0	LM3-1S-1	4.8	2.2	–	–	–
SDDI #5	163 + 83.32	4.8	LM3-1N-2 + bypass SDDI #7	4.3	0.5	–	–	–
SDDI #4	163 + 50.92	4.2	LM3-1S-2 + bypass SDDI #6	3.9	0.3	–	–	–
SDDI #3	162 + 23.09	16.0	27 COS2	16	0.0	–	–	–
SDDI #2	157 + 96.09	4.5	LM3-2N + bypass SDDI#4	4.1	0.4	–	–	–
SDDI #1	157 + 96.87	4.3	LM3-2S + bypass SDDI#5	3.9	0.4	–	–	–

Figure 5: Hydraulics Workmap - Update 1

Village 27 Lake Mead Boulevard (Scurry Bend to Sunset Run)

Legend

- Proposed Storm Drain
- Future Storm Drain
- Existing Storm Water Facilities
- Proposed Roadway
- Existing Roadway
- Interim Subbasins
- Ultimate Subbasins
- Proposed Future Developements

Intercepted Flow (Bypass Flow)

0 62.5 125 250 Feet

1 inch = 250 feet

N W E S

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Aerial Imagery Source:ESRI 2019
Projection: State Plane, Nevada East, NAD83 2011, US Feet

A.7. Village 27 Lake Mead Boulevard (Park Drift Trail to Mountain Run Drive) DS#5455

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: June 14, 2022
TO: **Land Development Services** Department of Building & Safety			FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Summerlin West Village 27 - Lake Mead Boulevard – Park Drift Trail to Mountain Run Drive**		**COPIES TO:** Atkins
Cross Streets:	Park Drift Trail and Mountain Run Drive		Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5455E.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-22-101-005, 137-21-501-001, 137-22-301-005, 137-21-701-001		CCRFCD
Zoning Action:			
FEMA Flood Zone	YES	NO **X**	
Proposed Storm Drain	YES **X**	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	5/18/2021	6/1/2021 & 6/9/2021	Not Approved	$400.00	4295558: $400
2nd submittal	10/6/2021 & 11/8/2021	11/16/2021	Not Approved	$400.00	4483803: $400
3rd Submittal	1/18/2022	2/10/2022	Conditional Approval	$400.00	4610397: $400
4th Submittal	4/26/2022	5/10/2022	Not Approved	$100.00	4755219: $100
5th Submittal	6/2/2022	6/14/2022	See Comments Below	$400.00	4814782: $400
			TOTAL FEES (LDDRS):	**$1,700.00**	**----**

REMARKS:

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

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

4th & 5th Submittals: Update #1 & Addendum #1 to remove the intersection of the Lake Mead Boulevard and Mountain Run Drive intersection

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

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

1. The project proposes to build temporary drainage facilities, ie, the interim berm upstream of the intersection of *Lake Mead Boulevard* and *Mountain Run Drive* and the berms/swales along the east and west bound *Lake Mead* roadways for interim flood protection. Prior to final plan approval the developer must complete a maintenance and liability agreement for the interim drainage improvements (berms or channels) and post a minimum maintenance bond of $50,000 or 50-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for constructing the facility and an exhibit that adequately shows the location and limits of the drainage facility to *City of Las Vegas Flood Control* for approval. Once the drainage study is conditionally approved, the engineer should contact the *City's Land Development Section* (229-6371) to begin the agreement process.

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

2. **This drainage study is acceptable in concept;** however, *City of Las Vegas* will not formally accept the study until the *Clark County Regional Flood Control District (CCRFCD)* has issued a letter of concurrence. The engineer should contact the CCRFCD to confirm that they have begun their review.

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

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

3. 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.

4. **Second Request:** *Submit a separate set of improvement plans to City of Las Vegas Street & Storm Services Division for their review. Contact Mr. Matthew Meyer of Operations and Maintenance Department at mmeyer@lasvegasnevada.gov for direction. Approval from Street & Storm Services must be obtained prior to the final approval of the drainage study.*

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

END OF REMARKS
HDR/AYS

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

(A)

Interim Condition Atkins				*Grand Park Detention Basin TDS VTN Interim Condition #2 Q100*
HEC-1 Node	HEC-1 Trib Area (sq mi)	Q10 (cfs)	Q100 (cfs)	
INT-A	0.2410	156	370	
INT-B	0.0880	55	136	
INTCOS7a	0.0012	1	2	
INTCOS7b	0.0134	10	24	
INT-L	0.1674	74	218	
LMBCOS1	0.0078	6	14	
LMBCOS2	0.0065	5	12	
LMBCOS3	0.0026	2	5	
NLMB1	0.0054	5	12	
NLMB2	0.0014	2	3	
SLMB1	0.0006	1	1	
SLMB2	0.0017	2	4	
SLMB3	0.0019	2	4	
SLMB4	0.0015	2	4	
SLMB5	0.0005	1	1	
SLMB6	0.0005	1	1	
ST5Fa	0.0004	0	1	
ST5Fb	0.0003	0	1	
ST5Fc	0.0009	1	2	
OFF4	0.0643	27	83	*95*
OFF5	0.0645	28	85	*76*
OFF6	0.0742	52	123	*129*
OFF7	0.0478	55	105	*91*
ON1	0.0551	81	152	*85*
CPAA	0.03	26	62	
CPBB	0.04	32	77	
CPCC	0.04	34	82	
CP4	0.21	107	296	
CP6	0.28	130	373	*237*
CP8	0.34	154	454	*308*
CP9	0.33	204	499	
CP9	0.33	204	499	*930*
GPDBIN	0.8	420	1,085	*1,233*
GPDB (out)	0.8	68	85	*88*

(B)

Interim Condition Atkins			
HEC-1 Node	HEC-1 Trib Area (sq mi)	Q10 (cfs)	Q100 (cfs)
INT-A	0.2410	156	370
INT-B	0.0880	55	136
INTCOS7a	0.0012	1	2
INTCOS7b	0.0134	10	24
INT-L	0.1674	74	218
**INT-La*	*0.0502*	*22*	*65*
**INT-Lb*	*0.1172*	*52*	*153*
LMBCOS1	0.0078	6	14
LMBCOS2	0.0065	5	12
LMBCOS3	0.0026	2	5
NLMB1	0.0054	5	12
NLMB2	0.0014	2	3
SLMB1	0.0006	1	1
SLMB2	0.0017	2	4
SLMB3	0.0019	2	4
SLMB4	0.0015	2	4
SLMB5	0.0005	1	1
SLMB6	0.0005	1	1
ST5Fa	0.0004	0	1
ST5Fb	0.0003	0	1
ST5Fc	0.0009	1	2
CPAA	0.03	26	62
CPBB	0.04	32	77
CPCC	0.04	34	82
CP4	0.21	107	296

** HEC-1 Subbasins Prorated by Area*

TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD
PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE

FIGURE 3-1: INTERIM HYDROLOGY WORKMAP (A) OVERALL (B) ZOOMED

Legend

- Combination Points (Interim)
- ROW
- Curb
- InterimFlow
- Future Roadways
- Proposed Storm Drain
- Existing SD Facilities
- Interim RipRap
- Subbasin (Interim)
- Prorated Interim Subbasins
- V30 Culvert and Rough Grading
- V30 Interim Rough Grading
- Proposed V27 Interim Berm
- Existing V30 Temporary Berm
- 50' Contours
- 10' Contours

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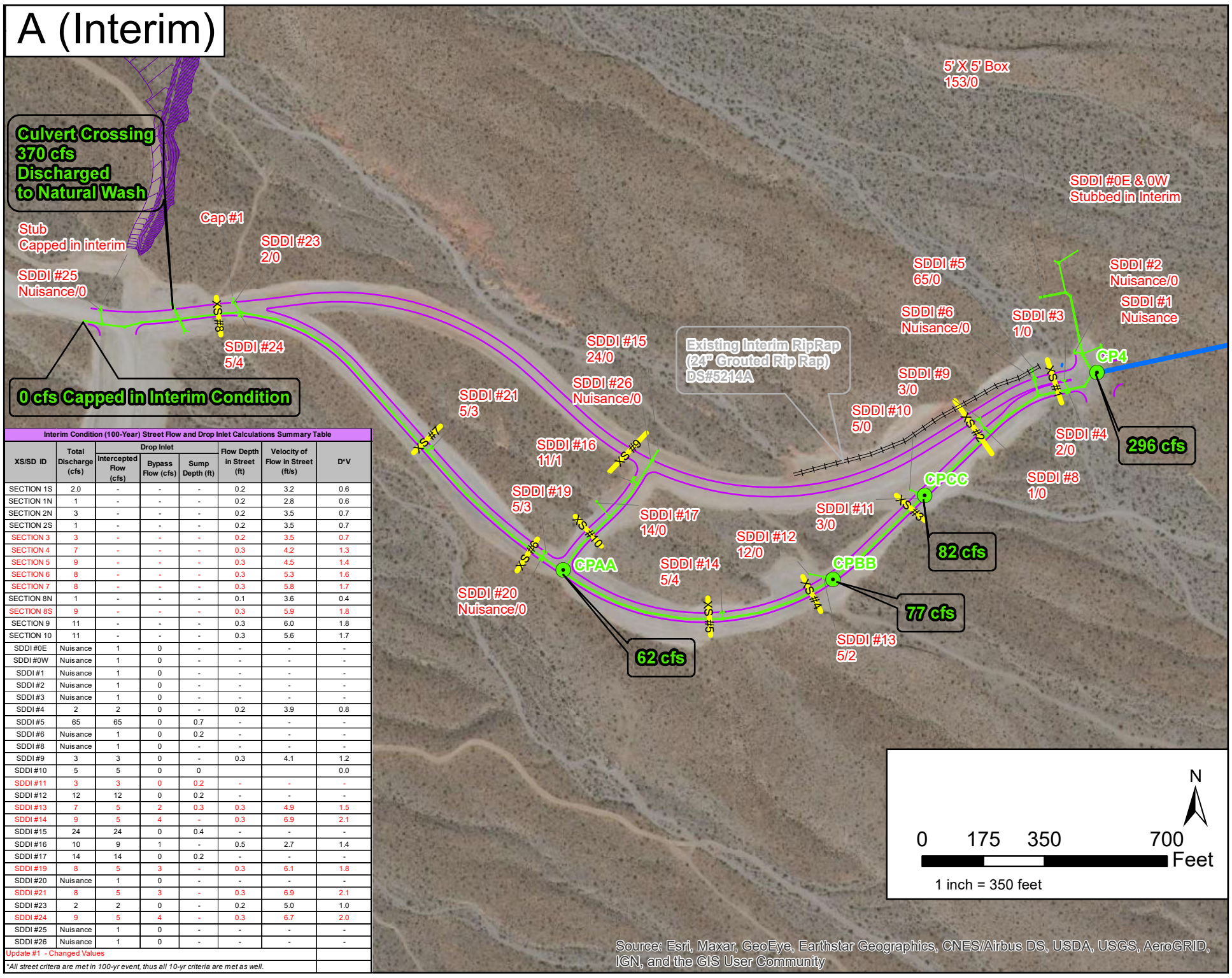
Aerial Source: Clark County (Most Current Flight)

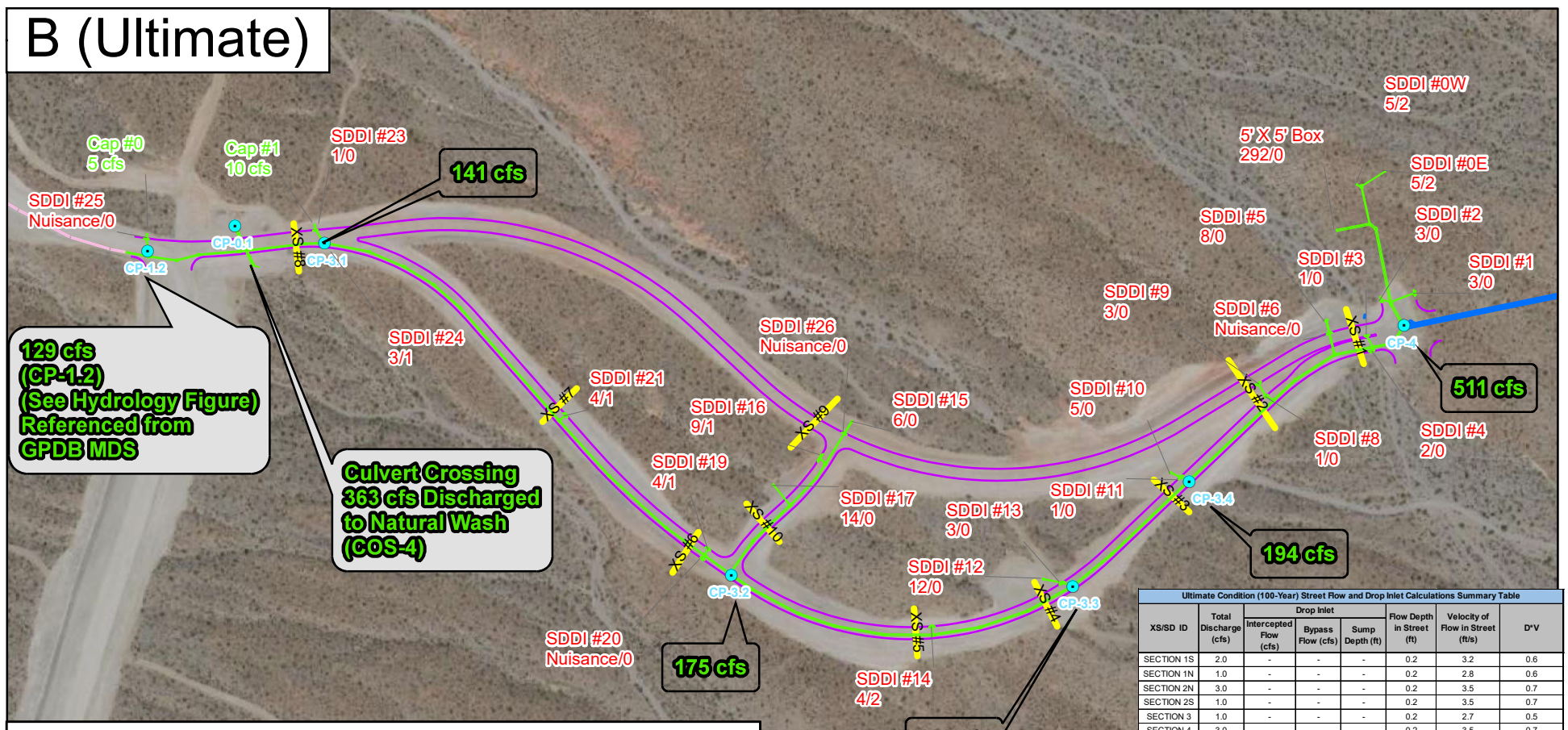
A (Interim)



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

XS/SD ID	Total Discharge (cfs)	Drop Inlet			Flow Depth in Street (ft)	Velocity of Flow in Street (ft/s)	D*V
		Intercepted Flow (cfs)	Bypass Flow (cfs)	Sump Depth (ft)			
SECTION 1S	2.0	-	-	-	0.2	3.2	0.6
SECTION 1N	1	-	-	-	0.2	2.8	0.6
SECTION 2N	3	-	-	-	0.2	3.5	0.7
SECTION 2S	1	-	-	-	0.2	3.5	0.7
SECTION 3	3	-	-	-	0.2	3.5	0.7
SECTION 4	7	-	-	-	0.3	4.2	1.3
SECTION 5	9	-	-	-	0.3	4.5	1.4
SECTION 6	8	-	-	-	0.3	5.3	1.6
SECTION 7	8	-	-	-	0.3	5.8	1.7
SECTION 8N	1	-	-	-	0.1	3.6	0.4
SECTION 8S	9	-	-	-	0.3	5.9	1.8
SECTION 9	11	-	-	-	0.3	6.0	1.8
SECTION 10	11	-	-	-	0.3	5.6	1.7
SDDI #0E	Nuisance	1	0	-	-	-	-
SDDI #0W	Nuisance	1	0	-	-	-	-
SDDI #1	Nuisance	1	0	-	-	-	-
SDDI #2	Nuisance	1	0	-	-	-	-
SDDI #3	Nuisance	1	0	-	-	-	-
SDDI #4	2	2	0	-	0.2	3.9	0.8
SDDI #5	65	65	0	0.7	-	-	-
SDDI #6	Nuisance	1	0	0.2	-	-	-
SDDI #8	Nuisance	1	0	-	-	-	-
SDDI #9	3	3	0	-	0.3	4.1	1.2
SDDI #10	5	5	0	0			0.0
SDDI #11	3	3	0	0.2	-	-	-
SDDI #12	12	12	0	0.2	-	-	-
SDDI #13	7	5	2	0.3	0.3	4.9	1.5
SDDI #14	9	5	4	-	0.3	6.9	2.1
SDDI #15	24	24	0	0.4	-	-	-
SDDI #16	10	9	1	-	0.5	2.7	1.4
SDDI #17	14	14	0	0.2	-	-	-
SDDI #19	8	5	3	-	0.3	6.1	1.8
SDDI #20	Nuisance	1	0	-	-	-	-
SDDI #21	8	5	3	-	0.3	6.9	2.1
SDDI #23	2	2	0	-	0.2	5.0	1.0
SDDI #24	9	5	4	-	0.3	6.7	2.0
SDDI #25	Nuisance	1	0	-	-	-	-
SDDI #26	Nuisance	1	0	-	-	-	-
Update #1 - Changed Values							
*All street critera are met in 100-yr event, thus all 10-yr criteria are met as well.							

B (Ultimate)



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

XS/SD ID	Total Discharge (cfs)	Drop Inlet			Flow Depth in Street (ft)	Velocity of Flow in Street (ft/s)	D*V
		Intercepted Flow (cfs)	Bypass Flow (cfs)	Sump Depth (ft)			
SECTION 1S	2.0	-	-	-	0.2	3.2	0.6
SECTION 1N	1.0	-	-	-	0.2	2.8	0.6
SECTION 2N	3.0	-	-	-	0.2	3.5	0.7
SECTION 2S	1.0	-	-	-	0.2	3.5	0.7
SECTION 3	1.0	-	-	-	0.2	2.7	0.5
SECTION 4	3.0	-	-	-	0.2	3.5	0.7
SECTION 5	6.0	-	-	-	0.3	4.1	1.2
SECTION 6	5.0	-	-	-	0.3	4.7	1.4
SECTION 7	5.0	-	-	-	0.2	5.2	1.5
SECTION 8N	1.0	-	-	-	0.1	3.6	0.4
SECTION 8S	4.0	-	-	-	0.2	5.2	0.4
SECTION 9	11.0	-	-	-	0.3	6.0	1.8
SECTION 10	11.0	-	-	-	0.3	5.6	1.7
**SDDI #0E	7	5	2	-	0.3	5.9	1.8
**SDDI #0W	7	5	2	-	0.3	5.9	1.8
**SDDI #1	3	3	0	-	0.4	4.3	1.7
**SDDI #2	3	3	0	-	0.4	4.4	1.8
SDDI #3	Nuisance	1	0	-	-	-	-
SDDI #4	2	2	0	-	0.2	3.9	0.8
SDDI #5	8	5	0	0	-	-	-
SDDI #6	Nuisance	1	0	-	-	-	-
SDDI #8	Nuisance	1	0	-	0.2	3.4	0.7
SDDI #9	3	3	0	-	0.3	4.1	1.2
SDDI #10	5	5	0	0	-	-	-
SDDI #11	Nuisance	1	0	-	-	-	-
SDDI #12	12	12	0	0.1	-	-	-
SDDI #13	3	3	0	0.3	-	-	-
SDDI #14	6	4	2	-	0.3	6.3	1.9
SDDI #15	6	6	0	0.4	-	-	-
SDDI #16	10	9	1	-	0.5	2.6	1.3
SDDI #17	14	14	0	0.2	-	-	-
SDDI #19	5	4	1	-	0.3	5.5	1.7
SDDI #20	Nuisance	1	0	-	-	-	-
SDDI #21	5	4	1	-	0.3	6.2	1.9
SDDI #23	1	1	0	-	0.2	4.6	0.9
SDDI #24	4	1	0	-	0.3	5.7	1.7
SDDI #25	Nuisance	1	0	-	-	-	-
SDDI #26	Nuisance	1	0	-	-	-	-
Update #1 - Changed Values							

*All street critera are met in 100-yr event, thus all 10-yr criteria are met as well.
** ST14 Flows Prorated by area

TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD
PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE

FIGURE 4: HYDRAULIC WORKMAP (A) INTERIM (B) ULTIMATE

Legend

- Combination Points
- Interim Existing RipRap
- Proposed Storm Drain
- Existing Storm Drain
- Future Storm Drain
- Proposed Roadway Curb
- Proposed V27 Interim Berm
- Sections

100-Yr Storm Drain Flows

100-Yr
Drop Inlet Calculations
SDDI #
Intercepted (cfs) / Bypass (cfs)

0 150 300 600
Feet
1 inch = 350 feet

N

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Aerial Source: Clark County Spring 2020

Source: Esri, Maxar, GeoEye, Earthstar Geogr
IGN, and the GIS User Community

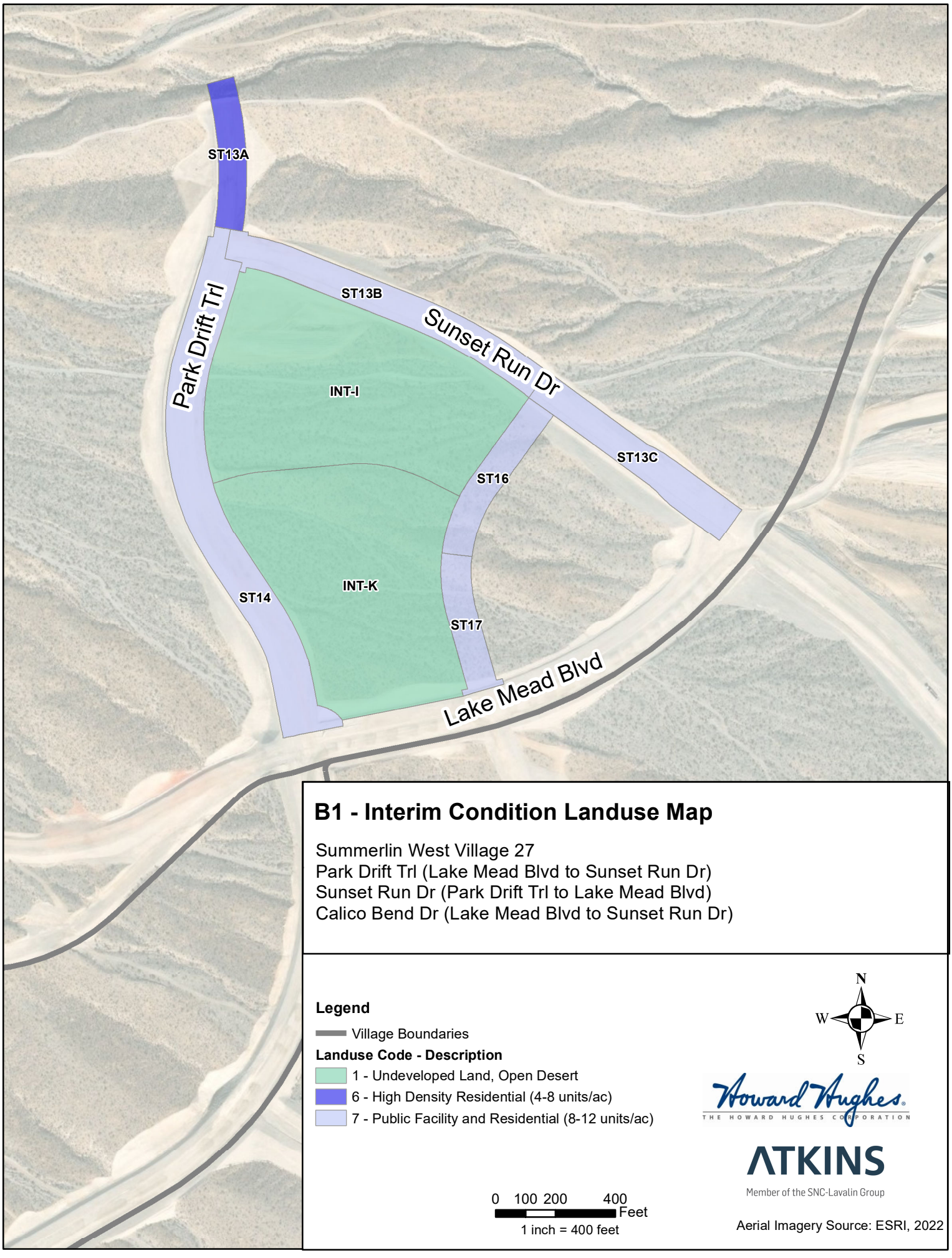
Appendix B. Hydrology Appendix

B.1. Landuse, Soil and Rainfall Maps

B.2. Parameters

B.3. HEC-1 Model

B.1 Landuse, Soil and Rainfall Maps



B1 - Interim Condition Landuse Map

Summerlin West Village 27
Park Drift Trl (Lake Mead Blvd to Sunset Run Dr)
Sunset Run Dr (Park Drift Trl to Lake Mead Blvd)
Calico Bend Dr (Lake Mead Blvd to Sunset Run Dr)

Legend

Village Boundaries

Landuse Code - Description

- 1 - Undeveloped Land, Open Desert
- 6 - High Density Residential (4-8 units/ac)
- 7 - Public Facility and Residential (8-12 units/ac)

N
W E
S

0 100 200 400 Feet
1 inch = 400 feet

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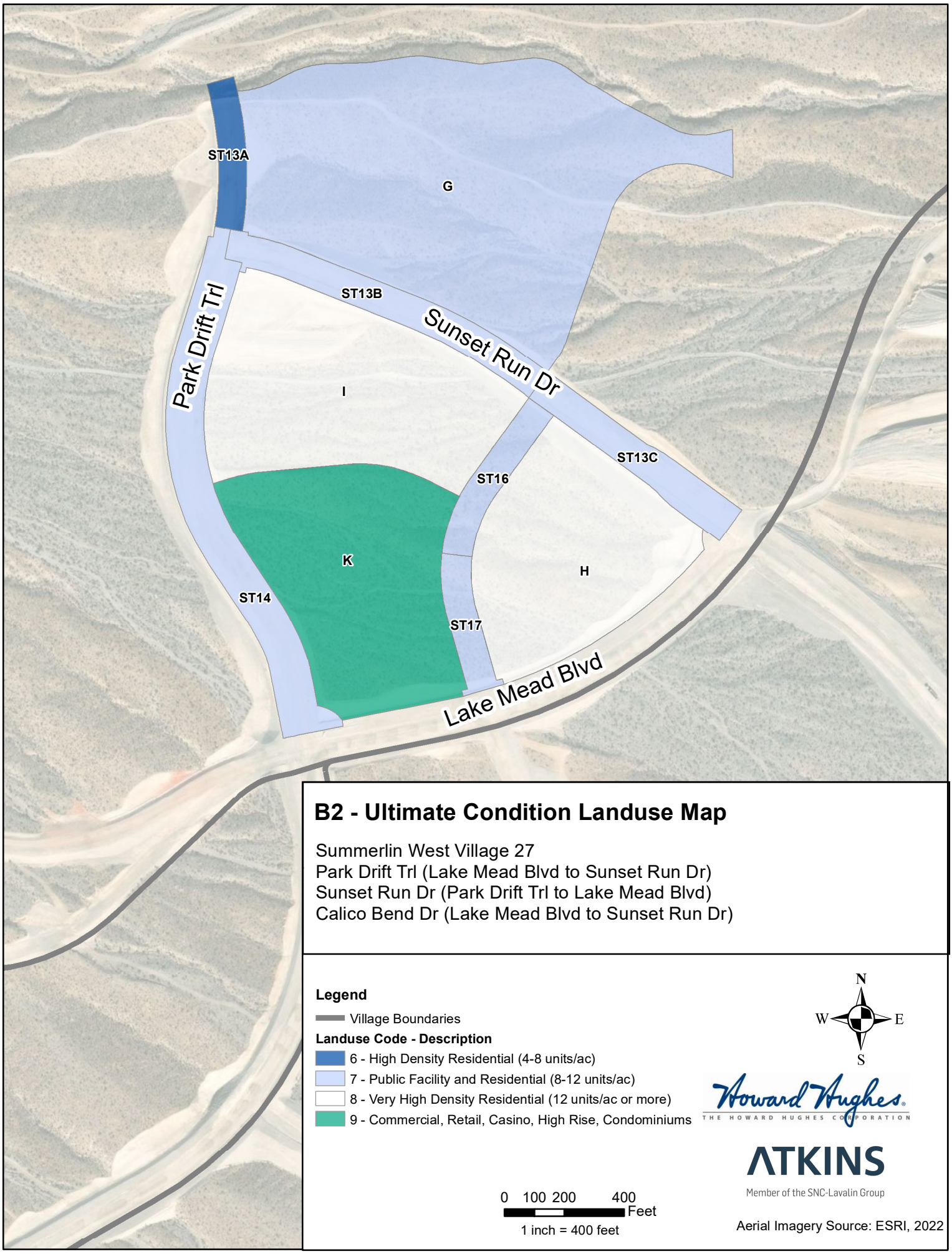
Aerial Imagery Source: ESRI, 2022



B2 - Ultimate Condition Landuse Map

Summerlin West Village 27
Park Drift Trl (Lake Mead Blvd to Sunset Run Dr)
Sunset Run Dr (Park Drift Trl to Lake Mead Blvd)
Calico Bend Dr (Lake Mead Blvd to Sunset Run Dr)

Legend

Village Boundaries

Landuse Code - Description

- 6 - High Density Residential (4-8 units/ac)
- 7 - Public Facility and Residential (8-12 units/ac)
- 8 - Very High Density Residential (12 units/ac or more)
- 9 - Commercial, Retail, Casino, High Rise, Condominiums

N
W E
S

0 100 200 400 Feet

1 inch = 400 feet

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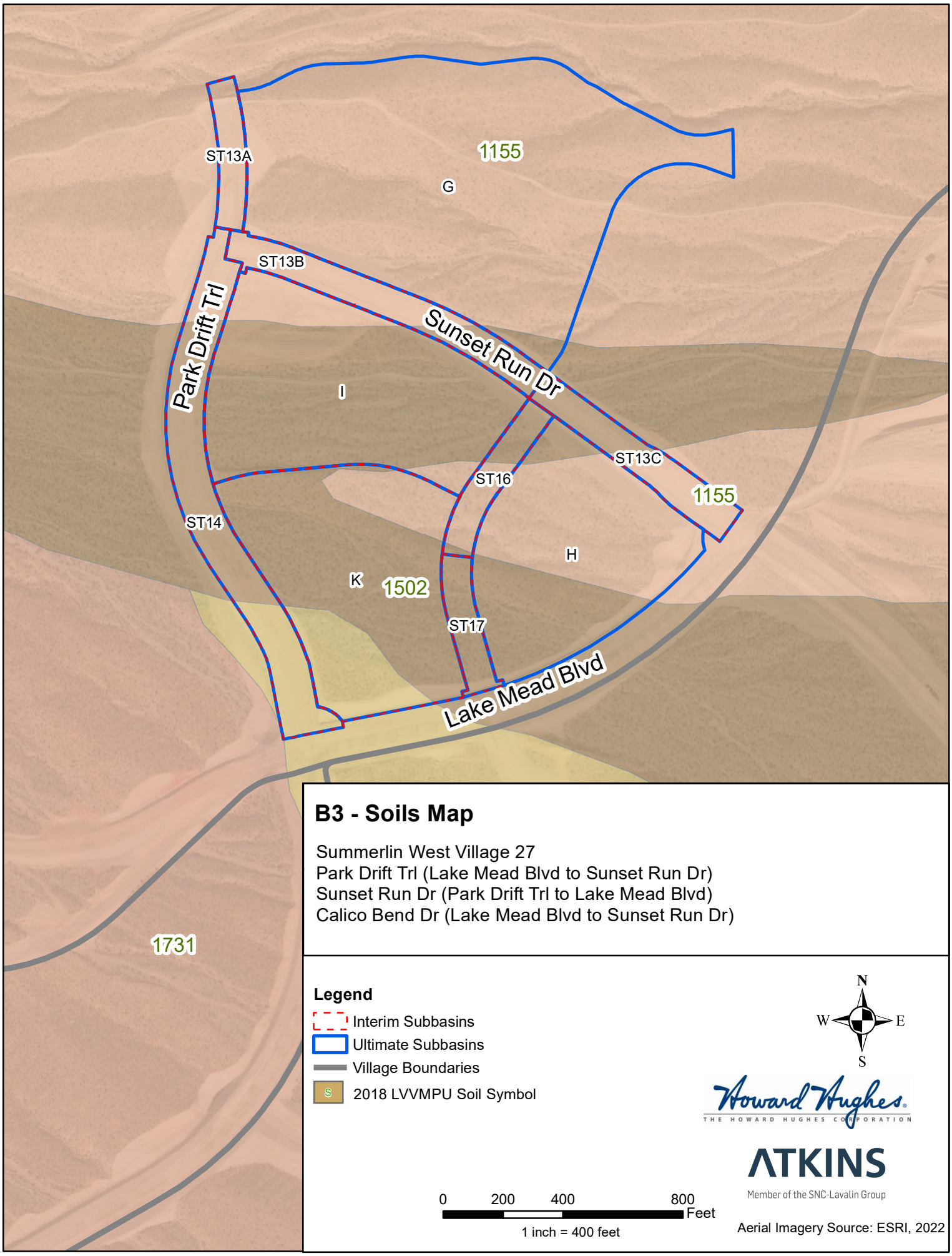
Aerial Imagery Source: ESRI, 2022



B3 - Soils Map

Summerlin West Village 27
Park Drift Trl (Lake Mead Blvd to Sunset Run Dr)
Sunset Run Dr (Park Drift Trl to Lake Mead Blvd)
Calico Bend Dr (Lake Mead Blvd to Sunset Run Dr)

Legend

- Interim Subbasins
- Ultimate Subbasins
- Village Boundaries
- S — 2018 LVVMPU Soil Symbol

N
W E
S

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ATKINS
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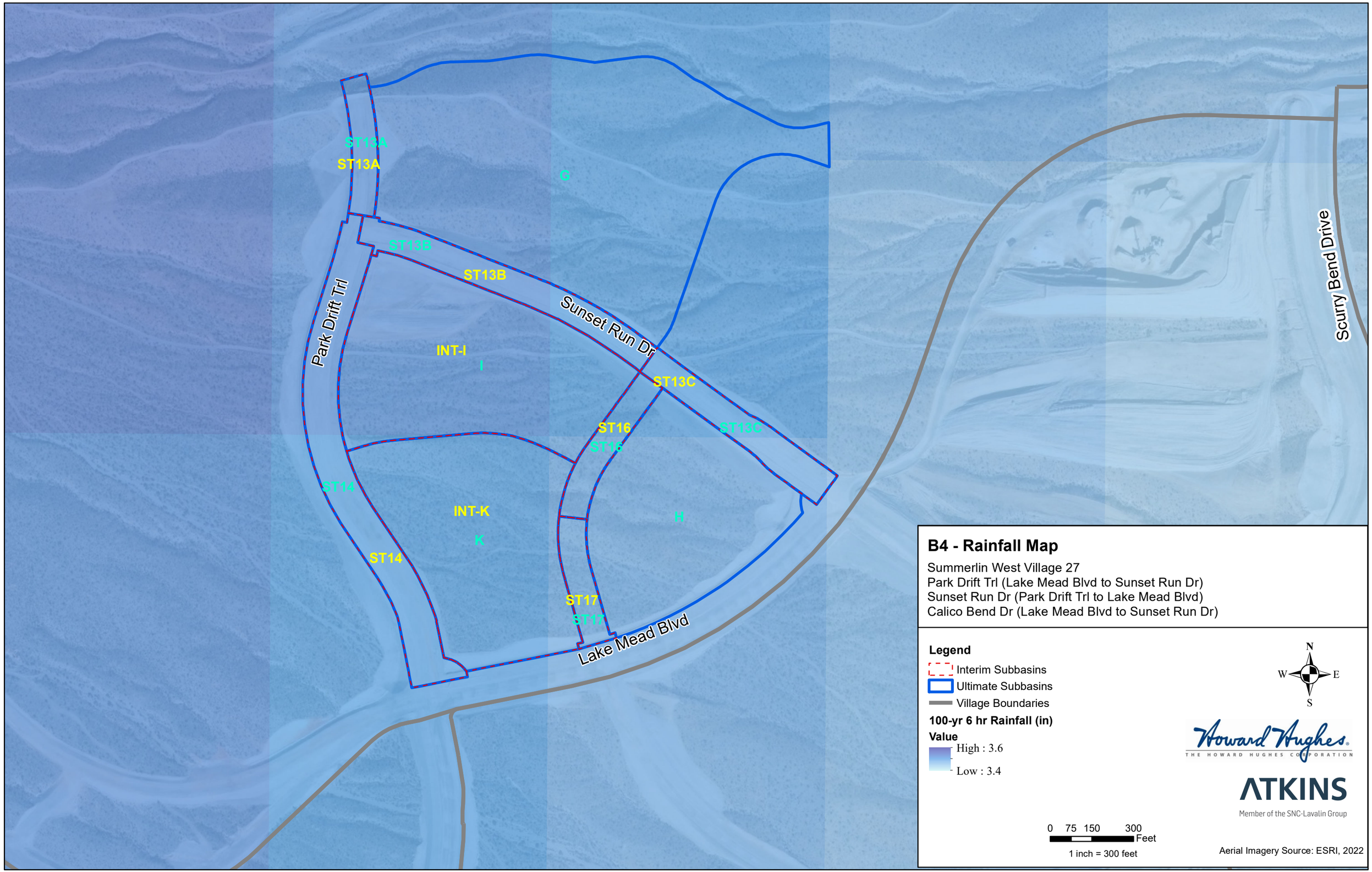
0 200 400 800 Feet

1 inch = 400 feet

Aerial Imagery Source: ESRI, 2022



B4 - Rainfall Map

Summerlin West Village 27
Park Drift Trl (Lake Mead Blvd to Sunset Run Dr)
Sunset Run Dr (Park Drift Trl to Lake Mead Blvd)
Calico Bend Dr (Lake Mead Blvd to Sunset Run Dr)

Legend

- Interim Subbasins
- Ultimate Subbasins
- Village Boundaries

100-yr 6 hr Rainfall (in)

Value

- High : 3.6
- Low : 3.4

N
W E
S

Howard Hughes
THE HOWARD HUGHES CORPORATION

ATKINS
Member of the SNC-Lavalin Group

0 75 150 300
Feet

1 inch = 300 feet

Aerial Imagery Source: ESRI, 2022

B.2 Parameters

Typical Sections for Roadways

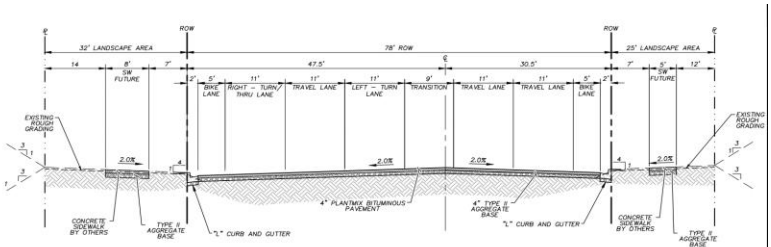
Ft	Type
0	*Setback*
14	Landscape
8	Sidewalk
7	Landscape
78	Paved
7	Landscape
5	Sidewalk
12	Landscape
0	Setback

Total
131

% Impervious
69.5%

Impervious total
91

MPU Landuse Index based on table from Sheet Landuse MPU 7



PARK DRIFT TRAIL - 78' ROW
N.T.S.
B 59

Ft	Type
0	*Setback*
13	Landscape
5	Sidewalk
7	Landscape
55.5	Paved
7	Landscape
8	Sidewalk
10	Landscape
0	Setback

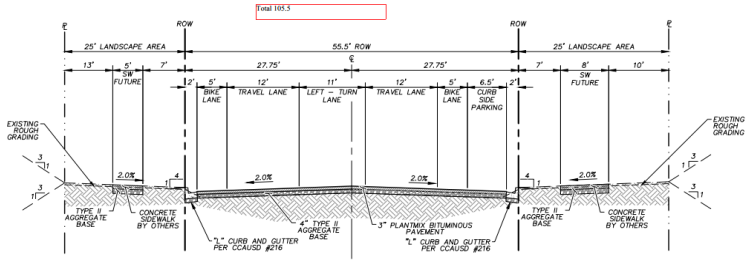
Total
105.5

% Impervious
64.9%

Impervious total
68.5

MPU Landuse Index based on table from Sheet Landuse MPU 7

Total 105.5



SUNSET RUN DRIVE - RIGHT CURB SIDE PARKING
N.T.S.
C 60

Ft	Type
0	*Setback*
13	Landscape
5	Sidewalk
7	Landscape
78.5	Paved
7	Landscape
8	Sidewalk
10	Landscape
0	Setback

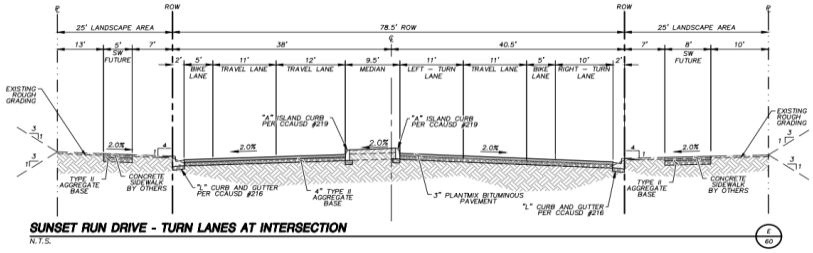
Total
128.5

% Impervious
71.2%

Impervious total
91.5

MPU Landuse Index based on table from Sheet Landuse MPU 7

128.5



SUNSET RUN DRIVE - TURN LANES AT INTERSECTION
N.T.S.
E 60

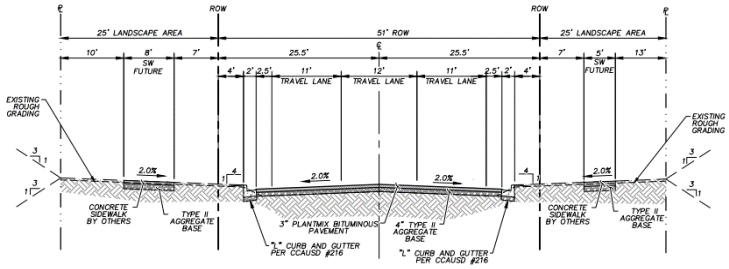
Ft	Type
0	*Setback*
10	Landscape
8	Sidewalk
7	Landscape
51	Paved
7	Landscape
5	Sidewalk
13	Landscape
0	Setback

Total
101

% Impervious
63.4%

Impervious total
64

MPU Landuse Index based on table from Sheet Landuse MPU 7



CALICO BEND DRIVE - NO PARKING
N.T.S.
H 61

Standard Form 4

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

TIME OF CONCENTRATION

Atkins
File: FORM4.XLS

ATKINS
Member of the SNC-Lavalin Group

Summerlin West Village 27
Park Drift Trail, Sunset Run Drive and Calico Bend Drive
(Triple Road)
ATKINS HEC-1 Hydrologic Parameters
Interim Conditions

BY: **SS**
QC:
DATE: **8/15/22**

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
INT-I	E	75.2	0.6	12.0	0.0188	100	2.0	7.1	982	8.5	4.3	8.6	2.9	10.0	N/A	**0.10****	3.50
INT-K	E	77.8	0.6	11.1	0.0173	100	2.0	6.6	762	7.7	4.1	8.2	2.6	9.2	N/A	**0.10****	3.49
ST13A	D	91.0	0.8	1.1	0.0017	20	2.0	1.8	490	0.6	1.6	2.4	5.2	7.1	12.8	**0.071**	3.50
ST13B	D	92.0	0.8	2.8	0.0043	30	2.0	2.2	1095	8.2	5.8	8.8	2.6	4.7	16.3	**0.05***	3.50
ST13C	D	91.3	0.8	2.1	0.0033	30	2.0	2.2	795	6.4	5.1	7.7	2.3	4.5	14.6	**0.05***	3.48
ST14	D	90.3	0.8	5.3	0.0082	30	2.0	2.3	1680	3.2	3.6	5.5	5.9	8.2	19.5	**0.082**	3.50
ST16	D	91.4	0.8	1.3	0.0021	30	2.0	2.2	584	3.1	3.6	5.4	2.6	4.8	13.4	**0.05***	3.48
ST17	D	88.0	0.8	1.1	0.0017	30	2.0	2.6	450	3.1	3.6	5.4	2.1	4.7	12.7	**0.05***	3.47

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

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

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

*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.

REFERENCE : **STANDARD FORM 4**

CN CALCULATIONS FOR SUMMERLIN WEST VILLAGE 27

Interim Conditions
Park Drift Trail, Sunset Run Drive and Calico Bend Drive

BASIN ID	LAND USE INDEX NUMBER	LAND USE DESCRIPTION	SOIL MAP UNIT #	SUBREGION CN	SUBREGION AREA (SQ FT)	SUBBASIN AREA (SQ FT)	PERCENT OF SUBBASIN	CUMULATIVE PERCENT	AREAL WEIGHTED CN	CUMULATIVE CN	COMPOSITE CN
INT-I	1	Undeveloped Land, Open Desert	1155	88	76352	522735	14.6%	14.6%	12.85	12.85	
INT-I	1	Undeveloped Land, Open Desert	1502	73	446355	522735	85.4%	100.0%	62.33	75.19	**75.2**
INT-K	1	Undeveloped Land, Open Desert	1155	88	63674	482822	13.2%	13.2%	11.61	11.61	
INT-K	1	Undeveloped Land, Open Desert	1156	87	95701	482822	19.8%	33.0%	17.24	28.85	
INT-K	1	Undeveloped Land, Open Desert	1502	73	323454	482822	67.0%	100.0%	48.90	77.75	**77.8**
ST13A	6	High-Density Residential, 4-8 units per acre (uses 6 units/acre)	1155	91	46864	46865	100.0%	100.0%	91.00	91.00	**91.0**
ST13B	7	Public Facility and Residential, 8-12 units/acre	1155	94	81244	121115	67.1%	67.1%	63.06	63.06	
ST13B	7	Public Facility and Residential, 8-12 units/acre	1502	88	39871	121115	32.9%	100.0%	28.97	92.03	**92.0**
ST13C	7	Public Facility and Residential, 8-12 units/acre	1155	94	50219	90817	55.3%	55.3%	51.98	51.98	
ST13C	6	High-Density Residential, 4-8 units per acre (uses 6 units/acre)	1502	88	40600	90817	44.7%	100.0%	39.34	91.32	**91.3**
ST14	7	Public Facility and Residential, 8-12 units/acre	1155	94	34039	229257	14.8%	14.8%	13.96	13.96	
ST14	7	Public Facility and Residential, 8-12 units/acre	1156	93	66252	229257	28.9%	43.7%	26.88	40.83	
ST14	7	Public Facility and Residential, 8-12 units/acre	1502	88	128877	229257	56.2%	100.0%	49.47	90.30	
ST14	7	Public Facility and Residential, 8-12 units/acre	1731	93	69	229257	0.0%	100.0%	0.03	90.33	**90.3**
ST16	7	Public Facility and Residential, 8-12 units/acre	1155	94	32614	58362	55.9%	55.9%	52.53	52.53	
ST16	7	Public Facility and Residential, 8-12 units/acre	1502	88	25753	58362	44.1%	100.0%	38.83	91.36	**91.4**
ST17	7	Public Facility and Residential, 8-12 units/acre	1502	88	47714	47714	100.0%	100.0%	88.00	88.00	**88.0**

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

TIME OF CONCENTRATION

Atkins
File: FORM4.XLS

ATKINS
Member of the SNC-Lavalin Group

Summerlin West Village 27
Park Drift Trail, Sunset Run Drive and Calico Bend Drive
(Triple Road)
ATKINS HEC-1 Hydrologic Parameters
Ultimate Conditions

BY: **SS**
QC:
DATE: **8/15/22**

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
G	D	93.9	0.8	22.8	0.0357	15	1.0	1.7	1175	7.0	5.3	8.1	2.9	4.7	16.6	**0.05***	3.50
H	D	94.4	0.9	9.5	0.0149	100	15.0	1.8	715	5.2	4.6	7.0	2.3	4.1	14.5	**0.05***	3.48
I	D	92.6	0.8	12.0	0.0188	40	13.0	1.3	1,015	8.0	5.7	8.7	2.5	3.7	15.9	**0.05***	3.50
K	D	94.0	0.9	11.1	0.0173	60	16.0	1.4	1170	5.0	4.5	6.8	3.5	4.9	16.8	**0.05***	3.49
ST13A	D	91.0	0.8	1.1	0.0017	20	2.0	1.8	490	0.6	1.6	2.4	5.2	7.1	12.8	**0.071**	3.50
ST13B	D	92.0	0.8	2.8	0.0043	30	2.0	2.2	1095	8.2	5.8	8.8	2.6	4.7	16.3	**0.05***	3.50
ST13C	D	91.3	0.8	2.1	0.0033	30	2.0	2.2	795	6.4	5.1	7.7	2.3	4.5	14.6	**0.05***	3.48
ST14	D	90.3	0.8	5.3	0.0082	30	2.0	2.3	1680	3.2	3.6	5.5	5.9	8.2	19.5	**0.082**	3.50
ST16	D	91.4	0.8	1.3	0.0021	30	2.0	2.2	584	3.1	3.6	5.4	2.6	4.8	13.4	**0.05***	3.48
ST17	D	88.0	0.8	1.1	0.0017	30	2.0	2.6	450	3.1	3.6	5.4	2.1	4.7	12.7	**0.05***	3.47

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

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

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

*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.

REFERENCE : **STANDARD FORM 4**

CN CALCULATIONS FOR SUMMERLIN WEST VILLAGE 27

Ultimate Conditions
Park Drift Trail, Sunset Run Drive and Calico Bend Drive

BASIN ID	LAND USE INDEX NUMBER	LAND USE DESCRIPTION	SOIL MAP UNIT #	SUBREGION CN	SUBREGION AREA (SQ FT)	SUBBASIN AREA (SQ FT)	PERCENT OF SUBBASIN	CUMULATIVE PERCENT	AREAL WEIGHTED CN	CUMULATIVE CN	COMPOSITE CN
G	7	Public Facility and Residential, 8-12 units/acre	1155	94	977775	995110	98.3%	98.3%	92.36	92.36	
G	7	Public Facility and Residential, 8-12 units/acre	1502	88	17338	995110	1.7%	100.0%	1.53	93.90	**93.9**
H	8	Very High-Density Residential, 12 units/acre or more	1155	96	248515	415190	59.9%	59.9%	57.46	57.46	
H	8	Very High-Density Residential, 12 units/acre or more	1502	92	166664	415190	40.1%	100.0%	36.93	94.39	**94.4**
I	8	Very High-Density Residential, 12 units/acre or more	1155	96	76352	522734	14.6%	14.6%	14.02	14.02	
I	8	Very High-Density Residential, 12 units/acre or more	1502	92	446355	522734	85.4%	100.0%	78.56	92.58	**92.6**
K	9	Commercial, Retail, Casino, High Rise Condominiums	1155	96	63674	482822	13.2%	13.2%	12.66	12.66	
K	9	Commercial, Retail, Casino, High Rise Condominiums	1156	96	95701	482822	19.8%	33.0%	19.03	31.69	
K	9	Commercial, Retail, Casino, High Rise Condominiums	1502	93	323454	482822	67.0%	100.0%	62.30	93.99	**94.0**
ST13A	6	High-Density Residential, 4-8 units per acre (uses 6 units/acre)	1155	91	46864	46865	100.0%	100.0%	91.00	91.00	**91.0**
ST13B	7	Public Facility and Residential, 8-12 units/acre	1155	94	81243	121115	67.1%	67.1%	63.05	63.05	
ST13B	7	Public Facility and Residential, 8-12 units/acre	1502	88	39871	121115	32.9%	100.0%	28.97	92.02	**92.0**
ST13C	7	Public Facility and Residential, 8-12 units/acre	1155	94	50219	90817	55.3%	55.3%	51.98	51.98	
ST13C	7	Public Facility and Residential, 8-12 units/acre	1502	88	40601	90817	44.7%	100.0%	39.34	91.32	**91.3**
ST14	7	Public Facility and Residential, 8-12 units/acre	1155	94	34039	229257	14.8%	14.8%	13.96	13.96	
ST14	7	Public Facility and Residential, 8-12 units/acre	1156	93	66252	229257	28.9%	43.7%	26.88	40.83	
ST14	7	Public Facility and Residential, 8-12 units/acre	1502	88	128877	229257	56.2%	100.0%	49.47	90.30	
ST14	7	Public Facility and Residential, 8-12 units/acre	1731	93	69	229257	0.0%	100.0%	0.03	90.33	**90.3**
ST16	7	Public Facility and Residential, 8-12 units/acre	1155	94	32615	58362	55.9%	55.9%	52.53	52.53	
ST16	7	Public Facility and Residential, 8-12 units/acre	1502	88	25751	58362	44.1%	100.0%	38.83	91.36	**91.4**
ST17	7	Public Facility and Residential, 8-12 units/acre	1502	88	47725	47725	100.0%	100.0%	88.00	88.00	**88.0**

B.3 HEC-1 Model

Interim Conditions Model

```
1****************************************                 ****************************************
 *                                      *                 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                 *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998              *                 *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                 *          609 SECOND STREET           *
 *                                      *                 *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   16AUG22  TIME  09:38:38  *                 *           (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    INPUT FILE DATE = August 2022
              2          ID    DESIGN STORM = 100-YEAR 6-HR STORM
              3          ID    STORM DISTRIBUTION = SDN #3
              4          ID    MODELED BY ATKINS (SAILUJ SHAKYA)
              5          ID    SUMMERLIN WEST V27 TRIPLE ROAD
              6          ID    INTERIM CONDITIONS
              7          ID
              8          ID                          AREA    DARF
              9          ID                          SQ. MI.
             10          ID                          0-0.5   0.99
             11          ID                          10-yr   0.57
             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     500
             19          IO       5       0       0
             20          IN       5       0       0
             21          JR    PREC    0.99    0.57
                         *

             22          KK   ST13A
             23          BA  0.0017
             24          PB    3.50
             25          PC       0    0.02   0.057    0.07   0.087   0.108   0.124    0.13    0.13    0.13
             26          PC    0.13    0.13    0.13   0.133    0.14   0.142   0.148   0.158   0.172   0.181
             27          PC    0.19   0.197   0.199     0.2   0.201   0.204   0.214   0.229   0.241   0.249
             28          PC   0.251   0.256    0.27   0.278   0.281   0.283   0.295   0.322   0.352   0.409
             29          PC   0.499    0.59    0.71   0.744   0.781   0.812   0.819   0.835   0.851   0.856
             30          PC    0.86   0.868   0.876   0.888    0.91   0.926   0.937    0.95    0.97   0.976
             31          PC   0.982   0.985   0.987   0.989    0.99   0.993   0.993   0.994   0.995   0.998
             32          PC   0.998   0.999       1
             33          LS       0    91.0
             34          UD   0.071
                         *

             35          KK   ST13B
             36          BA  0.0043
             37          PB    3.50
             38          LS       0    92.0
             39          UD    0.05
                         *

             40          KK   INT-I
             41          BA  0.0188
             42          PB    3.50
             43          LS       0    75.2
             44          UD    0.10
```

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

            45          KK    ST16
            46          BA  0.0021
            47          PB    3.48
            48          LS       0    91.4
            49          UD    0.05
                        *

            50          KK     CP1
            51          KM   COMBINE ST13A, ST13B, ST16 and INT-I
            52          HC       4
                        *

            53          KK   ST13C
            54          BA  0.0033
            55          PB    3.48
            56          LS       0    91.3
            57          UD    0.05
                        *

            58          KK     CP2
            59          KM   COMBINE CP1, ST16 and ST13C
            60          HC       2
                        *

            61          KK    ST14
            62          BA  0.0082
            63          PB    3.50
            64          LS       0    90.3
            65          UD   0.082
                        *

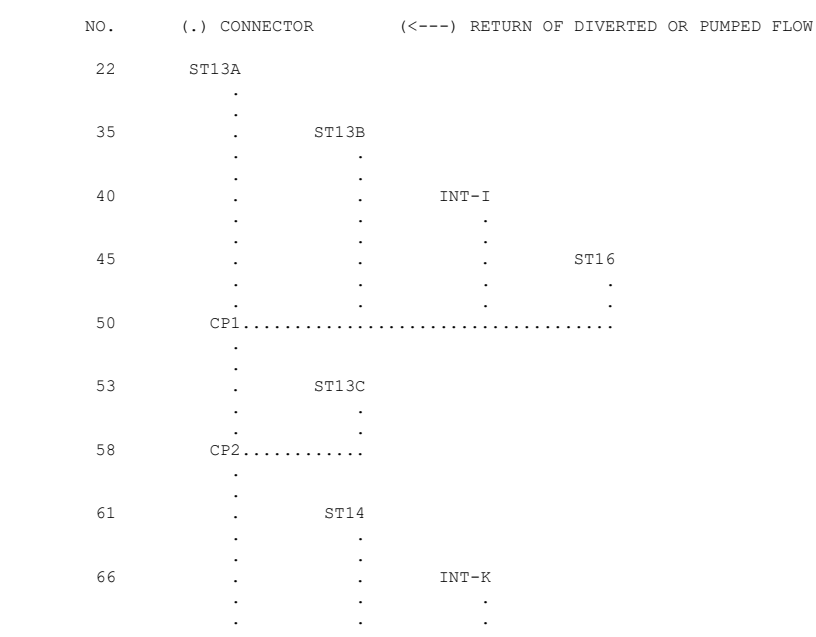
            66          KK   INT-K
            67          BA  0.0173
            68          PB    3.49
            69          LS       0    77.8
            70          UD     0.1
                        *

            71          KK    ST17
            72          BA  0.0017
            73          PB    3.47
            74          LS       0    88.0
            75          UD    0.05
                        *

            76          KK CPFALSE
            77          KM   COMBINE FOR MODEL STABILITY
            78          HC       3
                        *
            79          ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK



```
   71           .           .           .       ST17
                .           .           .         .
                .           .           .         .
   76           .     CPFALSE.......................

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************                                  ****************************************
 *                                      *                                  *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                  *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                  *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                  *          609 SECOND STREET           *
 *                                      *                                  *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   16AUG22  TIME  09:38:38  *                                  *           (916) 756-1104             *
 *                                      *                                  *                                      *
 ****************************************                                  ****************************************

                          INPUT FILE DATE = August 2022
                          DESIGN STORM = 100-YEAR 6-HR STORM
                          STORM DISTRIBUTION = SDN #3
                          MODELED BY ATKINS (SAILUJ SHAKYA)
                          SUMMERLIN WEST V27 TRIPLE ROAD
                          INTERIM CONDITIONS

                                              AREA    DARF
                                              SQ. MI.
                                              0-0.5   0.99
                                              10-yr   0.57


                        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         500  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE      2    0  ENDING DATE
                       NDTIME        1735  ENDING TIME
                       ICENT           19  CENTURY MARK

                     COMPUTATION INTERVAL     .08 HOURS
                          TOTAL TIME BASE   41.58 HOURS

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

      JP          MULTI-PLAN OPTION
                        NPLAN           1  NUMBER OF PLANS

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

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


                                                                  RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION     AREA    PLAN            RATIO 1  RATIO 2
                                                        .99      .57

 HYDROGRAPH AT
+                  ST13A       .00     1   FLOW           4.       2.
                                           TIME         3.50     3.50

 HYDROGRAPH AT
+                  ST13B       .00     1   FLOW          11.       6.
                                           TIME         3.50     3.50

 HYDROGRAPH AT
```

+	INT-I	.02	1	FLOW	22.	7.
				TIME	3.50	3.58
HYDROGRAPH AT						
+	ST16	.00	1	FLOW	5.	3.
				TIME	3.50	3.50
4 COMBINED AT						
+	CP1	.03	1	FLOW	43.	17.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ST13C	.00	1	FLOW	9.	4.
				TIME	3.50	3.50
2 COMBINED AT						
+	CP2	.03	1	FLOW	52.	21.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ST14	.01	1	FLOW	19.	9.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	INT-K	.02	1	FLOW	23.	8.
				TIME	3.50	3.58
HYDROGRAPH AT						
+	ST17	.00	1	FLOW	4.	2.
				TIME	3.50	3.50
3 COMBINED AT						
+	CPFALSE	.03	1	FLOW	46.	18.
				TIME	3.50	3.50

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

SNC·LAVALIN ATKINS Member of the SNC-Lavalin Group SUMMERLIN

Local Ultimate Conditions Model

```
1****************************************                    ****************************************
 *                                      *                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998              *                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                    *          609 SECOND STREET           *
 *                                      *                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   10AUG22  TIME  15:56:58  *                    *           (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    INPUT FILE DATE = August 2022
              2          ID    DESIGN STORM = 100-YEAR 6-HR STORM
              3          ID    STORM DISTRIBUTION = SDN #3
              4          ID    MODELED BY ATKINS (SAILUJ SHAKYA)
              5          ID    SUMMERLIN WEST V27 TRIPLE ROAD
              6          ID    LOCAL ULTIMATE CONDITIONS
              7          ID
              8          ID                          AREA    DARF
              9          ID                          SQ. MI.
             10          ID                          0-0.5   0.99
             11          ID                          10-yr   0.57
             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     500
             19          IO       5       0       0
             20          IN       5       0       0
             21          JR    PREC    0.99    0.57
                         *

             22          KK   ST13A
             23          KM   PAVED STREET BASIN - PARK DRIFT
             24          BA   .0017
             25          PB    3.50
             26          PC       0    0.02   0.057    0.07   0.087   0.108   0.124    0.13    0.13    0.13
             27          PC    0.13    0.13    0.13   0.133    0.14   0.142   0.148   0.158   0.172   0.181
             28          PC    0.19   0.197   0.199     0.2   0.201   0.204   0.214   0.229   0.241   0.249
             29          PC   0.251   0.256    0.27   0.278   0.281   0.283   0.295   0.322   0.352   0.409
             30          PC   0.499    0.59    0.71   0.744   0.781   0.812   0.819   0.835   0.851   0.856
             31          PC    0.86   0.868   0.876   0.888    0.91   0.926   0.937    0.95    0.97   0.976
             32          PC   0.982   0.985   0.987   0.989    0.99   0.993   0.993   0.994   0.995   0.998
             33          PC   0.998   0.999       1
             34          LS       0    91.0
             35          UD   0.071
                         *

             36          KK  RST13A
             37          KM   ROUTE ST13A TO CP-5.1A
             38          RD    1140   0.086   0.013       0    CIRC       2       0
                         *

             39          KK   ST13B
             40          KM   PAVED STREET BASIN - SUNSET RUN
             41          BA   .0043
             42          PB    3.50
             43          LS       0    92.0
             44          UD   0.050
```

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

```
   45  KK CP-5.1A
   46  KM   MINOR CP NOT SHOWN ON FIGURE.
   47  KM   COMBINE BASINS ST13 A, ST13B
   48  HC       2
               *
   49  KK       G
   50  KM   RESIDENTIAL, 8-12 UNITS PER ACRE
   51  BA   .0357
   52  PB    3.50
   53  LS       0    93.9
   54  UD   0.050
               *
   55  KK   G-Div
   56  KM   DIVERT OUT FLOW FROM  G TO V22 SYSTEM
   57  DT   G-Out
   58  DI    0    99
   59  DQ     0   7
               *
   60  KK CP-5.1B
   61  KM   MINOR CP NOT SHOWN ON FIGURE.
   62  KM   COMBINE BASIN SPLIT-G WITH CP-5.1A
   63  HC       2
               *
   64  KK       I
   65  KM   RESIDENTIAL, 12 UNITS PER ACRE OR MORE
   66  BA   .0188
   67  PB    3.50
   68  LS       0    92.6
   69  UD   0.050
               *
   70  KK    ST16
   71  KM   PAVED STREET BASIN - CALICO BEND
   72  BA   .0021
   73  PB    3.48
   74  LS       0    91.4
   75  UD   0.050
               *
   76  KK  CP-5.1
   77  KM   COMBINE BASINS I AND ST16 WITH CP-5.1B
   78  HC       3
               *
   79  KK RCP-5.1
   80  KM   ROUTE IN SD TO CP-6a
   81  RD     660   0.070   0.013       0    CIRC       4       0
               *
```



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

```
   82  KK   ST13C
   83  KM   PAVED STREET BASIN - SUNSET RUN
   84  BA   .0033
   85  PB    3.48
   86  LS       0    91.3
   87  UD   0.050
               *
   88  KK   CP-6a
   89  KM   COMBINE BASIN ST13C AND CP-5.1
   90  HC       2
               *
   91  KK    ST14
   92  BA  0.0082
   93  PB    3.50
   94  LS       0    90.3
   95  UD   0.082
               *
   96  KK       K
   97  BA  0.0173
   98  PB    3.49
   99  LS       0    94.0
  100  UD    0.05
               *
```

```
            101           KK    ST17
            102           BA  0.0017
            103           PB    3.47
            104           LS       0    88.0
            105           UD    0.05
                          *

            106           KK       H
            107           BA  0.0149
            108           PB    3.48
            109           LS       0    94.4
            110           UD    0.05
                          *

            111           KK CPFALSE
            112           KM   COMBINE FOR MODEL STABILITY
            113           HC       4
                          *
            114           ZZ
1
                 SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

    22       ST13A
                 V
                 V
    36      RST13A
                 .
                 .
    39           .       ST13B
                 .           .
                 .           .
    45     CP-5.1A............
                 .
                 .
    49           .           G
                 .           .
                 .           .
    57           .           .-------->   G-Out
    55           .       G-Div
                 .           .
                 .           .
    60     CP-5.1B............
                 .
                 .
    64           .           I
                 .           .
                 .           .
    70           .           .        ST16
                 .           .           .
                 .           .           .
    76      CP-5.1.........................
                 V
                 V
    79     RCP-5.1
                 .
                 .
    82           .       ST13C
                 .           .
                 .           .
    88       CP-6a............
                 .
                 .
    91           .        ST14
                 .           .
                 .           .
    96           .           .           K
                 .           .           .
                 .           .           .
   101           .           .           .        ST17
                 .           .           .           .
                 .           .           .           .
   106           .           .           .           .           H
                 .           .           .           .           .
                 .           .           .           .           .
   111           .     CPFALSE.....................................

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************                  ****************************************
 *                                      *                  *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                  *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                  *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                  *          609 SECOND STREET           *
 *                                      *                  *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   10AUG22  TIME  15:56:58  *                  *           (916) 756-1104             *
 *                                      *                  *                                      *
 ****************************************                  ****************************************
```

```
                          INPUT FILE DATE = August 2022
                          DESIGN STORM = 100-YEAR 6-HR STORM
                          STORM DISTRIBUTION = SDN #3
                          MODELED BY ATKINS (SAILUJ SHAKYA)
                          SUMMERLIN WEST V27 TRIPLE ROAD
                          LOCAL ULTIMATE CONDITIONS

                                                AREA    DARF
                                                SQ. MI.
                                                0-0.5   0.99
                                                10-yr   0.57


                        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         500  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE      2    0  ENDING DATE
                       NDTIME        1735  ENDING TIME
                       ICENT           19  CENTURY MARK

                     COMPUTATION INTERVAL     .08 HOURS
                          TOTAL TIME BASE   41.58 HOURS

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

      JP          MULTI-PLAN OPTION
                        NPLAN           1  NUMBER OF PLANS

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


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


                                                                    RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION     AREA    PLAN            RATIO 1  RATIO 2
                                                        .99      .57

 HYDROGRAPH AT
+                  ST13A       .00     1   FLOW           4.       2.
                                           TIME         3.50     3.50

 ROUTED TO
+                  RST13A      .00     1   FLOW           4.       2.
                                           TIME         3.50     3.50

 HYDROGRAPH AT
+                  ST13B       .00     1   FLOW          11.       6.
                                           TIME         3.50     3.50

  2 COMBINED AT
+                 CP-5.1A      .01     1   FLOW          15.       8.
                                           TIME         3.50     3.50

 HYDROGRAPH AT
+                       G      .04     1   FLOW          99.      52.
                                           TIME         3.50     3.50

 DIVERSION TO
+                  G-Out       .04     1   FLOW           7.       4.
                                           TIME         3.50     3.50
```

```
 HYDROGRAPH AT
+                 G-Div       .04     1   FLOW          92.      48.
                                           TIME         3.50     3.50

  2 COMBINED AT
+               CP-5.1B       .04     1   FLOW         107.      56.
                                           TIME         3.50     3.50

 HYDROGRAPH AT
+                     I       .02     1   FLOW          51.      26.
                                           TIME         3.50     3.50

 HYDROGRAPH AT
+                  ST16       .00     1   FLOW           5.       3.
                                           TIME         3.50     3.50

  3 COMBINED AT
+                CP-5.1       .06     1   FLOW         163.      85.
                                           TIME         3.50     3.50

 ROUTED TO
+               RCP-5.1       .06     1   FLOW         161.      83.
                                           TIME         3.50     3.50

 HYDROGRAPH AT
+                  ST13C      .00     1   FLOW           9.       4.
                                           TIME         3.50     3.50

  2 COMBINED AT
+                  CP-6a      .07     1   FLOW         169.      88.
                                           TIME         3.50     3.50

 HYDROGRAPH AT
+                  ST14       .01     1   FLOW          19.       9.
                                           TIME         3.50     3.50

 HYDROGRAPH AT
+                     K       .02     1   FLOW          48.      25.
                                           TIME         3.50     3.50

 HYDROGRAPH AT
+                  ST17       .00     1   FLOW           4.       2.
                                           TIME         3.50     3.50

 HYDROGRAPH AT
+                     H       .01     1   FLOW          41.      22.
                                           TIME         3.50     3.50

  4 COMBINED AT
+               CPFALSE       .04     1   FLOW         112.      58.
                                           TIME         3.50     3.50
1
                                    SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
                                        (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)
                                                                                 INTERPOLATED TO
                                                                                COMPUTATION INTERVAL
           ISTAQ    ELEMENT      DT       PEAK    TIME TO     VOLUME      DT       PEAK    TIME TO     VOLUME
                                                     PEAK                                    PEAK

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

          FOR PLAN = 1  RATIO=  .00
            RST13A  MANE         1.18      3.98    211.63      2.51      5.00      3.89    210.00        2.51


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .2273E+00 EXCESS= .0000E+00 OUTFLOW= .2273E+00 BASIN STORAGE= .6261E-04 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
            RST13A  MANE         1.36      1.97    211.48      1.16      5.00      1.88    210.00        1.16


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .1051E+00 EXCESS= .0000E+00 OUTFLOW= .1051E+00 BASIN STORAGE= .6382E-04 PERCENT ERROR=   -.1


          FOR PLAN = 1  RATIO=  .00
            RCP-5.1  MANE          .32    161.40    210.11      2.61      5.00    160.74    210.00        2.61


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .8715E+01 EXCESS= .0000E+00 OUTFLOW= .8715E+01 BASIN STORAGE= .3627E-04 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
            RCP-5.1  MANE          .37     84.10    210.37      1.27      5.00     83.26    210.00        1.27


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .4249E+01 EXCESS= .0000E+00 OUTFLOW= .4249E+01 BASIN STORAGE= .3392E-04 PERCENT ERROR=    .0
```

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

GPDB-MCDS Model
Updated with Parcel G split

```
1****************************************                    ****************************************
 *                                      *                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998              *                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                    *          609 SECOND STREET           *
 *                                      *                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   10AUG22  TIME  15:28:32  *                    *           (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    INPUT FILE DATE = DECEMBER 30 2021
              2          ID    DESIGN STORM = 100-YEAR 6-HR STORM
              3          ID    STORM DISTRIBUTION = SDN #3
              4          ID    MODELED BY ATKINS (KP)
              5          ID    SUMMERLIN WEST V27/V31/V30A GRAND PARK TRIBUTARY AREA MDS
              6          ID    UPDATE #1 ADDENDUM #1 (Update with Parcel G flowSplit)
              7          ID
              8          ID
              9          ID                          AREA    DARF
             10          ID                          SQ. MI.
             11          ID                          0-0.5   0.99
             12          ID                          0.5-1   0.975
             13          ID                          1-2     0.95
             14          ID
             15          ID
             16          ID  JR CARD RATIOS REPRESENT DEPTH-AREA REDUCTION FACTORS (DARF'S)
             17          ID
             18          ID  100-YEAR,  6-HOUR STORM,  SDN3
             19          ID
             20          IT       5       0       0     500
             21          IO       5       0       0
             22          IN       5       0       0
             23          JR    PREC    0.99   0.975    0.95
                         *

             24          KK      A1
             25          KM   SINGLE FAMILY SPECIAL ESTATES
             26          BA   .0896
             27          PB    3.59
             28          PC       0    0.02   0.057    0.07   0.087   0.108   0.124    0.13    0.13    0.13
             29          PC    0.13    0.13    0.13   0.133    0.14   0.142   0.148   0.158   0.172   0.181
             30          PC    0.19   0.197   0.199     0.2   0.201   0.204   0.214   0.229   0.241   0.249
             31          PC   0.251   0.256    0.27   0.278   0.281   0.283   0.295   0.322   0.352   0.409
             32          PC   0.499    0.59    0.71   0.744   0.781   0.812   0.819   0.835   0.851   0.856
             33          PC    0.86   0.868   0.876   0.888    0.91   0.926   0.937    0.95    0.97   0.976
             34          PC   0.982   0.985   0.987   0.989    0.99   0.993   0.993   0.994   0.995   0.998
             35          PC   0.998   0.999       1
             36          LS       0    83.6
             37          UD   0.120
                         *

             38          KK     A5b
             39          KM   SINGLE FAMILY SPECIAL ESTATE
             40          BA   .0056
             41          PB    3.60
             42          LS       0    83.3
             43          UD   0.058
                         *
1                                                  HEC-1 INPUT                                                 PAGE  2
```

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

  44          KK     RA5
  45          KM   ROUTE THROUGH SD TO CP-DC
  46          RD     900   0.071   0.013       0    CIRC       2       0
              *

  47          KK     DC1
  48          KM   DC: RESERVOIR
  49          BA   .0077
  50          PB    3.57
  51          LS       0    94.0
  52          UD   0.050
              *

  53          KK   COS14
  54          KM   OPEN SPACE
  55          BA   .0044
  56          PB    3.56
  57          LS       0    85.0
  58          UD     0.1
              *

  59          KK    CP-0
  60          KM   COMBINE BASINS A1, A5, DC1 AND COS14
  61          HC       4
              *

  62          KK   RCP-0
  63          KM   ROUTE CP-0 THROUGH BASIN M TO CP-0.1
  64          RD    2500   0.060   0.013       0    CIRC     2.5       0
              *

  65          KK       M
  66          KM   REISDENTIAL, 1-2 UNITS PER ACRE
  67          BA   .1193
  68          PB    3.55
  69          LS       0    80.5
  70          UD   0.109
              *

  71          KK  CP-0.1
  72          KM   COMBINE BASINS M AND COMB PT CP-0
  73          HC       2
              *

  74          KK RCP-0.1
  75          KM   ROUTE CP-0.1 THROUGH NATURAL CHANNEL IN COS4A
  76          RD    2600   0.062   0.040       0    TRAP      30       3
              *
1                                    HEC-1 INPUT                                          PAGE  3

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

  77          KK   COS4A
  78          KM   OPEN SPACE
  79          BA   .0389
  80          PB    3.51
  81          LS       0    85.0
  82          UD     0.1
              *

  83          KK CP-2.3A
  84          KM   MINOR CP. NOT SHOWN ON FIGURE
  85          KM   COMBINES BASINS COS4A. CP-0.1
  86          HC       2
              *

  87          KK     A3a
  88          KM   SINGLE FAMILY SPECIAL ESTATE
  89          BA  0.1392
  90          PB    3.61
  91          LS       0    75.9
  92          UD   0.143
              *

  93          KK    RA3a
  94          KM   ROUTE THROUGH NATURAL CHANNEL IN V31COS14 TO CP2.1
  95          RD    1000   0.085   0.040       0    TRAP      30       3
              *

  96          KKV31COS14
  97          KM   OPEN SPACE
  98          BA   .0095
  99          PB    3.57
 100          LS       0    85.0
 101          UD     0.1
              *
```

```
 102          KK     A3b
 103          KM   SINGLE FAMILY SPECIAL ESTATE
 104          BA  0.0258
 105          PB    3.61
 106          LS       0    83.0
 107          UD   0.079
              *

 108          KK  CP-2.1
 109          KM   COMBINE BASINS V31COS14, A3b, CP 2.0
 110          HC       3
              *

 111          KK RCP-2.1
 112          KM   ROUTE TO CP2.2A THROUGH NATURAL CHANNEL IN 30ACOS3
 113          RD    1500   0.065   0.040       0    TRAP      30       3
              *
1                                    HEC-1 INPUT                                        PAGE  4

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

 114          KK30ACOS2N
 115          KM   OPEN SPACE
 116          BA   .0042
 117          PB    3.54
 118          LS       0    85.0
 119          UD     0.1
              *

 120          KK 30ACOS3
 121          KM   OPEN SPACE
 122          BA   .0197
 123          PB    3.55
 124          LS       0    85.0
 125          UD     0.1
              *

 126          KK    ST4a
 127          KM   PAVED STREET BASIN - MOUNTAIN RUN
 128          BA   .0024
 129          PB    3.54
 130          LS       0    89.0
 131          UD   0.050
              *

 132          KK CP-2.2A
 133          KM   COMBINE BASINS 30ACOS3 AND ST4a AND 30ACOS2N AND CP-2.1
 134          KM   FLOW IS ROUTED DOWN MTN RUN
 135          HC       4
              *

 136          KK RCP2.2A
 137          KM   #ROUTE CP 2.2A THROUGH TWIN 6X6 RCB TO V30ACP1
 138          RD    3000    0.05   0.015       0    DEEP      12       0
              *
 139          KM   BEGIN REFERENCE OF GCW V29 MCDS HEC-1 ************************************
              *

 140          KK  V30A-D
 141          KM   GCW V29 MCDS SUBBASIN
 142          KM   BASIN AREA CHANGED
 143          BA  0.0558
 144          PB    3.54
 145          LS       0    88.1
 146          UD   0.107
              *

 147          KK  V30A-C
 148          KM   GCW V29 MCDS SUBBASIN
 149          KM   BASIN AREA CHANGED
 150          BA  0.0558
 151          PB    3.54
 152          LS       0    88.1
 153          UD   0.115
              *
1                                    HEC-1 INPUT                                        PAGE  5

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

 154          KK       E
 155          KM   ATKINS SUBBASIN
 156          KM   SF2: MEDIUM DENSITY
 157          BA   .0457
 158          PB    3.52
 159          LS       0    89.0
 160          UD   0.050
              *
```

```
161          KKV30ACOS1
162          KM   GCW V29 MCDS SUBBASIN
163          KM   BASIN AREA CHANGED
164          BA  0.0073
165          PB    3.52
166          LS       0    86.8
167          UD   0.111
             *

168          KKV30A-RD1
169          KM   GCW V29 MCDS SUBBASIN
170          KM   BASIN AREA CHANGED
171          KM   ALL OF V30A RD1 IS NOT FULLY COLLECTED
172          KM   BEFORE CP2.2B. FOR MODELLING PURPOSES THE FLOW IS COLLECTED AND SPLIT HERE.
173          BA  0.0222
174          PB    3.53
175          LS       0    98.0
176          UD   0.095
             *

177          KK V30ACP1
178          KM   COMBINE BASINS CP-2.2A, V30A D, V30A C, V30A RD1, E, V30ACOS1
179          HC       6
             *
180          KM   END REFERENCE OF GCW V29 MCDS HEC-1 ****************************************
             *

181          KKV30ACP1N
182          KM   50/50 FLOW SPLIT. NORTH ON PDT TO GPDB/SOUTH ON PDT TO DB 4-5
183          DTV30ACP1S
184          DI       0      10     100    1000
185          DQ       0       5      50     500
             *

186          KKRV30ACP1N
187          KM    ROUTE FLOW THROUGH 6X6 RCB AFTER EQUALIZER TO CP 2.3
188          RD    1100    0.01   0.015       0    DEEP       6       0
             *

