CITY OF LAS VEGAS **INTER-OFFICE MEMORANDUM**			**DATE:** **March 10, 2019**
TO: **Land Development Services** Department of Building & Safety			**FROM:** Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT: Drainage Study for: **Summerlin West V22 – Kettle Ridge Drive (Street J) and Scurry Bend Drive (Street N) Street Improvements** **(both from Lake Mead Blvd. to Fleet Wing Ave.)**			**COPIES TO:** Atkins
Cross Streets:	Lake Mead Boulevard & Desert Foothill Drive		Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5156D.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-14-401-006 & 137-23-101-002		CCRFCD
Zoning Action:	N/A		
FEMA Flood Zone	YES	NO **X**	
Proposed Storm Drain	YES **X**	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	7/16/2019	8/8/2019	Not Approved	$400.00	3490122: $400
2nd Submittal	9/11/2019	9/25/2019	Not Approved	$400.00	3563447: $400
3rd Submittal	10/16/2019	10/30/2019	Conditional Approval	$400.00	3612958: $400
4th Submittal & CCRFCD	2/25/2020 & 3/5/2020	3/10/2020	Concurrence Recv'd	$100.00	3755821: $100
			TOTAL FEES (LDDRS):	**$1,300.00**	**----**

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**

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. **Previous Comment**: From *Sheet 18/39* to *Sheet 21/39*, there are various proposed direct connection of lateral pipes to the 6'x6' RCB. However, the connection detail has not been provided. Provide as such in the next submittal.

   The response on *Storm Drain Construction Note #9* refers the connection detail to Sheet 33 should be revised to **Sheet 34**.

The following conditions are repeated until they are complete:

2. Drop inlets deeper than 10' require special structural design and structural calculations. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the *Building Department* for processing. The engineer must provide a copy of *Building Department* approval of the structures to *Flood Control* prior to final acceptance of the *Improvement Plans*.

3. The *Master Drainage Study Update* for *Summerlin West Planning Area* proposes a modification to internal flow patterns that alters the flow patterns to the *Beltway Channel* system downstream of the *Summerlin Parkway* interchange. The modification proposes a storm drain system within *Summerlin Village 22* area (Storm Drain F) that will collect flows from the Gowan channel tributary area and route them into the *Beltway Channel* (MPU Facility APBE 0122). This resulted in increased flows in the *Beltway Channel* segment between *Summerlin Parkway* and *Far Hills Boulevard*, ie, mitigation measures are required for the impacted *Beltway Channel* segment.

   A technical drainage study for the modification of the Beltway Channel has been submitted and has just been conditionally approved. The subject drainage study will not be approved prior to the construction bond of the *Beltway Channel Modification* project has been executed.

4. The project proposes to build temporary drainage facilities, ie, berms/swales along the west side of *Scurry Bend Drive* and *Kettle Ridge Drive* and at the southern end of *Kettle Ridge Drive* 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.

In an effort to increase administrative efficiency, for all original and re-submittal packages including updates and the addenda, the City of Las Vegas Public Works Department requires both a hardcopy and a digital copy (PDF) on CD for the drainage study.

A letter sealed and signed by a Nevada registered civil engineer must be included in every submittal certifying documents on the electronic CD matches 100% of the hardcopy submittal. The new submittal requirement is effective on May 1, 2019. If there are any questions regarding these new requirements, please contact Albert Sung in the City Flood Control Section at (702) 229-6541.



Sample Letter to certify CD.pdf

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.

Albert Sung

From: Anderson, Carl E <Carl.Anderson@atkinsglobal.com>
Sent: Friday, February 28, 2020 8:42 AM
To: Matthew Meyer; Albert Sung
Cc: Milstead, Caron; Ortiz, Tony; Barcos, Nicolas; Anderson, Molly
Subject: RE: Need review for TDS approval

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Albert,

As a follow-up to this conversation, Update DS#5156-1 was submitted on 2/25/20 to address the revision requested by Streets & Sanitation.

Let us know if you need anything else.

Thanks!

Carl Anderson *PE*
Project Manager
Engineering, Design and Project Management
Tel: +1 702 551 0333

Atkins, member of the SNC-Lavalin Group
2270 Corporate Circle, Suite 200
Henderson, NV 89074
+1 702 263 7275

From: Anderson, Carl E
Sent: Tuesday, February 4, 2020 10:54 AM
To: mmeyer@lasvegasnevada.gov; Albert Sung <YSung@LasVegasNevada.GOV>
Cc: Milstead, Caron <Caron.Milstead@atkinsglobal.com>; Ortiz, Tony <Tony.Ortiz@atkinsglobal.com>; Barcos, Nicolas <Nicolas.Barcos@atkinsglobal.com>; Anderson, Molly <Molly.Anderson@atkinsglobal.com>
Subject: RE: Need review for TDS approval

Thank you Albert. We will submit an update to address the drop.

Carl Anderson *PE*
Project Manager
Engineering, Design and Project Management
Tel: +1 702 551 0333

Atkins, member of the SNC-Lavalin Group
2270 Corporate Circle, Suite 200
Henderson, NV 89074
+1 702 263 7275

From: Albert Sung <YSung@LasVegasNevada.GOV>
Sent: Tuesday, February 4, 2020 9:38 AM

To: Milstead, Caron <Caron.Milstead@atkinsglobal.com>
Cc: Matthew Meyer <mmeyer@lasvegasnevada.gov>
Subject: RE: Need review for TDS approval

Hi Caron,

I have talked to Matthew Meyer, Manager of the City Street & Sanitation division and need you to do the following revision.

Please refer to improvement plan Sheet 21/44: Per the profile at the junction of the 6'x6' RCB to the 6'x10' RCB, you or your engineer proposed a four feet drop between the two boxes which will create difficulty for the maintenance crew in the future. So please have the design engineer submit an Update to the drainage study revising the connection to eliminate the 4'-drop. Since we initiate this revision, we'll remove the review fee for this submittal.

I'll advise you submit the revised set of plans to Mr. Meyer when you submit the update to us to save you time.

Hope this help!

Matt,

Please correct me if I said something wrong. Thanks.

Albert Y. Sung
Project Engineer
Public Works Dept. / Flood Control
(702) 229-6541
333 N. Rancho Dr. 7th Floor
Las Vegas, NV 89106

lasvegasnevada.gov

Your opinion is important! Click here to take a short survey.

From: Milstead, Caron <Caron.Milstead@atkinsglobal.com>
Sent: Tuesday, February 4, 2020 9:10 AM
To: Matthew Meyer <mmeyer@LasVegasNevada.GOV>
Cc: Albert Sung <YSung@LasVegasNevada.GOV>
Subject: Need review for TDS approval

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Good morning,
I am the new processor at Atkins Global and I am looking for guidance from you for approval of the drainage study . The project is located in Summerlin Village 22- Kettle Ridge Drive. Comment #7 states:
" The regional facility in Kettle Ridge Drive will be a public facility and will be maintained by the City. The improvement plan must be reviewed for maintenance and access concerns by City Streets & Sanitation Department for their review and approval which must be secured prior to the subject drainage study approval. Contact Mr. Matthew Myers , Streets & Sanitation manager for guidance ".

I have attached the TDS Conditional Approval form for your reference. The improvement plans are too large to email. They were electronically uploaded for the Civil permit - project# L19-02315 . If needed I can bring you a plan set. If you are not the proper person for this review, please advise who I might contact. If you have questions or need additional information, please let me know. Thank you in advance for your time.

Caron Milstead
Project Assistant III/ Processor
Engineering, Design and Project Management
Tel: +1 702 551 0370

Atkins, member of the SNC-Lavalin Group
2270 Corporate Circle, Suite 200
Henderson, NV 89074

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Consider the environment. Please don't print this e-mail unless you really need to.

REGIONAL FLOOD CONTROL DISTRICT

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

BOARD OF DIRECTORS

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March 5, 2020

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

DISTRICT CONCURRENCE: SUMMERLIN WEST V22- KETTLE RIDGE DRIVE (STREET J) AND SCURRY BEND DRIVE (STREET N) STREET IMPROVEMENTS (BOTH FROM LAKE MEAD BLVD. TO FLEET WING AVE.) (DS5156C) (RFCD No. 20-12436)

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated July 16, 2019, Addendum No. 1 dated September 11, 2019, and Supplement No. 1 dated October 16, 2019 for above-mentioned project as submitted by ATKINS. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Department of Public Works dated October 30, 2019.

District concurs with acceptance of this Technical Drainage Study by City of Las Vegas Department of Public Works with the following condition(s):

> Note that per District's Policies and Procedures Manual, Section VIII.D.13 Uniform Regulations for the Control of Drainage, the lead Entity shall provide As-Built plans or record drawings to the District after completion and final inspection of such privately installed flood control facilities that have a regional flood control significance.

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

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

REGIONAL FLOOD CONTROL DISTRICT

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

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

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

CCW:sa

c: Molly M. Anderson, P.E., Atkins

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SUMMERLIN®

Summerlin West Village 22

Kettle Ridge Drive (Street J)

Fleet Wing Avenue (Street G) to Lake Mead Boulevard

Scurry Bend Drive (Street N) Rough Grade

Fleet Wing Avenue (Street G) to Lake Mead Boulevard

February 25, 2020

Update #1

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Update #1: Kettle Ridge Drive & Scurry Bend Drive Rough Grade : Fleet Wing Avenue to Lake Mead Boulevard Date: February 25, 2020

Location of Development: a) Descriptive (Cross Streets) North/South: Fleet Wing Avenue

East/West: Lake Mead Boulevard

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

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

Name of Owner: Howard Hughes Company, LLC

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

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

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

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

Firm: Atkins

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

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: +/- 446 acres Being Developed/Disturbed: 35.89 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: 225.54 acres
6. Has the site drainage been evaluated in the past? ✔ **YES** **NO** If yes, please identify documentation: Master Conceptual Drainage Study for Summerlin West Village 22
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Existing CC-215 Western Beltway Channel
8. Briefly describe your proposed schedule for the subject project: ASAP

PROFESSIONAL ENGINEER STATE OF NEVADA
MOLLY M. ANDERSON
EXP. 12/31/20
CIVIL
No. 24365
2/25/20

Engineer's Seal

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

*New Required Field

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

Revision	Date
Addendum #1	September 11, 2019

DS #5156
Local Entity File No.

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Kettle Ridge Drive (Street J) & Scurry Bend Drive (Street N) Rough Grade	Map ID: 137-14-401-007 & 137-23-201-001
Firm Name: Atkins	Engineer: Molly Anderson, PE
Address: 2270 Corporate Circle, Ste 200 City: Henderson	State: NV Zip: 89074
Phone Number: (702) 551-0330	Fax Number: (702) 263-7200
Property Owner: Howard Hughes Company, LLC	
Address: 10801 West Charleston Blvd, Ste 300 City: Las Vegas	State: NV Zip: 89135

Reviewed By:	Date Received:	Date Accepted for Review:

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

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

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

I. GENERAL REQUIREMENT

Yes	No	
x		Design Manual **Standard Form 1** with the engineer's seal and signature.
X		Design Manual **Standard Form 4**.
X		2 copies of the 24” x 36” Drainage Plan.
	N/A	A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.

II. MAPS AND EXHIBITS

Yes	No	
X		A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.
X		A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.

REFERENCE:	**STANDARD FORM 2**

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.
	N/A	Location and detail of flood walls illustrating depth of flow, proposed grouting height, etc.
	N/A	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	
	N/A	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.
	N/A	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.
	N/A	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. __MMA__ 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.

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C.1. Interim Condition
C.2. Ultimate Condition

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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 **Update #1 to the Technical Drainage Study for Kettle Ridge Drive (Street J): Fleet Wing Avenue (Street G) to Lake Mead Boulevard & Scurry Bend Drive (Street N) Rough Grade: Fleet Wing Avenue (Street G) to Lake Mead Boulevard** electronic submittal matches the paper version bound into the study.



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

Your reference: DS #5156

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

February 25, 2020

RE: UPDATE #1 TO THE TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 22 KETTLE RIDGE DRIVE (STREET J): FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD & SCURRY BEND DRIVE (STREET N) ROUGH GRADE: FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

Dear Albert,

This letter and the attached documents have been prepared as an *Update #1 to the Technical Drainage Study (TDS) for Summerlin West Village 22 Kettle Ridge Drive (Street J) Fleet Wing Avenue (Street G) to Lake Mead Boulevard & Scurry Bend Drive (Street N) Rough Grade: Fleet Wing Avenue (Street G) to Lake Mead Boulevard*.

In response to the comments on the Conditional Approval Letter:

Comment #1: From the *Sheet 18/39* to *Sheet 21/39*, there are various proposed direct connection of lateral pipes to the 6'x6' RCB. However, the connection detail has not been provided. Provide as such in the next submittal.

The response on *Storm Drain Construction Note #9* refers the connection detail to Sheet 33 should be revised to Sheet 34.

Comment response: The connection detail callouts have been revised.

The following conditions are repeated until they are complete:
Comment #2: Drop inlets deeper than 10' require special structural design and structural calculations. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the *Building Department* for processing. The engineer must provide a copy of *Building Department* approval of the structures to *Flood Control* prior to the final acceptance of the drainage study.

Comment response: Structural details have been provided in this submittal for the deep drop inlets. Per coordination with Luis Morales of CLV Land Development, structural review will be concurrent with the Civil Improvement Plans. Atkins will provide approval letter of structural design to CLV Flood Control for final acceptance of drainage study.

Comment #3: The *Master Drainage Study Update* for *Summerlin West Planning Area* proposes a modification to internal flow patterns that alters the flow patterns to the *Beltway Channel* system downstream of the *Summerlin Parkway* interchange. The modification proposes a storm drain system within *Summerlin Village 22* area (Storm Drain F) that will collect flows from the Gowan channel tributary area and route them into the *Beltway Channel* (MPU Facility APBE 0122). This resulted in increased flows in the *Beltway Channel* segment between *Summerlin Parkway* and *Far Hills Boulevard*, i.e., mitigation measures are required for the impacted *Beltway Channel* segment.

A technical drainage study for the modification of the Beltway Channel has been submitted and has just been conditionally approved. The subject drainage study will not be approved prior to the construction bond of the *Beltway Channel Modification* project has been executed.

Comment response: The construction bond of the Beltway Channel Modification project has been executed. See receipt provided by VTN Nevada in Appendix B of originally Approved Technical Drainage Study (TDS) for Summerlin West Village 22 Kettle Ridge Drive (Street J) Fleet Wing Avenue (Street G) to Lake Mead Boulevard & Scurry Bend Drive (Street N) Rough Grade: Fleet Wing Avenue (Street G) to Lake Mead Boulevard.

Comment #4: The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.