189          KK       F
190          KM   SF2: MEDIUM DENSITY
191          BA   .0337
192          PB    3.51
193          LS       0    89.0
194          UD   0.056
             *
```



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

195          KK  CP-2.3
196          KM   COMBINES  MTN RUN SPLIT, BASIN F, AND CP-2.3A, AND V30A CP1N
197          HC       3
             *

198          KK RCP-2.3
199          KM   ROUTE TO CP-9 THROUGH SD
200          RD     630   0.022   0.015       0    DEEP       6       0
             *

201          KK     ST7
202          KM   PAVED STREET BASIN - PARK DRIFT
203          BA   .0076
204          PB    3.49
205          LS       0    89.0
206          UD   0.079
             *

207          KK     ST6
208          KM   PAVED STREET BASIN - PARK DRIFT
209          BA   .0050
210          PB    3.49
211          LS       0    89.2
212          UD   0.073
             *

213          KK   COS4B
214          KM   OPEN SPACE
215          BA   .0249
216          PB    3.49
217          LS       0    85.0
218          UD     0.1
             *

219          KK   CP-9A
220          KM   MINOR CP NOT SHOWN ON FIGURE.
221          KM   COMBINE BASINS ST6, COS4B
222          HC       2
```

```
                *
 223            KK     CP9
 224            KM   COMBINE BASIN ST7 WITH CP-2.3 AND CP-9A
 225            HC       3
                *
 226            KM   SUBSEQUENT INPUTS WITH "#" SYMBOL ARE AGAIN REFERENCED FROM VTN MODEL
                *

 227            KK    RCP9
 228            KM   #ROUTE CP9 THROUGH ST8 AND BASIN IN STORM DRAIN TO CP10
 229            RD    2651   0.055   0.015       0    DEEP       5       0
                *
1                                       HEC-1 INPUT                                                PAGE  7

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


 230            KK     ST8
 231            KM   #PAVED STREET BASIN - FOX HILL
 232            BA   .0042
 233            PB    3.46
 234            LS       0    98.0
 235            UD   0.050
                *

 236            KK    ST21
 237            KM   #PAVED STREET BASIN - GRAND PARK
 238            BA   .0036
 239            PB    3.46
 240            LS       0    98.0
 241            UD   0.064
                *

 242            KK    CP1A
 243            KM   #COS (RP): REGIONAL PARK - OPEN SPACE
 244            BA   .0701
 245            PB    3.46
 246            LS       0    87.9
 247            UD   0.111
                *

 248            KK    CP10
 249            KM   #COMBINE RCP9, ST8, ST21, AND CP1A
 250            KM   FLOW INTO BASIN VIA SOUTHERN INLET
 251            HC       4
                *

 252            KK   RCP10
 253            KM   #ROUTE CP10 THROUGH BASIN IN STORM DRAIN TO GPDBIN
 254            RD     708   0.046   0.015       0    DEEP       6       0
                *
 255            KM   END VTN MODEL REFERENCE
                *

 256            KK     A5a
 257            KM   SINGLE FAMILY SPECIAL ESTATE
 258            BA    .017
 259            PB    3.60
 260            LS       0    85.2
 261            UD   0.084
                *

 262            KK    RA5a
 263            KM   ROUTE A5a to CP-1
 264            RD    1600   0.006   0.013       0    CIRC     2.5       0
                *
1                                       HEC-1 INPUT                                                PAGE  8

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


 265            KK     ST1
 266            KM   PAVED STREET BASIN - LAKE MEAD
 267            KM   INCLUDED IN DRAINAGE AREA TO LMB AND MTN RUN
 268            BA   .0031
 269            PB    3.57
 270            LS       0    89.0
 271            UD   0.065
                *

 272            KK   COS3a
 273            KM   OPEN SPACE
 274            BA   .0095
 275            PB    3.57
 276            LS       0    85.0
 277            UD     0.1
                *

 278            KK    CP-1
```

```
          279          KM   COMBINE BASINS A5A, ST1, COS3a
          280          HC       3
                       *

          281          KK   RCP-1
          282          KM   ROUTE CP-1 TO CP-1.1 THROUGH ST3
          283          KM   ROUTE A5a to CP-1
          284          RD     900    0.06   0.013       0    CIRC     2.5       0
                       *

          285          KK     ST2
          286          KM   PAVED STREET BASIN- RESERVOIR ACCESS
          287          BA   .0088
          288          PB    3.57
          289          LS       0    87.9
          290          UD   0.085
                       *

          291          KK      A2
          292          KM   SINGLE FAMILY SPECIAL ESTATE
          293          BA   .0010
          294          PB    3.57
          295          LS       0    85.0
          296          UD   0.050
                       *

          297          KK   COS3b
          298          KM   OPEN SPACE
          299          BA   .0111
          300          PB    3.57
          301          LS       0    85.0
          302          UD     0.1
                       *
1                                          HEC-1 INPUT                                                PAGE  9

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

          303          KK   CP-1b
          304          KM   MINOR CP NOT SHOWN ON FIGURES. ONLY FOR MODELING
          305          KM   COMBINE BASINS A2 COS3b
          306          HC       2
                       *

          307          KK  RCP-1b
          308          KM   ROUTE TO CP-1b THROUGH NATURAL CHANNEL IN COS11
          309          RD     700   0.080   0.035       0    TRAP      30       3
                       *

          310          KK   COS11
          311          KM   OPEN SPACE
          312          BA   .0111
          313          PB    3.57
          314          LS       0    85.0
          315          UD     0.1
                       *

          316          KK   CP-1c
          317          KM   COMBINE BASINS A2, COS3b, COS11
          318          HC       2
                       *

          319          KK     ST3
          320          KM   PAVED STREET BASIN - LAKE MEAD
          321          BA   .0022
          322          PB    3.56
          323          LS       0    87.6
          324          UD   0.050
                       *

          325          KK  CP-1.1
          326          KM   COMBINE CP-1, CP1-a, CP-1b AND ST3
          327          HC       4
                       *

          328          KK RCP-1.1
          329          KM   ROUTE CP-1.1 TO CP-1.2
          330          RD     900    0.06   0.013       0    CIRC       3       0
                       *

          331          KK     ST4
          332          KM   PAVED STREET BASIN - LAKE MEAD
          333          BA   .0036
          334          PB    3.54
          335          LS       0    88.6
          336          UD   0.050
                       *
1                                          HEC-1 INPUT                                                PAGE 10

        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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```
          337          KK    COS9
          338          KM   OPEN SPACE
          339          BA   .0028
          340          PB    3.55
          341          LS       0    85.0
          342          UD     0.1
                       *

          343          KK  CP-1.2
          344          KM   COMBINE COS9 AND ST4 AND CP1.1
          345          HC       3
                       *

          346          KK    COS8
          347          KM   OPEN SPACE
          348          BA   .0068
          349          PB    3.53
          350          LS       0    81.1
          351          UD   0.154
                       *

          352          KK   COS7A
          353          KM   OPEN SPACE
          354          BA   .0008
          355          PB    3.54
          356          LS       0    85.3
          357          UD    0.10
                       *

          358          KK  CP-0.2
          359          KM   MINOR CP NOT SHOWN ON FIGURE.
          360          KM   COMBINE COS8 AND COS7A
          361          HC       2
                       *

          362          KK   SLMB1
          363          BA 0.00058
          364          PB     3.5
          365          LS       0    88.9
          366          UD   0.050
                       *

          367          KK  CP-3.1
          368          KM   COMBINE COMB PT CP-1.2 AND CP-0.2 AND SLMB1 AND NUISANCE FROM SPLITTER STRUCT
          369          HC       3
                       *

          370          KK RCP-3.1
          371          KM   ROUTE CP-3.1 TO CP-3.2 THROUGH SD
          372          RD    1200   0.065   0.013       0    CIRC     3.0       0
                       *
1                                        HEC-1 INPUT                                                PAGE 11

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

          373          KK   SLMB2
          374          BA 0.00165
          375          PB     3.5
          376          LS       0    87.8
          377          UD   0.050
                       *

          378          KK   SLMB3
          379          BA 0.00193
          380          PB     3.5
          381          LS       0    86.7
          382          UD   0.050
                       *

          383          KK  CP3.2a
          384          KM   COMBINE CP3.1, SLMB2, SLMB3
          385          KM   MINOR CP. NOT SHOWN ON FIGURE
          386          HC       3
                       *

          387          KK   COS7B
          388          KM   OPEN SPACE
          389          BA   .0033
          390          PB     3.5
          391          LS       0    85.0
          392          UD     0.1
                       *

          393          KK   NLMB1
          394          BA  0.0045
          395          PB     3.5
          396          LS       0    87.1
```

```
 397          UD   0.065
              *

 398          KK LMBCOS1
 399          BA  0.0078
 400          PB     3.5
 401          LS       0    85.0
 402          UD     0.1
              *

 403          KK  CP3.2b
 404          KM   COMBINE COS7B, NLMB1, LMBCOS1
 405          KM   MINOR CP. NOT SHOWN ON FIGURE
 406          HC       3
              *

 407          KK  CP-3.2
 408          KM   COMBINE CP3.2a and CP 3.2b
 409          HC       2
              *
1                                        HEC-1 INPUT                                          PAGE 12

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

 410          KK  RCP3.2
 411          KM   ROUTE TO CP3.3 IN 48 INCH SD
 412          RD     850    0.05   0.013       0    CIRC     4.0       0
              *

 413          KK   SLMB4
 414          BA 0.00151
 415          PB     3.5
 416          LS       0    88.1
 417          UD   0.050
              *

 418          KK   SLMB5
 419          BA 0.00048
 420          PB     3.5
 421          LS       0    89.0
 422          UD   0.050
              *

 423          KK LMBCOS2
 424          BA  0.0065
 425          PB     3.5
 426          LS       0    85.3
 427          UD     0.1
              *

 428          KK  CP-3.3
 429          KM   COMBINE CP3.2 SLMB4 SLMB5 LMBCOS2
 430          HC       4
              *
 431          KM   KK RCP3.3
 432          KM   ROUTE TO CP3.4 IN 48 INCH SD
 433          KM   RD  350    0.03   0.013   0       CIRC    4.0     0
 434          KM   ROUTING CARD REMOVED. REACH IS TOO SHORT.
              *

 435          KK   SLMB6
 436          BA 0.00050
 437          PB     3.5
 438          LS       0    89.0
 439          UD   0.050
              *

 440          KK LMBCOS3
 441          BA  0.0026
 442          PB     3.5
 443          LS       0    85.5
 444          UD     0.1
              *
1                                        HEC-1 INPUT                                          PAGE 13

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

 445          KK  CP-3.4
 446          KM   COMBINE SLMB6 LMBCOS3 CPBB
 447          HC       3
              *

 448          KK  RCP3.4
 449          KM   ROUTE TO CP4 IN 48 INCH SD
 450          RD     600   0.025   0.013       0    CIRC     4.0       0
              *

 451          KK   NLMB2
```

```
 452          BA  0.0014
 453          PB     3.5
 454          LS       0    88.9
 455          UD   0.051
              *

 456          KK   ST5Fa
 457          BA  0.0004
 458          PB     3.5
 459          LS       0    86.7
 460          UD   0.050
              *

 461          KK   ST5Fb
 462          BA 0.00035
 463          PB     3.5
 464          LS       0    88.4
 465          UD   0.050
              *

 466          KK   ST5Fc
 467          BA 0.00088
 468          PB     3.5
 469          LS       0    89.0
 470          UD   0.050
              *

 471          KK   COS7C
 472          KM   OPEN SPACE
 473          BA   .0043
 474          PB    3.50
 475          LS       0    85.1
 476          UD     0.1
              *

 477          KK    CP4a
 478          KM   COMBINE NLMB2 ST5Fa ST5Fb ST5Fc COS7C CP3.4
 479          KM   MINOR CP. NOT SHOWN ON FIGURE
 480          HC       6
              *
1                                        HEC-1 INPUT                                        PAGE 14

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

 481          KK    ST14
 482          KM   PAVED STREET BASIN - PARK DRIFT
 483          BA   .0082
 484          PB    3.50
 485          LS       0    90.3
 486          UD   0.082
              *

 487          KK       L
 488          KM   RESIDENTIAL, 4-8 UNITS PER ACRE
 489          BA   .1412
 490          PB    3.51
 491          LS       0    86.7
 492          UD   0.080
              *

 493          KK    CP-4
 494          KM   COMBINE BASINS ST14, L AND CP-4a
 495          HC       3
              *

 496          KK   RCP-4
 497          KM   ROUTE TO CP-5 IN SD
 498          RD     700   0.044   0.015       0    DEEP       5       0
              *

 499          KK       K
 500          KM   COMMERCIAL
 501          BA   .0173
 502          PB    3.49
 503          LS       0    94.0
 504          UD   0.050
              *

 505          KK   ST18A
 506          KM   PAVED STREET BASIN - LAKE MEAD
 507          BA   .0036
 508          PB    3.48
 509          LS       0    87.6
 510          UD   0.050
              *

 511          KK    ST17
 512          KM   PAVED STREET BASIN - CALICO BEND
 513          BA   .0017
```

```
 514          PB    3.47
 515          LS       0    88.0
 516          UD    0.05
              *
1                                        HEC-1 INPUT                                                PAGE 15

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

 517          KK    CP-5
 518          KM   COMBINE BASINS K, ST18A, ST17 AND CP-4
 519          HC       4
              *

 520          KK   RCP-5
 521          KM   ROUTE TO CP-6 IN SD
 522          RD    1090   0.053   0.015       0    DEEP       5       0
              *

 523          KK       H
 524          KM   RESIDENTIAL, 12 UNITS PER ACRE OR MORE
 525          BA   .0149
 526          PB    3.48
 527          LS       0    94.4
 528          UD   0.050
              *

 529          KK   ST18B
 530          KM   PAVED STREET BASIN - LAKE MEAD
 531          BA   .0071
 532          PB    3.47
 533          LS       0    85.1
 534          UD   0.054
              *

 535          KK   CP-6B
 536          KM   MINOR CP NOT SHOWN ON FIGURE.
 537          KM   COMBINE BASINS H, ST18B WITH CP5
 538          HC       3
              *

 539          KK   ST13A
 540          KM   PAVED STREET BASIN - PARK DRIFT
 541          BA   .0017
 542          PB    3.50
 543          LS       0    91.0
 544          UD   0.071
              *

 545          KK  RST13A
 546          KM   ROUTE ST13A TO CP-5.1A
 547          RD    1140   0.086   0.013       0    CIRC       2       0
              *

 548          KK   ST13B
 549          KM   PAVED STREET BASIN - SUNSET RUN
 550          BA   .0043
 551          PB    3.50
 552          LS       0    92.0
 553          UD   0.050
              *
1                                        HEC-1 INPUT                                                PAGE 16

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

 554          KK CP-5.1A
 555          KM   MINOR CP NOT SHOWN ON FIGURE.
 556          KM   COMBINE BASINS ST13 A, ST13B
 557          HC       2
              *

 558          KK       G
 559          KM   RESIDENTIAL, 8-12 UNITS PER ACRE
 560          BA   .0357
 561          PB    3.50
 562          LS       0    93.9
 563          UD   0.050
              *

 564          KK   G-Div
 565          KM   DIVERT OUT FLOW FROM  G TO V22 SYSTEM
 566          DT   G-out
 567          DI    0    99
 568          DQ     0   7
              *

 569          KK CP-5.1B
 570          KM   MINOR CP NOT SHOWN ON FIGURE.
 571          KM   COMBINE BASIN SPLIT-G WITH CP-5.1A
```

```
 572          HC       2
              *

 573          KK       I
 574          KM   RESIDENTIAL, 12 UNITS PER ACRE OR MORE
 575          BA   .0188
 576          PB    3.50
 577          LS       0    92.6
 578          UD   0.050
              *

 579          KK    ST16
 580          KM   PAVED STREET BASIN - CALICO BEND
 581          BA   .0021
 582          PB    3.48
 583          LS       0    91.4
 584          UD   0.050
              *

 585          KK  CP-5.1
 586          KM   COMBINE BASINS I AND ST16 WITH CP-5.1B
 587          HC       3
              *

 588          KK RCP-5.1
 589          KM   ROUTE IN SD TO CP-6a
 590          RD     660   0.070   0.013       0    CIRC       4       0
              *
1                                        HEC-1 INPUT                                          PAGE 17

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

 591          KK   ST13C
 592          KM   PAVED STREET BASIN - SUNSET RUN
 593          BA   .0033
 594          PB    3.48
 595          LS       0    91.3
 596          UD   0.050
              *

 597          KK   CP-6a
 598          KM   COMBINE BASIN ST13C AND CP-5.1
 599          HC       2
              *

 600          KK    CP-6
 601          KM   COMBIN CP6-A AND CP-6B
 602          HC       2
              *
 603          KM   ALL SUBSEQUENT INPUTS WITH "#" SYMBOL ARE REFERNECED FROM VTN MODEL
              *

 604          KK    RCP6
 605          KM   #ROUTE CP6 THROUGH 1/2 ST12 IN STORM DRAIN TO CP7
 606          RD     900   0.065   0.015       0    DEEP       5       0
              *

 607          KK       O
 608          KM   #SF3: HIGH DENSITY
 609          BA   .0371
 610          PB    3.46
 611          LS       0    93.1
 612          UD   0.097
              *

 613          KK    ST19
 614          KM   #PAVED STREET BASIN - HIGHLAND PRIDE
 615          BA   .0032
 616          PB    3.46
 617          LS       0    98.0
 618          UD   0.077
              *

 619          KK     CP7
 620          KM   #COMBINE RCP6, O, AND ST19
 621          HC       3
              *

 622          KK    RCP7
 623          KM   #ROUTE CP7 THROUGH 1/2 ST12 IN STORM DRAIN TO CP8
 624          RD     900   0.061   0.015       0    DEEP       5       0
              *
1                                        HEC-1 INPUT                                          PAGE 18

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

 625          KK       P
 626          KM   #SF3: HIGH DENSITY
```

```
 627          BA   .0214
 628          PB    3.46
 629          LS       0    93.3
 630          UD   0.073
              *

 631          KK    ST20
 632          KM   #PAVED STREET BASIN - CALICO BEND
 633          BA   .0062
 634          PB    3.46
 635          LS       0    98.0
 636          UD   0.070
              *

 637          KK    ST12
 638          KM   #PAVED STREET BASIN - SUNSET RUN
 639          BA   .0072
 640          PB    3.46
 641          LS       0    98.0
 642          UD   0.058
              *

 643          KK     CP8
 644          KM   #COMBINE CP7, P, ST20, AND ST12
 645          KM   FLOW INTO BASIN VIA NORTHERN INLET
 646          HC       4
              *

 647          KK    RCP8
 648          KM   #ROUTE CP8 THROUGH BASIN IN STORM DRAIN TO GPDBIN
 649          RD     996   0.025   0.015       0    DEEP       6       0
              *
 650          KM   END OF VTN REFERENCED SECTION
              *

 651          KK    CP1B
 652          KM   #COS (RP): REGIONAL PARK - OPEN SPACE
 653          BA   .0384
 654          PB    3.46
 655          LS       0    88.0
 656          UD   0.092
              *

 657          KK  GPDBIN
 658          KM   #COMBINE RCP8, RCP10, AND CP1B
 659          KM   TOTAL FLOW INTO GRAND PARK DETENTION BASIN
 660          HC       3
              *
```



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

 661          KK    GPDB
 662          KM   #VILLAGE 25 DETENTION BASIN (GRAND PARK DETENTION BASIN)
 663          KM   STORAGE VOLUME = 155.0 AC-FT AT 3534 STAGE
 664          KM   SEDIMENT VOLUME = 9.0 AC-FT (REMOVED FROM EACH STAGE)
 665          KM   OUTLET = 5'X5' RCB WITH 26" ORIFICE PLATE
 666          KM   100-YEAR DISCHARGE = 92 CFS
 667          KM   SPILLWAY LENGTH = 300 FT WITH 10:1 SIDE SLOPES
 668          KM   SPILLWAY HEIGHT = 3 FT
 669          KM   SPILLWAY CREST ELEVATION = 3532.0'
 670          KM   SPILLWAY TYPE = BROAD CRESTED TRAPEZOIDAL WEIR
 671          KM   PMF DISCHARGE = 4544 CFS
 672          KM   TOP OF EMBANKMENT ELEVATION = 3535.0'
 673          KM   STAGE/STORAGE/DISCHARGE CALCULATED BY: PLM OF VTN
 674          RS       1    STOR       0
 675          SV     0.0     1.8     6.7    13.0    20.4    29.1    39.7    54.3    74.9    97.0
 676          SV   108.6   120.7   133.2   146.0
 677          SE    3506    3514    3516    3518    3520    3522    3524    3526    3528    3530
 678          SE    3531    3532    3533    3534
 679          SQ       0    50.6    57.4    63.5    69.1    74.3    79.1    83.6    88.0    92.1
 680          SQ    94.1    96.0   921.2  2665.6
              *

 681          KK   RGPDB
 682          KM   #ROUTE GPDB THROUGH ST9 AND ST10 IN STORM DRAIN TO CP11
 683          RD    1972   0.039   0.015       0    DEEP       5       0
              *

 684          KK     ST9
 685          KM   #PAVED STREET BASIN - FOX HILL
 686          BA   .0046
 687          PB    3.46
 688          LS       0    98.0
 689          UD   0.059
              *

 690          KK    CP1C
 691          KM   #COS (RP): REGIONAL PARK - OPEN SPACE
```

```
            692          BA   .0451
            693          PB    3.46
            694          LS       0    88.0
            695          UD   0.096
                         *

            696          KK    ST10
            697          KM   #PAVED STREET BASIN - SKY VISTA
            698          BA   .0034
            699          PB    3.46
            700          LS       0    98.0
            701          UD   0.050
                         *
```



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


            702          KK    ST11
            703          KM   #PAVED STREET BASIN - SUNSET RUN
            704          BA   .0052
            705          PB    3.46
            706          LS       0    98.0
            707          UD   0.054
                         *

            708          KK    CP11
            709          KM   #COMBINE RGPDB, ST9, CP1C, ST10 AND ST11
            710          HC       5
                         *
            711          KM   END VTN MODEL REFERENCE
                         *

            712          KKV30ACP1S
            713          KM   FLOW SPLIT AT V30A CP1
            714          DRV30ACP1S       r
                         *

            715          KK  V30A-B
            716          KM   GCW SUBBASIN
            717          KM   BASIN AREA CHANGED
            718          BA  0.0423
            719          PB    3.51
            720          LS       0    89.0
            721          UD   0.087
                         *

            722          KKV30A-RD2
            723          KM   GCW SUBBASIN
            724          KM   BASIN AREA CHANGED
            725          BA  0.0053
            726          PB    3.50
            727          LS       0    98.0
            728          UD   0.051
                         *

            729          KK V30ACP2
            730          KM   GCW V29 MCDS CONCENTRATION POINT
            731          HC       3
                         *

            732          KK      A4
            733          KM   A4 DRAINS TO WOTUS-4 AND ULTIMATELY TO ALTA DB 4-5
            734          KM   A4 MODELED AND ACCOUNTED FOR IN V29 MCDS
            735          KM   SINGLE FAMILY SPECIAL ESTATE
            736          BA   .0640
            737          PB    3.57
            738          LS       0    80.9
            739          UD   0.165
                         *
```



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

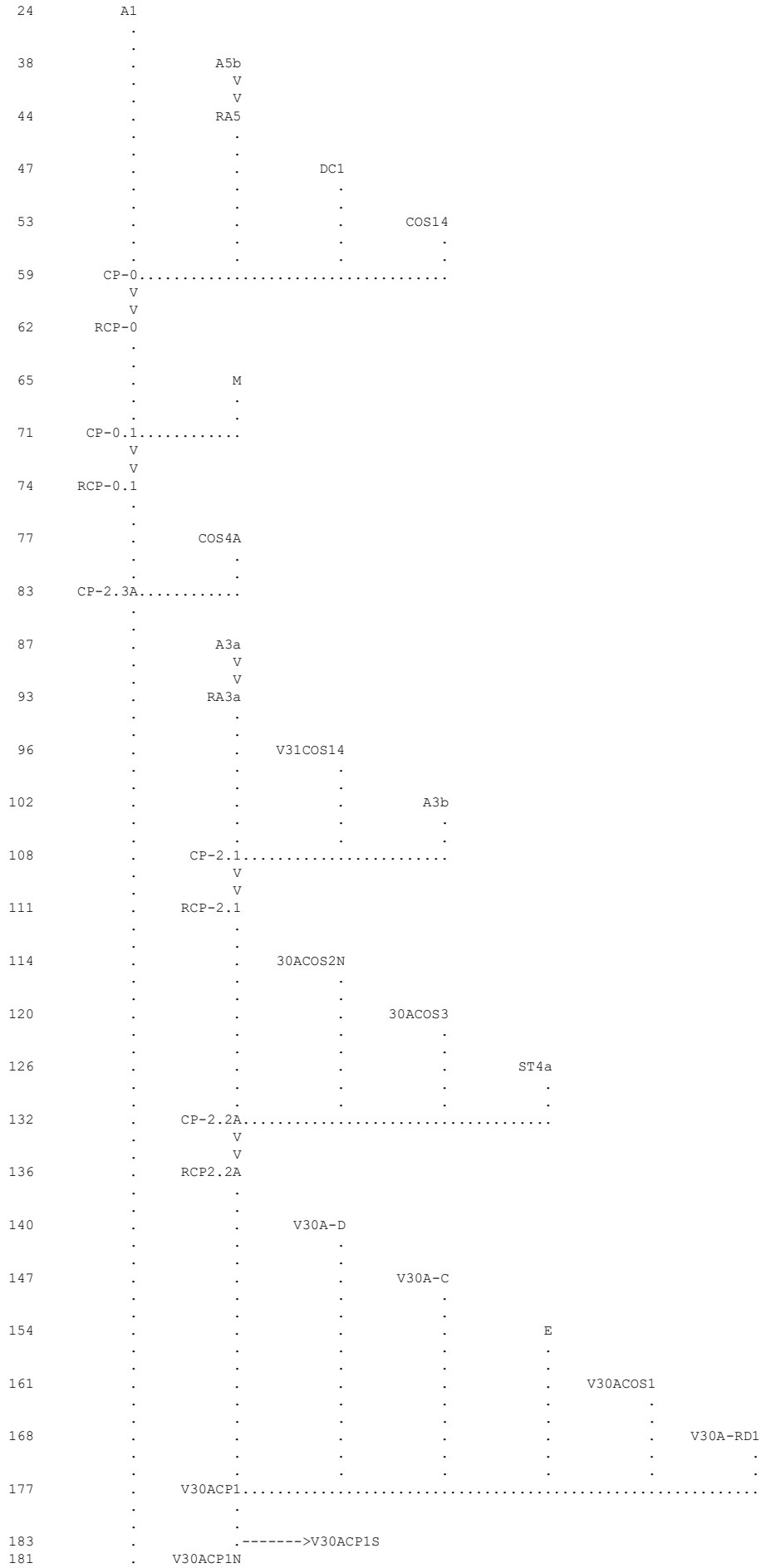

            740          KK30ACOS2S
            741          KM   30ACOS2S DRAINS TO V30B COS-2 AND ULTIMATELY TO ALTA DB 4-5
            742          KM   COMMUNITY OPEN SPACE
            743          BA   .0034
            744          PB    3.54
            745          LS       0    85.0
            746          UD    0.10
                         *
            747          ZZ
```

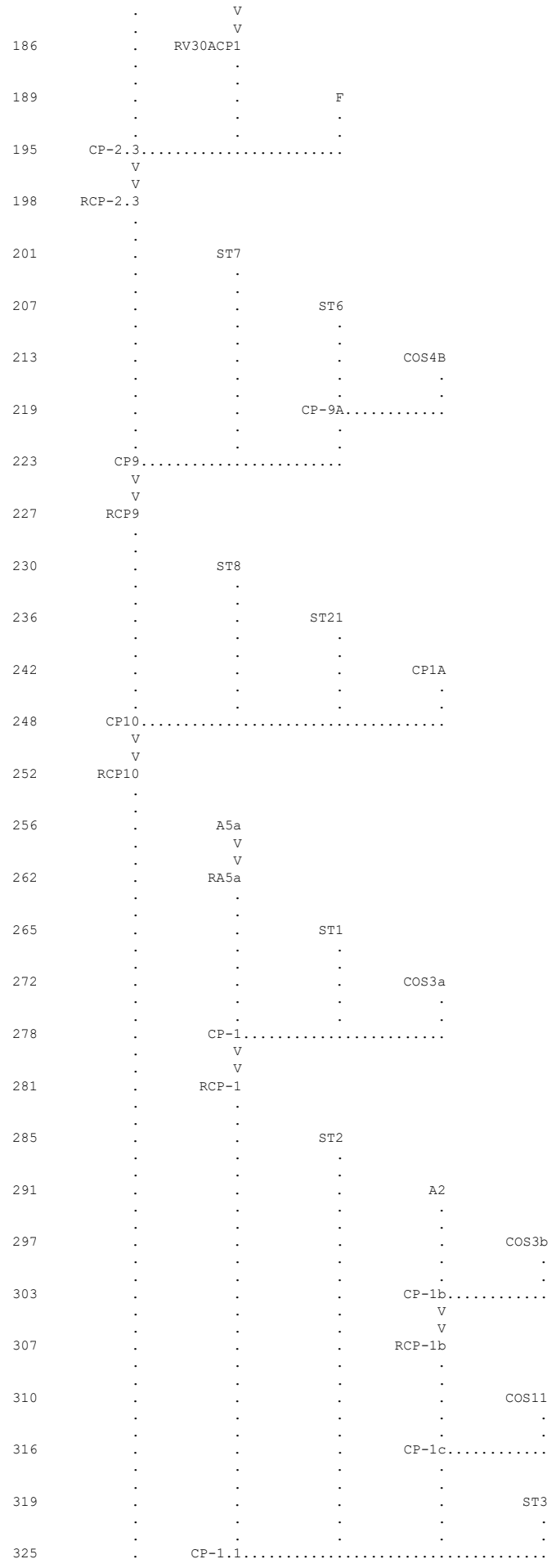
1

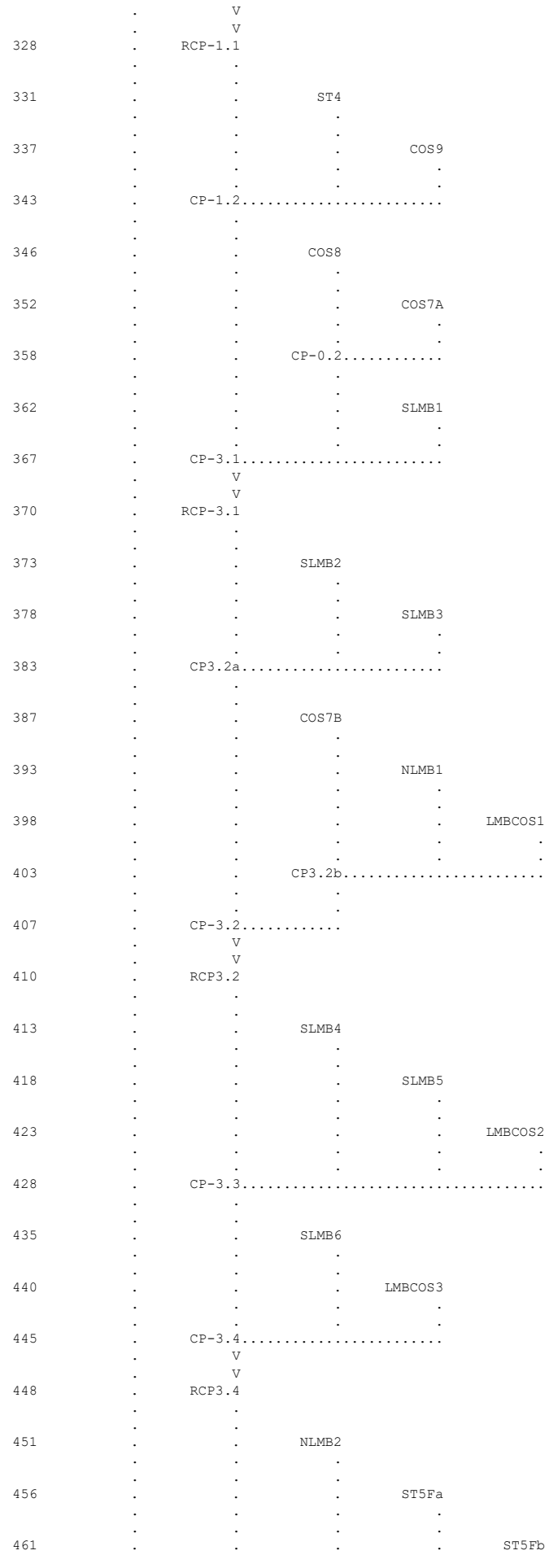
SCHEMATIC DIAGRAM OF STREAM NETWORK

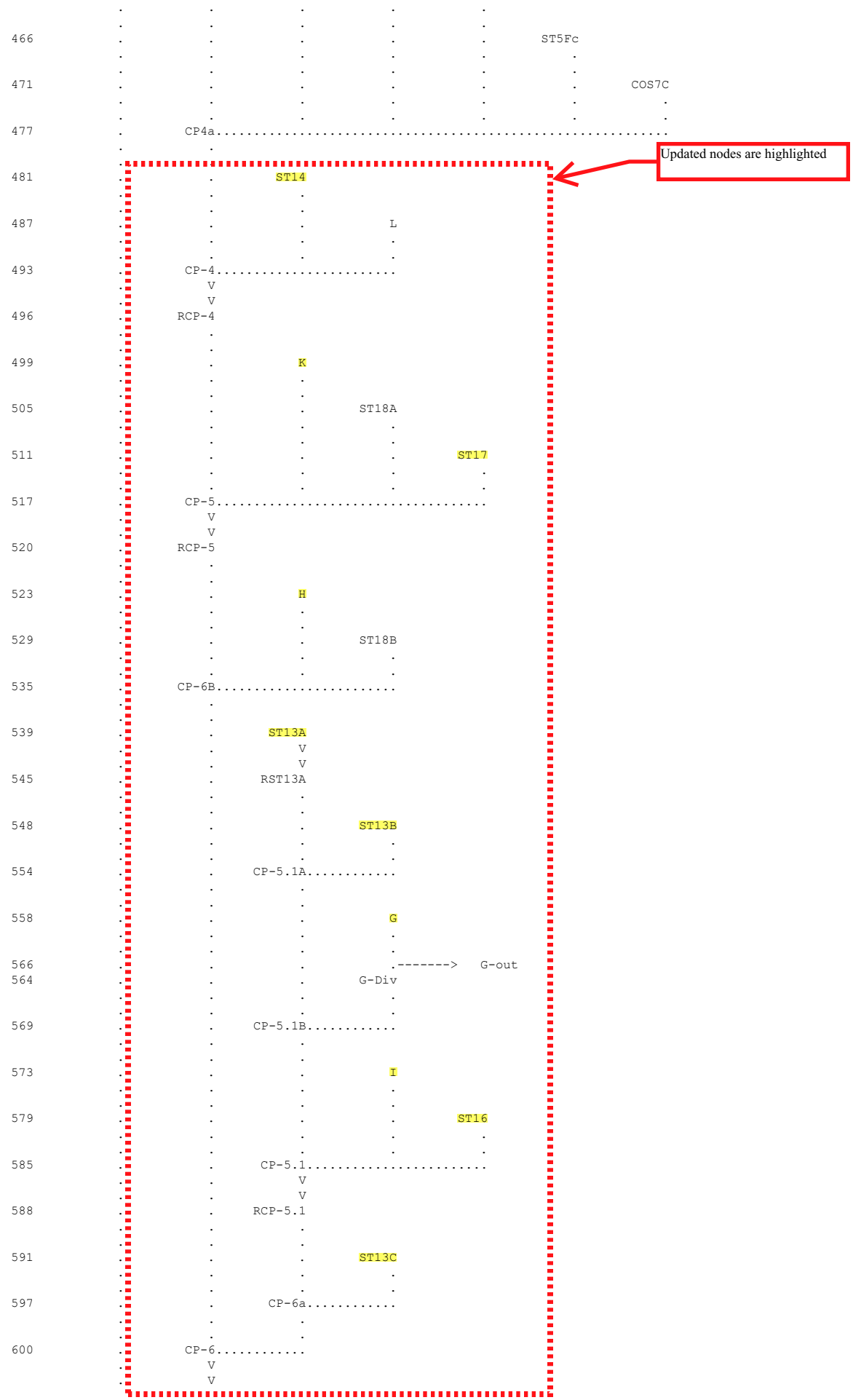
```
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

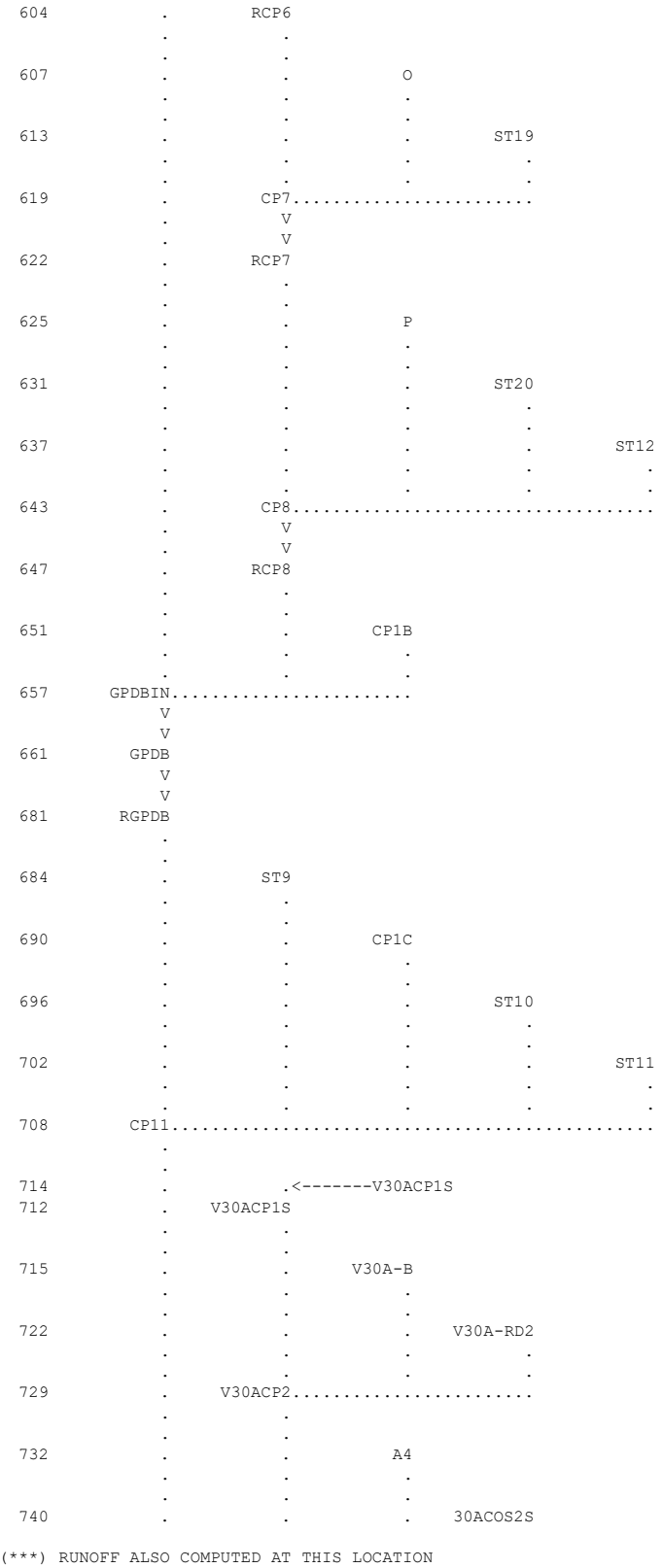
   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW
```


24 A1
38 A5b
44 RA5
47 DC1
53 COS14
59 CP-0
62 RCP-0
65 M
71 CP-0.1
74 RCP-0.1
77 COS4A
83 CP-2.3A
87 A3a
93 RA3a
96 V31COS14
102 A3b
108 CP-2.1
111 RCP-2.1
114 30ACOS2N
120 30ACOS3
126 ST4a
132 CP-2.2A
136 RCP2.2A
140 V30A-D
147 V30A-C
154 E
161 V30ACOS1
168 V30A-RD1
177 V30ACP1
183 V30ACP1S
181 V30ACP1N


RV30ACP1
CP-2.3
RCP-2.3
ST7
ST6
COS4B
CP-9A
CP9
RCP9
ST8
ST21
CP1A
CP10
RCP10
A5a
RA5a
ST1
COS3a
CP-1
RCP-1
ST2
A2
COS3b
CP-1b
RCP-1b
COS11
CP-1c
ST3
CP-1.1


RCP-1.1
ST4
COS9
CP-1.2
COS8
COS7A
CP-0.2
SLMB1
CP-3.1
RCP-3.1
SLMB2
SLMB3
CP3.2a
COS7B
NLMB1
LMBCOS1
CP3.2b
CP-3.2
RCP3.2
SLMB4
SLMB5
LMBCOS2
CP-3.3
SLMB6
LMBCOS3
CP-3.4
RCP3.4
NLMB2
ST5Fa
ST5Fb


ST5Fc
COS7C
CP4a
Updated nodes are highlighted
ST14
L
CP-4
RCP-4
K
ST18A
ST17
CP-5
RCP-5
H
ST18B
CP-6B
ST13A
RST13A
ST13B
CP-5.1A
G
G-out
G-Div
CP-5.1B
I
ST16
CP-5.1
RCP-5.1
ST13C
CP-6a
CP-6



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               JUN   1998              *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   10AUG22  TIME  15:28:32   *
*                                       *
*****************************************
```


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

INPUT FILE DATE = DECEMBER 30 2021
DESIGN STORM = 100-YEAR 6-HR STORM
STORM DISTRIBUTION = SDN #3
MODELED BY ATKINS (KP)
SUMMERLIN WEST V27/V31/V30A GRAND PARK TRIBUTARY AREA MDS
UPDATE #1 ADDENDUM #1 (Update with Parcel G flowSplit)

AREA SQ. MI.	DARF
0-0.5	0.99
0.5-1	0.975
1-2	0.95

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

100-YEAR, 6-HOUR STORM, SDN3

```
   21 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          500  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2    0  ENDING DATE
                      NDTIME         1735  ENDING TIME
                       ICENT           19  CENTURY MARK

                    COMPUTATION INTERVAL     .08 HOURS
                         TOTAL TIME BASE   41.58 HOURS

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

      JP          MULTI-PLAN OPTION
                        NPLAN           1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                      .99       .98       .95
1

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

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .99	RATIO 2 .98	RATIO 3 .95
HYDROGRAPH AT							
+	A1	.09	1	FLOW	153.	150.	144.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	A5b	.01	1	FLOW	12.	12.	11.
				TIME	3.50	3.50	3.50
ROUTED TO							
+	RA5	.01	1	FLOW	11.	11.	11.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	DC1	.01	1	FLOW	22.	21.	21.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	COS14	.00	1	FLOW	8.	8.	8.
				TIME	3.50	3.50	3.50
4 COMBINED AT							
+	CP-0	.11	1	FLOW	187.	183.	176.
				TIME	3.50	3.50	3.50
ROUTED TO							
+	RCP-0	.11	1	FLOW	183.	178.	172.
				TIME	3.58	3.58	3.58

HYDROGRAPH AT							
+	M	.12	1	FLOW	180.	176.	169.
				TIME	3.58	3.58	3.58
2 COMBINED AT							
+	CP-0.1	.23	1	FLOW	363.	354.	341.
				TIME	3.58	3.58	3.58
ROUTED TO							
+	RCP-0.1	.23	1	FLOW	355.	341.	328.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	COS4A	.04	1	FLOW	70.	69.	66.
				TIME	3.50	3.50	3.50
2 COMBINED AT							
+	CP-2.3A	.27	1	FLOW	421.	407.	390.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	A3a	.14	1	FLOW	173.	169.	161.
				TIME	3.58	3.58	3.58
ROUTED TO							
+	RA3a	.14	1	FLOW	165.	161.	153.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	V31COS14	.01	1	FLOW	18.	17.	17.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	A3b	.03	1	FLOW	49.	48.	46.
				TIME	3.50	3.50	3.50
3 COMBINED AT							
+	CP-2.1	.17	1	FLOW	222.	216.	207.
				TIME	3.58	3.58	3.58
ROUTED TO							
+	RCP-2.1	.17	1	FLOW	212.	207.	197.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	30ACOS2N	.00	1	FLOW	8.	7.	7.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	30ACOS3	.02	1	FLOW	36.	35.	34.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	ST4a	.00	1	FLOW	6.	6.	6.
				TIME	3.50	3.50	3.50
4 COMBINED AT							
+	CP-2.2A	.20	1	FLOW	257.	251.	239.
				TIME	3.58	3.58	3.58
ROUTED TO							
+	RCP2.2A	.20	1	FLOW	244.	238.	227.
				TIME	3.58	3.67	3.67
HYDROGRAPH AT							
+	V30A-D	.06	1	FLOW	110.	108.	104.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	V30A-C	.06	1	FLOW	108.	106.	102.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	E	.05	1	FLOW	114.	112.	108.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	V30ACOS1	.01	1	FLOW	13.	13.	13.
				TIME	3.50	3.58	3.58
HYDROGRAPH AT							
+	V30A-RD1	.02	1	FLOW	57.	56.	54.
				TIME	3.50	3.50	3.50
6 COMBINED AT							
+	V30ACP1	.39	1	FLOW	592.	577.	555.
				TIME	3.50	3.50	3.50
DIVERSION TO							

+	V30ACP1S	.39	1	FLOW	296.	289.	278.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	V30ACP1N	.39	1	FLOW	296.	289.	278.
				TIME	3.50	3.50	3.50
ROUTED TO							
+	RV30ACP1	.39	1	FLOW	293.	286.	276.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	F	.03	1	FLOW	82.	80.	78.
				TIME	3.50	3.50	3.50
3 COMBINED AT							
+	CP-2.3	.69	1	FLOW	764.	741.	714.
				TIME	3.58	3.58	3.58
ROUTED TO							
+	RCP-2.3	.69	1	FLOW	760.	738.	710.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	ST7	.01	1	FLOW	17.	16.	16.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	ST6	.00	1	FLOW	11.	11.	11.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	COS4B	.02	1	FLOW	45.	44.	42.
				TIME	3.50	3.50	3.50
2 COMBINED AT							
+	CP-9A	.03	1	FLOW	56.	55.	53.
				TIME	3.50	3.50	3.50
3 COMBINED AT							
+	CP9	.72	1	FLOW	825.	801.	771.
				TIME	3.58	3.58	3.58
ROUTED TO							
+	RCP9	.72	1	FLOW	812.	790.	759.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	ST8	.00	1	FLOW	12.	12.	12.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	ST21	.00	1	FLOW	10.	10.	10.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	CP1A	.07	1	FLOW	131.	128.	124.
				TIME	3.50	3.50	3.50
4 COMBINED AT							
+	CP10	.80	1	FLOW	956.	931.	896.
				TIME	3.58	3.58	3.58
ROUTED TO							
+	RCP10	.80	1	FLOW	951.	926.	891.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	A5a	.02	1	FLOW	34.	33.	32.
				TIME	3.50	3.50	3.50
ROUTED TO							
+	RA5a	.02	1	FLOW	32.	31.	30.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	ST1	.00	1	FLOW	7.	7.	7.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	COS3a	.01	1	FLOW	18.	17.	17.
				TIME	3.50	3.50	3.50
3 COMBINED AT							
+	CP-1	.03	1	FLOW	54.	53.	51.
				TIME	3.50	3.50	3.50
ROUTED TO							
+	RCP-1	.03	1	FLOW	54.	53.	51.
				TIME	3.58	3.58	3.58

HYDROGRAPH AT							
+	ST2	.01	1	FLOW	19.	19.	18.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	A2	.00	1	FLOW	2.	2.	2.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	COS3b	.01	1	FLOW	21.	20.	19.
				TIME	3.50	3.50	3.50
2 COMBINED AT							
+	CP-1b	.01	1	FLOW	23.	22.	21.
				TIME	3.50	3.50	3.50
ROUTED TO							
+	RCP-1b	.01	1	FLOW	22.	21.	20.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	COS11	.01	1	FLOW	21.	20.	19.
				TIME	3.50	3.50	3.50
2 COMBINED AT							
+	CP-1c	.02	1	FLOW	41.	40.	39.
				TIME	3.50	3.50	3.58
HYDROGRAPH AT							
+	ST3	.00	1	FLOW	5.	5.	5.
				TIME	3.50	3.50	3.50
4 COMBINED AT							
+	CP-1.1	.06	1	FLOW	118.	115.	111.
				TIME	3.50	3.50	3.50
ROUTED TO							
+	RCP-1.1	.06	1	FLOW	115.	113.	109.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	ST4	.00	1	FLOW	9.	9.	8.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	COS9	.00	1	FLOW	5.	5.	5.
				TIME	3.50	3.50	3.50
3 COMBINED AT							
+	CP-1.2	.07	1	FLOW	129.	127.	122.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	COS8	.01	1	FLOW	10.	10.	9.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	COS7A	.00	1	FLOW	1.	1.	1.
				TIME	3.50	3.50	3.50
2 COMBINED AT							
+	CP-0.2	.01	1	FLOW	11.	11.	11.
				TIME	3.58	3.58	3.58
HYDROGRAPH AT							
+	SLMB1	.00	1	FLOW	1.	1.	1.
				TIME	3.50	3.50	3.50
3 COMBINED AT							
+	CP-3.1	.08	1	FLOW	141.	138.	133.
				TIME	3.50	3.50	3.50
ROUTED TO							
+	RCP-3.1	.08	1	FLOW	137.	134.	129.
				TIME	3.50	3.58	3.58
HYDROGRAPH AT							
+	SLMB2	.00	1	FLOW	4.	4.	4.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	SLMB3	.00	1	FLOW	4.	4.	4.
				TIME	3.50	3.50	3.50
3 COMBINED AT							
+	CP3.2a	.08	1	FLOW	145.	142.	136.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							

```
+                 COS7B       .00     1   FLOW          6.       6.       6.
                                          TIME        3.50     3.50     3.50

 HYDROGRAPH AT
+                 NLMB1       .00     1   FLOW         10.      10.       9.
                                          TIME        3.50     3.50     3.50

 HYDROGRAPH AT
+               LMBCOS1       .01     1   FLOW         14.      14.      13.
                                          TIME        3.50     3.50     3.50

  3 COMBINED AT
+                CP3.2b       .02     1   FLOW         30.      29.      28.
                                          TIME        3.50     3.50     3.50

  2 COMBINED AT
+                CP-3.2       .10     1   FLOW        175.     171.     165.
                                          TIME        3.50     3.50     3.50

 ROUTED TO
+                RCP3.2       .10     1   FLOW        171.     167.     161.
                                          TIME        3.50     3.50     3.50

 HYDROGRAPH AT
+                 SLMB4       .00     1   FLOW          4.       4.       3.
                                          TIME        3.50     3.50     3.50

 HYDROGRAPH AT
+                 SLMB5       .00     1   FLOW          1.       1.       1.
                                          TIME        3.50     3.50     3.50

 HYDROGRAPH AT
+               LMBCOS2       .01     1   FLOW         12.      12.      11.
                                          TIME        3.50     3.50     3.50

  4 COMBINED AT
+                CP-3.3       .11     1   FLOW        188.     183.     176.
                                          TIME        3.50     3.50     3.50

 HYDROGRAPH AT
+                 SLMB6       .00     1   FLOW          1.       1.       1.
                                          TIME        3.50     3.50     3.50

 HYDROGRAPH AT
+               LMBCOS3       .00     1   FLOW          5.       5.       4.
                                          TIME        3.50     3.50     3.50

  3 COMBINED AT
+                CP-3.4       .11     1   FLOW        194.     189.     182.
                                          TIME        3.50     3.50     3.50

 ROUTED TO
+                RCP3.4       .11     1   FLOW        189.     185.     178.
                                          TIME        3.50     3.50     3.50

 HYDROGRAPH AT
+                 NLMB2       .00     1   FLOW          3.       3.       3.
                                          TIME        3.50     3.50     3.50

 HYDROGRAPH AT
+                 ST5Fa       .00     1   FLOW          1.       1.       1.
                                          TIME        3.50     3.50     3.50

 HYDROGRAPH AT
+                 ST5Fb       .00     1   FLOW          1.       1.       1.
                                          TIME        3.50     3.50     3.50

 HYDROGRAPH AT
+                 ST5Fc       .00     1   FLOW          2.       2.       2.
                                          TIME        3.50     3.50     3.50

 HYDROGRAPH AT
+                 COS7C       .00     1   FLOW          8.       8.       7.
                                          TIME        3.50     3.50     3.50

  6 COMBINED AT
+                  CP4a       .12     1   FLOW        205.     200.     192.
                                          TIME        3.50     3.50     3.50

 HYDROGRAPH AT
+                  ST14       .01     1   FLOW         19.      18.      18.
                                          TIME        3.50     3.50     3.50

 HYDROGRAPH AT
+                     L       .14     1   FLOW        292.     286.     276.
                                          TIME        3.50     3.50     3.50

  3 COMBINED AT
+                  CP-4       .27     1   FLOW        515.     504.     486.
                                          TIME        3.50     3.50     3.50
```

Updated nodes are highlighted

ROUTED TO							
+	RCP-4	.27	1	FLOW	506.	495.	477.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	K	.02	1	FLOW	48.	47.	46.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	ST18A	.00	1	FLOW	9.	8.	8.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	ST17	.00	1	FLOW	4.	4.	4.
				TIME	3.50	3.50	3.50
4 COMBINED AT							
+	CP-5	.29	1	FLOW	566.	554.	535.
				TIME	3.50	3.50	3.50
ROUTED TO							
+	RCP-5	.29	1	FLOW	553.	541.	521.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	H	.01	1	FLOW	41.	41.	39.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	ST18B	.01	1	FLOW	15.	15.	14.
				TIME	3.50	3.50	3.50
3 COMBINED AT							
+	CP-6B	.31	1	FLOW	609.	597.	575.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	ST13A	.00	1	FLOW	4.	4.	4.
				TIME	3.50	3.50	3.50
ROUTED TO							
+	RST13A	.00	1	FLOW	4.	4.	4.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	ST13B	.00	1	FLOW	11.	11.	11.
				TIME	3.50	3.50	3.50
2 COMBINED AT							
+	CP-5.1A	.01	1	FLOW	15.	15.	15.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	G	.04	1	FLOW	99.	97.	94.
				TIME	3.50	3.50	3.50
DIVERSION TO							
+	G-out	.04	1	FLOW	7.	7.	7.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	G-Div	.04	1	FLOW	92.	90.	88.
				TIME	3.50	3.50	3.50
2 COMBINED AT							
+	CP-5.1B	.04	1	FLOW	107.	105.	102.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	I	.02	1	FLOW	51.	50.	48.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	ST16	.00	1	FLOW	5.	5.	5.
				TIME	3.50	3.50	3.50
3 COMBINED AT							
+	CP-5.1	.06	1	FLOW	163.	160.	156.
				TIME	3.50	3.50	3.50
ROUTED TO							
+	RCP-5.1	.06	1	FLOW	161.	158.	153.
				TIME	3.50	3.50	3.50
HYDROGRAPH AT							
+	ST13C	.00	1	FLOW	9.	8.	8.
				TIME	3.50	3.50	3.50
2 COMBINED AT							

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+                 CP-6a       .07     1   FLOW         169.     166.     162.
                                          TIME         3.50     3.50     3.50

  2 COMBINED AT
+                  CP-6       .38     1   FLOW         779.     763.     737.
                                          TIME         3.50     3.50     3.50

 ROUTED TO
+                  RCP6       .38     1   FLOW         765.     750.     725.
                                          TIME         3.50     3.50     3.50

 HYDROGRAPH AT
+                     O       .04     1   FLOW          85.      83.      81.
                                          TIME         3.50     3.50     3.50

 HYDROGRAPH AT
+                  ST19       .00     1   FLOW           8.       8.       8.
                                          TIME         3.50     3.50     3.50

  3 COMBINED AT
+                   CP7       .42     1   FLOW         858.     842.     814.
                                          TIME         3.50     3.50     3.50

 ROUTED TO
+                  RCP7       .42     1   FLOW         844.     828.     800.
                                          TIME         3.50     3.50     3.50

 HYDROGRAPH AT
+                     P       .02     1   FLOW          53.      52.      51.
                                          TIME         3.50     3.50     3.50

 HYDROGRAPH AT
+                  ST20       .01     1   FLOW          17.      17.      16.
                                          TIME         3.50     3.50     3.50

 HYDROGRAPH AT
+                  ST12       .01     1   FLOW          20.      20.      19.
                                          TIME         3.50     3.50     3.50

  4 COMBINED AT
+                   CP8       .45     1   FLOW         935.     917.     886.
                                          TIME         3.50     3.50     3.50

 ROUTED TO
+                  RCP8       .45     1   FLOW         911.     894.     864.
                                          TIME         3.50     3.50     3.50

 HYDROGRAPH AT
+                  CP1B       .04     1   FLOW          77.      76.      73.
                                          TIME         3.50     3.50     3.50

  3 COMBINED AT
+                GPDBIN      1.29     1   FLOW        1846.    1807.    1739.
                                          TIME         3.50     3.50     3.50

 ROUTED TO
+                  GPDB      1.29     1   FLOW          92.      92.      91.
                                          TIME         5.33     5.33     5.33

                                    ** PEAK STAGES IN FEET **
                                    1   STAGE     3530.18  3529.96  3529.60
                                          TIME         5.33     5.33     5.33

 ROUTED TO
+                 RGPDB      1.29     1   FLOW          92.      92.      91.
                                          TIME         5.33     5.33     5.33

 HYDROGRAPH AT
+                   ST9       .00     1   FLOW          13.      13.      12.
                                          TIME         3.50     3.50     3.50

 HYDROGRAPH AT
+                  CP1C       .05     1   FLOW          90.      88.      85.
                                          TIME         3.50     3.50     3.50

 HYDROGRAPH AT
+                  ST10       .00     1   FLOW          10.      10.       9.
                                          TIME         3.50     3.50     3.50

 HYDROGRAPH AT
+                  ST11       .01     1   FLOW          15.      15.      14.
                                          TIME         3.50     3.50     3.50

  5 COMBINED AT
+                  CP11      1.35     1   FLOW         201.     198.     193.
                                          TIME         3.50     3.50     3.50

 HYDROGRAPH AT
+              V30ACP1S       .00     1   FLOW         296.     289.     278.
                                          TIME         3.50     3.50     3.50
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 HYDROGRAPH AT
+                V30A-B       .04     1   FLOW          91.      90.      87.
                                          TIME         3.50     3.50     3.50

 HYDROGRAPH AT
+              V30A-RD2       .01     1   FLOW          15.      15.      15.
                                          TIME         3.50     3.50     3.50

  3 COMBINED AT
+               V30ACP2       .05     1   FLOW         403.     393.     379.
                                          TIME         3.50     3.50     3.50

 HYDROGRAPH AT
+                    A4       .06     1   FLOW          92.      90.      86.
                                          TIME         3.58     3.58     3.58

 HYDROGRAPH AT
+              30ACOS2S       .00     1   FLOW           6.       6.       6.
                                          TIME         3.50     3.50     3.50
1
                                      SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
                                          (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)
                                                                                INTERPOLATED TO
                                                                              COMPUTATION INTERVAL
           ISTAQ    ELEMENT      DT       PEAK    TIME TO     VOLUME      DT       PEAK    TIME TO     VOLUME
                                                     PEAK                                    PEAK

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

          FOR PLAN = 1  RATIO=  .00
               RA5  MANE          .82     11.50    210.40      1.94      5.00     11.29    210.00        1.94


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .5781E+00 EXCESS= .0000E+00 OUTFLOW= .5781E+00 BASIN STORAGE= .5610E-04 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
               RA5  MANE          .82     11.29    210.53      1.89      5.00     11.04    210.00        1.89


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .5645E+00 EXCESS= .0000E+00 OUTFLOW= .5645E+00 BASIN STORAGE= .5507E-04 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
               RA5  MANE          .83     10.85    210.50      1.81      5.00     10.62    210.00        1.82


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .5418E+00 EXCESS= .0000E+00 OUTFLOW= .5418E+00 BASIN STORAGE= .5885E-04 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
             RCP-0  MANE         1.35    187.22    212.46      2.02      5.00    182.72    215.00        2.02


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .1156E+02 EXCESS= .0000E+00 OUTFLOW= .1156E+02 BASIN STORAGE= .1744E-03 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
             RCP-0  MANE         1.36    182.78    212.06      1.97      5.00    178.20    215.00        1.98


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .1129E+02 EXCESS= .0000E+00 OUTFLOW= .1129E+02 BASIN STORAGE= .1618E-03 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
             RCP-0  MANE         1.37    176.10    212.33      1.90      5.00    172.09    215.00        1.90


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .1086E+02 EXCESS= .0000E+00 OUTFLOW= .1086E+02 BASIN STORAGE= .1484E-03 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
           RCP-0.1  MANE         3.99    360.17    215.45      1.85      5.00    354.62    215.00        1.85


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .2229E+02 EXCESS= .0000E+00 OUTFLOW= .2230E+02 BASIN STORAGE= .2994E-02 PERCENT ERROR=   -.1


          FOR PLAN = 1  RATIO=  .00
           RCP-0.1  MANE         4.02    352.13    217.25      1.80      5.00    341.41    215.00        1.80


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .2175E+02 EXCESS= .0000E+00 OUTFLOW= .2177E+02 BASIN STORAGE= .3205E-02 PERCENT ERROR=   -.1


          FOR PLAN = 1  RATIO=  .00
           RCP-0.1  MANE         4.08    337.68    216.00      1.72      5.00    327.71    215.00        1.72
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CONTINUITY SUMMARY (AC-FT) - INFLOW= .2082E+02 EXCESS= .0000E+00 OUTFLOW= .2084E+02 BASIN STORAGE= .2823E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00

RA3a	MANE	1.77	171.07	216.50	1.41	5.00	165.21	215.00	1.41

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1049E+02 EXCESS= .0000E+00 OUTFLOW= .1049E+02 BASIN STORAGE= .9476E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RA3a	MANE	1.79	167.34	216.76	1.37	5.00	160.64	215.00	1.37

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1020E+02 EXCESS= .0000E+00 OUTFLOW= .1020E+02 BASIN STORAGE= .8753E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RA3a	MANE	1.82	158.92	216.66	1.31	5.00	152.90	215.00	1.31

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9713E+01 EXCESS= .0000E+00 OUTFLOW= .9714E+01 BASIN STORAGE= .9652E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-2.1	MANE	2.67	216.56	216.65	1.52	5.00	212.14	215.00	1.52

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1415E+02 EXCESS= .0000E+00 OUTFLOW= .1415E+02 BASIN STORAGE= .1857E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-2.1	MANE	2.70	210.21	215.90	1.48	5.00	206.59	215.00	1.48

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1378E+02 EXCESS= .0000E+00 OUTFLOW= .1378E+02 BASIN STORAGE= .1569E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-2.1	MANE	2.74	201.13	216.57	1.41	5.00	196.56	215.00	1.41

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1315E+02 EXCESS= .0000E+00 OUTFLOW= .1315E+02 BASIN STORAGE= .1396E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP2.2A	MANE	1.88	254.23	217.88	1.59	5.00	243.55	215.00	1.59

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1702E+02 EXCESS= .0000E+00 OUTFLOW= .1702E+02 BASIN STORAGE= .4075E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP2.2A	MANE	1.89	248.84	217.39	1.55	5.00	237.50	220.00	1.55

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1658E+02 EXCESS= .0000E+00 OUTFLOW= .1658E+02 BASIN STORAGE= .4992E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP2.2A	MANE	1.91	236.32	218.07	1.48	5.00	226.68	220.00	1.48

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1585E+02 EXCESS= .0000E+00 OUTFLOW= .1585E+02 BASIN STORAGE= .4206E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RV30ACP1	MANE	1.22	295.69	212.77	.99	5.00	292.97	215.00	.99

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2050E+02 EXCESS= .0000E+00 OUTFLOW= .2050E+02 BASIN STORAGE= .2800E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RV30ACP1	MANE	1.22	288.59	212.84	.97	5.00	286.02	215.00	.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2004E+02 EXCESS= .0000E+00 OUTFLOW= .2003E+02 BASIN STORAGE= .2745E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RV30ACP1	MANE	1.24	278.46	212.48	.93	5.00	275.82	215.00	.93

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1927E+02 EXCESS= .0000E+00 OUTFLOW= .1927E+02 BASIN STORAGE= .2647E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-2.3	MANE	.41	761.59	215.39	1.40	5.00	760.29	215.00	1.40

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5119E+02 EXCESS= .0000E+00 OUTFLOW= .5119E+02 BASIN STORAGE= .1105E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-2.3	MANE	.41	739.04	215.35	1.36	5.00	737.91	215.00	1.36	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4992E+02 EXCESS= .0000E+00 OUTFLOW= .4992E+02 BASIN STORAGE= .1126E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-2.3	MANE	.42	711.39	215.34	1.31	5.00	710.03	215.00	1.31	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4798E+02 EXCESS= .0000E+00 OUTFLOW= .4798E+02 BASIN STORAGE= .1122E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP9	MANE	1.20	816.38	215.38	1.43	5.00	812.35	215.00	1.44	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5541E+02 EXCESS= .0000E+00 OUTFLOW= .5541E+02 BASIN STORAGE= .3520E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP9	MANE	1.21	793.94	215.75	1.40	5.00	789.92	215.00	1.40	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5404E+02 EXCESS= .0000E+00 OUTFLOW= .5405E+02 BASIN STORAGE= .3800E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP9	MANE	1.22	763.52	215.39	1.34	5.00	759.47	215.00	1.35	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5195E+02 EXCESS= .0000E+00 OUTFLOW= .5195E+02 BASIN STORAGE= .3696E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP10	MANE	.33	953.47	215.38	1.52	5.00	951.04	215.00	1.52	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6498E+02 EXCESS= .0000E+00 OUTFLOW= .6498E+02 BASIN STORAGE= .9355E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP10	MANE	.33	927.71	215.16	1.48	5.00	925.74	215.00	1.48	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6341E+02 EXCESS= .0000E+00 OUTFLOW= .6341E+02 BASIN STORAGE= .9044E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP10	MANE	.33	893.24	215.23	1.43	5.00	890.73	215.00	1.43	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6099E+02 EXCESS= .0000E+00 OUTFLOW= .6099E+02 BASIN STORAGE= .9336E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RA5a	MANE	3.06	32.73	213.97	2.08	5.00	31.75	215.00	2.09	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1891E+01 EXCESS= .0000E+00 OUTFLOW= .1890E+01 BASIN STORAGE= .2426E-03 PERCENT ERROR= .1

FOR PLAN = 1 RATIO= .00

RA5a	MANE	3.07	31.54	214.89	2.04	5.00	31.41	215.00	2.04	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1851E+01 EXCESS= .0000E+00 OUTFLOW= .1850E+01 BASIN STORAGE= .3002E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RA5a	MANE	3.09	31.17	213.40	1.96	5.00	30.09	215.00	1.96	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1779E+01 EXCESS= .0000E+00 OUTFLOW= .1778E+01 BASIN STORAGE= .3058E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-1	MANE	.62	54.31	210.85	2.11	5.00	53.55	215.00	2.11	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3324E+01 EXCESS= .0000E+00 OUTFLOW= .3324E+01 BASIN STORAGE= .5826E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-1	MANE	.63	53.24	211.22	2.06	5.00	52.76	215.00	2.06	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3253E+01 EXCESS= .0000E+00 OUTFLOW= .3253E+01 BASIN STORAGE= .5769E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-1	MANE	.63	51.37	211.37	1.98	5.00	50.69	215.00	1.98	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3123E+01 EXCESS= .0000E+00 OUTFLOW= .3123E+01 BASIN STORAGE= .5591E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-1b	MANE	2.31	22.54	212.14	2.05	5.00	21.65	215.00	2.05	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1321E+01 EXCESS= .0000E+00 OUTFLOW= .1322E+01 BASIN STORAGE= .5499E-03 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00

RCP-1b	MANE	2.32	21.83	213.73	2.00	5.00	21.04	215.00	1.99	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1290E+01 EXCESS= .0000E+00 OUTFLOW= .1290E+01 BASIN STORAGE= .6976E-03 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00

RCP-1b	MANE	2.35	20.94	214.13	1.92	5.00	20.34	215.00	1.92	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1240E+01 EXCESS= .0000E+00 OUTFLOW= .1241E+01 BASIN STORAGE= .6715E-03 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00

RCP-1.1	MANE	.52	118.10	211.07	2.12	5.00	115.43	210.00	2.12	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7199E+01 EXCESS= .0000E+00 OUTFLOW= .7199E+01 BASIN STORAGE= .5141E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-1.1	MANE	.52	115.49	211.00	2.07	5.00	112.73	210.00	2.07	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7038E+01 EXCESS= .0000E+00 OUTFLOW= .7038E+01 BASIN STORAGE= .5415E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-1.1	MANE	.53	111.38	210.94	1.99	5.00	108.66	210.00	1.99	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6766E+01 EXCESS= .0000E+00 OUTFLOW= .6766E+01 BASIN STORAGE= .5759E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-3.1	MANE	.65	140.84	211.18	2.09	5.00	136.52	210.00	2.09	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8735E+01 EXCESS= .0000E+00 OUTFLOW= .8735E+01 BASIN STORAGE= .7212E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-3.1	MANE	.65	137.45	210.86	2.04	5.00	133.63	215.00	2.04	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8538E+01 EXCESS= .0000E+00 OUTFLOW= .8538E+01 BASIN STORAGE= .7202E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP-3.1	MANE	.66	132.60	211.11	1.96	5.00	128.85	215.00	1.96	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8207E+01 EXCESS= .0000E+00 OUTFLOW= .8207E+01 BASIN STORAGE= .6634E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP3.2	MANE	.47	174.60	210.59	2.09	5.00	170.89	210.00	2.09	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1085E+02 EXCESS= .0000E+00 OUTFLOW= .1085E+02 BASIN STORAGE= .5482E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

RCP3.2	MANE	.47	170.59	210.63	2.04	5.00	166.87	210.00	2.04	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1061E+02 EXCESS= .0000E+00 OUTFLOW= .1061E+02 BASIN STORAGE= .5436E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

```
           RCP3.2  MANE          .48    164.41    210.78      1.96      5.00    160.69    210.00        1.96

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1020E+02 EXCESS= .0000E+00 OUTFLOW= .1020E+02 BASIN STORAGE= .5194E-04 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
            RCP3.4  MANE          .43    193.30    210.69      2.09      5.00    189.44    210.00        2.09

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1214E+02 EXCESS= .0000E+00 OUTFLOW= .1214E+02 BASIN STORAGE= .5045E-04 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
            RCP3.4  MANE          .43    188.93    210.82      2.04      5.00    185.14    210.00        2.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1186E+02 EXCESS= .0000E+00 OUTFLOW= .1186E+02 BASIN STORAGE= .4791E-04 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
            RCP3.4  MANE          .44    181.87    210.67      1.96      5.00    178.10    210.00        1.96

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1141E+02 EXCESS= .0000E+00 OUTFLOW= .1141E+02 BASIN STORAGE= .4789E-04 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
             RCP-4  MANE          .39    512.35    210.60      2.12      5.00    506.12    210.00        2.13

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3012E+02 EXCESS= .0000E+00 OUTFLOW= .3012E+02 BASIN STORAGE= .9008E-04 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
             RCP-4  MANE          .39    501.62    210.58      2.08      5.00    495.24    210.00        2.08

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2945E+02 EXCESS= .0000E+00 OUTFLOW= .2945E+02 BASIN STORAGE= .9133E-04 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
             RCP-4  MANE          .39    483.68    210.56      2.00      5.00    477.22    210.00        2.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2834E+02 EXCESS= .0000E+00 OUTFLOW= .2834E+02 BASIN STORAGE= .9439E-04 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
             RCP-5  MANE          .55    562.21    210.43      2.17      5.00    552.77    210.00        2.17

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3334E+02 EXCESS= .0000E+00 OUTFLOW= .3334E+02 BASIN STORAGE= .1461E-03 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
             RCP-5  MANE          .55    550.73    210.45      2.12      5.00    541.12    210.00        2.12

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3261E+02 EXCESS= .0000E+00 OUTFLOW= .3261E+02 BASIN STORAGE= .1466E-03 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
             RCP-5  MANE          .56    531.80    210.70      2.04      5.00    521.42    210.00        2.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3139E+02 EXCESS= .0000E+00 OUTFLOW= .3139E+02 BASIN STORAGE= .1332E-03 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
            RST13A  MANE         1.18      3.98    211.63      2.51      5.00      3.89    210.00        2.51

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2273E+00 EXCESS= .0000E+00 OUTFLOW= .2273E+00 BASIN STORAGE= .6261E-04 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
            RST13A  MANE         1.19      3.97    211.22      2.46      5.00      3.83    210.00        2.46

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2229E+00 EXCESS= .0000E+00 OUTFLOW= .2230E+00 BASIN STORAGE= .5948E-04 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
            RST13A  MANE         1.19      3.83    211.37      2.38      5.00      3.71    210.00        2.38

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2155E+00 EXCESS= .0000E+00 OUTFLOW= .2155E+00 BASIN STORAGE= .7394E-04 PERCENT ERROR=    .0
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          FOR PLAN = 1  RATIO=  .00
           RCP-5.1  MANE          .32    161.40    210.11      2.61      5.00    160.74    210.00        2.61

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8715E+01 EXCESS= .0000E+00 OUTFLOW= .8715E+01 BASIN STORAGE= .3627E-04 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
           RCP-5.1  MANE          .33    158.92    210.18      2.56      5.00    157.99    210.00        2.56

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8553E+01 EXCESS= .0000E+00 OUTFLOW= .8553E+01 BASIN STORAGE= .3576E-04 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
           RCP-5.1  MANE          .33    154.05    210.11      2.48      5.00    153.41    210.00        2.48

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8282E+01 EXCESS= .0000E+00 OUTFLOW= .8282E+01 BASIN STORAGE= .3567E-04 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
              RCP6  MANE          .39    772.55    210.57      2.27      5.00    765.17    210.00        2.27

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4553E+02 EXCESS= .0000E+00 OUTFLOW= .4553E+02 BASIN STORAGE= .1014E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
              RCP6  MANE          .39    759.04    210.47      2.22      5.00    750.20    210.00        2.22

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4457E+02 EXCESS= .0000E+00 OUTFLOW= .4457E+02 BASIN STORAGE= .1076E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
              RCP6  MANE          .39    733.69    210.36      2.14      5.00    724.66    210.00        2.14

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4297E+02 EXCESS= .0000E+00 OUTFLOW= .4297E+02 BASIN STORAGE= .1085E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
              RCP7  MANE          .39    854.89    210.45      2.31      5.00    844.43    210.00        2.31

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5140E+02 EXCESS= .0000E+00 OUTFLOW= .5140E+02 BASIN STORAGE= .1027E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
              RCP7  MANE          .39    837.47    210.32      2.26      5.00    827.91    210.00        2.27

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5033E+02 EXCESS= .0000E+00 OUTFLOW= .5033E+02 BASIN STORAGE= .1091E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
              RCP7  MANE          .39    808.86    210.55      2.19      5.00    799.59    210.00        2.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4856E+02 EXCESS= .0000E+00 OUTFLOW= .4856E+02 BASIN STORAGE= .1026E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
              RCP8  MANE          .59    925.84    210.82      2.36      5.00    910.82    210.00        2.36

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5680E+02 EXCESS= .0000E+00 OUTFLOW= .5680E+02 BASIN STORAGE= .1629E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
              RCP8  MANE          .59    910.49    210.67      2.31      5.00    894.17    210.00        2.31

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5564E+02 EXCESS= .0000E+00 OUTFLOW= .5564E+02 BASIN STORAGE= .1796E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
              RCP8  MANE          .59    879.60    210.69      2.23      5.00    863.64    210.00        2.23

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5370E+02 EXCESS= .0000E+00 OUTFLOW= .5370E+02 BASIN STORAGE= .1824E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
             RGPDB  MANE         1.75     92.46    321.98      1.83      5.00     92.45    320.00        1.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1264E+03 EXCESS= .0000E+00 OUTFLOW= .1264E+03 BASIN STORAGE= .2767E-03 PERCENT ERROR=    .0
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          FOR PLAN = 1  RATIO=  .00
             RGPDB  MANE         1.75     92.01    322.36      1.79      5.00     92.01    320.00        1.79


CONTINUITY SUMMARY (AC-FT) - INFLOW= .1236E+03 EXCESS= .0000E+00 OUTFLOW= .1236E+03 BASIN STORAGE= .2680E-03 PERCENT ERROR=    .0


          FOR PLAN = 1  RATIO=  .00
             RGPDB  MANE         1.76     91.27    321.26      1.73      5.00     91.27    320.00        1.73


CONTINUITY SUMMARY (AC-FT) - INFLOW= .1190E+03 EXCESS= .0000E+00 OUTFLOW= .1190E+03 BASIN STORAGE= .2706E-03 PERCENT ERROR=    .0




*** NORMAL END OF HEC-1 ***
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Appendix C. Hydraulics Appendix

C.1. Interim and Ultimate Drop Inlet Calculations

C.2. Interim and Ultimate Normal Depth Calculations

C.3. Interim and Ultimate Condition WSPG-W Model

C.1. Interim and Ultimate Drop Inlet Calculations

Int/Ult SDDI#1 (Combination Inlet On Grade)

Project Description	
Solve For	Efficiency

Input Data	
Discharge	7 cfs
Slope	0.057 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	5.00 ft
Grate Type	Curved Vaned
Clogging	50.0 %
Curb Opening Length	7.50 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	68.34 %
Intercepted Flow	5 cfs
Bypass Flow	2 cfs
Spread	10.20 ft
Depth	0.3 ft
Flow Area	1.1 ft²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	6.3 ft/s
Splash Over Velocity	6.6 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.039
Grate Flow Ratio	0.441
Equivalent Cross Slope	0.108 ft/ft
Active Grate Length	2.50 ft
Length Factor	0.192
Total Interception Length	26.11 ft

Messages

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).	

Int/Ult SDDI#2 (Combination Inlet On Grade)

Project Description	
Solve For	Efficiency

Input Data	
Discharge	9 cfs
Slope	0.061 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	5.00 ft
Grate Type	Curved Vaned
Clogging	50.0 %
Curb Opening Length	7.50 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	62.12 %
Intercepted Flow	6 cfs
Bypass Flow	3 cfs
Spread	11.16 ft
Depth	0.3 ft
Flow Area	1.3 ft²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	6.8 ft/s
Splash Over Velocity	6.6 ft/s
Frontal Flow Factor	0.980
Side Flow Factor	0.033
Grate Flow Ratio	0.404
Equivalent Cross Slope	0.101 ft/ft
Active Grate Length	2.50 ft
Length Factor	0.162
Total Interception Length	30.95 ft

Messages

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).	

Int/Ult SDDI#3 (Combination Inlet On Grade)

Project Description	
Solve For	Efficiency

Input Data	
Discharge	2 cfs
Slope	0.006 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	Curved Vaned
Clogging	50.0 %
Curb Opening Length	5.00 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	92.89 %
Intercepted Flow	2 cfs
Bypass Flow	0 cfs
Spread	9.65 ft
Depth	0.3 ft
Flow Area	1.0 ft²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	2.0 ft/s
Splash Over Velocity	4.6 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.061
Grate Flow Ratio	0.465
Equivalent Cross Slope	0.113 ft/ft
Active Grate Length	1.25 ft
Length Factor	0.489
Total Interception Length	7.66 ft

Messages

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).	

Int/Ult SDDI#4 (Combination Inlet On Grade)

Project Description	
Solve For	Efficiency

Input Data	
Discharge	2 cfs
Slope	0.006 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	Curved Vaned
Clogging	50.0 %
Curb Opening Length	5.00 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	92.89 %
Intercepted Flow	2 cfs
Bypass Flow	0 cfs
Spread	9.65 ft
Depth	0.3 ft
Flow Area	1.0 ft²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	2.0 ft/s
Splash Over Velocity	4.6 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.061
Grate Flow Ratio	0.465
Equivalent Cross Slope	0.113 ft/ft
Active Grate Length	1.25 ft
Length Factor	0.489
Total Interception Length	7.66 ft

Messages

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).	

Int/Ult SDDI#5 (Combination Inlet On Grade)

Project Description	
Solve For	Efficiency

Input Data	
Discharge	2 cfs
Slope	0.101 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	Curved Vaned
Clogging	50.0 %
Curb Opening Length	5.00 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	89.19 %
Intercepted Flow	2 cfs
Bypass Flow	0 cfs
Spread	4.88 ft
Depth	0.2 ft
Flow Area	0.3 ft²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	6.4 ft/s
Splash Over Velocity	4.6 ft/s
Frontal Flow Factor	0.838
Side Flow Factor	0.008
Grate Flow Ratio	0.791
Equivalent Cross Slope	0.178 ft/ft
Active Grate Length	1.25 ft
Length Factor	0.276
Total Interception Length	13.60 ft

Messages

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).	

Int/Ult SDDI#6 (Combination Inlet On Grade)

Project Description	
Solve For	Efficiency

Input Data	
Discharge	2 cfs
Slope	0.101 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	Curved Vaned
Clogging	50.0 %
Curb Opening Length	5.00 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	89.19 %
Intercepted Flow	2 cfs
Bypass Flow	0 cfs
Spread	4.88 ft
Depth	0.2 ft
Flow Area	0.3 ft²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	6.4 ft/s
Splash Over Velocity	4.6 ft/s
Frontal Flow Factor	0.838
Side Flow Factor	0.008
Grate Flow Ratio	0.791
Equivalent Cross Slope	0.178 ft/ft
Active Grate Length	1.25 ft
Length Factor	0.276
Total Interception Length	13.60 ft

Messages

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).	

Int SDDI#7 (Ditch Inlet In Sag)

Project Description	
Solve For	Spread

Input Data	
Discharge	22 cfs
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	6.50 ft
Grate Width	4.00 ft
Grate Length	4.00 ft
Local Depression	0.0 in
Local Depression Width	24.0 in
Grate Type	P-50 mm x 100 mm (P-1-7/8"-4")
Clogging	50.0 %

Results	
Spread	10.82 ft
Depth	0.7 ft
Wetted Perimeter	11.05 ft
Top Width	10.82 ft
Open Grate Area	6.4 ft²
Active Grate Weir Length	12.00 ft

Int/Ult SDDI#8 (Combination Inlet On Grade)

Project Description	
Solve For	Efficiency

Input Data	
Discharge	6 cfs
Slope	0.045 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	Curved Vaned
Clogging	50.0 %
Curb Opening Length	10.00 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	78.97 %
Intercepted Flow	5 cfs
Bypass Flow	1 cfs
Spread	10.04 ft
Depth	0.3 ft
Flow Area	1.1 ft²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	5.5 ft/s
Splash Over Velocity	8.1 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.113
Grate Flow Ratio	0.448
Equivalent Cross Slope	0.109 ft/ft
Active Grate Length	3.75 ft
Length Factor	0.276
Total Interception Length	22.66 ft

Messages

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).	

Int/Ult SDDI#9 (Combination Inlet On Grade)

Project Description	
Solve For	Efficiency

Input Data	
Discharge	6 cfs
Slope	0.028 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	Curved Vaned
Clogging	50.0 %
Curb Opening Length	10.00 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	79.98 %
Intercepted Flow	5 cfs
Bypass Flow	1 cfs
Spread	11.09 ft
Depth	0.3 ft
Flow Area	1.3 ft²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	4.6 ft/s
Splash Over Velocity	8.1 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.151
Grate Flow Ratio	0.406
Equivalent Cross Slope	0.101 ft/ft
Active Grate Length	3.75 ft
Length Factor	0.303
Total Interception Length	20.60 ft

Messages

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).	

Int SDDI#10 (Ditch Inlet In Sag)

Project Description	
Solve For	Spread

Input Data	
Discharge	23 cfs
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	11.00 ft
Grate Width	4.00 ft
Grate Length	4.00 ft
Local Depression	0.0 in
Local Depression Width	24.0 in
Grate Type	P-50 mm x 100 mm (P-1-7/8"-4")
Clogging	50.0 %

Results	
Spread	15.45 ft
Depth	0.7 ft
Wetted Perimeter	15.69 ft
Top Width	15.45 ft
Open Grate Area	6.4 ft²
Active Grate Weir Length	12.00 ft

Int/Ult SDDI#11 (Combination Inlet On Grade)

Project Description	
Solve For	Efficiency

Input Data	
Discharge	2 cfs
Slope	0.029 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	Curved Vaned
Clogging	50.0 %
Curb Opening Length	5.00 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	92.70 %
Intercepted Flow	2 cfs
Bypass Flow	0 cfs
Spread	6.76 ft
Depth	0.2 ft
Flow Area	0.5 ft²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	3.8 ft/s
Splash Over Velocity	4.6 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.020
Grate Flow Ratio	0.634
Equivalent Cross Slope	0.146 ft/ft
Active Grate Length	1.25 ft
Length Factor	0.357
Total Interception Length	10.51 ft

Messages

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).	

Int/Ult SDDI#12 (Combination Inlet On Grade)

Project Description	
Solve For	Efficiency

Input Data	
Discharge	2 cfs
Slope	0.019 ft/ft
Gutter Width	1.50 ft
Gutter Cross Slope	0.086 ft/ft
Road Cross Slope	0.010 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	Curved Vaned
Clogging	50.0 %
Curb Opening Length	5.00 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	85.52 %
Intercepted Flow	2 cfs
Bypass Flow	0 cfs
Spread	11.48 ft
Depth	0.2 ft
Flow Area	0.7 ft²
Gutter Depression	1.4 in
Total Depression	5.4 in
Velocity	2.7 ft/s
Splash Over Velocity	4.6 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.018
Grate Flow Ratio	0.486
Equivalent Cross Slope	0.110 ft/ft
Active Grate Length	1.25 ft
Length Factor	0.342
Total Interception Length	10.96 ft

Messages

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).	

Int/Ult SDDI#13 (Combination Inlet On Grade)

Project Description	
Solve For	Efficiency

Input Data	
Discharge	2 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	2.50 ft
Grate Type	Curved Vaned
Clogging	50.0 %
Curb Opening Length	5.00 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	92.75 %
Intercepted Flow	2 cfs
Bypass Flow	0 cfs
Spread	6.71 ft
Depth	0.2 ft
Flow Area	0.5 ft²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	3.8 ft/s
Splash Over Velocity	4.6 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.020
Grate Flow Ratio	0.638
Equivalent Cross Slope	0.147 ft/ft
Active Grate Length	1.25 ft
Length Factor	0.355
Total Interception Length	10.58 ft

Messages

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).	

Int/Ult SDDI #14 (Combination Inlet In Sag)

Project Description	
Solve For	Spread

Input Data	
Discharge	4 cfs
Gutter Width	1.50 ft
Gutter Cross Slope	0.080 ft/ft
Road Cross Slope	0.019 ft/ft
Local Depression	4.0 in
Local Depression Width	26.0 in
Grate Width	1.50 ft
Grate Length	5.00 ft
Grate Type	Curved Vaned
Clogging	50.0 %
Curb Opening Length	7.50 ft
Opening Height	0.50 ft
Curb Throat Type	Horizontal
Throat Incline Angle	90.00 degrees

Options	
Calculation Option	Use Both

Results	
Spread	7.65 ft
Depth	0.2 ft
Gutter Depression	1.1 in
Total Depression	5.1 in
Open Grate Area	1.3 ft²
Active Grate Weir Length	6.50 ft

Int/Ult SDDI#15 (Combination Inlet On Grade)

Project Description	
Solve For	Efficiency

Input Data	
Discharge	3 cfs
Slope	0.055 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	Curved Vaned
Clogging	50.0 %
Curb Opening Length	5.00 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	83.41 %
Intercepted Flow	3 cfs
Bypass Flow	0 cfs
Spread	7.05 ft
Depth	0.2 ft
Flow Area	0.6 ft²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	5.3 ft/s
Splash Over Velocity	4.6 ft/s
Frontal Flow Factor	0.942
Side Flow Factor	0.011
Grate Flow Ratio	0.613
Equivalent Cross Slope	0.142 ft/ft
Active Grate Length	1.25 ft
Length Factor	0.244
Total Interception Length	15.35 ft

Messages

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).	

Int/Ult EX SDDI#1 (Combination Inlet On Grade)

Project Description	
Solve For	Efficiency

Input Data	
Discharge	7 cfs
Slope	0.022 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	5.00 ft
Grate Type	Curved Vaned
Clogging	50.0 %
Curb Opening Length	7.50 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	68.22 %
Intercepted Flow	5 cfs
Bypass Flow	2 cfs
Spread	12.41 ft
Depth	0.3 ft
Flow Area	1.6 ft²
Gutter Depression	1.2 in
Total Depression	5.2 in
Velocity	4.3 ft/s
Splash Over Velocity	6.6 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.073
Grate Flow Ratio	0.363
Equivalent Cross Slope	0.092 ft/ft
Active Grate Length	2.50 ft
Length Factor	0.232
Total Interception Length	21.57 ft

Messages

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).	

Int/Ult EX SDDI#2 (Combination Inlet On Grade)

Project Description	
Solve For	Efficiency

Input Data	
Discharge	1 cfs
Slope	0.008 ft/ft
Gutter Width	1.50 ft
Gutter Cross Slope	0.086 ft/ft
Road Cross Slope	0.004 ft/ft
Roughness Coefficient	0.016
Local Depression	4.0 in
Local Depression Width	26.0 in
Grate Width	1.50 ft
Grate Length	5.00 ft
Grate Type	Curved Vaned
Clogging	50.0 %
Curb Opening Length	7.50 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	100.00 %
Intercepted Flow	1 cfs
Bypass Flow	0 cfs
Spread	18.79 ft
Depth	0.2 ft
Flow Area	0.7 ft²
Gutter Depression	1.5 in
Total Depression	5.5 in
Velocity	1.3 ft/s
Splash Over Velocity	6.6 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.107
Grate Flow Ratio	0.436
Equivalent Cross Slope	0.096 ft/ft
Active Grate Length	2.50 ft
Length Factor	0.715
Total Interception Length	6.99 ft

Messages

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).	