Please note that effective March 15, 2019, the CCRFCD adopted new requirements for drainage study concurrence submittal. Follow the link below for specific guidance.
http://gustfront.ccrfcd.org/LandDev/LandDev.aspx

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

Comment #5: The project proposes to build temporary drainage facilities, i.e., berms/swales along the west side of *Scurry Bend Drive* and *Kettle Ridge Drive* and at the southern end of *Kettle Ridge Drive* 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 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.

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

Comment #6: The drainage study and the subject improvement plans also proposed a debris basin along the west side of the *Western Beltway*. Acknowledge in the next submittal that the debris basin is a temporary facility and will be removed in the ultimate condition.

Since the debris basin is an interim facility, *Summerlin* or *Howard Hughes Company* will be solely responsible for the maintenance of the facility. A construction and maintenance bond for the debris basin must be prepared and executed prior to the approval of the improvement plans.

Comment response: *Based on the Drainage Study and Improvement Plans for Kettle Bend Road by VTN, the flow from CP5 will be captured and routed within that storm drain system; therefore, the previously proposed debris basin has been eliminated.*

Comment #7: The regional facility in *Kettle Ridge Drive* will be a public facility and will be maintained by the City. The improvement plans must be reviewed for maintenance and access concerns by *City Street & Sanitation Department* for their review and approval which must be secured prior to the subject drainage study approval. Contact *Mr. Matthew Meyer, Streets & Sanitation Manager* for guidance.

Comment response: The improvement plans were submitted to Mr. Meyer of the City Street & Sanitation Department on October 3, 2019.

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

1. Update #1 Revisions

1.1. Hydrology

1.1.1. Interim Condition

The interim condition flows have been revised in two places due to recent relevant submittals for Summerlin West Village 22. The flow to the upstream end of the project has changed due to the revision in the nearby combination point from the Village 22 Master Conceptual Drainage Study #2. This flow decreased from 189 cfs to 185 cfs. See Village 22 Master Conceptual Drainage Study Update #2 reference information in **Appendix B.1**.

The interim condition flows have also been revised due to an increase in flow in the swale along the Scurry Bend Drive Rough Grade. INT-N was originally calculated to be 270 cfs, however with a more detailed analysis for Scurry Bend Drive Rough Grade, the flow in the "Pipe Outlet Swale" is 282 cfs. See Figure 4: Hydraulics Workmap in **Appendix B.2**. Revised Interim Condition Flows are shown in Table 1.

Table 1 – Revised Interim Condition Flows

HEC-1 Node	Tributary Area (sq mi)	Tributary Area (ac)	100-year Flow (cfs)
COFF*	0.08050	51.52	185
DI-DIV	0.08417	53.87	84
CP1	*0.19295*	*123.49*	*269*
INT-J1	0.01270	8.13	25
StrJ-1E	0.00093	0.59	3
StrJ-1W	0.00109	0.70	3
CP2	*0.20767*	*132.91*	*300*
INT-J2	0.02073	13.27	40
StrJ-2E	0.00071	0.46	2
StrJ-2W	0.00093	0.59	3
CP3	*0.23005*	*147.23*	*345*
INT-J3	0.02834	18.13	55
StrJ-3E	0.00062	0.39	2
StrJ-3W	0.00082	0.53	2
CP4	*0.25981*	*166.28*	*404*
INT-N**	0.15490	99.14	282
CP5	*0.41472*	*265.42*	*686*

*Referenced from the Summerlin West Village 22 Master Conceptual Drainage Study – Update #2
**Referenced from the Scurry Bend Rough Grade Technical Drainage Memo.

1.1.2. Ultimate Condition

Ultimate condition flows have also been revised due to the changes at the upstream end of the project site from the Summerlin West Village 22 Master Conceptual Drainage Study – Update #2. Results are summarized in Table 2 and are referenced in **Appendix B.1**.

Table 2 – Revised Ultimate Condition Flows

HEC-1 Node	Tributary Area (ac)	100-year Flow (cfs)
COFF*	51.52	185
DI-DIV	53.87	84
CP1	*123.49*	*269*
E*	13.91	58
StrJ-1E	0.59	3
StrJ-1W	0.70	3
CP2	*138.69*	*333*
NP-2*	1.34	5
StrJ-2E	0.46	2
StrJ-2W	0.59	3
CP3	*141.08*	*343*
F*	14.22	59
StrJ-3E	0.39	2
StrJ-3W	0.53	2
CP4	*156.22*	*406*
CSTG1*	54.95	229
CP5	*211.17*	*635*

*Referenced from the Summerlin West Village 22 Master Conceptual Drainage Study – Update #2

1.1.3. Interim vs. Ultimate Condition Mainline Comparison

Table 3 represents a comparison of the interim condition flows and the ultimate condition flows along the proposed mainline storm drain at each combination point. Since the interim condition flows are higher in some locations than the ultimate condition flows and are lower in other locations, both conditions must be re-run in WSPG-W.

Table 3 – Mainline Interim vs. Ultimate Condition Flows

Combination Point	Interim Condition 100-year Flow (cfs)	Ultimate Condition 100-year Flow (cfs)
CP1	**269**	**269**
CP2	300	**333**
CP3	**345**	343
CP4	404	**406**
CP5	**686**	635

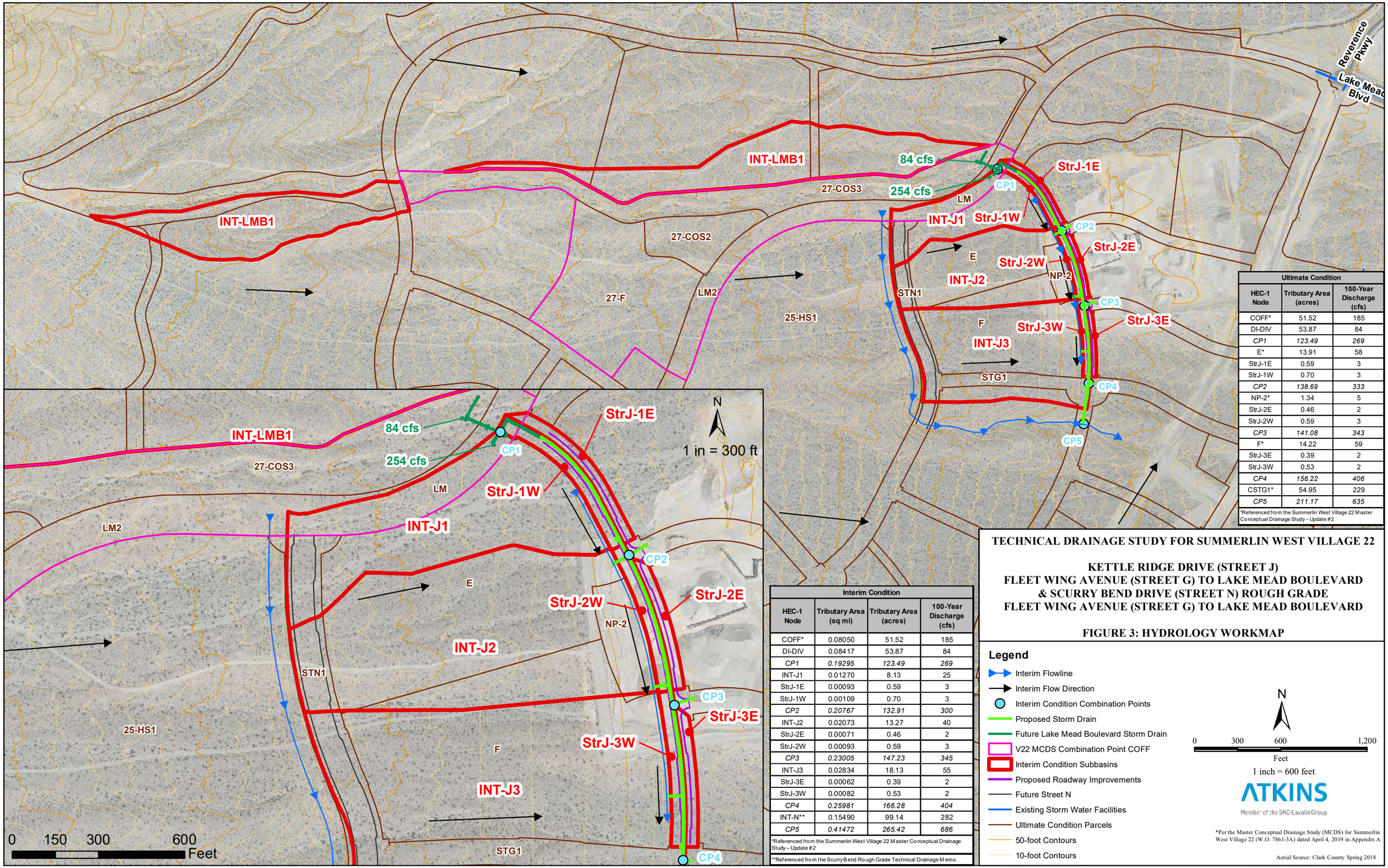
1.2. Hydraulics

The debris basin is being removed with this proposed Update #1. The Kettle Bend Road – Sunset Run Drive to Kestrel Creek Avenue (DS#5204C) by VTN has been approved upstream of the debris basin. The storm drain was designed to take in the original CP5. Therefore, there will be no flow getting to the debris basin from the proposed Kettle Ridge Drive improvements and it can be removed from the improvement plans. Reference information is located in **Appendix B.3**.

The WSPG-W models for the proposed improvement plans were re-run for both conditions to analyze the revised flows. WSPG-W output is located in **Appendix C**. Updated WSPG-W summary information is located in Table 4.

Table 4 – WSPG-W Mainline Summary Table

SDMH#	Plan Station	WSPG- W Station	Interim Condition			Ultimate Condition		
			Q_{100}	ΣQ_{100}	HGL (ft)	Q_{100}	ΣQ_{100}	HGL (ft)
Upstream	73+57.28	18+70.76	269	269	3449.68	269	269	3449.34
SDMH #8	70+59.52	15+74.56	0	269	3432.49	0	269	3432.40
SDMH #7	69+00.53	14+15.57	3	272	3423.10	3	272	3423.07
SDMH #6	68+31.25	13+46.29	28	300	3419.12	61	333	3426.11
SDMH #5	66+01.36	11+30.70	0	300	3421.66	0	333	3422.36
SDMH #4	63+83.02	9+18.57	0	300	3418.65	0	333	3418.75
SDMH #3	61+81.97	7+18.03	45	345	3418.81	11	344	3418.89
SDMH #2	58+75.60	4+12.82	55	400	3415.94	59	403	3415.97
SDMH #1	56+90.93	2+26.86	4.1	404.1	3407.26	267	670	3412.90
Downstream	54+60	0	0.1	404.2	3411.74	0	670	3411.74



Ultimate Condition		
HEC-1 Node	Tributary Area (acres)	100-Year Discharge (cfs)
COFF*	51.52	185
DI-DIV	53.87	84
CP1	*123.49*	*269*
E*	13.91	58
StrJ-1E	0.59	3
StrJ-1W	0.70	3
CP2	*138.69*	*333*
NP-2*	1.34	5
StrJ-2E	0.46	2
StrJ-2W	0.59	3
CP3	*141.08*	*343*
F*	14.22	59
StrJ-3E	0.39	2
StrJ-3W	0.53	2
CP4	*156.22*	*406*
CSTG1*	54.95	229
CP5	*211.17*	*635*

*Referenced from the Summerlin West Village 22 Master Conceptual Drainage Study – Update #2

Interim Condition			
HEC-1 Node	Tributary Area (sq mi)	Tributary Area (acres)	100-Year Discharge (cfs)
COFF*	0.08050	51.52	185
DI-DIV	0.08417	53.87	84
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CP4	*0.25981*	*166.28*	*404*
INT-N**	0.15490	99.14	282
CP5	*0.41472*	*265.42*	*686*

*Referenced from the Summerlin West Village 22 Master Conceptual Drainage Study – Update #2

**Referenced from the Scurry Bend Rough Grade Technical Drainage Memo.

TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (STREET J)
FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
& SCURRY BEND DRIVE (STREET N) ROUGH GRADE
FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

FIGURE 3: HYDROLOGY WORKMAP

Legend

- Interim Flowline
- Interim Flow Direction
- Interim Condition Combination Points
- Proposed Storm Drain
- Future Lake Mead Boulevard Storm Drain
- V22 MCDS Combination Point COFF
- Interim Condition Subbasins
- Proposed Roadway Improvements
- Future Street N
- Existing Storm Water Facilities
- Ultimate Condition Parcels
- 50-foot Contours
- 10-foot Contours

N

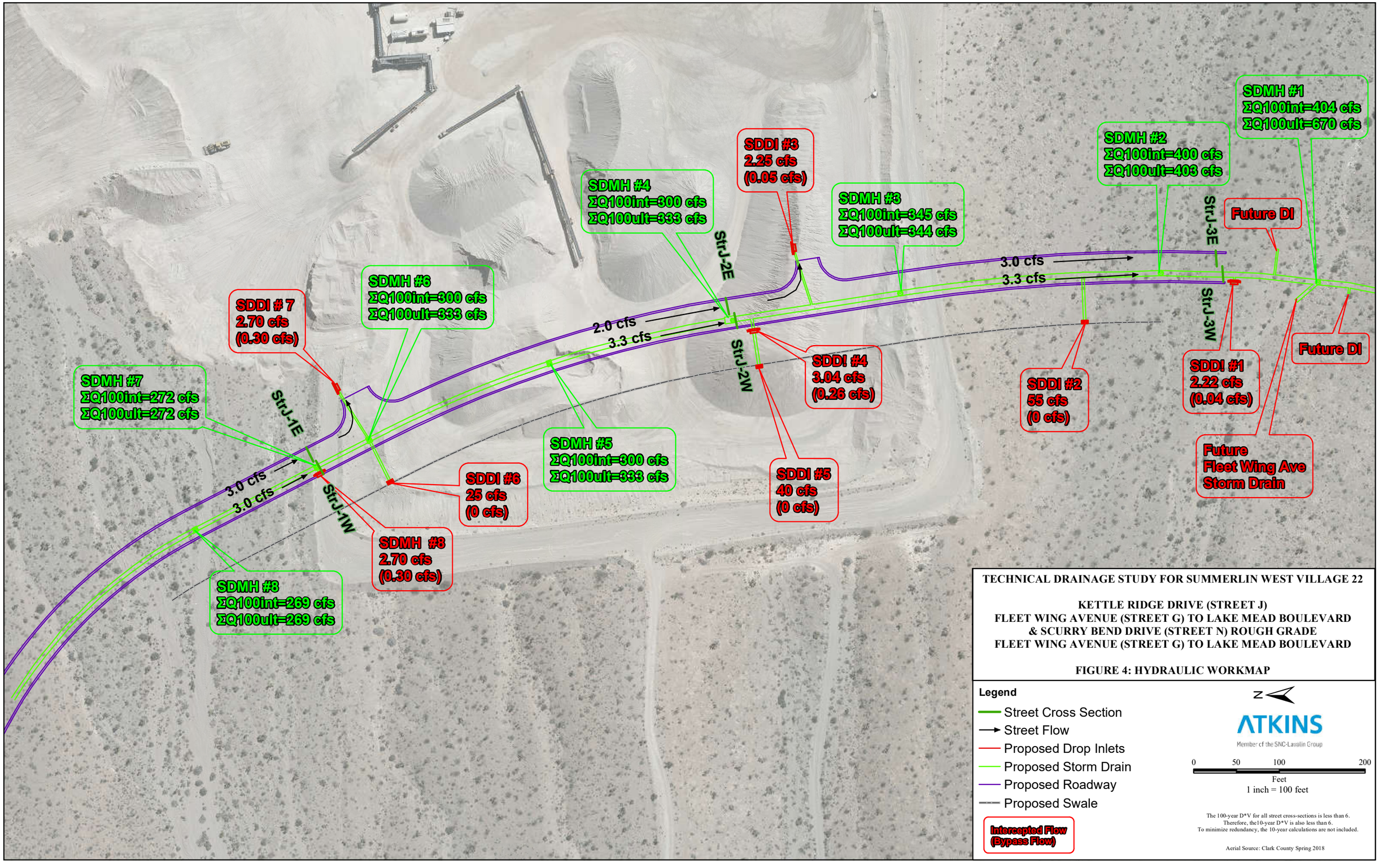
0 300 600 1,200
Feet

1 inch = 600 feet

ATKINS
Member of the SNC-Lavalin Group

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

Aerial Source: Clark County Spring 2018



TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (STREET J)
FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
& SCURRY BEND DRIVE (STREET N) ROUGH GRADE
FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

FIGURE 4: HYDRAULIC WORKMAP

Legend

- Street Cross Section
- Street Flow
- Proposed Drop Inlets
- Proposed Storm Drain
- Proposed Roadway
- Proposed Swale

Intercepted Flow
(Bypass Flow)

N

ATKINS
Member of the SNC-Lavalin Group

0 50 100 200
Feet
1 inch = 100 feet

The 100-year D*V for all street cross-sections is less than 6.
Therefore, the10-year D*V is also less than 6.
To minimize redundancy, the 10-year calculations are not included.

Aerial Source: Clark County Spring 2018

Appendices

Appendix A. Conditional Approval Letter

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: October 30, 2019
TO: **Land Development Services** Department of Building & Safety				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT: Drainage Study for: **Summerlin West V22 – Kettle Ridge Drive (Street J) and Scurry Bend Drive (Street N) Street Improvements** **(both from Lake Mead Blvd. to Fleet Wing Ave.)**				**COPIES TO:** Atkins
Cross Streets:	Lake Mead Boulevard & Desert Foothill Drive			Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5156C.doc			Bart Anderson, P.E., DevCo
Parcel Number:	137-14-401-006 & 137-23-101-002			CCRFCD
Zoning Action:	N/A			
FEMA Flood Zone	YES		NO **X**	
Proposed Storm Drain	YES **X**		NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	7/16/2019	8/8/2019	Not Approved	$400.00	3490122: $400
2nd Submittal	9/11/2019	9/25/2019	Not Approved	$400.00	3563447: $400
3rd Submittal	10/16/2019	10/30/2019	See Comments Below	$400.00	3612958: $400
			TOTAL FEES (LDDRS):	**$1,200.00**	----

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**

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. **Previous Comment**: From *Sheet 18/39* to *Sheet 21/39*, there are various proposed direct connection of lateral pipes to the 6'x6' RCB. However, the connection detail has not been provided. Provide as such in the next submittal.

   The response on *Storm Drain Construction Note #9* refers the connection detail to Sheet 33 should be revised to **Sheet 34**.

The following conditions are repeated until they are complete:

2. Drop inlets deeper than 10' require special structural design and structural calculations. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the *Building Department* for processing. The engineer must provide a copy of *Building Department* approval of the structures to *Flood Control* prior to final acceptance of the *Improvement Plans*.

3. The *Master Drainage Study Update* for *Summerlin West Planning Area* proposes a modification to internal flow patterns that alters the flow patterns to the *Beltway Channel* system downstream of the *Summerlin Parkway* interchange. The modification proposes a storm drain system within *Summerlin Village 22* area (Storm Drain F) that will collect flows from the Gowan channel tributary area and route them into the *Beltway Channel* (MPU Facility APBE 0122). This resulted in increased flows in the *Beltway Channel* segment between *Summerlin Parkway* and *Far Hills Boulevard*, ie, mitigation measures are required for the impacted *Beltway Channel* segment.

   A technical drainage study for the modification of the Beltway Channel has been submitted and has just been conditionally approved. The subject drainage study will not be approved prior to the construction bond of the *Beltway Channel Modification* project has been executed.

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

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

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

5. The project proposes to build temporary drainage facilities, ie, berms/swales along the west side of *Scurry Bend Drive* and *Kettle Ridge Drive* and at the southern end of *Kettle Ridge Drive* 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.

6. The drainage study and the subject improvement plans also proposed a debris basin along the west side of the *Western Beltway*. Acknowledge in the next submittal that the debris basin is a temporary facility and will be removed in the ultimate condition.

   Since the debris basin is an interim facility, *Summerlin* or *Howard Hughes Company* will be solely responsible for the maintenance of the facility. A construction and maintenance bond for the debris basin must be prepared and executed prior to the approval of the improvement plans.

7. The regional facility in *Kettle Ridge Drive* will be a public facility and will be maintained by the City. The improvement plans must be reviewed for maintenance and access concerns by *City Streets & Sanitation Department* for their review and approval which must be secured prior to the subject drainage study approval. Contact *Mr. Matthew Meyer, Streets & Sanitation Manager* for guidance.

In an effort to increase administrative efficiency, for all original and re-submittal packages including updates and the addenda, the City of Las Vegas Public Works Department requires both a hardcopy and a digital copy (PDF) on CD for the drainage study.

A letter sealed and signed by a Nevada registered civil engineer must be included in every submittal certifying documents on the electronic CD matches 100% of the hardcopy submittal. The new submittal requirement is effective on May 1, 2019. If there are any questions regarding these new requirements, please contact Albert Sung in the City Flood Control Section at (702) 229-6541.



Sample Letter to certify CD.pdf

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/14
AREA K-14

Appendix B. Reference Material

B.1. Summerlin West Village 22 Master Conceptual Drainage Study – Update #2 (by others)

B.2. Scurry Bend Drive Rough Grade

B.3. Kettle Bend Road Improvement Plans (by others)

B.1 Summerlin West Village 22 Master Conceptual Drainage Study – Update #2 (by others)

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.

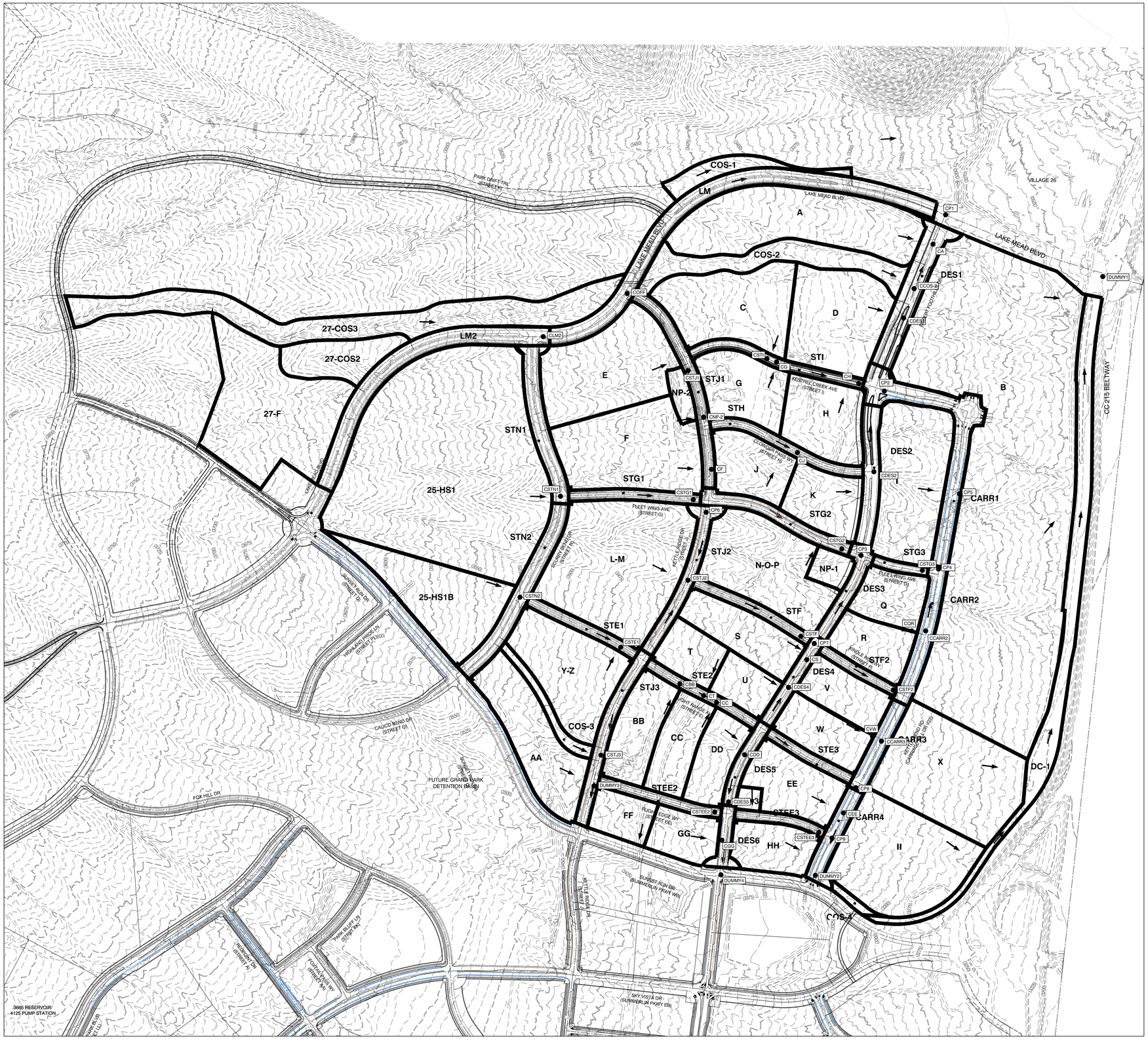
   A technical drainage study for the analysis, design and construction plans for the *Grand Park Detention Basin* must be submitted and approved by the City prior to the individual onsite parcel developments.

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



NORTH

GRAPHIC SCALE

350 0 175 350 700

1" = 350'