Int/Ult Ex. SDDI #7 (Combination Inlet In Sag)

Project Description	
Solve For	Spread

Input Data		
Discharge	5	cfs
Gutter Width	1.50	ft
Gutter Cross Slope	0.080	ft/ft
Road Cross Slope	0.020	ft/ft
Local Depression	4.0	in
Local Depression Width	26.0	in
Grate Width	1.50	ft
Grate Length	2.50	ft
Grate Type	Curved Vaned	
Clogging	50.0	%
Curb Opening Length	5.00	ft
Opening Height	0.50	ft
Curb Throat Type	Horizontal	
Throat Incline Angle	90.00	degrees

Options	
Calculation Option	Use Both

Results		
Spread	13.65	ft
Depth	0.4	ft
Gutter Depression	1.1	in
Total Depression	5.1	in
Open Grate Area	0.7	ft^2
Active Grate Weir Length	4.00	ft

Interim Swales Normal Depth Calculations

Worksheet for Int Swale 1 (Trapezoidal Channel)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.030
Channel Slope	0.038 ft/ft
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	5.00 ft
Discharge	17 cfs

Results	
Normal Depth	0.5 ft
Flow Area	3.3 ft²
Wetted Perimeter	8.17 ft
Hydraulic Radius	0.4 ft
Top Width	8.00 ft
Critical Depth	0.6 ft
Critical Slope	0.017 ft/ft
Velocity	5.2 ft/s
Velocity Head	0.424 ft
Specific Energy	0.92 ft
Froude Number	1.444
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.5 ft
Critical Depth	0.6 ft
Channel Slope	0.038 ft/ft
Critical Slope	0.017 ft/ft

C.2. Interim and Ultimate Normal Depth Calculations

Int/Ult Section 1E

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.063 ft/ft
Discharge	7 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.500
0+00.00	0.000
0+02.00	0.200
0+36.00	0.880

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.500)	(0+02.00, 0.200)	0.015
(0+02.00, 0.200)	(0+36.00, 0.880)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.4 ft
Elevation Range	0.00 to 0.88 ft
Flow Area	1.3 ft²
Wetted Perimeter	10.83 ft
Hydraulic Radius	0.1 ft
Top Width	10.44 ft
Normal Depth	0.4 ft
Critical Depth	0.5 ft
Critical Slope	0.007 ft/ft
Velocity	5.6 ft/s
Velocity Head	0.487 ft
Specific Energy	0.86 ft
Froude Number	2.851
Flow Type	Supercritical

GVF Input Data

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.4 ft
Critical Depth	0.5 ft
Channel Slope	0.063 ft/ft
Critical Slope	0.007 ft/ft

Int/Ult Section 1W

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.067 ft/ft
Discharge	9 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.500
0+00.00	0.000
0+02.00	0.200
0+36.00	0.880

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.500)	(0+02.00, 0.200)	0.015
(0+02.00, 0.200)	(0+36.00, 0.880)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.4 ft
Elevation Range	0.00 to 0.88 ft
Flow Area	1.5 ft²
Wetted Perimeter	11.91 ft
Hydraulic Radius	0.1 ft
Top Width	11.51 ft
Normal Depth	0.4 ft
Critical Depth	0.5 ft
Critical Slope	0.007 ft/ft
Velocity	6.1 ft/s
Velocity Head	0.571 ft
Specific Energy	0.96 ft
Froude Number	2.976
Flow Type	Supercritical

GVF Input Data

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.4 ft
Critical Depth	0.5 ft
Channel Slope	0.067 ft/ft
Critical Slope	0.007 ft/ft

Int/Ult Section 2E

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.006 ft/ft
Discharge	2 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.500
0+00.00	0.000
0+02.00	0.200
0+25.00	0.660

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.500)	(0+02.00, 0.200)	0.015
(0+02.00, 0.200)	(0+25.00, 0.660)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.4 ft
Elevation Range	0.00 to 0.66 ft
Flow Area	1.2 ft²
Wetted Perimeter	10.46 ft
Hydraulic Radius	0.1 ft
Top Width	10.09 ft
Normal Depth	0.4 ft
Critical Depth	0.3 ft
Critical Slope	0.008 ft/ft
Velocity	1.7 ft/s
Velocity Head	0.045 ft
Specific Energy	0.41 ft
Froude Number	0.877
Flow Type	Subcritical

GVF Input Data

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.4 ft
Critical Depth	0.3 ft
Channel Slope	0.006 ft/ft
Critical Slope	0.008 ft/ft

Int/Ult Section 2W

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.005 ft/ft
Discharge	2 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.500
0+00.00	0.000
0+02.00	0.200
0+25.00	0.660

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.500)	(0+02.00, 0.200)	0.015
(0+02.00, 0.200)	(0+25.00, 0.660)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.4 ft
Elevation Range	0.00 to 0.66 ft
Flow Area	1.3 ft²
Wetted Perimeter	10.88 ft
Hydraulic Radius	0.1 ft
Top Width	10.50 ft
Normal Depth	0.4 ft
Critical Depth	0.3 ft
Critical Slope	0.008 ft/ft
Velocity	1.6 ft/s
Velocity Head	0.039 ft
Specific Energy	0.41 ft
Froude Number	0.805
Flow Type	Subcritical

GVF Input Data

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.4 ft
Critical Depth	0.3 ft
Channel Slope	0.005 ft/ft
Critical Slope	0.008 ft/ft

Int/Ult Section 3N

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.101 ft/ft
Discharge	2 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.500
0+00.00	0.000
0+02.00	0.200
0+27.75	0.720

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.500)	(0+02.00, 0.200)	0.015
(0+02.00, 0.200)	(0+27.75, 0.720)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.3 ft
Elevation Range	0.00 to 0.72 ft
Flow Area	0.4 ft²
Wetted Perimeter	4.76 ft
Hydraulic Radius	0.1 ft
Top Width	4.50 ft
Normal Depth	0.3 ft
Critical Depth	0.3 ft
Critical Slope	0.008 ft/ft
Velocity	5.5 ft/s
Velocity Head	0.469 ft
Specific Energy	0.72 ft
Froude Number	3.404
Flow Type	Supercritical

GVF Input Data

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.3 ft
Critical Depth	0.3 ft
Channel Slope	0.101 ft/ft
Critical Slope	0.008 ft/ft

Int/Ult Section 3S

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.101 ft/ft
Discharge	2 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.500
0+00.00	0.000
0+02.00	0.200
0+27.75	0.720

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.500)	(0+02.00, 0.200)	0.015
(0+02.00, 0.200)	(0+27.75, 0.720)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.3 ft
Elevation Range	0.00 to 0.72 ft
Flow Area	0.4 ft²
Wetted Perimeter	4.76 ft
Hydraulic Radius	0.1 ft
Top Width	4.50 ft
Normal Depth	0.3 ft
Critical Depth	0.3 ft
Critical Slope	0.008 ft/ft
Velocity	5.5 ft/s
Velocity Head	0.469 ft
Specific Energy	0.72 ft
Froude Number	3.404
Flow Type	Supercritical

GVF Input Data

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.3 ft
Critical Depth	0.3 ft
Channel Slope	0.101 ft/ft
Critical Slope	0.008 ft/ft

Int/Ult Section 4N

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.052 ft/ft
Discharge	6 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.500
0+00.00	0.000
0+02.00	0.200
0+27.75	0.720

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.500)	(0+02.00, 0.200)	0.015
(0+02.00, 0.200)	(0+27.75, 0.720)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.4 ft
Elevation Range	0.00 to 0.72 ft
Flow Area	1.2 ft²
Wetted Perimeter	10.49 ft
Hydraulic Radius	0.1 ft
Top Width	10.12 ft
Normal Depth	0.4 ft
Critical Depth	0.5 ft
Critical Slope	0.007 ft/ft
Velocity	5.0 ft/s
Velocity Head	0.393 ft
Specific Energy	0.76 ft
Froude Number	2.583
Flow Type	Supercritical

GVF Input Data

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.4 ft
Critical Depth	0.5 ft
Channel Slope	0.052 ft/ft
Critical Slope	0.007 ft/ft

Int/Ult Section 5N

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.031 ft/ft
Discharge	6 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.500
0+00.00	0.000
0+02.00	0.200
0+30.00	0.760

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.500)	(0+02.00, 0.200)	0.015
(0+02.00, 0.200)	(0+30.00, 0.760)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.4 ft
Elevation Range	0.00 to 0.76 ft
Flow Area	1.5 ft²
Wetted Perimeter	11.80 ft
Hydraulic Radius	0.1 ft
Top Width	11.40 ft
Normal Depth	0.4 ft
Critical Depth	0.5 ft
Critical Slope	0.007 ft/ft
Velocity	4.1 ft/s
Velocity Head	0.263 ft
Specific Energy	0.65 ft
Froude Number	2.025
Flow Type	Supercritical

GVF Input Data

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.4 ft
Critical Depth	0.5 ft
Channel Slope	0.031 ft/ft
Critical Slope	0.007 ft/ft

Int/Ult Section 5S

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.055 ft/ft
Discharge	3 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.500
0+00.00	0.000
0+02.00	0.200
0+39.00	0.940

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.500)	(0+02.00, 0.200)	0.015
(0+02.00, 0.200)	(0+39.00, 0.940)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.3 ft
Elevation Range	0.00 to 0.94 ft
Flow Area	0.7 ft²
Wetted Perimeter	7.49 ft
Hydraulic Radius	0.1 ft
Top Width	7.17 ft
Normal Depth	0.3 ft
Critical Depth	0.4 ft
Critical Slope	0.007 ft/ft
Velocity	4.4 ft/s
Velocity Head	0.307 ft
Specific Energy	0.61 ft
Froude Number	2.557
Flow Type	Supercritical

GVF Input Data

Int/Ult Section 5S

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.3 ft
Critical Depth	0.4 ft
Channel Slope	0.055 ft/ft
Critical Slope	0.007 ft/ft

Int/Ult Section 6E

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.032 ft/ft
Discharge	2 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.500
0+00.00	0.000
0+02.00	0.200
0+21.50	0.590

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.500)	(0+02.00, 0.200)	0.015
(0+02.00, 0.200)	(0+21.50, 0.590)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.3 ft
Elevation Range	0.00 to 0.59 ft
Flow Area	0.6 ft²
Wetted Perimeter	6.95 ft
Hydraulic Radius	0.1 ft
Top Width	6.64 ft
Normal Depth	0.3 ft
Critical Depth	0.3 ft
Critical Slope	0.008 ft/ft
Velocity	3.3 ft/s
Velocity Head	0.172 ft
Specific Energy	0.46 ft
Froude Number	1.948
Flow Type	Supercritical

GVF Input Data

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.3 ft
Critical Depth	0.3 ft
Channel Slope	0.032 ft/ft
Critical Slope	0.008 ft/ft

Int/Ult Section 6W

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.029 ft/ft
Discharge	2 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.500
0+00.00	0.000
0+02.00	0.200
0+21.50	0.490

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.500)	(0+02.00, 0.200)	0.015
(0+02.00, 0.200)	(0+21.50, 0.490)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.3 ft
Elevation Range	0.00 to 0.50 ft
Flow Area	0.7 ft²
Wetted Perimeter	8.56 ft
Hydraulic Radius	0.1 ft
Top Width	8.26 ft
Normal Depth	0.3 ft
Critical Depth	0.3 ft
Critical Slope	0.008 ft/ft
Velocity	3.0 ft/s
Velocity Head	0.136 ft
Specific Energy	0.43 ft
Froude Number	1.818
Flow Type	Supercritical

GVF Input Data

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.3 ft
Critical Depth	0.3 ft
Channel Slope	0.029 ft/ft
Critical Slope	0.008 ft/ft

Int/Ult Section 7E

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.030 ft/ft
Discharge	2 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.500
0+00.00	0.000
0+02.00	0.200
0+21.50	0.590

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.500)	(0+02.00, 0.200)	0.015
(0+02.00, 0.200)	(0+21.50, 0.590)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.3 ft
Elevation Range	0.00 to 0.59 ft
Flow Area	0.6 ft²
Wetted Perimeter	7.08 ft
Hydraulic Radius	0.1 ft
Top Width	6.78 ft
Normal Depth	0.3 ft
Critical Depth	0.3 ft
Critical Slope	0.008 ft/ft
Velocity	3.2 ft/s
Velocity Head	0.162 ft
Specific Energy	0.46 ft
Froude Number	1.884
Flow Type	Supercritical

GVF Input Data

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.3 ft
Critical Depth	0.3 ft
Channel Slope	0.030 ft/ft
Critical Slope	0.008 ft/ft

Int/Ult Section 7W

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.029 ft/ft
Discharge	4 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.500
0+00.00	0.000
0+02.00	0.200
0+25.50	0.670

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.500)	(0+02.00, 0.200)	0.015
(0+02.00, 0.200)	(0+25.50, 0.670)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.4 ft
Elevation Range	0.00 to 0.67 ft
Flow Area	1.1 ft²
Wetted Perimeter	10.02 ft
Hydraulic Radius	0.1 ft
Top Width	9.65 ft
Normal Depth	0.4 ft
Critical Depth	0.4 ft
Critical Slope	0.007 ft/ft
Velocity	3.7 ft/s
Velocity Head	0.208 ft
Specific Energy	0.56 ft
Froude Number	1.920
Flow Type	Supercritical

GVF Input Data

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.4 ft
Critical Depth	0.4 ft
Channel Slope	0.029 ft/ft
Critical Slope	0.007 ft/ft

Int/Ult Section 5S

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.028 ft/ft
Discharge	4 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.500
0+00.00	0.000
0+02.00	0.200
0+39.00	0.940

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.500)	(0+02.00, 0.200)	0.015
(0+02.00, 0.200)	(0+39.00, 0.940)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.4 ft
Elevation Range	0.00 to 0.94 ft
Flow Area	1.1 ft²
Wetted Perimeter	10.09 ft
Hydraulic Radius	0.1 ft
Top Width	9.73 ft
Normal Depth	0.4 ft
Critical Depth	0.4 ft
Critical Slope	0.007 ft/ft
Velocity	3.6 ft/s
Velocity Head	0.203 ft
Specific Energy	0.56 ft
Froude Number	1.891
Flow Type	Supercritical

GVF Input Data

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.00 ft
Number Of Steps	0.000

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.4 ft
Critical Depth	0.4 ft
Channel Slope	0.028 ft/ft
Critical Slope	0.007 ft/ft

C.3. Interim and Ultimate Condition WSPG-W Model

WSPGW Models -
Mainline for Sunset Run Drive

```
T1 Summerlin West Village 27
T2 Ultimate Condition
T3 Sunset Run Drive SD
SO   1000.00 3623.140  1                          3630.000
R    1077.08 3631.267  1      .013                                    0.0    0
JX   1082.74 3631.636  1  2   .013    3.00          3631.765        -62.2
R    1228.69 3635.284  1      .013                                    0.0    0
R    1231.52 3635.355  1      .013                                    5.3    0
JX   1234.35 3635.834  3  2   .013    3.00          3635.555         84.7
R    1329.40 3645.220  3      .013                                    0.0    0
R    1335.06 3645.999  3      .013                                   -6.8    1
R    1553.08 3669.061  3      .013                                    0.0    0
R    1558.74 3669.758  3      .013                                    1.3    1
R    1816.72 3687.822  3      .013                                    0.0    0
JX   1822.38 3688.319  3  2   .013    6.00          3688.220         89.8
R    1907.73 3691.301  3      .013                                    0.0    0
JX   1913.39 3691.729  3  2   .013    6.00          3691.600        -90.0
R    1993.23 3695.371  3      .013                                    0.0    0
JX   1996.06 3695.600  3  4  4.013   51.00    92.00 3695.7003695.700 89.7-90.0    .000
R    1998.89 3695.952  2      .013                                    3.0    0
R    2152.49 3709.623  2      .013                                    0.0    0
R    2158.49 3710.390  2      .013                                    8.5    1
R    2463.49 3740.890  2      .013                                    0.0    0
R    2469.49 3741.680  2      .013                                    2.5    1
R    2557.41 3750.170  2      .013                                    0.0    0
JX   2563.41 3750.950  2  2  2.013    2.00     2.00 3750.6603750.660 89.9-90.0    .000
R    2814.85 3775.200  2      .013                                    0.0    0
R    2820.85 3775.750  2      .013                                    9.2    1
R    3020.13 3779.740  2      .013                                    0.0    0
R    3026.13 3780.067  2      .013                                  -89.8    1
R    3110.25 3781.933  2      .013                                    0.0    0
R    3116.25 3782.200  2      .013                                    0.0    1
SH   3116.25 3782.200  2
CD   1  4   0    .000   4.500     .000  .000  .000   .00
CD   2  4   0    .000   2.000     .000  .000  .000   .00
CD   3  4   0    .000   4.000     .000  .000  .000   .00
CD   4  4   0    .000   2.500     .000  .000  .000   .00
Q            4.00    .0
```

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

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 7:42:27

Summerlin West Village 27
Ultimate Condition
Sunset Run Drive SD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	3623.140	1.754	3624.894	169.00	29.45	13.47	3638.36	.00	3.79	4.39	4.500	.000	.00	0 .0
14.822	.1054					.0695	1.03	1.75	4.54	1.58	.013	.00	.00	PIPE
1014.822	3624.703	1.782	3626.485	169.00	28.83	12.91	3639.39	.00	3.79	4.40	4.500	.000	.00	0 .0
26.327	.1054					.0633	1.67	1.78	4.40	1.58	.013	.00	.00	PIPE
1041.149	3627.479	1.847	3629.325	169.00	27.49	11.73	3641.06	.00	3.79	4.43	4.500	.000	.00	0 .0
20.046	.1054					.0556	1.11	1.85	4.11	1.58	.013	.00	.00	PIPE
1061.196	3629.592	1.915	3631.507	169.00	26.21	10.67	3642.17	.00	3.79	4.45	4.500	.000	.00	0 .0
15.884	.1054					.0488	.78	1.91	3.84	1.58	.013	.00	.00	PIPE
1077.080	3631.267	1.985	3633.252	169.00	24.99	9.70	3642.95	.00	3.79	4.47	4.500	.000	.00	0 .0
JUNCT STR	.0652					.0469	.27	1.99	3.58		.013	.00	.00	PIPE
1082.740	3631.636	1.937	3633.573	166.00	25.36	9.98	3643.56	.00	3.76	4.46	4.500	.000	.00	0 .0
8.966	.0250					.0489	.44	1.94	3.69	2.34	.013	.00	.00	PIPE
1091.706	3631.860	1.920	3633.780	166.00	25.65	10.21	3643.99	.00	3.76	4.45	4.500	.000	.00	0 .0
33.925	.0250					.0531	1.80	1.92	3.75	2.34	.013	.00	.00	PIPE
1125.631	3632.708	1.852	3634.560	166.00	26.90	11.24	3645.80	.00	3.76	4.43	4.500	.000	.00	0 .0
29.823	.0250					.0605	1.80	1.85	4.02	2.34	.013	.00	.00	PIPE
1155.454	3633.453	1.787	3635.240	166.00	28.21	12.36	3647.60	.00	3.76	4.40	4.500	.000	.00	0 .0
26.717	.0250					.0689	1.84	1.79	4.30	2.34	.013	.00	.00	PIPE

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

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 7:42:27

Summerlin West Village 27
Ultimate Condition
Sunset Run Drive SD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1182.171	3634.121	1.725	3635.846	166.00	29.59	13.60	3649.44	.00	3.76	4.38	4.500	.000	.00	0 .0
24.259	.0250					.0786	1.91	1.72	4.61	2.34	.013	.00	.00	PIPE
1206.430	3634.728	1.665	3636.392	166.00	31.03	14.96	3651.35	.00	3.76	4.35	4.500	.000	.00	0 .0
22.260	.0250					.0896	1.99	1.66	4.93	2.34	.013	.00	.00	PIPE
1228.690	3635.284	1.607	3636.891	166.00	32.55	16.45	3653.34	.00	3.76	4.31	4.500	.000	.00	0 .0
2.830	.0251					.0964	.27	1.61	5.27	2.34	.013	.00	.00	PIPE
1231.520	3635.355	1.599	3636.954	166.00	32.77	16.68	3653.63	.00	3.76	4.31	4.500	.000	.00	0 .0
JUNCT STR	.1693					.0984	.28	1.60	5.33		.013	.00	.00	PIPE
1234.350	3635.834	1.658	3637.492	163.00	33.11	17.03	3654.52	.00	3.69	3.94	4.000	.000	.00	0 .0
95.050	.0987					.1002	9.52	1.66	5.22	1.66	.013	.00	.00	PIPE
1329.400	3645.220	1.653	3646.873	163.00	33.26	17.18	3664.05	.00	3.69	3.94	4.000	.000	.00	0 .0
5.660	.1376					.0999	.57	1.65	5.26	1.52	.013	.00	.00	PIPE
1335.060	3645.999	1.661	3647.659	163.00	33.05	16.96	3664.62	.00	3.69	3.94	4.000	.000	.00	0 .0
36.901	.1058					.0979	3.61	1.66	5.21	1.63	.013	.00	.00	PIPE
1371.961	3649.902	1.672	3651.574	163.00	32.76	16.67	3668.24	.00	3.69	3.95	4.000	.000	.00	0 .0
97.297	.1058					.0908	8.84	1.67	5.14	1.63	.013	.00	.00	PIPE
1469.258	3660.194	1.733	3661.927	163.00	31.24	15.15	3677.08	.00	3.69	3.96	4.000	.000	.00	0 .0
50.557	.1058					.0798	4.03	1.73	4.80	1.63	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 7:42:27

Summerlin West Village 27
Ultimate Condition
Sunset Run Drive SD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1519.815	3665.542	1.797	3667.339	163.00	29.78	13.78	3681.11	.00	3.69	3.98	4.000	.000	.00	0 .0
33.265	.1058					.0701	2.33	1.80	4.48	1.63	.013	.00	.00	PIPE
1553.080	3669.061	1.864	3670.925	163.00	28.40	12.52	3683.45	.00	3.69	3.99	4.000	.000	.00	0 .0
5.660	.1231					.0644	.36	1.86	4.17	1.56	.013	.00	.00	PIPE
1558.740	3669.758	1.885	3671.643	163.00	28.00	12.17	3683.82	.00	3.69	3.99	4.000	.000	.00	0 .0
96.600	.0700					.0594	5.74	1.88	4.09	1.83	.013	.00	.00	PIPE
1655.340	3676.522	1.955	3678.477	163.00	26.71	11.08	3689.56	.00	3.69	4.00	4.000	.000	.00	0 .0
52.883	.0700					.0524	2.77	1.95	3.81	1.83	.013	.00	.00	PIPE
1708.223	3680.225	2.029	3682.254	163.00	25.47	10.07	3692.33	.00	3.69	4.00	4.000	.000	.00	0 .0
35.083	.0700					.0461	1.62	2.03	3.55	1.83	.013	.00	.00	PIPE
1743.306	3682.681	2.107	3684.789	163.00	24.29	9.16	3693.95	.00	3.69	3.99	4.000	.000	.00	0 .0
25.577	.0700					.0407	1.04	2.11	3.30	1.83	.013	.00	.00	PIPE
1768.883	3684.472	2.189	3686.662	163.00	23.16	8.33	3694.99	.00	3.69	3.98	4.000	.000	.00	0 .0
19.652	.0700					.0359	.71	2.19	3.07	1.83	.013	.00	.00	PIPE
1788.535	3685.848	2.276	3688.124	163.00	22.08	7.57	3695.69	.00	3.69	3.96	4.000	.000	.00	0 .0
15.581	.0700					.0317	.49	2.28	2.85	1.83	.013	.00	.00	PIPE
1804.116	3686.939	2.367	3689.306	163.00	21.05	6.88	3696.19	.00	3.69	3.93	4.000	.000	.00	0 .0
12.604	.0700					.0281	.35	2.37	2.64	1.83	.013	.00	.00	PIPE

FILE: SRD_Mainline_SD.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 4

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 7:42:27

Summerlin West Village 27
Ultimate Condition
Sunset Run Drive SD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1816.720	3687.822	2.464	3690.286	163.00	20.07	6.26	3696.54	.00	3.69	3.89	4.000	.000	.00	0 .0
JUNCT STR	.0878					.0273	.15	2.46	2.45		.013	.00	.00	PIPE
1822.380	3688.319	2.349	3690.668	157.00	20.47	6.50	3697.17	.00	3.65	3.94	4.000	.000	.00	0 .0
40.221	.0349					.0273	1.10	2.35	2.58	2.20	.013	.00	.00	PIPE
1862.601	3689.724	2.406	3692.130	157.00	19.88	6.14	3698.27	.00	3.65	3.92	4.000	.000	.00	0 .0
45.129	.0349					.0248	1.12	2.41	2.47	2.20	.013	.00	.00	PIPE
1907.730	3691.301	2.505	3693.806	157.00	18.96	5.58	3699.39	.00	3.65	3.87	4.000	.000	.00	0 .0
JUNCT STR	.0756					.0243	.14	2.50	2.28		.013	.00	.00	PIPE
1913.390	3691.729	2.373	3694.103	151.00	19.44	5.87	3699.97	.00	3.60	3.93	4.000	.000	.00	0 .0
19.767	.0456					.0239	.47	2.37	2.44	1.98	.013	.00	.00	PIPE
1933.157	3692.631	2.468	3695.099	151.00	18.55	5.34	3700.44	.00	3.60	3.89	4.000	.000	.00	0 .0
15.694	.0456					.0212	.33	2.47	2.26	1.98	.013	.00	.00	PIPE
1948.850	3693.347	2.571	3695.918	151.00	17.69	4.86	3700.78	.00	3.60	3.83	4.000	.000	.00	0 .0
12.391	.0456					.0188	.23	2.57	2.09	1.98	.013	.00	.00	PIPE
1961.242	3693.912	2.681	3696.593	151.00	16.86	4.42	3701.01	.00	3.60	3.76	4.000	.000	.00	0 .0
9.832	.0456					.0168	.16	2.68	1.93	1.98	.013	.00	.00	PIPE
1971.074	3694.360	2.799	3697.159	151.00	16.08	4.01	3701.17	.00	3.60	3.67	4.000	.000	.00	0 .0
7.760	.0456					.0149	.12	2.80	1.77	1.98	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 7:42:27

Summerlin West Village 27
Ultimate Condition
Sunset Run Drive SD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1978.833	3694.714	2.926	3697.640	151.00	15.33	3.65	3701.29	.00	3.60	3.55	4.000	.000	.00	0 .0
5.995	.0456					.0134	.08	2.93	1.62	1.98	.013	.00	.00	PIPE
1984.828	3694.988	3.064	3698.052	151.00	14.62	3.32	3701.37	.00	3.60	3.39	4.000	.000	.00	0 .0
4.414	.0456					.0121	.05	3.06	1.48	1.98	.013	.00	.00	PIPE
1989.242	3695.189	3.218	3698.407	151.00	13.94	3.02	3701.42	.00	3.60	3.17	4.000	.000	.00	0 .0
2.873	.0456					.0109	.03	3.22	1.33	1.98	.013	.00	.00	PIPE
1992.116	3695.320	3.392	3698.713	151.00	13.29	2.74	3701.45	.00	3.60	2.87	4.000	.000	.00	0 .0
1.114	.0456					.0101	.01	3.39	1.18	1.98	.013	.00	.00	PIPE
1993.230	3695.371	3.603	3698.974	151.00	12.67	2.49	3701.47	.00	3.60	2.39	4.000	.000	.00	0 .0
JUNCT STR	.0809					.0049	.01	3.60	1.00		.013	.00	.00	PIPE
1996.060	3695.600	8.220	3703.820	8.00	2.55	.10	3703.92	.00	1.01	.00	2.000	.000	.00	0 .0
2.830	.1243					.0013	.00	8.22	.00	.43	.013	.00	.00	PIPE
1998.890	3695.952	7.873	3703.825	8.00	2.55	.10	3703.93	.00	1.01	.00	2.000	.000	.00	0 .0
66.925	.0890					.0012	.08	7.87	.00	.46	.013	.00	.00	PIPE
2065.815	3701.908	2.000	3703.908	8.00	2.55	.10	3704.01	.00	1.01	.00	2.000	.000	.00	0 .0
.303	.0890					.0012	.00	2.00	.00	.46	.013	.00	.00	PIPE
2066.118	3701.935	1.972	3703.908	8.00	2.55	.10	3704.01	.00	1.01	.47	2.000	.000	.00	0 .0
HYDRAULIC JUMP														

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 7:42:27

Summerlin West Village 27
Ultimate Condition
Sunset Run Drive SD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2066.118	3701.935	.465	3702.400	8.00	14.43	3.24	3705.64	.00	1.01	1.69	2.000	.000	.00	0 .0
7.323	.0890					.0890	.65	.46	4.44	.46	.013	.00	.00	PIPE
2073.441	3702.587	.465	3703.052	8.00	14.43	3.24	3706.29	.00	1.01	1.69	2.000	.000	.00	0 .0
48.705	.0890					.0909	4.43	.46	4.44	.46	.013	.00	.00	PIPE
2122.146	3706.922	.460	3707.383	8.00	14.65	3.33	3710.72	.00	1.01	1.68	2.000	.000	.00	0 .0
30.344	.0890					.0995	3.02	.46	4.53	.46	.013	.00	.00	PIPE
2152.490	3709.623	.445	3710.068	8.00	15.37	3.67	3713.73	.00	1.01	1.66	2.000	.000	.00	0 .0
6.000	.1278					.1031	.62	.44	4.84	.42	.013	.00	.00	PIPE
2158.490	3710.390	.452	3710.842	8.00	15.04	3.51	3714.36	.00	1.01	1.67	2.000	.000	.00	0 .0
257.609	.1000					.1000	25.76	.45	4.70	.45	.013	.00	.00	PIPE
2416.099	3736.151	.452	3736.603	8.00	15.04	3.51	3740.12	.00	1.01	1.67	2.000	.000	.00	0 .0
47.391	.1000					.1010	4.79	.45	4.70	.45	.013	.00	.00	PIPE
2463.490	3740.890	.449	3741.339	8.00	15.15	3.56	3744.90	.00	1.01	1.67	2.000	.000	.00	0 .0
6.000	.1317					.0978	.59	.45	4.75	.42	.013	.00	.00	PIPE
2469.490	3741.680	.459	3742.139	8.00	14.69	3.35	3745.49	.00	1.01	1.68	2.000	.000	.00	0 .0
22.873	.0966					.0914	2.09	.46	4.55	.46	.013	.00	.00	PIPE
2492.363	3743.889	.465	3744.353	8.00	14.45	3.24	3747.60	.00	1.01	1.69	2.000	.000	.00	0 .0
21.670	.0966					.0837	1.81	.46	4.45	.46	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 7:42:27

Summerlin West Village 27
Ultimate Condition
Sunset Run Drive SD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2514.032	3745.981	.480	3746.462	8.00	13.78	2.95	3749.41	.00	1.01	1.71	2.000	.000	.00	0 .0
10.758	.0966					.0732	.79	.48	4.17	.46	.013	.00	.00	PIPE
2524.790	3747.020	.497	3747.517	8.00	13.14	2.68	3750.20	.00	1.01	1.73	2.000	.000	.00	0 .0
6.958	.0966					.0640	.45	.50	3.90	.46	.013	.00	.00	PIPE
2531.749	3747.692	.514	3748.206	8.00	12.53	2.44	3750.64	.00	1.01	1.75	2.000	.000	.00	0 .0
5.022	.0966					.0560	.28	.51	3.65	.46	.013	.00	.00	PIPE
2536.771	3748.177	.532	3748.709	8.00	11.94	2.22	3750.92	.00	1.01	1.77	2.000	.000	.00	0 .0
3.845	.0966					.0490	.19	.53	3.42	.46	.013	.00	.00	PIPE
2540.616	3748.548	.550	3749.098	8.00	11.39	2.01	3751.11	.00	1.01	1.79	2.000	.000	.00	0 .0
3.053	.0966					.0429	.13	.55	3.20	.46	.013	.00	.00	PIPE
2543.669	3748.843	.569	3749.412	8.00	10.86	1.83	3751.24	.00	1.01	1.80	2.000	.000	.00	0 .0
2.483	.0966					.0375	.09	.57	2.99	.46	.013	.00	.00	PIPE
2546.152	3749.083	.589	3749.672	8.00	10.35	1.66	3751.34	.00	1.01	1.82	2.000	.000	.00	0 .0
2.051	.0966					.0328	.07	.59	2.80	.46	.013	.00	.00	PIPE
2548.203	3749.281	.610	3749.891	8.00	9.87	1.51	3751.40	.00	1.01	1.84	2.000	.000	.00	0 .0
1.713	.0966					.0287	.05	.61	2.62	.46	.013	.00	.00	PIPE
2549.916	3749.446	.631	3750.077	8.00	9.41	1.38	3751.45	.00	1.01	1.86	2.000	.000	.00	0 .0
1.441	.0966					.0252	.04	.63	2.45	.46	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 7:42:27

Summerlin West Village 27
Ultimate Condition
Sunset Run Drive SD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2551.356	3749.585	.653	3750.239	8.00	8.97	1.25	3751.49	.00	1.01	1.88	2.000	.000	.00	0 .0
1.216	.0966					.0221	.03	.65	2.29	.46	.013	.00	.00	PIPE
2552.572	3749.703	.676	3750.379	8.00	8.56	1.14	3751.52	.00	1.01	1.89	2.000	.000	.00	0 .0
1.027	.0966					.0193	.02	.68	2.15	.46	.013	.00	.00	PIPE
2553.599	3749.802	.700	3750.502	8.00	8.16	1.03	3751.54	.00	1.01	1.91	2.000	.000	.00	0 .0
.866	.0966					.0169	.01	.70	2.01	.46	.013	.00	.00	PIPE
2554.465	3749.885	.725	3750.611	8.00	7.78	.94	3751.55	.00	1.01	1.92	2.000	.000	.00	0 .0
.727	.0966					.0148	.01	.73	1.87	.46	.013	.00	.00	PIPE
2555.192	3749.956	.751	3750.707	8.00	7.42	.85	3751.56	.00	1.01	1.94	2.000	.000	.00	0 .0
.605	.0966					.0130	.01	.75	1.75	.46	.013	.00	.00	PIPE
2555.797	3750.014	.778	3750.792	8.00	7.07	.78	3751.57	.00	1.01	1.95	2.000	.000	.00	0 .0
.498	.0966					.0114	.01	.78	1.64	.46	.013	.00	.00	PIPE
2556.295	3750.062	.807	3750.869	8.00	6.74	.71	3751.57	.00	1.01	1.96	2.000	.000	.00	0 .0
.401	.0966					.0100	.00	.81	1.53	.46	.013	.00	.00	PIPE
2556.696	3750.101	.836	3750.937	8.00	6.43	.64	3751.58	.00	1.01	1.97	2.000	.000	.00	0 .0
.315	.0966					.0088	.00	.84	1.43	.46	.013	.00	.00	PIPE
2557.010	3750.131	.867	3750.998	8.00	6.13	.58	3751.58	.00	1.01	1.98	2.000	.000	.00	0 .0
.237	.0966					.0077	.00	.87	1.33	.46	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 7:42:27

Summerlin West Village 27
Ultimate Condition
Sunset Run Drive SD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
2557.247	3750.154	.899	3751.053	8.00	5.84	.53	3751.58	.00	1.01	1.99	2.000	.000	.00	0 .0
.163	.0966					.0068	.00	.90	1.24	.46	.013	.00	.00	PIPE
2557.410	3750.170	.932	3751.102	8.00	5.57	.48	3751.58	.00	1.01	2.00	2.000	.000	.00	0 .0
JUNCT STR	.1300					.0514	.31	.93	1.16		.013	.00	.00	PIPE
2563.410	3750.950	.324	3751.274	4.00	12.11	2.28	3753.55	.00	.70	1.47	2.000	.000	.00	0 .0
189.670	.0964					.0964	18.29	.32	4.51	.32	.013	.00	.00	PIPE
2753.080	3769.243	.324	3769.567	4.00	12.11	2.28	3771.84	.00	.70	1.47	2.000	.000	.00	0 .0
31.990	.0964					.0915	2.93	.32	4.51	.32	.013	.00	.00	PIPE
2785.070	3772.328	.333	3772.660	4.00	11.66	2.11	3774.77	.00	.70	1.49	2.000	.000	.00	0 .0
11.758	.0964					.0811	.95	.33	4.28	.32	.013	.00	.00	PIPE
2796.827	3773.462	.344	3773.806	4.00	11.12	1.92	3775.73	.00	.70	1.51	2.000	.000	.00	0 .0
6.358	.0964					.0708	.45	.34	4.01	.32	.013	.00	.00	PIPE
2803.185	3774.075	.355	3774.430	4.00	10.60	1.74	3776.18	.00	.70	1.53	2.000	.000	.00	0 .0
4.238	.0964					.0618	.26	.36	3.76	.32	.013	.00	.00	PIPE
2807.423	3774.484	.367	3774.851	4.00	10.11	1.59	3776.44	.00	.70	1.55	2.000	.000	.00	0 .0
3.108	.0964					.0540	.17	.37	3.52	.32	.013	.00	.00	PIPE
2810.531	3774.783	.380	3775.163	4.00	9.64	1.44	3776.61	.00	.70	1.57	2.000	.000	.00	0 .0
2.402	.0964					.0472	.11	.38	3.30	.32	.013	.00	.00	PIPE

Summerlin West Village 27
Ultimate Condition
Sunset Run Drive SD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
2812.933	3775.015	.392	3775.407	4.00	9.19	1.31	3776.72	.00	.70	1.59	2.000	.000	.00	0 .0
1.917	.0964					.0412	.08	.39	3.09	.32	.013	.00	.00	PIPE
2814.850	3775.200	.406	3775.606	4.00	8.76	1.19	3776.80	.00	.70	1.61	2.000	.000	.00	0 .0
1.519	.0917					.0364	.06	.41	2.90	.33	.013	.00	.00	PIPE
2816.369	3775.339	.417	3775.757	4.00	8.41	1.10	3776.86	.00	.70	1.63	2.000	.000	.00	0 .0
1.439	.0917					.0321	.05	.42	2.74	.33	.013	.00	.00	PIPE
2817.808	3775.471	.432	3775.903	4.00	8.02	1.00	3776.90	.00	.70	1.65	2.000	.000	.00	0 .0
1.197	.0917					.0281	.03	.43	2.57	.33	.013	.00	.00	PIPE
2819.004	3775.581	.446	3776.027	4.00	7.65	.91	3776.94	.00	.70	1.67	2.000	.000	.00	0 .0
1.002	.0917					.0245	.02	.45	2.40	.33	.013	.00	.00	PIPE
2820.006	3775.673	.462	3776.134	4.00	7.29	.83	3776.96	.00	.70	1.69	2.000	.000	.00	0 .0
.844	.0917					.0215	.02	.46	2.25	.33	.013	.00	.00	PIPE
2820.850	3775.750	.477	3776.227	4.00	6.95	.75	3776.98	.00	.70	1.71	2.000	.000	.00	0 .0
101.432	.0200					.0200	2.03	.48	2.11	.48	.013	.00	.00	PIPE
2922.282	3777.781	.477	3778.258	4.00	6.95	.75	3779.01	.00	.70	1.71	2.000	.000	.00	0 .0
40.989	.0200					.0202	.83	.48	2.11	.48	.013	.00	.00	PIPE
2963.271	3778.602	.476	3779.077	4.00	6.99	.76	3779.84	.00	.70	1.70	2.000	.000	.00	0 .0
33.877	.0200					.0218	.74	.48	2.13	.48	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 7:42:27

Summerlin West Village 27
Ultimate Condition
Sunset Run Drive SD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
2997.148	3779.280	.460	3779.740	4.00	7.33	.83	3780.57	.00	.70	1.68	2.000	.000	.00	0 .0
13.900	.0200				.0249	.35	.46	2.27	.48	.013	.00	.00	PIPE	
3011.048	3779.558	.445	3780.003	4.00	7.69	.92	3780.92	.00	.70	1.66	2.000	.000	.00	0 .0
9.082	.0200				.0285	.26	.44	2.42	.48	.013	.00	.00	PIPE	
3020.130	3779.740	.430	3780.170	4.00	8.07	1.01	3781.18	.00	.70	1.64	2.000	.000	.00	0 .0
1.163	.0545				.0297	.03	.43	2.59	.37	.013	.00	.00	PIPE	
3021.293	3779.803	.435	3780.239	4.00	7.93	.98	3781.22	.00	.70	1.65	2.000	.000	.00	0 .0
2.708	.0545				.0272	.07	.44	2.53	.37	.013	.00	.00	PIPE	
3024.002	3779.951	.450	3780.401	4.00	7.56	.89	3781.29	.00	.70	1.67	2.000	.000	.00	0 .0
2.128	.0545				.0238	.05	.45	2.37	.37	.013	.00	.00	PIPE	
3026.130	3780.067	.465	3780.532	4.00	7.21	.81	3781.34	.00	.70	1.69	2.000	.000	.00	0 .0
3.198	.0222				.0222	.07	.47	2.22	.47	.013	.00	.00	PIPE	
3029.328	3780.138	.465	3780.603	4.00	7.21	.81	3781.41	.00	.70	1.69	2.000	.000	.00	0 .0
41.394	.0222				.0219	.91	.47	2.22	.47	.013	.00	.00	PIPE	
3070.722	3781.056	.468	3781.525	4.00	7.14	.79	3782.32	.00	.70	1.69	2.000	.000	.00	0 .0
28.658	.0222				.0202	.58	.47	2.19	.47	.013	.00	.00	PIPE	
3099.380	3781.692	.485	3782.177	4.00	6.81	.72	3782.90	.00	.70	1.71	2.000	.000	.00	0 .0
10.870	.0222				.0177	.19	.48	2.05	.47	.013	.00	.00	PIPE	

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Summerlin West Village 27
Ultimate Condition
Sunset Run Drive SD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
3110.250	3781.933	.501	3782.434	4.00	6.49	.65	3783.09	.00	.70	1.73	2.000	.000	.00	0 .0
1.122	.0445					.0157	.02	.50	1.92	.39	.013	.00	.00	PIPE
3111.371	3781.983	.514	3782.497	4.00	6.26	.61	3783.11	.00	.70	1.75	2.000	.000	.00	0 .0
1.236	.0445					.0140	.02	.51	1.83	.39	.013	.00	.00	PIPE
3112.607	3782.038	.532	3782.570	4.00	5.97	.55	3783.12	.00	.70	1.77	2.000	.000	.00	0 .0
.991	.0445					.0122	.01	.53	1.71	.39	.013	.00	.00	PIPE
3113.598	3782.082	.550	3782.632	4.00	5.69	.50	3783.14	.00	.70	1.79	2.000	.000	.00	0 .0
.790	.0445					.0107	.01	.55	1.60	.39	.013	.00	.00	PIPE
3114.388	3782.117	.569	3782.686	4.00	5.43	.46	3783.14	.00	.70	1.80	2.000	.000	.00	0 .0
.618	.0445					.0094	.01	.57	1.50	.39	.013	.00	.00	PIPE
3115.007	3782.145	.589	3782.734	4.00	5.18	.42	3783.15	.00	.70	1.82	2.000	.000	.00	0 .0
.478	.0445					.0082	.00	.59	1.40	.39	.013	.00	.00	PIPE
3115.484	3782.166	.610	3782.776	4.00	4.94	.38	3783.15	.00	.70	1.84	2.000	.000	.00	0 .0
.348	.0445					.0072	.00	.61	1.31	.39	.013	.00	.00	PIPE
3115.832	3782.181	.631	3782.813	4.00	4.71	.34	3783.16	.00	.70	1.86	2.000	.000	.00	0 .0
.237	.0445					.0063	.00	.63	1.23	.39	.013	.00	.00	PIPE
3116.070	3782.192	.653	3782.845	4.00	4.49	.31	3783.16	.00	.70	1.88	2.000	.000	.00	0 .0
.136	.0445					.0055	.00	.65	1.15	.39	.013	.00	.00	PIPE

FILE: SRD_Mainline_SD.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 13

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 7:42:27

Summerlin West Village 27
Ultimate Condition
Sunset Run Drive SD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
3116.206	3782.198	.676	3782.874	4.00	4.28	.28	3783.16	.00	.70	1.89	2.000	.000	.00	0 .0
.044	.0445					.0048	.00	.68	1.07	.39	.013	.00	.00	PIPE
3116.250	3782.200	.701	3782.901	4.00	4.07	.26	3783.16	.00	.70	1.91	2.000	.000	.00	0 .0

WSPGW Models - Laterals
Sunset Run Drive

```
T1 Summerlin West Village 27
T2 Ulimate Condition
T3 SDDI3_SDMH1
SO   1000.00 3782.200  1                          3782.901
R    1037.20 3782.790  1      .013                                  0.0    0
SH   1037.20 3782.790  1
CD   1  4    0    .000   2.000     .000  .000  .000   .00
Q             2.00    .0
```

FILE: SDDI3_SDMH1.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8: 9:44

Summerlin West Village 27
Ulimate Condition
SDDI3_SDMH1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	3782.200	.701	3782.901	2.00	2.04	.06	3782.97	.00	.49	1.91	2.000	.000	.00	0 .0
1.206	.0159					.0012	.00	.70	.50	.36	.013	.00	.00	PIPE
1001.206	3782.219	.677	3782.896	2.00	2.14	.07	3782.97	.00	.49	1.89	2.000	.000	.00	0 .0
1.105	.0159					.0014	.00	.68	.54	.36	.013	.00	.00	PIPE
1002.311	3782.237	.654	3782.890	2.00	2.24	.08	3782.97	.00	.49	1.88	2.000	.000	.00	0 .0
.231	.0159					.0016	.00	.65	.57	.36	.013	.00	.00	PIPE
1002.541	3782.240	.632	3782.872	2.00	2.35	.09	3782.96	.00	.49	1.86	2.000	.000	.00	0 .0
HYDRAULIC JUMP														
1002.541	3782.240	.361	3782.602	2.00	5.17	.42	3783.02	.00	.49	1.54	2.000	.000	.00	0 .0
3.191	.0159					.0153	.05	.36	1.82	.36	.013	.00	.00	PIPE
1005.732	3782.291	.362	3782.653	2.00	5.15	.41	3783.07	.00	.49	1.54	2.000	.000	.00	0 .0
15.705	.0159					.0143	.22	.36	1.81	.36	.013	.00	.00	PIPE
1021.437	3782.540	.375	3782.914	2.00	4.91	.37	3783.29	.00	.49	1.56	2.000	.000	.00	0 .0
6.261	.0159					.0125	.08	.37	1.69	.36	.013	.00	.00	PIPE
1027.699	3782.639	.387	3783.026	2.00	4.68	.34	3783.37	.00	.49	1.58	2.000	.000	.00	0 .0
3.583	.0159					.0109	.04	.39	1.59	.36	.013	.00	.00	PIPE
1031.282	3782.696	.400	3783.096	2.00	4.46	.31	3783.41	.00	.49	1.60	2.000	.000	.00	0 .0
2.288	.0159					.0095	.02	.40	1.49	.36	.013	.00	.00	PIPE

FILE: SDDI3_SDMH1.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8: 9:44

Summerlin West Village 27
Ulimate Condition
SDDI3_SDMH1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1033.569	3782.732	.414	3783.146	2.00	4.26	.28	3783.43	.00	.49	1.62	2.000	.000	.00	0 .0
1.533	.0159					.0083	.01	.41	1.39	.36	.013	.00	.00	PIPE
1035.102	3782.757	.428	3783.185	2.00	4.06	.26	3783.44	.00	.49	1.64	2.000	.000	.00	0 .0
1.006	.0159					.0073	.01	.43	1.31	.36	.013	.00	.00	PIPE
1036.108	3782.773	.443	3783.215	2.00	3.87	.23	3783.45	.00	.49	1.66	2.000	.000	.00	0 .0
.635	.0159					.0063	.00	.44	1.22	.36	.013	.00	.00	PIPE
1036.743	3782.783	.458	3783.240	2.00	3.69	.21	3783.45	.00	.49	1.68	2.000	.000	.00	0 .0
.351	.0159					.0055	.00	.46	1.14	.36	.013	.00	.00	PIPE
1037.094	3782.788	.473	3783.262	2.00	3.52	.19	3783.45	.00	.49	1.70	2.000	.000	.00	0 .0
.106	.0159					.0048	.00	.47	1.07	.36	.013	.00	.00	PIPE
1037.200	3782.790	.491	3783.281	2.00	3.34	.17	3783.45	.00	.49	1.72	2.000	.000	.00	0 .0

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T1 Summerlin West Village 27
T2 Ultimate Condition
T3 SDDI4_SDMH1
SO   1000.00 3782.200  1                          3782.901
R    1014.10 3784.000  1      .013                                  0.0    0
SH   1014.10 3784.000  1
CD   1  4    0    .000   2.000     .000  .000  .000   .00
Q             2.00    .0
```

FILE: SDDI4_SDMH1.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:10:19

Summerlin West Village 27
Ultimate Condition
SDDI4_SDMH1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	3782.199	.235	3782.435	2.00	9.66	1.45	3783.88	.00	.49	1.29	2.000	.000	.00	0 .0
.697	.1277					.0900	.06	.24	4.24	.22	.013	.00	.00	PIPE
1000.697	3782.289	.236	3782.525	2.00	9.57	1.42	3783.95	.00	.49	1.29	2.000	.000	.00	0 .0
2.730	.1277					.0832	.23	.24	4.19	.22	.013	.00	.00	PIPE
1003.427	3782.637	.244	3782.882	2.00	9.12	1.29	3784.17	.00	.49	1.31	2.000	.000	.00	0 .0
1.988	.1277					.0726	.14	.24	3.93	.22	.013	.00	.00	PIPE
1005.415	3782.891	.252	3783.144	2.00	8.70	1.18	3784.32	.00	.49	1.33	2.000	.000	.00	0 .0
1.531	.1277					.0634	.10	.25	3.69	.22	.013	.00	.00	PIPE
1006.947	3783.087	.261	3783.347	2.00	8.30	1.07	3784.42	.00	.49	1.35	2.000	.000	.00	0 .0
1.224	.1277					.0553	.07	.26	3.46	.22	.013	.00	.00	PIPE
1008.170	3783.243	.269	3783.512	2.00	7.91	.97	3784.48	.00	.49	1.37	2.000	.000	.00	0 .0
.999	.1277					.0483	.05	.27	3.24	.22	.013	.00	.00	PIPE
1009.169	3783.370	.278	3783.649	2.00	7.54	.88	3784.53	.00	.49	1.38	2.000	.000	.00	0 .0
.830	.1277					.0422	.03	.28	3.04	.22	.013	.00	.00	PIPE
1009.999	3783.476	.288	3783.764	2.00	7.19	.80	3784.57	.00	.49	1.40	2.000	.000	.00	0 .0
.698	.1277					.0368	.03	.29	2.85	.22	.013	.00	.00	PIPE
1010.697	3783.565	.297	3783.863	2.00	6.86	.73	3784.59	.00	.49	1.42	2.000	.000	.00	0 .0
.591	.1277					.0321	.02	.30	2.67	.22	.013	.00	.00	PIPE

FILE: SDDI4_SDMH1.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:10:19

Summerlin West Village 27
Ultimate Condition
SDDI4_SDMH1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1011.288	3783.641	.307	3783.948	2.00	6.54	.66	3784.61	.00	.49	1.44	2.000	.000	.00	0 .0
.502	.1277					.0281	.01	.31	2.50	.22	.013	.00	.00	PIPE
1011.790	3783.705	.318	3784.023	2.00	6.23	.60	3784.63	.00	.49	1.46	2.000	.000	.00	0 .0
.428	.1277					.0245	.01	.32	2.34	.22	.013	.00	.00	PIPE
1012.218	3783.760	.328	3784.088	2.00	5.94	.55	3784.64	.00	.49	1.48	2.000	.000	.00	0 .0
.366	.1277					.0214	.01	.33	2.20	.22	.013	.00	.00	PIPE
1012.583	3783.806	.339	3784.146	2.00	5.67	.50	3784.64	.00	.49	1.50	2.000	.000	.00	0 .0
.311	.1277					.0187	.01	.34	2.06	.22	.013	.00	.00	PIPE
1012.894	3783.846	.351	3784.197	2.00	5.40	.45	3784.65	.00	.49	1.52	2.000	.000	.00	0 .0
.264	.1277					.0163	.00	.35	1.93	.22	.013	.00	.00	PIPE
1013.158	3783.880	.362	3784.242	2.00	5.15	.41	3784.65	.00	.49	1.54	2.000	.000	.00	0 .0
.223	.1277					.0143	.00	.36	1.81	.22	.013	.00	.00	PIPE
1013.381	3783.908	.375	3784.283	2.00	4.91	.37	3784.66	.00	.49	1.56	2.000	.000	.00	0 .0
.185	.1277					.0125	.00	.37	1.69	.22	.013	.00	.00	PIPE
1013.566	3783.932	.387	3784.319	2.00	4.68	.34	3784.66	.00	.49	1.58	2.000	.000	.00	0 .0
.153	.1277					.0109	.00	.39	1.59	.22	.013	.00	.00	PIPE
1013.719	3783.951	.400	3784.352	2.00	4.46	.31	3784.66	.00	.49	1.60	2.000	.000	.00	0 .0
.123	.1277					.0095	.00	.40	1.49	.22	.013	.00	.00	PIPE

FILE: SDDI4_SDMH1.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:10:19

Summerlin West Village 27
Ultimate Condition
SDDI4_SDMH1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1013.842	3783.967	.414	3784.381	2.00	4.26	.28	3784.66	.00	.49	1.62	2.000	.000	.00	0 .0
.097	.1277					.0083	.00	.41	1.39	.22	.013	.00	.00	PIPE
1013.939	3783.979	.428	3784.407	2.00	4.06	.26	3784.66	.00	.49	1.64	2.000	.000	.00	0 .0
.072	.1277					.0073	.00	.43	1.31	.22	.013	.00	.00	PIPE
1014.011	3783.989	.443	3784.431	2.00	3.87	.23	3784.66	.00	.49	1.66	2.000	.000	.00	0 .0
.050	.1277					.0063	.00	.44	1.22	.22	.013	.00	.00	PIPE
1014.061	3783.995	.458	3784.453	2.00	3.69	.21	3784.66	.00	.49	1.68	2.000	.000	.00	0 .0
.030	.1277					.0055	.00	.46	1.14	.22	.013	.00	.00	PIPE
1014.090	3783.999	.473	3784.472	2.00	3.52	.19	3784.66	.00	.49	1.70	2.000	.000	.00	0 .0
.010	.1277					.0048	.00	.47	1.07	.22	.013	.00	.00	PIPE
1014.100	3784.000	.491	3784.491	2.00	3.34	.17	3784.66	.00	.49	1.72	2.000	.000	.00	0 .0

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T1 Summerlin West Village 27
T2 Ultimate Condition
T3 SDDI5_SDMH4
SO   1000.00 3750.660  1                          3751.188
R    1036.13 3751.390  1      .013                                  0.0    0
SH   1036.13 3751.390  1
CD   1  4   0    .000   2.000     .000  .000  .000   .00
Q             2.00    .0
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FILE: SDDI5_SDMH4.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:22: 9

Summerlin West Village 27
Ultimate Condition
SDDI5_SDMH4

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1000.000	3750.660	.341	3751.001	2.00	5.62	.49	3751.49	.00	.49	1.50	2.000	.000	.00	0 .0
15.892	.0202				.0185	.29	.34	2.04	.34	.013	.00	.00	PIPE	
1015.892	3750.981	.351	3751.332	2.00	5.40	.45	3751.79	.00	.49	1.52	2.000	.000	.00	0 .0
7.566	.0202				.0163	.12	.35	1.93	.34	.013	.00	.00	PIPE	
1023.458	3751.134	.362	3751.497	2.00	5.15	.41	3751.91	.00	.49	1.54	2.000	.000	.00	0 .0
4.244	.0202				.0143	.06	.36	1.81	.34	.013	.00	.00	PIPE	
1027.702	3751.220	.375	3751.594	2.00	4.91	.37	3751.97	.00	.49	1.56	2.000	.000	.00	0 .0
2.754	.0202				.0125	.03	.37	1.69	.34	.013	.00	.00	PIPE	
1030.456	3751.276	.387	3751.663	2.00	4.68	.34	3752.00	.00	.49	1.58	2.000	.000	.00	0 .0
1.915	.0202				.0109	.02	.39	1.59	.34	.013	.00	.00	PIPE	
1032.370	3751.314	.400	3751.715	2.00	4.46	.31	3752.02	.00	.49	1.60	2.000	.000	.00	0 .0
1.359	.0202				.0095	.01	.40	1.49	.34	.013	.00	.00	PIPE	
1033.729	3751.342	.414	3751.756	2.00	4.26	.28	3752.04	.00	.49	1.62	2.000	.000	.00	0 .0
.973	.0202				.0083	.01	.41	1.39	.34	.013	.00	.00	PIPE	
1034.703	3751.361	.428	3751.789	2.00	4.06	.26	3752.05	.00	.49	1.64	2.000	.000	.00	0 .0
.669	.0202				.0073	.00	.43	1.31	.34	.013	.00	.00	PIPE	
1035.371	3751.375	.443	3751.817	2.00	3.87	.23	3752.05	.00	.49	1.66	2.000	.000	.00	0 .0
.436	.0202				.0063	.00	.44	1.22	.34	.013	.00	.00	PIPE	

FILE: SDDI5_SDMH4.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:22: 9

Summerlin West Village 27
Ultimate Condition
SDDI5_SDMH4

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1035.807	3751.384	.458	3751.841	2.00	3.69	.21	3752.05	.00	.49	1.68	2.000	.000	.00	0 .0
.247	.0202					.0055	.00	.46	1.14	.34	.013	.00	.00	PIPE
1036.054	3751.388	.473	3751.862	2.00	3.52	.19	3752.05	.00	.49	1.70	2.000	.000	.00	0 .0
.076	.0202					.0048	.00	.47	1.07	.34	.013	.00	.00	PIPE
1036.130	3751.390	.491	3751.881	2.00	3.34	.17	3752.05	.00	.49	1.72	2.000	.000	.00	0 .0

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T1 Summerlin West Village 27
T2 Ultimate Condition
T3 SDDI6_SDMH4
SO   1000.00 3750.660  1                          3751.188
R    1015.37 3751.810  1      .013                                  0.0    0
SH   1015.37 3751.810  1
CD   1  4   0    .000   2.000     .000  .000  .000   .00
Q             2.00    .0
```

FILE: SDDI6_SDMH4.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:22:46

Summerlin West Village 27
Ultimate Condition
SDDI6_SDMH4

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1000.000	3750.660	.266	3750.925	2.00	8.07	1.01	3751.94	.00	.49	1.36	2.000	.000	.00	0 .0
1.724	.0748					.0531	.09	.27	3.33	.25	.013	.00	.00	PIPE
1001.724	3750.789	.269	3751.058	2.00	7.91	.97	3752.03	.00	.49	1.37	2.000	.000	.00	0 .0
2.987	.0748					.0483	.14	.27	3.24	.25	.013	.00	.00	PIPE
1004.711	3751.012	.278	3751.291	2.00	7.54	.88	3752.17	.00	.49	1.38	2.000	.000	.00	0 .0
2.172	.0748					.0422	.09	.28	3.04	.25	.013	.00	.00	PIPE
1006.883	3751.175	.288	3751.462	2.00	7.19	.80	3752.27	.00	.49	1.40	2.000	.000	.00	0 .0
1.666	.0748					.0368	.06	.29	2.85	.25	.013	.00	.00	PIPE
1008.549	3751.300	.297	3751.597	2.00	6.86	.73	3752.33	.00	.49	1.42	2.000	.000	.00	0 .0
1.322	.0748					.0321	.04	.30	2.67	.25	.013	.00	.00	PIPE
1009.871	3751.398	.307	3751.706	2.00	6.54	.66	3752.37	.00	.49	1.44	2.000	.000	.00	0 .0
1.069	.0748					.0281	.03	.31	2.50	.25	.013	.00	.00	PIPE
1010.940	3751.479	.318	3751.796	2.00	6.23	.60	3752.40	.00	.49	1.46	2.000	.000	.00	0 .0
.877	.0748					.0245	.02	.32	2.34	.25	.013	.00	.00	PIPE
1011.817	3751.544	.328	3751.872	2.00	5.94	.55	3752.42	.00	.49	1.48	2.000	.000	.00	0 .0
.727	.0748					.0214	.02	.33	2.20	.25	.013	.00	.00	PIPE
1012.544	3751.599	.339	3751.938	2.00	5.67	.50	3752.44	.00	.49	1.50	2.000	.000	.00	0 .0
.604	.0748					.0187	.01	.34	2.06	.25	.013	.00	.00	PIPE

FILE: SDDI6_SDMH4.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:22:46

Summerlin West Village 27
Ultimate Condition
SDDI6_SDMH4

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1013.148	3751.644	.351	3751.994	2.00	5.40	.45	3752.45	.00	.49	1.52	2.000	.000	.00	0 .0
.502	.0748					.0163	.01	.35	1.93	.25	.013	.00	.00	PIPE
1013.650	3751.681	.362	3752.044	2.00	5.15	.41	3752.46	.00	.49	1.54	2.000	.000	.00	0 .0
.417	.0748					.0143	.01	.36	1.81	.25	.013	.00	.00	PIPE
1014.067	3751.713	.375	3752.087	2.00	4.91	.37	3752.46	.00	.49	1.56	2.000	.000	.00	0 .0
.342	.0748					.0125	.00	.37	1.69	.25	.013	.00	.00	PIPE
1014.409	3751.738	.387	3752.125	2.00	4.68	.34	3752.47	.00	.49	1.58	2.000	.000	.00	0 .0
.279	.0748					.0109	.00	.39	1.59	.25	.013	.00	.00	PIPE
1014.688	3751.759	.400	3752.160	2.00	4.46	.31	3752.47	.00	.49	1.60	2.000	.000	.00	0 .0
.223	.0748					.0095	.00	.40	1.49	.25	.013	.00	.00	PIPE
1014.911	3751.776	.414	3752.190	2.00	4.26	.28	3752.47	.00	.49	1.62	2.000	.000	.00	0 .0
.174	.0748					.0083	.00	.41	1.39	.25	.013	.00	.00	PIPE
1015.085	3751.789	.428	3752.217	2.00	4.06	.26	3752.47	.00	.49	1.64	2.000	.000	.00	0 .0
.128	.0748					.0073	.00	.43	1.31	.25	.013	.00	.00	PIPE
1015.213	3751.798	.443	3752.241	2.00	3.87	.23	3752.47	.00	.49	1.66	2.000	.000	.00	0 .0
.088	.0748					.0063	.00	.44	1.22	.25	.013	.00	.00	PIPE
1015.301	3751.805	.458	3752.263	2.00	3.69	.21	3752.47	.00	.49	1.68	2.000	.000	.00	0 .0
.052	.0748					.0055	.00	.46	1.14	.25	.013	.00	.00	PIPE

FILE: SDDI6_SDMH4.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:22:46

Summerlin West Village 27
Ultimate Condition
SDDI6_SDMH4

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	ZR	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall				Type Ch
1015.353	3751.809	.473	3752.282	2.00	3.52	.19	3752.47	.00	.49	1.70	2.000	.000	.00	0	.0
.017	.0748				.0048	.00	.47	1.07	.25	.013		.00	.00	PIPE	
1015.370	3751.810	.491	3752.301	2.00	3.34	.17	3752.47	.00	.49	1.72	2.000	.000	.00	0	.0

```
T1 Summerlin West Village 27
T2 Ultimate Condition
T3 SDDI7_SDMH7
SO   1000.00 3695.700  1                          3701.397
R    1054.73 3698.690  1      .013                                  0.0    0
SH   1054.73 3698.690  1
CD   1  4   0    .000   2.500     .000  .000  .000   .00
Q            51.00    .0
```

FILE: SDDI7_SDMH7.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:37:49

Summerlin West Village 27
Ultimate Condition
SDDI7_SDMH7

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	ZR	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall				Type Ch
1000.000	3695.700	5.697	3701.397	51.00	10.39	1.68	3703.07	.00	2.31	.00	2.500	.000	.00	0	.0
54.730	.0546				.0155	.85	5.70	.00	1.30	.013		.00	.00	PIPE	
1054.730	3698.690	3.553	3702.243	51.00	10.39	1.68	3703.92	.00	2.31	.00	2.500	.000	.00	0	.0

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T1 Summerlin West Village 27
T2 Ultimate Condition
T3 SDDI8_SDMH8
SO   1000.00 3691.600  1                          3693.955
R    1038.67 3693.530  1      .013                                    0.0    0
SH   1038.67 3693.530  1
CD   1  4   0    .000   2.000     .000  .000  .000   .00
Q             6.00    .0
```

FILE: SDDI8_SDMH8.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:47:29

Summerlin West Village 27
Ultimate Condition
SDDI8_SDMH8

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1000.000	3691.600	2.355	3693.955	6.00	1.91	.06	3694.01	.00	.87	.00	2.000	.000	.00	0 .0
7.214	.0499				.0007	.01	2.35	.00	.47	.013	.00	.00	PIPE	
1007.214	3691.960	2.000	3693.960	6.00	1.91	.06	3694.02	.00	.87	.00	2.000	.000	.00	0 .0
3.629	.0499				.0007	.00	2.00	.00	.47	.013	.00	.00	PIPE	
1010.843	3692.141	1.815	3693.956	6.00	2.00	.06	3694.02	.00	.87	1.16	2.000	.000	.00	0 .0
2.059	.0499				.0006	.00	1.81	.22	.47	.013	.00	.00	PIPE	
1012.902	3692.244	1.707	3693.951	6.00	2.10	.07	3694.02	.00	.87	1.41	2.000	.000	.00	0 .0
1.665	.0499				.0007	.00	1.71	.26	.47	.013	.00	.00	PIPE	
1014.567	3692.327	1.618	3693.945	6.00	2.20	.08	3694.02	.00	.87	1.57	2.000	.000	.00	0 .0
1.430	.0499				.0008	.00	1.62	.30	.47	.013	.00	.00	PIPE	
1015.997	3692.398	1.540	3693.939	6.00	2.31	.08	3694.02	.00	.87	1.68	2.000	.000	.00	0 .0
1.258	.0499				.0008	.00	1.54	.33	.47	.013	.00	.00	PIPE	
1017.255	3692.461	1.470	3693.931	6.00	2.42	.09	3694.02	.00	.87	1.77	2.000	.000	.00	0 .0
1.123	.0499				.0009	.00	1.47	.36	.47	.013	.00	.00	PIPE	
1018.377	3692.517	1.406	3693.924	6.00	2.54	.10	3694.02	.00	.87	1.83	2.000	.000	.00	0 .0
1.008	.0499				.0011	.00	1.41	.39	.47	.013	.00	.00	PIPE	
1019.386	3692.568	1.347	3693.915	6.00	2.67	.11	3694.02	.00	.87	1.88	2.000	.000	.00	0 .0
.110	.0499				.0011	.00	1.35	.43	.47	.013	.00	.00	PIPE	

FILE: SDDI8_SDMH8.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:47:29

Summerlin West Village 27
Ultimate Condition
SDDI8_SDMH8

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1019.496	3692.573	1.347	3693.920	6.00	2.67	.11	3694.03	.00	.87	1.88	2.000	.000	.00	0 .0
HYDRAULIC JUMP														
1019.496	3692.573	.531	3693.104	6.00	8.99	1.25	3694.36	.00	.87	1.77	2.000	.000	.00	0 .0
4.043	.0499				.0278	.11	.53	2.58	.47	.013	.00	.00	PIPE	
1023.539	3692.776	.549	3693.325	6.00	8.57	1.14	3694.46	.00	.87	1.79	2.000	.000	.00	0 .0
3.303	.0499				.0243	.08	.55	2.41	.47	.013	.00	.00	PIPE	
1026.842	3692.940	.568	3693.509	6.00	8.17	1.04	3694.54	.00	.87	1.80	2.000	.000	.00	0 .0
2.597	.0499				.0213	.06	.57	2.26	.47	.013	.00	.00	PIPE	
1029.439	3693.070	.588	3693.658	6.00	7.79	.94	3694.60	.00	.87	1.82	2.000	.000	.00	0 .0
2.081	.0499				.0186	.04	.59	2.11	.47	.013	.00	.00	PIPE	
1031.519	3693.174	.608	3693.782	6.00	7.42	.86	3694.64	.00	.87	1.84	2.000	.000	.00	0 .0
1.679	.0499				.0163	.03	.61	1.97	.47	.013	.00	.00	PIPE	
1033.198	3693.258	.630	3693.887	6.00	7.08	.78	3694.67	.00	.87	1.86	2.000	.000	.00	0 .0
1.365	.0499				.0143	.02	.63	1.85	.47	.013	.00	.00	PIPE	
1034.564	3693.326	.652	3693.978	6.00	6.75	.71	3694.69	.00	.87	1.87	2.000	.000	.00	0 .0
1.102	.0499				.0125	.01	.65	1.73	.47	.013	.00	.00	PIPE	
1035.666	3693.381	.675	3694.055	6.00	6.44	.64	3694.70	.00	.87	1.89	2.000	.000	.00	0 .0
.888	.0499				.0110	.01	.67	1.62	.47	.013	.00	.00	PIPE	

FILE: SDDI8_SDMH8.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:47:29

Summerlin West Village 27
Ultimate Condition
SDDI8_SDMH8

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1036.553	3693.425	.699	3694.124	6.00	6.14	.58	3694.71	.00	.87	1.91	2.000	.000	.00	0 .0
.698	.0499					.0096	.01	.70	1.51	.47	.013	.00	.00	PIPE
1037.252	3693.460	.724	3694.184	6.00	5.85	.53	3694.72	.00	.87	1.92	2.000	.000	.00	0 .0
.540	.0499					.0084	.00	.72	1.41	.47	.013	.00	.00	PIPE
1037.792	3693.487	.750	3694.236	6.00	5.58	.48	3694.72	.00	.87	1.94	2.000	.000	.00	0 .0
.398	.0499					.0074	.00	.75	1.32	.47	.013	.00	.00	PIPE
1038.190	3693.506	.777	3694.283	6.00	5.32	.44	3694.72	.00	.87	1.95	2.000	.000	.00	0 .0
.270	.0499					.0065	.00	.78	1.23	.47	.013	.00	.00	PIPE
1038.460	3693.520	.805	3694.325	6.00	5.07	.40	3694.72	.00	.87	1.96	2.000	.000	.00	0 .0
.158	.0499					.0057	.00	.80	1.15	.47	.013	.00	.00	PIPE
1038.619	3693.528	.834	3694.362	6.00	4.84	.36	3694.72	.00	.87	1.97	2.000	.000	.00	0 .0
.051	.0499					.0050	.00	.83	1.07	.47	.013	.00	.00	PIPE
1038.670	3693.530	.866	3694.396	6.00	4.60	.33	3694.73	.00	.87	1.98	2.000	.000	.00	0 .0

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T1 Summerlin West Village 27
T2 Ultimate Condition
T3 SDDI9-SDMH38
SO   1000.00 3631.760  1                          3633.413
R    1052.38 3636.170  1      .013                                    0.0    0
SH   1052.38 3636.170  1
CD   1  4    0    .000   2.000     .000  .000  .000   .00
Q             6.00    .0
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FILE: SDDI9_SDMH38.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 9:24:36

Summerlin West Village 27
Ultimate Condition
SDDI9-SDMH38

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1000.000	3631.760	1.653	3633.413	6.00	2.16	.07	3633.49	.00	.87	1.51	2.000	.000	.00	0 .0
.363	.0842					.0007	.00	1.65	.28	.41	.013	.00	.00	PIPE
1000.363	3631.791	1.621	3633.412	6.00	2.20	.08	3633.49	.00	.87	1.57	2.000	.000	.00	0 .0
HYDRAULIC JUMP														
1000.363	3631.791	.418	3632.209	6.00	12.58	2.46	3634.67	.00	.87	1.63	2.000	.000	.00	0 .0
1.240	.0842					.0761	.09	.42	4.09	.41	.013	.00	.00	PIPE
1001.603	3631.895	.419	3632.314	6.00	12.54	2.44	3634.76	.00	.87	1.63	2.000	.000	.00	0 .0
15.811	.0842					.0711	1.12	.42	4.08	.41	.013	.00	.00	PIPE
1017.414	3633.226	.434	3633.659	6.00	11.96	2.22	3635.88	.00	.87	1.65	2.000	.000	.00	0 .0
8.473	.0842					.0621	.53	.43	3.82	.41	.013	.00	.00	PIPE
1025.887	3633.939	.448	3634.387	6.00	11.40	2.02	3636.41	.00	.87	1.67	2.000	.000	.00	0 .0
5.622	.0842					.0543	.31	.45	3.58	.41	.013	.00	.00	PIPE
1031.508	3634.413	.464	3634.876	6.00	10.87	1.84	3636.71	.00	.87	1.69	2.000	.000	.00	0 .0
4.112	.0842					.0475	.20	.46	3.35	.41	.013	.00	.00	PIPE
1035.620	3634.759	.479	3635.238	6.00	10.36	1.67	3636.91	.00	.87	1.71	2.000	.000	.00	0 .0
3.166	.0842					.0415	.13	.48	3.14	.41	.013	.00	.00	PIPE
1038.787	3635.025	.496	3635.521	6.00	9.88	1.52	3637.04	.00	.87	1.73	2.000	.000	.00	0 .0
2.524	.0842					.0363	.09	.50	2.94	.41	.013	.00	.00	PIPE

FILE: SDDI9_SDMH38.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 9:24:36

Summerlin West Village 27
Ultimate Condition
SDDI9-SDMH38

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1041.310	3635.238	.513	3635.751	6.00	9.42	1.38	3637.13	.00	.87	1.75	2.000	.000	.00	0 .0
2.052	.0842					.0317	.07	.51	2.75	.41	.013	.00	.00	PIPE
1043.363	3635.411	.531	3635.941	6.00	8.98	1.25	3637.19	.00	.87	1.77	2.000	.000	.00	0 .0
1.693	.0842					.0278	.05	.53	2.57	.41	.013	.00	.00	PIPE
1045.056	3635.553	.549	3636.102	6.00	8.57	1.14	3637.24	.00	.87	1.79	2.000	.000	.00	0 .0
1.412	.0842					.0243	.03	.55	2.41	.41	.013	.00	.00	PIPE
1046.468	3635.672	.568	3636.240	6.00	8.17	1.04	3637.28	.00	.87	1.80	2.000	.000	.00	0 .0
1.182	.0842					.0213	.03	.57	2.26	.41	.013	.00	.00	PIPE
1047.650	3635.772	.588	3636.360	6.00	7.79	.94	3637.30	.00	.87	1.82	2.000	.000	.00	0 .0
.993	.0842					.0186	.02	.59	2.11	.41	.013	.00	.00	PIPE
1048.643	3635.855	.608	3636.464	6.00	7.42	.86	3637.32	.00	.87	1.84	2.000	.000	.00	0 .0
.831	.0842					.0163	.01	.61	1.97	.41	.013	.00	.00	PIPE
1049.474	3635.925	.630	3636.555	6.00	7.08	.78	3637.33	.00	.87	1.86	2.000	.000	.00	0 .0
.696	.0842					.0143	.01	.63	1.85	.41	.013	.00	.00	PIPE
1050.170	3635.984	.652	3636.636	6.00	6.75	.71	3637.34	.00	.87	1.87	2.000	.000	.00	0 .0
.575	.0842					.0125	.01	.65	1.73	.41	.013	.00	.00	PIPE
1050.745	3636.032	.675	3636.707	6.00	6.44	.64	3637.35	.00	.87	1.89	2.000	.000	.00	0 .0
.472	.0842					.0110	.01	.67	1.62	.41	.013	.00	.00	PIPE

FILE: SDDI9_SDMH38.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 9:24:36

Summerlin West Village 27
Ultimate Condition
SDDI9-SDMH38

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1051.217	3636.072	.699	3636.771	6.00	6.14	.58	3637.36	.00	.87	1.91	2.000	.000	.00	0 .0
.377	.0842					.0096	.00	.70	1.51	.41	.013	.00	.00	PIPE
1051.594	3636.104	.724	3636.828	6.00	5.85	.53	3637.36	.00	.87	1.92	2.000	.000	.00	0 .0
.296	.0842					.0084	.00	.72	1.41	.41	.013	.00	.00	PIPE
1051.890	3636.129	.750	3636.878	6.00	5.58	.48	3637.36	.00	.87	1.94	2.000	.000	.00	0 .0
.220	.0842					.0074	.00	.75	1.32	.41	.013	.00	.00	PIPE
1052.111	3636.147	.777	3636.924	6.00	5.32	.44	3637.36	.00	.87	1.95	2.000	.000	.00	0 .0
.151	.0842					.0065	.00	.78	1.23	.41	.013	.00	.00	PIPE
1052.262	3636.160	.805	3636.965	6.00	5.07	.40	3637.36	.00	.87	1.96	2.000	.000	.00	0 .0
.089	.0842					.0057	.00	.80	1.15	.41	.013	.00	.00	PIPE
1052.351	3636.167	.834	3637.002	6.00	4.84	.36	3637.36	.00	.87	1.97	2.000	.000	.00	0 .0
.029	.0842					.0050	.00	.83	1.07	.41	.013	.00	.00	PIPE
1052.380	3636.170	.866	3637.036	6.00	4.60	.33	3637.36	.00	.87	1.98	2.000	.000	.00	0 .0

```
T1 Summerlin West Village 27
T2 Ultimate Condition
T3 SDDI14_SDMH14
SO   1000.00 3690.680  1                          3691.703
R    1017.49 3692.470  1      .013                                  0.0    0
SH   1017.49 3692.470  1
CD   1  4   0    .000   2.000     .000  .000  .000   .00
Q             4.00    .0
```

FILE: SDDI14_SDMH14.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:59:58

Summerlin West Village 27
Ultimate Condition
SDDI14_SDMH14

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	3690.680	.358	3691.038	4.00	10.48	1.71	3692.74	.00	.70	1.53	2.000	.000	.00	0 .0
2.914	.1023					.0607	.18	.36	3.70	.32	.013	.00	.00	PIPE
1002.914	3690.978	.368	3691.345	4.00	10.09	1.58	3692.93	.00	.70	1.55	2.000	.000	.00	0 .0
2.698	.1023					.0537	.14	.37	3.51	.32	.013	.00	.00	PIPE
1005.612	3691.254	.380	3691.634	4.00	9.62	1.44	3693.07	.00	.70	1.57	2.000	.000	.00	0 .0
2.123	.1023					.0469	.10	.38	3.29	.32	.013	.00	.00	PIPE
1007.735	3691.471	.393	3691.864	4.00	9.17	1.31	3693.17	.00	.70	1.59	2.000	.000	.00	0 .0
1.718	.1023					.0410	.07	.39	3.08	.32	.013	.00	.00	PIPE
1009.454	3691.647	.406	3692.053	4.00	8.74	1.19	3693.24	.00	.70	1.61	2.000	.000	.00	0 .0
1.415	.1023					.0358	.05	.41	2.89	.32	.013	.00	.00	PIPE
1010.869	3691.792	.420	3692.212	4.00	8.34	1.08	3693.29	.00	.70	1.63	2.000	.000	.00	0 .0
1.180	.1023					.0313	.04	.42	2.71	.32	.013	.00	.00	PIPE
1012.048	3691.913	.434	3692.347	4.00	7.95	.98	3693.33	.00	.70	1.65	2.000	.000	.00	0 .0
.992	.1023					.0274	.03	.43	2.54	.32	.013	.00	.00	PIPE
1013.040	3692.014	.449	3692.463	4.00	7.58	.89	3693.36	.00	.70	1.67	2.000	.000	.00	0 .0
.839	.1023					.0239	.02	.45	2.38	.32	.013	.00	.00	PIPE
1013.879	3692.100	.465	3692.565	4.00	7.23	.81	3693.38	.00	.70	1.69	2.000	.000	.00	0 .0
.710	.1023					.0209	.01	.46	2.22	.32	.013	.00	.00	PIPE

FILE: SDDI14_SDMH14.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:59:58

Summerlin West Village 27
Ultimate Condition
SDDI14_SDMH14

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1014.589	3692.173	.480	3692.653	4.00	6.89	.74	3693.39	.00	.70	1.71	2.000	.000	.00	0 .0
.601	.1023					.0183	.01	.48	2.08	.32	.013	.00	.00	PIPE
1015.190	3692.234	.497	3692.731	4.00	6.57	.67	3693.40	.00	.70	1.73	2.000	.000	.00	0 .0
.507	.1023					.0160	.01	.50	1.95	.32	.013	.00	.00	PIPE
1015.697	3692.286	.514	3692.800	4.00	6.26	.61	3693.41	.00	.70	1.75	2.000	.000	.00	0 .0
.426	.1023					.0140	.01	.51	1.83	.32	.013	.00	.00	PIPE
1016.124	3692.330	.532	3692.862	4.00	5.97	.55	3693.42	.00	.70	1.77	2.000	.000	.00	0 .0
.354	.1023					.0122	.00	.53	1.71	.32	.013	.00	.00	PIPE
1016.478	3692.366	.550	3692.917	4.00	5.69	.50	3693.42	.00	.70	1.79	2.000	.000	.00	0 .0
.291	.1023					.0107	.00	.55	1.60	.32	.013	.00	.00	PIPE
1016.769	3692.396	.569	3692.965	4.00	5.43	.46	3693.42	.00	.70	1.80	2.000	.000	.00	0 .0
.233	.1023					.0094	.00	.57	1.50	.32	.013	.00	.00	PIPE
1017.003	3692.420	.589	3693.009	4.00	5.18	.42	3693.43	.00	.70	1.82	2.000	.000	.00	0 .0
.184	.1023					.0082	.00	.59	1.40	.32	.013	.00	.00	PIPE
1017.187	3692.439	.610	3693.049	4.00	4.94	.38	3693.43	.00	.70	1.84	2.000	.000	.00	0 .0
.136	.1023					.0072	.00	.61	1.31	.32	.013	.00	.00	PIPE
1017.323	3692.453	.631	3693.084	4.00	4.71	.34	3693.43	.00	.70	1.86	2.000	.000	.00	0 .0
.094	.1023					.0063	.00	.63	1.23	.32	.013	.00	.00	PIPE

FILE: SDDI14_SDMH14.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:59:58

Summerlin West Village 27
Ultimate Condition
SDDI14_SDMH14

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1017.417	3692.463	.653	3693.116	4.00	4.49	.31	3693.43	.00	.70	1.88	2.000	.000	.00	0 .0
.055	.1023					.0055	.00	.65	1.15	.32	.013	.00	.00	PIPE
1017.472	3692.468	.676	3693.145	4.00	4.28	.28	3693.43	.00	.70	1.89	2.000	.000	.00	0 .0
.018	.1023					.0048	.00	.68	1.07	.32	.013	.00	.00	PIPE
1017.490	3692.470	.701	3693.171	4.00	4.07	.26	3693.43	.00	.70	1.91	2.000	.000	.00	0 .0

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T1 Summerlin West Village 27
T2 Ultimate Condition
T3 SDDI13_SDMH9
SO   1000.00 3688.220  1                          3690.477
R    1059.73 3690.372  1      .013                                  0.0    0
R    1062.73 3690.580  1      .013                                 90.2    0
JX   1065.73 3690.833  1  1   .013    4.00          3690.680         90.0
R    1088.25 3691.980  1      .013                                  0.0    0
SH   1088.25 3691.980  1
CD   1  4   0    .000   2.000     .000  .000  .000   .00
Q             2.00    .0
```

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:54:15

Summerlin West Village 27
Ultimate Condition
SDDI13_SDMH9

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	3688.220	2.257	3690.477	6.00	1.91	.06	3690.53	.00	.87	.00	2.000	.000	.00	0 .0
7.277	.0360					.0007	.01	2.26	.00	.51	.013	.00	.00	PIPE
1007.277	3688.482	2.000	3690.482	6.00	1.91	.06	3690.54	.00	.87	.00	2.000	.000	.00	0 .0
5.052	.0360					.0007	.00	2.00	.00	.51	.013	.00	.00	PIPE
1012.329	3688.664	1.815	3690.479	6.00	2.00	.06	3690.54	.00	.87	1.16	2.000	.000	.00	0 .0
2.867	.0360					.0006	.00	1.81	.22	.51	.013	.00	.00	PIPE
1015.196	3688.768	1.707	3690.475	6.00	2.10	.07	3690.54	.00	.87	1.41	2.000	.000	.00	0 .0
2.319	.0360					.0007	.00	1.71	.26	.51	.013	.00	.00	PIPE
1017.515	3688.851	1.618	3690.469	6.00	2.20	.08	3690.54	.00	.87	1.57	2.000	.000	.00	0 .0
1.992	.0360					.0008	.00	1.62	.30	.51	.013	.00	.00	PIPE
1019.507	3688.923	1.540	3690.463	6.00	2.31	.08	3690.55	.00	.87	1.68	2.000	.000	.00	0 .0
1.754	.0360					.0008	.00	1.54	.33	.51	.013	.00	.00	PIPE
1021.260	3688.986	1.470	3690.456	6.00	2.42	.09	3690.55	.00	.87	1.77	2.000	.000	.00	0 .0
1.567	.0360					.0009	.00	1.47	.36	.51	.013	.00	.00	PIPE
1022.827	3689.042	1.406	3690.449	6.00	2.54	.10	3690.55	.00	.87	1.83	2.000	.000	.00	0 .0
1.348	.0360					.0011	.00	1.41	.39	.51	.013	.00	.00	PIPE
1024.175	3689.091	1.347	3690.438	6.00	2.67	.11	3690.55	.00	.87	1.88	2.000	.000	.00	0 .0

HYDRAULIC JUMP

FILE: SDDI13_SDMH9.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:54:15

Summerlin West Village 27
Ultimate Condition
SDDI13_SDMH9

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1024.175	3689.091	.525	3689.616	6.00	9.11	1.29	3690.91	.00	.87	1.76	2.000	.000	.00	0 .0
12.313	.0360					.0289	.36	.53	2.63	.51	.013	.00	.00	PIPE
1036.488	3689.534	.544	3690.078	6.00	8.69	1.17	3691.25	.00	.87	1.78	2.000	.000	.00	0 .0
8.148	.0360					.0253	.21	.54	2.46	.51	.013	.00	.00	PIPE
1044.637	3689.828	.562	3690.391	6.00	8.28	1.06	3691.46	.00	.87	1.80	2.000	.000	.00	0 .0
5.548	.0360					.0221	.12	.56	2.30	.51	.013	.00	.00	PIPE
1050.185	3690.028	.582	3690.610	6.00	7.90	.97	3691.58	.00	.87	1.82	2.000	.000	.00	0 .0
4.061	.0360					.0194	.08	.58	2.15	.51	.013	.00	.00	PIPE
1054.245	3690.174	.602	3690.777	6.00	7.53	.88	3691.66	.00	.87	1.84	2.000	.000	.00	0 .0
3.087	.0360					.0169	.05	.60	2.01	.51	.013	.00	.00	PIPE
1057.332	3690.286	.623	3690.909	6.00	7.18	.80	3691.71	.00	.87	1.85	2.000	.000	.00	0 .0
2.398	.0360					.0148	.04	.62	1.88	.51	.013	.00	.00	PIPE
1059.730	3690.372	.645	3691.017	6.00	6.84	.73	3691.74	.00	.87	1.87	2.000	.000	.00	0 .0
.237	.0693					.0136	.00	.65	1.76	.43	.013	.00	.00	PIPE
1059.967	3690.388	.652	3691.040	6.00	6.75	.71	3691.75	.00	.87	1.87	2.000	.000	.00	0 .0
.725	.0693					.0125	.01	.65	1.73	.43	.013	.00	.00	PIPE
1060.693	3690.439	.675	3691.114	6.00	6.44	.64	3691.76	.00	.87	1.89	2.000	.000	.00	0 .0
.592	.0693					.0110	.01	.67	1.62	.43	.013	.00	.00	PIPE

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:54:15

Summerlin West Village 27
Ultimate Condition
SDDI13_SDMH9

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1061.285	3690.480	.699	3691.178	6.00	6.14	.58	3691.76	.00	.87	1.91	2.000	.000	.00	0 .0
.471	.0693					.0096	.00	.70	1.51	.43	.013	.00	.00	PIPE
1061.756	3690.512	.724	3691.236	6.00	5.85	.53	3691.77	.00	.87	1.92	2.000	.000	.00	0 .0
.368	.0693					.0084	.00	.72	1.41	.43	.013	.00	.00	PIPE
1062.124	3690.538	.750	3691.288	6.00	5.58	.48	3691.77	.00	.87	1.94	2.000	.000	.00	0 .0
.273	.0693					.0074	.00	.75	1.32	.43	.013	.00	.00	PIPE
1062.397	3690.557	.777	3691.334	6.00	5.32	.44	3691.77	.00	.87	1.95	2.000	.000	.00	0 .0
.187	.0693					.0065	.00	.78	1.23	.43	.013	.00	.00	PIPE
1062.584	3690.570	.805	3691.375	6.00	5.07	.40	3691.77	.00	.87	1.96	2.000	.000	.00	0 .0
.110	.0693					.0057	.00	.80	1.15	.43	.013	.00	.00	PIPE
1062.694	3690.578	.834	3691.412	6.00	4.84	.36	3691.77	.00	.87	1.97	2.000	.000	.00	0 .0
.036	.0693					.0050	.00	.83	1.07	.43	.013	.00	.00	PIPE
1062.730	3690.580	.866	3691.446	6.00	4.60	.33	3691.78	.00	.87	1.98	2.000	.000	.00	0 .0
JUNCT STR	.0843					.0024	.01	.87	1.00		.013	.00	.00	PIPE
1065.730	3690.833	1.126	3691.959	2.00	1.10	.02	3691.98	.00	.49	1.98	2.000	.000	.00	0 .0
.805	.0509					.0002	.00	1.13	.20	.27	.013	.00	.00	PIPE
1066.535	3690.874	1.083	3691.957	2.00	1.15	.02	3691.98	.00	.49	1.99	2.000	.000	.00	0 .0
.757	.0509					.0003	.00	1.08	.22	.27	.013	.00	.00	PIPE