LEGEND

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

ULTIMATE CONDITION HEC-1 SUMMARY TABLE

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

REVISION | BY | DATE | REV

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

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

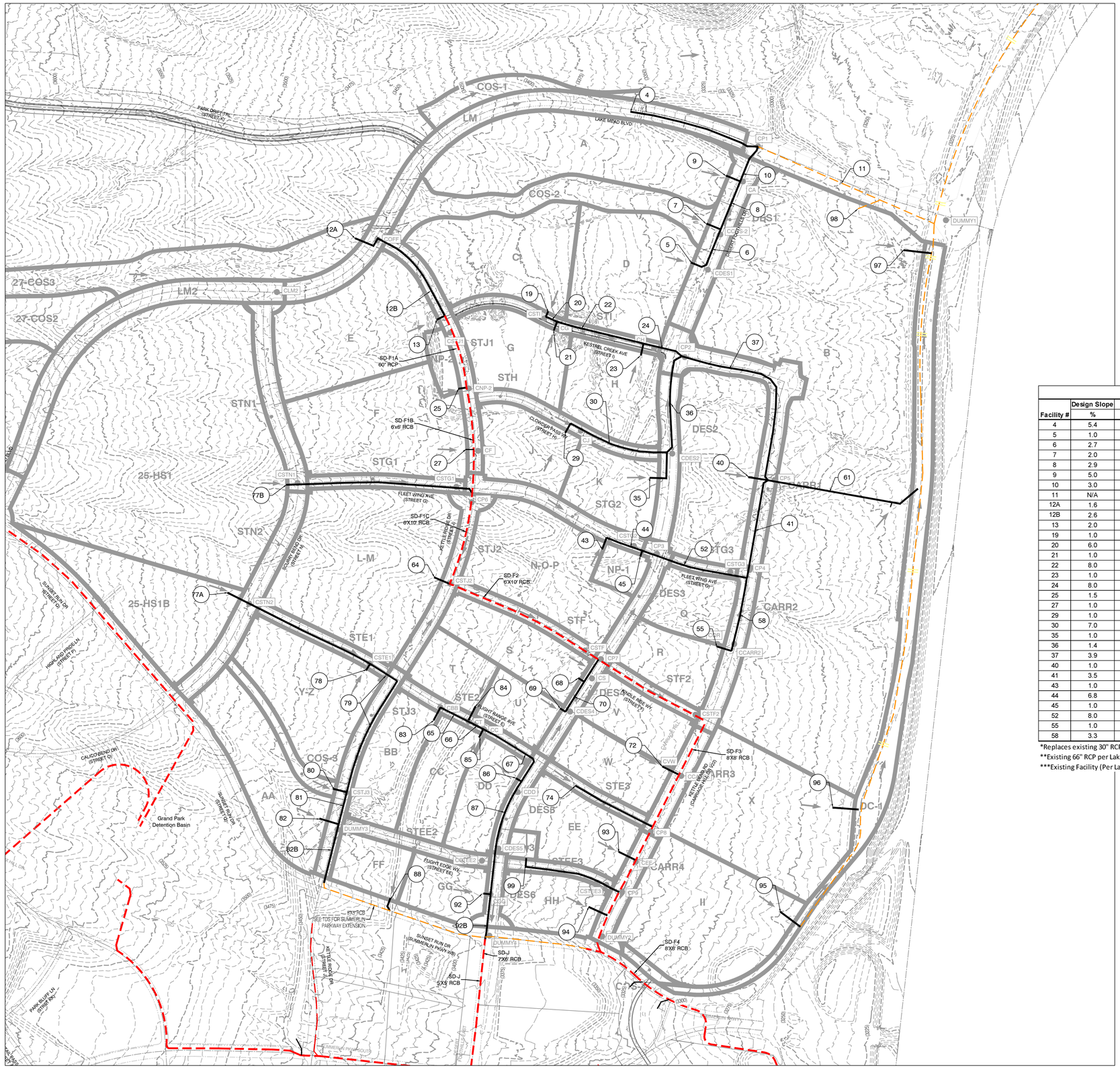
FIGURE 6
ULTIMATE CONDITION BASIN MAP

SUMMERLIN WEST VILLAGE 22

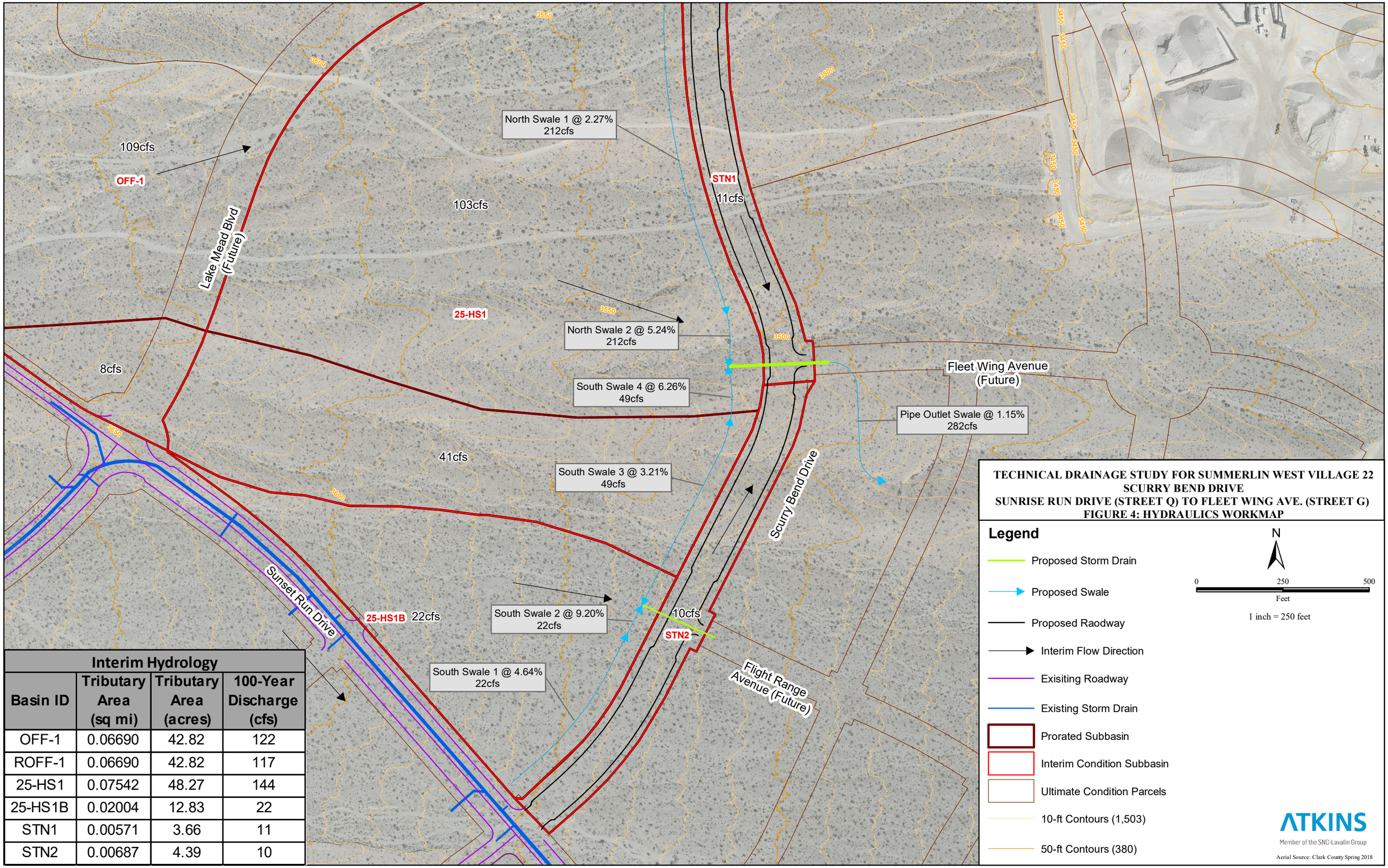
DRAWN BY: JTA
DESIGNED BY:
CHECKED BY:
OCT 2019
SCALE: 1" = 350' HORIZ. N/A VERT.
PROJECT NO: 7861

SHEET
OF SHEETS
DRAWING NO.

H:\7861\Village 22 Master\Drainage\5_LIP2\A_Figures\Figure 6 - Village 22 Drainage Basin Map.dwg


COS-1
LM
A
COS-2
B
C
D
CDES1
CDES2
CDES3
CDES4
CDES5
CDES6
CARR1
CARR2
CARR3
CARR4
CCARR2
DES1
DES2
DES3
DES5
DES6
LM2
27-COS3
27-COS2
25-HS1
25-HS1B
E
STJ1
STI
STH
F
STG1
STN1
STN2
L-M
STJ2
N-O-P
NP-1
STG2
STG3
STF
STF1
STF2
STE1
STE2
STE3
STEE2
STEE3
G
H
J
K
Q
R
S
T
U
V
W
X
Y-Z
AA
BB
CC
DD
EE
FF
GG
HH
II
COS-3
DC-1
Grand Park Detention Basin
LAKE MEAD BLVD (STREET A)
PARK DRIVE TRL (STREET N)
KESTREL CREEK AVE (STREET I)
CLOVERDALE PASS DR (STREET H)
FLEET WING AVE (STREET G)
SCURRY BEND DR (STREET M)
HIGHLAND RIDGE LN (STREET P)
SUNSET RUN DR (STREET O)
PARK SLOPE LN (STREET R)
CALICO BEND DR (STREET Q)
SUNSET RUN DR (SUMMERLIN PKWY WB)
SUNSET RUN DR (SUMMERLIN PKWY EB)
SUMMERLIN PKWY (SOUTH)
DESERT FOOT AVE
SD-F1A 60" RCP
SD-F1B 6'x6' RCB
SD-F1C 6'X10' RCB
SD-F2 6'X10' RCB
SD-F3/ 8'X8' RCB
SD-F4 8'X8' RCB
SD-J 7'X6' RCB
SD-J 5'X5' RCB
6'X7' RCB
SEE TOS FOR SUMMERLIN PARKWAY EXTENSION

B.2 Scurry Bend Drive Rough Grade



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

TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 22
SCURRY BEND DRIVE
SUNRISE RUN DRIVE (STREET Q) TO FLEET WING AVE. (STREET G)
FIGURE 4: HYDRAULICS WORKMAP

Legend

- Proposed Storm Drain
- Proposed Swale
- Proposed Raodway
- Interim Flow Direction
- Exisiting Roadway
- Existing Storm Drain
- Prorated Subbasin
- Interim Condition Subbasin
- Ultimate Condition Parcels
- 10-ft Contours (1,503)
- 50-ft Contours (380)

N

0 250 500
Feet

1 inch = 250 feet

ATKINS
Member of the SNC-Lavalin Group

Aerial Source: Clark County Spring 2018

B.3 Kettle Bend Road Improvement Plans (by others)

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: February 20, 2020
TO: **Land Development Services** Department of Building & Safety			FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT: Drainage Study for: **Summerlin West Village 22 - Kettle Bend Road (Sunset Run Drive to Kestrel Creek Road)**			**COPIES TO:** VTN Nevada
Cross Streets:	Kettle Bend Road & Summerlin Parkway		The Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5204C.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-23-101-002		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	10/15/2019	11/20/2019	Not Approved	$400.00	3611329: $400
2nd Submittal	1/14/2020	2/5/2020	Not Approved	$400.00	3705772: $400
Supplement	2/13/2020	2/20/2020	See Comments Below	N/C	N/C
			TOTAL FEES (LDDRS):	**$800.00**	**----**

REMARKS:

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

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

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

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

1. The subject drainage study is premised on the developed *Sunset Run Drive (Summerlin Parkway Extension West Bound)* to the south. The subject improvement plans will not be approved prior to the execution of the construction bond of *Summerlin West V21 – Summerlin Parkway Extension* and the associated facilities.
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. The street and the associated storm drain facilities will eventually be transferred to the *City of Las Vegas*, the engineer/developer must coordinate with *City of Las Vegas Streets & Sanitation Department* for their review and approval prior to the final acceptance of the subject improvement plans.

4. The project proposes to build temporary drainage facilities including drainage berms/swales along the west side of the proposed *Kettle Bend Road* and a 20'-wide *Interim Berm*. Prior to final plan approval the developer must complete a ***Maintenance & Liability Agreement*** for the interim drainage improvements and post a minimum maintenance bond of $50,000 or 50-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for constructing the facilities and an exhibit that adequately shows the location and limits of the drainage facilities to *City of Las Vegas Flood Control* for approval. Once the drainage study is conditionally approved, the engineer should contact the *City's Land Development Section* (229-6371) to begin the agreement process.

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

5. Drop inlets deeper than 10' require special structural design and structural calculations. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the *City of Las Vegas Building & Safety Department* for processing. The engineer must provide a copy of *Building Department* approval of the structures to *Flood Control* prior to final acceptance of the drainage study.

6. All special structures and mainline storm drain connection require details and structural calculations to be reviewed by the *City of Las Vegas Building & Safety Department*. Approval by the *Building Department* must be obtained prior to the final approval of the subject 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/23
AREA K-23

SUMMERLIN WEST VILLAGE 22
KETTLE BEND ROAD-SUNSET RUN DRIVE TO KESTREL CREEK AVENUE

APN: 137-23-201-101

CITY OF LAS VEGAS

STATE OF NEVADA

DEVELOPED BY:

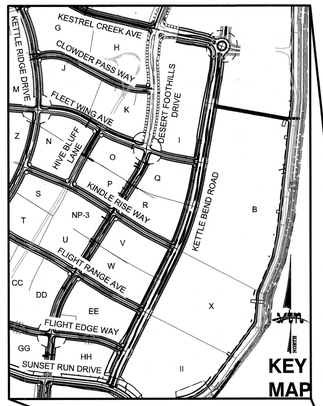
HOWARD HUGHES COMPANY, LLC

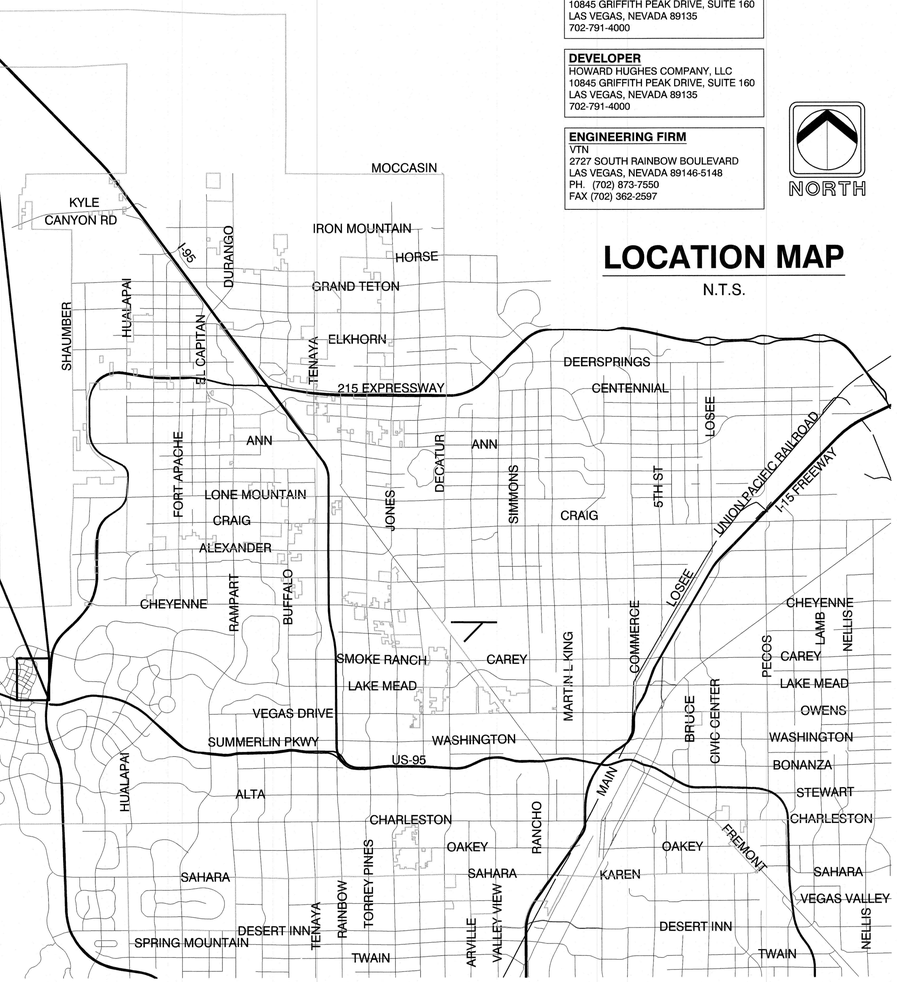
10845 GRIFFITH PEAK DRIVE, SUITE 160
LAS VEGAS, NEVADA 89135
702-791-4000

FUTURE S.I.D. PROJECT

SHEET INDEX

SHEET #	SHEET	DESCRIPTION	
1	CV	COVER SHEET	
2	NT	NOTE SHEET	
3	HC1	HORIZONTAL CONTROL PLAN 1	
4	HC2	HORIZONTAL CONTROL PLAN 2	
5	HC3	HORIZONTAL CONTROL PLAN 3	
6	HC4	HORIZONTAL CONTROL PLAN 4	
7	HC5	HORIZONTAL CONTROL PLAN 5	
8	HC6	HORIZONTAL CONTROL PLAN 6	
9	HC7	HORIZONTAL CONTROL PLAN 7	
10	HC8	HORIZONTAL CONTROL PLAN 8	
11	HC9	HORIZONTAL CONTROL PLAN 9	
12	HC10	HORIZONTAL CONTROL PLAN 10	
13	HC11	HORIZONTAL CONTROL PLAN 11	
14	MUTW	MASTER UTILITY WATER	
15	MUTSS	MASTER UTILITY SANITARY SEWER	
16	MUTSD	MASTER UTILITY STORM DRAIN	
17	MGRD-1	MASTER GRADING PLAN 1	
18	MGRD-2	MASTER GRADING PLAN 2	
19	GR1	GRADING PLAN 1	
20	GR2	GRADING PLAN 2	
21	GR3	GRADING PLAN 3	
22	GR4	GRADING PLAN 4	
23	GR5	GRADING PLAN 5	
24	GR6	GRADING PLAN 6	
25	GR7	GRADING PLAN 7	
26	GR8	GRADING PLAN 8	
27	GR9	GRADING PLAN 9	
28	GR10	GRADING PLAN 10	
29	GR11	GRADING PLAN 11	
30	GR12	GRADING PLAN 12	
31	GR13	GRADING PLAN 13	
32	DT1	DETAIL SHEET 1	
33	DT2	DETAIL SHEET 2	
34	DT3	DETAIL SHEET 3	
35	DT4	DETAIL SHEET 4	
36	DT5	DETAIL SHEET 5	
37	UT1	UTILITY PLAN 1	51+00 TO 54+00
38	UT1A	UTILITY PROFILE 1A	
39	UT2	UTILITY PLAN 2	54+00 TO 59+00
40	UT2A	UTILITY PROFILE 2A	
41	UT3	UTILITY PLAN 3	59+00 TO 64+25
42	UT3A	UTILITY PROFILE 3A	
43	UT4	UTILITY PLAN & PROFILE 4	64+25 TO 68+50
44	UT5	UTILITY PLAN & PROFILE 5	68+50 TO 72+80
45	UT6	UTILITY PLAN & PROFILE 6	72+80 TO 77+40
46	UT7	UTILITY PLAN & PROFILE 7	77+40 TO 81+00
47	UT8	UTILITY PLAN & PROFILE 8	81+00 TO 84+20
48	UT9	UTILITY PLAN & PROFILE 9	84+20 TO 87+75
49	UT10	UTILITY PLAN & PROFILE 10	10+00 TO 14+19
50	UT11	UTILITY PLAN & PROFILE 11	10+00 TO 12+20
51	UT12	UTILITY PLAN & PROFILE 12	7+50 TO 4+60
52	UT13	UTILITY PLAN & PROFILE 13	7+50 TO 10+00
53	UT14	UTILITY PLAN & PROFILE 14 WATER LATERAL	
54	UT15	UTILITY PLAN & PROFILE 15 SEWER LATERAL	
55	UT16	UTILITY PLAN & PROFILE 16 SEWER & WATER LATERAL	
56	UT17	UTILITY PLAN & PROFILE 17 SEWER LATERAL	
57	UT18	UTILITY PLAN & PROFILE 18 WATER LATERAL	
58	UT19	UTILITY PLAN & PROFILE 19 SEWER LATERAL	
59	UT20	UTILITY PLAN & PROFILE 20 SEWER & WATER LATERAL	
60	UT21	UTILITY PLAN & PROFILE 21 WATER LATERAL	
61	UT22	UTILITY PLAN & PROFILE 22 SEWER LATERAL	
62	UT23	UTILITY PLAN & PROFILE 23 SEWER LATERAL	
63	UT24	UTILITY PLAN & PROFILE 24 WATER LATERAL	
64	UT25	UTILITY PLAN & PROFILE 25 SEWER & WATER LATERAL	
65	UT26	UTILITY PLAN & PROFILE 26 SEWER & WATER LATERAL	
66	UT27	UTILITY PLAN & PROFILE 27 WATER LATERAL	
67	UT28	UTILITY PLAN & PROFILE 28 WATER LATERAL	
68	UT29	UTILITY PLAN & PROFILE 29 STORM DRAIN LATERAL	
69	UT30	UTILITY PLAN & PROFILE 30 STORM DRAIN LATERAL	
70	UT31	UTILITY PLAN & PROFILE 31 STORM DRAIN LATERAL	
71	UT32	UTILITY PLAN & PROFILE 32 STORM DRAIN LATERAL	
72	UT33	UTILITY PLAN & PROFILE 33 STORM DRAIN LATERAL	
73	UT34	UTILITY PLAN & PROFILE 34 STORM DRAIN LATERAL	
74	UT35	UTILITY PLAN & PROFILE 35 STORM DRAIN LATERAL	
75	UT36	UTILITY PLAN & PROFILE 36 STORM DRAIN LATERAL	
76	UT37	UTILITY PLAN & PROFILE 37 STORM DRAIN LATERAL	
77	UT38	UTILITY PLAN & PROFILE 38 STORM DRAIN LATERAL	
78	UT39	UTILITY PLAN & PROFILE 39 STORM DRAIN LATERAL	
79	UT40	UTILITY PLAN & PROFILE 40 STORM DRAIN LATERAL	
80	UT41	UTILITY PLAN & PROFILE 41 STORM DRAIN LATERAL	
81	UT42	UTILITY PLAN & PROFILE 42 STORM DRAIN LATERAL	
82	UT43	UTILITY PLAN & PROFILE 43 STORM DRAIN LATERAL	
83	UT44	UTILITY PLAN & PROFILE 44 STORM DRAIN LATERAL	
84	UT45	UTILITY PLAN & PROFILE 45 STORM DRAIN LATERAL	
85	UT46	UTILITY PLAN & PROFILE 46 STORM DRAIN LATERAL	
86	UT47	UTILITY PLAN & PROFILE 47 STORM DRAIN LATERAL	
87	TR1	TRAFFIC PLAN 1	
88	TR2	TRAFFIC PLAN 2	
89	TR3	TRAFFIC PLAN 3	
90	TR4	TRAFFIC PLAN 4	
91	TR5	TRAFFIC PLAN 5	
92	TR6	TRAFFIC PLAN 6	
93	S1	STRUCTURAL SHEET 1	
94	S2	STRUCTURAL SHEET 2	





LOCATION MAP

N.T.S.

OWNER
HOWARD HUGHES COMPANY, LLC
10845 GRIFFITH PEAK DRIVE, SUITE 160
LAS VEGAS, NEVADA 89135
702-791-4000

DEVELOPER
HOWARD HUGHES COMPANY, LLC
10845 GRIFFITH PEAK DRIVE, SUITE 160
LAS VEGAS, NEVADA 89135
702-791-4000

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

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

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

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

FIRE DEPARTMENT APPROVAL

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

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

APPROVALS

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

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

DEPARTMENT OF PLANNING, CITY OF LAS VEGAS DATE

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

DIRECTOR OF BUILDING & SAFETY DATE

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

CENTRAL TELEPHONE COMPANY d/b/a CENTURYLINK DATE

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

NV ENERGY DATE

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

COX COMMUNICATIONS LAS VEGAS, INC. DATE

SOUTHWEST GAS CORPORATION DATE

LAS VEGAS FIRE & RESCUE DATE

OWNER:DEVELOPER

KEVIN T. ORROCK, VICE PRESIDENT DATE

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY

LAS VEGAS VALLEY WATER DISTRICT

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER

PROJECT:---- DATE:_____

SHEETS:

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

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

COVER SHEET

SUMMERLIN WEST VILLAGE 22
KETTLE BEND ROAD-SUNSET RUN DRIVE TO KESTREL CREEK AVENUE

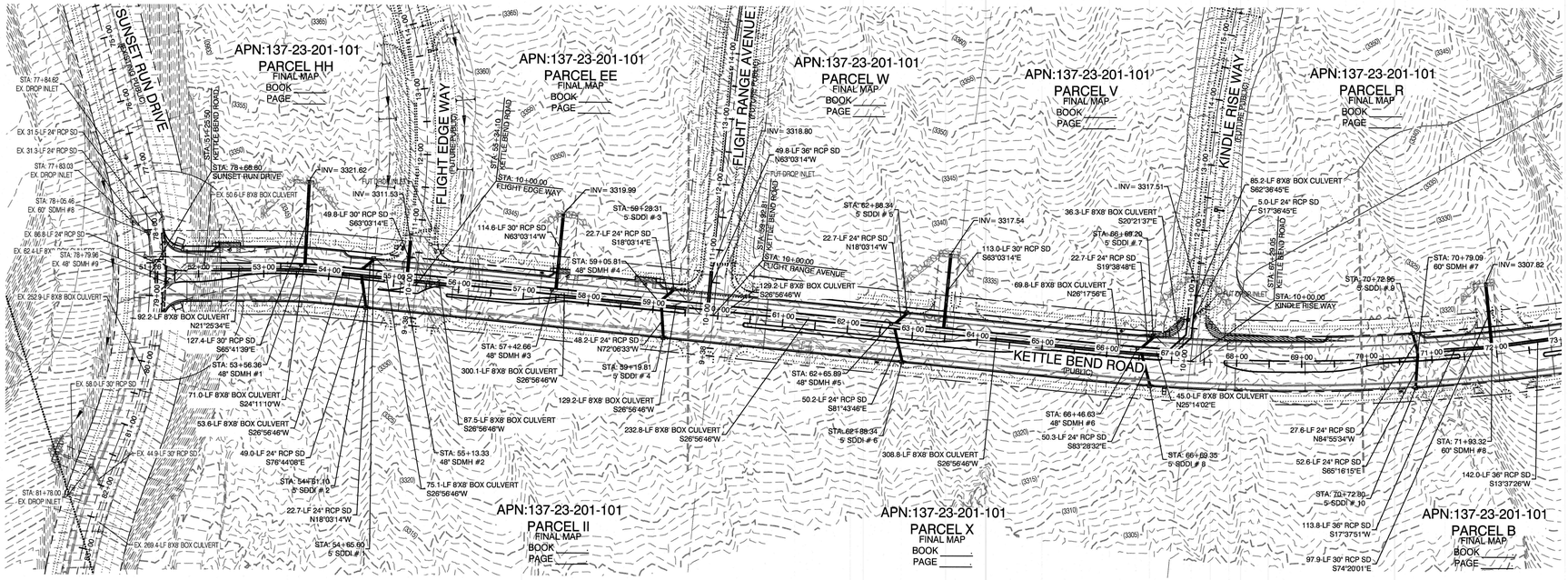
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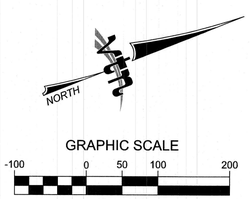
PROFESSIONAL ENGINEER - STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/21
CIVIL
No. 15745
1/14/20

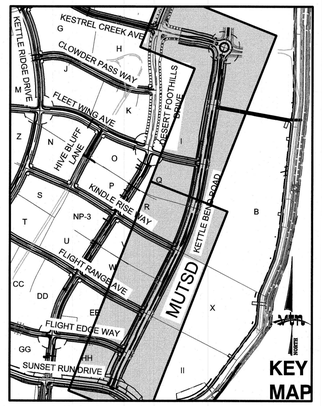
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CV
1 OF 94 SHEETS

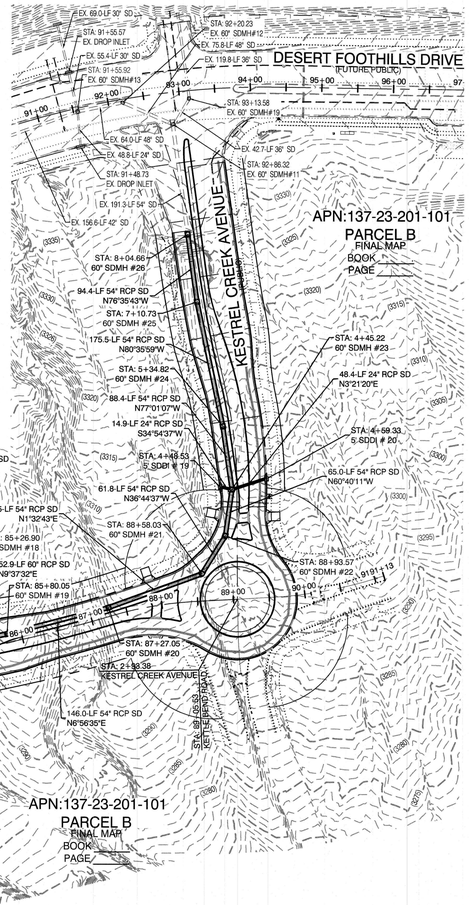
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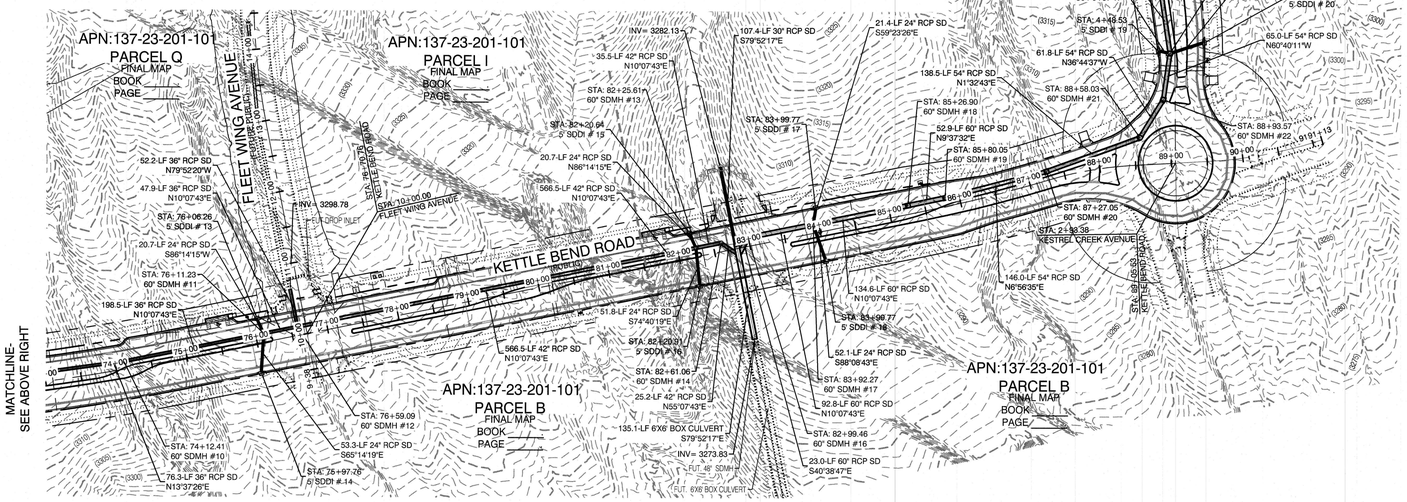
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GRADING PERMIT NOTE

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

GEOTECHNICAL NOTE:

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

SIGHT VISIBILITY ZONES:

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

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL AND STREET LIGHT SYSTEM CONDUITS
FOR ASSISTANCE
Call before you
Underground
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
1-702-229-6811
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

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

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

ENGINEER DISCLAIMER NOTE:

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

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE WITH CITY OF LAS VEGAS, #DS05204

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

REV	DATE	BY	REVISION

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10845 GRIFFITH PEAK DRIVE, SUITE 160
LAS VEGAS, NEVADA 89135
(702) 476-3500

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

CITY OF LAS VEGAS

MASTER UTILITY STORM DRAIN

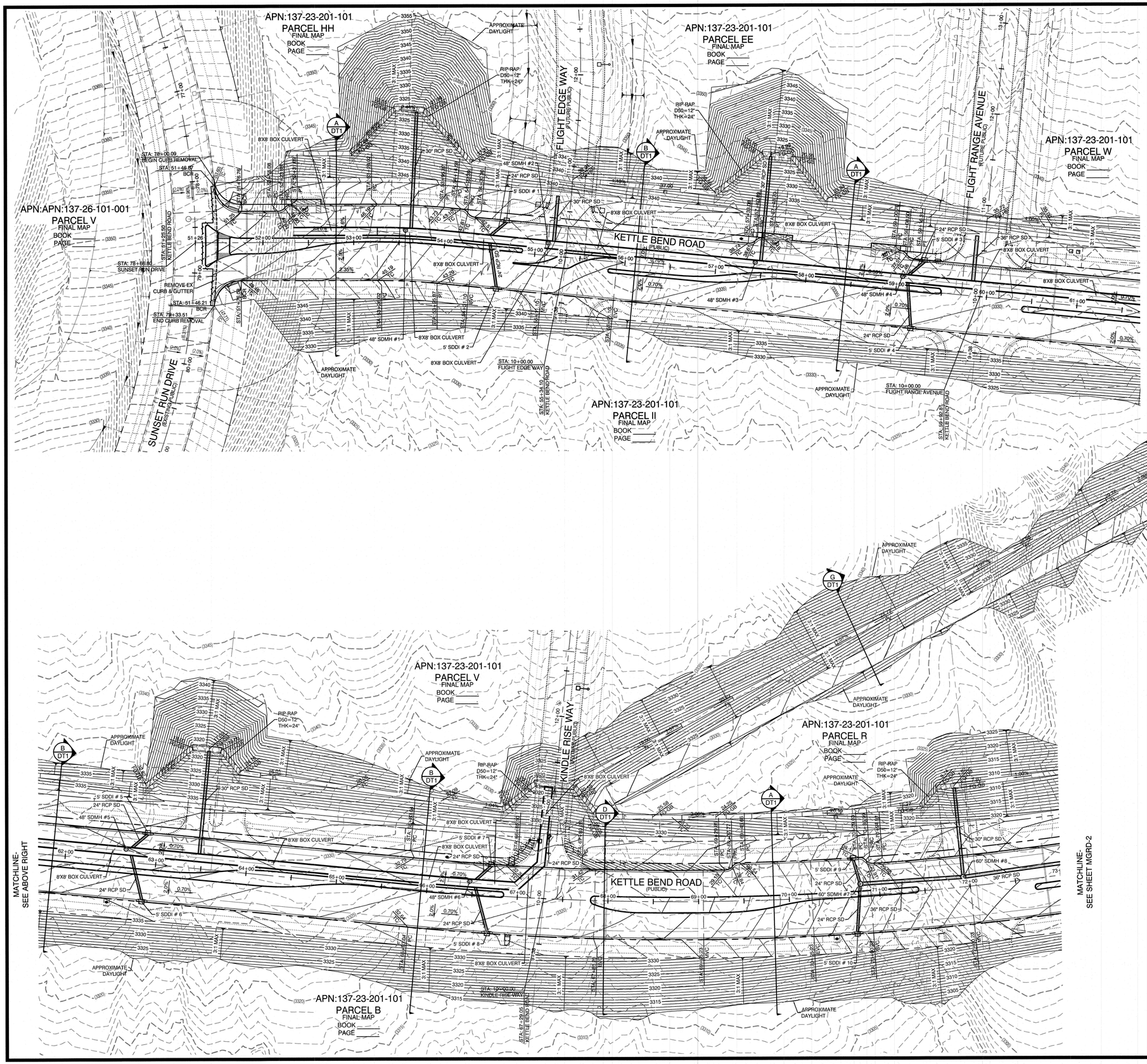
SUMMERLIN WEST VILLAGE 22
KETTLE BEND ROAD-SUNSET RUN
DRIVE TO KESTREL CREEK AVENUE

DRAWN BY: BCC
DESIGNED BY: BCC
CHECKED BY: WJM
PROJECT NO: 7981
05/30/2019
05/30/2019
01/13/2020
SCALE: 1"=-80' N/A
HORIZ. VERT.

PROFESSIONAL ENGINEER-STATE OF NEVADA
WILLIAM J MEYER
EXP: 12/31/21
CIVIL
No. 15745
01/14/20

SHEET
MUTSD
16 OF 94 SHEETS
DRAWING NO.

H:\7981\Kettle Bend Road\Sheet Set\7981-MUTSD.dwg(1/11/2020 3:21 AM)brandonc



STORM DRAIN DROP INLET NOTE:

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

OFFSITE FLOOD CONTROL NOTE:

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

GRADING PERMIT NOTE

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GEOTECHNICAL NOTE:

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

SIGHT VISIBILITY ZONES:

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I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE WITH CITY OF LAS VEGAS, #DS05204

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

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL AND STREET LIGHT SYSTEM CONDUITS
Call before you Underground
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-229-6811
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

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

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

REV	DATE	BY	REVISION

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10845 GRIFFITH PEAK DRIVE, SUITE 180
LAS VEGAS, NEVADA 89135
(702) 791-4000

CITY OF LAS VEGAS

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

MASTER GRADING PLAN 1

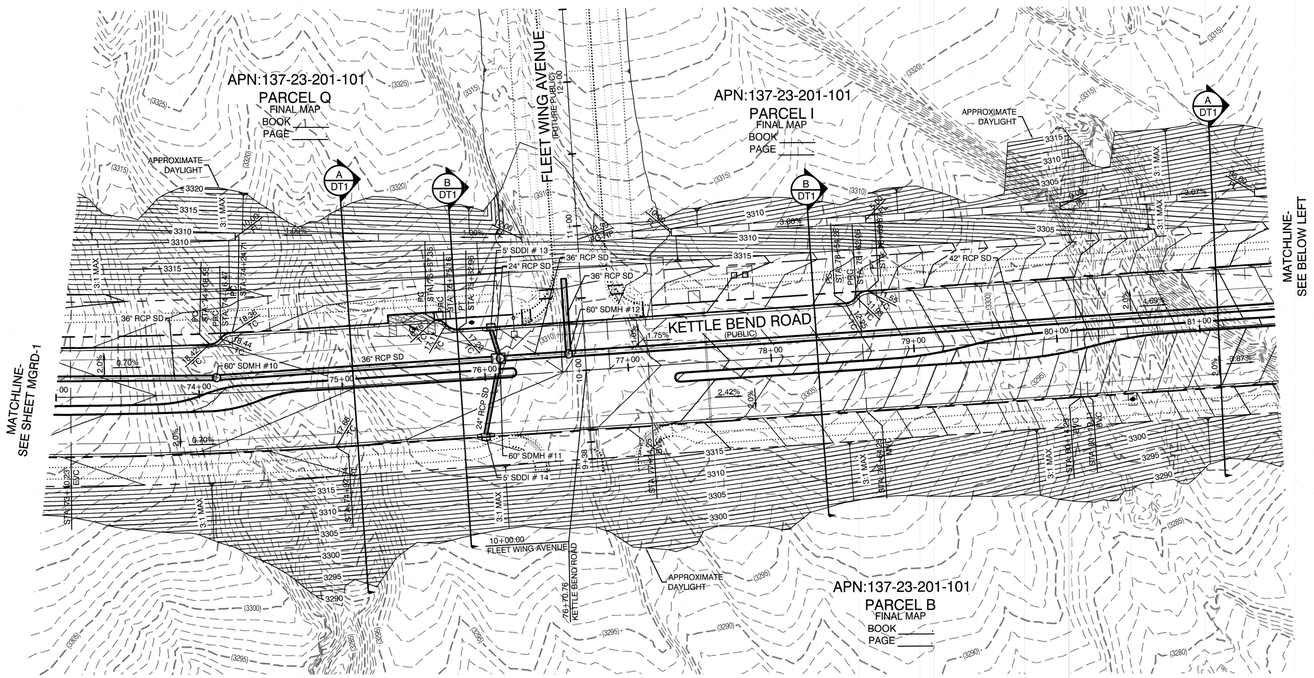
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KETTLE BEND ROAD-SUNSET RUN
DRIVE TO KESTREL CREEK AVENUE

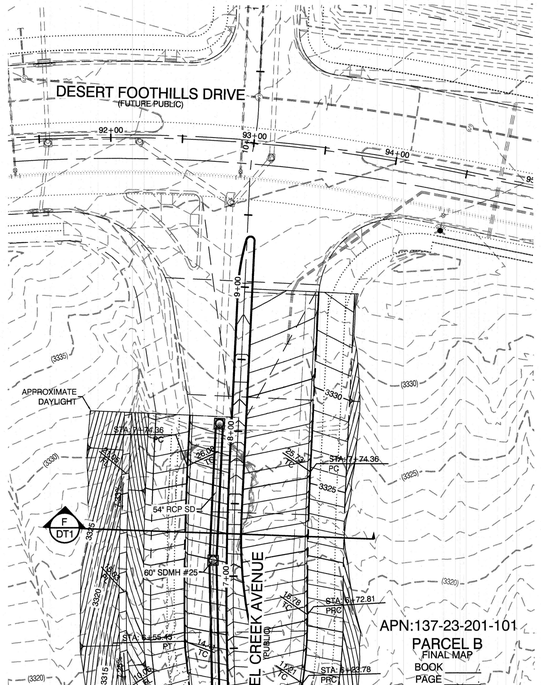
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CHECKED BY: WM	01/13/2020		
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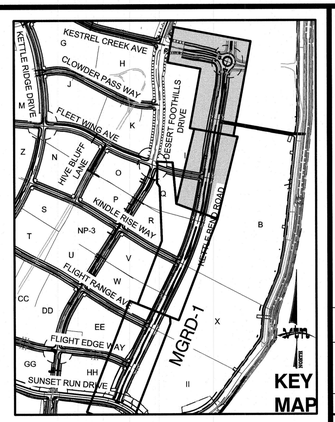
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WILLIAM J. MEYER
EXP: 12/31/21
CIVIL
No. 15745
1-14-20

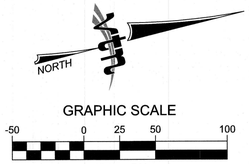
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17 OF **94** SHEETS
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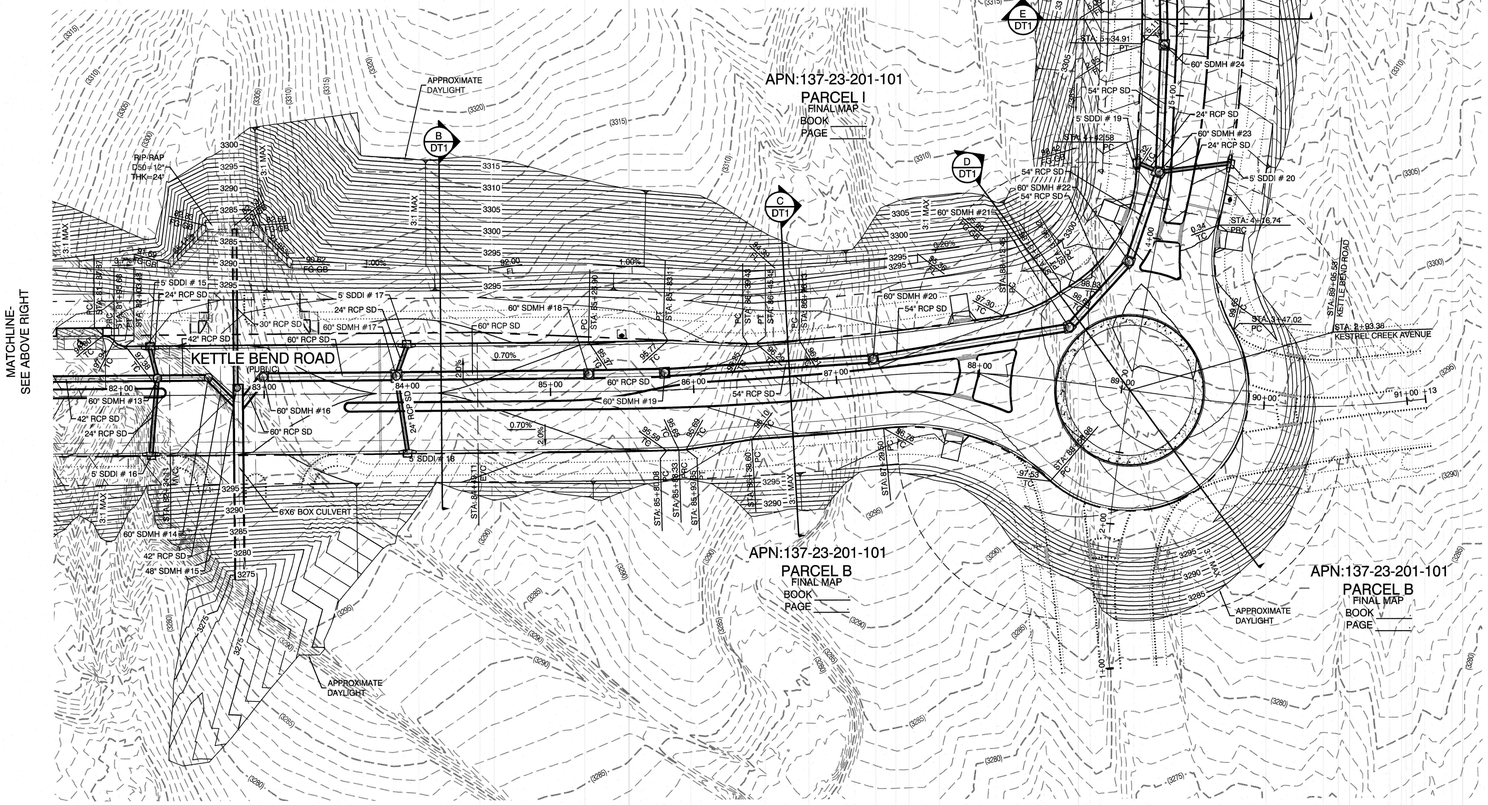
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Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR
1-800-227-2600
AND
1-702-455-6000
CLARK COUNTY TRAFFIC OPERATIONS

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

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

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

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

SIGHT VISIBILITY ZONES:
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I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE WITH CITY OF LAS VEGAS, #DS05204

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

REV	DATE	BY	REVISION

CITY OF LAS VEGAS

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10845 GRIFFITH PEAK DRIVE, SUITE 160
LAS VEGAS, NEVADA 89135
702-791-4050

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PH. (702) 873-7550 FAX (702) 382-2897 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

MASTER GRADING PLAN 2

SUMMERLIN WEST VILLAGE 22
KETTLE BEND ROAD-SUNSET RUN DRIVE TO KESTREL CREEK AVENUE

DRAWN BY: BCC	07/25/2019	SCALE:	1"=50'
DESIGNED BY: BCC	07/25/2019	HORIZ.	N/A
CHECKED BY: WJM	01/13/2020	VERT.	
PROJECT NO: 7861			

PROFESSIONAL ENGINEER STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/21
CIVIL
No. 15745

SHEET
MGRD-2
18 OF **94** SHEETS
DRAWING NO.