FILE: SDDI13_SDMH9.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 4

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:54:15

Summerlin West Village 27
Ultimate Condition
SDDI13_SDMH9

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1067.292	3690.913	1.043	3691.955	2.00	1.21	.02	3691.98	.00	.49	2.00	2.000	.000	.00	0 .0
.718	.0509					.0003	.00	1.04	.23	.27	.013	.00	.00	PIPE
1068.009	3690.949	1.004	3691.953	2.00	1.27	.02	3691.98	.00	.49	2.00	2.000	.000	.00	0 .0
.676	.0509					.0003	.00	1.00	.25	.27	.013	.00	.00	PIPE
1068.685	3690.984	.967	3691.951	2.00	1.33	.03	3691.98	.00	.49	2.00	2.000	.000	.00	0 .0
.640	.0509					.0004	.00	.97	.27	.27	.013	.00	.00	PIPE
1069.325	3691.016	.932	3691.948	2.00	1.39	.03	3691.98	.00	.49	2.00	2.000	.000	.00	0 .0
.604	.0509					.0004	.00	.93	.29	.27	.013	.00	.00	PIPE
1069.929	3691.047	.899	3691.946	2.00	1.46	.03	3691.98	.00	.49	1.99	2.000	.000	.00	0 .0
.571	.0509					.0005	.00	.90	.31	.27	.013	.00	.00	PIPE
1070.500	3691.076	.867	3691.943	2.00	1.53	.04	3691.98	.00	.49	1.98	2.000	.000	.00	0 .0
.537	.0509					.0006	.00	.87	.33	.27	.013	.00	.00	PIPE
1071.036	3691.104	.836	3691.939	2.00	1.61	.04	3691.98	.00	.49	1.97	2.000	.000	.00	0 .0
.505	.0509					.0006	.00	.84	.36	.27	.013	.00	.00	PIPE
1071.541	3691.129	.806	3691.936	2.00	1.69	.04	3691.98	.00	.49	1.96	2.000	.000	.00	0 .0
.474	.0509					.0007	.00	.81	.38	.27	.013	.00	.00	PIPE
1072.015	3691.153	.778	3691.932	2.00	1.77	.05	3691.98	.00	.49	1.95	2.000	.000	.00	0 .0
.045	.0509					.0008	.00	.78	.41	.27	.013	.00	.00	PIPE

FILE: SDDI13_SDMH9.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 5

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:54:15

Summerlin West Village 27
Ultimate Condition
SDDI13_SDMH9

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1072.060	3691.156	.751	3691.907	2.00	1.85	.05	3691.96	.00	.49	1.94	2.000	.000	.00	0 .0
HYDRAULIC JUMP														
1072.060	3691.156	.288	3691.443	2.00	7.19	.80	3692.25	.00	.49	1.40	2.000	.000	.00	0 .0
3.368	.0509					.0368	.12	.29	2.85	.27	.013	.00	.00	PIPE
1075.427	3691.327	.297	3691.625	2.00	6.86	.73	3692.35	.00	.49	1.42	2.000	.000	.00	0 .0
3.002	.0509					.0321	.10	.30	2.67	.27	.013	.00	.00	PIPE
1078.429	3691.480	.307	3691.787	2.00	6.54	.66	3692.45	.00	.49	1.44	2.000	.000	.00	0 .0
2.186	.0509					.0281	.06	.31	2.50	.27	.013	.00	.00	PIPE
1080.615	3691.591	.318	3691.909	2.00	6.23	.60	3692.51	.00	.49	1.46	2.000	.000	.00	0 .0
1.669	.0509					.0245	.04	.32	2.34	.27	.013	.00	.00	PIPE
1082.284	3691.676	.328	3692.004	2.00	5.94	.55	3692.55	.00	.49	1.48	2.000	.000	.00	0 .0
1.315	.0509					.0214	.03	.33	2.20	.27	.013	.00	.00	PIPE
1083.599	3691.743	.339	3692.082	2.00	5.67	.50	3692.58	.00	.49	1.50	2.000	.000	.00	0 .0
1.052	.0509					.0187	.02	.34	2.06	.27	.013	.00	.00	PIPE
1084.651	3691.797	.351	3692.147	2.00	5.40	.45	3692.60	.00	.49	1.52	2.000	.000	.00	0 .0
.849	.0509					.0163	.01	.35	1.93	.27	.013	.00	.00	PIPE
1085.500	3691.840	.362	3692.202	2.00	5.15	.41	3692.61	.00	.49	1.54	2.000	.000	.00	0 .0
.688	.0509					.0143	.01	.36	1.81	.27	.013	.00	.00	PIPE

FILE: SDDI13_SDMH9.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 6

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:54:15

Summerlin West Village 27
Ultimate Condition
SDDI13_SDMH9

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1086.188	3691.875	.375	3692.250	2.00	4.91	.37	3692.62	.00	.49	1.56	2.000	.000	.00	0 .0
.555	.0509					.0125	.01	.37	1.69	.27	.013	.00	.00	PIPE
1086.743	3691.903	.387	3692.291	2.00	4.68	.34	3692.63	.00	.49	1.58	2.000	.000	.00	0 .0
.446	.0509					.0109	.00	.39	1.59	.27	.013	.00	.00	PIPE
1087.189	3691.926	.400	3692.326	2.00	4.46	.31	3692.64	.00	.49	1.60	2.000	.000	.00	0 .0
.351	.0509					.0095	.00	.40	1.49	.27	.013	.00	.00	PIPE
1087.540	3691.944	.414	3692.358	2.00	4.26	.28	3692.64	.00	.49	1.62	2.000	.000	.00	0 .0
.272	.0509					.0083	.00	.41	1.39	.27	.013	.00	.00	PIPE
1087.811	3691.958	.428	3692.386	2.00	4.06	.26	3692.64	.00	.49	1.64	2.000	.000	.00	0 .0
.198	.0509					.0073	.00	.43	1.31	.27	.013	.00	.00	PIPE
1088.009	3691.968	.443	3692.410	2.00	3.87	.23	3692.64	.00	.49	1.66	2.000	.000	.00	0 .0
.135	.0509					.0063	.00	.44	1.22	.27	.013	.00	.00	PIPE
1088.145	3691.975	.458	3692.432	2.00	3.69	.21	3692.64	.00	.49	1.68	2.000	.000	.00	0 .0
.080	.0509					.0055	.00	.46	1.14	.27	.013	.00	.00	PIPE
1088.225	3691.979	.473	3692.452	2.00	3.52	.19	3692.64	.00	.49	1.70	2.000	.000	.00	0 .0
.025	.0509					.0048	.00	.47	1.07	.27	.013	.00	.00	PIPE
1088.250	3691.980	.491	3692.471	2.00	3.34	.17	3692.64	.00	.49	1.72	2.000	.000	.00	0 .0

```
T1 Summerlin West Village 27
T2
T3 SDDI15-SDMH12
SO   1000.00 3635.555  1                          3637.223
R    1032.16 3644.865  1      .013                                  0.0    0
SH   1032.16 3644.865  1
CD   1  4    0    .000   2.000     .000  .000  .000   .00
Q             3.00    .0
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FILE: SDDI15_SDMH12.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 9:18:23

Summerlin West Village 27

SDDI15-SDMH12

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	3635.555	1.668	3637.223	3.00	1.07	.02	3637.24	.00	.60	1.49	2.000	.000	.00	0 .0
.283	.2895					.0002	.00	1.67	.14	.22	.013	.00	.00	PIPE
1000.283	3635.637	1.584	3637.221	3.00	1.12	.02	3637.24	.00	.60	1.62	2.000	.000	.00	0 .0
.250	.2895					.0002	.00	1.58	.15	.22	.013	.00	.00	PIPE
1000.533	3635.709	1.510	3637.219	3.00	1.18	.02	3637.24	.00	.60	1.72	2.000	.000	.00	0 .0
.226	.2895					.0002	.00	1.51	.17	.22	.013	.00	.00	PIPE
1000.758	3635.774	1.443	3637.217	3.00	1.24	.02	3637.24	.00	.60	1.79	2.000	.000	.00	0 .0
.206	.2895					.0002	.00	1.44	.19	.22	.013	.00	.00	PIPE
1000.964	3635.834	1.381	3637.215	3.00	1.30	.03	3637.24	.00	.60	1.85	2.000	.000	.00	0 .0
.038	.2895					.0003	.00	1.38	.20	.22	.013	.00	.00	PIPE
1001.002	3635.845	1.381	3637.226	3.00	1.30	.03	3637.25	.00	.60	1.85	2.000	.000	.00	0 .0
HYDRAULIC JUMP														
1001.002	3635.845	.219	3636.064	3.00	16.01	3.98	3640.04	.00	.60	1.25	2.000	.000	.00	0 .0
5.773	.2895					.2654	1.53	.22	7.29	.22	.013	.00	.00	PIPE
1006.775	3637.516	.223	3637.738	3.00	15.69	3.82	3641.56	.00	.60	1.26	2.000	.000	.00	0 .0
7.063	.2895					.2413	1.70	.22	7.09	.22	.013	.00	.00	PIPE
1013.839	3639.561	.230	3639.791	3.00	14.96	3.47	3643.27	.00	.60	1.28	2.000	.000	.00	0 .0
3.909	.2895					.2106	.82	.23	6.65	.22	.013	.00	.00	PIPE

SDDI15-SDMH12

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1017.747	3640.692	.238	3640.930	3.00	14.26	3.16	3644.09	.00	.60	1.29	2.000	.000	.00	0 .0
2.642	.2895					.1838	.49	.24	6.23	.22	.013	.00	.00	PIPE
1020.390	3641.457	.245	3641.702	3.00	13.60	2.87	3644.57	.00	.60	1.31	2.000	.000	.00	0 .0
1.960	.2895					.1604	.31	.25	5.85	.22	.013	.00	.00	PIPE
1022.349	3642.024	.254	3642.278	3.00	12.97	2.61	3644.89	.00	.60	1.33	2.000	.000	.00	0 .0
1.531	.2895					.1400	.21	.25	5.48	.22	.013	.00	.00	PIPE
1023.881	3642.468	.262	3642.730	3.00	12.36	2.37	3645.10	.00	.60	1.35	2.000	.000	.00	0 .0
1.238	.2895					.1222	.15	.26	5.14	.22	.013	.00	.00	PIPE
1025.118	3642.826	.271	3643.096	3.00	11.79	2.16	3645.25	.00	.60	1.37	2.000	.000	.00	0 .0
1.023	.2895					.1067	.11	.27	4.82	.22	.013	.00	.00	PIPE
1026.141	3643.122	.280	3643.402	3.00	11.24	1.96	3645.36	.00	.60	1.39	2.000	.000	.00	0 .0
.861	.2895					.0931	.08	.28	4.52	.22	.013	.00	.00	PIPE
1027.002	3643.371	.289	3643.660	3.00	10.72	1.78	3645.44	.00	.60	1.41	2.000	.000	.00	0 .0
.732	.2895					.0813	.06	.29	4.23	.22	.013	.00	.00	PIPE
1027.735	3643.583	.299	3643.882	3.00	10.22	1.62	3645.50	.00	.60	1.43	2.000	.000	.00	0 .0
.629	.2895					.0710	.04	.30	3.97	.22	.013	.00	.00	PIPE
1028.363	3643.765	.309	3644.074	3.00	9.74	1.47	3645.55	.00	.60	1.44	2.000	.000	.00	0 .0
.544	.2895					.0620	.03	.31	3.72	.22	.013	.00	.00	PIPE

SDDI15-SDMH12

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1028.907	3643.923	.319	3644.242	3.00	9.29	1.34	3645.58	.00	.60	1.46	2.000	.000	.00	0 .0
.472	.2895					.0541	.03	.32	3.49	.22	.013	.00	.00	PIPE
1029.379	3644.060	.330	3644.389	3.00	8.86	1.22	3645.61	.00	.60	1.48	2.000	.000	.00	0 .0
.411	.2895					.0473	.02	.33	3.27	.22	.013	.00	.00	PIPE
1029.790	3644.179	.341	3644.520	3.00	8.44	1.11	3645.63	.00	.60	1.50	2.000	.000	.00	0 .0
.359	.2895					.0413	.01	.34	3.06	.22	.013	.00	.00	PIPE
1030.149	3644.283	.352	3644.635	3.00	8.05	1.01	3645.64	.00	.60	1.52	2.000	.000	.00	0 .0
.314	.2895					.0361	.01	.35	2.87	.22	.013	.00	.00	PIPE
1030.464	3644.374	.364	3644.738	3.00	7.68	.92	3645.65	.00	.60	1.54	2.000	.000	.00	0 .0
.275	.2895					.0315	.01	.36	2.69	.22	.013	.00	.00	PIPE
1030.738	3644.453	.376	3644.830	3.00	7.32	.83	3645.66	.00	.60	1.56	2.000	.000	.00	0 .0
.240	.2895					.0275	.01	.38	2.52	.22	.013	.00	.00	PIPE
1030.979	3644.523	.389	3644.912	3.00	6.98	.76	3645.67	.00	.60	1.58	2.000	.000	.00	0 .0
.209	.2895					.0240	.01	.39	2.36	.22	.013	.00	.00	PIPE
1031.188	3644.583	.402	3644.986	3.00	6.65	.69	3645.67	.00	.60	1.60	2.000	.000	.00	0 .0
.182	.2895					.0210	.00	.40	2.21	.22	.013	.00	.00	PIPE
1031.370	3644.636	.416	3645.052	3.00	6.34	.62	3645.68	.00	.60	1.62	2.000	.000	.00	0 .0
.157	.2895					.0184	.00	.42	2.07	.22	.013	.00	.00	PIPE

SDDI15-SDMH12

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1031.527	3644.682	.430	3645.112	3.00	6.05	.57	3645.68	.00	.60	1.64	2.000	.000	.00	0 .0
.135	.2895					.0160	.00	.43	1.94	.22	.013	.00	.00	PIPE
1031.663	3644.721	.445	3645.166	3.00	5.77	.52	3645.68	.00	.60	1.66	2.000	.000	.00	0 .0
.115	.2895					.0140	.00	.44	1.82	.22	.013	.00	.00	PIPE
1031.778	3644.754	.460	3645.214	3.00	5.50	.47	3645.68	.00	.60	1.68	2.000	.000	.00	0 .0
.097	.2895					.0123	.00	.46	1.70	.22	.013	.00	.00	PIPE
1031.875	3644.782	.476	3645.258	3.00	5.24	.43	3645.68	.00	.60	1.70	2.000	.000	.00	0 .0
.081	.2895					.0107	.00	.48	1.59	.22	.013	.00	.00	PIPE
1031.956	3644.806	.492	3645.298	3.00	5.00	.39	3645.69	.00	.60	1.72	2.000	.000	.00	0 .0
.066	.2895					.0094	.00	.49	1.49	.22	.013	.00	.00	PIPE
1032.021	3644.825	.509	3645.334	3.00	4.77	.35	3645.69	.00	.60	1.74	2.000	.000	.00	0 .0
.052	.2895					.0082	.00	.51	1.40	.22	.013	.00	.00	PIPE
1032.073	3644.840	.526	3645.366	3.00	4.54	.32	3645.69	.00	.60	1.76	2.000	.000	.00	0 .0
.039	.2895					.0072	.00	.53	1.31	.22	.013	.00	.00	PIPE
1032.112	3644.851	.544	3645.396	3.00	4.33	.29	3645.69	.00	.60	1.78	2.000	.000	.00	0 .0
.027	.2895					.0063	.00	.54	1.22	.22	.013	.00	.00	PIPE
1032.139	3644.859	.563	3645.422	3.00	4.13	.27	3645.69	.00	.60	1.80	2.000	.000	.00	0 .0
.016	.2895					.0055	.00	.56	1.15	.22	.013	.00	.00	PIPE

FILE: SDDI15_SDMH12.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 5

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 9:18:23

Summerlin West Village 27

SDDI15-SDMH12

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1032.155	3644.864	.583	3645.447	3.00	3.94	.24	3645.69	.00	.60	1.82	2.000	.000	.00	0 .0
.005	.2895				.0048	.00	.58	1.07	.22	.013		.00	.00	PIPE
1032.160	3644.865	.604	3645.469	3.00	3.75	.22	3645.69	.00	.60	1.84	2.000	.000	.00	0 .0

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T1 Summerlin West Village 27
T2 Ultimate Condition
T3 SDCAP1_SDMH7
SO   1000.00 3695.700  1                          3701.397
R    1069.32 3697.890  1      .013                                  0.0    0
SH   1069.32 3697.890  1
CD   1  4   0    .000   2.500     .000  .000  .000   .00
Q            92.00    .0
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FILE: SDCAP1_SDMH7.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-30-2022 Time: 8:39:55

Summerlin West Village 27
Ultimate Condition
SDCAP1_SDMH7

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	ZR	No Wth Prs/Pip	Type Ch
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall				
1000.000	3695.700	5.697	3701.397	92.00	18.74	5.45	3706.85	.00	2.48	.00	2.500	.000	.00	0	.0	
69.320	.0316					.0503	3.49	5.70	.00	2.50	.013	.00	.00			PIPE
1069.320	3697.890	6.994	3704.884	92.00	18.74	5.45	3710.34	.00	2.48	.00	2.500	.000	.00	0	.0	

WSPGW Models - Laterals
Park Drift Trail

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T1 SUMMERLIN WEST VILLAGE 27
T2 LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE - EXSDCAP3 to EXSDMH 4)
T3 ATKINS - 100 YEAR ULTIMATE CONDITION
SO      0.00 3710.54  55                          3717.41
REM*****     ATKINS    END EXSDMH#4
REM*****     ATKINS    BEGIN EXSDMH#3 EXSDDI #2 and 1
R      53.34 3712.14  55     .013                           .000        -18.3 0
JX     56.34 3712.30  55 24 24.013     1.0     7.0  3712.23 3712.23  64.9-80.5    .000
R      59.34 3712.46  55     .013                           .000  00.0 0
REM*****     ATKINS    END SDMH#3
REM*****     ATKINS    BEGIN SDMH#2 No DI
R     225.39 3725.13  55     .013                           .000  00.0 0 42.0    1
R     231.39 3725.57  55     .013                           .000
REM*****     ATKINS    END EXSDMH#2   No DI
REM*****     ATKINS    BEGIN EXSDMH#1 No DI
R     242.81 3726.35  55     .013                           .000         47.7 0
JX    245.81 3726.47  55 30   .013    16.0          3726.76          80.4         .000
R     248.81 3726.59  55     .013                           .000  00.0 0
REM*****     ATKINS    END EXSDMH#1   No DI
REM*****     EX SD CAP 3
R     321.87 3727.32  55     .013
REM*****
SH    321.87 3727.32  55
CD  24  4   1    .000   2.000      .000  .000  .000   .00
CD  30  4   1    .000   2.500      .000  .000  .000   .00
CD  55  2   0    .000   5.000     5.000  .000  .000   .00
Q         292.0
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FILE: EXSDCAP3_EXSDMH4.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 3:20:44

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE - EXSDCAP3 t
o 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
.000	3710.540	2.349	3712.889	316.00	26.90	11.24	3724.13	.00	4.99	5.00	5.000	5.000	.00	0 .0
53.340	.0300					.0452	2.41	2.35	3.09	2.69	.013	.00	.00	RECTANG
53.340	3712.140	2.260	3714.400	316.00	27.96	12.14	3726.54	.00	4.99	5.00	5.000	5.000	.00	0 .0
JUNCT STR	.0534					.0501	.15	2.26	3.28		.013	.00	.00	RECTANG
56.340	3712.300	2.138	3714.438	308.00	28.81	12.89	3727.32	.00	4.90	5.00	5.000	5.000	.00	0 .0
3.000	.0533					.0526	.16	2.14	3.47	2.13	.013	.00	.00	RECTANG
59.340	3712.459	2.138	3714.598	308.00	28.81	12.88	3727.48	.00	4.90	5.00	5.000	5.000	.00	0 .0
5.345	.0763					.0522	.28	2.14	3.47	1.87	.013	.00	.00	RECTANG
64.685	3712.867	2.150	3715.018	308.00	28.65	12.75	3727.76	.00	4.90	5.00	5.000	5.000	.00	0 .0
38.103	.0763					.0486	1.85	2.15	3.44	1.87	.013	.00	.00	RECTANG
102.789	3715.775	2.255	3718.030	308.00	27.32	11.59	3729.62	.00	4.90	5.00	5.000	5.000	.00	0 .0
28.132	.0763					.0428	1.20	2.26	3.21	1.87	.013	.00	.00	RECTANG
130.920	3717.921	2.365	3720.286	308.00	26.05	10.53	3730.82	.00	4.90	5.00	5.000	5.000	.00	0 .0
21.778	.0763					.0376	.82	2.37	2.98	1.87	.013	.00	.00	RECTANG
152.699	3719.583	2.481	3722.063	308.00	24.83	9.58	3731.64	.00	4.90	5.00	5.000	5.000	.00	0 .0
17.363	.0763					.0331	.58	2.48	2.78	1.87	.013	.00	.00	RECTANG
170.061	3720.908	2.602	3723.509	308.00	23.68	8.71	3732.21	.00	4.90	5.00	5.000	5.000	.00	0 .0
14.106	.0763					.0292	.41	2.60	2.59	1.87	.013	.00	.00	RECTANG

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 3:20:44

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE - EXSDCAP3 t
o 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
184.167	3721.984	2.729	3724.713	308.00	22.58	7.91	3732.63	.00	4.90	5.00	5.000	5.000	.00	0 .0
11.598	.0763					.0258	.30	2.73	2.41	1.87	.013	.00	.00	RECTANG
195.765	3722.869	2.862	3725.731	308.00	21.53	7.19	3732.93	.00	4.90	5.00	5.000	5.000	.00	0 .0
9.601	.0763					.0227	.22	2.86	2.24	1.87	.013	.00	.00	RECTANG
205.366	3723.602	3.001	3726.603	308.00	20.52	6.54	3733.14	.00	4.90	5.00	5.000	5.000	.00	0 .0
7.969	.0763					.0201	.16	3.00	2.09	1.87	.013	.00	.00	RECTANG
213.335	3724.210	3.148	3727.358	308.00	19.57	5.95	3733.30	.00	4.90	5.00	5.000	5.000	.00	0 .0
6.607	.0763					.0177	.12	3.15	1.94	1.87	.013	.00	.00	RECTANG
219.941	3724.714	3.302	3728.016	308.00	18.66	5.41	3733.42	.00	4.90	5.00	5.000	5.000	.00	0 .0
5.449	.0763					.0157	.09	3.30	1.81	1.87	.013	.00	.00	RECTANG
225.390	3725.130	3.463	3728.593	308.00	17.79	4.91	3733.51	.00	4.90	5.00	5.000	5.000	.00	0 .0
1.647	.0734					.0144	.02	3.46	1.68	1.89	.013	.00	.00	RECTANG
227.037	3725.251	3.517	3728.768	308.00	17.51	4.76	3733.53	.00	4.90	5.00	5.000	5.000	.00	0 .0
4.353	.0734					.0133	.06	3.52	1.65	1.89	.013	.00	.00	RECTANG
231.390	3725.570	3.689	3729.260	308.00	16.70	4.33	3733.59	.00	4.90	5.00	5.000	5.000	.00	0 .0
3.666	.0683					.0118	.04	3.69	1.53	1.94	.013	.00	.00	RECTANG
235.056	3725.821	3.863	3729.684	308.00	15.95	3.95	3733.63	.00	4.90	5.00	5.000	5.000	.00	0 .0
2.951	.0683					.0105	.03	3.86	1.43	1.94	.013	.00	.00	RECTANG

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 3:20:44

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE - EXSDCAP3 t
o 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
238.007	3726.022	4.051	3730.073	308.00	15.21	3.59	3733.66	.00	4.90	5.00	5.000	5.000	.00	0 .0
2.182	.0683					.0093	.02	4.05	1.33	1.94	.013	.00	.00	RECTANG
240.188	3726.171	4.249	3730.420	308.00	14.50	3.26	3733.68	.00	4.90	5.00	5.000	5.000	.00	0 .0
1.488	.0683					.0083	.01	4.25	1.24	1.94	.013	.00	.00	RECTANG
241.677	3726.273	4.456	3730.729	308.00	13.82	2.97	3733.70	.00	4.90	5.00	5.000	5.000	.00	0 .0
.857	.0683					.0074	.01	4.46	1.15	1.94	.013	.00	.00	RECTANG
242.533	3726.331	4.674	3731.005	308.00	13.18	2.70	3733.70	.00	4.90	5.00	5.000	5.000	.00	0 .0
.277	.0683					.0066	.00	4.67	1.07	1.94	.013	.00	.00	RECTANG
242.810	3726.350	4.903	3731.253	308.00	12.56	2.45	3733.70	.00	4.90	5.00	5.000	5.000	.00	0 .0
JUNCT STR	.0400					.0048	.01	4.90	1.00		.013	.00	.00	RECTANG
245.810	3726.470	5.925	3732.395	292.00	9.86	1.51	3733.90	.00	4.73	5.00	5.000	5.000	.00	0 .0
3.000	.0400					.0037	.01	5.93	.71	2.27	.013	.00	.00	RECTANG
248.810	3726.590	5.687	3732.278	292.00	10.27	1.64	3733.91	.00	4.73	5.00	5.000	5.000	.00	0 .0
17.139	.0100					.0041	.07	5.69	.76	3.87	.013	.00	.00	RECTANG
265.949	3726.761	5.423	3732.184	292.00	10.77	1.80	3733.98	.00	4.73	5.00	5.000	5.000	.00	0 .0
4.983	.0100					.0044	.02	5.42	.82	3.87	.013	.00	.00	RECTANG
270.932	3726.811	5.340	3732.151	292.00	10.94	1.86	3734.01	.00	4.73	5.00	5.000	5.000	.00	0 .0
HYDRAULIC JUMP														

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WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 3:20:44

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE - EXSDCAP3 t
o 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
270.932	3726.811	4.170	3730.981	292.00	14.00	3.05	3734.03	.00	4.73	5.00	5.000	5.000	.00	0 .0
27.964	.0100				.0080	.22	4.17	1.21	3.87	.013	.00	.00	RECTANG	
298.896	3727.091	4.300	3731.391	292.00	13.58	2.86	3734.25	.00	4.73	5.00	5.000	5.000	.00	0 .0
18.323	.0100				.0072	.13	4.30	1.15	3.87	.013	.00	.00	RECTANG	
317.219	3727.274	4.510	3731.784	292.00	12.95	2.60	3734.39	.00	4.73	5.00	5.000	5.000	.00	0 .0
4.651	.0100				.0064	.03	4.51	1.07	3.87	.013	.00	.00	RECTANG	
321.870	3727.320	4.731	3732.051	292.00	12.34	2.37	3734.42	.00	4.73	5.00	5.000	5.000	.00	0 .0

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T1 SUMMERLIN WEST VILLAGE 27                                                0
T2 LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE EXSDDI#1 to EXSDMH#3)
T3 ATKINS - 100 YEAR ULTIMATE CONDITION
SO    100.00 3712.23  24                          3714.419
REM*****     ATKINS     EXSDMH#4
R     155.99 3718.69  24     .013                            .000  00.0 0
REM*****     ATKINS     EXSDDI#1
SH    155.99 3718.69  24
CD  24  4   1    .000   2.000     .000  .000  .000   .00
Q          7.0
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FILE: EXSDDI1_EXSDMH3.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 4: 1:10

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE EXSDDI#1 to
EX 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
100.000	3712.230	2.189	3714.419	7.00	2.23	.08	3714.50	.00	.94	.00	2.000	.000	.00	1 .0
1.652	.1154					.0009	.00	2.19	.00	.41	.013	.00	.00	PIPE
101.652	3712.420	2.000	3714.420	7.00	2.23	.08	3714.50	.00	.94	.00	2.000	.000	.00	1 .0
1.011	.1154					.0009	.00	2.00	.00	.41	.013	.00	.00	PIPE
102.662	3712.537	1.880	3714.417	7.00	2.28	.08	3714.50	.00	.94	.95	2.000	.000	.00	1 .0
HYDRAULIC JUMP														
102.662	3712.537	.417	3712.954	7.00	14.73	3.37	3716.32	.00	.94	1.63	2.000	.000	.00	1 .0
5.823	.1154					.1027	.60	.42	4.80	.41	.013	.00	.00	PIPE
108.485	3713.209	.422	3713.631	7.00	14.48	3.26	3716.89	.00	.94	1.63	2.000	.000	.00	1 .0
13.179	.1154					.0940	1.24	.42	4.69	.41	.013	.00	.00	PIPE
121.664	3714.729	.437	3715.166	7.00	13.81	2.96	3718.13	.00	.94	1.65	2.000	.000	.00	1 .0
7.660	.1154					.0822	.63	.44	4.39	.41	.013	.00	.00	PIPE
129.324	3715.613	.451	3716.064	7.00	13.17	2.69	3718.76	.00	.94	1.67	2.000	.000	.00	1 .0
5.264	.1154					.0718	.38	.45	4.12	.41	.013	.00	.00	PIPE
134.588	3716.220	.467	3716.687	7.00	12.56	2.45	3719.14	.00	.94	1.69	2.000	.000	.00	1 .0
3.928	.1154					.0628	.25	.47	3.85	.41	.013	.00	.00	PIPE
138.515	3716.674	.483	3717.156	7.00	11.97	2.23	3719.38	.00	.94	1.71	2.000	.000	.00	1 .0
3.073	.1154					.0549	.17	.48	3.61	.41	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 4: 1:10

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE EXSDDI#1 to
EX 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
141.588	3717.028	.499	3717.528	7.00	11.41	2.02	3719.55	.00	.94	1.73	2.000	.000	.00	1 .0
2.475	.1154					.0480	.12	.50	3.38	.41	.013	.00	.00	PIPE
144.063	3717.314	.517	3717.830	7.00	10.88	1.84	3719.67	.00	.94	1.75	2.000	.000	.00	1 .0
2.035	.1154					.0420	.09	.52	3.16	.41	.013	.00	.00	PIPE
146.098	3717.549	.535	3718.083	7.00	10.38	1.67	3719.75	.00	.94	1.77	2.000	.000	.00	1 .0
1.698	.1154					.0368	.06	.53	2.96	.41	.013	.00	.00	PIPE
147.796	3717.744	.553	3718.297	7.00	9.89	1.52	3719.82	.00	.94	1.79	2.000	.000	.00	1 .0
1.430	.1154					.0322	.05	.55	2.77	.41	.013	.00	.00	PIPE
149.225	3717.909	.572	3718.482	7.00	9.43	1.38	3719.86	.00	.94	1.81	2.000	.000	.00	1 .0
1.212	.1154					.0281	.03	.57	2.59	.41	.013	.00	.00	PIPE
150.437	3718.049	.592	3718.641	7.00	8.99	1.26	3719.90	.00	.94	1.83	2.000	.000	.00	1 .0
1.030	.1154					.0246	.03	.59	2.43	.41	.013	.00	.00	PIPE
151.467	3718.168	.613	3718.781	7.00	8.58	1.14	3719.92	.00	.94	1.84	2.000	.000	.00	1 .0
.877	.1154					.0216	.02	.61	2.27	.41	.013	.00	.00	PIPE
152.345	3718.270	.634	3718.904	7.00	8.18	1.04	3719.94	.00	.94	1.86	2.000	.000	.00	1 .0
.747	.1154					.0189	.01	.63	2.12	.41	.013	.00	.00	PIPE
153.092	3718.356	.657	3719.012	7.00	7.80	.94	3719.96	.00	.94	1.88	2.000	.000	.00	1 .0
.632	.1154					.0166	.01	.66	1.99	.41	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 4: 1:10

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE EXSDDI#1 to
EX 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
153.724	3718.429	.680	3719.109	7.00	7.43	.86	3719.97	.00	.94	1.89	2.000	.000	.00	1 .0
.534	.1154					.0145	.01	.68	1.86	.41	.013	.00	.00	PIPE
154.258	3718.490	.704	3719.194	7.00	7.09	.78	3719.97	.00	.94	1.91	2.000	.000	.00	1 .0
.445	.1154					.0127	.01	.70	1.74	.41	.013	.00	.00	PIPE
154.704	3718.542	.729	3719.271	7.00	6.76	.71	3719.98	.00	.94	1.93	2.000	.000	.00	1 .0
.368	.1154					.0111	.00	.73	1.62	.41	.013	.00	.00	PIPE
155.072	3718.584	.755	3719.339	7.00	6.44	.64	3719.98	.00	.94	1.94	2.000	.000	.00	1 .0
.296	.1154					.0098	.00	.76	1.52	.41	.013	.00	.00	PIPE
155.368	3718.618	.783	3719.401	7.00	6.14	.59	3719.99	.00	.94	1.95	2.000	.000	.00	1 .0
.233	.1154					.0086	.00	.78	1.42	.41	.013	.00	.00	PIPE
155.601	3718.645	.811	3719.456	7.00	5.86	.53	3719.99	.00	.94	1.96	2.000	.000	.00	1 .0
.175	.1154					.0075	.00	.81	1.32	.41	.013	.00	.00	PIPE
155.775	3718.665	.841	3719.506	7.00	5.58	.48	3719.99	.00	.94	1.97	2.000	.000	.00	1 .0
.121	.1154					.0066	.00	.84	1.24	.41	.013	.00	.00	PIPE
155.896	3718.679	.872	3719.551	7.00	5.32	.44	3719.99	.00	.94	1.98	2.000	.000	.00	1 .0
.070	.1154					.0058	.00	.87	1.15	.41	.013	.00	.00	PIPE
155.967	3718.687	.904	3719.591	7.00	5.08	.40	3719.99	.00	.94	1.99	2.000	.000	.00	1 .0
.023	.1154					.0051	.00	.90	1.08	.41	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 4: 1:10

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE EXSDDI#1 to
EX 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
155.990	3718.690	.939	3719.629	7.00	4.83	.36	3719.99	.00	.94	2.00	2.000	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 27                                                0
T2 LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE SDDI#2 to SDMH#3)
T3 ATKINS - 100 YEAR ULTIMATE CONDITION
SO    100.00 3712.23  24                         3714.419
REM*****     ATKINS     EXSDMH#4
R     119.80 3717.46  24     .013                          .000  00.0 0
REM*****     ATKINS     EXSDDI#2
SH     77.26 3717.46  24
CD  24  4   1    .000   2.000     .000  .000  .000   .00
Q           1.0
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FILE: EXSDDI2_EXSDMH3.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 3:59:14

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE SDDI#2 to SD
MH 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
100.000	3712.230	2.189	3714.419	1.00	.32	.00	3714.42	.00	.34	.00	2.000	.000	.00	1 .0
.715	.2641					.0000	.00	2.19	.00	.13	.013	.00	.00	PIPE
100.715	3712.419	2.000	3714.419	1.00	.32	.00	3714.42	.00	.34	.00	2.000	.000	.00	1 .0
.698	.2641					.0000	.00	2.00	.00	.13	.013	.00	.00	PIPE
101.413	3712.603	1.815	3714.418	1.00	.33	.00	3714.42	.00	.34	1.16	2.000	.000	.00	1 .0
.407	.2641					.0000	.00	1.81	.04	.13	.013	.00	.00	PIPE
101.820	3712.711	1.707	3714.418	1.00	.35	.00	3714.42	.00	.34	1.41	2.000	.000	.00	1 .0
.335	.2641					.0000	.00	1.71	.04	.13	.013	.00	.00	PIPE
102.156	3712.799	1.618	3714.417	1.00	.37	.00	3714.42	.00	.34	1.57	2.000	.000	.00	1 .0
.294	.2641					.0000	.00	1.62	.05	.13	.013	.00	.00	PIPE
102.449	3712.877	1.540	3714.417	1.00	.39	.00	3714.42	.00	.34	1.68	2.000	.000	.00	1 .0
.264	.2641					.0000	.00	1.54	.05	.13	.013	.00	.00	PIPE
102.714	3712.947	1.470	3714.417	1.00	.40	.00	3714.42	.00	.34	1.77	2.000	.000	.00	1 .0
.242	.2641					.0000	.00	1.47	.06	.13	.013	.00	.00	PIPE
102.955	3713.011	1.406	3714.417	1.00	.42	.00	3714.42	.00	.34	1.83	2.000	.000	.00	1 .0
.223	.2641					.0000	.00	1.41	.07	.13	.013	.00	.00	PIPE
103.179	3713.070	1.347	3714.417	1.00	.44	.00	3714.42	.00	.34	1.88	2.000	.000	.00	1 .0
.208	.2641					.0000	.00	1.35	.07	.13	.013	.00	.00	PIPE

FILE: EXSDDI2_EXSDMH3.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 3:59:14

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE SDDI#2 to SD
MH 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
103.387	3713.125	1.292	3714.416	1.00	.47	.00	3714.42	.00	.34	1.91	2.000	.000	.00	1 .0
.195	.2641					.0000	.00	1.29	.08	.13	.013	.00	.00	PIPE
103.582	3713.176	1.240	3714.416	1.00	.49	.00	3714.42	.00	.34	1.94	2.000	.000	.00	1 .0
.183	.2641					.0000	.00	1.24	.08	.13	.013	.00	.00	PIPE
103.765	3713.225	1.191	3714.416	1.00	.51	.00	3714.42	.00	.34	1.96	2.000	.000	.00	1 .0
.173	.2641					.0000	.00	1.19	.09	.13	.013	.00	.00	PIPE
103.938	3713.270	1.145	3714.415	1.00	.54	.00	3714.42	.00	.34	1.98	2.000	.000	.00	1 .0
.163	.2641					.0001	.00	1.15	.10	.13	.013	.00	.00	PIPE
104.101	3713.313	1.101	3714.415	1.00	.56	.00	3714.42	.00	.34	1.99	2.000	.000	.00	1 .0
.155	.2641					.0001	.00	1.10	.11	.13	.013	.00	.00	PIPE
104.256	3713.354	1.060	3714.415	1.00	.59	.01	3714.42	.00	.34	2.00	2.000	.000	.00	1 .0
.147	.2641					.0001	.00	1.06	.11	.13	.013	.00	.00	PIPE
104.403	3713.393	1.021	3714.414	1.00	.62	.01	3714.42	.00	.34	2.00	2.000	.000	.00	1 .0
.140	.2641					.0001	.00	1.02	.12	.13	.013	.00	.00	PIPE
104.543	3713.430	.983	3714.413	1.00	.65	.01	3714.42	.00	.34	2.00	2.000	.000	.00	1 .0
.133	.2641					.0001	.00	.98	.13	.13	.013	.00	.00	PIPE
104.676	3713.465	.947	3714.413	1.00	.68	.01	3714.42	.00	.34	2.00	2.000	.000	.00	1 .0
.127	.2641					.0001	.00	.95	.14	.13	.013	.00	.00	PIPE

FILE: EXSDDI2_EXSDMH3.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 3:59:14

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE SDDI#2 to SD
MH 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
104.803	3713.499	.913	3714.412	1.00	.72	.01	3714.42	.00	.34	1.99	2.000	.000	.00	1 .0
.121	.2641					.0001	.00	.91	.15	.13	.013	.00	.00	PIPE
104.924	3713.531	.880	3714.411	1.00	.75	.01	3714.42	.00	.34	1.99	2.000	.000	.00	1 .0
.115	.2641					.0001	.00	.88	.16	.13	.013	.00	.00	PIPE
105.039	3713.561	.849	3714.410	1.00	.79	.01	3714.42	.00	.34	1.98	2.000	.000	.00	1 .0
.110	.2641					.0001	.00	.85	.17	.13	.013	.00	.00	PIPE
105.149	3713.590	.819	3714.409	1.00	.83	.01	3714.42	.00	.34	1.97	2.000	.000	.00	1 .0
.105	.2641					.0002	.00	.82	.19	.13	.013	.00	.00	PIPE
105.254	3713.618	.790	3714.409	1.00	.87	.01	3714.42	.00	.34	1.96	2.000	.000	.00	1 .0
.100	.2641					.0002	.00	.79	.20	.13	.013	.00	.00	PIPE
105.353	3713.645	.763	3714.407	1.00	.91	.01	3714.42	.00	.34	1.94	2.000	.000	.00	1 .0
.096	.2641					.0002	.00	.76	.21	.13	.013	.00	.00	PIPE
105.449	3713.670	.736	3714.406	1.00	.95	.01	3714.42	.00	.34	1.93	2.000	.000	.00	1 .0
.022	.2641					.0003	.00	.74	.23	.13	.013	.00	.00	PIPE
105.471	3713.676	.711	3714.386	1.00	1.00	.02	3714.40	.00	.34	1.91	2.000	.000	.00	1 .0
HYDRAULIC JUMP														
105.471	3713.676	.134	3713.809	1.00	11.10	1.91	3715.72	.00	.34	1.00	2.000	.000	.00	1 .0
3.806	.2641					.2314	.88	.13	6.51	.13	.013	.00	.00	PIPE

FILE: EXSDDI2_EXSDMH3.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 4

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 3:59:14

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE SDDI#2 to SD
MH 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
109.277	3714.680	.138	3714.818	1.00	10.57	1.74	3716.55	.00	.34	1.01	2.000	.000	.00	1 .0
2.454	.2641					.2016	.49	.14	6.10	.13	.013	.00	.00	PIPE
111.731	3715.329	.142	3715.471	1.00	10.08	1.58	3717.05	.00	.34	1.03	2.000	.000	.00	1 .0
1.572	.2641					.1759	.28	.14	5.72	.13	.013	.00	.00	PIPE
113.303	3715.744	.147	3715.891	1.00	9.61	1.43	3717.33	.00	.34	1.04	2.000	.000	.00	1 .0
1.135	.2641					.1534	.17	.15	5.37	.13	.013	.00	.00	PIPE
114.438	3716.043	.152	3716.195	1.00	9.17	1.30	3717.50	.00	.34	1.06	2.000	.000	.00	1 .0
.871	.2641					.1338	.12	.15	5.03	.13	.013	.00	.00	PIPE
115.309	3716.274	.157	3716.431	1.00	8.74	1.19	3717.62	.00	.34	1.08	2.000	.000	.00	1 .0
.697	.2641					.1167	.08	.16	4.72	.13	.013	.00	.00	PIPE
116.006	3716.458	.162	3716.620	1.00	8.33	1.08	3717.70	.00	.34	1.09	2.000	.000	.00	1 .0
.570	.2641					.1018	.06	.16	4.43	.13	.013	.00	.00	PIPE
116.576	3716.608	.167	3716.776	1.00	7.94	.98	3717.76	.00	.34	1.11	2.000	.000	.00	1 .0
.477	.2641					.0888	.04	.17	4.15	.13	.013	.00	.00	PIPE
117.053	3716.734	.173	3716.907	1.00	7.57	.89	3717.80	.00	.34	1.12	2.000	.000	.00	1 .0
.403	.2641					.0775	.03	.17	3.90	.13	.013	.00	.00	PIPE
117.456	3716.841	.179	3717.020	1.00	7.22	.81	3717.83	.00	.34	1.14	2.000	.000	.00	1 .0
.345	.2641					.0676	.02	.18	3.65	.13	.013	.00	.00	PIPE

FILE: EXSDDI2_EXSDMH3.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 5

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 3:59:14

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE SDDI#2 to SD
MH 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
117.801	3716.932	.184	3717.116	1.00	6.89	.74	3717.85	.00	.34	1.16	2.000	.000	.00	1 .0
.296	.2641					.0589	.02	.18	3.43	.13	.013	.00	.00	PIPE
118.098	3717.010	.191	3717.201	1.00	6.57	.67	3717.87	.00	.34	1.17	2.000	.000	.00	1 .0
.256	.2641					.0514	.01	.19	3.21	.13	.013	.00	.00	PIPE
118.354	3717.078	.197	3717.275	1.00	6.26	.61	3717.88	.00	.34	1.19	2.000	.000	.00	1 .0
.223	.2641					.0449	.01	.20	3.01	.13	.013	.00	.00	PIPE
118.577	3717.137	.203	3717.340	1.00	5.97	.55	3717.89	.00	.34	1.21	2.000	.000	.00	1 .0
.194	.2641					.0391	.01	.20	2.83	.13	.013	.00	.00	PIPE
118.771	3717.188	.210	3717.398	1.00	5.69	.50	3717.90	.00	.34	1.23	2.000	.000	.00	1 .0
.168	.2641					.0342	.01	.21	2.65	.13	.013	.00	.00	PIPE
118.939	3717.232	.217	3717.449	1.00	5.43	.46	3717.91	.00	.34	1.24	2.000	.000	.00	1 .0
.147	.2641					.0298	.00	.22	2.48	.13	.013	.00	.00	PIPE
119.086	3717.271	.224	3717.495	1.00	5.17	.42	3717.91	.00	.34	1.26	2.000	.000	.00	1 .0
.127	.2641					.0260	.00	.22	2.33	.13	.013	.00	.00	PIPE
119.213	3717.305	.232	3717.537	1.00	4.93	.38	3717.91	.00	.34	1.28	2.000	.000	.00	1 .0
.111	.2641					.0227	.00	.23	2.18	.13	.013	.00	.00	PIPE
119.324	3717.334	.239	3717.573	1.00	4.70	.34	3717.92	.00	.34	1.30	2.000	.000	.00	1 .0
.095	.2641					.0198	.00	.24	2.05	.13	.013	.00	.00	PIPE

FILE: EXSDDI2_EXSDMH3.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 6

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 3:59:14

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE SDDI#2 to SD
MH 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
119.419	3717.359	.247	3717.607	1.00	4.48	.31	3717.92	.00	.34	1.32	2.000	.000	.00	1 .0
.082	.2641					.0173	.00	.25	1.92	.13	.013	.00	.00	PIPE
119.501	3717.381	.255	3717.636	1.00	4.28	.28	3717.92	.00	.34	1.34	2.000	.000	.00	1 .0
.069	.2641					.0151	.00	.26	1.80	.13	.013	.00	.00	PIPE
119.570	3717.399	.264	3717.663	1.00	4.08	.26	3717.92	.00	.34	1.35	2.000	.000	.00	1 .0
.058	.2641					.0132	.00	.26	1.69	.13	.013	.00	.00	PIPE
119.629	3717.415	.273	3717.687	1.00	3.89	.23	3717.92	.00	.34	1.37	2.000	.000	.00	1 .0
.049	.2641					.0115	.00	.27	1.58	.13	.013	.00	.00	PIPE
119.678	3717.427	.282	3717.709	1.00	3.71	.21	3717.92	.00	.34	1.39	2.000	.000	.00	1 .0
.039	.2641					.0100	.00	.28	1.48	.13	.013	.00	.00	PIPE
119.717	3717.438	.291	3717.729	1.00	3.53	.19	3717.92	.00	.34	1.41	2.000	.000	.00	1 .0
.031	.2641					.0088	.00	.29	1.39	.13	.013	.00	.00	PIPE
119.748	3717.446	.301	3717.747	1.00	3.37	.18	3717.92	.00	.34	1.43	2.000	.000	.00	1 .0
.023	.2641					.0076	.00	.30	1.30	.13	.013	.00	.00	PIPE
119.771	3717.452	.311	3717.763	1.00	3.21	.16	3717.92	.00	.34	1.45	2.000	.000	.00	1 .0
.016	.2641					.0067	.00	.31	1.22	.13	.013	.00	.00	PIPE
119.787	3717.457	.321	3717.778	1.00	3.06	.15	3717.92	.00	.34	1.47	2.000	.000	.00	1 .0
.009	.2641					.0058	.00	.32	1.14	.13	.013	.00	.00	PIPE

FILE: EXSDDI2_EXSDMH3.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 7

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 3:59:14

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BOULEVARD (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE SDDI#2 to SD
MH 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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
119.797	3717.459	.332	3717.791	1.00	2.92	.13	3717.92	.00	.34	1.49	2.000	.000	.00	1 .0
.003	.2641				.0051	.00	.33	1.07	.13	.013	.00	.00	PIPE	
119.800	3717.460	.344	3717.804	1.00	2.77	.12	3717.92	.00	.34	1.51	2.000	.000	.00	1 .0
77.260	3717.460	.344	3717.804	1.00	2.77	.12	3717.92	.00	.34	1.51	2.000	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 27
T2 LAKE MEAD BLVD (PARK DRIFT TRL TO MOUNTAIN RUN DR-SDDI1 to EXSDMH 1)
T3 ATKINS - 100 YEAR ULTIMATE CONDITION
SO    100.00 3726.76  30                          3731.824
REM*****     ATKINS    END EXSDMH#1
REM*****     ATKINS    BEGIN SDMH#0 WITH SDDI1
R     184.03 3730.22  30     .013                           .000        -70.1
JX    187.03 3730.41  24 24   .013     9.0          3730.54          90.0         .000
R     190.03 3730.60  24     .013                           .000   0.0 0
REM*****     ATKINS    END EXSDMH#0
REM*****     SDDI #1
R     251.12 3731.82  24     .013
SH    251.12 3731.82  24
CD  24  4   1    .000   2.000      .000  .000  .000   .00
CD  30  4   1    .000   2.500      .000  .000  .000   .00
Q           7.0
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FILE: SDDI1_EXSDMH1.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 4:42:19

SUMMERLIN WEST VILLAGE 27

LAKE MEAD BLVD (PARK DRIFT TRL TO MOUNTAIN RUN DR-SDDI1 to EXSDMH 1)

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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
100.000	3726.760	5.064	3731.824	16.00	3.26	.16	3731.99	.00	1.35	.00	2.500	.000	.00	1 .0
65.621	.0412					.0015	.10	5.06	.00	.74	.013	.00	.00	PIPE
165.621	3729.462	2.500	3731.962	16.00	3.26	.16	3732.13	.00	1.35	.00	2.500	.000	.00	1 .0
5.389	.0412					.0014	.01	2.50	.00	.74	.013	.00	.00	PIPE
171.011	3729.684	2.268	3731.952	16.00	3.42	.18	3732.13	.00	1.35	1.45	2.500	.000	.00	1 .0
2.926	.0412					.0014	.00	2.27	.34	.74	.013	.00	.00	PIPE
173.937	3729.804	2.134	3731.938	16.00	3.59	.20	3732.14	.00	1.35	1.77	2.500	.000	.00	1 .0
2.294	.0412					.0015	.00	2.13	.40	.74	.013	.00	.00	PIPE
176.231	3729.899	2.023	3731.922	16.00	3.76	.22	3732.14	.00	1.35	1.97	2.500	.000	.00	1 .0
1.903	.0412					.0016	.00	2.02	.45	.74	.013	.00	.00	PIPE
178.134	3729.977	1.925	3731.903	16.00	3.94	.24	3732.14	.00	1.35	2.10	2.500	.000	.00	1 .0
1.612	.0412					.0018	.00	1.93	.50	.74	.013	.00	.00	PIPE
179.746	3730.044	1.838	3731.882	16.00	4.14	.27	3732.15	.00	1.35	2.21	2.500	.000	.00	1 .0
1.368	.0412					.0020	.00	1.84	.55	.74	.013	.00	.00	PIPE
181.114	3730.100	1.758	3731.858	16.00	4.34	.29	3732.15	.00	1.35	2.28	2.500	.000	.00	1 .0
1.154	.0412					.0023	.00	1.76	.60	.74	.013	.00	.00	PIPE
182.267	3730.148	1.684	3731.831	16.00	4.55	.32	3732.15	.00	1.35	2.34	2.500	.000	.00	1 .0
.957	.0412					.0026	.00	1.68	.65	.74	.013	.00	.00	PIPE

FILE: SDDI1_EXSDMH1.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 4:42:19

SUMMERLIN WEST VILLAGE 27
LAKE MEAD BLVD (PARK DRIFT TRL TO MOUNTAIN RUN DR-SDDI1 to EXSDMH 1)
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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
183.224	3730.187	1.615	3731.802	16.00	4.77	.35	3732.16	.00	1.35	2.39	2.500	.000	.00	1 .0
.766	.0412					.0029	.00	1.61	.71	.74	.013	.00	.00	PIPE
183.990	3730.219	1.550	3731.768	16.00	5.01	.39	3732.16	.00	1.35	2.43	2.500	.000	.00	1 .0
.040	.0412					.0031	.00	1.55	.77	.74	.013	.00	.00	PIPE
184.030	3730.220	1.546	3731.766	16.00	5.02	.39	3732.16	.00	1.35	2.43	2.500	.000	.00	1 .0
JUNCT STR	.0633					.0020	.01	1.55	.77		.013	.00	.00	PIPE
187.030	3730.410	1.997	3732.407	7.00	2.23	.08	3732.48	.00	.94	.15	2.000	.000	.00	1 .0
2.801	.0634					.0009	.00	2.00	.09	.47	.013	.00	.00	PIPE
189.831	3730.587	1.814	3732.402	7.00	2.34	.08	3732.49	.00	.94	1.16	2.000	.000	.00	1 .0
.199	.0634					.0008	.00	1.81	.26	.47	.013	.00	.00	PIPE
190.030	3730.600	1.801	3732.401	7.00	2.35	.09	3732.49	.00	.94	1.20	2.000	.000	.00	1 .0
5.042	.0200					.0009	.00	1.80	.26	.64	.013	.00	.00	PIPE
195.072	3730.701	1.696	3732.397	7.00	2.46	.09	3732.49	.00	.94	1.44	2.000	.000	.00	1 .0
4.099	.0200					.0009	.00	1.70	.31	.64	.013	.00	.00	PIPE
199.171	3730.782	1.609	3732.392	7.00	2.58	.10	3732.50	.00	.94	1.59	2.000	.000	.00	1 .0
3.510	.0200					.0010	.00	1.61	.35	.64	.013	.00	.00	PIPE
202.681	3730.853	1.532	3732.385	7.00	2.71	.11	3732.50	.00	.94	1.69	2.000	.000	.00	1 .0
3.078	.0200					.0012	.00	1.53	.39	.64	.013	.00	.00	PIPE

FILE: SDDI1_EXSDMH1.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 4:42:19

SUMMERLIN WEST VILLAGE 27

LAKE MEAD BLVD (PARK DRIFT TRL TO MOUNTAIN RUN DR-SDDI1 to EXSDMH 1)

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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
205.759	3730.914	1.463	3732.377	7.00	2.84	.13	3732.50	.00	.94	1.77	2.000	.000	.00	1 .0
2.728	.0200					.0013	.00	1.46	.43	.64	.013	.00	.00	PIPE
208.487	3730.969	1.399	3732.368	7.00	2.98	.14	3732.51	.00	.94	1.83	2.000	.000	.00	1 .0
2.430	.0200					.0015	.00	1.40	.46	.64	.013	.00	.00	PIPE
210.917	3731.017	1.341	3732.358	7.00	3.13	.15	3732.51	.00	.94	1.88	2.000	.000	.00	1 .0
2.153	.0200					.0016	.00	1.34	.51	.64	.013	.00	.00	PIPE
213.071	3731.060	1.286	3732.346	7.00	3.28	.17	3732.51	.00	.94	1.92	2.000	.000	.00	1 .0

HYDRAULIC JUMP

213.071	3731.060	.657	3731.717	7.00	7.80	.94	3732.66	.00	.94	1.88	2.000	.000	.00	1 .0
9.076	.0200					.0166	.15	.66	1.99	.64	.013	.00	.00	PIPE
222.147	3731.241	.680	3731.921	7.00	7.43	.86	3732.78	.00	.94	1.89	2.000	.000	.00	1 .0
9.859	.0200					.0145	.14	.68	1.86	.64	.013	.00	.00	PIPE
232.006	3731.438	.704	3732.142	7.00	7.09	.78	3732.92	.00	.94	1.91	2.000	.000	.00	1 .0
6.298	.0200					.0127	.08	.70	1.74	.64	.013	.00	.00	PIPE
238.303	3731.564	.729	3732.293	7.00	6.76	.71	3733.00	.00	.94	1.93	2.000	.000	.00	1 .0
4.347	.0200					.0111	.05	.73	1.62	.64	.013	.00	.00	PIPE
242.651	3731.651	.755	3732.406	7.00	6.44	.64	3733.05	.00	.94	1.94	2.000	.000	.00	1 .0
3.070	.0200					.0098	.03	.76	1.52	.64	.013	.00	.00	PIPE

FILE: SDDI1_EXSDMH1.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 4

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 4:42:19

SUMMERLIN WEST VILLAGE 27

LAKE MEAD BLVD (PARK DRIFT TRL TO MOUNTAIN RUN DR-SDDI1 to EXSDMH 1)

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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
245.721	3731.712	.783	3732.495	7.00	6.14	.59	3733.08	.00	.94	1.95	2.000	.000	.00	1 .0
2.183	.0200					.0086	.02	.78	1.42	.64	.013	.00	.00	PIPE
247.905	3731.756	.811	3732.567	7.00	5.86	.53	3733.10	.00	.94	1.96	2.000	.000	.00	1 .0
1.514	.0200					.0075	.01	.81	1.32	.64	.013	.00	.00	PIPE
249.418	3731.786	.841	3732.627	7.00	5.58	.48	3733.11	.00	.94	1.97	2.000	.000	.00	1 .0
.983	.0200					.0066	.01	.84	1.24	.64	.013	.00	.00	PIPE
250.401	3731.806	.872	3732.677	7.00	5.32	.44	3733.12	.00	.94	1.98	2.000	.000	.00	1 .0
.545	.0200					.0058	.00	.87	1.15	.64	.013	.00	.00	PIPE
250.946	3731.817	.904	3732.720	7.00	5.08	.40	3733.12	.00	.94	1.99	2.000	.000	.00	1 .0
.174	.0200					.0051	.00	.90	1.08	.64	.013	.00	.00	PIPE
251.120	3731.820	.939	3732.759	7.00	4.83	.36	3733.12	.00	.94	2.00	2.000	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 27                                                0
T2 LAKE MEAD BLVD (PARK DRIFT TRL TO MOUNTAIN RUN DR SDDI2 to EXSDMH#1)
T3 ATKINS - 100 YEAR ULTIMATE CONDITION
SO    100.00 3730.54  24                          3732.09
REM*****     ATKINS     EXSDMH#0
REM*****     ATKINS     SDDI2
R     114.11 3731.24  24     .013                           .000  00.0 0
SH    114.11 3731.24  24
CD  24  4   1    .000   2.000     .000  .000  .000   .00
Q           9.0
```

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 5: 7:10

SUMMERLIN WEST VILLAGE 27

LAKE MEAD BLVD (PARK DRIFT TRL TO MOUNTAIN RUN DR SDDI2 to EXSDMH#1)

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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
100.000	3730.540	.706	3731.246	9.00	9.07	1.28	3732.52	.00	1.07	1.91	2.000	.000	.00	1 .0
1.464	.0496					.0215	.03	.71	2.22	.57	.013	.00	.00	PIPE
101.464	3730.613	.717	3731.330	9.00	8.89	1.23	3732.56	.00	1.07	1.92	2.000	.000	.00	1 .0
2.867	.0496					.0196	.06	.72	2.16	.57	.013	.00	.00	PIPE
104.331	3730.755	.743	3731.498	9.00	8.48	1.12	3732.61	.00	1.07	1.93	2.000	.000	.00	1 .0
2.306	.0496					.0172	.04	.74	2.02	.57	.013	.00	.00	PIPE
106.637	3730.869	.769	3731.639	9.00	8.08	1.01	3732.65	.00	1.07	1.95	2.000	.000	.00	1 .0
1.863	.0496					.0151	.03	.77	1.88	.57	.013	.00	.00	PIPE
108.500	3730.962	.797	3731.759	9.00	7.71	.92	3732.68	.00	1.07	1.96	2.000	.000	.00	1 .0
1.508	.0496					.0133	.02	.80	1.76	.57	.013	.00	.00	PIPE
110.008	3731.037	.826	3731.863	9.00	7.35	.84	3732.70	.00	1.07	1.97	2.000	.000	.00	1 .0
1.208	.0496					.0116	.01	.83	1.64	.57	.013	.00	.00	PIPE
111.216	3731.097	.857	3731.953	9.00	7.00	.76	3732.72	.00	1.07	1.98	2.000	.000	.00	1 .0
.956	.0496					.0102	.01	.86	1.53	.57	.013	.00	.00	PIPE
112.172	3731.144	.888	3732.032	9.00	6.68	.69	3732.72	.00	1.07	1.99	2.000	.000	.00	1 .0
.738	.0496					.0090	.01	.89	1.43	.57	.013	.00	.00	PIPE
112.910	3731.181	.921	3732.102	9.00	6.37	.63	3732.73	.00	1.07	1.99	2.000	.000	.00	1 .0
.543	.0496					.0079	.00	.92	1.33	.57	.013	.00	.00	PIPE

FILE: SDDI2_EXSDMH0.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-17-2022 Time: 5: 7:10

SUMMERLIN WEST VILLAGE 27

LAKE MEAD BLVD (PARK DRIFT TRL TO MOUNTAIN RUN DR SDDI2 to EXSDMH#1)

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 or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
113.453	3731.208	.956	3732.163	9.00	6.07	.57	3732.74	.00	1.07	2.00	2.000	.000	.00	1 .0
.371	.0496					.0069	.00	.96	1.24	.57	.013	.00	.00	PIPE
113.824	3731.226	.992	3732.218	9.00	5.79	.52	3732.74	.00	1.07	2.00	2.000	.000	.00	1 .0
.216	.0496					.0061	.00	.99	1.16	.57	.013	.00	.00	PIPE
114.040	3731.237	1.030	3732.266	9.00	5.52	.47	3732.74	.00	1.07	2.00	2.000	.000	.00	1 .0
.070	.0496					.0054	.00	1.03	1.08	.57	.013	.00	.00	PIPE
114.110	3731.240	1.071	3732.311	9.00	5.26	.43	3732.74	.00	1.07	1.99	2.000	.000	.00	1 .0

WSPGW Models - Laterals
Park Drift Trail

```
T1 Summerlin West Village 27
T2 Ultimate Condition
T3 SDDI10_5X6
SO   1000.00 3684.760  1                          3689.000
R    1011.76 3687.336  1      .013                                    0.0    0
JX   1016.93 3688.158  1  1   .013    5.00          3688.158         90.0
R    1078.01 3694.270  1      .013                                    0.0    0
SH   1078.01 3694.270  1
CD   1  4   0    .000   3.500     .000  .000  .000   .00
Q            48.00    .0
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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-16-2022 Time: 4:36:14

Summerlin West Village 27
Ultimate Condition
SDDI10_5X6

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	3684.760	1.054	3685.814	53.00	21.71	7.32	3693.13	.00	2.28	3.21	3.500	.000	.00	0 .0
1.666	.2190					.0695	.12	1.05	4.39	.79	.013	.00	.00	PIPE
1001.666	3685.125	1.068	3686.193	53.00	21.32	7.06	3693.25	.00	2.28	3.22	3.500	.000	.00	0 .0
3.885	.2190					.0635	.25	1.07	4.28	.79	.013	.00	.00	PIPE
1005.551	3685.976	1.106	3687.081	53.00	20.33	6.42	3693.50	.00	2.28	3.25	3.500	.000	.00	0 .0
3.332	.2190					.0556	.19	1.11	4.00	.79	.013	.00	.00	PIPE
1008.884	3686.706	1.144	3687.850	53.00	19.38	5.83	3693.68	.00	2.28	3.28	3.500	.000	.00	0 .0
2.876	.2190					.0487	.14	1.14	3.74	.79	.013	.00	.00	PIPE
1011.760	3687.336	1.185	3688.521	53.00	18.48	5.30	3693.82	.00	2.28	3.31	3.500	.000	.00	0 .0
JUNCT STR	.1590					.0519	.27	1.18	3.50		.013	.00	.00	PIPE
1016.930	3688.158	1.055	3689.213	48.00	19.65	6.00	3695.21	.00	2.16	3.21	3.500	.000	.00	0 .0
7.970	.1001					.0558	.44	1.05	3.97	.92	.013	.00	.00	PIPE
1024.900	3688.956	1.080	3690.036	48.00	19.02	5.62	3695.66	.00	2.16	3.23	3.500	.000	.00	0 .0
9.443	.1001					.0500	.47	1.08	3.79	.92	.013	.00	.00	PIPE
1034.343	3689.901	1.118	3691.018	48.00	18.14	5.11	3696.13	.00	2.16	3.26	3.500	.000	.00	0 .0
7.550	.1001					.0438	.33	1.12	3.55	.92	.013	.00	.00	PIPE
1041.894	3690.656	1.157	3691.813	48.00	17.29	4.64	3696.46	.00	2.16	3.29	3.500	.000	.00	0 .0
6.177	.1001					.0383	.24	1.16	3.32	.92	.013	.00	.00	PIPE

Summerlin West Village 27
Ultimate Condition
SDDI10_5X6

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1048.070	3691.275	1.198	3692.473	48.00	16.49	4.22	3696.69	.00	2.16	3.32	3.500	.000	.00	0 .0
5.134	.1001					.0336	.17	1.20	3.10	.92	.013	.00	.00	PIPE
1053.205	3691.788	1.241	3693.029	48.00	15.72	3.84	3696.87	.00	2.16	3.35	3.500	.000	.00	0 .0
4.315	.1001					.0295	.13	1.24	2.90	.92	.013	.00	.00	PIPE
1057.519	3692.220	1.285	3693.505	48.00	14.99	3.49	3696.99	.00	2.16	3.37	3.500	.000	.00	0 .0
3.651	.1001					.0258	.09	1.28	2.71	.92	.013	.00	.00	PIPE
1061.170	3692.585	1.331	3693.916	48.00	14.29	3.17	3697.09	.00	2.16	3.40	3.500	.000	.00	0 .0
3.104	.1001					.0227	.07	1.33	2.53	.92	.013	.00	.00	PIPE
1064.274	3692.896	1.379	3694.275	48.00	13.63	2.88	3697.16	.00	2.16	3.42	3.500	.000	.00	0 .0
2.645	.1001					.0199	.05	1.38	2.37	.92	.013	.00	.00	PIPE
1066.919	3693.160	1.429	3694.590	48.00	12.99	2.62	3697.21	.00	2.16	3.44	3.500	.000	.00	0 .0
2.253	.1001					.0175	.04	1.43	2.21	.92	.013	.00	.00	PIPE
1069.172	3693.386	1.481	3694.867	48.00	12.39	2.38	3697.25	.00	2.16	3.46	3.500	.000	.00	0 .0
1.913	.1001					.0153	.03	1.48	2.06	.92	.013	.00	.00	PIPE
1071.085	3693.577	1.536	3695.113	48.00	11.81	2.17	3697.28	.00	2.16	3.47	3.500	.000	.00	0 .0
1.616	.1001					.0135	.02	1.54	1.92	.92	.013	.00	.00	PIPE
1072.701	3693.739	1.593	3695.332	48.00	11.26	1.97	3697.30	.00	2.16	3.49	3.500	.000	.00	0 .0
1.354	.1001					.0118	.02	1.59	1.80	.92	.013	.00	.00	PIPE

FILE: SDDI10_5X6.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-16-2022 Time: 4:36:14

Summerlin West Village 27
Ultimate Condition
SDDI10_5X6

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1074.055	3693.874	1.653	3695.527	48.00	10.74	1.79	3697.32	.00	2.16	3.49	3.500	.000	.00	0 .0
1.120	.1001					.0104	.01	1.65	1.67	.92	.013	.00	.00	PIPE
1075.175	3693.986	1.715	3695.701	48.00	10.24	1.63	3697.33	.00	2.16	3.50	3.500	.000	.00	0 .0
.910	.1001					.0092	.01	1.72	1.56	.92	.013	.00	.00	PIPE
1076.085	3694.077	1.780	3695.858	48.00	9.76	1.48	3697.34	.00	2.16	3.50	3.500	.000	.00	0 .0
.716	.1001					.0081	.01	1.78	1.45	.92	.013	.00	.00	PIPE
1076.800	3694.149	1.849	3695.998	48.00	9.31	1.35	3697.34	.00	2.16	3.49	3.500	.000	.00	0 .0
.540	.1001					.0071	.00	1.85	1.35	.92	.013	.00	.00	PIPE
1077.340	3694.203	1.921	3696.124	48.00	8.87	1.22	3697.35	.00	2.16	3.48	3.500	.000	.00	0 .0
.375	.1001					.0063	.00	1.92	1.26	.92	.013	.00	.00	PIPE
1077.716	3694.240	1.997	3696.238	48.00	8.46	1.11	3697.35	.00	2.16	3.46	3.500	.000	.00	0 .0
.221	.1001					.0056	.00	2.00	1.17	.92	.013	.00	.00	PIPE
1077.937	3694.263	2.077	3696.340	48.00	8.07	1.01	3697.35	.00	2.16	3.44	3.500	.000	.00	0 .0
.073	.1001					.0049	.00	2.08	1.08	.92	.013	.00	.00	PIPE
1078.010	3694.270	2.163	3696.433	48.00	7.69	.92	3697.35	.00	2.16	3.40	3.500	.000	.00	0 .0

```
T1 Summerlin West Village 27
T2 Ultimate Condition
T3 SSDDI11_SDMH13
SO   1000.00 3693.750  1                          3694.451
R    1033.00 3695.530  1      .013                                  0.0    0
SH   1033.00 3695.530  1
CD   1  4    0    .000   2.000     .000  .000  .000   .00
Q             2.00    .0
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FILE: SDDI11_SDMH13.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-16-2022 Time: 2:51:51

Summerlin West Village 27
Ultimate Condition
SSDDI11_SDMH13

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	3693.749	.270	3694.020	2.00	7.87	.96	3694.98	.00	.49	1.37	2.000	.000	.00	0 .0
11.771	.0539					.0479	.56	.27	3.22	.27	.013	.00	.00	PIPE
1011.771	3694.384	.278	3694.663	2.00	7.54	.88	3695.55	.00	.49	1.38	2.000	.000	.00	0 .0
6.020	.0539					.0422	.25	.28	3.04	.27	.013	.00	.00	PIPE
1017.791	3694.709	.288	3694.997	2.00	7.19	.80	3695.80	.00	.49	1.40	2.000	.000	.00	0 .0
3.697	.0539					.0368	.14	.29	2.85	.27	.013	.00	.00	PIPE
1021.488	3694.908	.297	3695.206	2.00	6.86	.73	3695.94	.00	.49	1.42	2.000	.000	.00	0 .0
2.588	.0539					.0321	.08	.30	2.67	.27	.013	.00	.00	PIPE
1024.076	3695.048	.307	3695.355	2.00	6.54	.66	3696.02	.00	.49	1.44	2.000	.000	.00	0 .0
1.932	.0539					.0281	.05	.31	2.50	.27	.013	.00	.00	PIPE
1026.007	3695.152	.318	3695.470	2.00	6.23	.60	3696.07	.00	.49	1.46	2.000	.000	.00	0 .0
1.499	.0539					.0245	.04	.32	2.34	.27	.013	.00	.00	PIPE
1027.506	3695.233	.328	3695.561	2.00	5.94	.55	3696.11	.00	.49	1.48	2.000	.000	.00	0 .0
1.193	.0539					.0214	.03	.33	2.20	.27	.013	.00	.00	PIPE
1028.700	3695.298	.339	3695.637	2.00	5.67	.50	3696.14	.00	.49	1.50	2.000	.000	.00	0 .0
.962	.0539					.0187	.02	.34	2.06	.27	.013	.00	.00	PIPE
1029.661	3695.350	.351	3695.700	2.00	5.40	.45	3696.15	.00	.49	1.52	2.000	.000	.00	0 .0
.781	.0539					.0163	.01	.35	1.93	.27	.013	.00	.00	PIPE

Summerlin West Village 27
Ultimate Condition
SSDDI11_SDMH13

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1030.443	3695.392	.362	3695.754	2.00	5.15	.41	3696.17	.00	.49	1.54	2.000	.000	.00	0 .0
.636	.0539					.0143	.01	.36	1.81	.27	.013	.00	.00	PIPE
1031.079	3695.426	.375	3695.801	2.00	4.91	.37	3696.18	.00	.49	1.56	2.000	.000	.00	0 .0
.515	.0539					.0125	.01	.37	1.69	.27	.013	.00	.00	PIPE
1031.594	3695.454	.387	3695.841	2.00	4.68	.34	3696.18	.00	.49	1.58	2.000	.000	.00	0 .0
.415	.0539					.0109	.00	.39	1.59	.27	.013	.00	.00	PIPE
1032.008	3695.477	.400	3695.877	2.00	4.46	.31	3696.19	.00	.49	1.60	2.000	.000	.00	0 .0
.327	.0539					.0095	.00	.40	1.49	.27	.013	.00	.00	PIPE
1032.335	3695.494	.414	3695.908	2.00	4.26	.28	3696.19	.00	.49	1.62	2.000	.000	.00	0 .0
.254	.0539					.0083	.00	.41	1.39	.27	.013	.00	.00	PIPE
1032.589	3695.508	.428	3695.936	2.00	4.06	.26	3696.19	.00	.49	1.64	2.000	.000	.00	0 .0
.185	.0539					.0073	.00	.43	1.31	.27	.013	.00	.00	PIPE
1032.775	3695.518	.443	3695.960	2.00	3.87	.23	3696.19	.00	.49	1.66	2.000	.000	.00	0 .0
.127	.0539					.0063	.00	.44	1.22	.27	.013	.00	.00	PIPE
1032.901	3695.525	.458	3695.982	2.00	3.69	.21	3696.19	.00	.49	1.68	2.000	.000	.00	0 .0
.075	.0539					.0055	.00	.46	1.14	.27	.013	.00	.00	PIPE
1032.976	3695.529	.473	3696.002	2.00	3.52	.19	3696.19	.00	.49	1.70	2.000	.000	.00	0 .0
.024	.0539					.0048	.00	.47	1.07	.27	.013	.00	.00	PIPE

FILE: SDDI11_SDMH13.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-16-2022 Time: 2:51:51

Summerlin West Village 27
Ultimate Condition
SSDDI11_SDMH13

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1033.000	3695.530	.491	3696.021	2.00	3.34	.17	3696.19	.00	.49	1.72	2.000	.000	.00	0 .0

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T1 Summerlin West Village 27
T2 Ultimate Condition
T3 SDDI12_SDMH13
SO   1000.00 3693.750  1                          3694.451
R    1010.00 3695.410  1      .013                                  0.0    0
SH   1010.00 3695.410  1
CD   1  4   0    .000   2.000     .000  .000  .000   .00
Q             2.00    .0
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FILE: SDDI12_SDMH13.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-16-2022 Time: 2:54:28

Summerlin West Village 27
Ultimate Condition
SDDI12_SDMH13

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	3693.749	.231	3693.980	2.00	9.91	1.53	3695.51	.00	.49	1.28	2.000	.000	.00	0 .0
1.365	.1660					.0936	.13	.23	4.40	.20	.013	.00	.00	PIPE
1001.365	3693.976	.236	3694.212	2.00	9.57	1.42	3695.63	.00	.49	1.29	2.000	.000	.00	0 .0
1.466	.1660					.0832	.12	.24	4.19	.20	.013	.00	.00	PIPE
1002.831	3694.219	.244	3694.464	2.00	9.12	1.29	3695.76	.00	.49	1.31	2.000	.000	.00	0 .0
1.172	.1660					.0726	.09	.24	3.93	.20	.013	.00	.00	PIPE
1004.003	3694.414	.252	3694.666	2.00	8.70	1.18	3695.84	.00	.49	1.33	2.000	.000	.00	0 .0
.959	.1660					.0634	.06	.25	3.69	.20	.013	.00	.00	PIPE
1004.962	3694.573	.261	3694.834	2.00	8.30	1.07	3695.90	.00	.49	1.35	2.000	.000	.00	0 .0
.800	.1660					.0553	.04	.26	3.46	.20	.013	.00	.00	PIPE
1005.762	3694.706	.269	3694.975	2.00	7.91	.97	3695.95	.00	.49	1.37	2.000	.000	.00	0 .0
.674	.1660					.0483	.03	.27	3.24	.20	.013	.00	.00	PIPE
1006.436	3694.818	.278	3695.096	2.00	7.54	.88	3695.98	.00	.49	1.38	2.000	.000	.00	0 .0
.573	.1660					.0422	.02	.28	3.04	.20	.013	.00	.00	PIPE
1007.009	3694.913	.288	3695.200	2.00	7.19	.80	3696.00	.00	.49	1.40	2.000	.000	.00	0 .0
.491	.1660					.0368	.02	.29	2.85	.20	.013	.00	.00	PIPE
1007.500	3694.994	.297	3695.292	2.00	6.86	.73	3696.02	.00	.49	1.42	2.000	.000	.00	0 .0
.422	.1660					.0321	.01	.30	2.67	.20	.013	.00	.00	PIPE

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-16-2022 Time: 2:54:28

Summerlin West Village 27
Ultimate Condition
SDDI12_SDMH13

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1007.921	3695.064	.307	3695.372	2.00	6.54	.66	3696.04	.00	.49	1.44	2.000	.000	.00	0 .0
.363	.1660					.0281	.01	.31	2.50	.20	.013	.00	.00	PIPE
1008.284	3695.125	.318	3695.442	2.00	6.23	.60	3696.05	.00	.49	1.46	2.000	.000	.00	0 .0
.312	.1660					.0245	.01	.32	2.34	.20	.013	.00	.00	PIPE
1008.596	3695.177	.328	3695.505	2.00	5.94	.55	3696.05	.00	.49	1.48	2.000	.000	.00	0 .0
.269	.1660					.0214	.01	.33	2.20	.20	.013	.00	.00	PIPE
1008.864	3695.221	.339	3695.560	2.00	5.67	.50	3696.06	.00	.49	1.50	2.000	.000	.00	0 .0
.230	.1660					.0187	.00	.34	2.06	.20	.013	.00	.00	PIPE
1009.095	3695.260	.351	3695.610	2.00	5.40	.45	3696.06	.00	.49	1.52	2.000	.000	.00	0 .0
.196	.1660					.0163	.00	.35	1.93	.20	.013	.00	.00	PIPE
1009.291	3695.292	.362	3695.655	2.00	5.15	.41	3696.07	.00	.49	1.54	2.000	.000	.00	0 .0
.166	.1660					.0143	.00	.36	1.81	.20	.013	.00	.00	PIPE
1009.457	3695.320	.375	3695.694	2.00	4.91	.37	3696.07	.00	.49	1.56	2.000	.000	.00	0 .0
.139	.1660					.0125	.00	.37	1.69	.20	.013	.00	.00	PIPE
1009.596	3695.343	.387	3695.730	2.00	4.68	.34	3696.07	.00	.49	1.58	2.000	.000	.00	0 .0
.115	.1660					.0109	.00	.39	1.59	.20	.013	.00	.00	PIPE
1009.712	3695.362	.400	3695.762	2.00	4.46	.31	3696.07	.00	.49	1.60	2.000	.000	.00	0 .0
.093	.1660					.0095	.00	.40	1.49	.20	.013	.00	.00	PIPE

FILE: SDDI12_SDMH13.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-16-2022 Time: 2:54:28

Summerlin West Village 27
Ultimate Condition
SDDI12_SDMH13

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1009.804	3695.377	.414	3695.792	2.00	4.26	.28	3696.07	.00	.49	1.62	2.000	.000	.00	0 .0
.073	.1660					.0083	.00	.41	1.39	.20	.013	.00	.00	PIPE
1009.878	3695.390	.428	3695.818	2.00	4.06	.26	3696.07	.00	.49	1.64	2.000	.000	.00	0 .0
.055	.1660					.0073	.00	.43	1.31	.20	.013	.00	.00	PIPE
1009.932	3695.399	.443	3695.841	2.00	3.87	.23	3696.07	.00	.49	1.66	2.000	.000	.00	0 .0
.038	.1660					.0063	.00	.44	1.22	.20	.013	.00	.00	PIPE
1009.970	3695.405	.458	3695.863	2.00	3.69	.21	3696.07	.00	.49	1.68	2.000	.000	.00	0 .0
.023	.1660					.0055	.00	.46	1.14	.20	.013	.00	.00	PIPE
1009.993	3695.409	.473	3695.882	2.00	3.52	.19	3696.07	.00	.49	1.70	2.000	.000	.00	0 .0
.007	.1660					.0048	.00	.47	1.07	.20	.013	.00	.00	PIPE
1010.000	3695.410	.491	3695.901	2.00	3.34	.17	3696.07	.00	.49	1.72	2.000	.000	.00	0 .0

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T1 Summerlin West Village 27
T2 Ultimate Condition
T3 SDMH13_5X6
SO   1000.00 3682.610  1                          3687.000
R    1079.55 3693.163  1      .013                                  0.0    0
R    1085.38 3693.750  1      .013                                  0.0    0
SH   1085.38 3693.750  1
CD   1  4   0    .000   2.000     .000  .000  .000   .00
Q             4.00    .0
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FILE: SDMH13_5X6.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-16-2022 Time: 2:46:56

Summerlin West Village 27
Ultimate Condition
SDMH13_5X6

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	3682.610	4.390	3687.000	4.00	1.27	.03	3687.03	.00	.70	.00	2.000	.000	.00	0 .0
18.058	.1327					.0003	.01	4.39	.00	.30	.013	.00	.00	PIPE
1018.058	3685.006	2.000	3687.006	4.00	1.27	.03	3687.03	.00	.70	.00	2.000	.000	.00	0 .0
1.374	.1327					.0003	.00	2.00	.00	.30	.013	.00	.00	PIPE
1019.432	3685.188	1.815	3687.003	4.00	1.34	.03	3687.03	.00	.70	1.16	2.000	.000	.00	0 .0
.793	.1327					.0003	.00	1.81	.15	.30	.013	.00	.00	PIPE
1020.225	3685.293	1.707	3687.000	4.00	1.40	.03	3687.03	.00	.70	1.41	2.000	.000	.00	0 .0
.648	.1327					.0003	.00	1.71	.17	.30	.013	.00	.00	PIPE
1020.873	3685.379	1.618	3686.997	4.00	1.47	.03	3687.03	.00	.70	1.57	2.000	.000	.00	0 .0
.563	.1327					.0003	.00	1.62	.20	.30	.013	.00	.00	PIPE
1021.435	3685.454	1.540	3686.994	4.00	1.54	.04	3687.03	.00	.70	1.68	2.000	.000	.00	0 .0
.501	.1327					.0004	.00	1.54	.22	.30	.013	.00	.00	PIPE
1021.936	3685.520	1.470	3686.990	4.00	1.62	.04	3687.03	.00	.70	1.77	2.000	.000	.00	0 .0
.344	.1327					.0004	.00	1.47	.24	.30	.013	.00	.00	PIPE
1022.280	3685.566	1.406	3686.972	4.00	1.69	.04	3687.02	.00	.70	1.83	2.000	.000	.00	0 .0
HYDRAULIC JUMP														
1022.280	3685.566	.300	3685.866	4.00	13.55	2.85	3688.72	.00	.70	1.43	2.000	.000	.00	0 .0
27.155	.1327					.1247	3.38	.30	5.25	.30	.013	.00	.00	PIPE

WATER SURFACE PROFILE LISTING Date: 8-16-2022 Time: 2:46:56

Summerlin West Village 27
Ultimate Condition
SDMH13_5X6

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1049.435	3689.168	.309	3689.478	4.00	12.95	2.60	3692.08	.00	.70	1.45	2.000	.000	.00	0 .0
9.677	.1327					.1093	1.06	.31	4.94	.30	.013	.00	.00	PIPE
1059.112	3690.452	.320	3690.771	4.00	12.35	2.37	3693.14	.00	.70	1.47	2.000	.000	.00	0 .0
5.493	.1327					.0954	.52	.32	4.63	.30	.013	.00	.00	PIPE
1064.604	3691.181	.330	3691.511	4.00	11.77	2.15	3693.66	.00	.70	1.49	2.000	.000	.00	0 .0
3.742	.1327					.0833	.31	.33	4.34	.30	.013	.00	.00	PIPE
1068.346	3691.677	.341	3692.018	4.00	11.23	1.96	3693.98	.00	.70	1.51	2.000	.000	.00	0 .0
2.779	.1327					.0728	.20	.34	4.07	.30	.013	.00	.00	PIPE
1071.125	3692.046	.353	3692.399	4.00	10.70	1.78	3694.18	.00	.70	1.52	2.000	.000	.00	0 .0
2.169	.1327					.0636	.14	.35	3.81	.30	.013	.00	.00	PIPE
1073.294	3692.333	.365	3692.698	4.00	10.21	1.62	3694.32	.00	.70	1.54	2.000	.000	.00	0 .0
1.747	.1327					.0555	.10	.36	3.57	.30	.013	.00	.00	PIPE
1075.041	3692.565	.377	3692.942	4.00	9.73	1.47	3694.41	.00	.70	1.56	2.000	.000	.00	0 .0
1.438	.1327					.0485	.07	.38	3.35	.30	.013	.00	.00	PIPE
1076.478	3692.756	.390	3693.146	4.00	9.28	1.34	3694.48	.00	.70	1.58	2.000	.000	.00	0 .0
1.200	.1327					.0424	.05	.39	3.13	.30	.013	.00	.00	PIPE
1077.678	3692.915	.403	3693.318	4.00	8.85	1.22	3694.53	.00	.70	1.60	2.000	.000	.00	0 .0
1.012	.1327					.0370	.04	.40	2.94	.30	.013	.00	.00	PIPE

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-16-2022 Time: 2:46:56

Summerlin West Village 27
Ultimate Condition
SDMH13_5X6

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1078.690	3693.049	.417	3693.466	4.00	8.43	1.10	3694.57	.00	.70	1.62	2.000	.000	.00	0 .0
.860	.1327					.0324	.03	.42	2.75	.30	.013	.00	.00	PIPE
1079.550	3693.164	.431	3693.594	4.00	8.04	1.00	3694.60	.00	.70	1.64	2.000	.000	.00	0 .0
.277	.1007					.0297	.01	.43	2.58	.32	.013	.00	.00	PIPE
1079.827	3693.191	.434	3693.626	4.00	7.95	.98	3694.61	.00	.70	1.65	2.000	.000	.00	0 .0
1.015	.1007					.0274	.03	.43	2.54	.32	.013	.00	.00	PIPE
1080.841	3693.293	.449	3693.743	4.00	7.58	.89	3694.63	.00	.70	1.67	2.000	.000	.00	0 .0
.857	.1007					.0239	.02	.45	2.38	.32	.013	.00	.00	PIPE
1081.698	3693.380	.465	3693.844	4.00	7.23	.81	3694.65	.00	.70	1.69	2.000	.000	.00	0 .0
.725	.1007					.0209	.02	.46	2.22	.32	.013	.00	.00	PIPE
1082.423	3693.453	.480	3693.933	4.00	6.89	.74	3694.67	.00	.70	1.71	2.000	.000	.00	0 .0
.613	.1007					.0183	.01	.48	2.08	.32	.013	.00	.00	PIPE
1083.036	3693.514	.497	3694.011	4.00	6.57	.67	3694.68	.00	.70	1.73	2.000	.000	.00	0 .0
.517	.1007					.0160	.01	.50	1.95	.32	.013	.00	.00	PIPE
1083.554	3693.566	.514	3694.080	4.00	6.26	.61	3694.69	.00	.70	1.75	2.000	.000	.00	0 .0
.435	.1007					.0140	.01	.51	1.83	.32	.013	.00	.00	PIPE
1083.988	3693.610	.532	3694.142	4.00	5.97	.55	3694.70	.00	.70	1.77	2.000	.000	.00	0 .0
.361	.1007					.0122	.00	.53	1.71	.32	.013	.00	.00	PIPE

FILE: SDMH13_5X6.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 4

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 8-16-2022 Time: 2:46:56

Summerlin West Village 27
Ultimate Condition
SDMH13_5X6

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1084.350	3693.646	.550	3694.197	4.00	5.69	.50	3694.70	.00	.70	1.79	2.000	.000	.00	0 .0
.296	.1007					.0107	.00	.55	1.60	.32	.013	.00	.00	PIPE
1084.646	3693.676	.569	3694.245	4.00	5.43	.46	3694.70	.00	.70	1.80	2.000	.000	.00	0 .0
.238	.1007					.0094	.00	.57	1.50	.32	.013	.00	.00	PIPE
1084.884	3693.700	.589	3694.289	4.00	5.18	.42	3694.71	.00	.70	1.82	2.000	.000	.00	0 .0
.187	.1007					.0082	.00	.59	1.40	.32	.013	.00	.00	PIPE
1085.071	3693.719	.610	3694.329	4.00	4.94	.38	3694.71	.00	.70	1.84	2.000	.000	.00	0 .0
.139	.1007					.0072	.00	.61	1.31	.32	.013	.00	.00	PIPE
1085.210	3693.733	.631	3694.364	4.00	4.71	.34	3694.71	.00	.70	1.86	2.000	.000	.00	0 .0
.096	.1007					.0063	.00	.63	1.23	.32	.013	.00	.00	PIPE
1085.306	3693.743	.653	3694.396	4.00	4.49	.31	3694.71	.00	.70	1.88	2.000	.000	.00	0 .0
.056	.1007					.0055	.00	.65	1.15	.32	.013	.00	.00	PIPE
1085.362	3693.748	.676	3694.425	4.00	4.28	.28	3694.71	.00	.70	1.89	2.000	.000	.00	0 .0
.018	.1007					.0048	.00	.68	1.07	.32	.013	.00	.00	PIPE
1085.380	3693.750	.701	3694.451	4.00	4.07	.26	3694.71	.00	.70	1.91	2.000	.000	.00	0 .0

Appendix D. Proposed Improvement Plans

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27	ROADWAY GRADING PLAN	SUNSET RUN DRIVE – STA 13+00 TO STA 17+50
28	ROADWAY PLAN & PROFILE	SUNSET RUN DRIVE – STA 13+00 TO STA 17+50
29	ROADWAY GRADING PLAN	SUNSET RUN DRIVE – STA 17+50 TO STA 22+00
30	ROADWAY PLAN & PROFILE	SUNSET RUN DRIVE – STA 17+50 TO STA 22+00
31	ROADWAY GRADING PLAN	SUNSET RUN DRIVE – STA 22+00 TO STA 26+50
32	ROADWAY PLAN & PROFILE	SUNSET RUN DRIVE – STA 22+00 TO STA 26+50
33	ROADWAY GRADING PLAN	SUNSET RUN DRIVE – STA 26+50 TO END
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UTILITY NOTE

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

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

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

NOTICE OF INTENT NOTE

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

PROPOSED RIGHT-OF-WAY ACREAGE
6.94 AC.