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Appendix C. Revised WSPG-W

C.1. Interim Condition

C.2. Ultimate Condition

C.1 Interim Condition

```
T1 SUMMERLIN WEST VILLAGE 22                                                    0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR INTERIM CONDITION
SO       .00 3404.320  1                          3411.735
R     191.77 3405.330  1      .013                                -5.587    .000 0
JX    193.77 3405.340  1  4   .013     .100         3412.780        -90.0         .000
R     226.86 3405.505  1      .013                                 .000    .000 1
REM  *****  SDMH#1
JX    230.86 3405.525  1  2   .013    0.100         3405.720        -45.0         .000
REM  *****  FLEET WING AVENUE
R     246.12 3405.601  1      .013                                 .000    .000 0
TS    296.42 3409.850  3      .013                                 .000
JX    298.42 3409.860  3  4   .013    2.000         3409.970         90.0         .000
REM  *****
R     325.70 3410.010  3      .013                                 .000    .000 0
JX    327.70 3410.020  3  4   .013    2.000         3413.500        -90.0         .000
REM  *****  SDDI#1
R     412.82 3410.440  3      .013                                 .000    .000 1
REM  *****  SDMH#2
R     502.84 3410.900  3      .013                                -0.058    .000 0
JX    504.84 3410.900  3  5   .013   55.000         3411.090        -90.0       -5.000
REM  *****  SDDI#2
R     718.03 3411.980  3      .013                                -6.208    .000 1
REM  *****  SDMH#3
R     821.25 3412.500  3      .013                                 .000    .000 0
JX    823.25 3412.700  3  4   .013    2.000         3412.700         85.0         .000
REM  *****  SDDI#3
R     892.26 3412.850  3      .013                                 .000    .000 0
JX    895.26 3412.865  3  5   .013   43.000         3413.050        -90.0         .000
REM  *****  SDDI#4 & SDDI#5
R     913.57 3412.950  3      .013                                -8.345    .000 1
REM  *****  SDMH#4
TS    918.57 3413.980  6      .013                                 .000
REM  *****  SDMH#5
R    1130.70 3415.070  6      .013                                 .000    .000 0
R    1135.70 3415.270  6      .013                                 .000    .000 1
R    1346.29 3416.410  6      .013                                 .000    .000 0
JX   1351.29 3416.610  8  4  5.013    3.000   25.0003416.6703416.670 85.0-90.0    .000
REM  *****  SDDI#7 & SDDI#6
R    1415.57 3420.640  8      .013                                 .000    .000 0
JX   1420.57 3420.810  8  4   .013    3.000         3423.000        -90.0         .000
REM  *****  SDDI#8
R    1574.56 3430.070  8      .013                                 .000    .000 0
R    1579.56 3430.250  8      .013                                -.528    .000 0
R    1870.76 3447.340  8      .013                                 .000    .000 0
SH   1870.76 3447.340  8                        3449.680
CD   1  3   0    .000   6.000   10.000  .000  .000   .00
CD   2  4   1    .000   4.000     .000  .000  .000   .00
CD   3  3   0    .000   6.000    6.000  .000  .000   .00
CD   4  4   1    .000   2.000     .000  .000  .000   .00
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Q           269.000   .0
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FILE: KETTLE-RIDGE-INT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time: 9:45:35

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM 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	3404.320	7.415	3411.735	404.20	6.74	.70	3412.44	.00	3.70	10.00	6.000	10.000	.00	0 .0
191.770	.0053					.0015	.29	.00	.48	3.14	.013	.00	.00	BOX
191.770	3405.330	6.728	3412.058	404.20	6.74	.70	3412.76	.00	3.70	10.00	6.000	10.000	.00	0 .0
JUNCT STR	.0050					.0015	.00	6.73	.48		.013	.00	.00	BOX
193.770	3405.340	6.722	3412.062	404.10	6.74	.70	3412.77	.00	3.70	10.00	6.000	10.000	.00	0 .0
29.920	.0050					.0015	.04	6.72	.48	3.21	.013	.00	.00	BOX
223.690	3405.489	6.643	3412.132	404.10	6.74	.70	3412.84	.00	3.70	10.00	6.000	10.000	.00	0 .0
HYDRAULIC JUMP														
223.690	3405.489	1.753	3407.242	404.10	23.05	8.25	3415.49	.00	3.70	10.00	6.000	10.000	.00	0 .0
3.170	.0050					.0287	.09	1.75	3.07	3.21	.013	.00	.00	BOX
226.860	3405.505	1.752	3407.257	404.10	23.06	8.26	3415.51	.00	3.70	10.00	6.000	10.000	.00	0 .0
JUNCT STR	.0050					.0290	.12	1.75	3.07		.013	.00	.00	BOX
230.860	3405.525	1.740	3407.265	404.00	23.21	8.37	3415.63	.00	3.70	10.00	6.000	10.000	.00	0 .0
15.260	.0050					.0305	.47	1.74	3.10	3.20	.013	.00	.00	BOX
246.120	3405.601	1.697	3407.298	404.00	23.81	8.80	3416.10	.00	3.70	10.00	6.000	10.000	.00	0 .0
TRANS STR	.0845					.0185	.93	1.70	3.22		.013	.00	.00	BOX
296.420	3409.850	5.203	3415.053	404.00	12.94	2.60	3417.65	.00	5.20	6.00	6.000	6.000	.00	0 .0
JUNCT STR	.0050					.0045	.01	5.20	1.00		.013	.00	.00	BOX

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time: 9:45:35

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR INTERIM CONDITION

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
298.420	3409.860	5.618	3415.478	402.00	11.93	2.21	3417.69	.00	5.19	6.00	6.000	6.000	.00	0 .0
27.280	.0055					.0045	.12	5.62	.89	5.16	.013	.00	.00	BOX
		---------- WARNING - Flow depth near top of box conduit ----------												
325.700	3410.010	5.484	3415.494	402.00	12.22	2.32	3417.81	.00	5.19	6.00	6.000	6.000	.00	0 .0
JUNCT STR	.0050					.0043	.01	5.48	.92		.013	.00	.00	BOX
		---------- WARNING - Flow depth near top of box conduit ----------												
327.700	3410.020	5.695	3415.715	400.00	11.71	2.13	3417.84	.00	5.17	6.00	6.000	6.000	.00	0 .0
85.120	.0049					.0043	.36	5.69	.86	5.37	.013	.00	.00	BOX
		---------- WARNING - Flow depth near top of box conduit ----------												
412.820	3410.440	5.502	3415.942	400.00	12.12	2.28	3418.22	.00	5.17	6.00	6.000	6.000	.00	0 .0
90.020	.0051					.0046	.42	5.50	.91	5.29	.013	.00	.00	BOX
		---------- WARNING - Flow depth near top of box conduit ----------												
502.840	3410.900	5.316	3416.216	400.00	12.54	2.44	3418.66	6.00	5.17	6.00	6.000	6.000	.00	0 .0
JUNCT STR	.0000					.0041	.01	6.00	.96		.013	.00	.00	BOX

FILE: KETTLE-RIDGE-INT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time: 9:45:35

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM 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	
504.840	3410.900	6.890	3417.789	345.00	9.58	1.43	3419.22	.00	4.68	6.00	6.000	6.000	.00	0 .0
213.190	.0051					.0041	.87	.00	.69	4.72	.013	.00	.00	BOX
718.030	3411.980	6.828	3418.808	345.00	9.58	1.43	3420.23	.00	4.68	6.00	6.000	6.000	.00	0 .0
103.220	.0050					.0041	.42	6.83	.69	4.73	.013	.00	.00	BOX
821.250	3412.500	6.731	3419.231	345.00	9.58	1.43	3420.66	.00	4.68	6.00	6.000	6.000	.00	0 .0
JUNCT STR	.1000					.0041	.01	6.73	.69		.013	.00	.00	BOX
823.250	3412.700	6.572	3419.272	343.00	9.53	1.41	3420.68	.00	4.66	6.00	6.000	6.000	.00	0 .0
69.010	.0022					.0040	.28	6.57	.69	6.00	.013	.00	.00	BOX
892.260	3412.850	6.701	3419.551	343.00	9.53	1.41	3420.96	.00	4.66	6.00	6.000	6.000	.00	0 .0
JUNCT STR	.0050					.0031	.01	.00	.69		.013	.00	.00	BOX
895.260	3412.865	7.359	3420.224	300.00	8.33	1.08	3421.30	.00	4.27	6.00	6.000	6.000	.00	0 .0
18.310	.0046					.0031	.06	.00	.60	4.37	.013	.00	.00	BOX
913.570	3412.950	7.450	3420.400	300.00	8.33	1.08	3421.48	.00	4.27	6.00	6.000	6.000	.00	0 .0
TRANS STR	.2060							7.45	.60		.013	.00	.00	BOX
918.570	3413.980	4.670	3418.650	300.00	15.72	3.84	3422.49	.00	4.67	2.48	5.000	.000	.00	1 .0
16.693	.0051					.0121	.20	4.67	1.00	5.00	.013	.00	.00	PIPE
935.263	3414.066	5.000	3419.066	300.00	15.28	3.62	3422.69	.00	4.67	.00	5.000	.000	.00	1 .0
195.437	.0051					.0130	2.54	5.00	.00	5.00	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR INTERIM 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	
1130.700	3415.070	6.589	3421.659	300.00	15.28	3.62	3425.28	.00	4.67	.00	5.000	.000	.00	1 .0
5.000	.0400				.0133	.07	6.59	.00	2.72	.013	.00	.00	PIPE	
1135.700	3415.270	6.636	3421.906	300.00	15.28	3.62	3425.53	.00	4.67	.00	5.000	.000	.00	1 .0
132.760	.0054				.0133	1.76	6.64	.00	5.00	.013	.00	.00	PIPE	
1268.460	3415.989	7.679	3423.667	300.00	15.28	3.62	3427.29	.00	4.67	.00	5.000	.000	.00	1 .0
HYDRAULIC JUMP														
1268.460	3415.989	2.988	3418.977	300.00	24.50	9.32	3428.30	.00	4.67	4.90	5.000	.000	.00	1 .0
17.767	.0054				.0308	.55	2.99	2.73	5.00	.013	.00	.00	PIPE	
1286.227	3416.085	2.924	3419.009	300.00	25.15	9.82	3428.83	.00	4.67	4.93	5.000	.000	.00	1 .0
30.531	.0054				.0339	1.04	2.92	2.85	5.00	.013	.00	.00	PIPE	
1316.758	3416.250	2.812	3419.062	300.00	26.38	10.81	3429.87	.00	4.67	4.96	5.000	.000	.00	1 .0
29.532	.0054				.0384	1.13	2.81	3.07	5.00	.013	.00	.00	PIPE	
1346.290	3416.410	2.705	3419.115	300.00	27.67	11.89	3431.00	.00	4.67	4.98	5.000	.000	.00	1 .0
JUNCT STR	.0400				.0496	.25	2.71	3.31		.013	.00	.00	PIPE	
1351.290	3416.610	2.441	3419.051	272.00	30.88	14.80	3433.85	.00	4.34	4.48	4.500	.000	.00	1 .0
64.280	.0627				.0575	3.69	2.44	3.88	2.39	.013	.00	.00	PIPE	
1415.570	3420.640	2.464	3423.104	272.00	30.51	14.45	3437.56	.00	4.34	4.48	4.500	.000	.00	1 .0
JUNCT STR	.0340				.0580	.29	2.46	3.81		.013	.00	.00	PIPE	

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SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM 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	
1420.570	3420.810	2.409	3423.219	269.00	31.03	14.95	3438.17	.00	4.33	4.49	4.500	.000	.00	1 .0
153.990	.0601					.0591	9.10	2.41	3.93	2.40	.013	.00	.00	PIPE
1574.560	3430.070	2.420	3432.490	269.00	30.86	14.78	3447.27	.24	4.33	4.49	4.500	.000	.00	1 .0
5.000	.0360					.0590	.29	2.66	3.90	2.83	.013	.00	.00	PIPE
1579.560	3430.250	2.412	3432.662	269.00	30.99	14.91	3447.57	.00	4.33	4.49	4.500	.000	.00	1 .0
291.200	.0587					.0625	18.19	2.41	3.93	2.42	.013	.00	.00	PIPE

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T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR INTERIM CONDITION LATERAL 57+89
SO    327.5003413.500  1                          3415.715
R     360.2903415.440  1      .013                              .000    .000 0
SH    360.2903415.440  1                          3415.440
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             2.000   .0
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SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM CONDITION LATERAL 57+89

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	
327.500	3413.500	2.215	3415.715	2.00	.64	.01	3415.72	.00	.49	.00	2.000	.000	.00	1 .0
3.640	.0592					.0001	.00	2.22	.00	.26	.013	.00	.00	PIPE
331.140	3413.715	2.000	3415.715	2.00	.64	.01	3415.72	.00	.49	.00	2.000	.000	.00	1 .0
3.110	.0592					.0001	.00	2.00	.00	.26	.013	.00	.00	PIPE
334.250	3413.899	1.815	3415.714	2.00	.67	.01	3415.72	.00	.49	1.16	2.000	.000	.00	1 .0
1.811	.0592					.0001	.00	1.81	.07	.26	.013	.00	.00	PIPE
336.061	3414.007	1.707	3415.714	2.00	.70	.01	3415.72	.00	.49	1.41	2.000	.000	.00	1 .0
1.490	.0592					.0001	.00	1.71	.09	.26	.013	.00	.00	PIPE
337.551	3414.095	1.618	3415.713	2.00	.73	.01	3415.72	.00	.49	1.57	2.000	.000	.00	1 .0
1.303	.0592					.0001	.00	1.62	.10	.26	.013	.00	.00	PIPE
338.854	3414.172	1.540	3415.712	2.00	.77	.01	3415.72	.00	.49	1.68	2.000	.000	.00	1 .0
1.169	.0592					.0001	.00	1.54	.11	.26	.013	.00	.00	PIPE
340.023	3414.241	1.470	3415.711	2.00	.81	.01	3415.72	.00	.49	1.77	2.000	.000	.00	1 .0
1.068	.0592					.0001	.00	1.47	.12	.26	.013	.00	.00	PIPE
341.091	3414.304	1.406	3415.710	2.00	.85	.01	3415.72	.00	.49	1.83	2.000	.000	.00	1 .0
.985	.0592					.0001	.00	1.41	.13	.26	.013	.00	.00	PIPE
342.077	3414.363	1.347	3415.709	2.00	.89	.01	3415.72	.00	.49	1.88	2.000	.000	.00	1 .0
.916	.0592					.0001	.00	1.35	.14	.26	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM CONDITION LATERAL 57+89

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
342.993	3414.417	1.292	3415.708	2.00	.93	.01	3415.72	.00	.49	1.91	2.000	.000	.00	1 .0
.855	.0592					.0001	.00	1.29	.16	.26	.013	.00	.00	PIPE
343.848	3414.467	1.240	3415.707	2.00	.98	.01	3415.72	.00	.49	1.94	2.000	.000	.00	1 .0
.802	.0592					.0002	.00	1.24	.17	.26	.013	.00	.00	PIPE
344.650	3414.515	1.191	3415.706	2.00	1.03	.02	3415.72	.00	.49	1.96	2.000	.000	.00	1 .0
.752	.0592					.0002	.00	1.19	.18	.26	.013	.00	.00	PIPE
345.402	3414.559	1.145	3415.704	2.00	1.08	.02	3415.72	.00	.49	1.98	2.000	.000	.00	1 .0
.709	.0592					.0002	.00	1.15	.20	.26	.013	.00	.00	PIPE
346.111	3414.601	1.101	3415.702	2.00	1.13	.02	3415.72	.00	.49	1.99	2.000	.000	.00	1 .0
.669	.0592					.0002	.00	1.10	.21	.26	.013	.00	.00	PIPE
346.780	3414.641	1.060	3415.701	2.00	1.18	.02	3415.72	.00	.49	2.00	2.000	.000	.00	1 .0
.632	.0592					.0003	.00	1.06	.23	.26	.013	.00	.00	PIPE
347.413	3414.678	1.021	3415.698	2.00	1.24	.02	3415.72	.00	.49	2.00	2.000	.000	.00	1 .0
.597	.0592					.0003	.00	1.02	.24	.26	.013	.00	.00	PIPE
348.009	3414.713	.983	3415.697	2.00	1.30	.03	3415.72	.00	.49	2.00	2.000	.000	.00	1 .0
.564	.0592					.0004	.00	.98	.26	.26	.013	.00	.00	PIPE
348.573	3414.747	.947	3415.694	2.00	1.36	.03	3415.72	.00	.49	2.00	2.000	.000	.00	1 .0
.533	.0592					.0004	.00	.95	.28	.26	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:31:33

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR INTERIM CONDITION LATERAL 57+89

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
349.106	3414.778	.913	3415.691	2.00	1.43	.03	3415.72	.00	.49	1.99	2.000	.000	.00	1 .0
.503	.0592					.0005	.00	.91	.30	.26	.013	.00	.00	PIPE
349.609	3414.808	.880	3415.688	2.00	1.50	.03	3415.72	.00	.49	1.99	2.000	.000	.00	1 .0
.474	.0592					.0005	.00	.88	.32	.26	.013	.00	.00	PIPE
350.083	3414.836	.849	3415.685	2.00	1.57	.04	3415.72	.00	.49	1.98	2.000	.000	.00	1 .0
.445	.0592					.0006	.00	.85	.35	.26	.013	.00	.00	PIPE
350.528	3414.863	.819	3415.682	2.00	1.65	.04	3415.72	.00	.49	1.97	2.000	.000	.00	1 .0
.420	.0592					.0007	.00	.82	.37	.26	.013	.00	.00	PIPE
350.948	3414.887	.790	3415.678	2.00	1.73	.05	3415.72	.00	.49	1.96	2.000	.000	.00	1 .0
.391	.0592					.0008	.00	.79	.40	.26	.013	.00	.00	PIPE
351.339	3414.911	.763	3415.674	2.00	1.82	.05	3415.72	.00	.49	1.94	2.000	.000	.00	1 .0
.160	.0592					.0009	.00	.76	.43	.26	.013	.00	.00	PIPE
351.499	3414.920	.736	3415.656	2.00	1.91	.06	3415.71	.00	.49	1.93	2.000	.000	.00	1 .0
HYDRAULIC JUMP														
351.499	3414.920	.297	3415.218	2.00	6.86	.73	3415.95	.00	.49	1.42	2.000	.000	.00	1 .0
1.078	.0592					.0321	.03	.30	2.67	.26	.013	.00	.00	PIPE
352.578	3414.984	.307	3415.291	2.00	6.54	.66	3415.95	.00	.49	1.44	2.000	.000	.00	1 .0
1.608	.0592					.0281	.05	.31	2.50	.26	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:31:33

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM CONDITION LATERAL 57+89

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
354.185	3415.079	.318	3415.397	2.00	6.23	.60	3416.00	.00	.49	1.46	2.000	.000	.00	1 .0
1.273	.0592					.0245	.03	.32	2.34	.26	.013	.00	.00	PIPE
355.458	3415.154	.328	3415.482	2.00	5.94	.55	3416.03	.00	.49	1.48	2.000	.000	.00	1 .0
1.029	.0592					.0214	.02	.33	2.20	.26	.013	.00	.00	PIPE
356.487	3415.215	.339	3415.554	2.00	5.67	.50	3416.05	.00	.49	1.50	2.000	.000	.00	1 .0
.838	.0592					.0187	.02	.34	2.06	.26	.013	.00	.00	PIPE
357.324	3415.265	.351	3415.615	2.00	5.40	.45	3416.07	.00	.49	1.52	2.000	.000	.00	1 .0
.686	.0592					.0163	.01	.35	1.93	.26	.013	.00	.00	PIPE
358.011	3415.305	.362	3415.667	2.00	5.15	.41	3416.08	.00	.49	1.54	2.000	.000	.00	1 .0
.562	.0592					.0143	.01	.36	1.81	.26	.013	.00	.00	PIPE
358.573	3415.338	.375	3415.713	2.00	4.91	.37	3416.09	.00	.49	1.56	2.000	.000	.00	1 .0
.457	.0592					.0125	.01	.37	1.69	.26	.013	.00	.00	PIPE
359.030	3415.365	.387	3415.753	2.00	4.68	.34	3416.09	.00	.49	1.58	2.000	.000	.00	1 .0
.370	.0592					.0109	.00	.39	1.59	.26	.013	.00	.00	PIPE
359.400	3415.387	.400	3415.788	2.00	4.46	.31	3416.10	.00	.49	1.60	2.000	.000	.00	1 .0
.293	.0592					.0095	.00	.40	1.49	.26	.013	.00	.00	PIPE
359.692	3415.405	.414	3415.819	2.00	4.26	.28	3416.10	.00	.49	1.62	2.000	.000	.00	1 .0
.228	.0592					.0083	.00	.41	1.39	.26	.013	.00	.00	PIPE

FILE: LATERAL-57+89-INT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 5

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:31:33

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM CONDITION LATERAL 57+89

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	
359.920	3415.418	.428	3415.846	2.00	4.06	.26	3416.10	.00	.49	1.64	2.000	.000	.00	1 .0
.167	.0592					.0073	.00	.43	1.31	.26	.013	.00	.00	PIPE
360.087	3415.428	.443	3415.871	2.00	3.87	.23	3416.10	.00	.49	1.66	2.000	.000	.00	1 .0
.114	.0592					.0063	.00	.44	1.22	.26	.013	.00	.00	PIPE
360.201	3415.435	.458	3415.893	2.00	3.69	.21	3416.10	.00	.49	1.68	2.000	.000	.00	1 .0
.067	.0592					.0055	.00	.46	1.14	.26	.013	.00	.00	PIPE
360.268	3415.439	.473	3415.912	2.00	3.52	.19	3416.10	.00	.49	1.70	2.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR INTERIM CONDITION LATERAL 59+67
SO    504.8403411.090  1                          3417.789
R     556.8303416.290  1      .013                              .000    .000 0
SH    556.8303416.290  1                          3416.290
CD   1  4   1    .000   3.000     .000  .000  .000   .00
Q            55.000   .0
```