PROPOSED DISTURBED AREA ACREAGE
7.02 AC.

GEOTECHNICAL ENGINEER
PREPARED BY: NOVA GEOTECHNICAL & INSPECTION SERVICES
4480 W. HACIENDA AVENUE, SUITE 104, LAS VEGAS, NV 89118
PHONE: 702-873-3478
PROJECT NO.: G-19-183
DATED: OCTOBER 21, 2019 AND SUBSEQUENT UPDATE LETTER DATED: JANUARY 18, 2022

PUBLIC EARTHWORK QUANTITIES (RAW)
CUT: 1100
FILL: 6700

SUMMERLIN WEST VILLAGE 27 IMPROVEMENT PLANS FOR:

PARK DRIFT TRAIL
(LAKE MEAD BOULEVARD TO SUNSET RUN DRIVE),

SUNSET RUN DRIVE
(PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD),
AND

CALICO BEND DRIVE
(LAKE MEAD BOULEVARD TO SUNSET RUN DRIVE)
FUTURE SID PROJECT

APN: 137-22-101-005, 137-21-501-001,
AND 137-22-301-005.

SUMMERLIN®

OWNER /DEVELOPER

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

BRIAN WALSH, SR. VICE PRESIDENT — DATE

ENGINEER / CONSULTANT

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

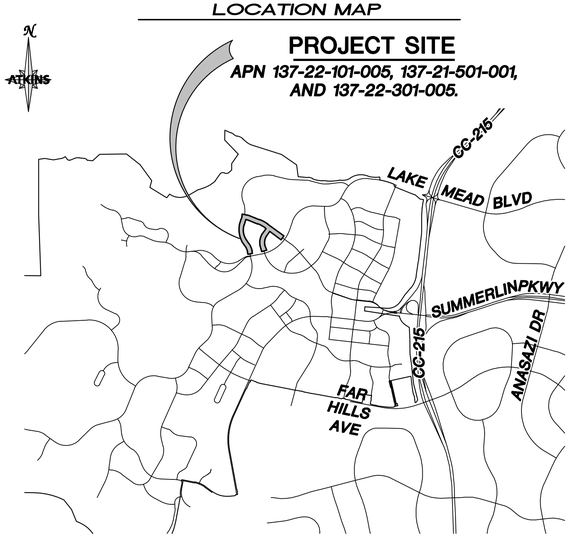
NPDES PERMIT NOTE

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

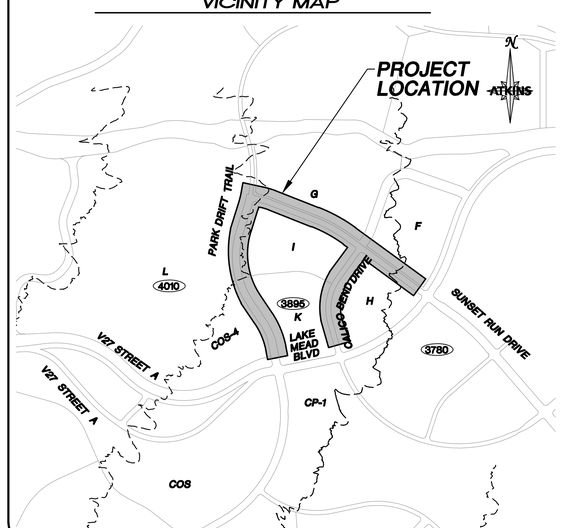
FEMA FLOOD ZONE INFORMATION

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

LOCATION MAP



VICINITY MAP



APPROVALS

CITY OF LAS VEGAS ENGINEERING

CITY OF LAS VEGAS DEPARTMENT OF PLANNING

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

LAS VEGAS FIRE AND RESCUE

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. _____ FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

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 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 ORIGIN: 400,000.00 M (1,312,333.3333 FTUS)
EASTING AT CENTRAL MERIDIAN: 300,000 M (984,250.0000 FTUS)
SCALE FACTOR ON CENTRAL MERIDIAN: 1.000135 (EXACT)
NOTES:

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

BENCHMARK

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 4 AS SHOWN ON THE MAP THEREOF IN BOOK 126 OF PLATS, PAGE 16, OFFICIAL RECORDS, CITY OF LAS VEGAS CLARK COUNTY, NEVADA

FAST Call before you UnderGround 1-702-432-5300 PROJECT AND OPERATIONAL SYSTEM OF TRANSPORTATION

Call before you Dig AVOID CUTTING, UNCOVERING OR DAMAGING UTILITY LINES. IT'S COSTLY. Call 811 OR 1-800-642-2444

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

PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY JOSEPH ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN®

SUMMERLIN WEST VILLAGE 27
PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD),
SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD),
AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)
COVER SHEET

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	NONE
VERT.:	NONE
DATE:	SEPTEMBER, 2022
DRAWING NO.	1 / 69
JOB NO.	100069474B

00000000
L00-00000

C:\pw_work\atkinsn01\dms585537\6947478-01-TITL-C1.dwg LAYOUT: C1 Sep 07, 2022 - 1:50PM

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

NOTE TO CONTRACTOR

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

CITY OF LAS VEGAS STORM WATER MANAGEMENT NOTES

1. STANDARD NOTE NO. 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 THE CITY OF LAS VEGAS AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. STANDARD NOTE NO. 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 THE LVMC 14.18.130 AND CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT'S HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL SECTION 1500 AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDANCE MANUAL.
3. STANDARD NOTE NO. 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; REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.5.
4. STANDARD NOTE NO. 4: AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT 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 DISTURBANCE ACTIVITIES. REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
5. STANDARD NOTE NO. 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
6. HAS BEEN REDUCED BY 50 PERCENT OR MORE.

REVISED 06/04/2018

	EXISTING	PROPOSED	FUTURE
DAYLIGHT LINE			
FLOWLINE			
CENTERLINE			
PARCEL LINE			
RIGHT OF WAY			
PAVEMENT STRIPING			
OVERHEAD POWER	—OHP—	—OHP—	
UNDERGROUND POWER	—UGP—	—UGP—	
SANITARY SEWER	—S—	15" SS	
WATER		24"W (3550)	
STORM DRAIN			
GAS	—G—	—G—	
CABLE T.V.	—CATV—	—CATV—	
TELEPHONE	—T—	—T—	
STREETLIGHT CONDUIT	—STLT—	STLT	
STOP BAR			
CONCRETE ENCASEMENT			
FENCE			
BLOCK WALL			
RETAINING WALL			
SAWCUT PAVEMENT			
CONTOUR	(3000)	3005	
SPOT ELEVATION	x 3011.6	x 3011.67	
CURB AND GUTTER			
EDGE OF PAVEMENT			
EASEMENT			
MATCHLINE			
SIGN			
DOUBLE POST SIGN			
STORM DRAIN MANHOLE	SD		
STORM DRAIN STRUCTURE			
DROP INLET			
BEEHIVE INLET		OR	
SEWER MANHOLE	S	S	
FIRE HYDRANT			
CAP AND BLOWOFF			
GATE VALVE			
REDUCER			
STREETLIGHT	OR		
PULLBOX			
SIGNAL POLE			
ELEVATION	(0000.0) EG	0000.00 FG	
WATER PRESSURE ZONE BOUNDARY			
WATER PRESSURE ZONE		0000	
HARDSCAPE			
EXISTING RED ROCK			

ROADWAY ALIGNMENT DESIGNATIONS

"PDT" = PARK DRIFT TRAIL
"SRD" = SUNSET RUN DRIVE
"CBD" = CALICO BEND DRIVE
"LMB" = LAKE MEAD BOULEVARD

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

BASIS OF BEARING

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

BENCHMARK

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

FAST Call before you UnderGround 1-702-432-5300 NEVADA811.COM SYSTEM OF TRANSPORTATION

Call before you Dig AVOID CUTTING & DAMAGING UTILITY LINES. IT'S COSTLY. Call 811 or 1-800-642-2444

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

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

PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27

PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

LEGEND AND ABBREVIATIONS

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE

00000000
L00–00000
DATE: SEPTEMBER, 2022
DRAWING NO. 2 / 69
JOB NO. 1000694748

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CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR BOARD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE'S WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHELL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORILY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.
6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300' IN EXTRUDED-TYPE CURB.
8. AC PAVEMENT TO BE ONE-HALF INCH (½") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS.
9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 216.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE AS SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY THE (COMPANY, REPORT #, DATE) APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOWLINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.
16. WALL NOTES: ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.
17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC, THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.
21. ~~AFTER HAUNCHING AND PRIOR TO BACKFILL OPERATIONS WHICH WOULD COVER SANITARY SEWER AND STORM DRAIN FACILITIES, CONTRACTOR IS REQUIRED TO SCHEDULE CLV OPEN-TRENCH UTILITY SURVEY INSPECTION FOR DETERMINATION OF FINAL LOCATION COORDINATES. FACILITIES TO BE LOCATED BY CLV SHALL INCLUDE AT A MINIMUM THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES AND TRANSITION STRUCTURES; STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET; THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXIT THE PUBLIC RIGHT-OF-WAY, SEWER AND STORM DRAIN MAIN ALIGNMENT, INCLUDING DEFLECTION POINTS.~~

   SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE CITY AND APPROVED PRIOR TO ACCEPTANCE OF FACILITY VIDEO INSPECTION. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES AND TRANSITION STRUCTURES, STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET; THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXIT THE PUBLIC RIGHT-OF-WAY, SEWER AND STORM DRAIN MAIN ALIGNMENT, INCLUDING DEFLECTION POINTS. THE LOCATION SHALL BE DESCRIBED BY COORDINATES WHICH SHALL BE BASED ON THE OFFICIAL HORIZONTAL AND VERTICAL CONTROL NETWORKS OF THE CITY OF LAS VEGAS. FINAL LOCATION MAPS MUST BE SEALED AND CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINTIES OF ± 0.09 METERS (± 0.3 FEET) HORIZONTALLY AND VERTICALLY. SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S).
22. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST EDITION.
23. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

REVISED 06/04/2018

CITY OF LAS VEGAS GRADING NOTES

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

		HORIZONTAL	VERTICAL	COMPACTION
A.	PAVEMENT AREA SUBGRADE	0.1'+	+0.0' TO −0.1'	SEE SOILS REPORT
B.	ENGINEERED FILL	0.5'+	+0.1' TO −0.1'	SEE SOILS REPORT

   COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE.

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

REVISED 04/15/10

PLAN CONCURRENCE NOTE

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

1. V25 LAKE MEAD BOULEVARD (SUNSET RUN DRIVE TO PARK DRIFT TRAIL)
2. V27 ROUGH GRADING PACKAGE
3. V27 LAKE MEAD BOULEVARD (SCURRY BEND DRIVE TO SUNSET RUN DRIVE)
4. V27 STREET A (PARK DRIFT TRAIL TO MOUNTAIN RUN DRIVE)
5. V27 PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

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 #6631 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS.
2. ONLY FIRE HYDRANTS THAT ARE ON THE LAS VEGAS VALLEY WATER DISTRICT'S APPROVED PRODUCTS LIST ARE ALLOWED TO BE INSTALLED.
3. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK. IFC § 105.6.15
4. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MADE SERVICEABLE PRIOR TO AND DURING THE TIME OF CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. IFC § 3310, § 3312
5. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. IFC § 507.5.7.3
6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL. IFC § 106.3
7. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. IFC § 507.2.1, NFPA 24
8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. IFC § 507
9. PRIVATE HYDRANTS SHALL BE PAINTED RED. IFC § 507.5.7.1
10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. IFC § 507
11. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: IFC § C102
    - RESIDENTIAL – 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
    - COMMERCIAL – 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
12. WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1000 FT SPACING, TO PROTECT THE TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. IFC § C102.8
13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.
14. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. IFC § C102.10
15. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. IFC § 102.4
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. IFC § C102.7
17. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. IFC § C102.6
18. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. FOR SYSTEMS REQUIRED TO HAVE TWO (2) SOURCES OF WATER SUPPLY, SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS AND/OR FIRE SPRINKLER LEAD-INS CAN BE OUT OF SERVICE DUE TO A SERVICE INTERRUPTION. FOR SYSTEMS PERMITTED TO HAVE ONE SOURCE OF WATER SUPPLY, SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 3 FIRE HYDRANTS AND/OR FIRE SPRINKLER LEAD-IN CAN BE OUT OF SERVICE DUE TO A SERVICE INTERRUPTION. IFC § C104
19. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. IFC § 503.2.3
20. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12% ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FT PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. IFC § 503.2.7; 503.2.8
21. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. IFC § 503.2.4
22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13FT 6 INS. IFC § 503.2.1
23. FIRE DEPARTMENT ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 33 FT WITH PARKING ON BOTH SIDES MEASURED TO FACE OF CURB. NOT LESS THAN 28 FT WIDE WITH PARKING RESTRICTED TO ONE SIDE MEASURED TO FACE OF CURB. NOT LESS THAN 24 FT WIDE WITH NO PARKING ON EITHER SIDE MEASURED TO FACE OF CURB. FIRE LANES THROUGH PARKING LOTS SHALL BE NOT LESS THAN 24 FT. IFC § 503.2.1.1
24. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. IFC § 503.1.1
25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 200 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-ENDS OR A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT. CLV REGULATION AND MOU
26. ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. CLV REGULATION
27. ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS OF 100 FT ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM THE ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. IFC § 503.3
28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM. IFC § 503.6
29. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS, OR HAVING FOUR OR MORE TRAVEL LANES AND A TRAFFIC COUNT OF MORE THAN 30,000 VEHICLES PER DAY, ALL HYDRANTS BEINGS UTILIZED TO DELIVER FIRE FLOW TO THE PROPOSED LOCATION SHALL BE LOCATED ON THE SAME SIDE OF THE STREET AS THE PROPOSED DEVELOPMENT. CLV REGULATION

REVISED FEBRUARY 4, 2019

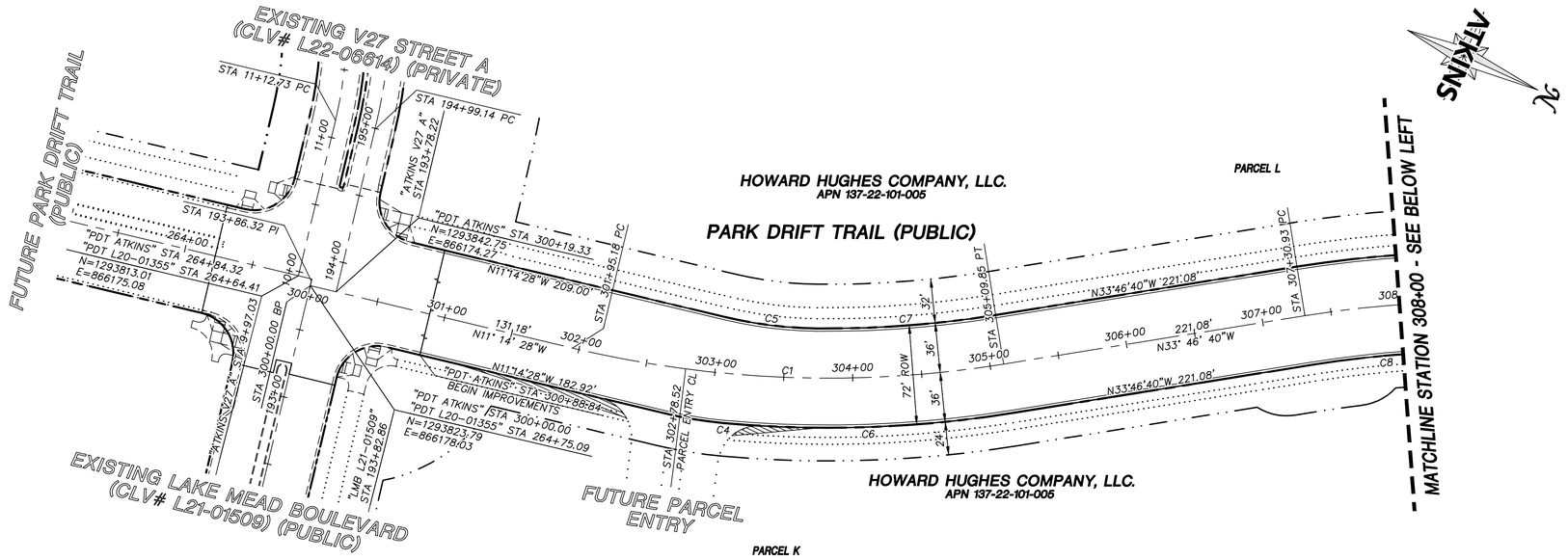
CITY OF LAS VEGAS TRAFFIC NOTES

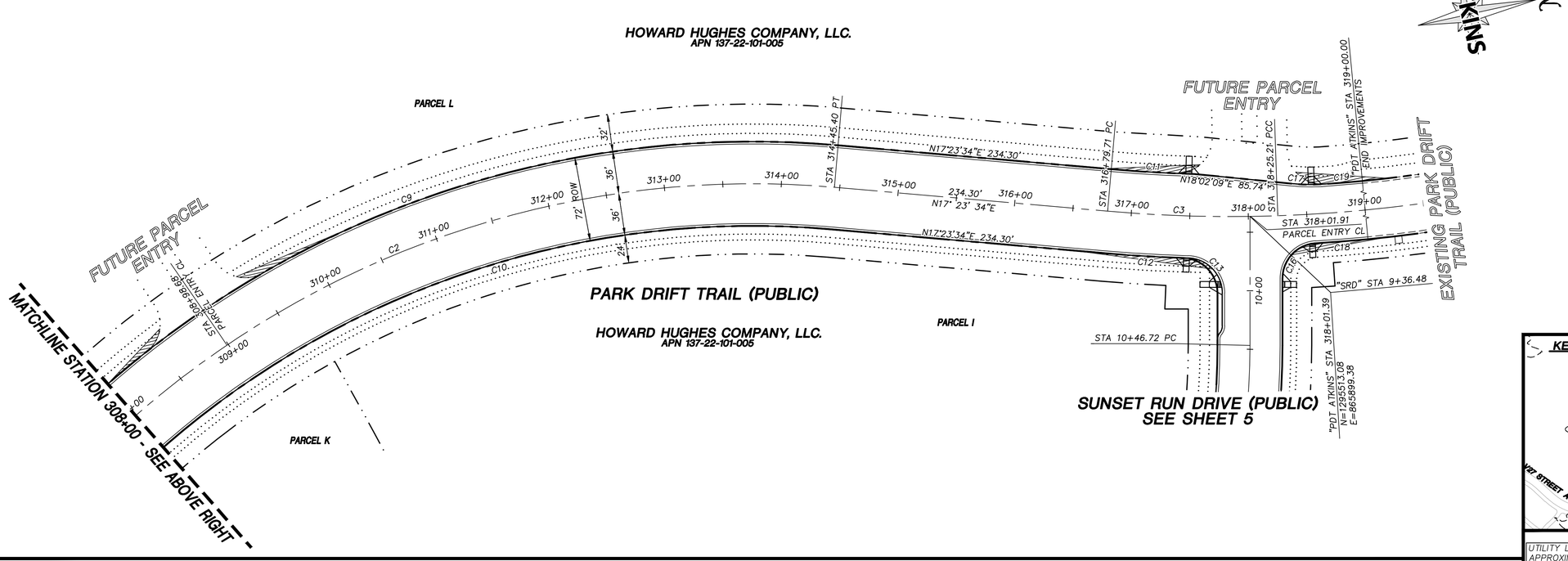
1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.
2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.
3. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
4. WHEN A DESIGNATED "SUGGESTED ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD". THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.
5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW TRAFFIC SIGNS SHALL UTILIZE TYPE XI RETROREFLECTIVE SHEETING IN ACCORDANCE WITH CCAUSS 627 AND 716 AND SHALL HAVE AN ANTI-GRAFFITI PROTECTIVE OVERLAY FILM THAT IS A MATCHING COMPONENT TO, AND OF THE SAME MANUFACTURER AS THE RETROREFLECTIVE SHEETING TO WHICH IT IS APPLIED. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.
7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5') FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.
8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.
9. STREET SIGNS AND STOP SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.
10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR IMSA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT OF WAY.
11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA (RTC). IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.
13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.
14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.
15. THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPICTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

REVISED JUNE 4, 2018

CITY OF LAS VEGAS SEWER NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS. ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEER.
3. CHISEL "S" OR "C" IN CURBS WHERE SEWER OR GAS LATERALS PASS UNDER THE CURB.
4. POLYVINYL (PVC) SEWER PIPE SHALL MEET ASTM D-3034 SDR 35 SPECIFICATIONS, INSTALLED WITH SAND BEDDING AND BACKFILL OF TYPE II AGGREGATE BASE.
5. ALL MANHOLES PAVED IN STREETS EIGHTY (80') FOOT R/W AND LARGER SHALL HAVE CONCRETE COLLARS. STREETS LESS THAN EIGHTY (80') FOOT R/W WILL REQUIRE RETROFIT IF PAVING DOES NOT CONFORM TO CITY STANDARDS AT THE MANHOLE.
6. TEE SADDLES SHALL BE USED TO CONNECT SEWER LATERALS TO EXISTING MAIN LINES UP TO TWELVE INCH (12") DIAMETER. CONNECTIONS TO FIFTEEN INCH (15") OR LARGER MAINS SHALL REQUIRE SPECIAL PROCEDURES. IN LINE "Y"S SHALL BE USED ON LINES TWELVE INCHES (12") OR ABOVE.
7. WATER MAINS SHALL BE PROTECTED IN ACCORDANCE WITH LVVWD STANDARDS WHENEVER A SEWER MAIN CROSSES OVER A WATER MAIN OR THE SEWER IS LESS THAN EIGHTEEN INCH (18") UNDER A WATER MAIN.
8. ALL CONTRACTORS INSTALLING SEWER MAINS THAT WILL BE UNDER THE JURISDICTION OF THE CITY OF LAS VEGAS MUST BE STATE OF NEVADA CLASS "A" CONTRACTORS.
9. THE CITY OF LAS VEGAS WILL NOT ACCEPT ANY SEWER MAIN WHICH HAVE A VERTICAL DEFLECTION OF MORE THAN ONE TENTH (0.1) OF A FOOT FROM THE APPROVED CONSTRUCTION PLANS AT ANY LOCATION. SEWER MAINS FOUND TO EXCEED THIS TOLERANCE WILL HAVE TO BE REPAIRED OR REMOVED OR REPLACED TO THE SATISFACTION OF THE CITY ENGINEER PRIOR TO ACCEPTANCE BY THE CITY OF LAS VEGAS.
10. INSTALLATION OF CURVED SEWER REQUIRES THE USE OF C-900 PIPE WHICH ALLOWS FOR PIPE DEFLECTION AT THE JOINTS.
11. SEWER SERVICES AS APPROVED ON THIS PLAN, ARE INTENDED SPECIFICALLY FOR THE LOT AND USE SHOWN, AND ARE NOT INTENDED TO SERVE ADDITIONAL PAR





SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY	UNIT
ROADWAY		
4" BITUMINOUS A.C.	13840	SY
3" BITUMINOUS A.C.	16400	SY
4" TYPE II AGGREGATE	3600	CY
TYPE "L" CURB AND GUTTER	9590	LF
TYPE "A" MEDIAN CURB	560	LF

ROADWAY NOTES

1. SEE SHEETS 59-61 FOR TYPICAL SECTIONS, DETAILS
2. SEE SHEET 2 FOR ROADWAY ALIGNMENT ABBREVIATIONS

CENTERLINE CURVE TABLE

NO.	RADIUS	DELTA	LENGTH	TANGENT
C1	800.00'	22°32'13"	314.67'	159.40'
C2	800.00'	51°10'14"	714.48'	383.04'
C3	1200.00'	5°48'35"	121.68'	60.89'

BACK OF CURB CURVE TABLE

NO.	RADIUS	DELTA	LENGTH	TANGENT
C4	836.00'	14°19'18"	208.97'	105.03'
C5	300.00'	12°46'58"	66.93'	33.61'
C6	836.00'	14°19'18"	208.97'	105.03'
C7	764.00'	9°45'14"	130.06'	65.19'
C8	764.00'	8°01'07"	106.92'	53.55'
C9	836.00'	51°10'14"	746.63'	400.28'
C10	764.00'	43°09'07"	575.40'	302.12'
C11	1164.00'	3°28'56"	70.74'	35.38'
C12	1236.00'	3°20'07"	71.95'	35.98'
C13	30.00'	88°11'27"	46.18'	29.07'
C16	30.00'	86°35'38"	45.34'	28.27'
C17	143.00'	9°27'57"	23.63'	11.84'
C18	1225.00'	2°06'18"	45.01'	22.51'
C19	1175.00'	1°42'28"	35.02'	17.51'

GRAPHIC SCALE
50 0 25 50 100
HORIZONTAL: 1"= 50'

BASIS OF BEARING

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

BENCHMARK

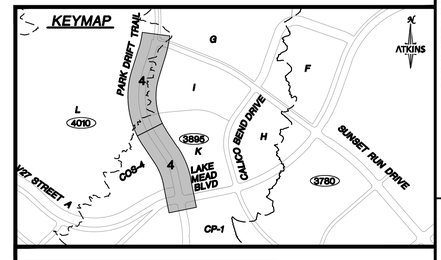
CITY OF LAS VEGAS BENCHMARK: D368
(REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET)
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
T21S,R59E,S03

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

Call before you Dig AVOID OUTAGE & UNDERGROUND UTILITY CABLE CUTS. DON'T DIG. Call 811 or 1-800-642-2444

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

KEYMAP



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

PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTEGA EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27
PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

HORIZONTAL CONTROL PLAN
PARK DRIFT TRAIL

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: 1"=50'
VERT.: NONE

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L00-00000
DATE: SEPTEMBER, 2022
DRAWING NO. 4 /69

JOB NO. 100069474B

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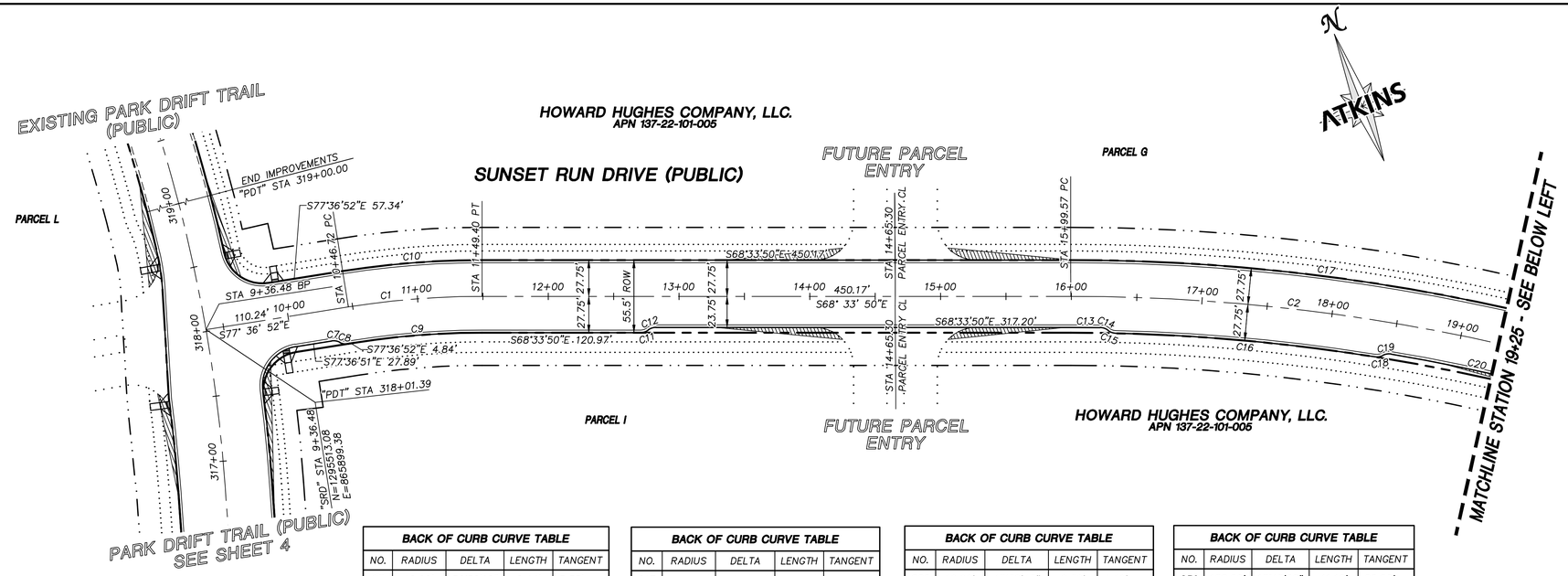
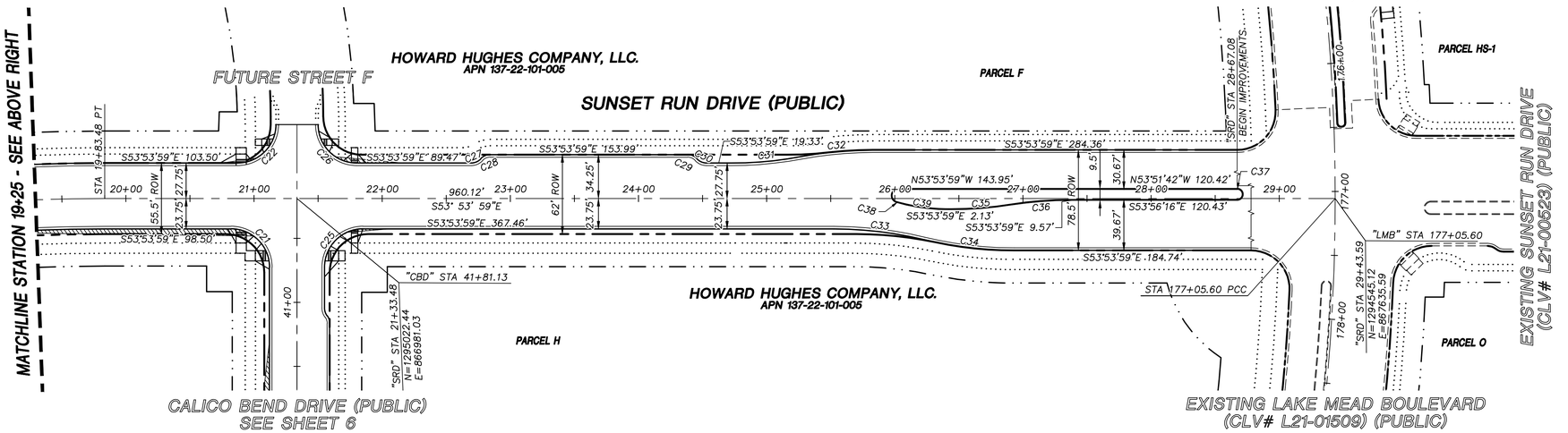




ROADWAY NOTES

1. SEE SHEET 59–61 FOR TYPICAL SECTIONS, DETAILS
2. SEE SHEET 2 FOR ROADWAY ALIGNMENT ABBREVIATIONS

CENTERLINE CURVE TABLE

NO.	RADIUS	DELTA	LENGTH	TANGENT
C1	650.00'	9°03'01"	102.67'	51.44'
C2	1500.00'	14°39'52"	383.91'	193.01'

BACK OF CURB CURVE TABLE

NO.	RADIUS	DELTA	LENGTH	TANGENT
C7	10.00'	36°52'12"	6.44'	3.33'
C8	10.00'	36°52'12"	6.44'	3.33'
C9	622.25'	9°03'01"	98.29'	49.25'
C10	677.75'	9°03'01"	107.06'	53.64'
C11	10.00'	36°52'12"	6.44'	3.33'
C12	10.00'	36°52'12"	6.44'	3.33'
C13	1476.25'	0°52'05"	22.36'	11.18'
C14	10.00'	37°06'13"	6.48'	3.36'
C15	10.00'	36°38'14"	6.39'	3.31'
C16	1472.25'	7°44'55"	199.11'	99.71'

BACK OF CURB CURVE TABLE

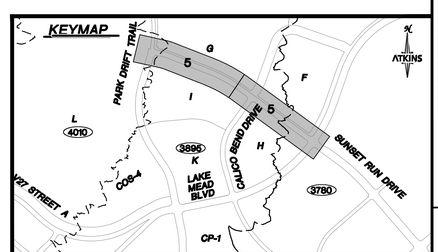
NO.	RADIUS	DELTA	LENGTH	TANGENT
C17	1527.75'	14°39'52"	391.01'	196.58'
C18	10.00'	36°38'14"	6.39'	3.31'
C19	10.00'	37°06'13"	6.48'	3.36'
C20	1476.25'	5°06'54"	131.79'	65.94'
C21	30.00'	90°00'00"	47.12'	30.00'
C22	30.00'	90°00'00"	47.12'	30.00'
C25	30.00'	89°42'37"	46.97'	29.85'
C26	30.00'	90°00'00"	47.12'	30.00'
C27	10.00'	47°32'48"	8.30'	4.40'
C28	10.00'	47°32'45"	8.30'	4.40'

BACK OF CURB CURVE TABLE

NO.	RADIUS	DELTA	LENGTH	TANGENT
C29	10.00'	47°32'45"	8.30'	4.40'
C30	10.00'	47°32'46"	8.30'	4.40'
C31	300.00'	10°36'21"	55.53'	27.85'
C32	300.00'	10°36'21"	55.53'	27.85'
C33	300.00'	13°34'17"	71.06'	35.70'
C34	300.00'	13°34'13"	71.05'	35.69'
C35	300.00'	8°54'58"	46.68'	23.39'
C36	300.00'	8°54'58"	46.68'	23.39'
C37	4.00'	179°55'26"	12.56'	6018.43'
C38	150.00'	15°42'02"	41.10'	20.68'

BACK OF CURB CURVE TABLE

NO.	RADIUS	DELTA	LENGTH	TANGENT
C39	150.00'	15°42'02"	41.10'	20.68'



GRAPHIC SCALE
50 0 25 50 100
HORIZONTAL: 1"= 50'

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REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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Henderson, Nevada 89074
Telephone: +1.702.263.7275
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PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

HORIZONTAL CONTROL PLAN
SUNSET RUN DRIVE

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: 1"=50'
VERT.: NONE

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DATE: SEPTEMBER, 2022
DRAWING NO. 5 / 69
JOB NO. 100069474B

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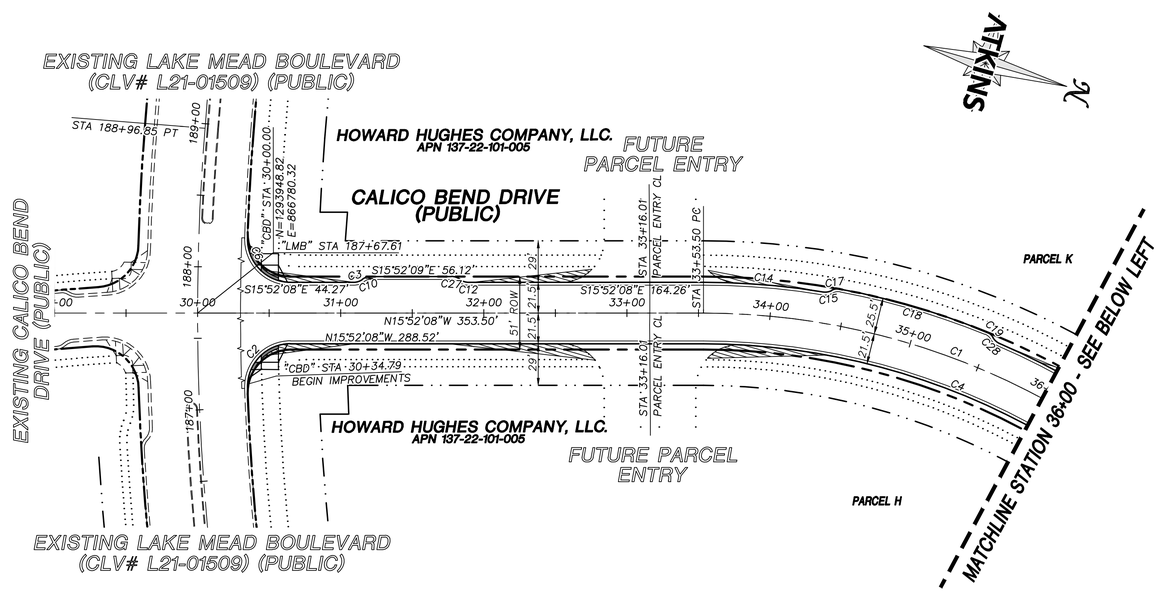

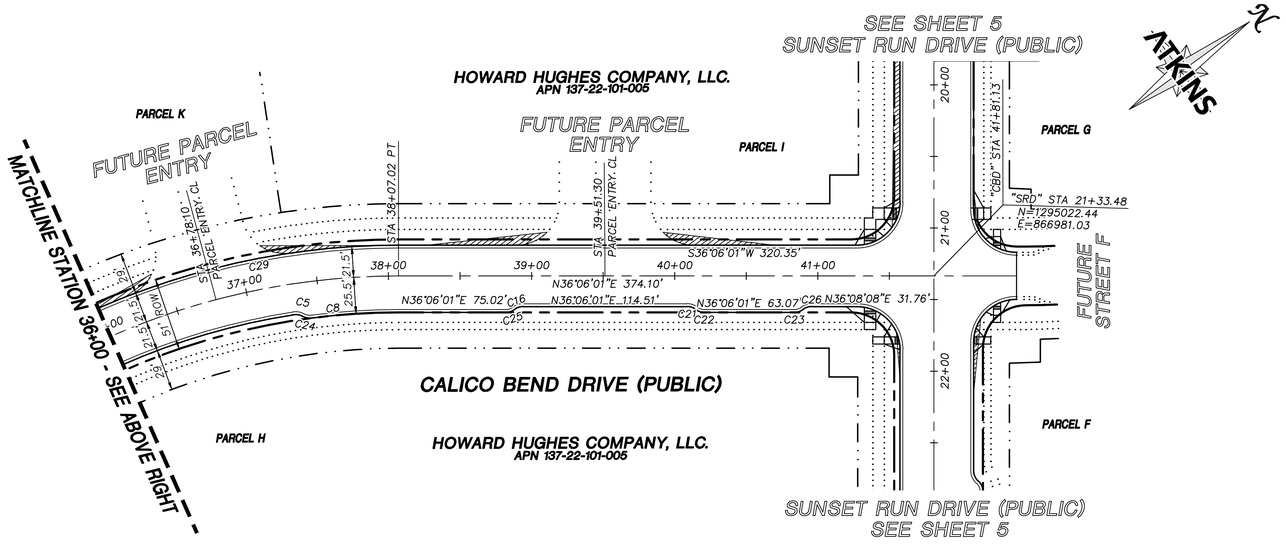

ROADWAY NOTES

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2. SEE SHEET 2 FOR ROADWAY ALIGNMENT ABBREVIATIONS

CENTERLINE CURVE TABLE

NO.	RADIUS	DELTA	LENGTH	TANGENT
C1	500.00'	51°58'10"	453.52'	243.70'

BACK OF CURB CURVE TABLE

NO.	RADIUS	DELTA	LENGTH	TANGENT
C2	30.00'	92°36'56"	48.49'	31.40'
C3	10.00'	36°52'12"	6.44'	3.33'
C4	478.50'	43°08'34"	360.30'	189.18'
C5	10.00'	37°35'51"	6.56'	3.40'
C6	30.00'	90°12'48"	47.24'	30.11'
C8	474.50'	7°23'00"	61.15'	30.62'
C10	10.00'	36°52'12"	6.44'	3.33'
C12	10.00'	36°52'12"	6.44'	3.33'
C14	521.50'	9°11'31"	83.66'	41.92'
C15	10.00'	36°13'05"	6.32'	3.27'
C16	10.00'	36°52'12"	6.44'	3.33'
C17	10.00'	37°31'54"	6.55'	3.40'
C18	525.50'	11°32'51"	105.91'	53.14'
C19	10.00'	37°31'54"	6.55'	3.40'
C21	10.00'	36°52'15"	6.44'	3.33'
C22	10.00'	36°52'13"	6.44'	3.33'
C23	10.00'	36°52'12"	6.44'	3.33'

BACK OF CURB CURVE TABLE

NO.	RADIUS	DELTA	LENGTH	TANGENT
C24	10.00'	36°09'16"	6.31'	3.26'
C25	10.00'	36°52'12"	6.44'	3.33'
C26	10.00'	36°52'12"	6.44'	3.33'
C27	10.00'	36°52'12"	6.44'	3.33'
C28	10.00'	36°13'05"	6.32'	3.27'
C29	521.50'	28°36'10"	260.34'	132.94'

GRAPHIC SCALE
50 0 25 50 100
HORIZONTAL: 1"= 50'

BASIS OF BEARING

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

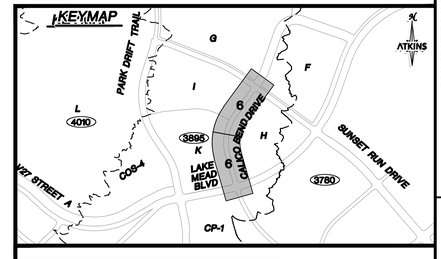
BENCHMARK

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

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

Call before you Dig AVOID OUTAGE & UNDERGROUND UTILITY CABLE CUTS. DON'T DIG. Call 811 or 1-800-642-2444

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

KEYMAP


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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27
PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

HORIZONTAL CONTROL PLAN
CALICO BEND DRIVE

00000000	DESIGNED BY: D. SMITH
L00-00000	DRAWN BY: C. HONEY
DATE: SEPTEMBER, 2022	CHECKED BY: N. BARCOS
DRAWING NO. 6 / 69	HORIZ.: 1"=50' VERT.: NONE

JOB NO. 100069474B

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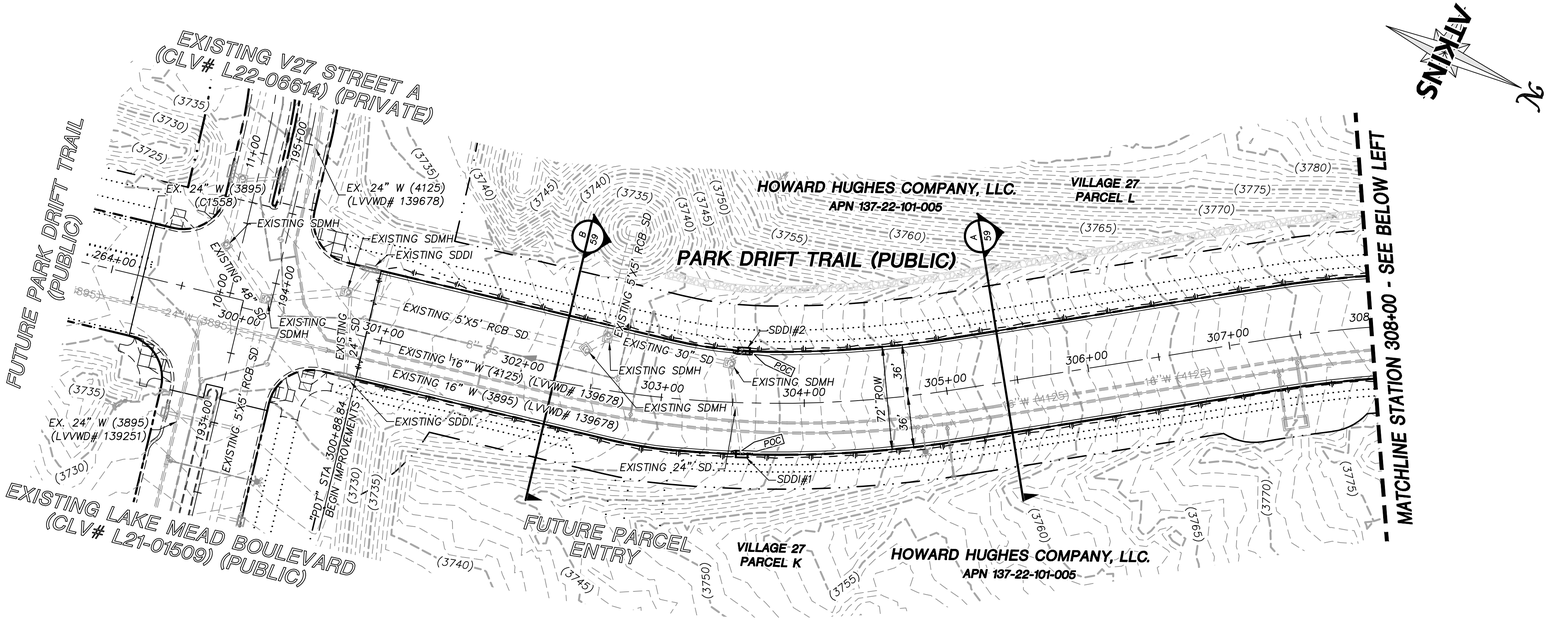

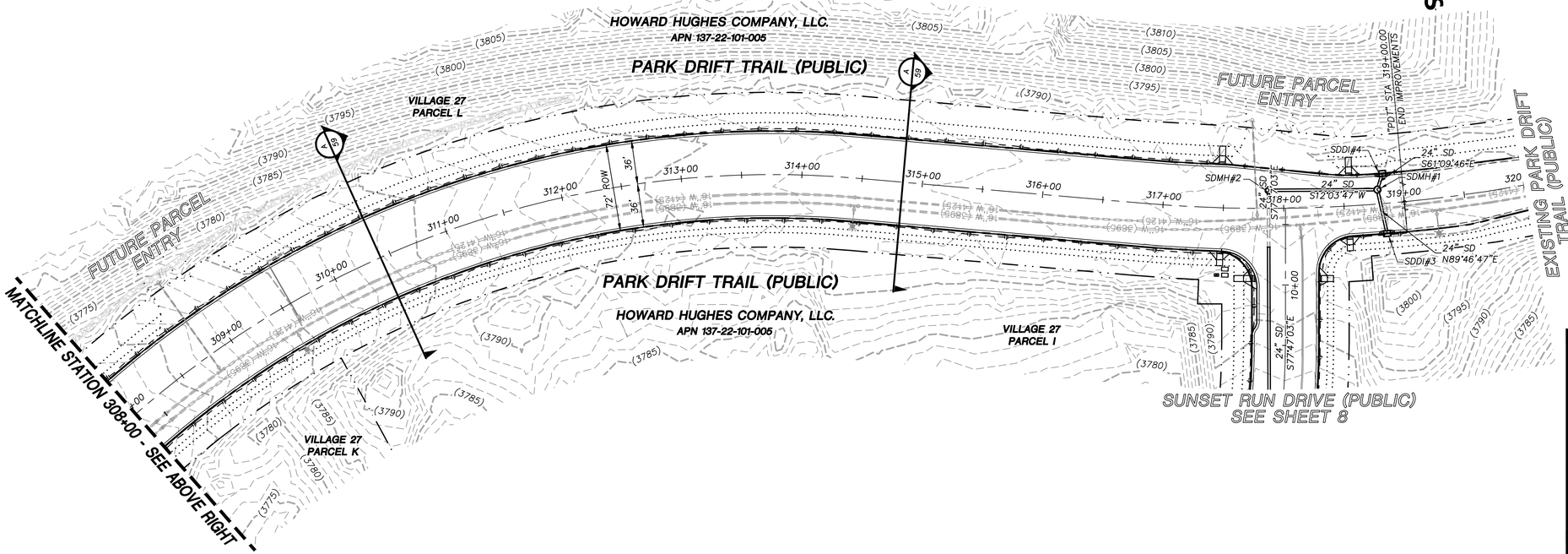

SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY	UNIT
DRAINAGE		
24" CLASS III RCP	1550	LF
30" CLASS III RCP	1230	LF
42" CLASS III RCP	10	LF
48" CLASS III RCP	180	LF
48" CLASS IV RCP	590	LF
TYPE I MANHOLE	6	EACH
TYPE III MANHOLE	8	EACH
7.5' TYPE CM DROP INLET	4	EACH
4'X4' NDOT TYPE 2 DROP INLET	2	EACH
5' TYPE CM DROP INLET	7	EACH
10' TYPE CM DROP INLET	2	EACH

MASTER PLAN NOTE

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STORM DRAIN NOTES

1. SEE PROFILE SHEETS FOR CONSTRUCTION NOTES AND INFORMATION RELATED TO PIPE SIZE (INNER DIAMETER), MANHOLE BASE SIZE (INSIDE DIMENSIONS), AND DROP INLET LENGTHS (CURB OPENING).
2. ALL STORM DRAIN MATERIAL TO BE CLASS III REINFORCED CONCRETE PIPE, UNLESS OTHERWISE NOTED IN PROFILES.
3. CONTRACTOR TO PROVIDE 6" MINIMUM OF CLEARANCE BETWEEN OUTSIDE OF PIPE TO INSIDE WALL OF STORM DRAIN STRUCTURES.

GRAPHIC SCALE
50 0 25 50 100
HORIZONTAL: 1"= 50'

SOILS REPORT

BY NOVA
PROJECT NO. G-20-059
DATED 10/7/20
EARTHWORK QUANTITIES (RAW):
CUT= 1100 CU YDS
FILL= 6700 CU YDS

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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

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T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 TRAFFIC AND GENERAL SYSTEM OF TRANSPORTATION

Call before you Dig AVOID CUTTING TELECOMMUNICATION UTILITY LINES IN CLARK COUNTY. Call 811 or 1-800-642-2444

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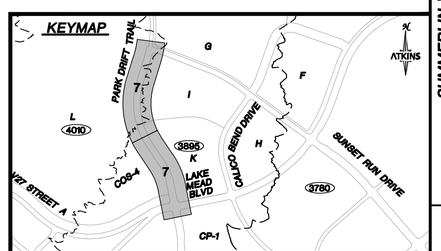

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NEVADA SIGNATURE ENGINEER STATE OF NEVADA ANTHONY LEE ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

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MASTER DRAINAGE PLAN
PARK DRIFT TRAIL

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: 1"=50'
VERT.: NONE

00000000
L00-00000
DATE: SEPTEMBER, 2022
DRAWING NO. 7 / 69
JOB NO. 100069474B

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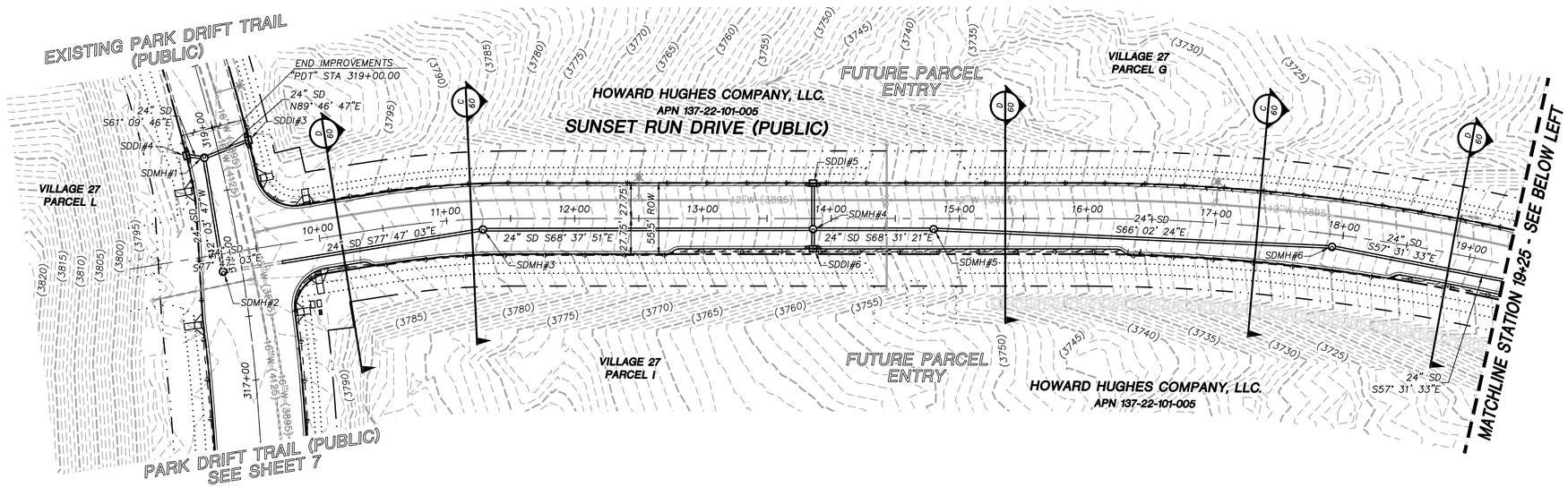

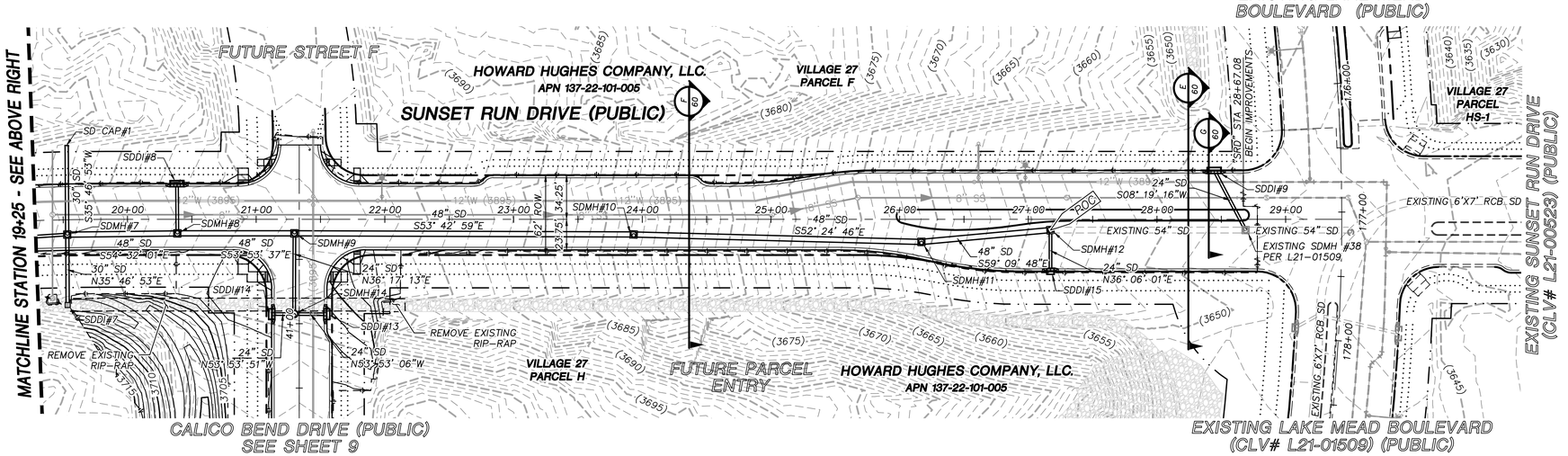

MASTER PLAN NOTE

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GRAPHIC SCALE
50 0 25 50 100
HORIZONTAL: 1"= 50'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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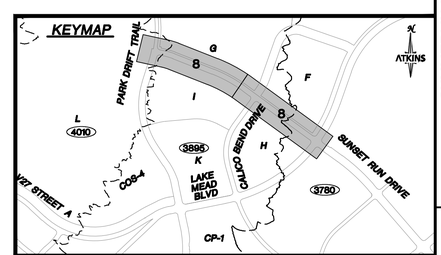
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
T21S,R59E,S03

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

Call before you Dig AVOID DIGGING IN UNKNOWN UTILITY LINES. IT'S COSTLY. Call 811 or 1-800-642-2444

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

KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

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Fax: +1.702.263.7200

SUMMERLIN

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MASTER DRAINAGE PLAN
SUNSET RUN DRIVE

00000000	DESIGNED BY: D. SMITH
L00-00000	DRAWN BY: C. HONEY
DATE: SEPTEMBER, 2022	CHECKED BY: N. BARCOS
DRAWING NO. 8 / 69	HORIZ.: 1"=50' VERT.: NONE

JOB NO. 1000694748

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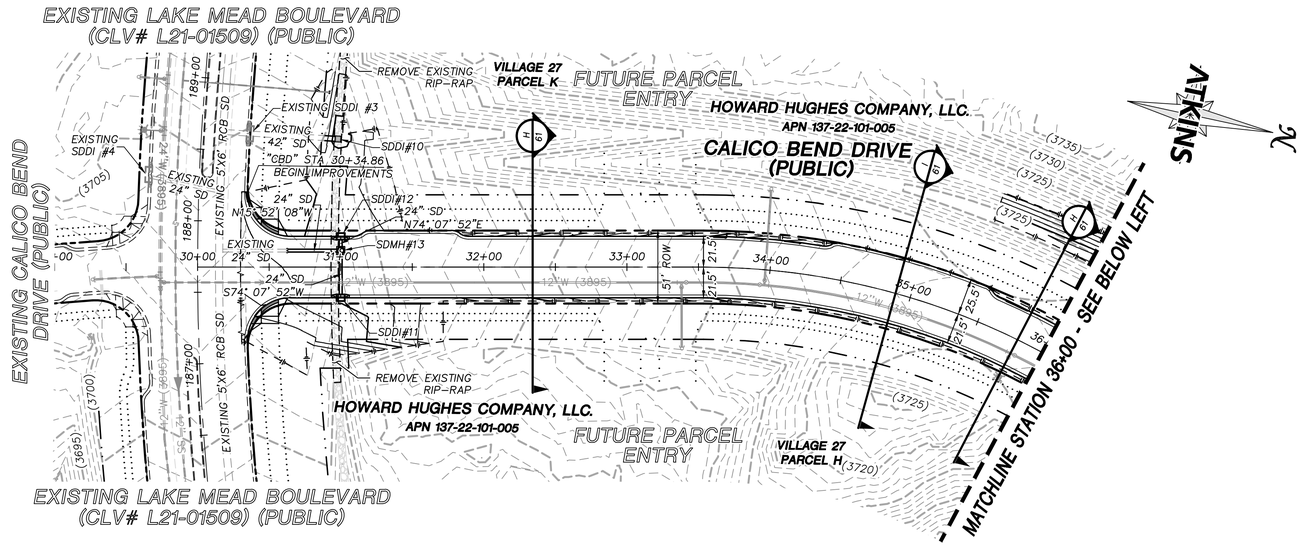

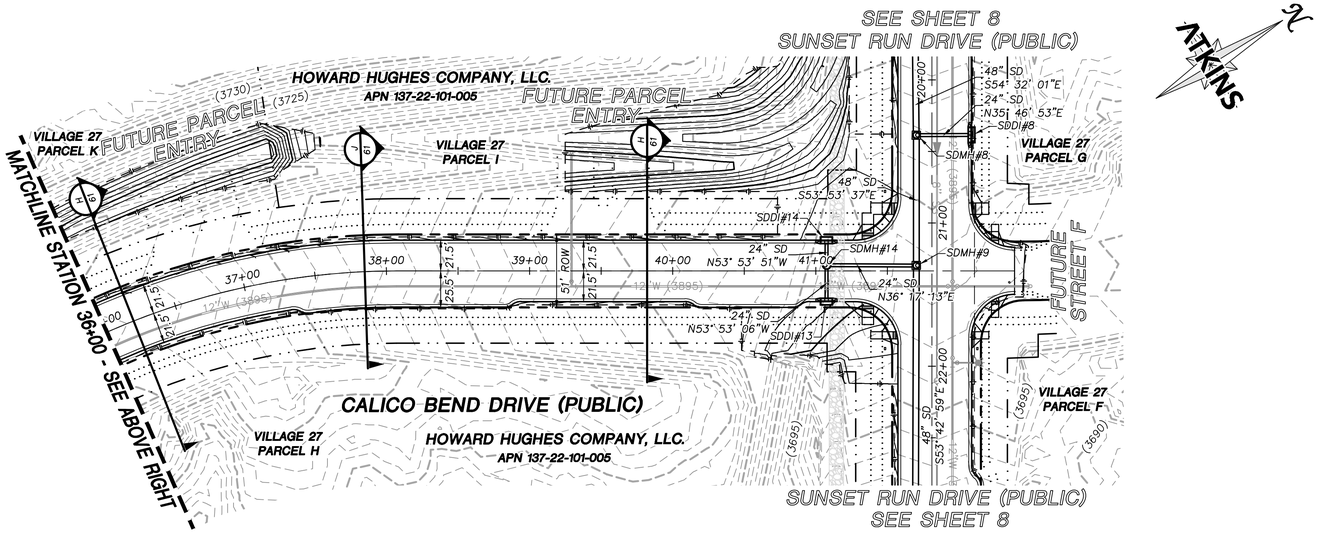

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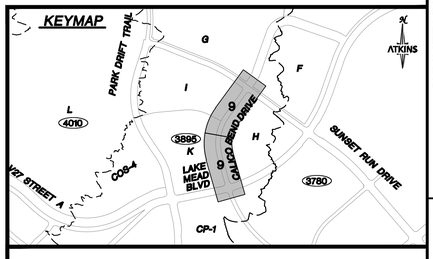

GRAPHIC SCALE
50 0 25 50 100
HORIZONTAL: 1"= 50'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

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BENCHMARK

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T21S,R59E,S03

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Call before you Dig AVOID CUTTING ALL BURIED UTILITY LINES. IT'S COSTLY. Call 811 OR 1-800-642-2444

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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY L. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REV.	DESCRIPTION	BY	DATE	APPROVAL
	REVISIONS			

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

SUMMERLIN

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MASTER DRAINAGE PLAN
CALICO BEND DRIVE

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: 1"=50'
VERT.: NONE

00000000
L00-00000

DATE: SEPTEMBER, 2022
DRAWING NO. 9/69

JOB NO. 1000694748

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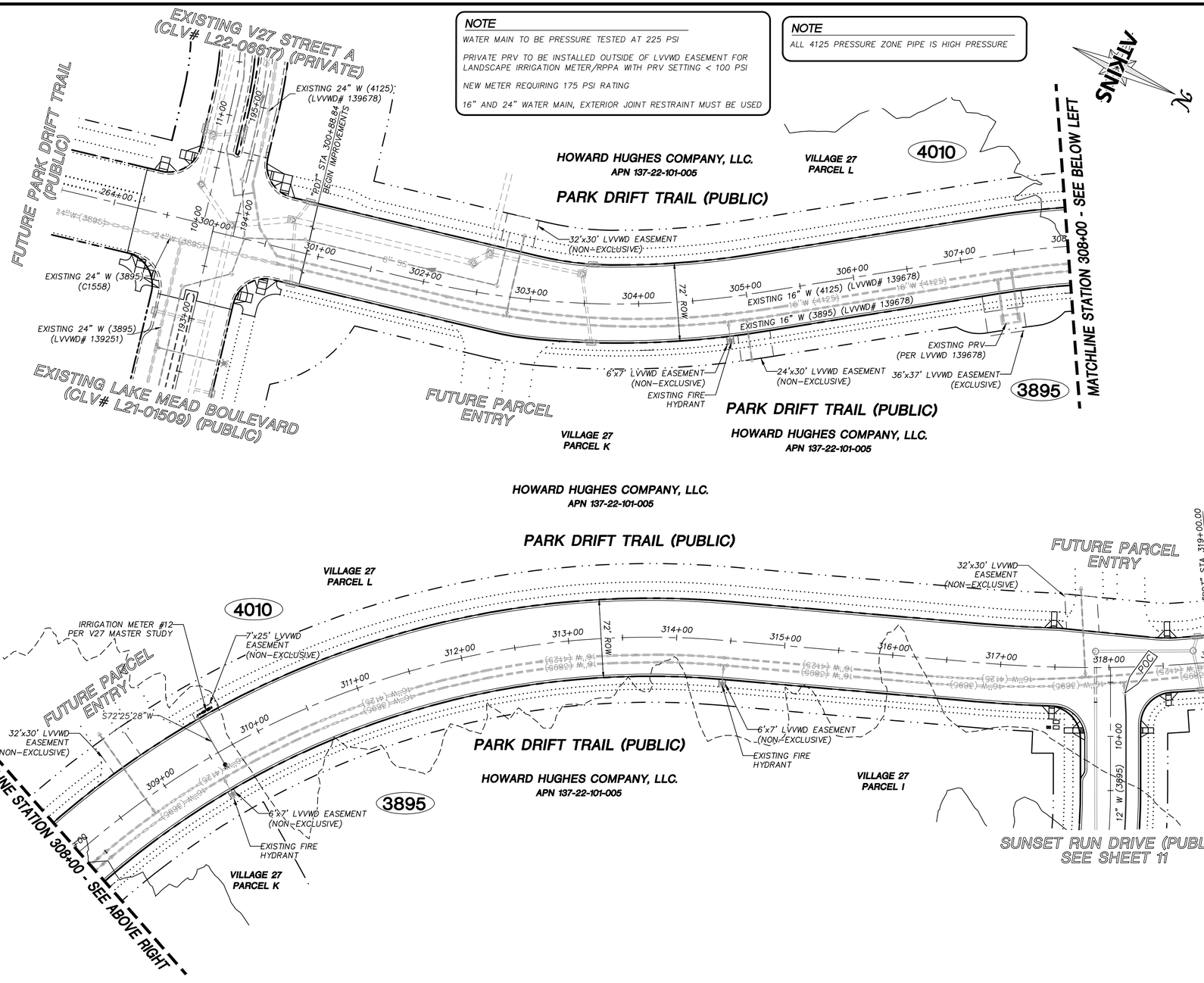

SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY	UNIT
WATER		
12" DIP	1400	LF
6" DIP	85	LF
12" C-900	2050	LF
12"X12" TEE	4	EACH
12"X12" CROSS	2	EACH
12"X6" TEE	5	EACH
16"X6" TEE	1	EACH
12" GATE VALVE	21	EACH
1.5" IRRIGATION WATER METER	2	EACH
FIRE HYDRANT ASSEMBLY	5	EACH
12" CAP W/ 2" BLOWOFF	6	EACH
IRRIGATION SLEEVES	1150	LF

MASTER PLAN NOTE

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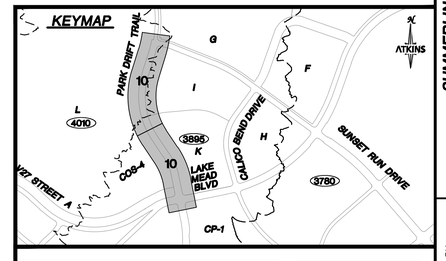
WATER NOTES

1. SEE ROAD PLAN AND PROFILE SHEETS FOR CONSTRUCTION NOTES AND INFORMATION RELATED TO PIPE SIZE, LENGTH, AND SIZE OF FITTINGS.
2. ALL WATER PIPE MATERIAL TO BE WATER QUALITY RATED AWWA DIP, UNLESS OTHERWISE NOTED IN PROFILES.
3. INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING PER UDACS PLATE #15.
4. PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.
5. SEE SHEET 68 FOR WATER DETAILS.
6. ALL DUCTILE IRON PIPE FITTINGS TO BE MECHANICALLY RESTRAINED PER UDACS 2.15.
7. CONTRACTOR TO INSTALL PIPE BENDS AS NECESSARY IN ORDER TO ACHIEVE EQUIVALENT PIPE CENTERLINE RADIUS PER UDACS SECTION 2.07 WATER MAIN JOINT DEFLECTION.
8. ALL MEASUREMENTS ARE FROM CENTER OF FITTING TO CENTER OF FITTING.
9. THIS PROJECT PROVIDES FOR THE INSTALLATION OF OFF-SITE WATER MAINS ONLY, AND DOES NOT PROVIDE OR IMPLY ANY WATER COMMITMENT.
10. ALL SEWER AND STORM DRAIN UTILITY CROSSINGS TO COMPLY WITH UDACS SECTION 2.22.
11. IN ROUGH GRADING AREAS, RIM ELEVATIONS FOR STRUCTURES ARE SET AT 8.5" ABOVE ROUGH GRADE.

IRRIGATION METER TABLE

NO.*	STA/OFF	FG ELEVATION	OWNER
11	18+87.44/30.87L	3706.75	HOA

*NOTE: METER NUMBERING SET BY SMP IRRIGATION MASTER PLAN DATED 12/12/2019



GRAPHIC SCALE
50 0 25 50 100
HORIZONTAL: 1"= 50'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE:_____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

BASIS OF BEARING

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1215,859E,503

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

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SUMMERLIN

SUMMERLIN WEST VILLAGE 27
PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

MASTER WATER PLAN
PARK DRIFT TRAIL

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: 1"=50'
VERT.: NONE

0000000000
L00-00000

DATE: SEPTEMBER, 2022

DRAWING NO. 10/69

JOB NO. 1000694748

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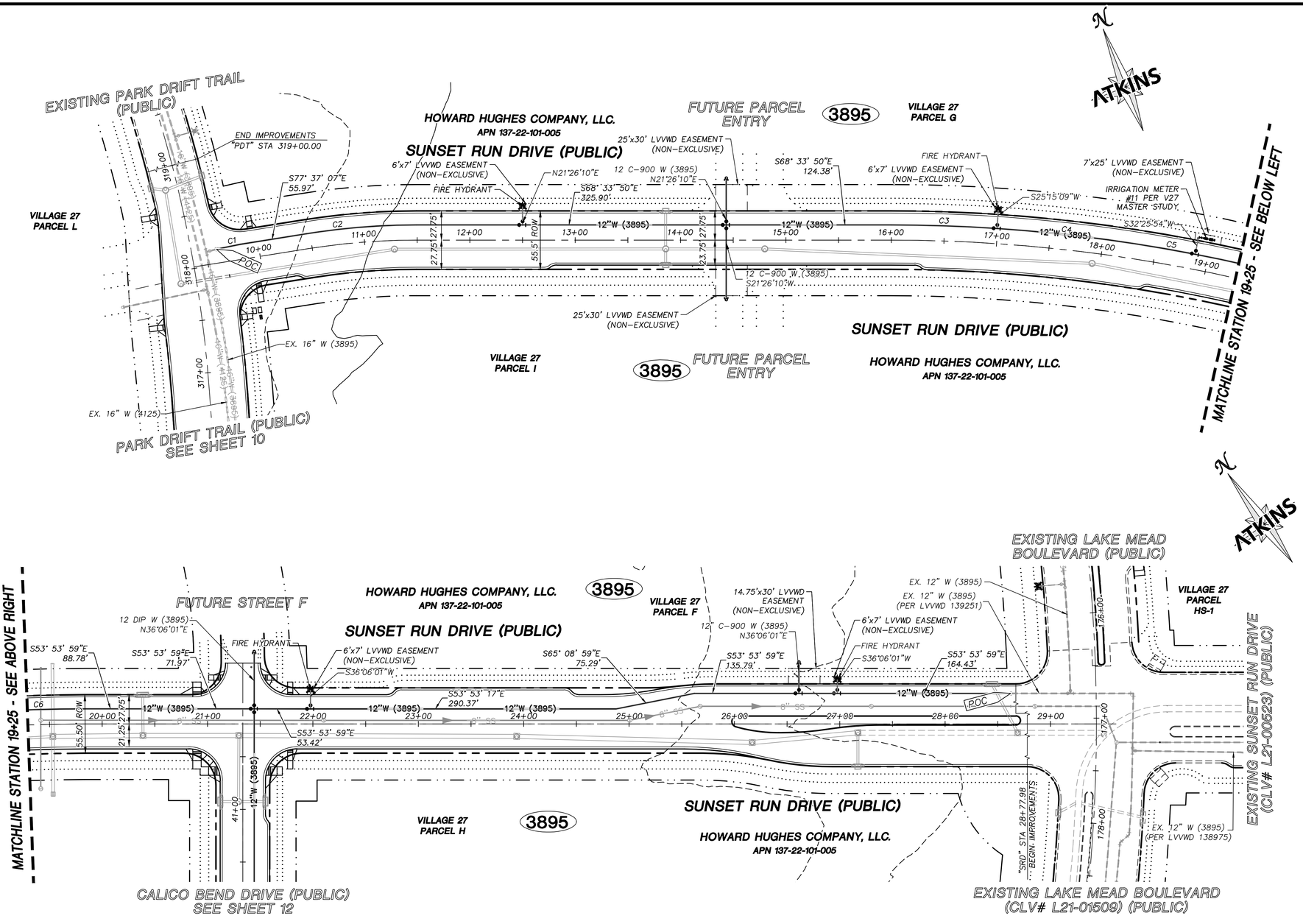

MASTER PLAN NOTE

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WATER NOTES

1. SEE ROAD PLAN AND PROFILE SHEETS FOR CONSTRUCTION NOTES AND INFORMATION RELATED TO PIPE SIZE, LENGTH, AND SIZE OF FITTINGS.
2. ALL WATER PIPE MATERIAL TO BE WATER QUALITY RATED AWWA DIP, UNLESS OTHERWISE NOTED IN PROFILES.
3. INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING PER UDACS PLATE #15.
4. PROTECT IN PLACE AND ADJUST LVVWD EXISTING FACILITIES TO FINISHED GRADE. ALL LVVWD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.
5. SEE SHEET 68 FOR WATER DETAILS.
6. ALL DUCTILE IRON PIPE FITTINGS TO BE MECHANICALLY RESTRAINED PER UDACS 2.15.
7. CONTRACTOR TO INSTALL PIPE BENDS AS NECESSARY IN ORDER TO ACHIEVE EQUIVALENT PIPE CENTERLINE RADIUS PER UDACS SECTION 2.07 WATER MAIN JOINT DEFLECTION.
8. ALL MEASUREMENTS ARE FROM CENTER OF FITTING TO CENTER OF FITTING.
9. THIS PROJECT PROVIDES FOR THE INSTALLATION OF OFF-SITE WATER MAINS ONLY, AND DOES NOT PROVIDE OR IMPLY ANY WATER COMMITMENT.
10. ALL SEWER AND STORM DRAIN UTILITY CROSSINGS TO COMPLY WITH UDACS SECTION 2.22.
11. IN ROUGH GRADING AREAS, RIM ELEVATIONS FOR STRUCTURES ARE SET AT 8.5" ABOVE ROUGH GRADE.

WATERLINE CURVE TABLE

NO.	RADIUS	DELTA	LENGTH	TANGENT
C1	484.91'	3°37'17"	30.65'	15.33'
C2	645.68'	9°18'44"	104.94'	52.59'
C3	1514.37'	3°48'45"	100.77'	50.40'
C4	1514.37'	4°59'20"	131.86'	65.97'
C5	1514.37'	2°11'26"	57.90'	28.95'
C6	1514.37'	3°40'07"	96.96'	48.50'

GRAPHIC SCALE
50 0 25 50 100
HORIZONTAL: 1"= 50'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ 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 (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

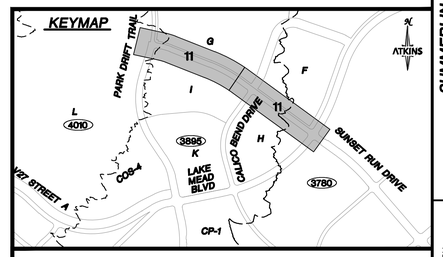
BENCHMARK

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

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

Call before you Dig AVOID CUTTING & DAMAGING UTILITY LINES. IT'S QUICK! Call 811 1-800-642-2444

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



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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTIZ EXP. 6-30-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

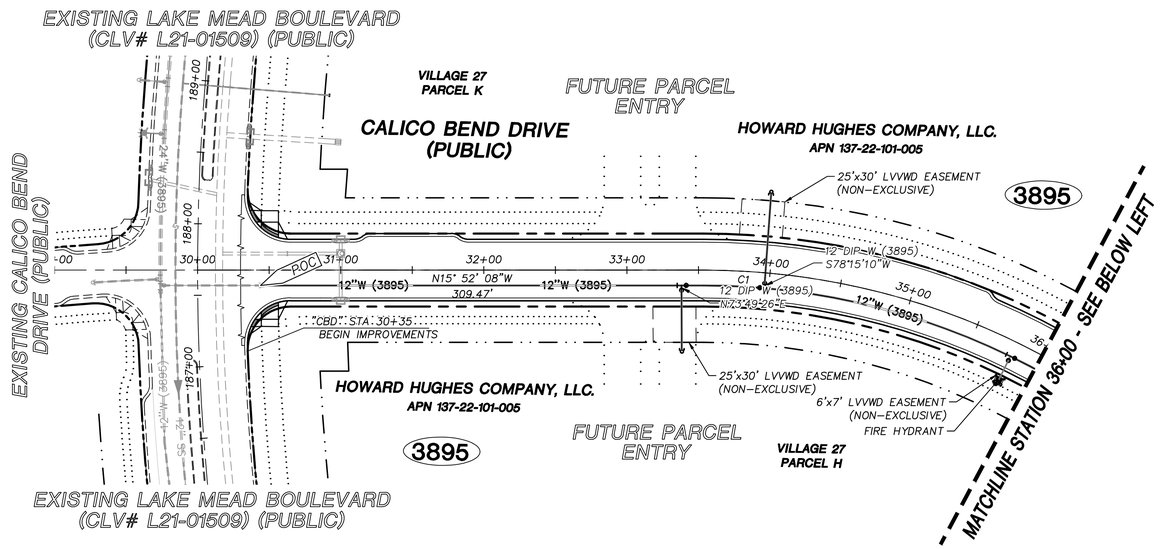
SUMMERLIN WEST VILLAGE 27
PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

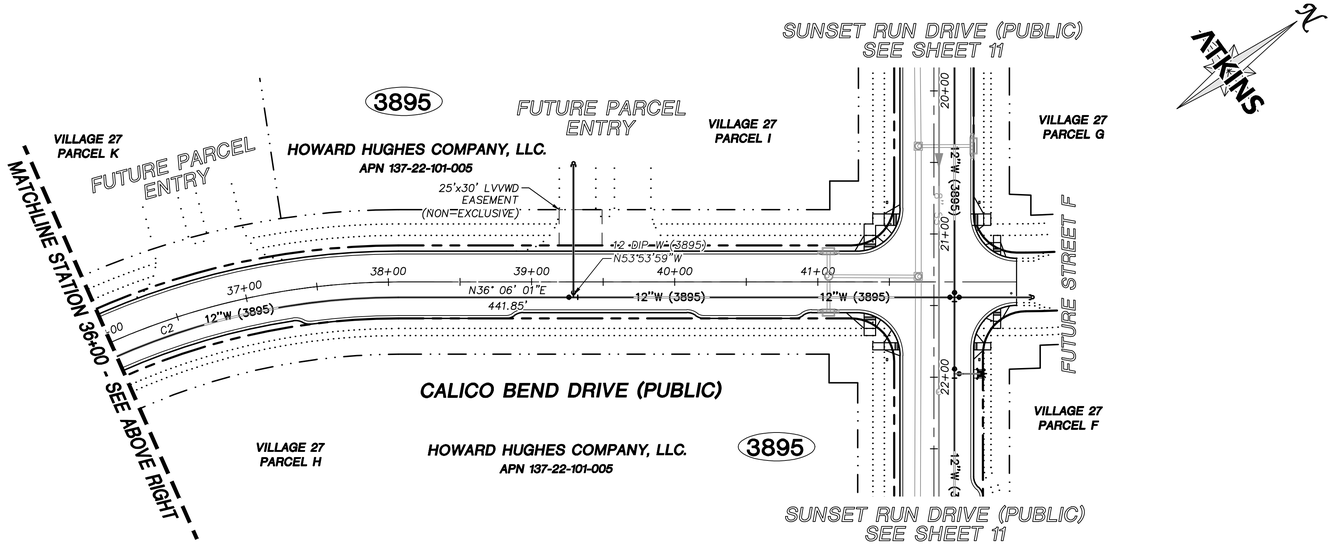
MASTER WATER PLAN
SUNSET RUN DRIVE

00000000	DESIGNED BY: D. SMITH
L00-00000	DRAWN BY: C. HONEY
DATE: SEPTEMBER, 2022	CHECKED BY: N. BARCOS
DRAWING NO. 11/69	HORIZ.: 1"=50' VERT.: NONE

JOB NO. 100069474B

C:\pw_work\ctkrom01\dms585371\6947478-07-WATR-W2.dwg LAYOUT: W2 Sep 07, 2022 - 1:56PM





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WATERLINE CURVE TABLE

NO.	RADIUS	DELTA	LENGTH	TANGENT
C1	489.25'	4°58'50"	42.53'	21.28'
C2	489.25'	46°59'19"	401.24'	212.67'

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

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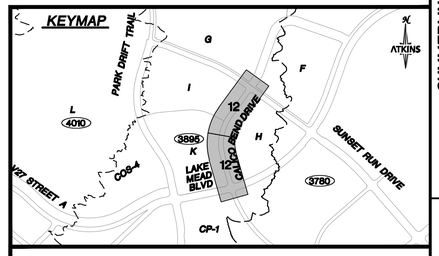
MASTER WATER PLAN
CALICO BEND DRIVE

KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA
ANTHONY L. ORTIZ
EXP. 12-31-23
CIVIL
No. 18849

GRAPHIC SCALE
50 0 25 50 100
HORIZONTAL: 1"= 50'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ 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 (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK: D368 (REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET)
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN. 1215,R59E,S03

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

Call before you Dig AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S QUICK! Call 811 or 1-800-642-2444

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

00000000	DESIGNED BY: D. SMITH
L00-00000	DRAWN BY: C. HONEY
DATE: SEPTEMBER, 2022	CHECKED BY: N. BARCOS
DRAWING NO. 12/69	HORIZ.: 1"=50' VERT.: NONE

JOB NO. 1000694748

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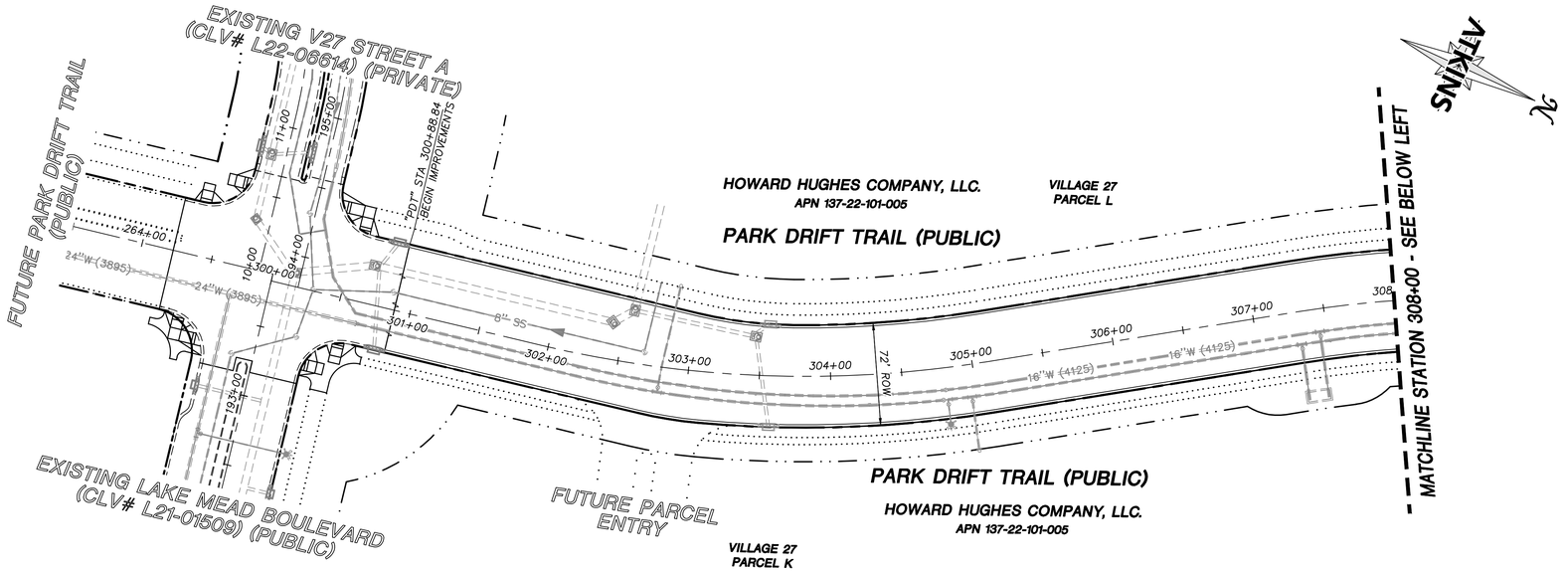

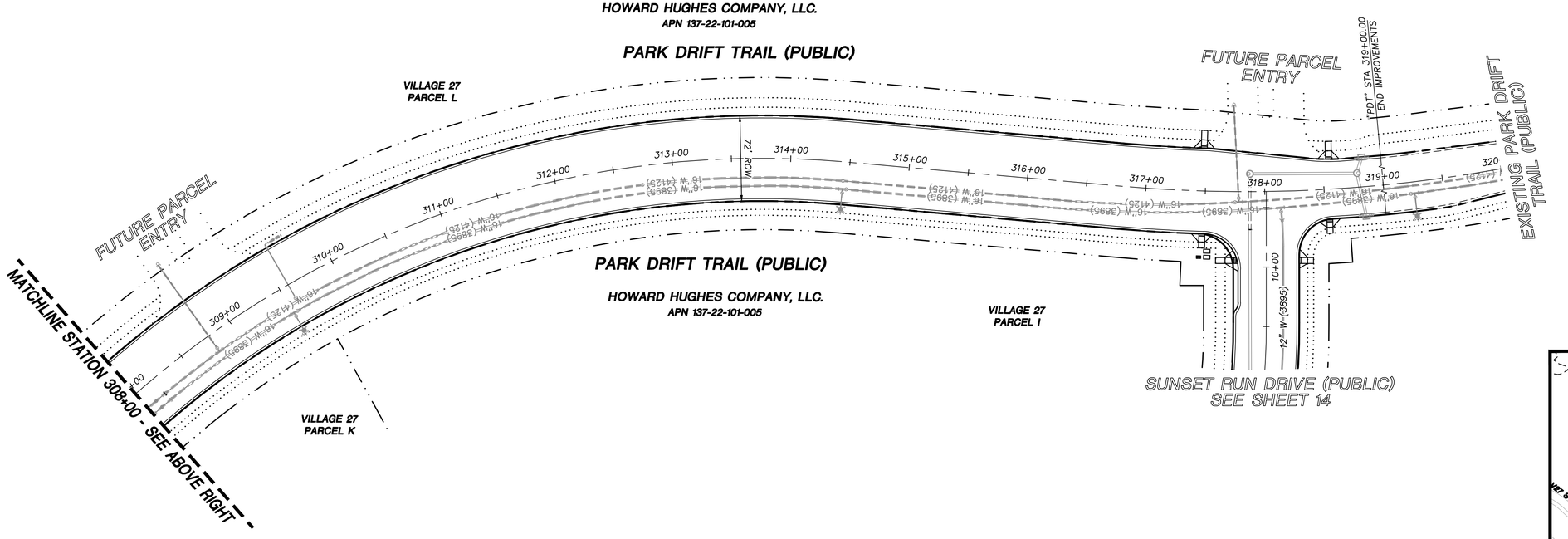

SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY	UNIT
SEWER		
8" C-900	1070	LF
SEWER CAP	1	EACH
SEWER MANHOLE	6	EACH

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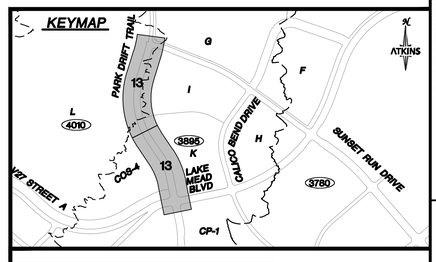
4. ALL SEWER MANHOLES GREATER THAN 20' DEEP TO BE LINED WITH CORROSION PROTECTION PER DCSCWS STANDARD PLATE SD-1.



GRAPHIC SCALE
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HORIZONTAL: 1"= 50'

BASIS OF BEARING

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NEVADA PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY L. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

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MASTER SEWER PLAN
PARK DRIFT TRAIL

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: 1"=50'
VERT.: NONE

00000000
L00-00000
DATE: SEPTEMBER, 2022
DRAWING NO. 13/69

JOB NO. 1000694748

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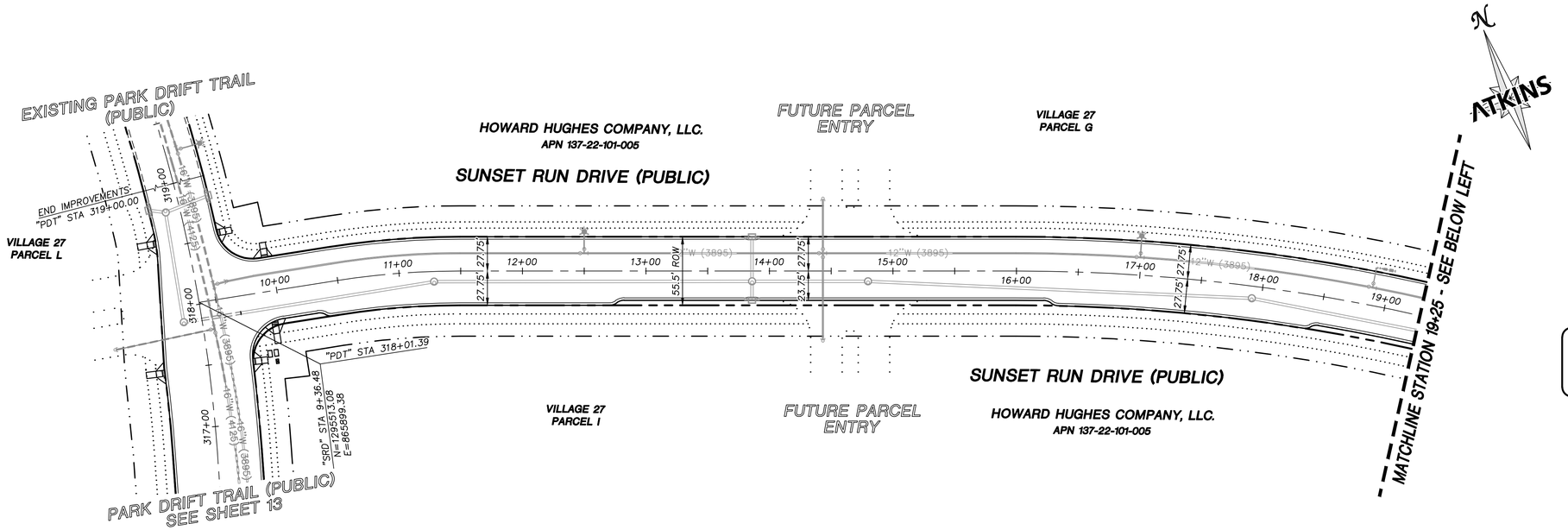

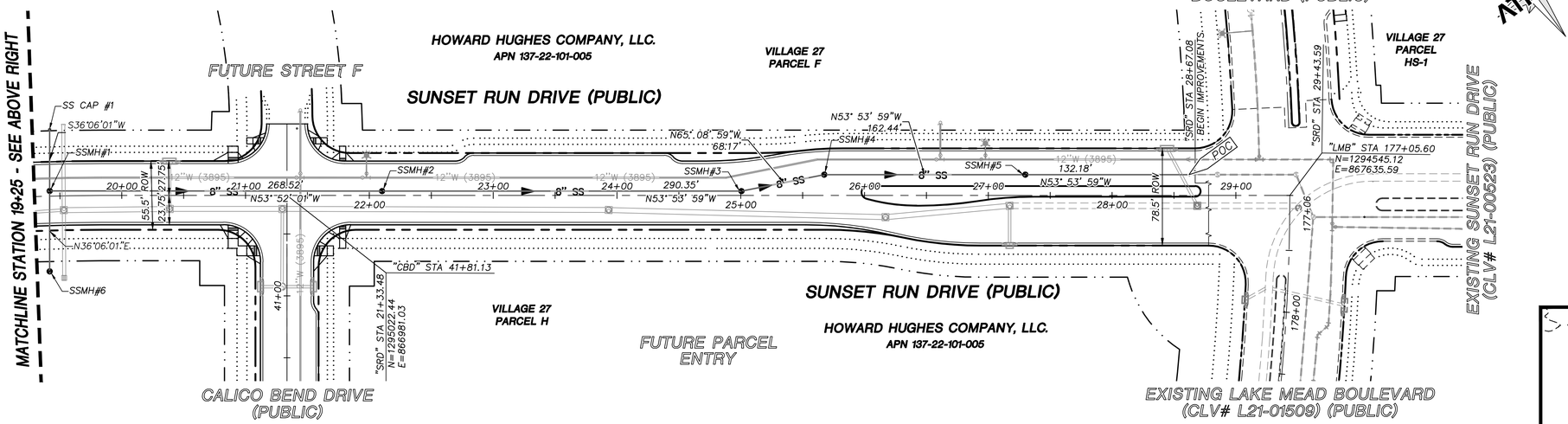

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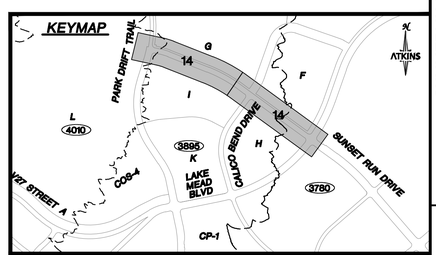

GRAPHIC SCALE
50 0 25 50 100
HORIZONTAL: 1" = 50'

BASIS OF BEARING

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T21S,R59E,S03

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Call before you Dig AVOID OUTAGES, INTERRUPTIONS & UTILITY LINES. IT'S COSTLY. Call 811 OR 1-800-642-2444

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

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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY L. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

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MASTER SEWER PLAN
SUNSET RUN DRIVE

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	1"=50'
VERT.:	NONE
00000000	
L00-00000	
DATE:	SEPTEMBER, 2022
DRAWING NO.	14/69
JOB NO.	1000694745

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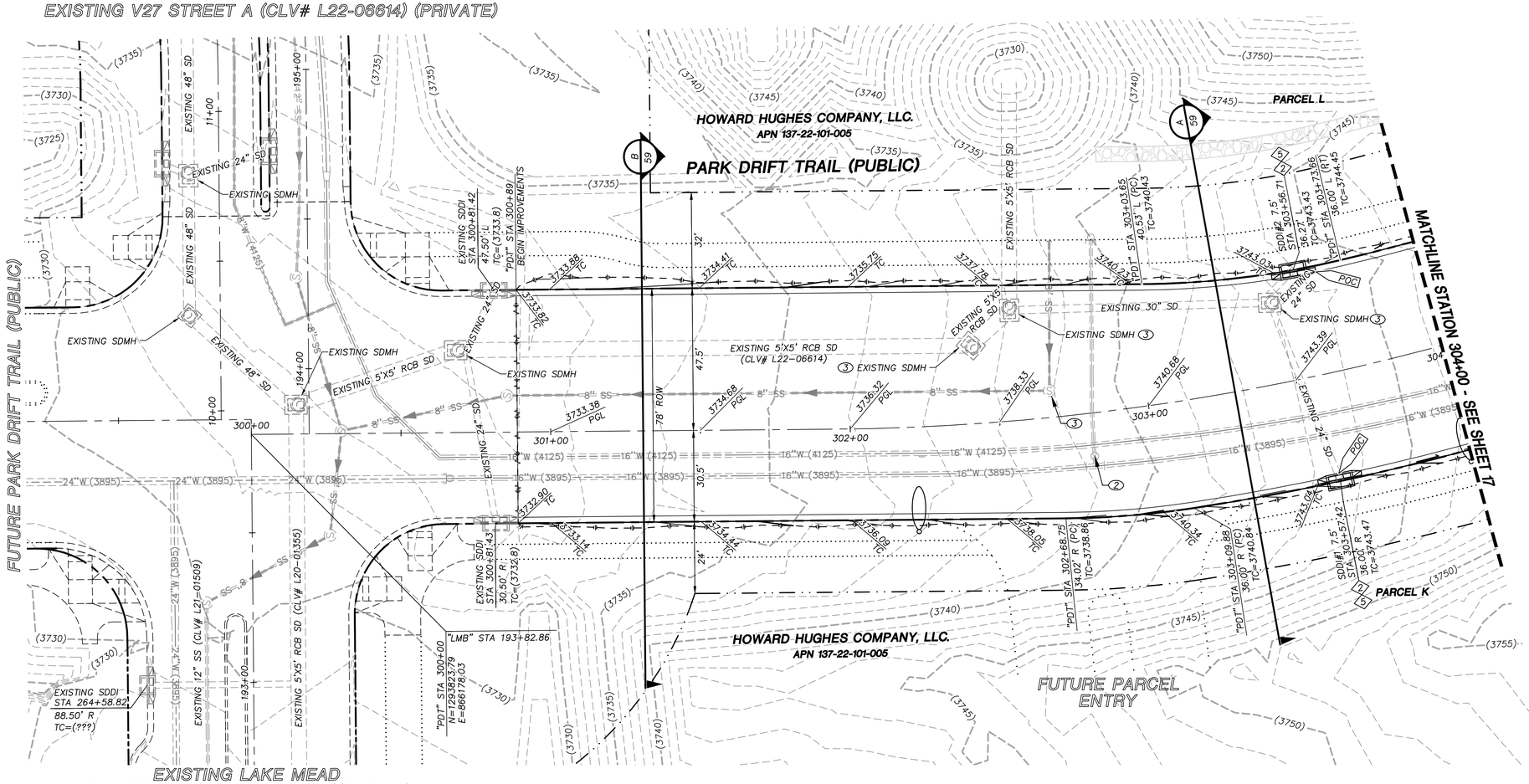

GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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T21S,R59E,S03

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

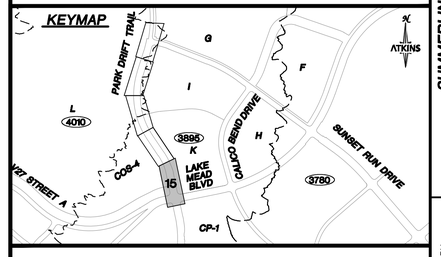
STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE 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 TYPE II SD MANHOLE PER CCAUSD #405
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
6. INSTALL RIP-RAP (D50=8", THICKNESS=24")
7. INSTALL NDOT TYPE II DROP INLET PER NDOT DS-32
8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

EXISTING UTILITY CONSTRUCTION NOTES

1. ADJUST EXISTING BLOW OFF VALVE TO GRADE
2. ADJUST EXISTING GATE VALVE TO GRADE
3. ADJUST EXISTING MANHOLE TO GRADE

KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY J. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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Telephone: +1.702.263.7275
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SUMMERLIN

SUMMERLIN WEST VILLAGE 27

PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

ROADWAY GRADING PLAN

PARK DRIFT TRAIL - BEGIN TO STA 304+00

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ: 1"=20' VERT: NONE

00000000 L00-00000

DATE: SEPTEMBER, 2022

DRAWING NO. 15/69

JOB NO. 1000694748

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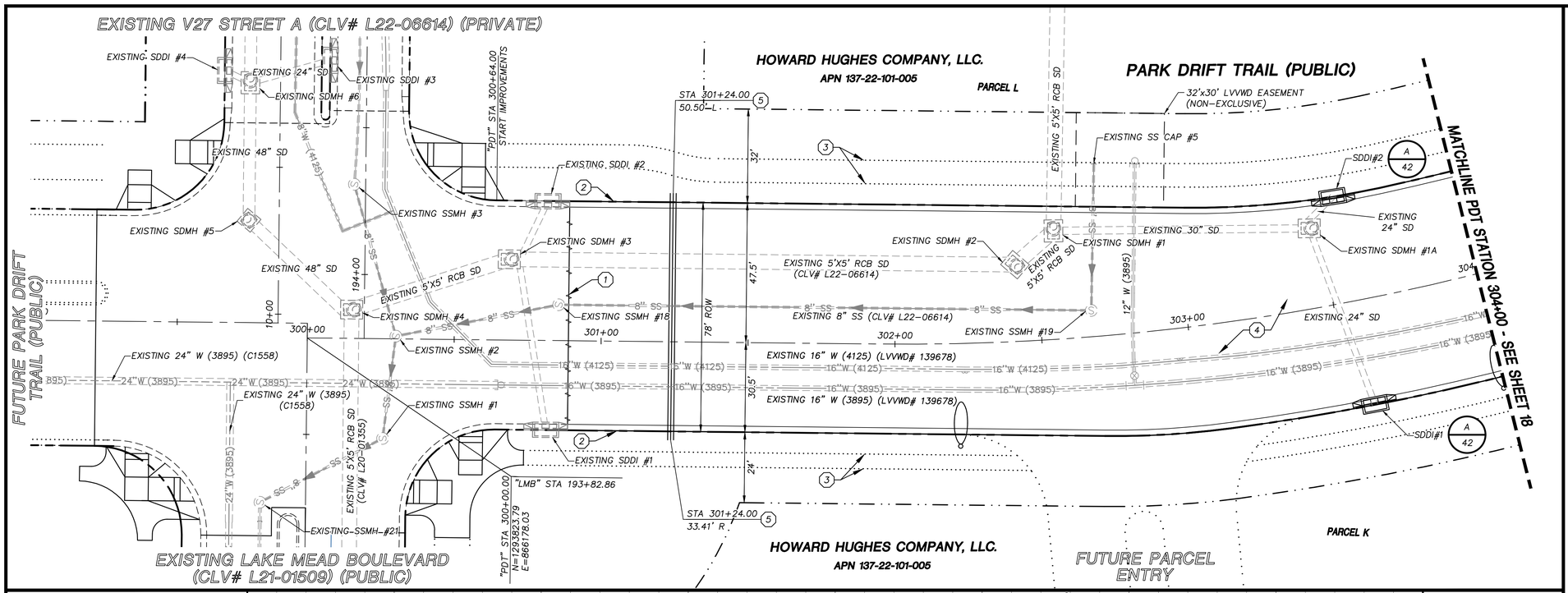

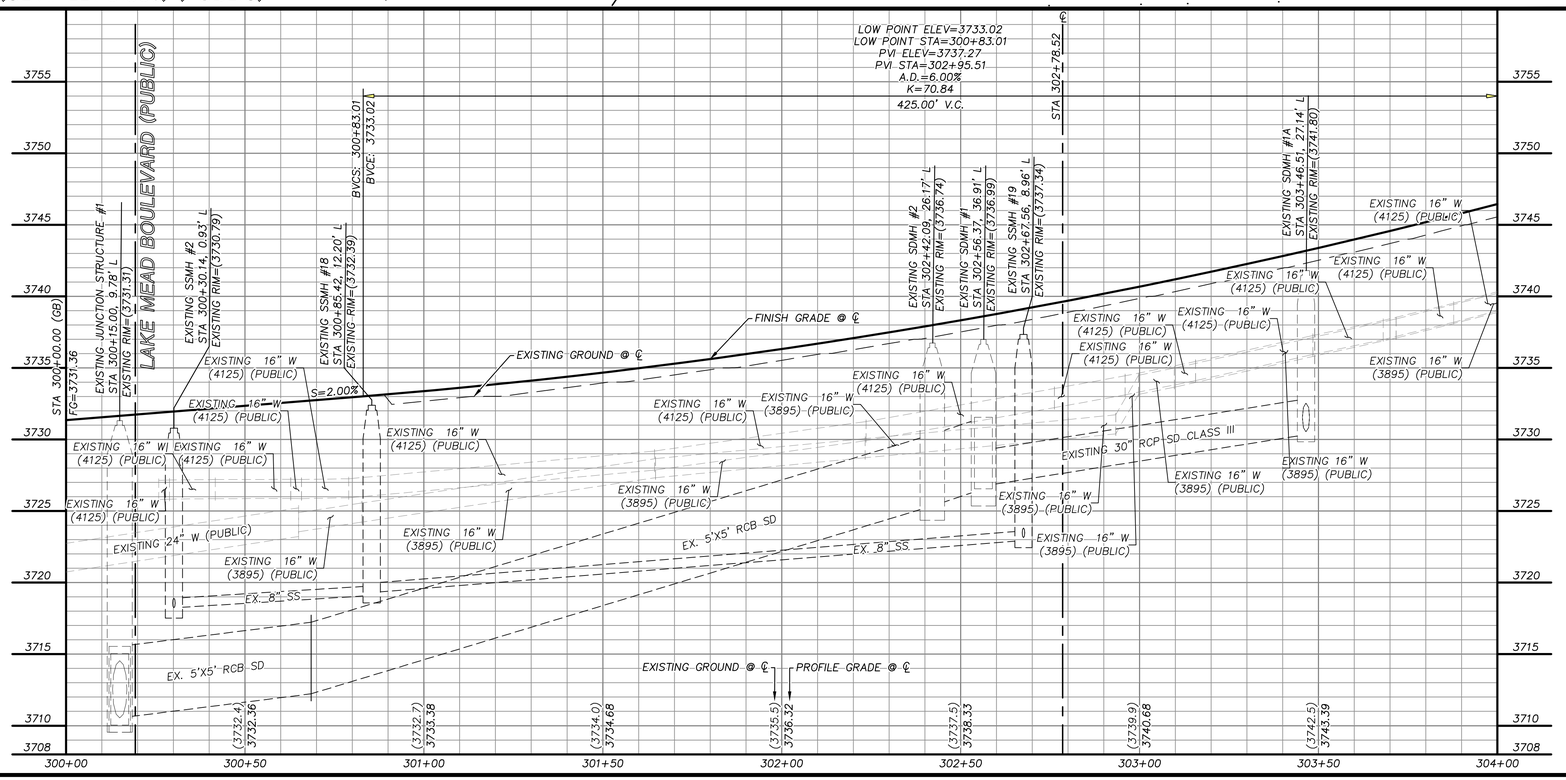

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
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4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
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6. INSTALL RIP-RAP (D50=8", THICKNESS=24")
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8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

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 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. INSTALL CORROSION PROTECTION PER 3.16.8

WATERLINE CONSTRUCTION NOTES

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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 45° VERTICAL BEND PER UDACS PLATE #31
7. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
8. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
9. INSTALL 22.5° VERTICAL BEND PER UDACS PLATE #31
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11. INSTALL 1-1/2" SERVICE SADDLE PER UDACS PLATE #4
12. INSTALL COMBINATION AIR VALVE ASSEMBLY WITH ALL APPURTENANCES PER UDACS PLATE #38
13. INSTALL 11.25° BEND PER UDACS SECTION 2.15

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEETS 59, 60, AND 61 FOR TYPICAL PAVEMENT SECTIONS
5. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL C ON SHEET 68
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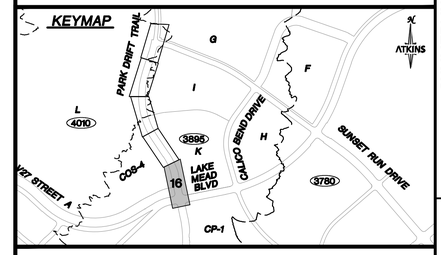
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT MODIFIED SPILLOUT CURB AND GUTTER PER CCAUSD #216 AND DETAIL F ON SHEET 67

KEYMAP



GRAPHIC SCALE

10 0 5 10 20
HORIZONTAL: 1"=20'
5 0 2.5 5 10
VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

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 (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

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

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

Call before you Dig AVOID CUTTING TELECOMMUNICATION UTILITY CABLES IN CLARK COUNTY. Call 811 or 1-800-642-2444

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

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

NEVADA PROFESSIONAL ENGINEER ANTHONY J. ORTIZ EXP. 12-31-23 CIVIL No. 18849 STATE OF NEVADA

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27
PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

ROADWAY PLAN & PROFILE
PARK DRIFT TRAIL - BEGIN TO STA 304+00

00000000	DESIGNED BY: D. SMITH
L00-00000	DRAWN BY: C. HONEY
DATE: SEPTEMBER, 2022	CHECKED BY: N. BARCOS
DRAWING NO. 16/69	HORIZ.: 1"=20' VERT.: 1"=4'

JOB NO. 100069474B

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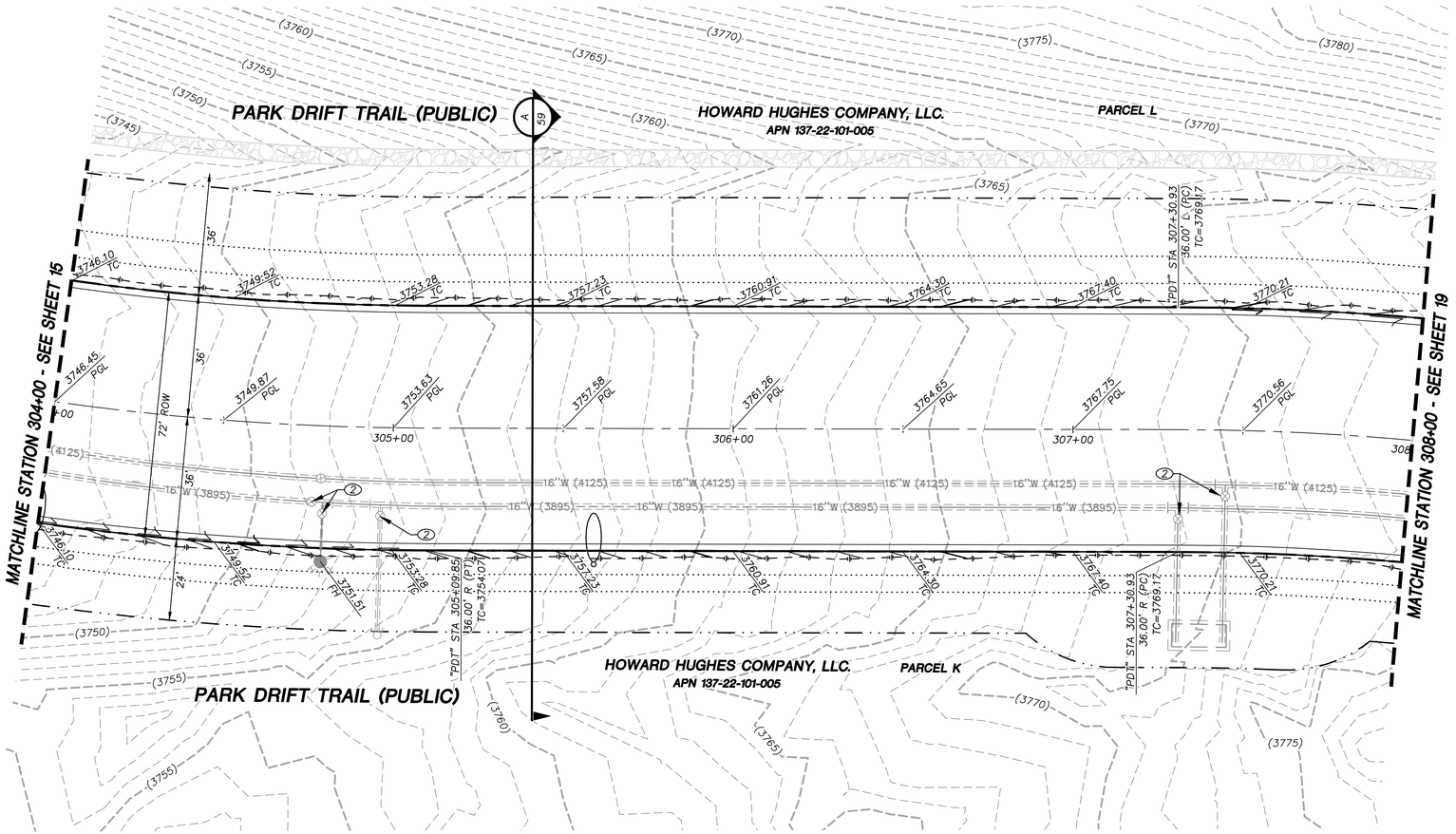

GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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

BENCHMARK

CITY OF LAS VEGAS BENCHMARK: D368
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(3,246.63 FEET)
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T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 TRAFFIC AND INTERNAL SYSTEM OF TRANSPORTATION

Call before you Dig AVOID CUTTING NEIGHBORHOOD UTILITY LINES. DON'T DO IT. Call 811 OR 1-800-642-2444

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

STORM DRAIN CONSTRUCTION NOTES

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2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
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9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

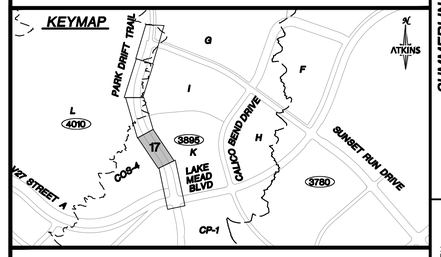
EXISTING UTILITY CONSTRUCTION NOTES

1. ADJUST EXISTING BLOW OFF VALVE TO GRADE
2. ADJUST EXISTING GATE VALVE TO GRADE
3. ADJUST EXISTING MANHOLE TO GRADE

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTIZ EXP. 12-31-23 CIVIL No. 18849

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

SUMMERLIN

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ROADWAY GRADING PLAN

PARK DRIFT TRAIL - STA 304+00 TO STA 308+00

00000000	DESIGNED BY: D. SMITH
L00-00000	DRAWN BY: C. HONEY
DATE: SEPTEMBER, 2022	CHECKED BY: N. BARCOS
DRAWING NO. 17/69	HORIZ.: 1"=20' VERT.: NONE

JOB NO. 100069474B

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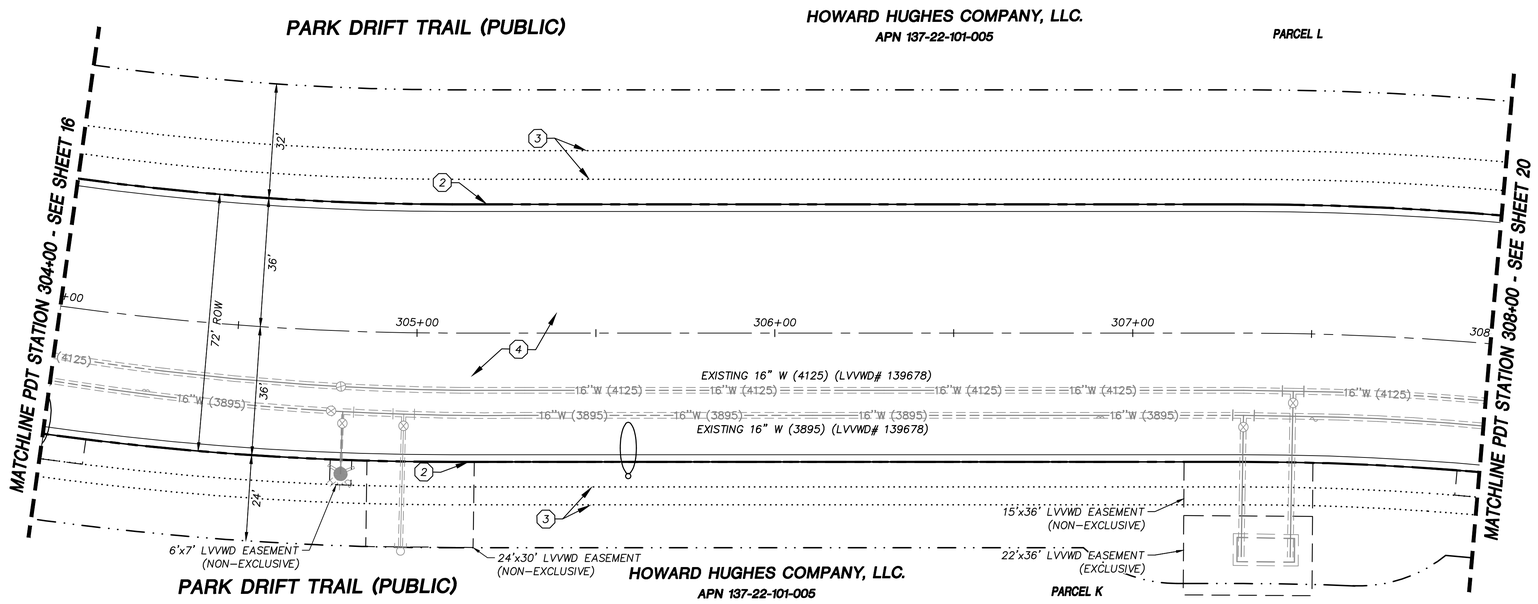

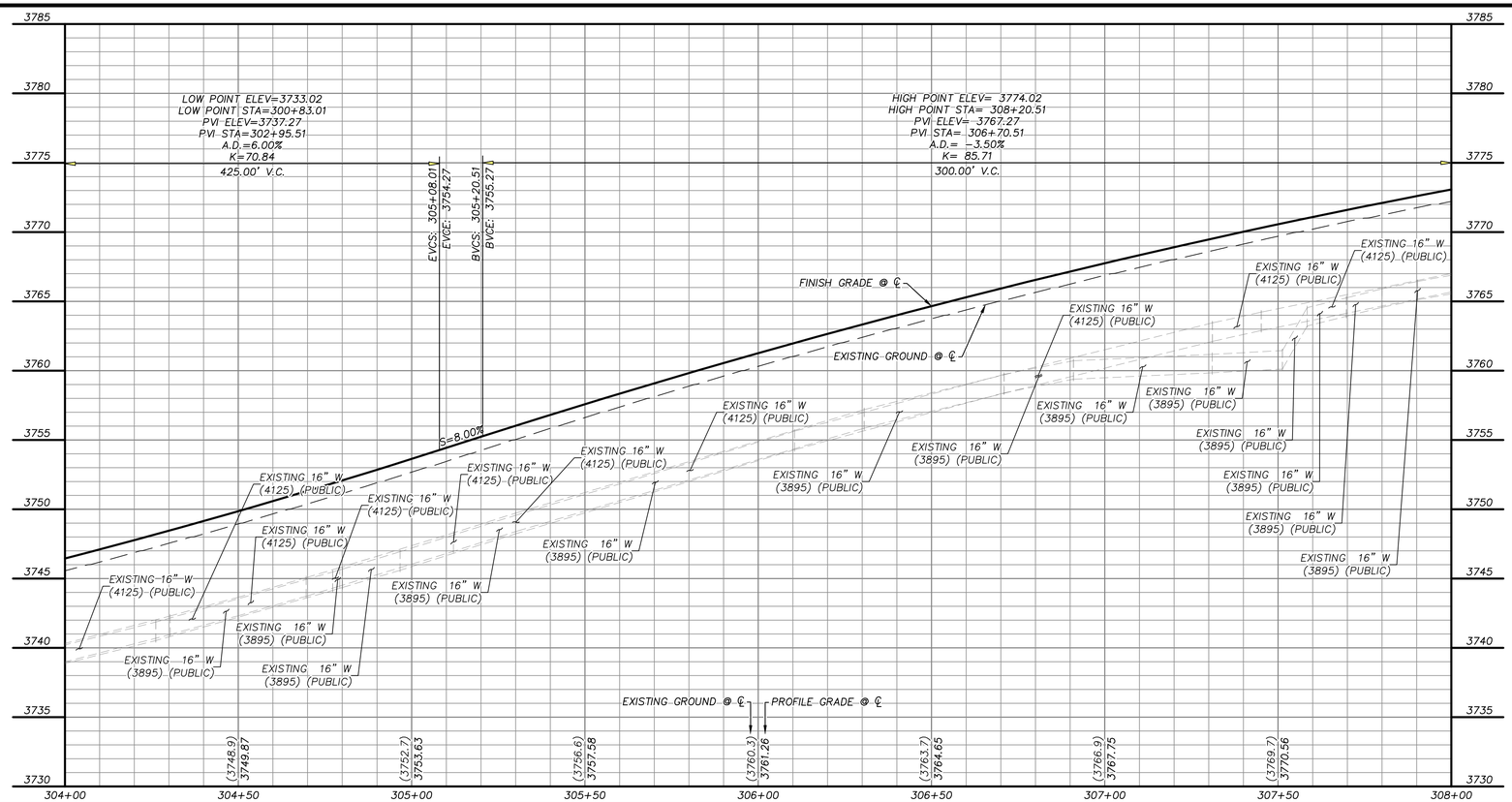

GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

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 (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

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T21S,R59E,S03

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Call before you Dig AVOID OUTAGES, HAZARDS AND UTILITY DAMAGE FINES. Call 811 or 1-800-642-2444

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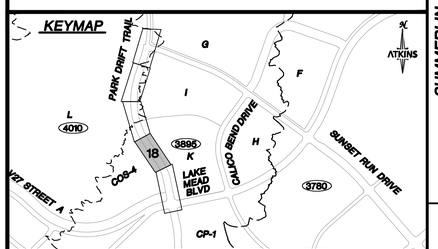
KEYMAP



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NEVADA PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27

PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

PARK DRIFT TRAIL - STA 304+00 TO STA 308+00

ROADWAY PLAN & PROFILE

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	1"=20'
VERT.:	1"=4'
00000000	
L00-00000	
DATE:	SEPTEMBER, 2022
DRAWING NO.	18/69

JOB NO. 100069474B

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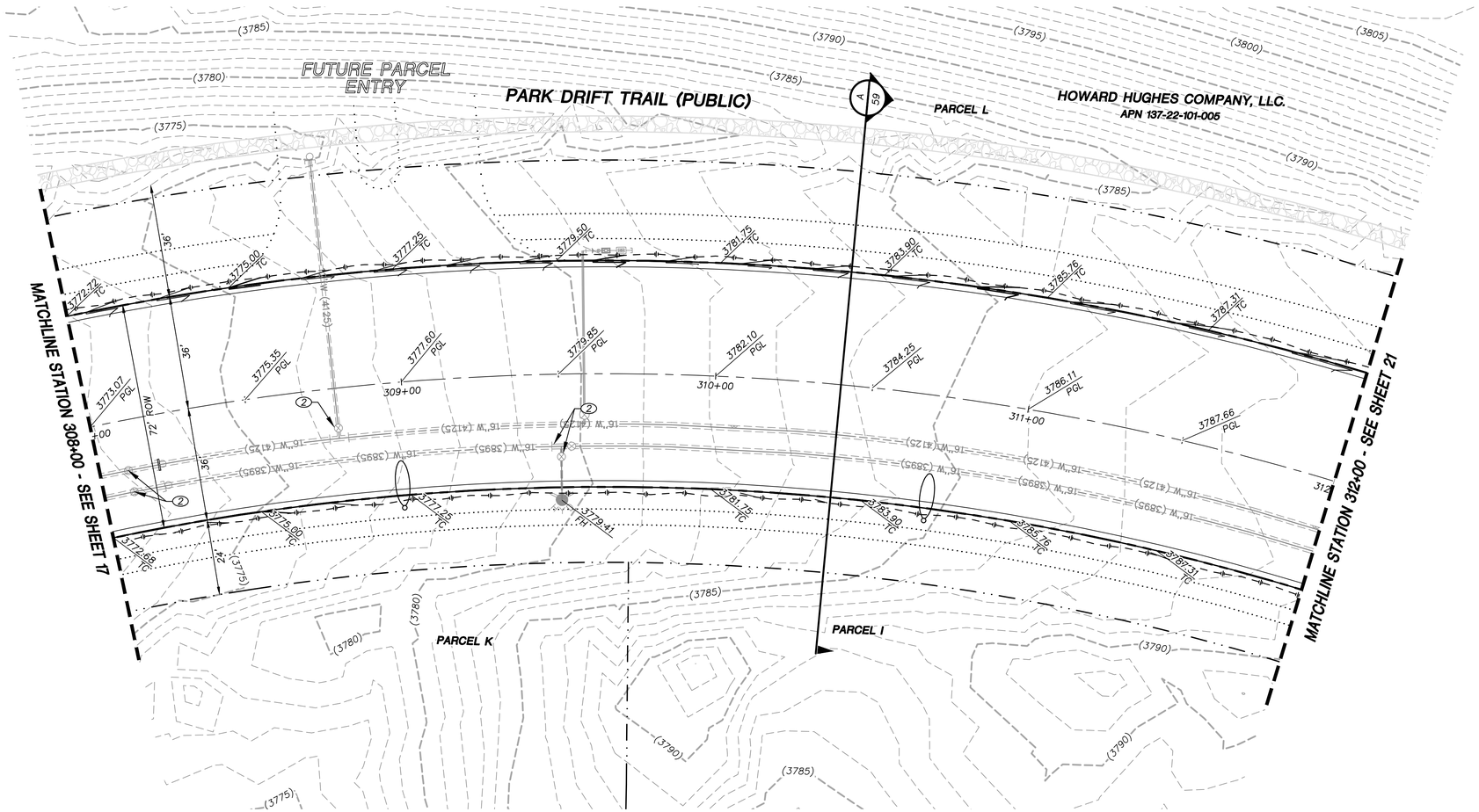

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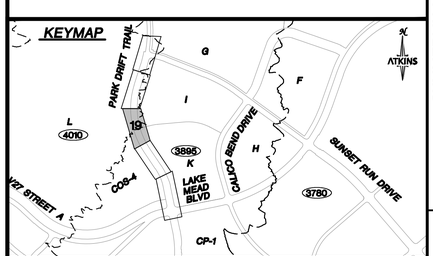
REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL



GRAPHIC SCALE
10 0 5 10 20
HORIZONTAL: 1"=20'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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

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(REVISED 2008)
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FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
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ATKINS
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ROADWAY GRADING PLAN
PARK DRIFT TRAIL - STA 308+00 TO STA 312+00

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	1"=20'
VERT.:	NONE
00000000	
L00-00000	
DATE:	SEPTEMBER, 2022
DRAWING NO.	19/69

JOB NO. 1000694748

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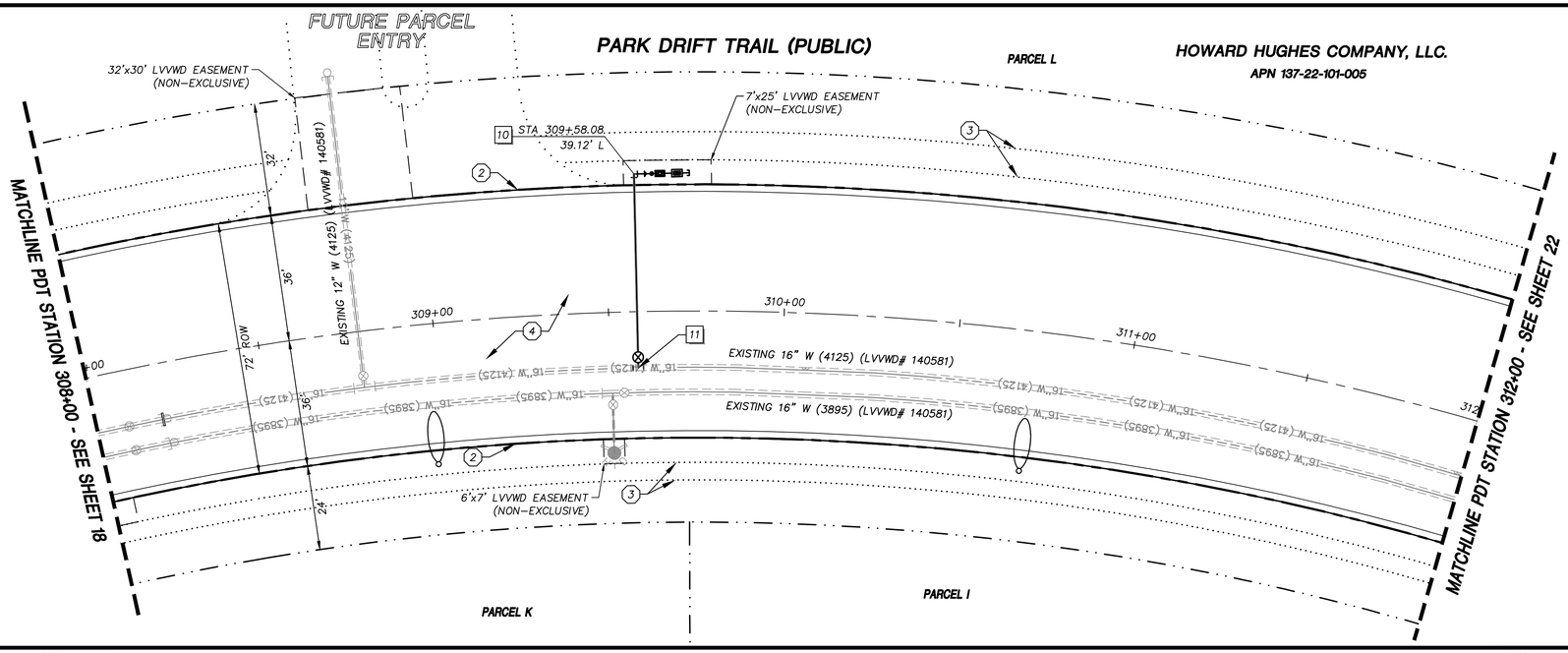

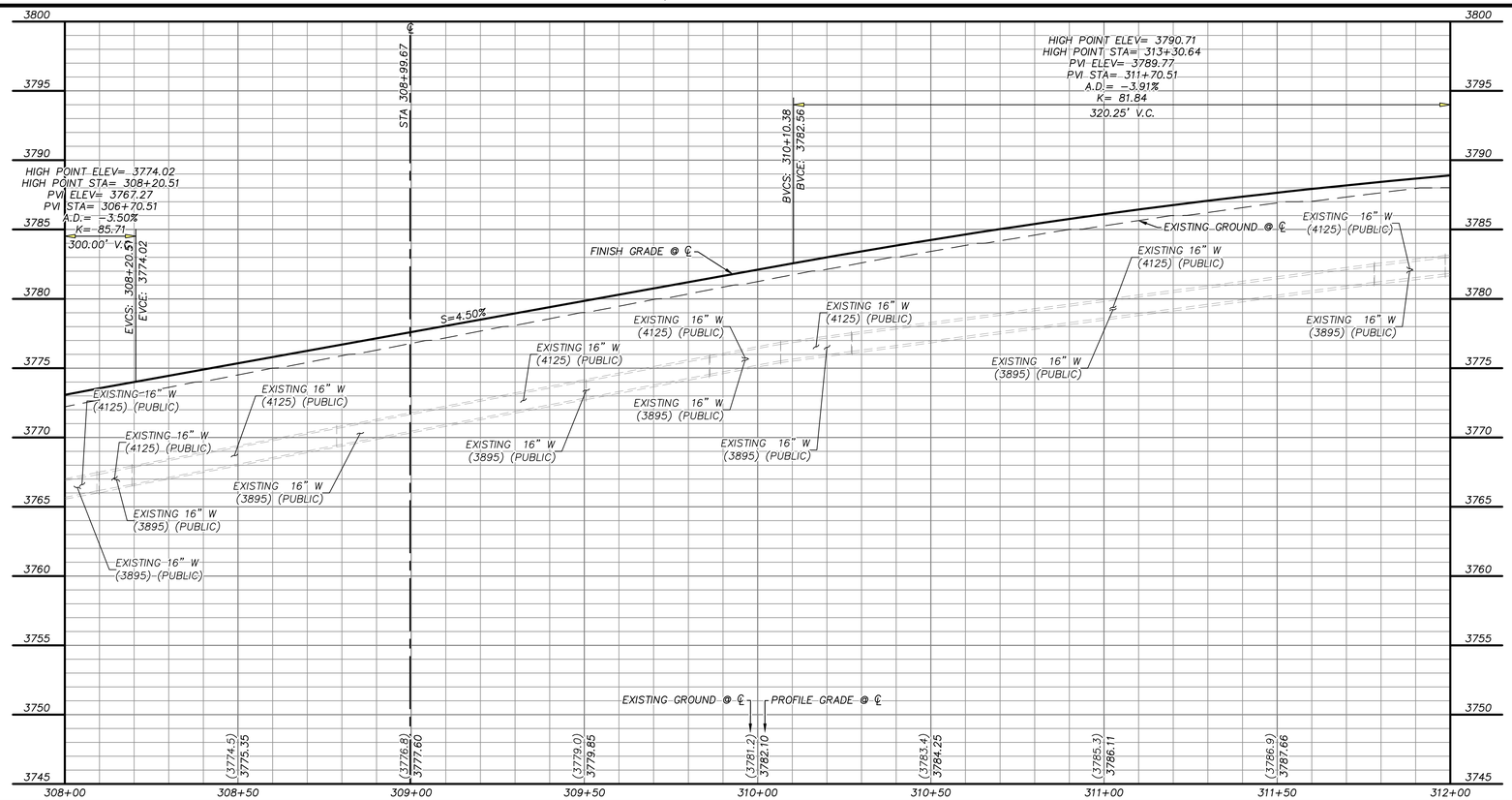

GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

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 (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

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

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

Call before you Dig AVOID CUTTING HYDROVACUUM UTILITY LINES. ITS COURTLY. Call 811 OR 1-800-642-2444

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STORM DRAIN CONSTRUCTION NOTES

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2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
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4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
6. INSTALL RIP-RAP (D50=8", THICKNESS=24")
7. INSTALL NDOT TYPE II DROP INLET PER NDOT DS-32
8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

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 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. INSTALL CORROSION PROTECTION PER 3.16.8

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 45° VERTICAL BEND PER UDACS PLATE #31
7. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
8. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
9. INSTALL 22.5° VERTICAL BEND PER UDACS PLATE #31
10. INSTALL 1-1/2" IRRIGATION METER WITH 1-1/2" RPPA PER UDACS PLATES #4 AND #8 WITH CURB STOP PER DETAIL D ON SHEET 68
11. INSTALL 1-1/2" SERVICE SADDLE PER UDACS PLATE #4
12. INSTALL COMBINATION AIR VALVE ASSEMBLY WITH ALL APPURTENANCES PER UDACS PLATE #38
13. INSTALL 11.25° BEND PER UDACS SECTION 2.15

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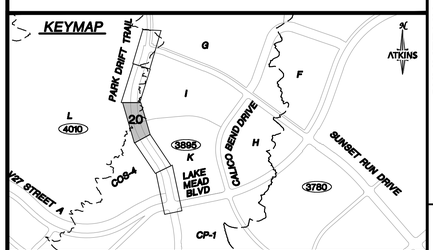
1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEETS 59, 60, AND 61 FOR TYPICAL PAVEMENT SECTIONS
5. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL C ON SHEET 68
6. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN CS-3B (A=B=6.5').
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT MODIFIED SPILLOUT CURB AND GUTTER PER CCAUSD #216 AND DETAIL F ON SHEET 67

KEYMAP



REV.	DESCRIPTION	BY	DATE	APPROVAL

REVISIONS

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27
PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD),
SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD),
AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

ROADWAY PLAN & PROFILE
PARK DRIFT TRAIL - STA 308+00 TO STA 312+00

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: 1"=20'
VERT.: 1"=4'

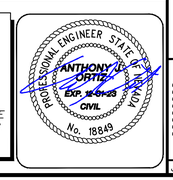
00000000
L00-00000

DATE: SEPTEMBER, 2022

DRAWING NO. 20/69

JOB NO. 1000694748

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.



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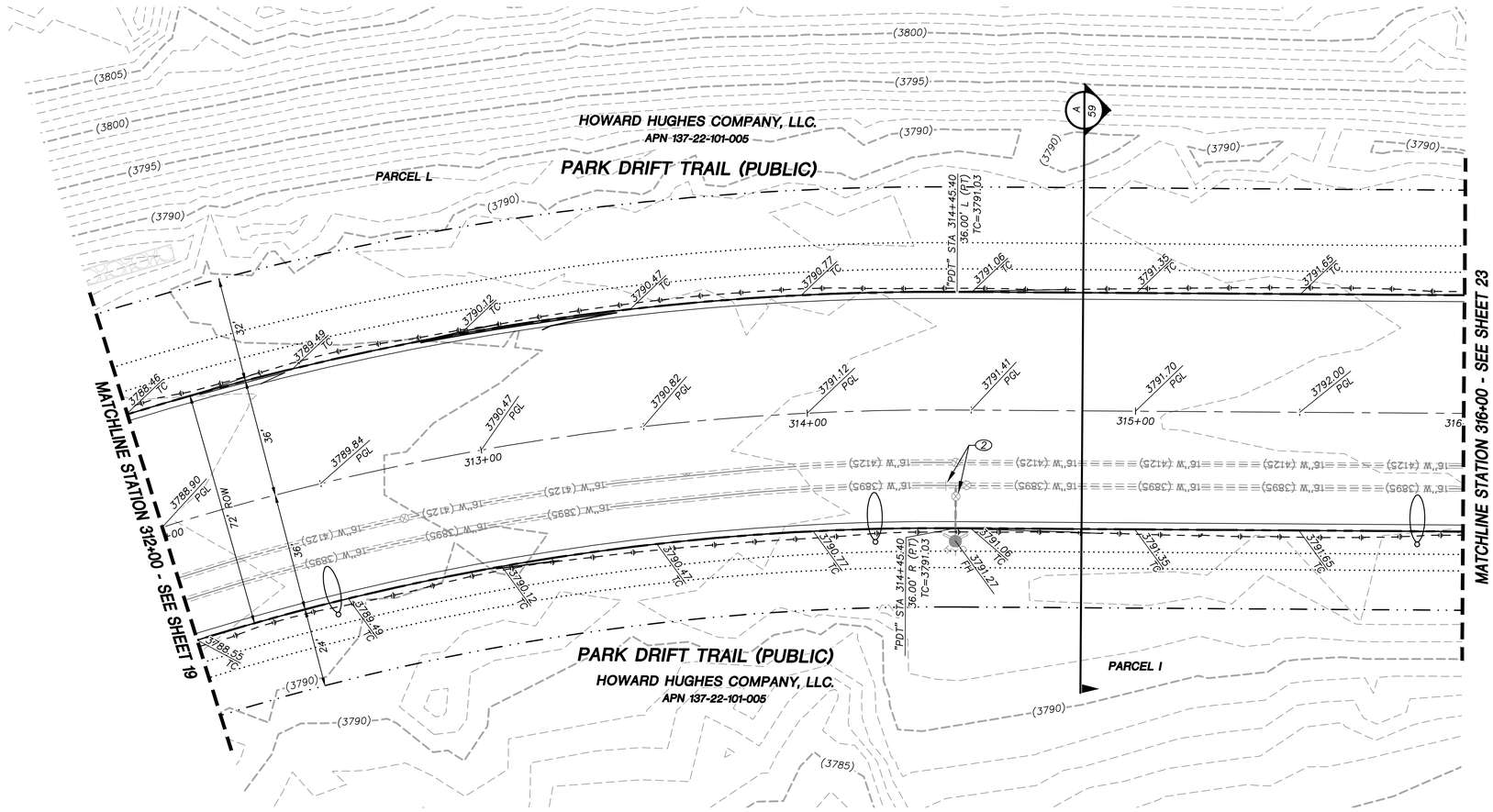

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8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

EXISTING UTILITY CONSTRUCTION NOTES

1. ADJUST EXISTING BLOW OFF VALVE TO GRADE
2. ADJUST EXISTING GATE VALVE TO GRADE
3. ADJUST EXISTING MANHOLE TO GRADE

REVISIONS			
REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

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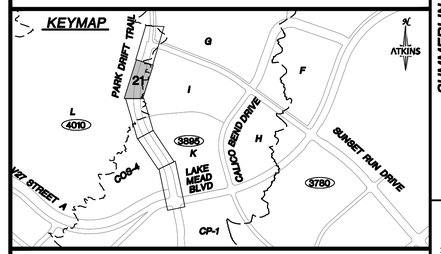
PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

PARK DRIFT TRAIL - STA 312+00 TO STA 316+00
ROADWAY GRADING PLAN

KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA
ANTHONY ORTIZ
Exp. 12-31-23
CIVIL
No. 18849

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: 1"=20'
VERT.: NONE
DATE: SEPTEMBER, 2022
DRAWING NO. 21/69
JOB NO. 100069474B

GRAPHIC SCALE
10 0 5 10 20
HORIZONTAL: 1"=20'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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

BENCHMARK

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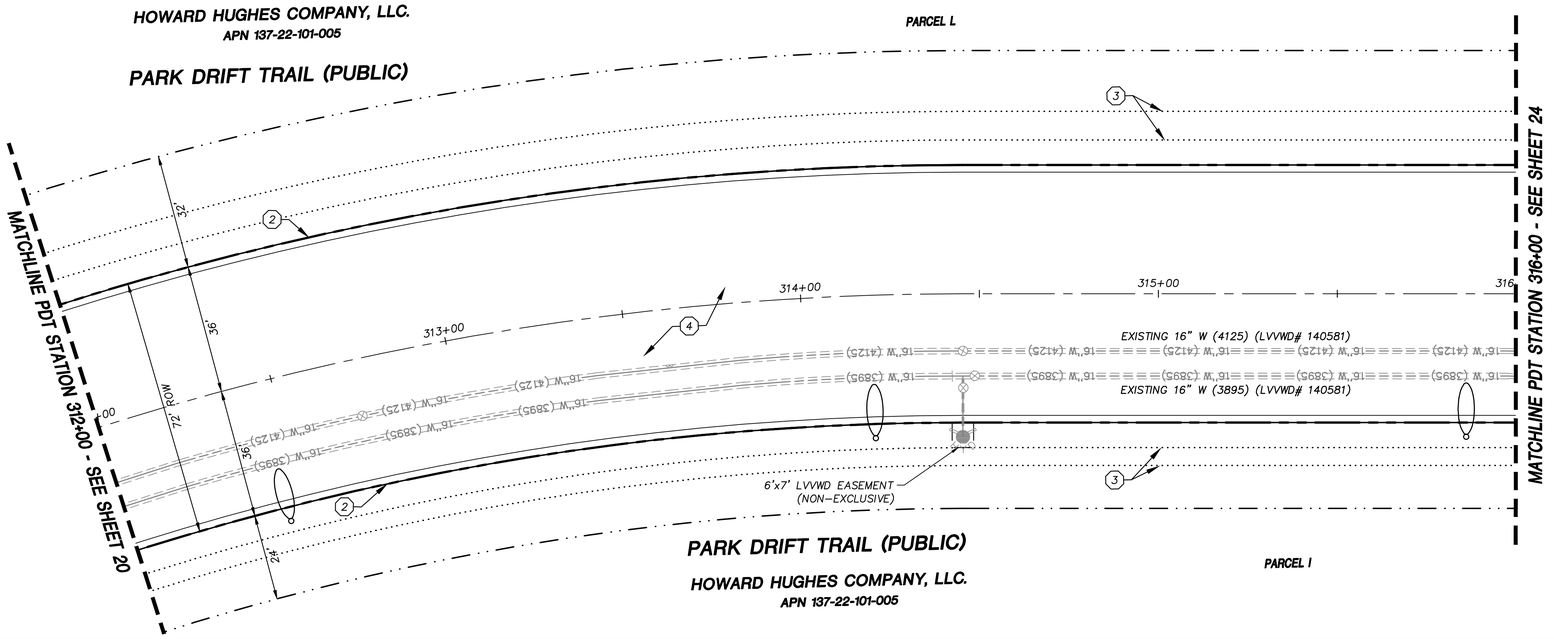
FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
T21S,R59E,S03

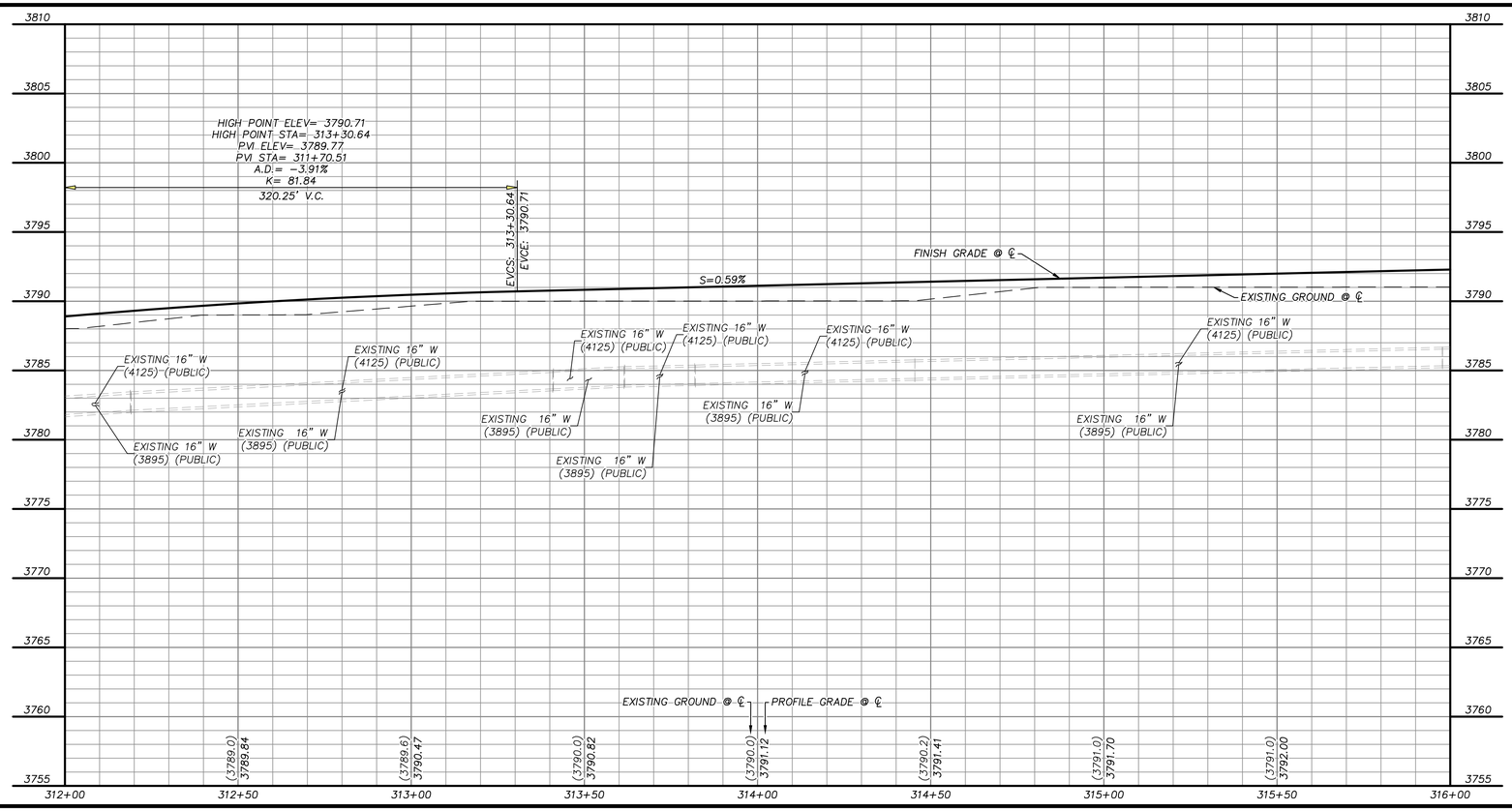
FAST Call before you UnderGround 1-702-432-5300 REMEMBER AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you Dig AVOID CUTTING HAZARDOUS UTILITY LINES 72HRS (3 DAYS) Call 811 OR 1-800-642-2444

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

C:\pw_work\atkronO1\dms585371\6947486-10-GRAD-01.dwg LAYOUT: 4 Sep 07, 2022 - 2:30PM





GRAPHIC SCALE

10 0 5 10 20

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APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE:_____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

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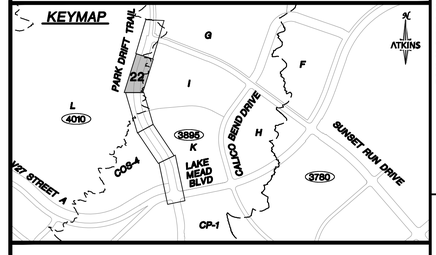
KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY L. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REV.	DESCRIPTION	BY	DATE	APPROVAL
	REVISIONS			

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27
PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

PARK DRIFT TRAIL - STA 312+00 TO STA 316+00
ROADWAY PLAN & PROFILE

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	1"=20'
VERT.:	1"=4'
00000000	
L00-00000	
DATE:	SEPTEMBER, 2022
DRAWING NO.	22/69

JOB NO. 1000694748

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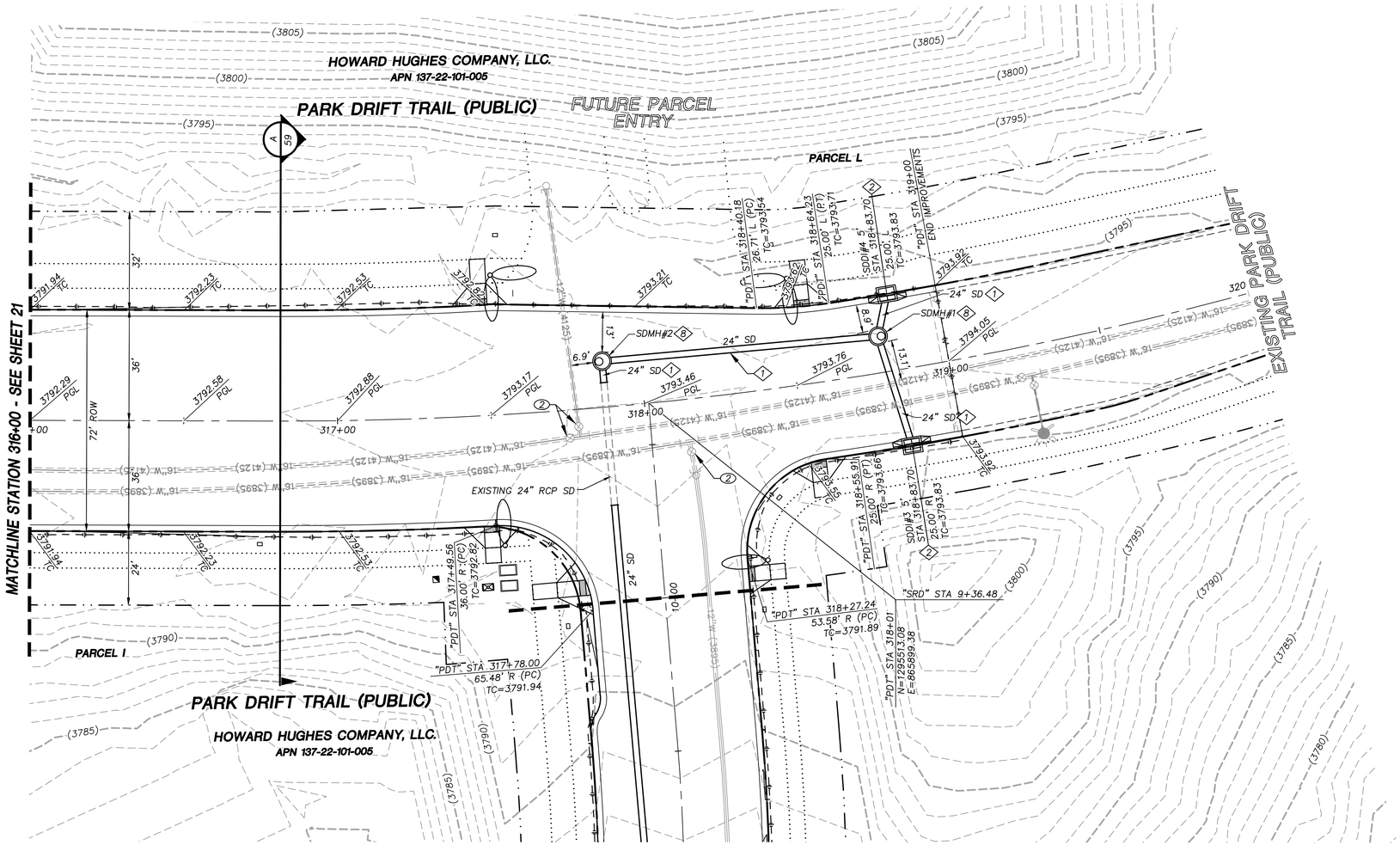

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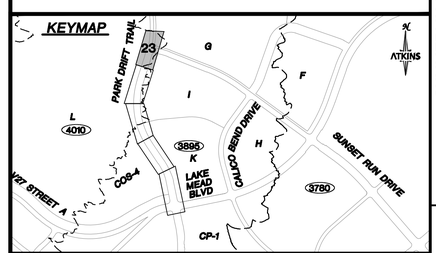
REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

KEYMAP



GRAPHIC SCALE
10 0 5 10 20
HORIZONTAL: 1"=20'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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

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ATKINS
2270 Corporate Circle Suite 200
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Telephone: +1.702.263.7275
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ROADWAY GRADING PLAN
PARK DRIFT TRAIL - STA 316+00 TO END

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	1"=20'
VERT.:	NONE
00000000	L00-00000
DATE:	SEPTEMBER, 2022
DRAWING NO.	23/69

JOB NO. 1000694748

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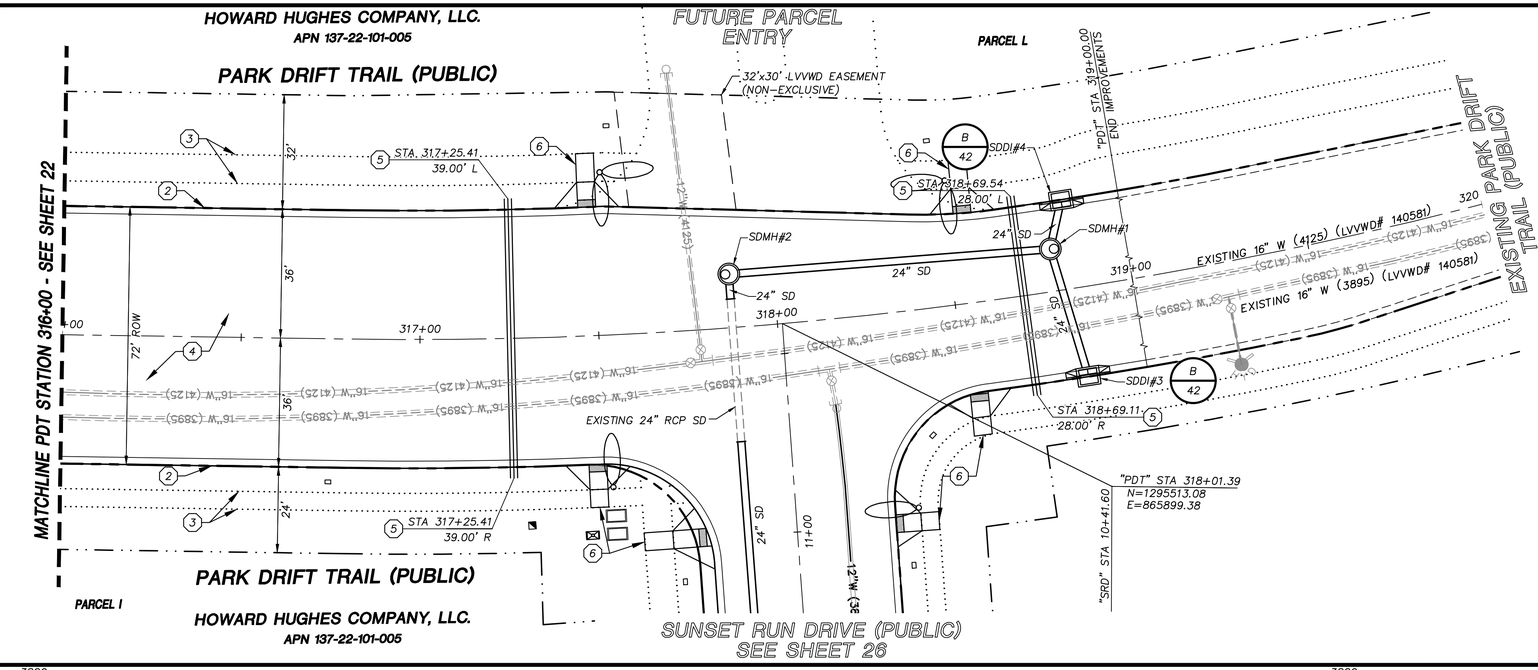
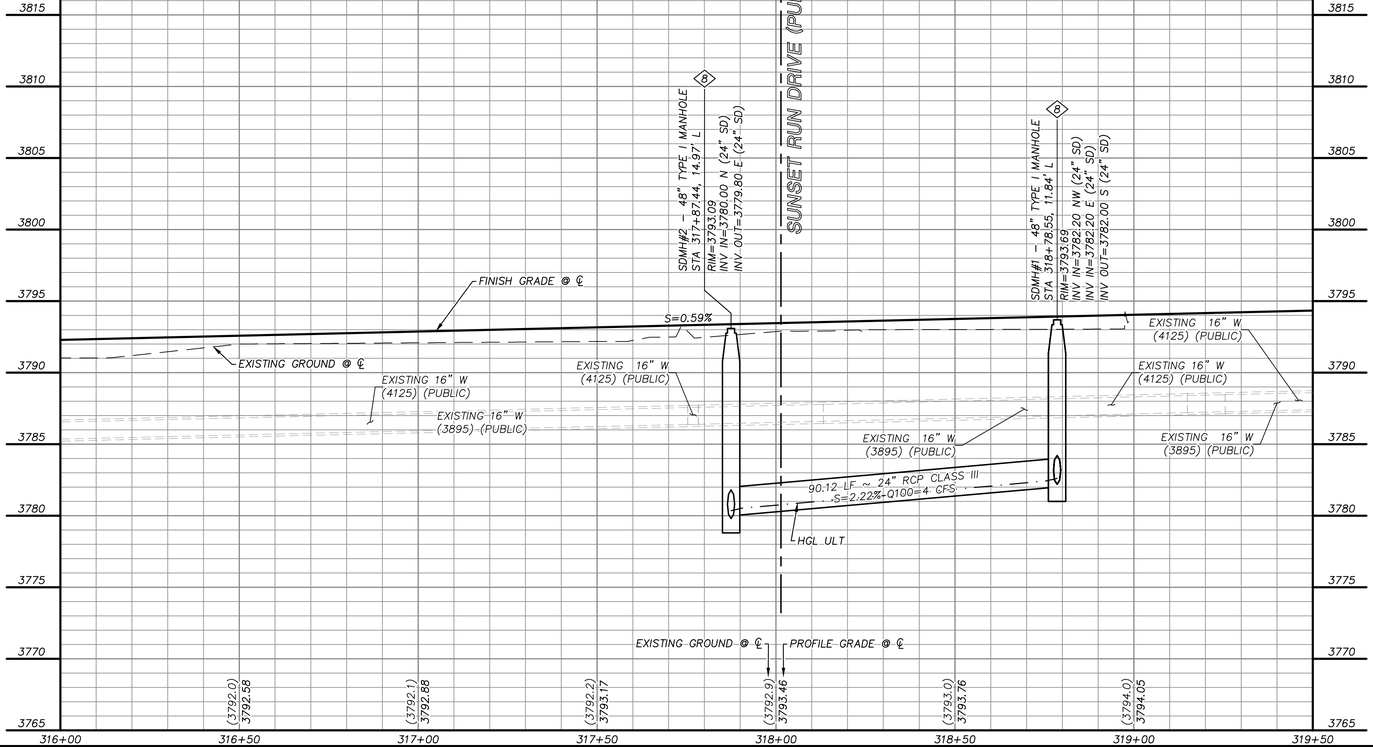




GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

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 (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

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

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

Call before you Dig AVOID CUTTING, BLASTING OR UTILITY CONTACTS. DON'T! Call 811 OR 1-800-642-2444

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

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. INSTALL TYPE II SD MANHOLE PER CCAUSD #405
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
6. INSTALL RIP-RAP (D50=8", THICKNESS=24")
7. INSTALL NDOT TYPE II DROP INLET PER NDOT DS-32
8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

SEWER CONSTRUCTION NOTES

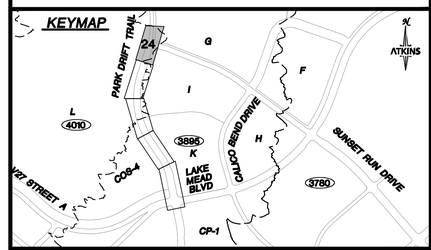
1. INSTALL SEWER MANHOLE PER DCSWCS SD-1 AND SD-4
2. INSTALL SEWER MAIN PER DCSWCS SD-17
3. STUB AND CAP SEWER PIPE. PLACE 4"X4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).
4. REMOVE CAP AND CONNECT TO EXISTING SEWER STUB
5. INSTALL CORROSION PROTECTION PER 3.16.8

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 45° VERTICAL BEND PER UDACS PLATE #31
7. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
8. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
9. INSTALL 22.5° VERTICAL BEND PER UDACS PLATE #31
10. INSTALL 1-1/2" IRRIGATION METER WITH 1-1/2" RPPA PER UDACS PLATES #4 AND #8 WITH CURB STOP PER DETAIL D ON SHEET 68
11. INSTALL 1-1/2" SERVICE SADDLE PER UDACS PLATE #4
12. INSTALL COMBINATION AIR VALVE ASSEMBLY WITH ALL APPURTENANCES PER UDACS PLATE #38
13. INSTALL 11.25° BEND PER UDACS SECTION 2.15

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEETS 59, 60, AND 61 FOR TYPICAL PAVEMENT SECTIONS
5. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL C ON SHEET 68
6. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN CS-3B (A=B=6.5').
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT MODIFIED SPILLOUT CURB AND GUTTER PER CCAUSD #216 AND DETAIL F ON SHEET 67



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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY L. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27

PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

ROADWAY PLAN & PROFILE

PARK DRIFT TRAIL - STA 316+00 TO END

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	1"=20'
VERT.:	1"=4'
DATE:	SEPTEMBER, 2022
DRAWING NO.	24/69

00000000
L00-00000

JOB NO. 1000694748

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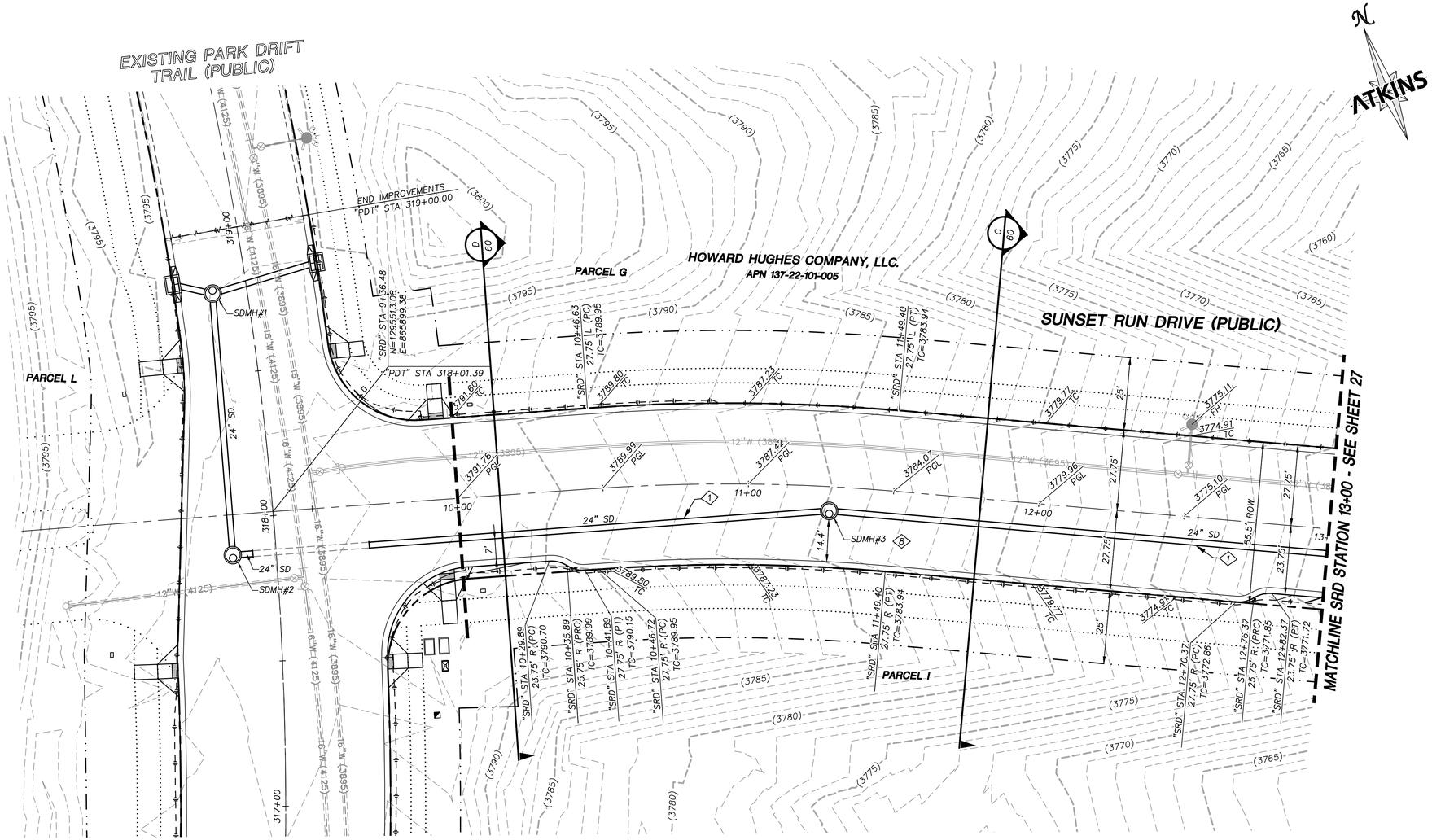

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8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

EXISTING UTILITY CONSTRUCTION NOTES

1. ADJUST EXISTING BLOW OFF VALVE TO GRADE
2. ADJUST EXISTING GATE VALVE TO GRADE
3. ADJUST EXISTING MANHOLE TO GRADE

GRAPHIC SCALE
10 0 5 10 20
HORIZONTAL: 1"=20'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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

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T21S,R59E,S03

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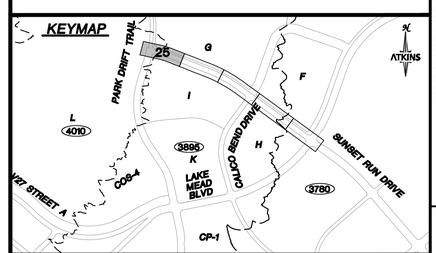
KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY LEE ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27
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ROADWAY GRADING PLAN
SUNSET RUN DRIVE - BEGIN TO STA 13+00

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	1"=20'
VERT.:	
00000000	
L00-00000	
DATE:	SEPTEMBER, 2022
DRAWING NO.	25/69

JOB NO. 1000694748

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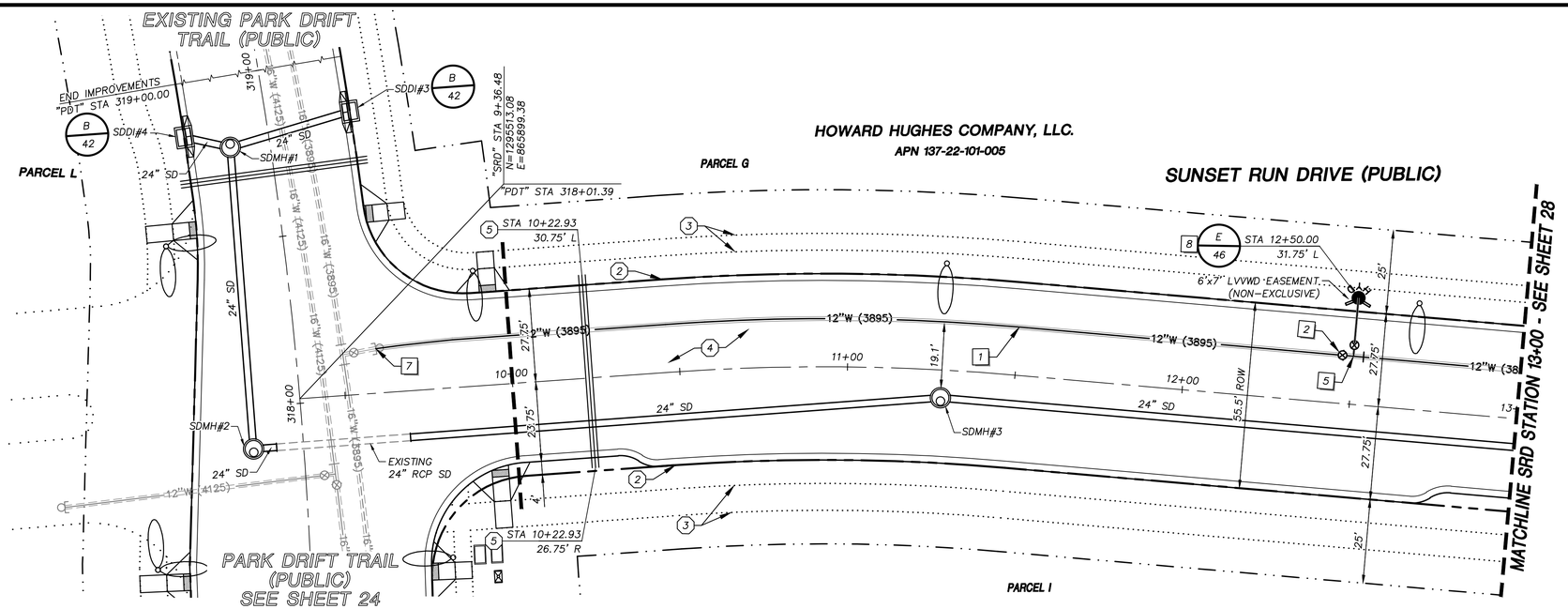

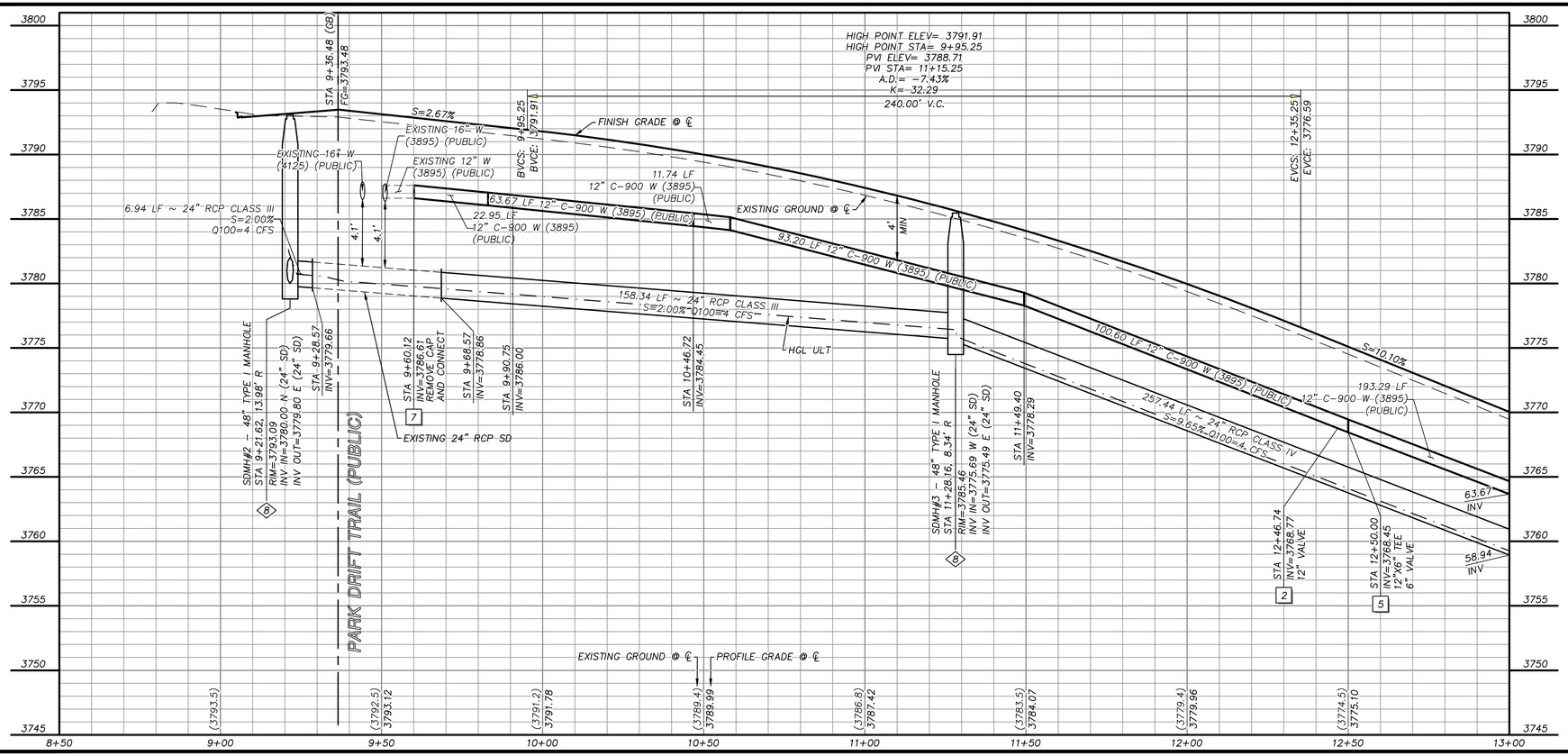

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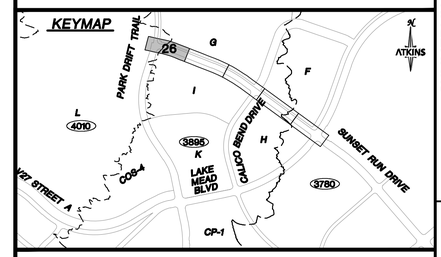
KEYMAP



GRAPHIC SCALE

10 0 5 10 20
HORIZONTAL: 1"=20'
5 0 2.5 5 10
VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

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 (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

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T21S,R59E,S03

FAST Call before you UnderGround 1-702-432-5300 REMOTE AND NATIONAL SYSTEM OF TRANSPORTATION

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

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

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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTEGA EXP. 6-30-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

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ROADWAY PLAN & PROFILE

SUNSET RUN DRIVE - BEGIN TO STA 13+00

00000000	DESIGNED BY: D. SMITH
L00-00000	DRAWN BY: C. HONEY
DATE: SEPTEMBER, 2022	CHECKED BY: N. BARCOS
DRAWING NO. 26/69	HORIZ.: 1"=20' VERT.: 1"=4'

JOB NO. 1000694748

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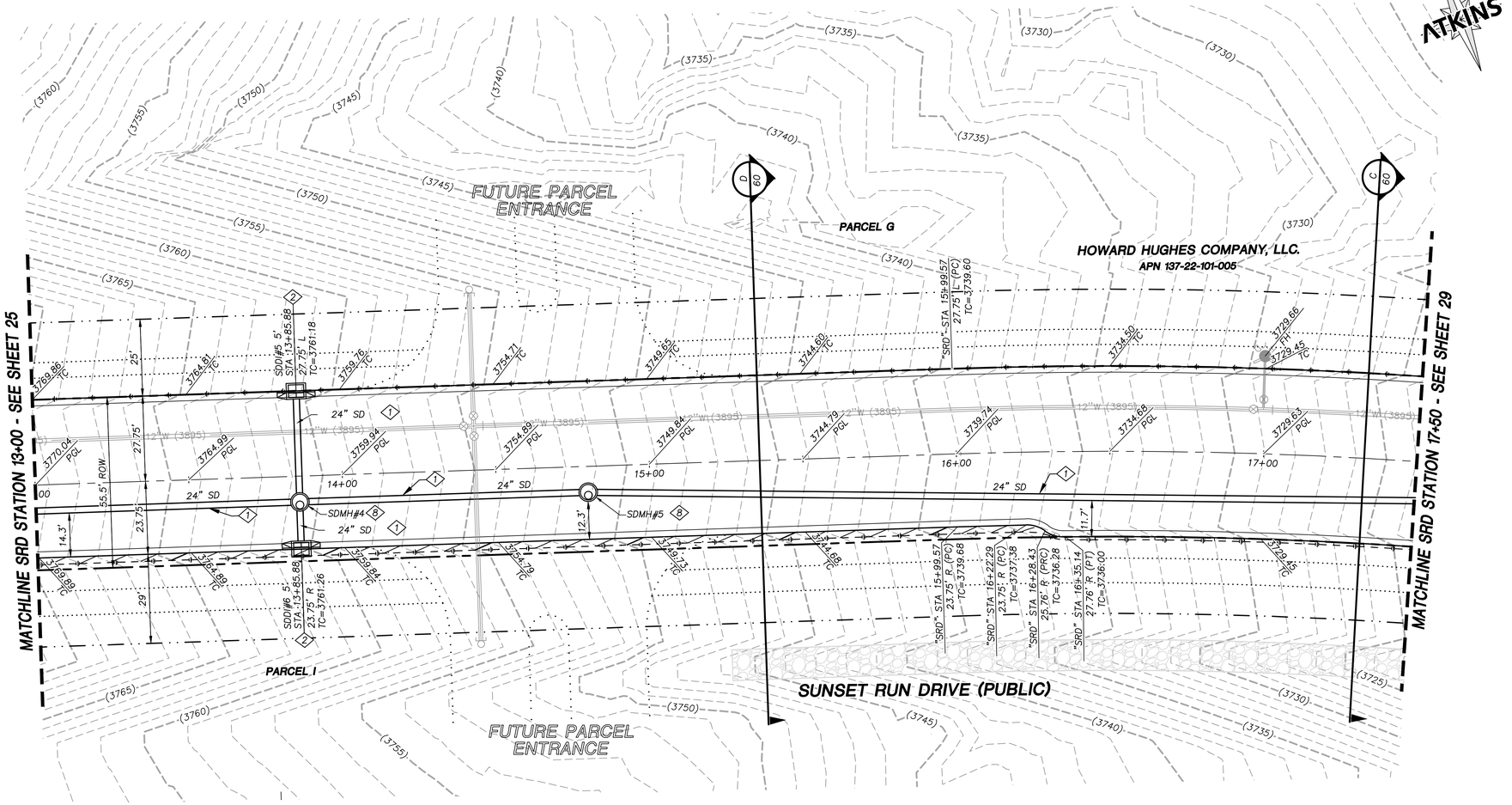

STORM DRAIN CONSTRUCTION NOTES

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EXISTING UTILITY CONSTRUCTION NOTES

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2. ADJUST EXISTING GATE VALVE TO GRADE
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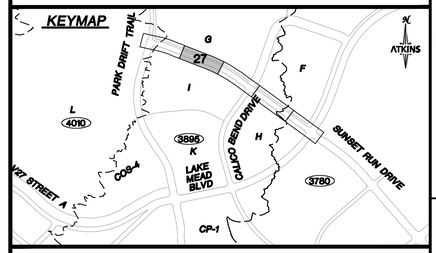
REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL



GRAPHIC SCALE
10 0 5 10 20
HORIZONTAL: 1"=20'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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ROADWAY GRADING PLAN
SUNSET RUN DRIVE - STA 13+00 TO STA 17+50

00000000 L00-00000	DESIGNED BY: D. SMITH	DRAWN BY: C. HONEY	CHECKED BY: N. BARCOS
DATE: SEPTEMBER, 2022	DRAWING NO. 27/69	HORIZ.: 1"=20' VERT.:	

JOB No. 100069474B

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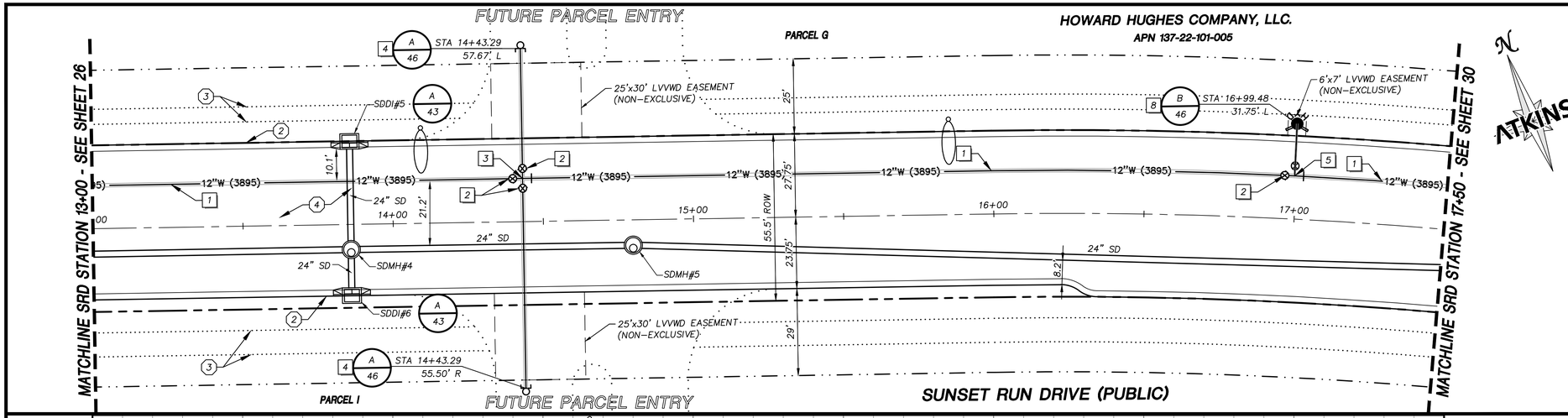

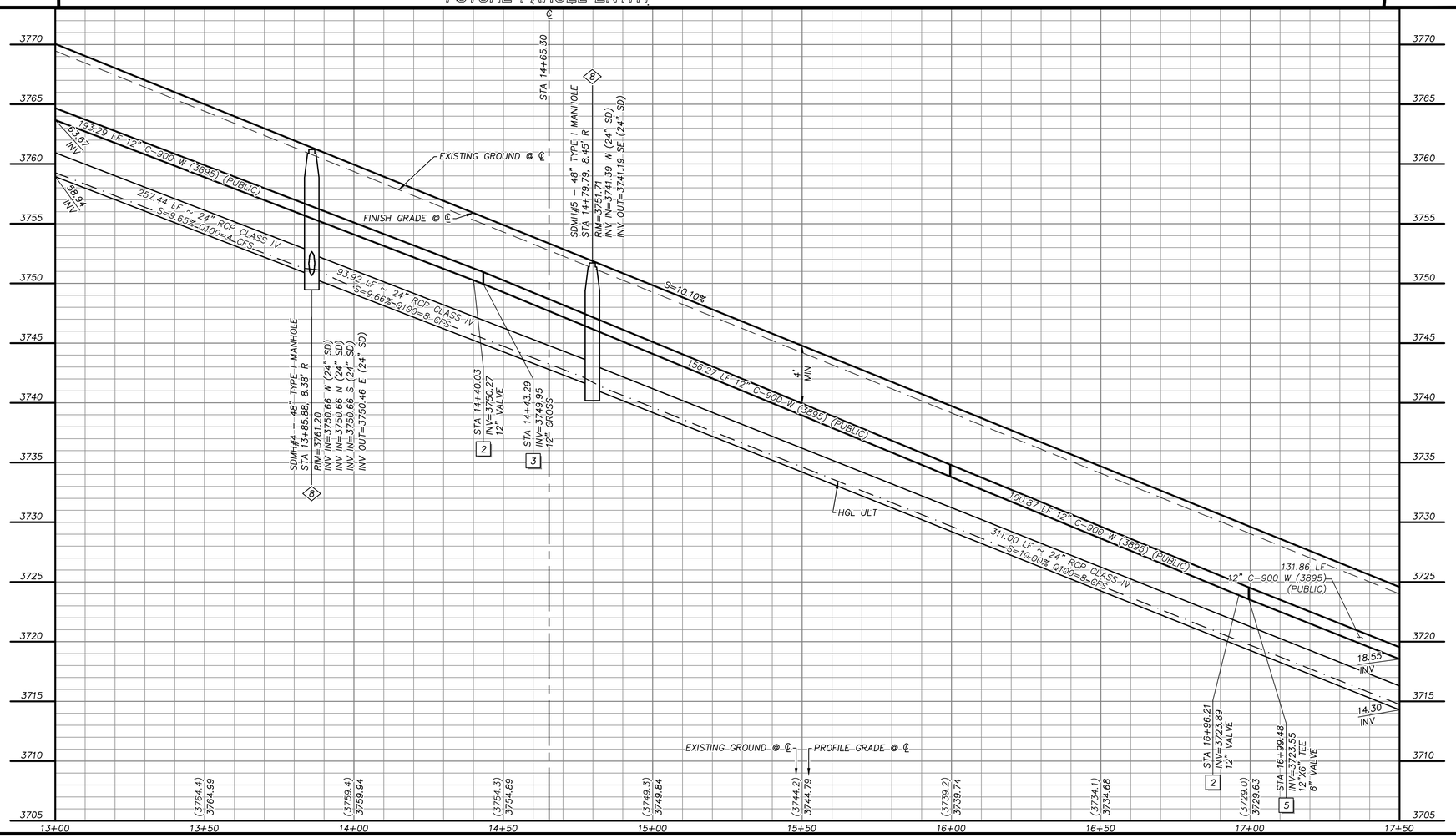

GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

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VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

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9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

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 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. INSTALL CORROSION PROTECTION PER 3.16.8

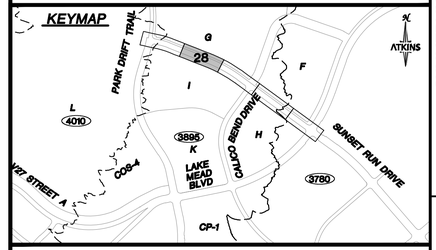
WATERLINE CONSTRUCTION NOTES

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 45° VERTICAL BEND PER UDACS PLATE #31
7. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
8. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
9. INSTALL 22.5° VERTICAL BEND PER UDACS PLATE #31
10. INSTALL 1-1/2" IRRIGATION METER WITH 1-1/2" RPPA PER UDACS PLATES #4 AND #8 WITH CURB STOP PER DETAIL D ON SHEET 68
11. INSTALL 1-1/2" SERVICE SADDLE PER UDACS PLATE #4
12. INSTALL COMBINATION AIR VALVE ASSEMBLY WITH ALL APPURTENANCES PER UDACS PLATE #38
13. INSTALL 11.25° BEND PER UDACS SECTION 2.15

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEETS 59, 60, AND 61 FOR TYPICAL PAVEMENT SECTIONS
5. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL C ON SHEET 68
6. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN CS-3B (A=B=6.5').
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT MODIFIED SPILLOUT CURB AND GUTTER PER CCAUSD #216 AND DETAIL F ON SHEET 67

KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27

PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

ROADWAY PLAN & PROFILE

SUNSET RUN DRIVE - STA 13+00 TO STA 17+50

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	1"=20'
VERT.:	1"=4'
00000000	
L00-00000	
DATE:	SEPTEMBER, 2022
DRAWING NO.	28/69
JOB NO.	1000694748

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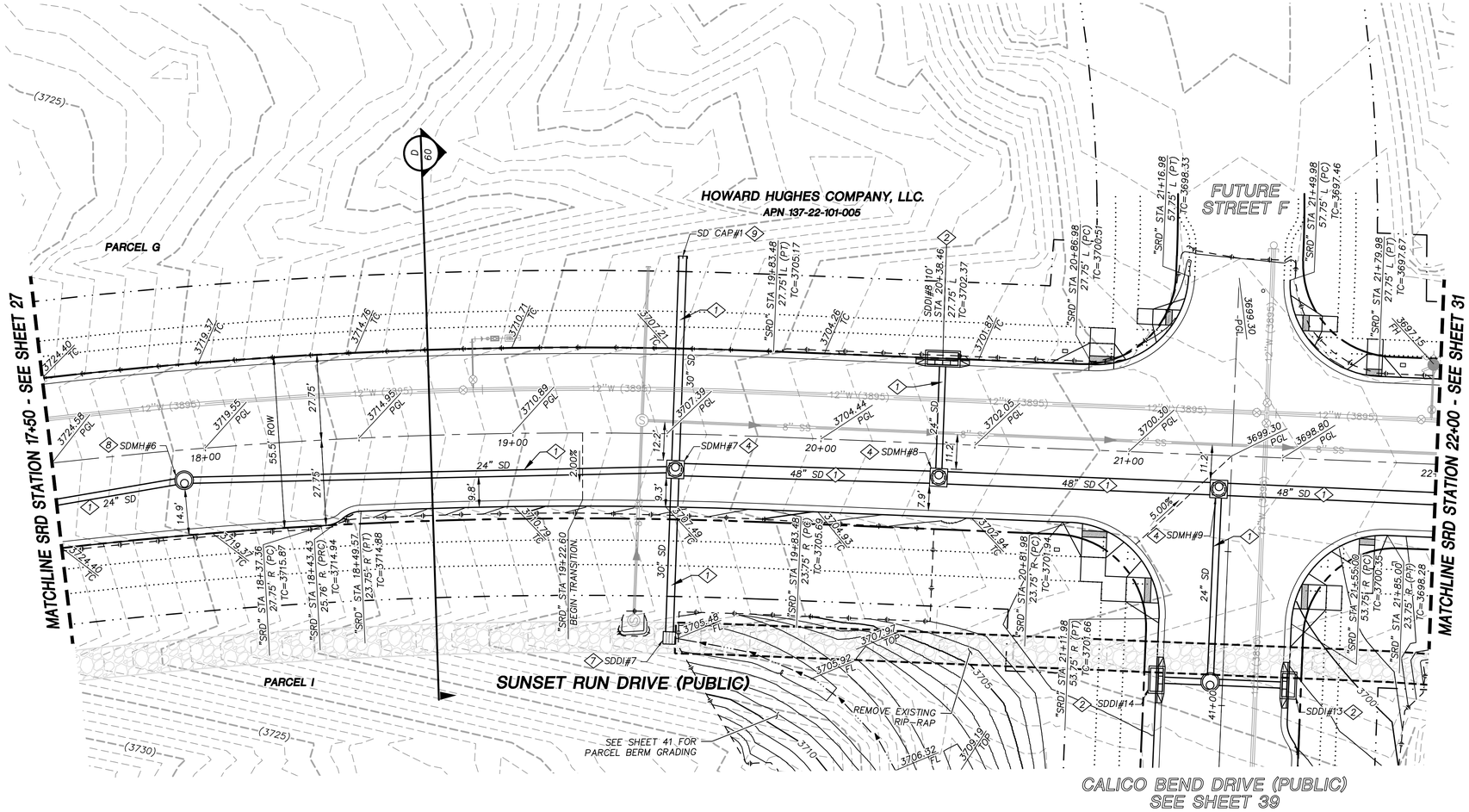


STORM DRAIN CONSTRUCTION NOTES

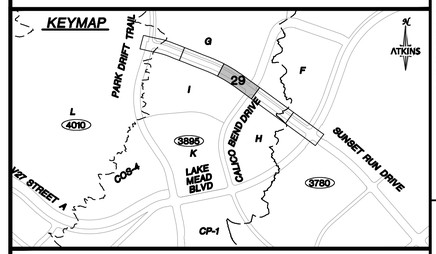
1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. INSTALL TYPE II SD MANHOLE PER CCAUSD #405
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
6. INSTALL RIP-RAP (D50=8", THICKNESS=24")
7. INSTALL NDOT TYPE II DROP INLET PER NDOT DS-32
8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

EXISTING UTILITY CONSTRUCTION NOTES

1. ADJUST EXISTING BLOW OFF VALVE TO GRADE
2. ADJUST EXISTING GATE VALVE TO GRADE
3. ADJUST EXISTING MANHOLE TO GRADE

REVISIONS			
REV.	DESCRIPTION	BY	DATE	APPROVAL

KEYMAP



GRAPHIC SCALE
10 0 5 10 20
HORIZONTAL: 1"=20'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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

BENCHMARK

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

FAST Call before you UnderGround 1-702-432-5300 EMERGENCY AND INTERNAL SYSTEM OF TRANSPORTATION

Call before you Dig AVOID CUTTING HAZARDOUS UTILITY LINES ITS QUICK! Call 811 OR 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES, ITS QUICK! CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

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

PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTIZ EXP. 12-31-23 CIVIL No. 18849

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27
PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

ROADWAY GRADING PLAN
SUNSET RUN DRIVE - STA 17+50 TO STA 22+00

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: 1"=20'
VERT.:
DATE: SEPTEMBER, 2022
DRAWING NO. 29/69
00000000 L00-00000
JOB NO. 1000694748

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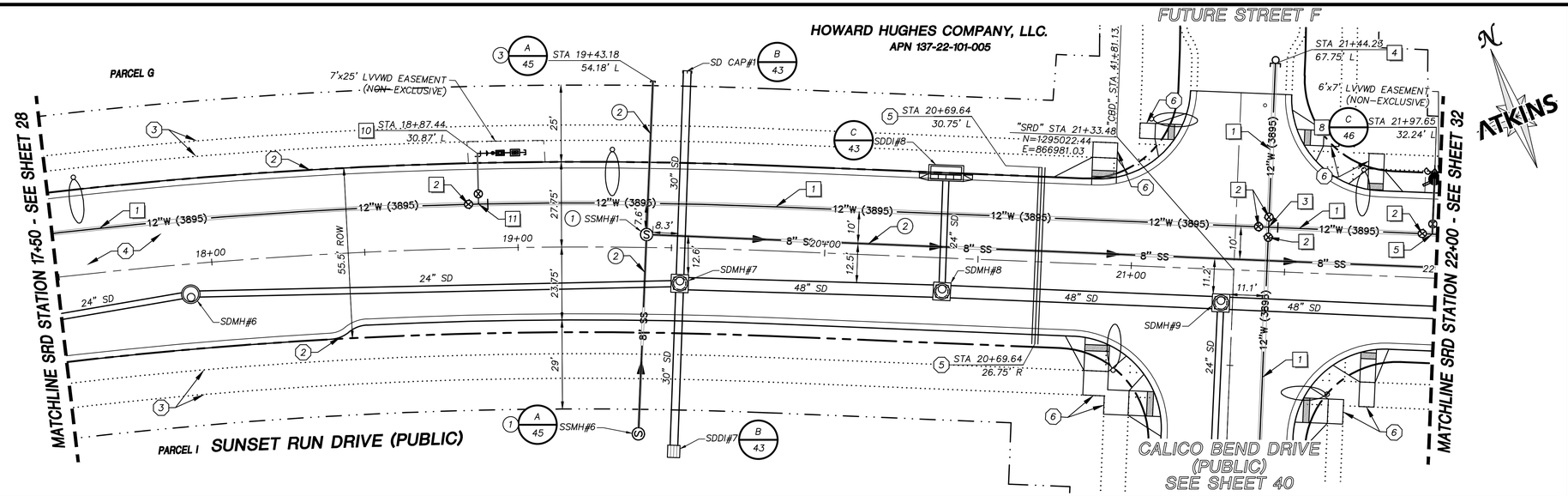

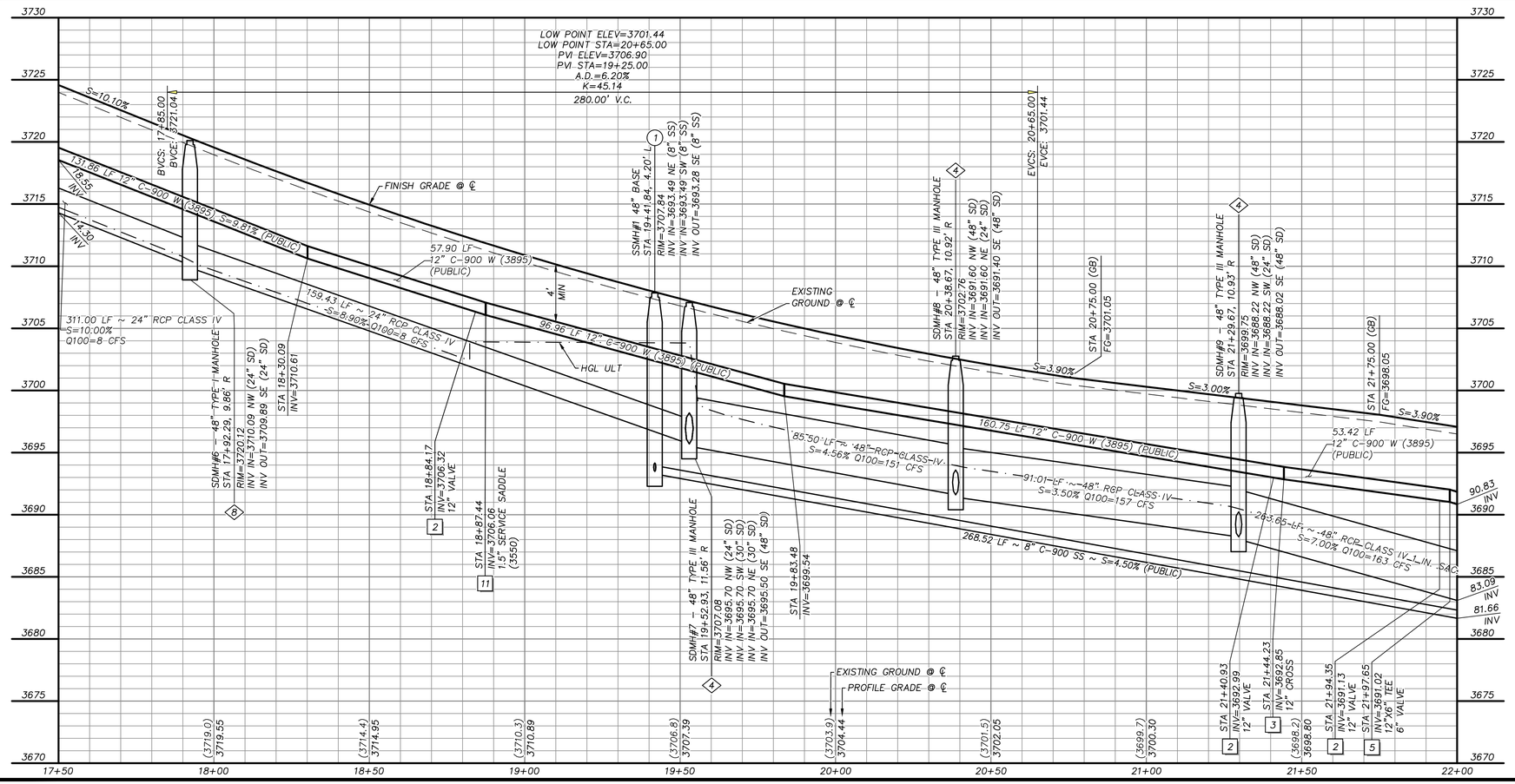

GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

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

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

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

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ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
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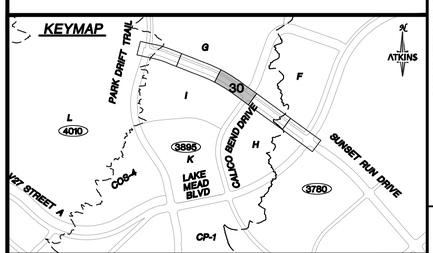
KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY L. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS			
REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27

PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

ROADWAY PLAN & PROFILE

SUNSET RUN DRIVE - STA 17+50 TO STA 22+00

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	1"=20'
VERT.:	1"=4'

00000000	
L00-00000	
DATE:	SEPTEMBER, 2022
DRAWING NO.	30/69

JOB NO. 1000694748

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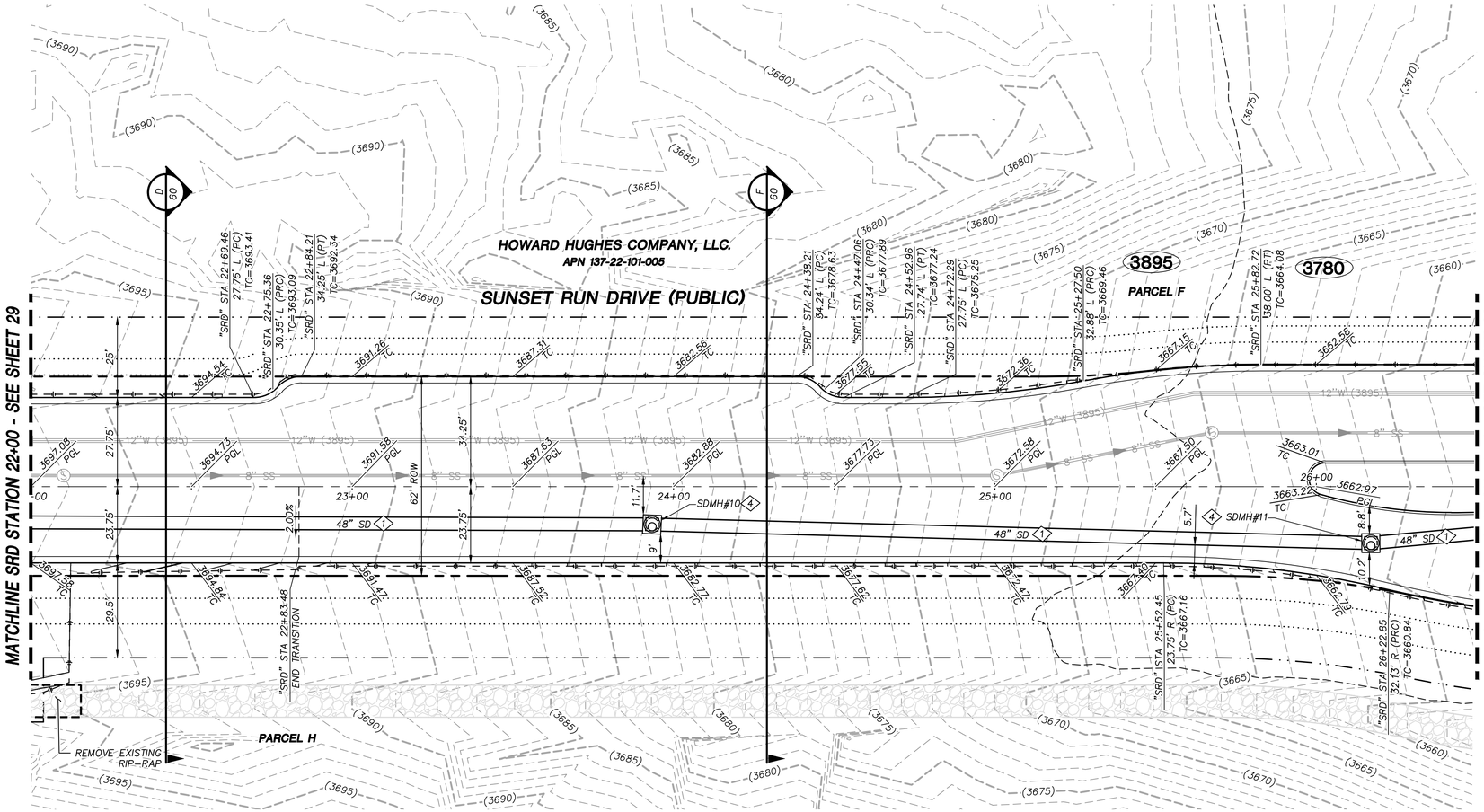

STORM DRAIN CONSTRUCTION NOTES

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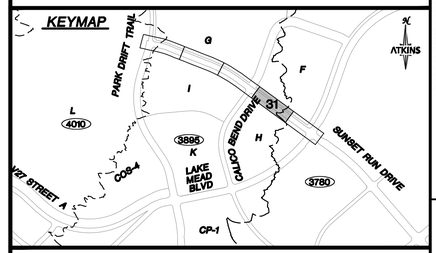
REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

KEYMAP



GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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BENCHMARK

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

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Telephone: +1.702.263.7275
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PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

ROADWAY GRADING PLAN

SUNSET RUN DRIVE - STA 22+00 TO STA 26+50

00000000 L00-00000	DESIGNED BY: D. SMITH	DRAWN BY: C. HONEY	CHECKED BY: N. BARCOS
DATE: SEPTEMBER, 2022	DRAWING NO. 31/69	HORIZ.: 1"=20'	VERT.:

JOB NO. 100069474B

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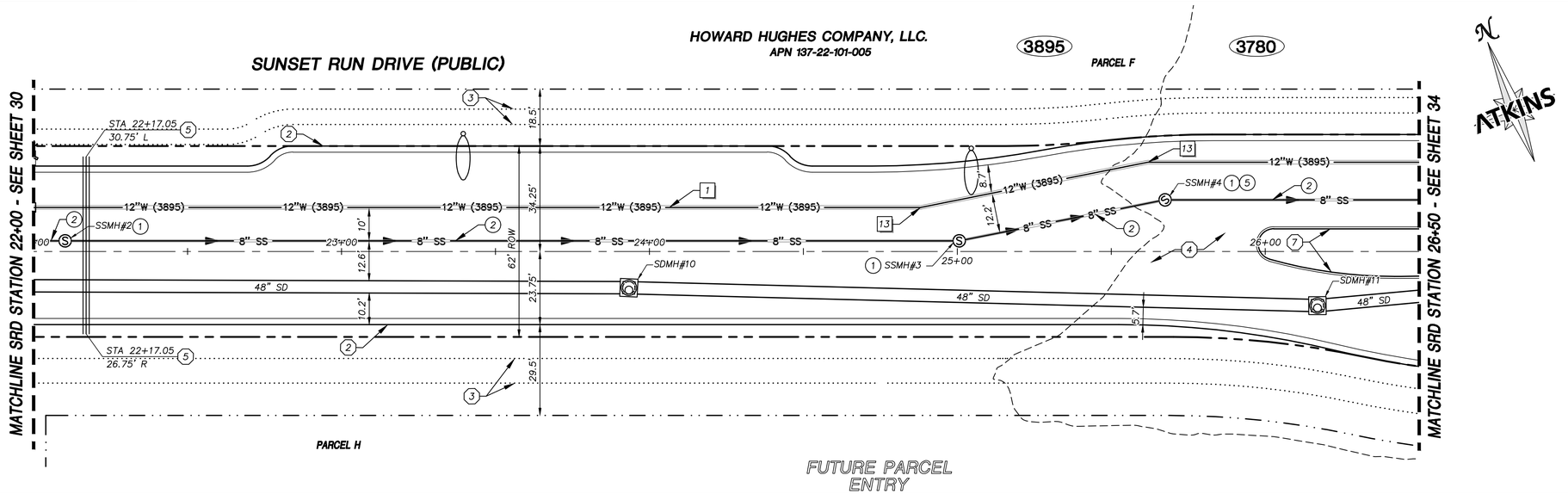

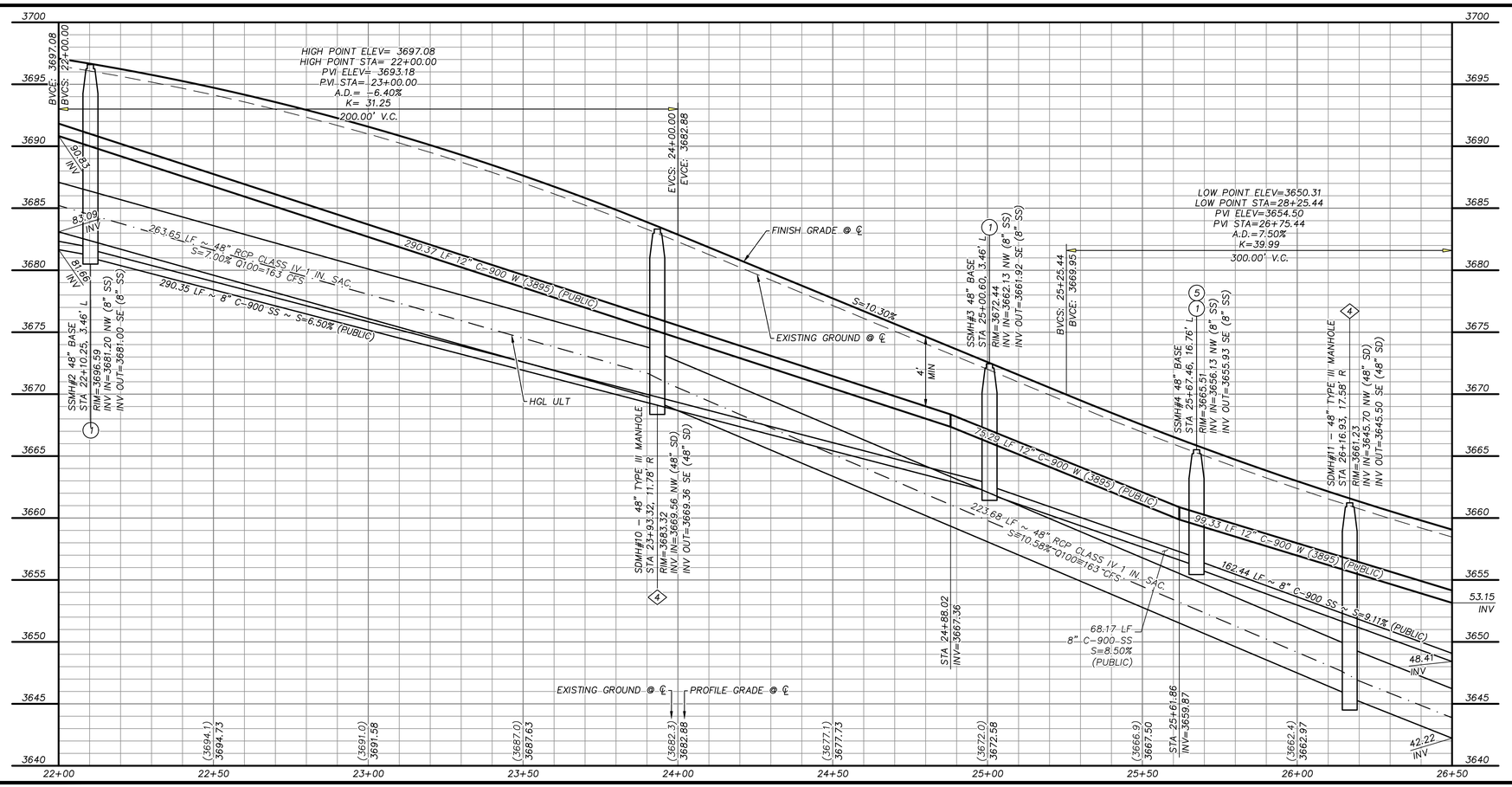

GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE:_____

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

FAST Call before you UnderGround 1-702-432-5300 REMEMBER AND REFERENCE SYSTEM OF TRANSPORTATION

Call before you Dig AVOID CUTTING UNDERGROUND UTILITY LINES IN CLARK COUNTY. Call 811 or 1-800-642-2444

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

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8. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
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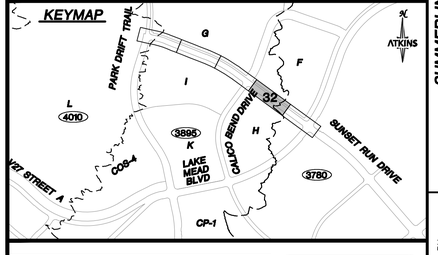
10. INSTALL 1-1/2" IRRIGATION METER WITH 1-1/2" RPPA PER UDACS PLATES #4 AND #8 WITH CURB STOP PER DETAIL D ON SHEET 68
11. INSTALL 1-1/2" SERVICE SADDLE PER UDACS PLATE #4
12. INSTALL COMBINATION AIR VALVE ASSEMBLY WITH ALL APPURTENANCES PER UDACS PLATE #38
13. INSTALL 11.25° BEND PER UDACS SECTION 2.15

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEETS 59, 60, AND 61 FOR TYPICAL PAVEMENT SECTIONS
5. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL C ON SHEET 68
6. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN CS-3B (A=B=6.5').
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT MODIFIED SPILLOUT CURB AND GUTTER PER CCAUSD #216 AND DETAIL F ON SHEET 67

KEYMAP



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NEVADA PROFESSIONAL ENGINEER ANTHONY J. ORTIZ EXP. 12-31-23 CIVIL No. 18849 STATE OF NEVADA

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27

PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

ROADWAY PLAN & PROFILE

SUNSET RUN DRIVE - STA 22+00 TO STA 26+50

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: 1"=20'
VERT.: 1"=4'

00000000
L00-00000

DATE: SEPTEMBER, 2022

DRAWING NO. 32/69

JOB NO. 100069474B

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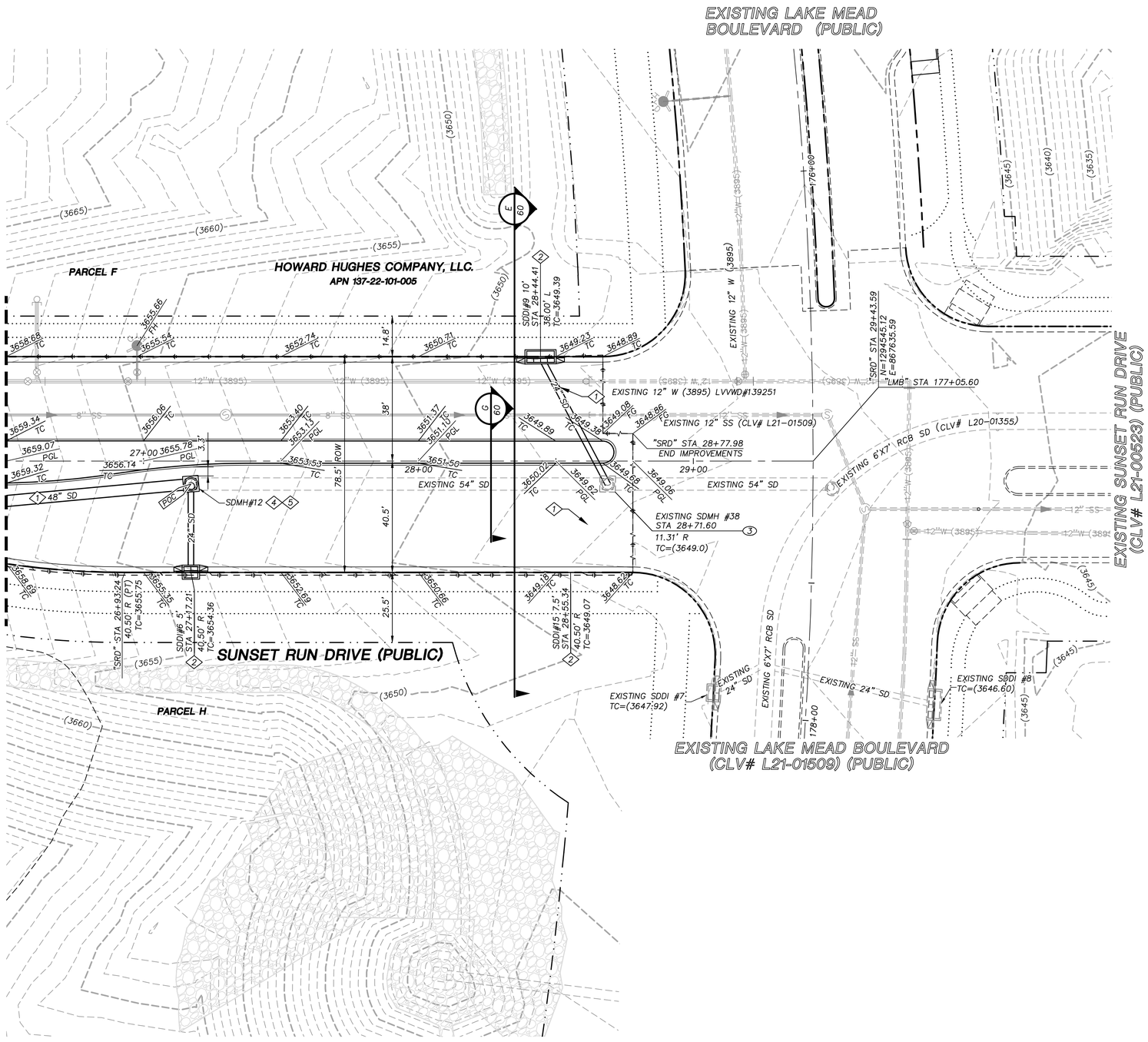


GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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

BENCHMARK

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

FAST Call before you UnderGround 1-702-432-5300 REMEMBER AND ARTERIAL SYSTEMS OF TRANSPORTATION

Call before you Dig AVOID CUTTING OR DAMAGING UTILITY LINES. IT'S QUIET! Call 811 or 1-800-642-2444

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

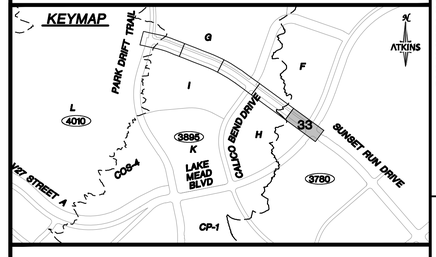
STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. INSTALL TYPE II SD MANHOLE PER CCAUSD #405
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
6. INSTALL RIP-RAP (D50=8", THICKNESS=24")
7. INSTALL NDOT TYPE II DROP INLET PER NDOT DS-32
8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

EXISTING UTILITY CONSTRUCTION NOTES

1. ADJUST EXISTING BLOW OFF VALVE TO GRADE
2. ADJUST EXISTING GATE VALVE TO GRADE
3. ADJUST EXISTING MANHOLE TO GRADE

KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY L. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

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ROADWAY GRADING PLAN

SUNSET RUN DRIVE - STA 26+50 TO END

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	1"=20'
VERT.:	
0000000 L00-00000	
DATE:	SEPTEMBER, 2022
DRAWING NO.	33/69
JOB NO.	1000694748

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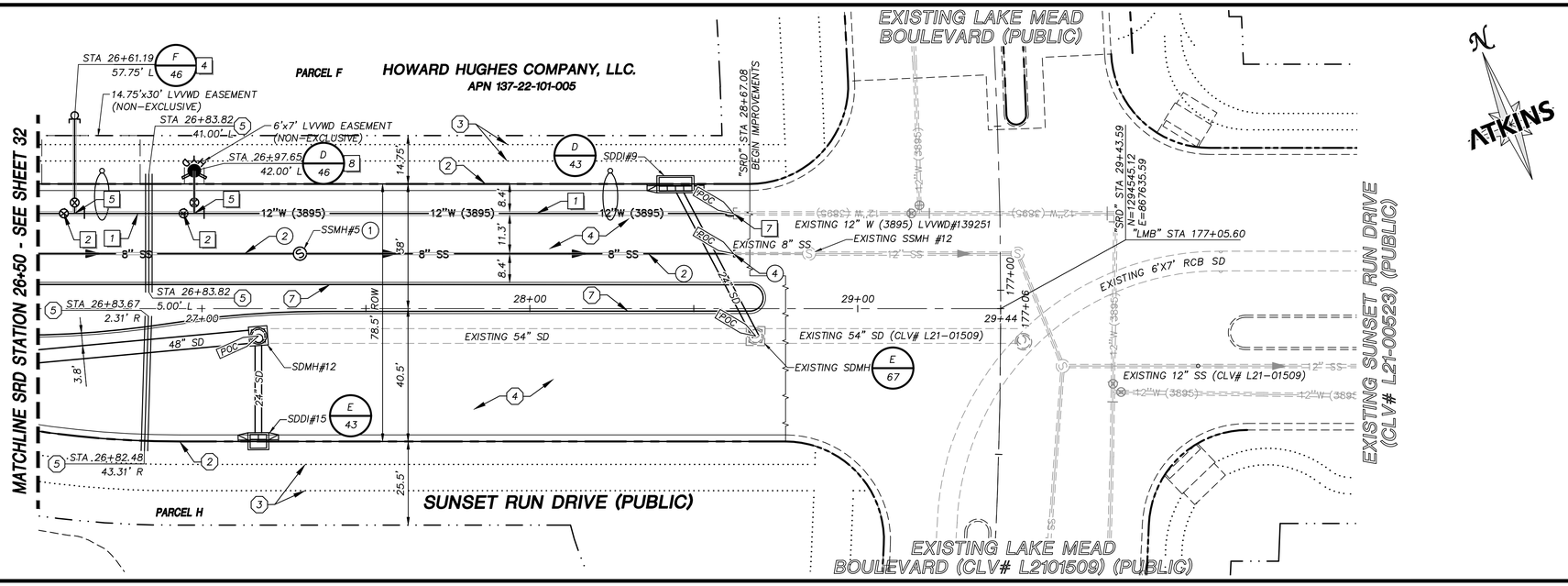

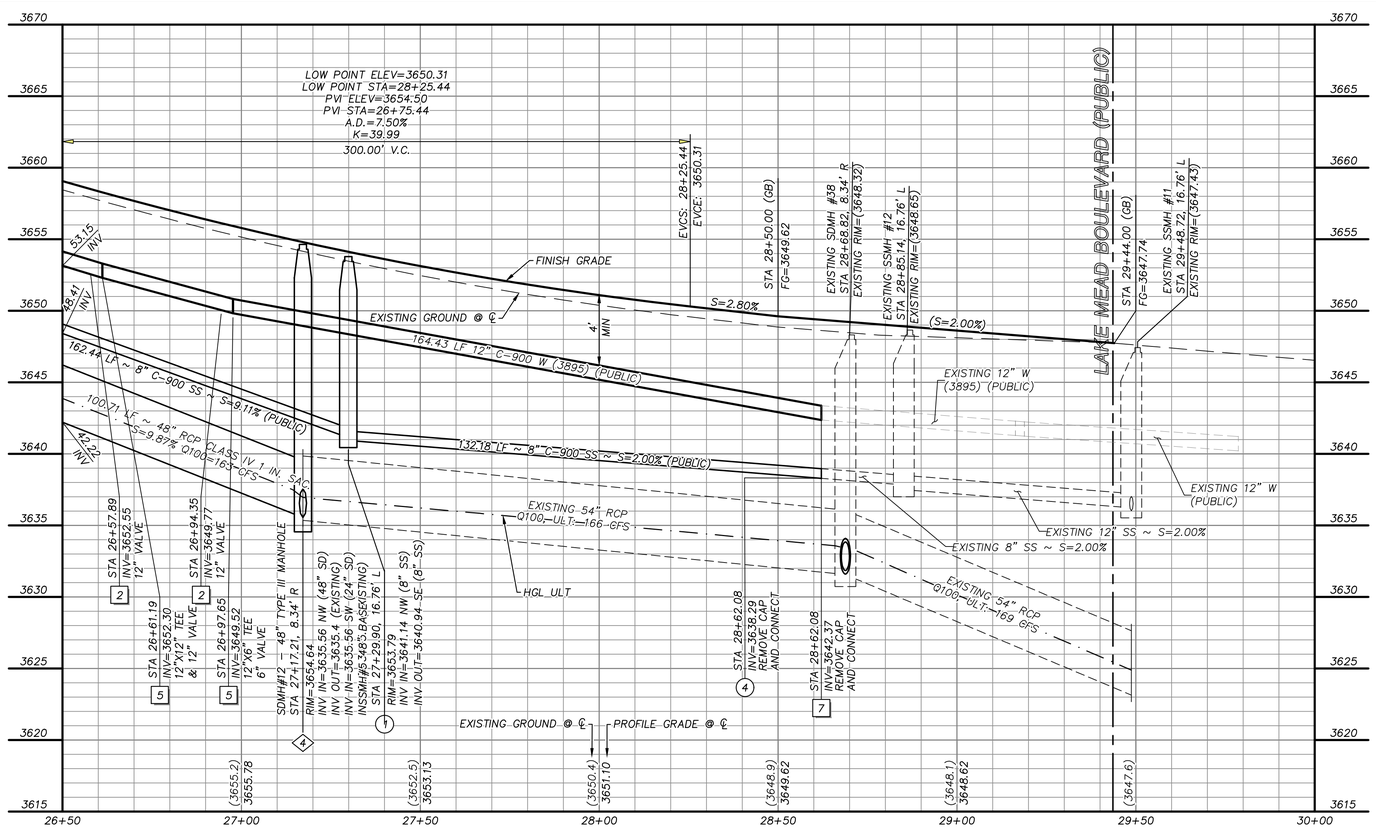

GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

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

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

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

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STORM DRAIN CONSTRUCTION NOTES

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4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
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8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

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 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. INSTALL CORROSION PROTECTION PER 3.16.8

WATERLINE CONSTRUCTION NOTES

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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
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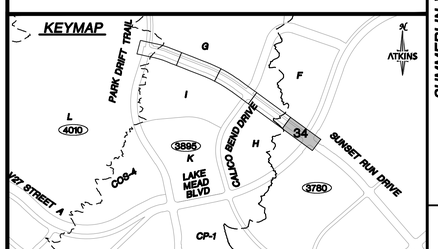
KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY L. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

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ROADWAY PLAN & PROFILE

SUNSET RUN DRIVE - STA 26+50 TO END

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	1"=20'
VERT.:	1"=4'
00000000	
L00-00000	
DATE:	SEPTEMBER, 2022
DRAWING NO.	34/69

JOB NO. 1000694748

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STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
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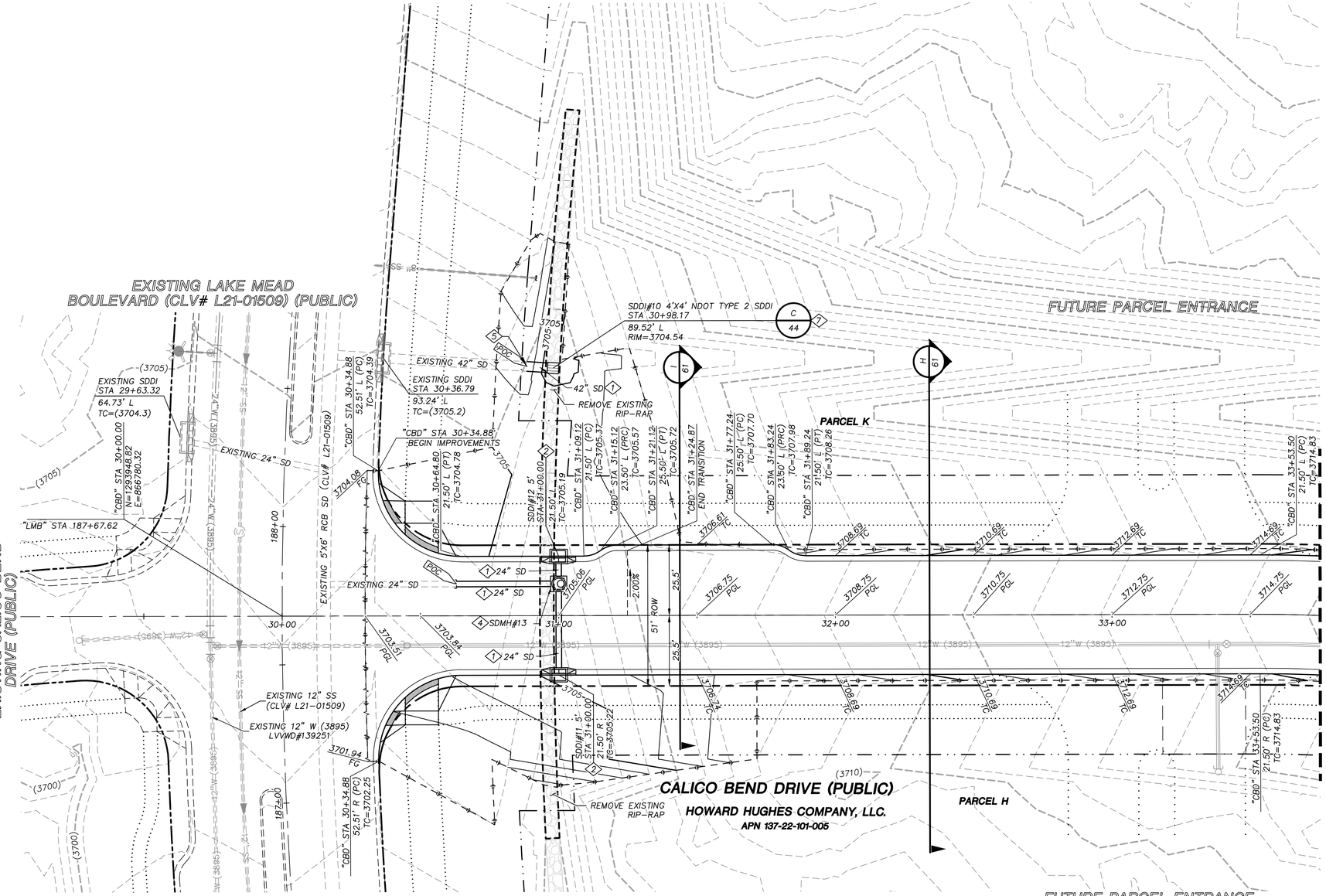

GRAPHIC SCALE
10 0 5 10 20
HORIZONTAL: 1"=20'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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FND USC&GS DISC SET IN ROCK RIDGE 150' SOUTH OF CHARLESTON BLVD. & WEST OF DETENTION BASIN.
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Henderson, Nevada 89074
Telephone: +1.702.263.7275
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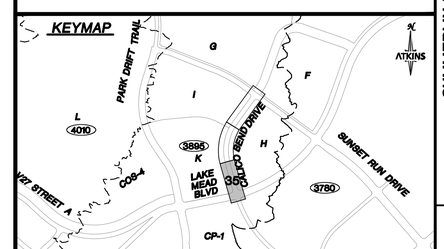
ROADWAY GRADING PLAN
CALICO BEND DRIVE - BEGIN TO STA 33+75

KEYMAP



DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
DATE:	SEPTEMBER, 2022
HORIZ.:	1"=20'
VERT.:	
DRAWING NO.	36/69
JOB NO.	1000694745

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L00-00000

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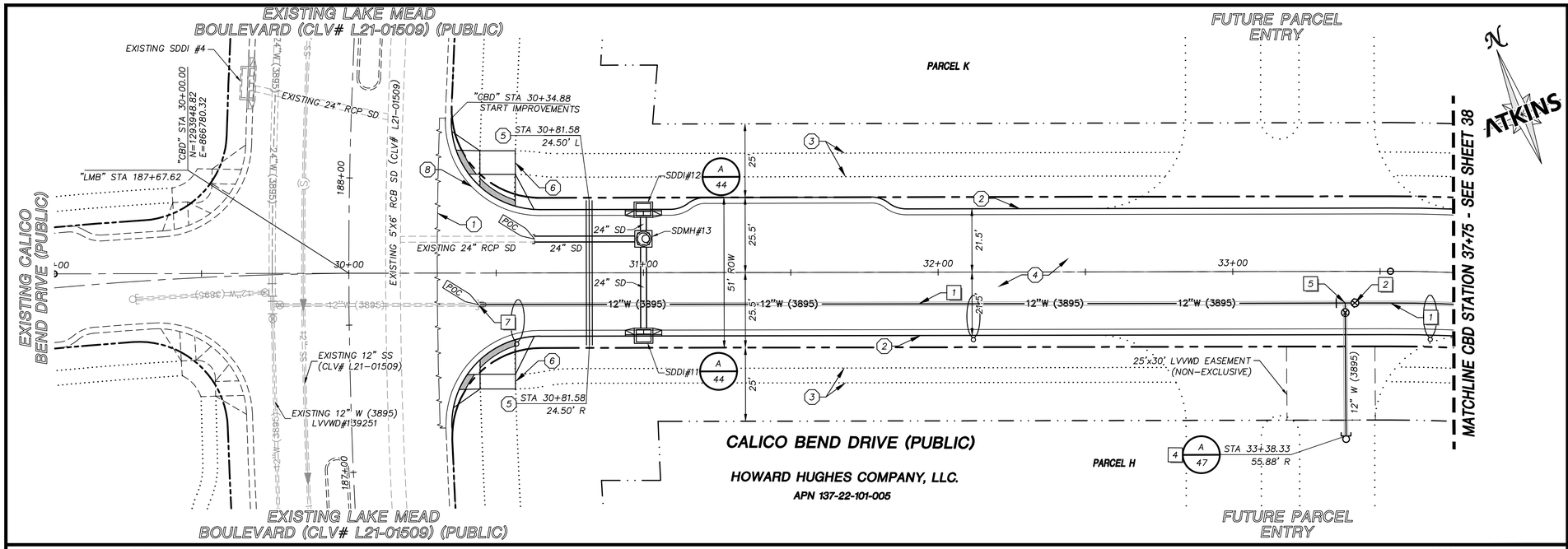

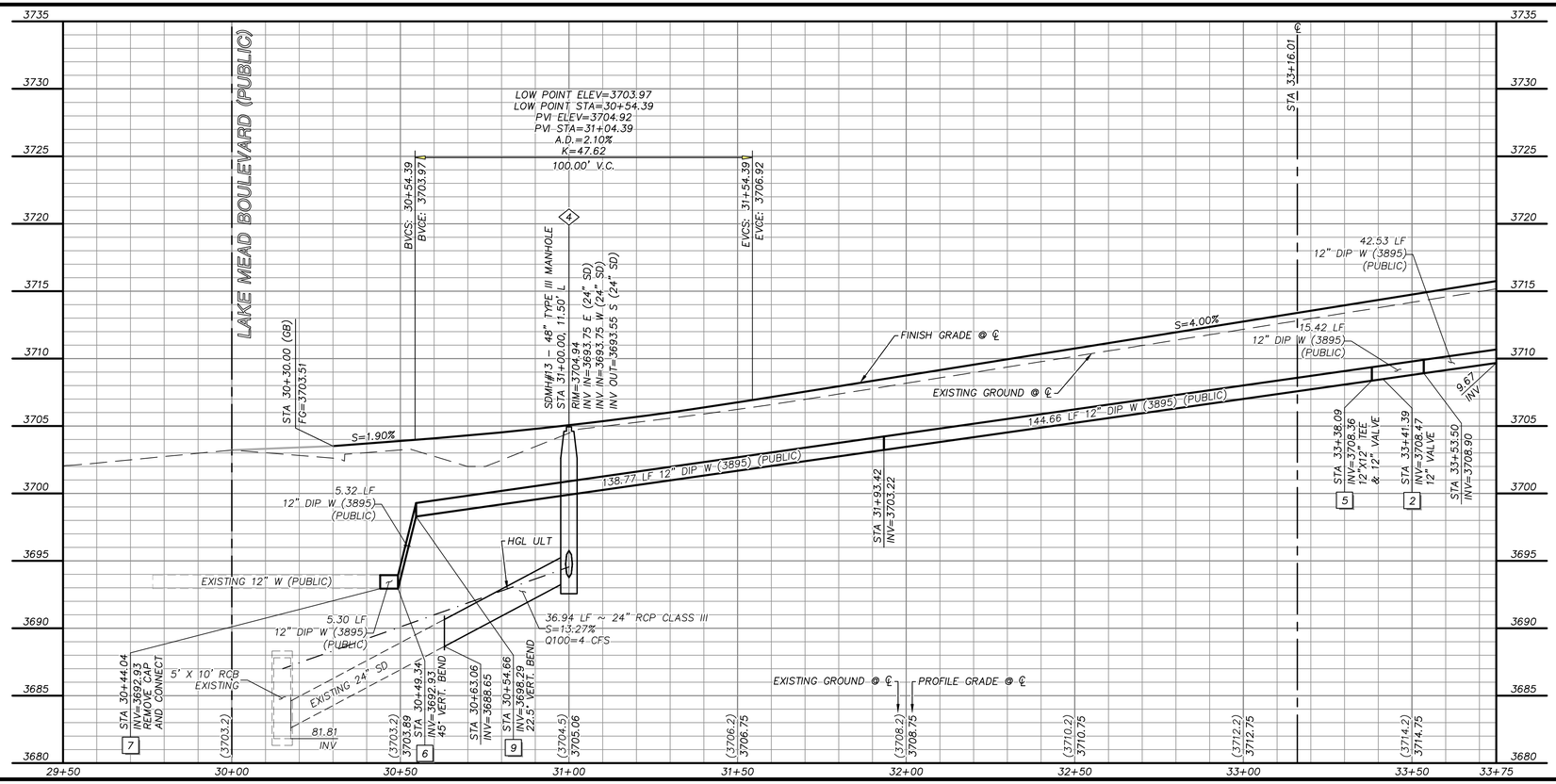

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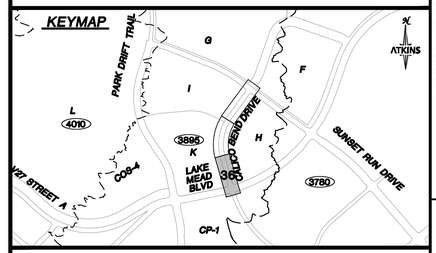
KEYMAP



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GRAPHIC SCALE

HORIZONTAL: 1"=20'

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

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

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

Call before you Dig AVOID CUTTING UNDERGROUND UTILITY LINES, ITS QUICK! Call 811 OR 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES, ITS QUICK! CALL BEFORE YOU DIG OVERHEAD 1-702-227-2929

PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS			
REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27

PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD) AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

ROADWAY PLAN & PROFILE

CALICO BEND DRIVE - BEGIN TO STA 33+75

00000000	DESIGNED BY: D. SMITH
L00-00000	DRAWN BY: C. HONEY
DATE: SEPTEMBER, 2022	CHECKED BY: N. BARCOS
DRAWING NO. 36/69	HORIZ.: 1"=20' VERT.: 1"=4'
JOB NO. 1000694748	

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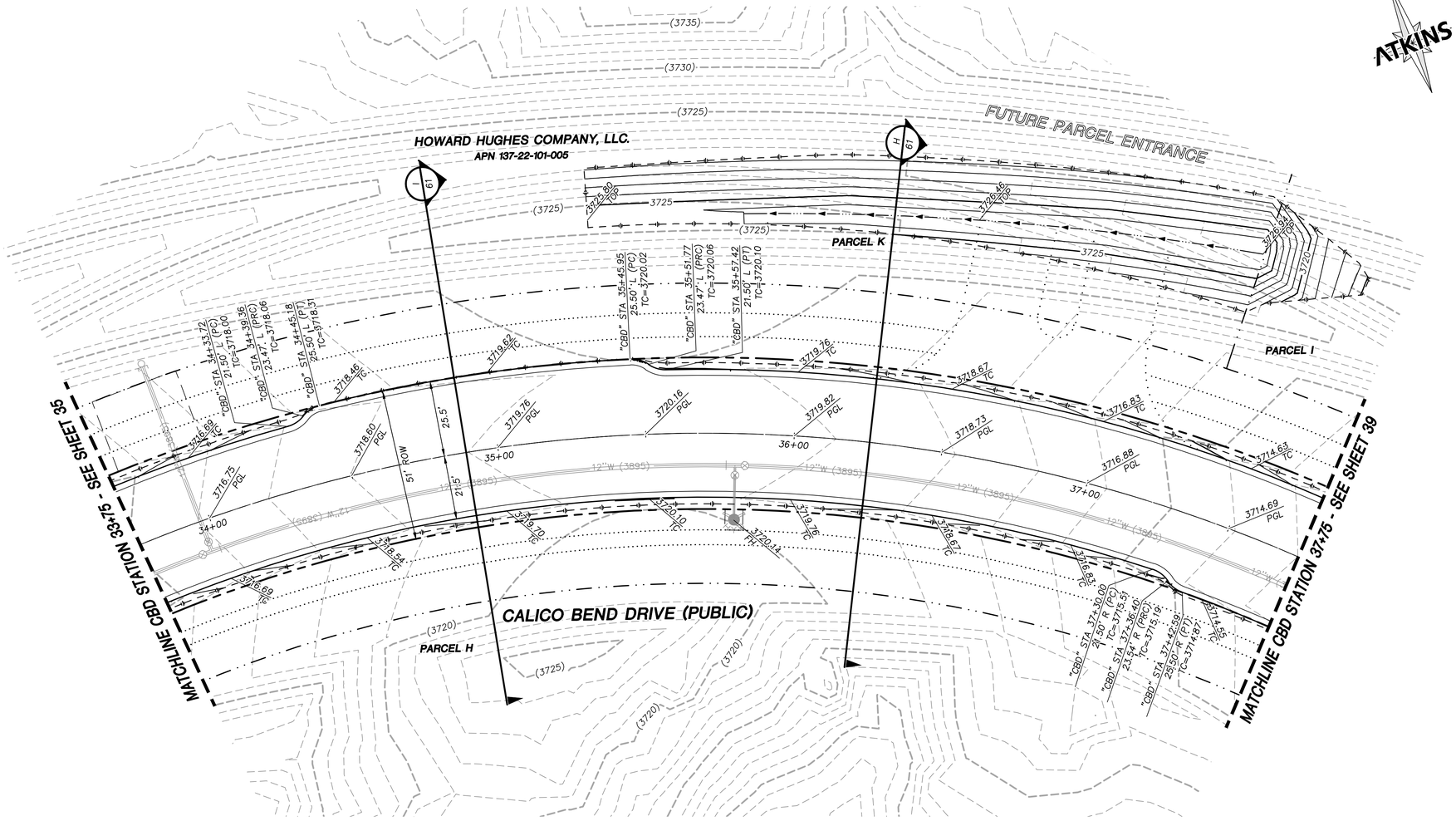
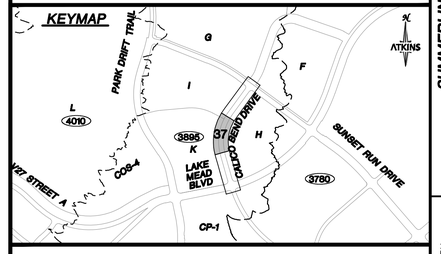


STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. INSTALL TYPE II SD MANHOLE PER CCAUSD #405
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
6. INSTALL RIP-RAP (D50=8", THICKNESS=24")
7. INSTALL NDOT TYPE II DROP INLET PER NDOT DS-32
8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL



GRAPHIC SCALE
10 0 5 10 20
HORIZONTAL: 1"=20'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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

BENCHMARK

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

FAST Call before you UnderGround 1-702-432-5300 NEVADA AND ARIZONA SYSTEM OF TRANSMISSION

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

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

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

NEVADA PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY L. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

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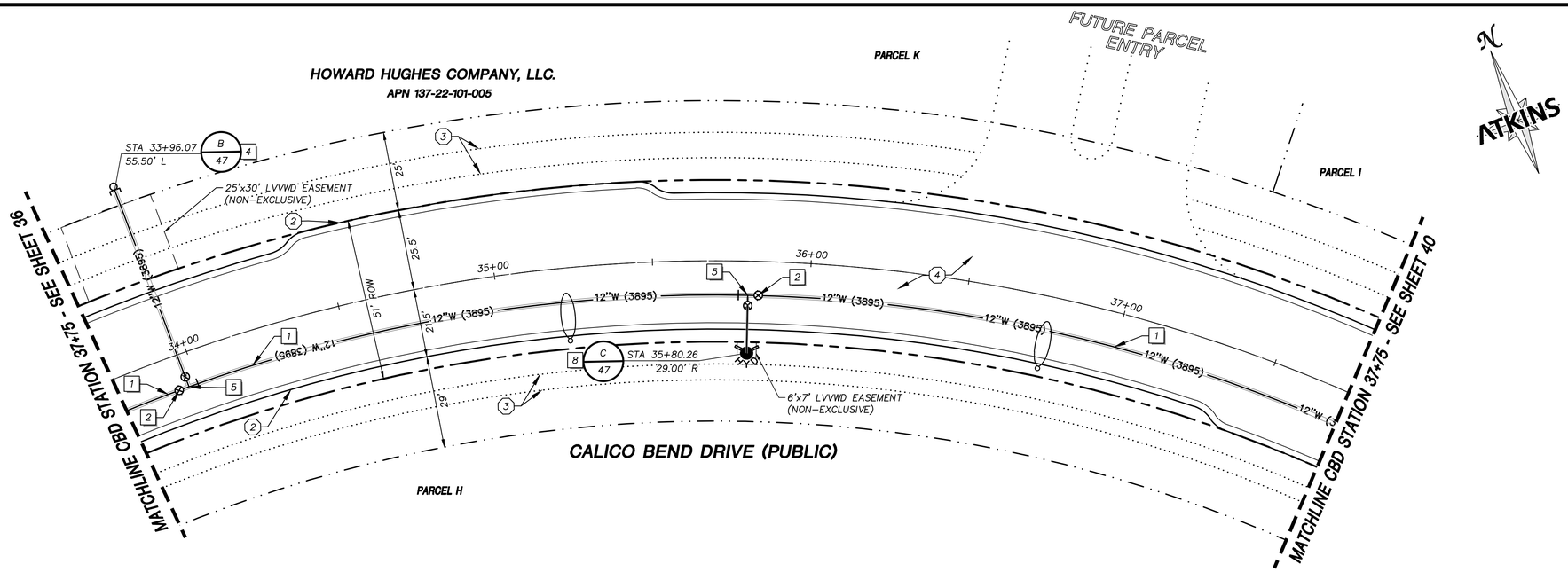
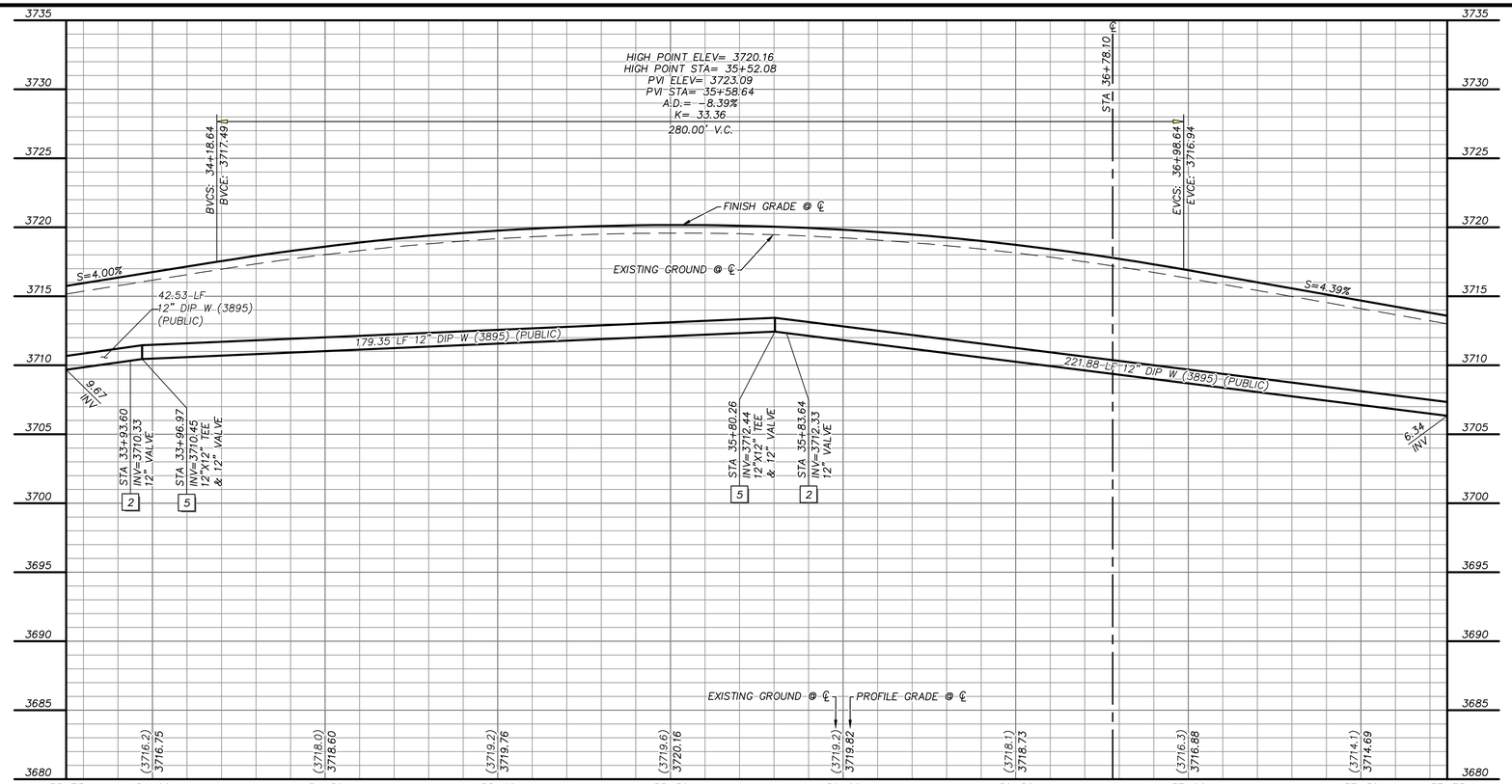
ROADWAY GRADING PLAN
CALICO BEND DRIVE - STA 33+75 TO STA 37+75

00000000	DESIGNED BY: D. SMITH
L00-00000	DRAWN BY: C. HONEY
DATE: SEPTEMBER, 2022	CHECKED BY: N. BARCOS
DRAWING NO. 37/69	HORIZ.: 1"=20' VERT.:

JOB NO. 1000694748

C:\pw_work\atkinsn01\dms585371\694748-10-GRAD-03.dwg LAYOUT: 2 Sep 07, 2022 - 2:32PM





GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

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 (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

BENCHMARK

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

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

Call before you Dig AVOID CUTTING & DAMAGING UTILITY LINES. IT'S COURTLY. Call 811 or 1-800-642-2444

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

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE 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 TYPE II SD MANHOLE PER CCAUSD #405
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
6. INSTALL RIP-RAP (D50=8", THICKNESS=24")
7. INSTALL NDOT TYPE II DROP INLET PER NDOT DS-32
8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

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 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. INSTALL CORROSION PROTECTION PER 3.16.8

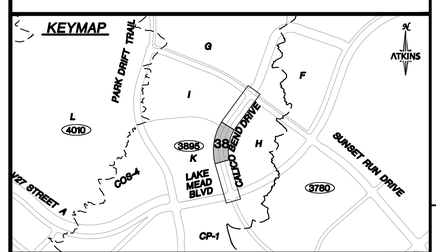
WATERLINE CONSTRUCTION NOTES

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 45° VERTICAL BEND PER UDACS PLATE #31
7. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
8. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
9. INSTALL 22.5° VERTICAL BEND PER UDACS PLATE #31
10. INSTALL 1-1/2" IRRIGATION METER WITH 1-1/2" RPPA PER UDACS PLATES #4 AND #8 WITH CURB STOP PER DETAIL D ON SHEET 68
11. INSTALL 1-1/2" SERVICE SADDLE PER UDACS PLATE #4
12. INSTALL COMBINATION AIR VALVE ASSEMBLY WITH ALL APPURTENANCES PER UDACS PLATE #38
13. INSTALL 11.25° BEND PER UDACS SECTION 2.15

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEETS 59, 60, AND 61 FOR TYPICAL PAVEMENT SECTIONS
5. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL C ON SHEET 68
6. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN CS-3B (A=B=6.5').
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT MODIFIED SPILLOUT CURB AND GUTTER PER CCAUSD #216 AND DETAIL F ON SHEET 67

KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTEGA CIVIL EXP. 6-30-23 No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27
PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

ROADWAY PLAN & PROFILE
CALICO BEND DRIVE - STA 33+75 TO STA 37+75

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	1"=20'
VERT.:	1"=4'
00000000	
L00-00000	
DATE	SEPTEMBER, 2022
DRAWING NO.	38/69
JOB NO.	100069474B

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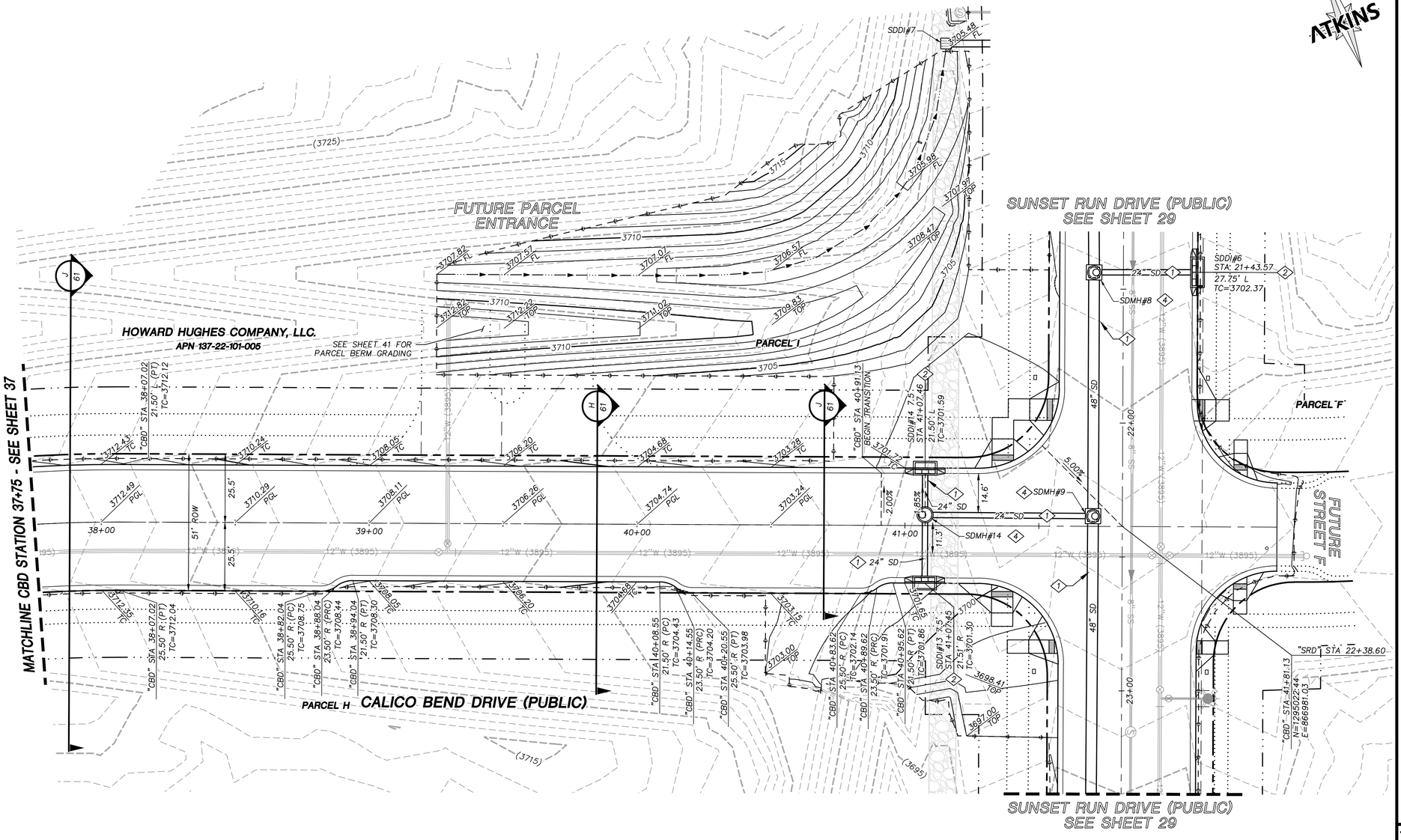

STORM DRAIN CONSTRUCTION NOTES

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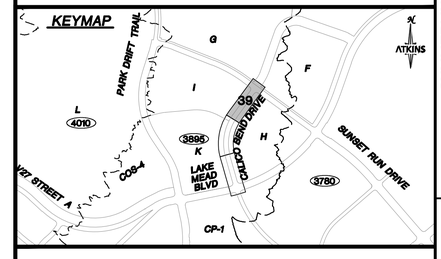
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL



GRAPHIC SCALE
10 0 5 10 20
HORIZONTAL: 1"=20'

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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

BENCHMARK

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

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

Call before you Dig AVOID CUTTING OR DISTURBING UTILITY LINES. BE SHORTLY. Call 811 OR 1-800-642-2444

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

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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY L. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

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ROADWAY GRADING PLAN
CALICO BEND DRIVE - STA 37+75 TO END

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	1"=20'
VERT.:	
00000000	
L00-00000	
DATE:	SEPTEMBER, 2022
DRAWING NO.	39/69
JOB NO.	1000694748

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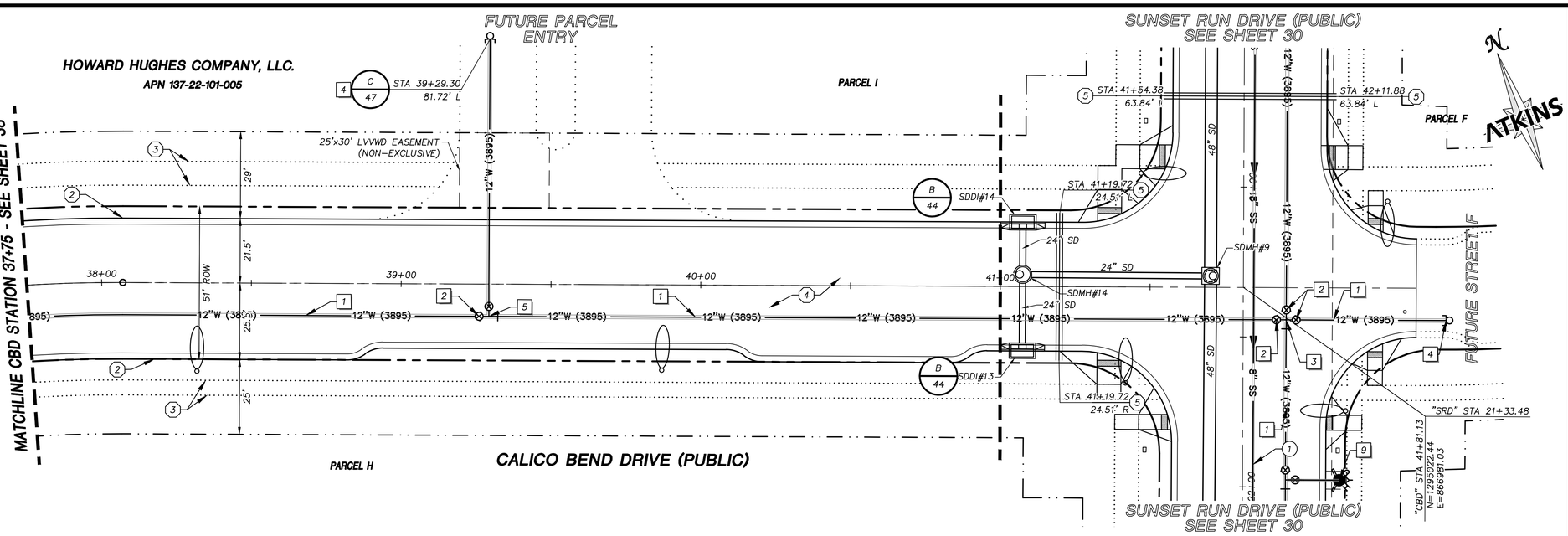

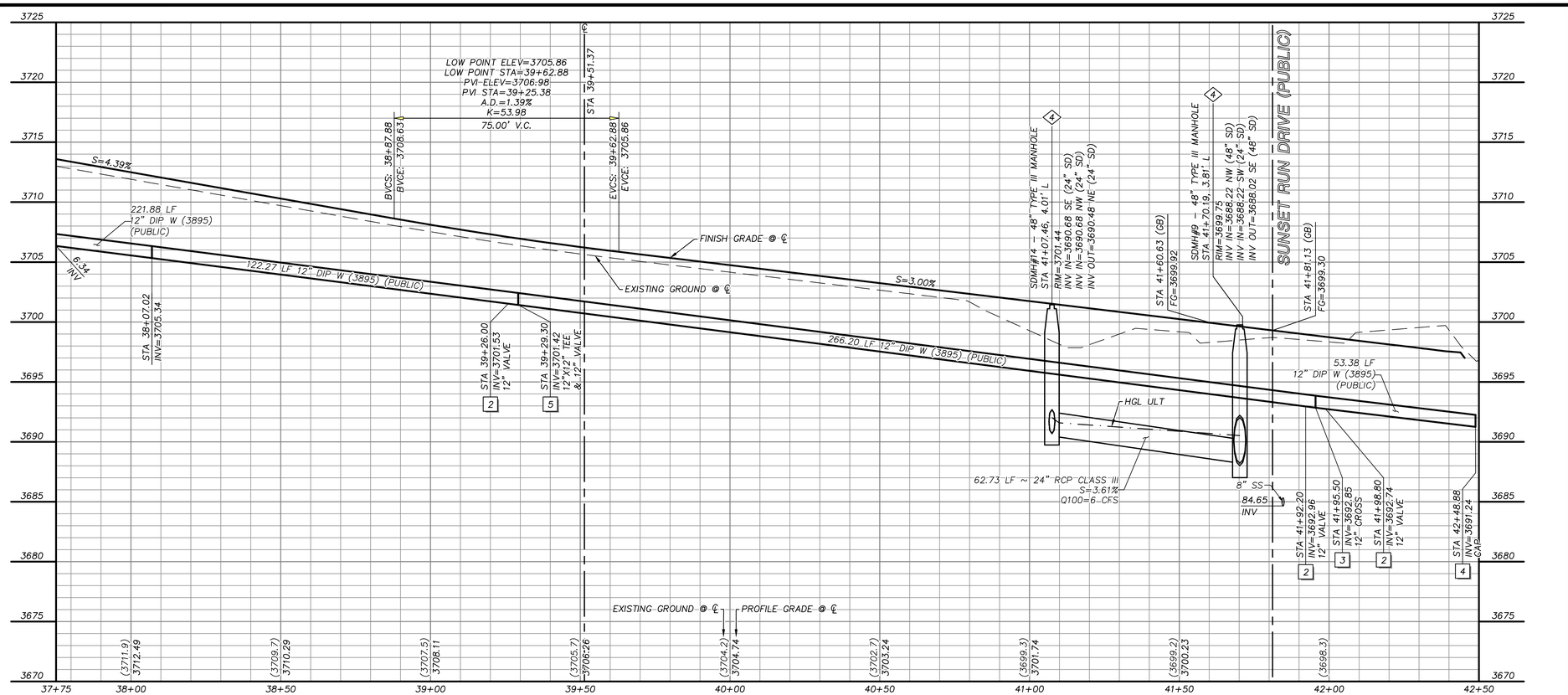

GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

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 (NCRS), LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

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T21S,R59E,S03

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Call before you Dig AVOID OUTAGES, HITS/DAMAGES UTILITY LINES & COSTLY FINES. Call 811 or 1-800-642-2444

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

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11. INSTALL 1-1/2" SERVICE SADDLE PER UDACS PLATE #4
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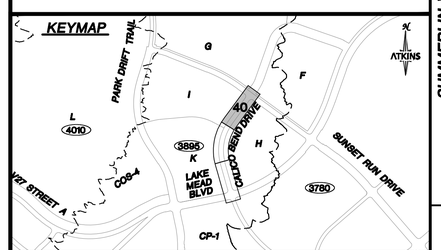
13. INSTALL 11.25° BEND PER UDACS SECTION 2.15

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEETS 59, 60, AND 61 FOR TYPICAL PAVEMENT SECTIONS
5. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL C ON SHEET 68
6. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN CS-3B (A=B=6.5').
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT MODIFIED SPILLOUT CURB AND GUTTER PER CCAUSD #216 AND DETAIL F ON SHEET 67

KEYMAP



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NEVADA PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY LEE ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

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ROADWAY PLAN & PROFILE

CALICO BEND DRIVE - STA 37+75 TO END

00000000	DESIGNED BY: D. SMITH
L00-00000	DRAWN BY: C. HONEY
DATE: SEPTEMBER, 2022	CHECKED BY: N. BARCOS
DRAWING NO. 40/69	HORIZ.: 1"=20' VERT.: 1"=4'

JOB NO. 100069474B

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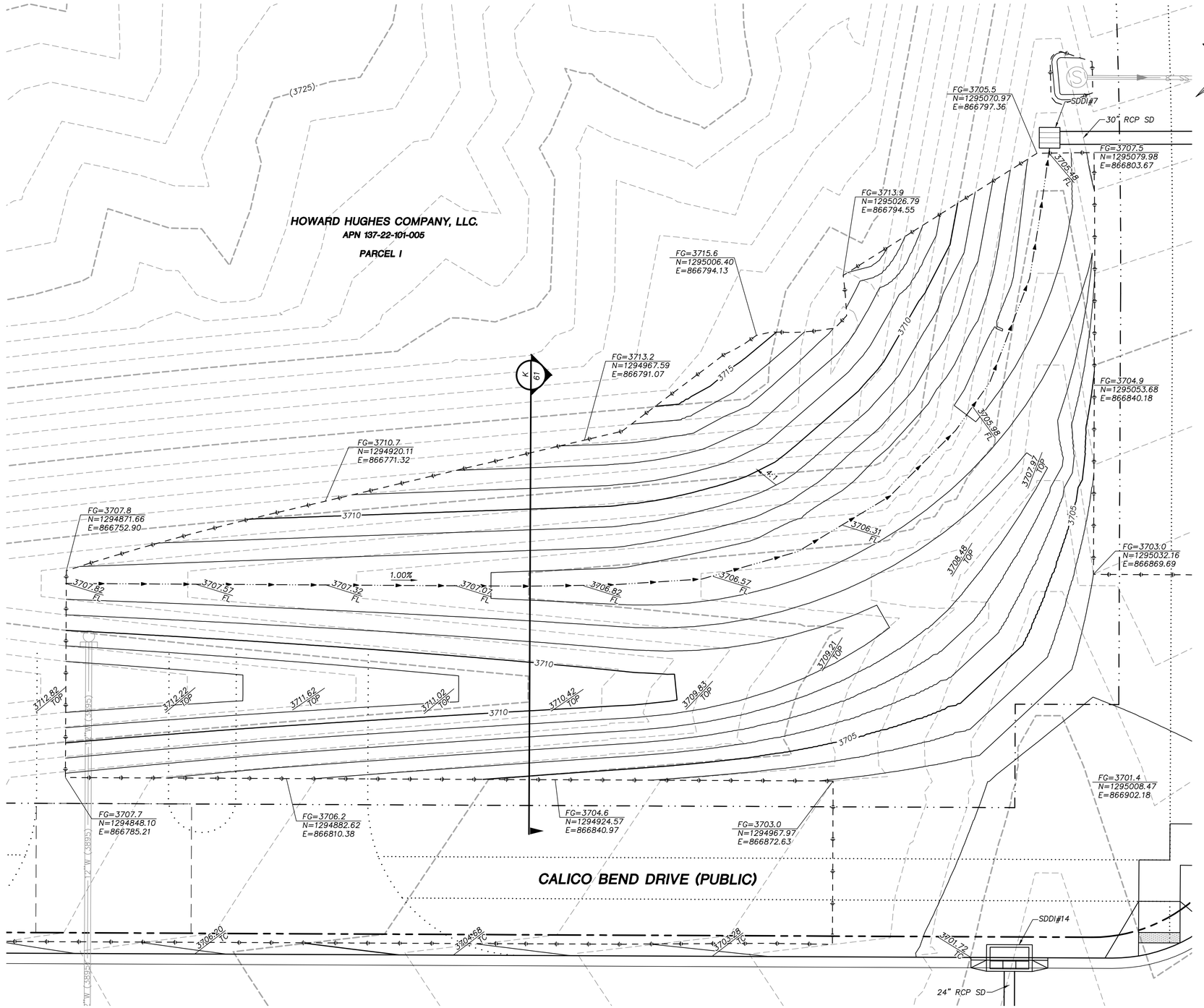


GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. INSTALL TYPE II SD MANHOLE PER CCAUSD #405
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
6. INSTALL RIP-RAP (D50=8", THICKNESS=24")
7. INSTALL NDOT TYPE II DROP INLET PER NDOT DS-32
8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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

BENCHMARK

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

FAST Call before you UnderGround 1-702-432-5300 REGIONAL NOTIFICATION SYSTEM OF UTILITY LOCATIONS

Call before you Dig AVOID CUTTING TELECOMMUNICATIONS UTILITY LINES. DIAL 811 OR 1-800-642-2444

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

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

NEVADA PROFESSIONAL ENGINEER — ANTHONY D. ORTIZ — EXP. 12-31-23 — CIVIL — No. 18849 — STATE OF NEVADA

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

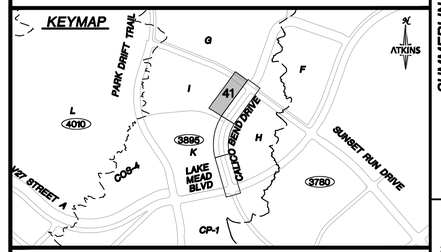
SUMMERLIN

SUMMERLIN WEST VILLAGE 27

PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

ROADWAY GRADING PLAN

KEYMAP



DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: 1"=10'
VERT.:

00000000
L00-00000
DATE: SEPTEMBER, 2022
DRAWING NO. 41/69

JOB NO. 100069474B

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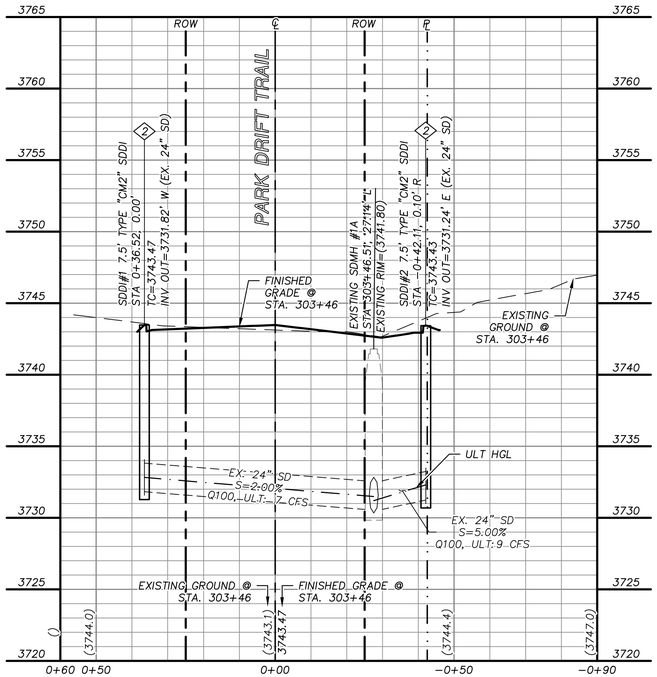
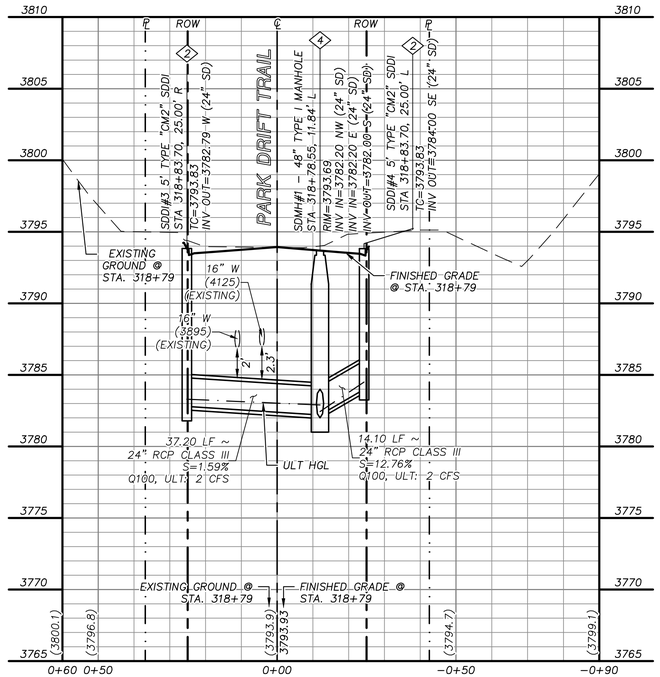


STORM DRAIN LATERAL 1

"PDT" STA. 303+46 SEE SHEET 16

A / 42



STORM DRAIN LATERAL 2

"PDT" STA. 318+79 SEE SHEET 24

B / 42

GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE:_____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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

BENCHMARK

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

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

Call before you Dig 811 1-800-642-2444

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

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. INSTALL TYPE II SD MANHOLE PER CCAUSD #405
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
6. INSTALL RIP-RAP (D50=8", THICKNESS=24")
7. INSTALL NDOT TYPE II DROP INLET PER NDOT DS-32
8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

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 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. INSTALL CORROSION PROTECTION PER 3.16.8

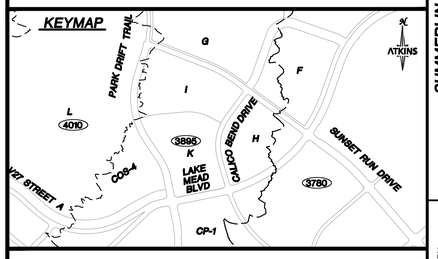
WATERLINE CONSTRUCTION NOTES

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 45° VERTICAL BEND PER UDACS PLATE #31
7. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
8. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
9. INSTALL 22.5° VERTICAL BEND PER UDACS PLATE #31
10. INSTALL 1-1/2" IRRIGATION METER WITH 1-1/2" RPPA PER UDACS PLATES #4 AND #8 WITH CURB STOP PER DETAIL D ON SHEET 68
11. INSTALL 1-1/2" SERVICE SADDLE PER UDACS PLATE #4
12. INSTALL COMBINATION AIR VALVE ASSEMBLY WITH ALL APPURTENANCES PER UDACS PLATE #38
13. INSTALL 11.25° BEND PER UDACS SECTION 2.15

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEETS 59, 60, AND 61 FOR TYPICAL PAVEMENT SECTIONS
5. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL C ON SHEET 68
6. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN CS-3B (A=B=6.5').
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT MODIFIED SPILLOUT CURB AND GUTTER PER CCAUSD #216 AND DETAIL F ON SHEET 67

KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTEGA EXP. 12-31-23 CIVIL No. 18849

REVISIONS			
REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27

PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD) AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

STORM DRAIN LATERAL PROFILES PARK DRIFT TRAIL

00000000	DESIGNED BY: D. SMITH
L00-00000	DRAWN BY: C. HONEY
DATE: SEPTEMBER, 2022	CHECKED BY: N. BARCOS
DRAWING NO. 42/69	HORIZ.: NONE VERT.: NONE
JOB NO. 100069474B	

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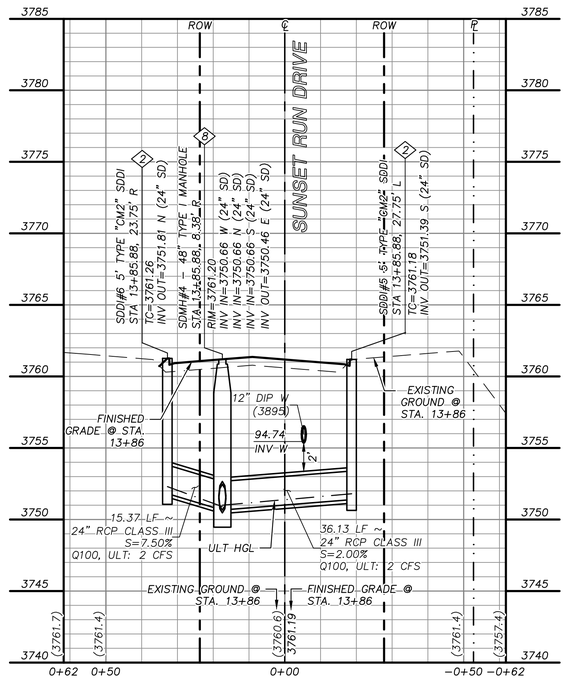
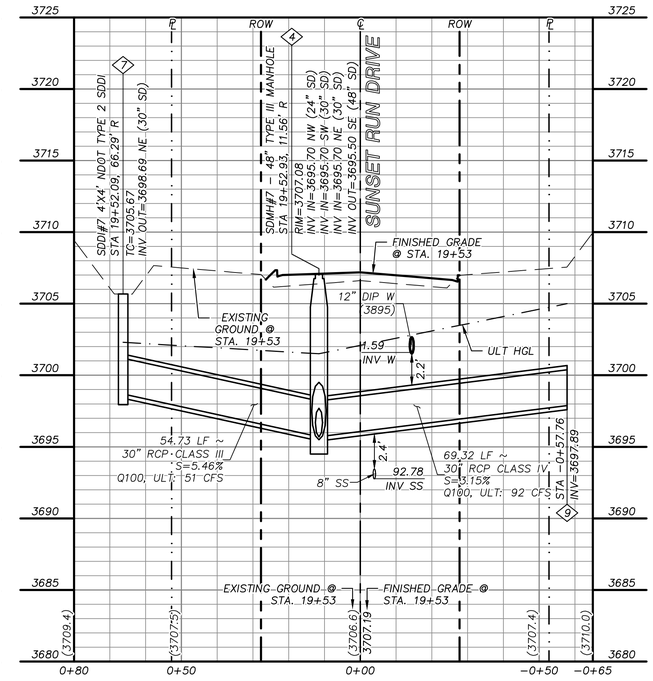


STORM DRAIN LATERAL 1

"SRD" STA. 13+86 SEE SHEET 28

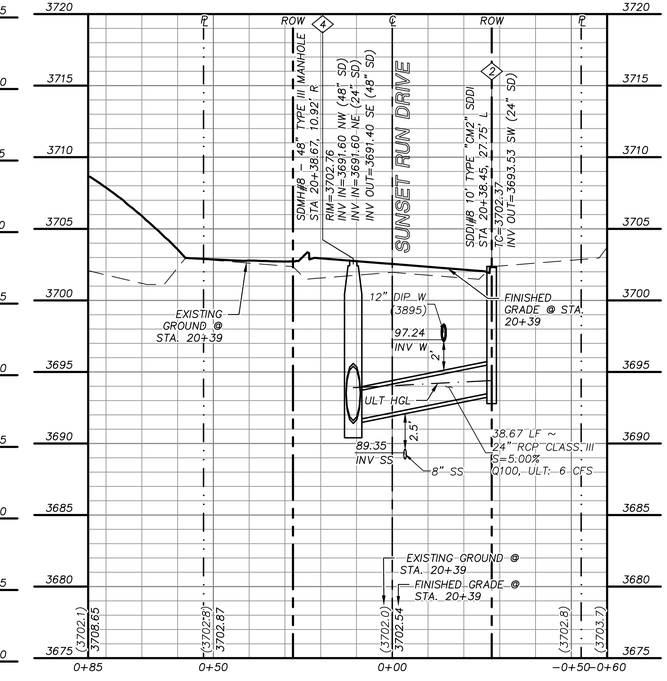
A 43



STORM DRAIN LATERAL 2

"SRD" STA. 19+53 SEE SHEET 30

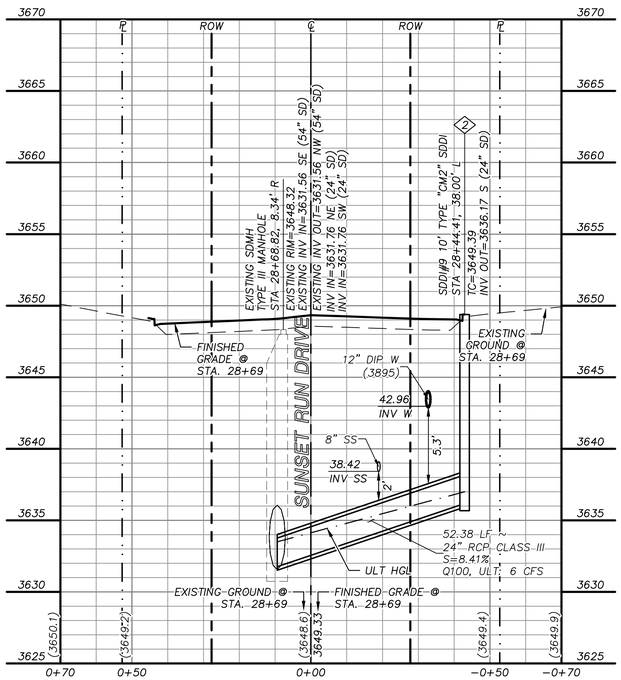
B 43



STORM DRAIN LATERAL 3

"SRD" STA. 20+39 SEE SHEET 30

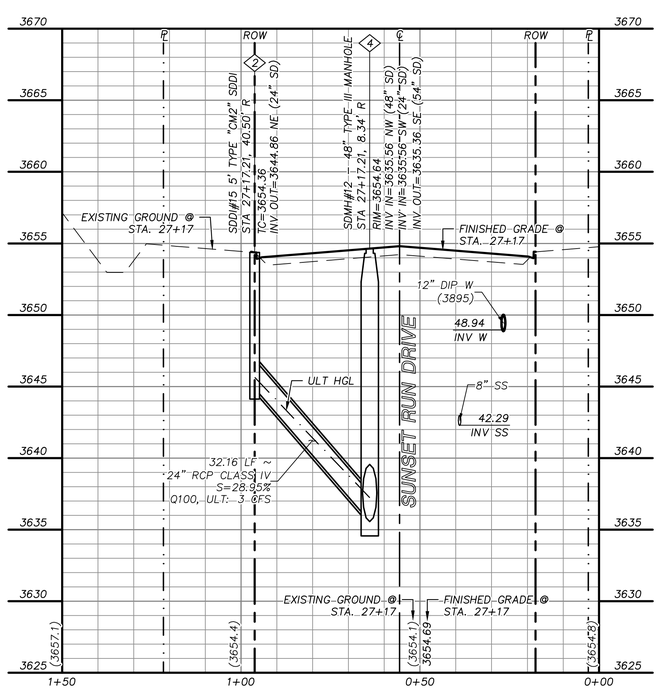
C 43



STORM DRAIN LATERAL 4

"SRD" STA. 28+69 SEE SHEET 34

D 43



STORM DRAIN LATERAL 5

"SRD" STA. 27+17 SEE SHEET 34

E 43

GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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

BENCHMARK

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

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

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

STORM DRAIN CONSTRUCTION NOTES

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2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. INSTALL TYPE II SD MANHOLE PER CCAUSD #405
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
6. INSTALL RIP-RAP (D50=8", THICKNESS=24")
7. INSTALL NDOT TYPE II DROP INLET PER NDOT DS-32
8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

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 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. INSTALL CORROSION PROTECTION PER 3.16.8

WATERLINE CONSTRUCTION NOTES

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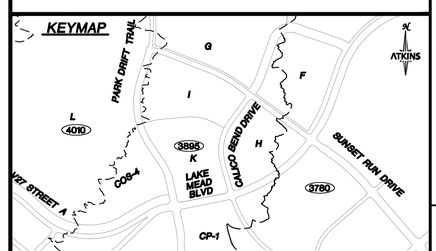
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL CROSS PER UDACS PLATE #31
4. INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
5. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
6. INSTALL 45° VERTICAL BEND PER UDACS PLATE #31
7. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
8. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
9. INSTALL 22.5° VERTICAL BEND PER UDACS PLATE #31
10. INSTALL 1-1/2" IRRIGATION METER WITH 1-1/2" RPPA PER UDACS PLATES #4 AND #8 WITH CURB STOP PER DETAIL D ON SHEET 68
11. INSTALL 1-1/2" SERVICE SADDLE PER UDACS PLATE #4
12. INSTALL COMBINATION AIR VALVE ASSEMBLY WITH ALL APPURTENANCES PER UDACS PLATE #38
13. INSTALL 11.25° BEND PER UDACS SECTION 2.15

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEETS 59, 60, AND 61 FOR TYPICAL PAVEMENT SECTIONS
5. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL C ON SHEET 68
6. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN CS-3B (A=B=6.5').
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT MODIFIED SPILLOUT CURB AND GUTTER PER CCAUSD #216 AND DETAIL F ON SHEET 67



REV.	DESCRIPTION	BY	DATE	APPROVAL

REVISIONS

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

SUMMERLIN

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PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

STORM DRAIN LATERAL PROFILES
SUNSET RUN DRIVE

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE

DATE: SEPTEMBER, 2022
DRAWING NO. 43/69

JOB NO. 1000694748

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

PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY L. ORTIZ EXP. 12-31-23 CIVIL No. 18849

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L00-00000

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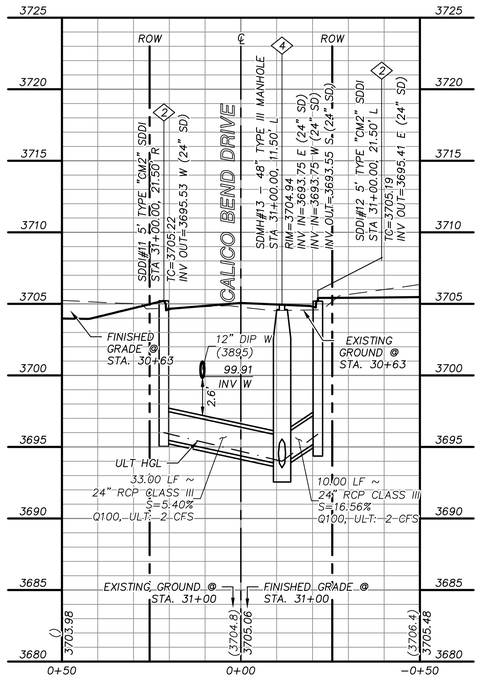
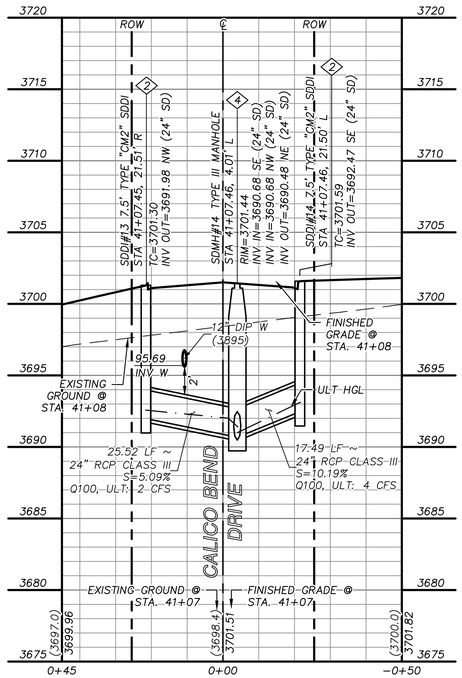


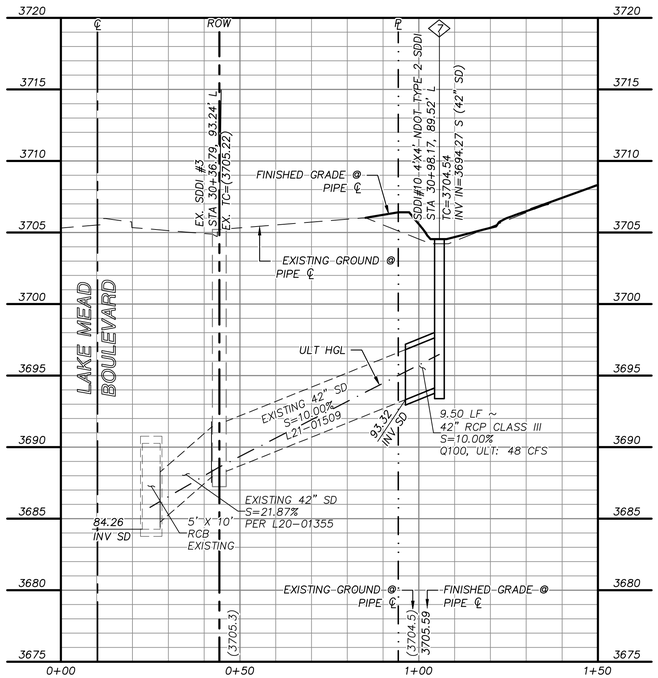
STORM DRAIN LATERAL 1

"CBD" STA. 31+00 SEE SHEET 36



STORM DRAIN LATERAL 2

"CBD" STA. 41+07 SEE SHEET 40



STORM DRAIN LATERAL 3

"CBD" STA. 30+98 SEE SHEET 35

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. INSTALL TYPE II SD MANHOLE PER CCAUSD #405
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
6. INSTALL RIP-RAP (D50=8", THICKNESS=24")
7. INSTALL NDOT TYPE II DROP INLET PER NDOT DS-32
8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

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 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. INSTALL CORROSION PROTECTION PER 3.16.8

WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN PER UDACS PLATES #17 AND PLATE #19
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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 45° VERTICAL BEND PER UDACS PLATE #31
7. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
8. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
9. INSTALL 22.5° VERTICAL BEND PER UDACS PLATE #31
10. INSTALL 1-1/2" IRRIGATION METER WITH 1-1/2" RPPA PER UDACS PLATES #4 AND #8 WITH CURB STOP PER DETAIL D ON SHEET 68
11. INSTALL 1-1/2" SERVICE SADDLE PER UDACS PLATE #4
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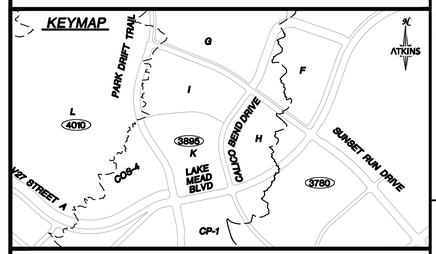
13. INSTALL 11.25° BEND PER UDACS SECTION 2.15

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEETS 59, 60, AND 61 FOR TYPICAL PAVEMENT SECTIONS
5. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL C ON SHEET 68
6. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN CS-3B (A=B=6.5').
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT MODIFIED SPILLOUT CURB AND GUTTER PER CCAUSD #216 AND DETAIL F ON SHEET 67

KEYMAP



GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE:_____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

BASIS OF BEARING

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

BENCHMARK

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

FAST Call before you UnderGround 1-702-432-5300 NEVADA811 AND AUTOMAT SYSTEM OF TRANSPORTATION

Call before you Dig 811 1-800-642-2444

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

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

PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTEGA EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27

PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD) AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

STORM DRAIN LATERAL PROFILES
CALICO BEND DRIVE

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE

00000000
L00-00000
DATE: SEPTEMBER, 2022
DRAWING NO. 44/69

JOB NO. 100069474B

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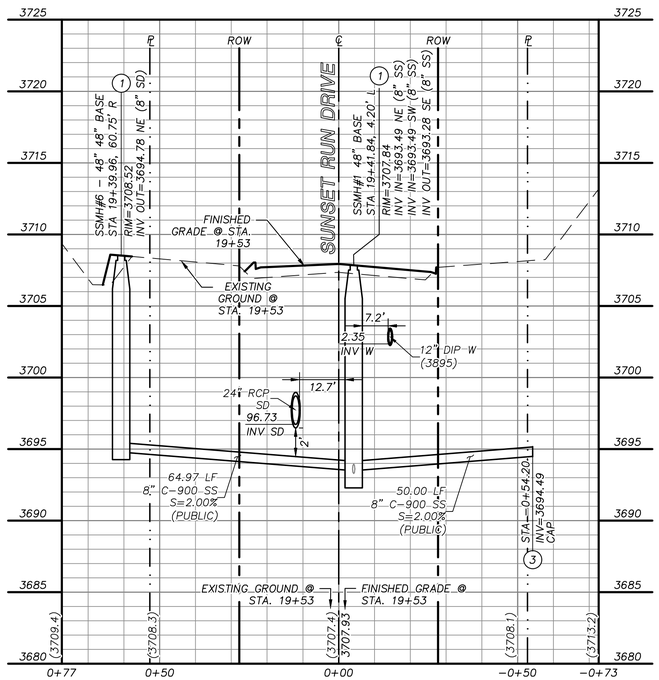

SEWER LATERAL 1

"SRD" STA. 19+53 SEE SHEET 30 (A/45)

GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

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T21S,R59E,S03

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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY D. ORTIZ EXP. 12-31-23 CIVIL No. 18849

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. INSTALL TYPE II SD MANHOLE PER CCAUSD #405
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
6. INSTALL RIP-RAP (D50=8", THICKNESS=24")
7. INSTALL NDOT TYPE II DROP INLET PER NDOT DS-32
8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

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 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. INSTALL CORROSION PROTECTION PER 3.16.8

WATERLINE CONSTRUCTION NOTES

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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 45° VERTICAL BEND PER UDACS PLATE #31
7. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
8. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
9. INSTALL 22.5° VERTICAL BEND PER UDACS PLATE #31
10. INSTALL 1-1/2" IRRIGATION METER WITH 1-1/2" RPPA PER UDACS PLATES #4 AND #8 WITH CURB STOP PER DETAIL D ON SHEET 68
11. INSTALL 1-1/2" SERVICE SADDLE PER UDACS PLATE #4
12. INSTALL COMBINATION AIR VALVE ASSEMBLY WITH ALL APPURTENANCES PER UDACS PLATE #38
13. INSTALL 11.25° BEND PER UDACS SECTION 2.15

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4. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEETS 59, 60, AND 61 FOR TYPICAL PAVEMENT SECTIONS
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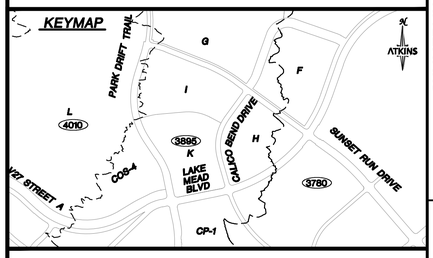
6. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN CS-3B (A=B=6.5').
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT MODIFIED SPILLOUT CURB AND GUTTER PER CCAUSD #216 AND DETAIL F ON SHEET 67

KEYMAP



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SEWER LATERAL PROFILES SUNSET RUN DRIVE

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE

00000000
L00-00000

DATE: SEPTEMBER, 2022

DRAWING NO. 45/69

JOB NO. 100069474B

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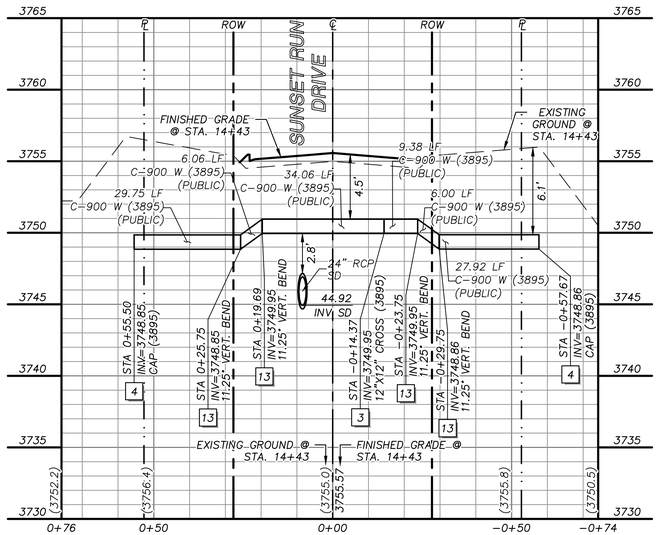
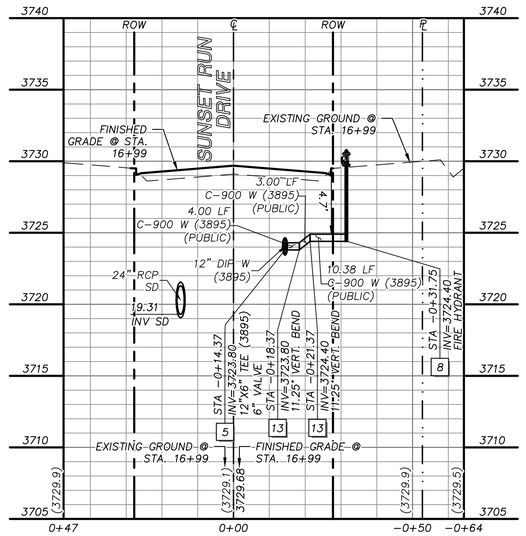
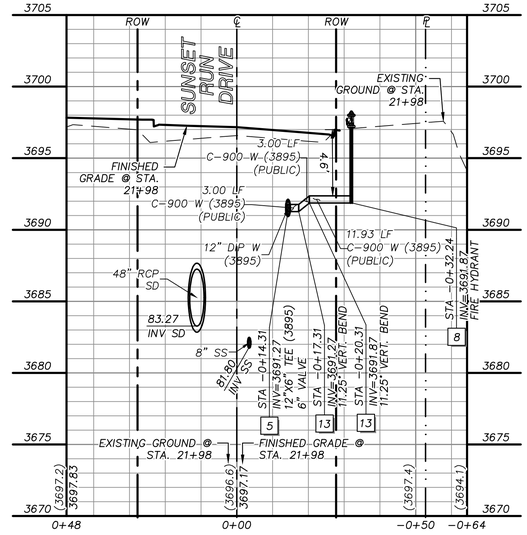


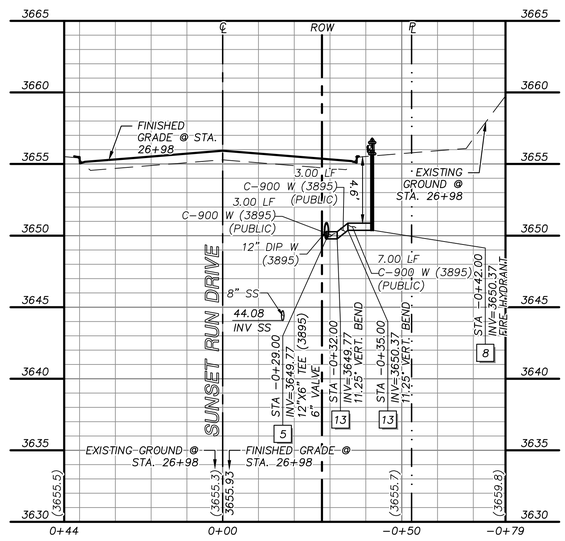
WATER LATERAL 1
"SRD" STA. 14+43 SEE SHEET 28 — A / 46



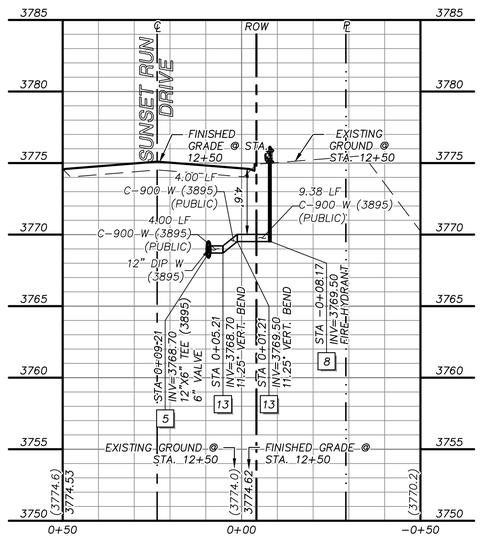
WATER LATERAL 2
"SRD" STA. 16+99 SEE SHEET 28 — B / 46



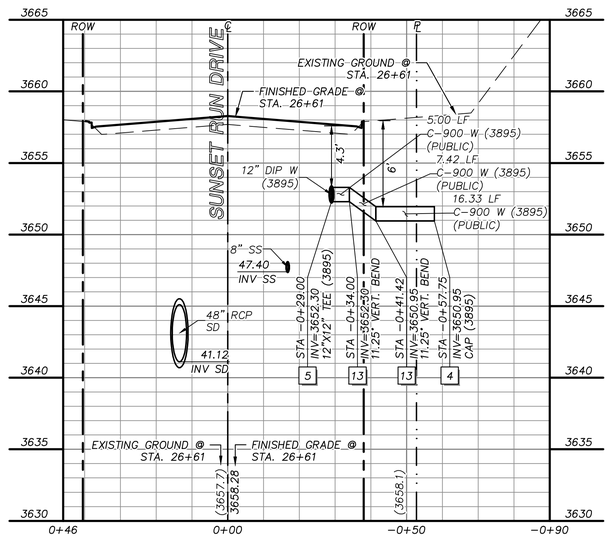
WATER LATERAL 3
"SRD" STA. 21+98 SEE SHEET 30 — C / 46



WATER LATERAL 4
"SRD" STA. 26+98 SEE SHEET 34 — D / 46



WATER LATERAL 5
"SRD" STA. 12+50 SEE SHEET 26 — E / 46



WATER LATERAL 6
"SRD" STA. 26+61 SEE SHEET 34 — F / 46

GRAPHIC SCALE
10 0 5 10 20
HORIZONTAL: 1"=20'
5 0 2.5 5 10
VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE:_____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

NICOLAS 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#0000

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BENCHMARK

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T21S,R59E,S03

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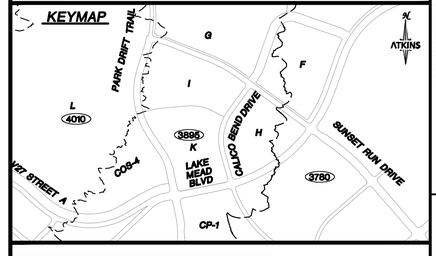
KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA — ANTHONY L. ORTIZ — EXP. 12-31-25 — CIVIL — No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
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Telephone: +1.702.263.7275
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WATER LATERAL PROFILES
SUNSET RUN DRIVE

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE

00000000
L00-00000
DATE: SEPTEMBER, 2022
DRAWING NO. 46/69

JOB NO. 1000694748

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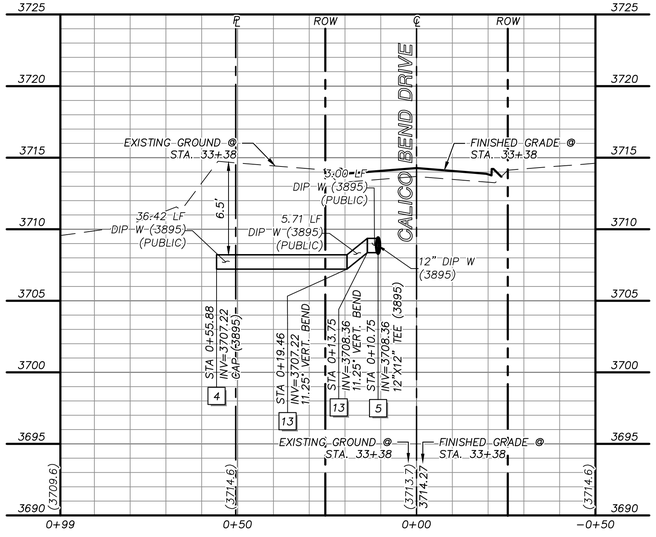
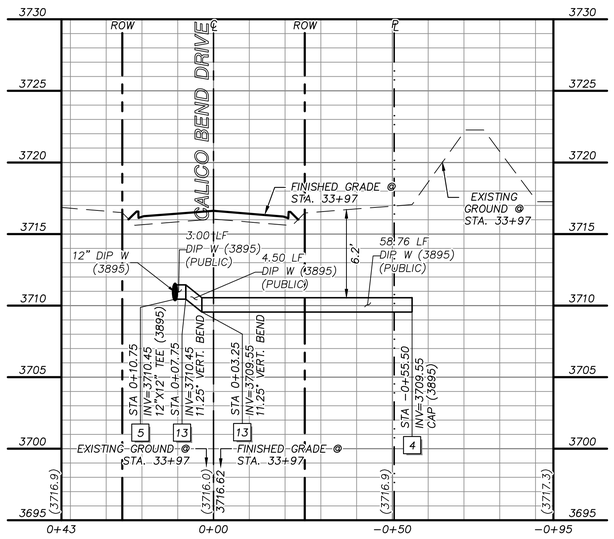


WATER LATERAL 1

"CBD" STA. 33+38 SEE SHEET 36

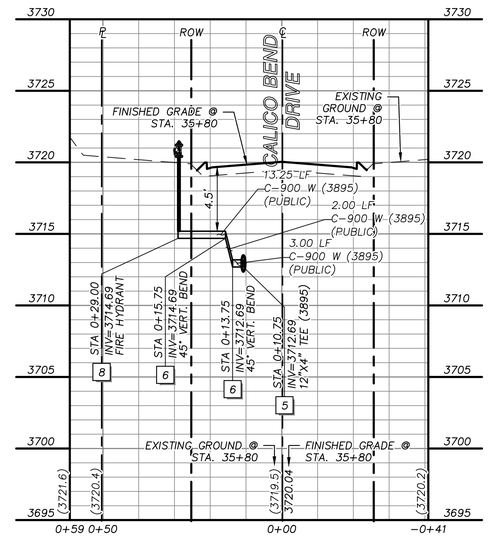
A 47



WATER LATERAL 2

"CBD" STA. 33+97 SEE SHEET 38

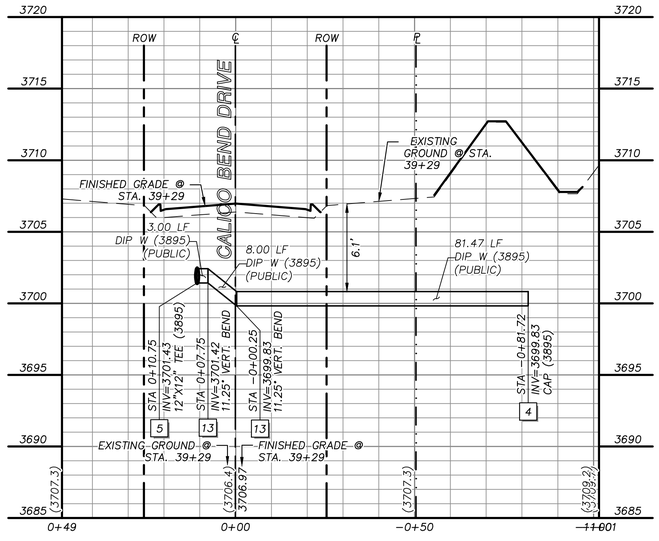
B 47



WATER LATERAL 3

"CBD" STA. 35+80 SEE SHEET 38

C 47



WATER LATERAL 3

"CBD" STA. 39+29 SEE SHEET 40

D 47

GRAPHIC SCALE

10 0 5 10 20

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE:_____

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7. INSTALL NDOT TYPE II DROP INLET PER NDOT DS−32
8. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL

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 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. INSTALL CORROSION PROTECTION PER 3.16.8

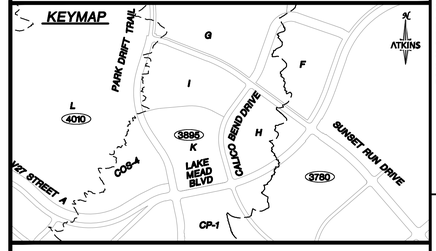
WATERLINE CONSTRUCTION NOTES

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 45° VERTICAL BEND PER UDACS PLATE #31
7. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
8. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, AND #40
9. INSTALL 22.5° VERTICAL BEND PER UDACS PLATE #31
10. INSTALL 1−1/2" IRRIGATION METER WITH 1−1/2" RPPA PER UDACS PLATES #4 AND #8 WITH CURB STOP PER DETAIL D ON SHEET 68
11. INSTALL 1−1/2" SERVICE SADDLE PER UDACS PLATE #4
12. INSTALL COMBINATION AIR VALVE ASSEMBLY WITH ALL APPURTENANCES PER UDACS PLATE #38
13. INSTALL 11.25° BEND PER UDACS SECTION 2.15

ROADWAY CONSTRUCTION NOTES

1. SAWCUT AND MATCH EXISTING
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEETS 59, 60, AND 61 FOR TYPICAL PAVEMENT SECTIONS
5. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2−4", 1−6") PER DETAIL C ON SHEET 68
6. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN CS−3B (A=B=6.5').
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT MODIFIED SPILLOUT CURB AND GUTTER PER CCAUSD #216 AND DETAIL F ON SHEET 67

KEYMAP



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PROFESSIONAL ENGINEER STATE OF NEVADA — ANTHONY L. ORTIZ — EXP. 12-31-25 — CIVIL — No. 18849

REVISIONS

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2270 Corporate Circle Suite 200
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Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN WEST VILLAGE 27
PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

WATER LATERAL PROFILES
CALICO BEND DRIVE

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	NONE
VERT.:	NONE
00000000	L00−00000
DATE:	SEPTEMBER, 2022
DRAWING NO.	47/69

JOB NO. 1000694748

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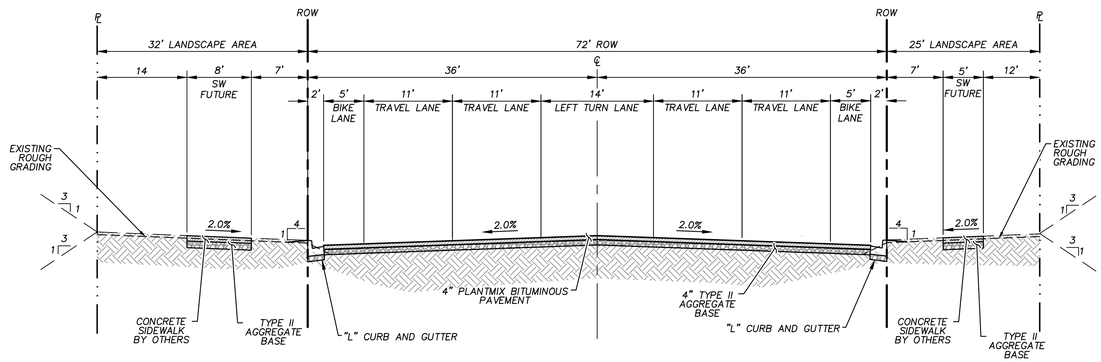
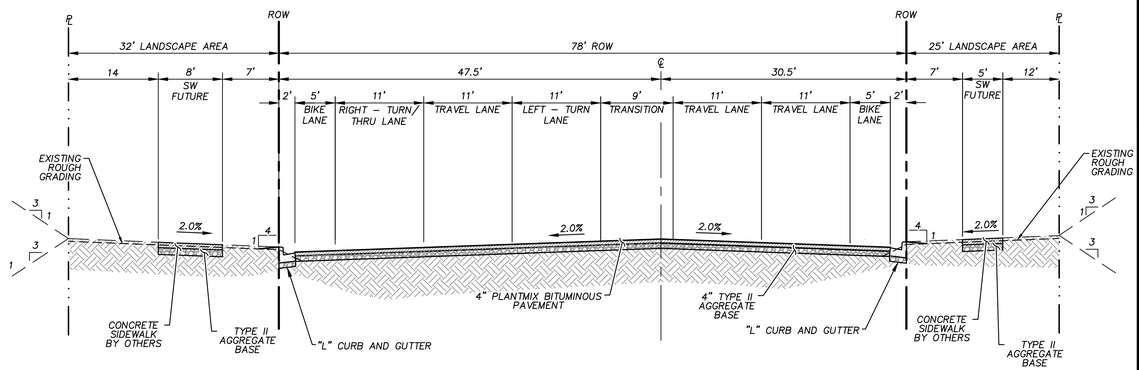


PARK DRIFT TRAIL - 72' ROW

N.T.S.

A
59



PARK DRIFT TRAIL - 78' ROW

N.T.S.

B
59

BASIS OF BEARING

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

BENCHMARK

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

FAST Call before you UnderGround 1-702-432-5300 REMOTELY AND INTERNAL SYSTEM OF TRANSPORTATION

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

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PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY J. ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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Telephone: +1.702.263.7275
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SUMMERLIN

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TYPICAL SECTIONS

DESIGNED BY:	D. SMITH
DRAWN BY:	C. HONEY
CHECKED BY:	N. BARCOS
HORIZ.:	NONE
VERT.:	NONE
00000000 L00-00000	
DATE:	SEPTEMBER, 2022
DRAWING NO.	59/69
JOB NO.	1000694748

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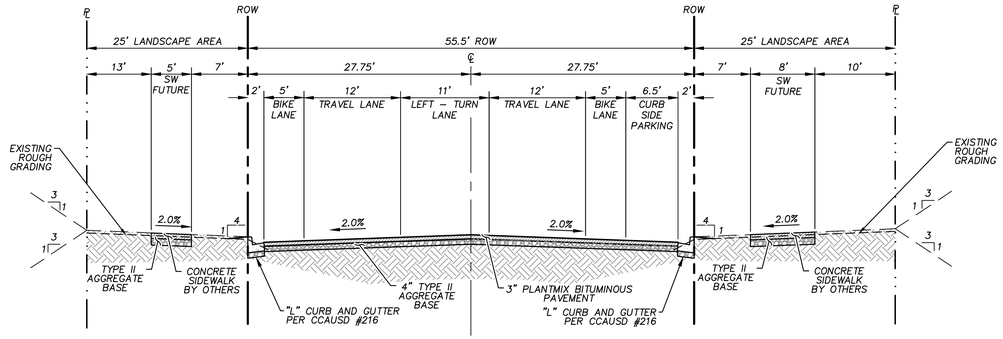

SUNSET RUN DRIVE - RIGHT CURB SIDE PARKING

N.T.S.

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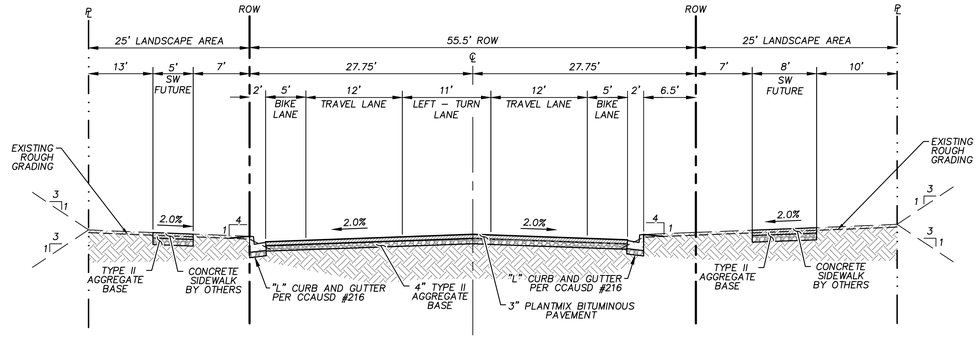

SUNSET RUN DRIVE - NO PARKING

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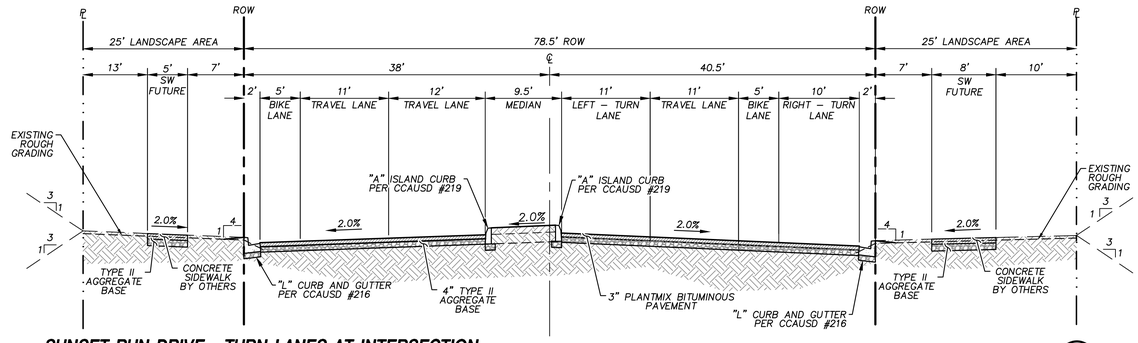

SUNSET RUN DRIVE - TURN LANES AT INTERSECTION

N.T.S.

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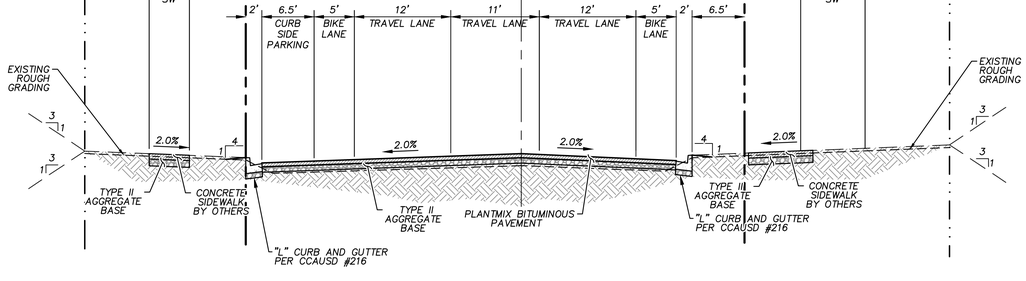

SUNSET RUN DRIVE - LEFT CURB SIDE PARKING

N.T.S.

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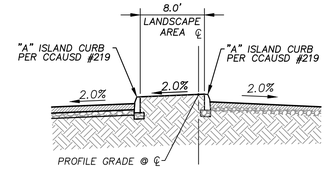

SUNSET RUN DRIVE - OFFSET MEDIAN DETAIL

N.T.S.

G
60

BASIS OF BEARING

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

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T21S,R59E,S03

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FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

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ANTHONY L. ORTIZ
EXP. 12-31-23
CIVIL
No. 18849

REVISIONS

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Fax: +1.702.263.7200

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TYPICAL SECTIONS

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE

00000000
L00-00000

DATE: SEPTEMBER, 2022

DRAWING NO. 60/69

JOB NO. 1000694745

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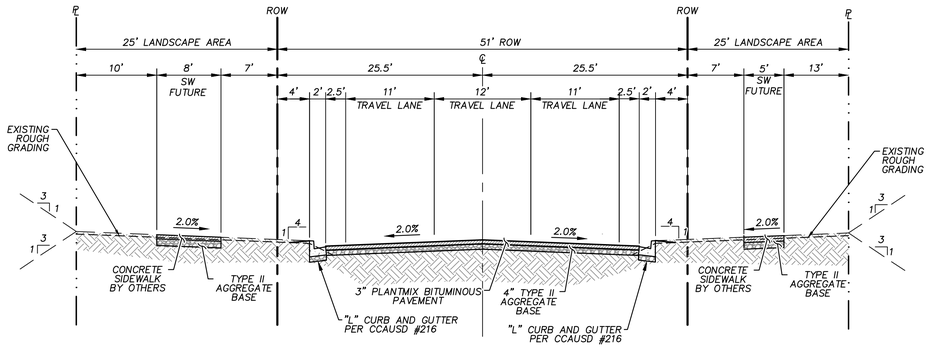

CALICO BEND DRIVE - NO PARKING

N.T.S.

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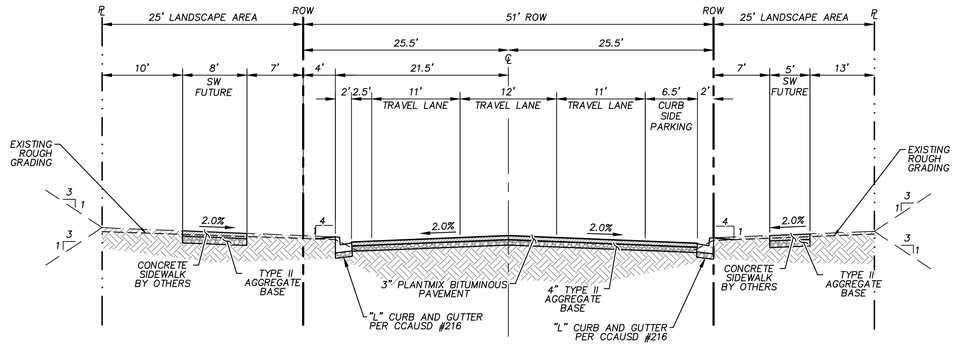
61



CALICO BEND DRIVE - LEFT CURB SIDE PARKING

N.T.S.

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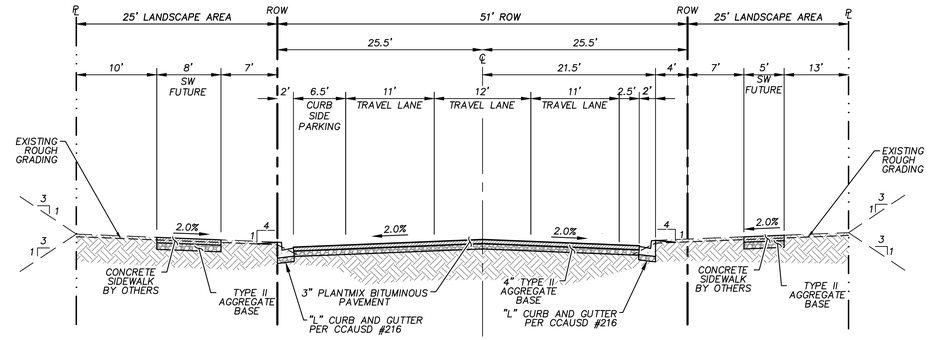

CALICO BEND DRIVE - RIGHT CURB SIDE PARKING

N.T.S.

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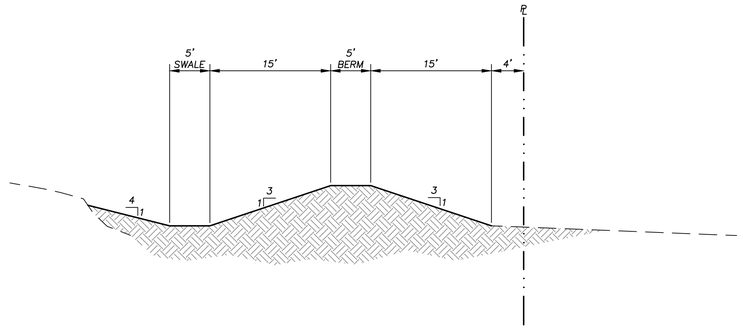

CALICO BEND DRIVE - SWALE REGRADE

N.T.S.

K
61

BASIS OF BEARING

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ANTHONY L. ORTIZ
EXP. 12-31-23
CIVIL
No. 18849

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TYPICAL SECTIONS

00000000	DESIGNED BY: D. SMITH
L00-00000	DRAWN BY: C. HONEY
DATE: SEPTEMBER, 2022	CHECKED BY: N. BARCOS
DRAWING NO. 61/69	HORIZ.: NONE
JOB NO. 1000694748	VERT.: NONE

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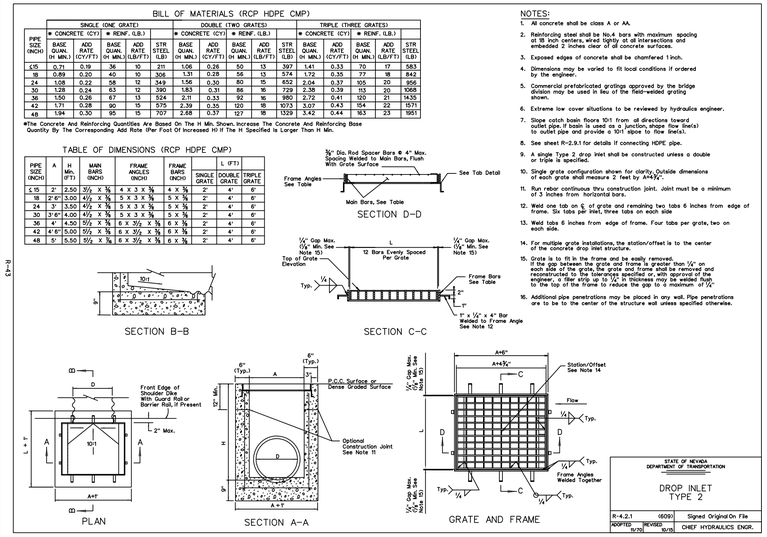
BILL OF MATERIALS (RCP HDPE CMP)

PIPE SIZE (INCH)	SINGLE (ONE GRATE) ✱ CONCRETE (CY) BASE QUAN. (In MIN.)	ADD RATE (CY/FT)	✱ REINF. (LB.) BASE QUAN. (In MIN.)	ADD RATE (LB/FT)	STR (TID) (LB)	DOUBLE (TWO GRATES) ✱ CONCRETE (CY) BASE QUAN. (In MIN.)	ADD RATE (CY/FT)	✱ REINF. (LB.) BASE QUAN. (In MIN.)	ADD RATE (LB/FT)	STR (TID) (LB)	TRIPLE (THREE GRATES) ✱ CONCRETE (CY) BASE QUAN. (In MIN.)	ADD RATE (CY/FT)	✱ REINF. (LB.) BASE QUAN. (In MIN.)	ADD RATE (LB/FT)	STR (TID) (LB)
≤15	0.71	0.19	36	10	211	1.06	0.28	50	13	397	1.41	0.33	70	17	583
18	0.89	0.20	40	10	306	1.31	0.28	56	13	574	1.72	0.35	77	18	842
24	1.08	0.22	58	12	549	1.56	0.30	80	15	652	2.04	0.37	105	20	956
30	1.28	0.24	63	12	390	1.83	0.31	86	16	729	2.38	0.39	113	20	1068
36	1.50	0.26	67	13	524	2.11	0.33	92	16	980	2.72	0.41	120	21	1435
42	1.71	0.28	90	15	575	2.39	0.35	120	18	1073	3.07	0.43	154	22	1571
48	1.94	0.30	95	15	707	2.68	0.37	127	18	1329	3.42	0.44	163	23	1951

✱The Concrete And Reinforcing Quantities Are Based On The H Min. Shown. Increase The Concrete And Reinforcing Base Quantity By The Corresponding Add Rate (Per Foot Of Increased H) If The H Specified Is Larger Than H Min.

TABLE OF DIMENSIONS (RCP HDPE CMP)

PIPE SIZE (INCH)	A	H Min. (FT)	MAIN BARS (INCH)	FRAME ANGLES (INCH)	FRAME BARS (INCH)	L (FT) SINGLE GRATE	L (FT) DOUBLE GRATE	L (FT) TRIPLE GRATE
≤ 15	2'	2.50	3½ x ⅜	4 X 3 X ⅜	4 X ⅜	2'	4'	6'
18	2'-6"	3.00	4½ x ⅜	5 X 3 X ⅜	5 X ⅜	2'	4'	6'
24	3'	3.50	4½ X ⅜	5 X 3 X ⅜	5 X ⅜	2'	4'	6'
30	3'-6"	4.00	4½ X ⅜	5 X 3 X ⅜	5 X ⅜	2'	4'	6'
36	4'	4.50	5½ X ⅜	6 X 3½ X ⅜	6 X ⅜	2'	4'	6'
42	4'-6"	5.00	5½ X ⅜	6 X 3½ X ⅜	6 X ⅜	2'	4'	6'
48	5'	5.50	5½ X ⅜	6 X 3½ X ⅜	6 X ⅜	2'	4'	6'



NOTES:
1. All concrete shall be class A or AA.
2. Reinforcing steel shall be No.4 bars with maximum spacing at 18 inch centers, wired tightly at all intersections and embedded 2 inches clear of all concrete surfaces.
3. Exposed edges of concrete shall be chamfered 1 inch.
4. Dimensions may be varied to fit local conditions if ordered by the engineer.
5. Commercial prefabricated gratings approved by the bridge engineer may be used in lieu of the field-welded grating shown.
6. Extreme low cover situations to be reviewed by hydraulics engineer.
7. Slope catch basin floors 10:1 from all directions toward outlet pipe. If basin is used as a junction, shape flow line(s) to outlet pipe and provide a 10:1 slope to flow line(s).
8. See sheet R-2.9.1 for details if connecting HDPE pipe.
9. A single Type 2 drop inlet shall be constructed unless a double or triple is specified.
10. Single grate configuration shown for clarity. Outside dimensions of each grate shall measure 2 feet by 4'-6".
11. Run rebar continuous thru construction joint. Joint must be a minimum of 3 inches from horizontal bars.
12. Weld one tab on ℄ of grate and remaining two tabs 6 inches from edge of frame. Six tabs per inlet, three tabs on each side.
13. Weld tabs 6 inches from edge of frame. Four tabs per grate, two on each side.
14. For multiple grate installations, the station/offset is to the center of the concrete drop inlet structure.
15. Grate is to fit in the frame and be easily removed. If the gap between the grate and frame is greater than ½" on each side of the grate, the grate and frame shall be removed and replaced at the Contractor's expense. If approved by the bridge engineer, a filler strip up to ½" in thickness may be welded from to the top of the frame to reduce the gap to a maximum of ½".
16. Additional pipe penetrations may be placed in any wall. Pipe penetrations are to be to the center of the structure wall unless specified otherwise.

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION

DROP INLET TYPE 2

R-4.2.1	6609	Signed Original On File
ADOPTED 11/20	REVISED 10/15	CHIEF HYDRAULICS ENGR.

DROP INLET TYPE 2 PER NDOT

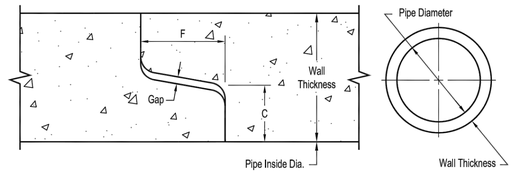
N.T.S.

A 67

Rinker MATERIALS™

Concrete Pipe Division

Reinforced Concrete Pipe Tongue & Groove Joint 12" - 96" Diameter



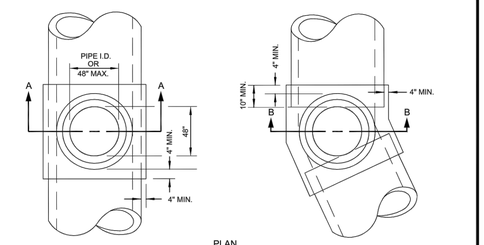
Section Thru Joint — Section Thru Barrel

Table of Dimensions and Weights						
Pipe Inside Diameter (Inches)	Wall Thickness (Inches)	C (Inches)	F (Inches)	Gap (Inches)	Length (Feet)	Weight (Lbs./Ft.)
12	2	7/8	2	1/4	6	92
15	2 1/4	1 1/16	2	1/4	6, 8	127
18	2 1/2	1 3/16	2	1/4	6, 8	168
21	2 3/4	1 1/4	2 1/4	1/4	6, 8	214
24	3	1 5/16	2 1/2	1/4	6, 8	265
30	3 1/2	1 1/2	2 3/4	9/32	6, 8	384
36	4	1 13/16	3	9/32	6, 8	524
42	4 1/2	1 7/8	3 1/4	3/8	6, 8	685
48	5	2	3 3/4	3/8	6, 8	867
54	5 1/2	2 1/4	4	3/8	6, 8	1071
60	6	2 1/2	4 1/4	1/2	6, 8	1296
66	6 1/2	2 3/4	4 1/2	1/2	6, 8	1542
72	7	3	4 1/2	1/2	6, 8	1810
78	7 1/2	3 1/4	4 1/2	1/2	6, 8	2098
84	8	3 1/2	4 1/2	1/2	6, 8	2410
90	8 1/2	3 3/8	5 1/2	1/2	6, 8	2740
96	9	3 5/8	5 1/2	1/2	6, 8	3095

Pipe dimensions may vary depending on equipment availability.

Notes:
1. Pipe manufactured to meet current ASTM specifications.
2. Contact a Concrete Pipe Division representative for details not listed on this sheet.

Rinker 001



NOTE:
1. STEPS SHALL BE INSTALLED ON THE UPSTREAM WALL OF THE MANHOLE.

AGENCY APPROVED	B	C	H	L	M	N

SPECIFICATION REFERENCE	
501	CONCRETE
505	REINFORCING STEEL
609	CATCH BASINS, MANHOLES & INLETS

UNIFORM STANDARD DRAWINGS
CLARK COUNTY AREA

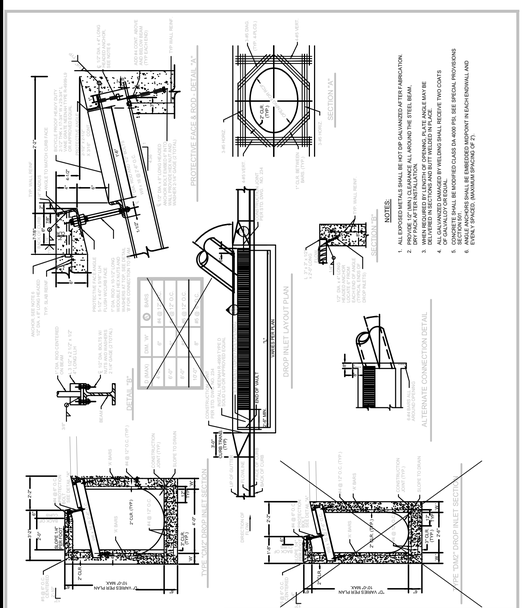
TYPE III MANHOLE

DATE | DWG. NO. 406

TYPE III MANHOLE

N.T.S.

E 67



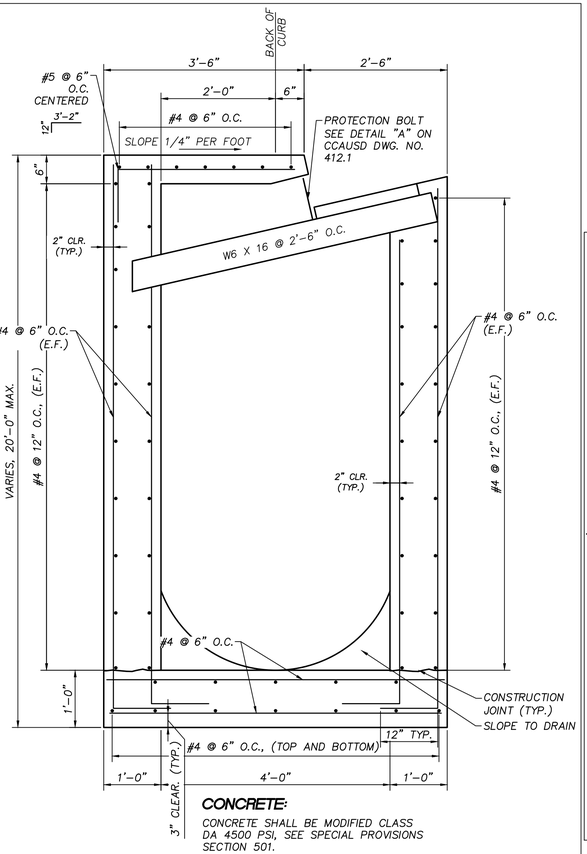
AGENCY APPROVED	B	C	H	L	M	N

SPECIFICATION REFERENCE	
501	CONCRETE
501	CONCRETE STRUCTURES
501	REINFORCING STEEL
501	STEEL

UNIFORM STANDARD DRAWINGS
CLARK COUNTY AREA

TYPE "C-D" MODIFIED DROP INLET

DATE 9-14-06 | DWG. NO. 412.1



CONCRETE:

CONCRETE SHALL BE MODIFIED CLASS DA 4500 PSI, SEE SPECIAL PROVISIONS SECTION 501.

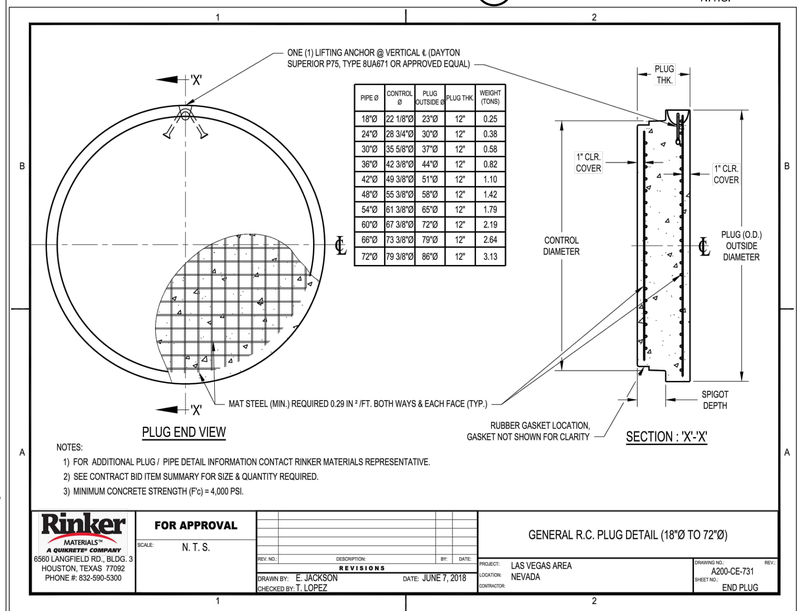
NOTE:

THIS DETAIL IS MEANT TO MODIFY THE TYPE "CM2" DROP INLET SECTION PER CCAUSD DWG. NO. 412.1 FOR STRUCTURES WITH DEPTHS GREATER THAN 10'. ALL OTHER INFORMATION OF THE STANDARD DRAWING STILL APPLY UNLESS OVERWRITTEN BY THIS DETAIL.

SUPPLEMENT TO "CM2" DROP INLET (D>10')

N.T.S.

C 67



PIPE Ø	CONTROL Ø	PLUG OUTSIDE Ø	PLUG THK.	WEIGHT (TONS)
18"Ø	22 1/8"Ø	23"Ø	12"	0.25
24"Ø	28 3/4"Ø	30"Ø	12"	0.38
30"Ø	35 5/8"Ø	37"Ø	12"	0.58
36"Ø	42 3/8"Ø	44"Ø	12"	0.82
42"Ø	49 3/8"Ø	51"Ø	12"	1.10
48"Ø	55 3/8"Ø	58"Ø	12"	1.42
54"Ø	61 3/8"Ø	65"Ø	12"	1.79
60"Ø	67 3/8"Ø	72"Ø	12"	2.19
66"Ø	73 3/8"Ø	79"Ø	12"	2.64
72"Ø	79 3/8"Ø	86"Ø	12"	3.13

NOTES:
1) FOR ADDITIONAL PLUG / PIPE DETAIL INFORMATION CONTACT RINKER MATERIALS REPRESENTATIVE.
2) SEE CONTRACT BID ITEM SUMMARY FOR SIZE & QUANTITY REQUIRED.
3) MINIMUM CONCRETE STRENGTH (F'c) = 4,000 PSI.

Rinker MATERIALS™ A QUIKRETE® COMPANY
6580 LANGFIELD RD., BLDG. 3
HOUSTON, TEXAS 77092
PHONE #: 832-590-5300

FOR APPROVAL

SCALE: N. T. S.

REVISIONS

DRAWN BY: E. JACKSON DATE: JUNE 7, 2018
CHECKED BY: T. LOPEZ

GENERAL R.C. PLUG DETAIL (18"Ø TO 72"Ø)

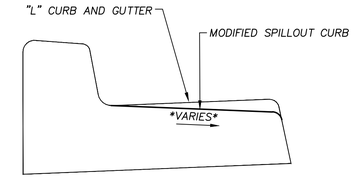
PROJECT: LAS VEGAS AREA
LOCATION: NEVADA
CONTRACTOR:

DRAWING NO: A200-CE-731
SHEET NO.: END PLUG
REV.:

TYPICAL STORM DRAIN CAP

N.T.S.

D 67



"L" CURB TO SPILLOUT CURB TRANSITION

N.T.S.

F 67

PROFESSIONAL ENGINEER-STATE OF NEVADA
A MOHOTTI ALAGIYAWANNA
EXP. 12-31-22
CIVIL
No. 026458

PROFESSIONAL ENGINEER STATE OF NEVADA
ANTHONY L. ORTIZ
EXP. 12-31-23
CIVIL
No. 18849

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

Call before you Dig AVOID CUTTING UNDERGROUND UTILITY LINES, IT'S COSTLY! Call 811 OR 1-800-642-2444

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

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27
PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD), AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

STORM DRAIN DETAILS

DESIGNED BY: D. SMITH	00000000
DRAWN BY: C. HONEY	L00-00000
CHECKED BY: N. BARCOS	DATE: SEPTEMBER, 2022
HORIZ.: NONE	DRAWING NO. 67/69
VERT.: NONE	

JOB NO. 1000694748

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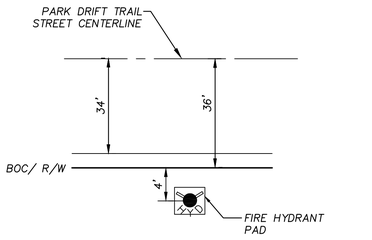
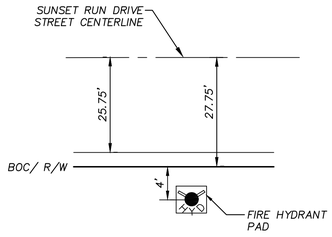
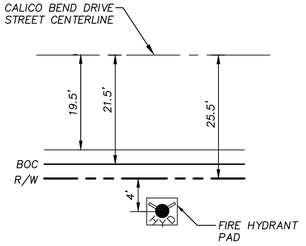


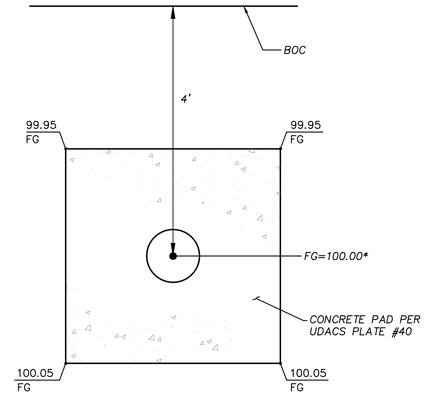
FIRE HYDRANT LOCATION DETAIL - PDT (A1/68)
N.T.S.



FIRE HYDRANT LOCATION DETAIL - SRD (A2/68)
N.T.S.



FIRE HYDRANT LOCATION DETAIL - CBD (A3/68)
N.T.S.



*NOTE: THE GRADES SHOWN IN THIS DETAIL ARE RELATIVE NOT ACTUAL, 100.00 IS THE REFERENCE GRADE FOR THE CENTER OF PAD ELEVATION. SEE P-SHEETS FOR ACTUAL FINISHED GRADE FOR CENTER OF PAD. CALCULATE THE CORNER GRADES PER SHEET 9 FINISHED GRADE.

FIRE HYDRANT PAD GRADING DETAIL (B/68)
N.T.S.

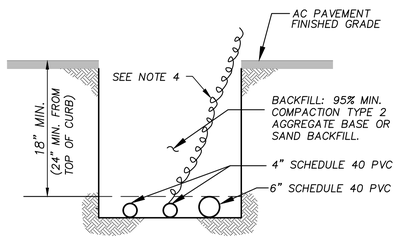
1 SLEEVES AND CONDUITS SHALL BE INSTALLED 18" BELOW FINISHED GRADE AND SHALL EXTEND 5' BEYOND BACK OF CURBS, WALLS AND PAVING.

2 CONTRACTOR SHALL RECORD LOCATIONS OF INSTALLED SLEEVES: A COPY OF THE FILED NOTES SHALL BE GIVEN TO SUMMERLIN'S ENGINEER FOLLOWING CONSTRUCTION.

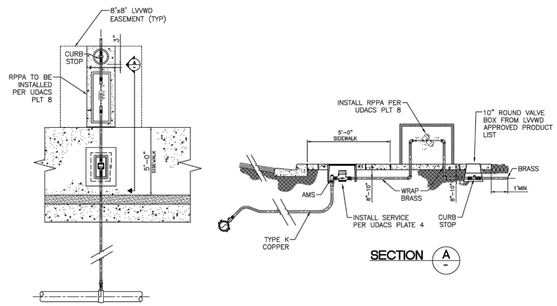
3 HORIZONTAL LOCATION OF SLEEVES SHOWN ON P-SHEETS.

4 THE CONTRACTOR TO PROVIDE A WIRE THROUGH THE SLEEVE TO GRADE LEVEL (FOR FUTURE SLEEVE LOCATION).

5 CONTRACTOR TO IDENTIFY SLEEVE LOCATION ON TOP OF CURB.



IRRIGATION SLEEVES DETAIL (C/68)
N.T.S.



IRRIGATION METER DETAIL (D/68)
N.T.S.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT NO. ###### FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1,500 GPM AT 20 PSI RESIDUAL

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

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

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

PROFESSIONAL ENGINEER STATE OF NEVADA ANTHONY ORTIZ EXP. 12-31-23 CIVIL No. 18849

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN WEST VILLAGE 27
PARK DRIFT TRAIL (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD), SUNSET RUN DRIVE (PARK DRIFT TRAIL TO LAKE MEAD BOULEVARD) AND CALICO BEND DRIVE (SUNSET RUN DRIVE TO LAKE MEAD BOULEVARD)

WATER DETAILS

DESIGNED BY: D. SMITH
DRAWN BY: C. HONEY
CHECKED BY: N. BARCOS
HORIZ.: NONE
VERT.: NONE

00000000
L00-00000
DATE: SEPTEMBER, 2022
DRAWING NO. 68/69
JOB NO. 1000694748

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Appendix E. CD-ROM

Atkins

2270 Corporate Circle
Suite 200
Henderson, NV 89074-7755

Tel: +1 702 263 7275/+1 800 483 6244
Fax: +1 702 263 7200
Direct: 702 551 0309
Vance.Skidmore@atkinsglobal.com

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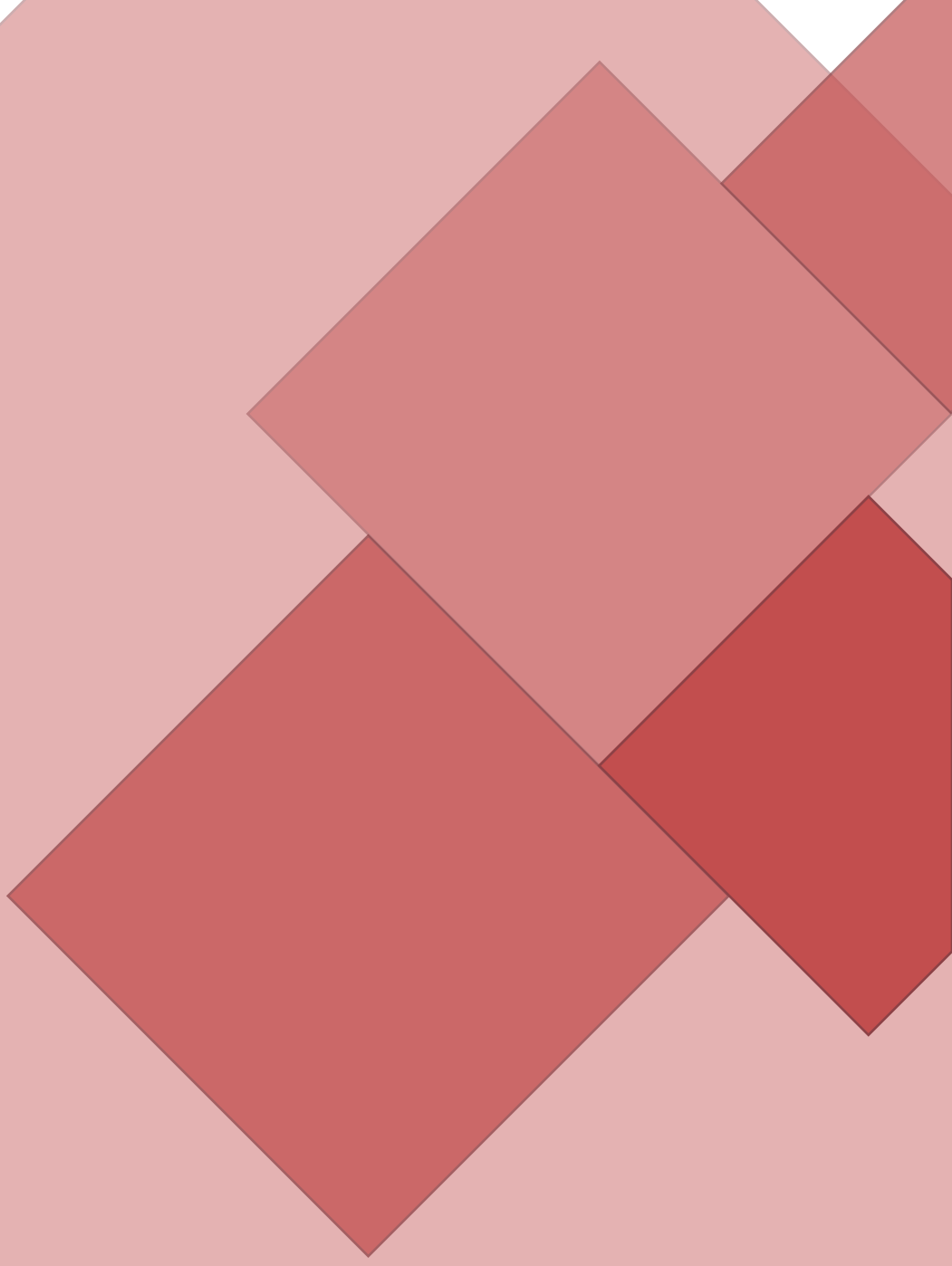

2270 Corporate Circle
Suite 200
Henderson NV 89074-7755
Tel: 702.263.7275
www.atkinsglobal.com/northamerica

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