FILE: LATERAL-59+67-INT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:28:53

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR INTERIM CONDITION LATERAL 59+67

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
504.840	3411.090	6.699	3417.789	55.00	7.78	.94	3418.73	.00	2.41	.00	3.000	.000	.00	1 .0
31.957	.1000					.0068	.22	6.70	.00	1.05	.013	.00	.00	PIPE
536.797	3414.286	3.718	3418.004	55.00	7.78	.94	3418.94	.00	2.41	.00	3.000	.000	.00	1 .0
HYDRAULIC JUMP														
536.797	3414.286	1.488	3415.774	55.00	15.73	3.84	3419.61	.00	2.41	3.00	3.000	.000	.00	1 .0
2.107	.1000					.0270	.06	1.49	2.57	1.05	.013	.00	.00	PIPE
538.904	3414.497	1.521	3416.017	55.00	15.29	3.63	3419.65	.00	2.41	3.00	3.000	.000	.00	1 .0
3.593	.1000					.0244	.09	1.52	2.46	1.05	.013	.00	.00	PIPE
542.497	3414.856	1.579	3416.435	55.00	14.58	3.30	3419.74	.00	2.41	3.00	3.000	.000	.00	1 .0
3.041	.1000					.0215	.07	1.58	2.29	1.05	.013	.00	.00	PIPE
545.539	3415.160	1.641	3416.801	55.00	13.90	3.00	3419.80	.00	2.41	2.99	3.000	.000	.00	1 .0
2.569	.1000					.0190	.05	1.64	2.13	1.05	.013	.00	.00	PIPE
548.107	3415.417	1.705	3417.123	55.00	13.26	2.73	3419.85	.00	2.41	2.97	3.000	.000	.00	1 .0
2.159	.1000					.0168	.04	1.71	1.98	1.05	.013	.00	.00	PIPE
550.266	3415.633	1.774	3417.407	55.00	12.64	2.48	3419.89	.00	2.41	2.95	3.000	.000	.00	1 .0
1.798	.1000					.0149	.03	1.77	1.83	1.05	.013	.00	.00	PIPE
552.065	3415.813	1.846	3417.659	55.00	12.05	2.26	3419.91	.00	2.41	2.92	3.000	.000	.00	1 .0
1.476	.1000					.0132	.02	1.85	1.70	1.05	.013	.00	.00	PIPE

FILE: LATERAL-59+67-INT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:28:53

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM CONDITION LATERAL 59+67

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	
553.541	3415.961	1.923	3417.884	55.00	11.49	2.05	3419.93	.00	2.41	2.88	3.000	.000	.00	1 .0
1.183	.1000					.0117	.01	1.92	1.57	1.05	.013	.00	.00	PIPE
554.724	3416.079	2.005	3418.084	55.00	10.96	1.86	3419.95	.00	2.41	2.82	3.000	.000	.00	1 .0
.911	.1000					.0104	.01	2.00	1.45	1.05	.013	.00	.00	PIPE
555.635	3416.170	2.093	3418.263	55.00	10.45	1.69	3419.96	.00	2.41	2.76	3.000	.000	.00	1 .0
.654	.1000					.0093	.01	2.09	1.33	1.05	.013	.00	.00	PIPE
556.289	3416.236	2.187	3418.423	55.00	9.96	1.54	3419.96	.00	2.41	2.67	3.000	.000	.00	1 .0
.401	.1000					.0083	.00	2.19	1.22	1.05	.013	.00	.00	PIPE
556.689	3416.276	2.291	3418.567	55.00	9.50	1.40	3419.97	.00	2.41	2.55	3.000	.000	.00	1 .0
.141	.1000					.0075	.00	2.29	1.11	1.05	.013	.00	.00	PIPE
556.830	3416.290	2.406	3418.696	55.00	9.05	1.27	3419.97	.00	2.41	2.39	3.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR INTERIM CONDITION LATERAL 62+86
SO    823.2503412.700  1                          3419.272
R     892.5703415.550  1      .013                              .000    .000 0
SH    892.5703415.550  1                          3419.300
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             2.000   .0
```

FILE: lateral-62+86-int.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:18:29

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR INTERIM CONDITION LATERAL 62+86

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	
823.250	3412.700	6.572	3419.272	2.00	.64	.01	3419.28	.00	.49	.00	2.000	.000	.00	1 .0
69.320	.0411				.0001	.01	6.57	.00	.28	.013	.00	.00	PIPE	
892.570	3415.550	3.727	3419.277	2.00	.64	.01	3419.28	.00	.49	.00	2.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR INTERIM CONDITION  LATERAL 63+58
SO    895.2603413.050  1                          3420.224
R     907.2603413.610  1      .013                                .000    .000 0
JX    909.2603413.810  1  2   .013    3.000         3413.810       90.0         .000
R     951.2803418.750  1      .013                                .000    .000 0
SH    951.2803418.750  1                          3418.750
CD   1  4   1    .000   3.000     .000  .000  .000   .00
CD   2  2   0    .000  13.000    3.000  .000  .000   .00
Q            40.000   .0
```

FILE: LATERAL-63+58-INT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:29:16

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR INTERIM CONDITION LATERAL 63+58

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energ 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
895.260	3413.050	7.174	3420.224	43.00	6.08	.57	3420.80	.00	2.14	.00	3.000	.000	.00	1 .0
12.000	.0467					.0042	.05	7.17	.00	1.12	.013	.00	.00	PIPE
907.260	3413.610	6.664	3420.274	43.00	6.08	.57	3420.85	.00	2.14	.00	3.000	.000	.00	1 .0
JUNCT STR	.1000					.0039	.01	6.66	.00		.013	.00	.00	PIPE
909.260	3413.810	6.626	3420.437	40.00	5.66	.50	3420.93	.00	2.06	.00	3.000	.000	.00	1 .0
30.944	.1176					.0036	.11	6.63	.00	.85	.013	.00	.00	PIPE
940.204	3417.448	3.098	3420.546	40.00	5.66	.50	3421.04	.00	2.06	.00	3.000	.000	.00	1 .0
HYDRAULIC JUMP														
940.204	3417.448	1.313	3418.761	40.00	13.44	2.81	3421.57	.00	2.06	2.98	3.000	.000	.00	1 .0
1.316	.1176					.0220	.03	1.31	2.37	.85	.013	.00	.00	PIPE
941.520	3417.602	1.342	3418.944	40.00	13.07	2.65	3421.60	.00	2.06	2.98	3.000	.000	.00	1 .0
1.958	.1176					.0199	.04	1.34	2.27	.85	.013	.00	.00	PIPE
943.478	3417.833	1.392	3419.224	40.00	12.46	2.41	3421.64	.00	2.06	2.99	3.000	.000	.00	1 .0
1.669	.1176					.0175	.03	1.39	2.12	.85	.013	.00	.00	PIPE
945.146	3418.029	1.444	3419.473	40.00	11.88	2.19	3421.67	.00	2.06	3.00	3.000	.000	.00	1 .0
1.415	.1176					.0154	.02	1.44	1.98	.85	.013	.00	.00	PIPE
946.561	3418.195	1.499	3419.694	40.00	11.33	1.99	3421.69	.00	2.06	3.00	3.000	.000	.00	1 .0
1.191	.1176					.0136	.02	1.50	1.84	.85	.013	.00	.00	PIPE

FILE: LATERAL-63+58-INT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:29:16

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM CONDITION LATERAL 63+58

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	
947.752	3418.335	1.556	3419.891	40.00	10.80	1.81	3421.70	.00	2.06	3.00	3.000	.000	.00	1 .0
.988	.1176					.0120	.01	1.56	1.71	.85	.013	.00	.00	PIPE
948.740	3418.451	1.617	3420.068	40.00	10.30	1.65	3421.72	.00	2.06	2.99	3.000	.000	.00	1 .0
.807	.1176					.0106	.01	1.62	1.59	.85	.013	.00	.00	PIPE
949.547	3418.546	1.680	3420.226	40.00	9.82	1.50	3421.72	.00	2.06	2.98	3.000	.000	.00	1 .0
.639	.1176					.0093	.01	1.68	1.48	.85	.013	.00	.00	PIPE
950.186	3418.621	1.747	3420.368	40.00	9.36	1.36	3421.73	.00	2.06	2.96	3.000	.000	.00	1 .0
.485	.1176					.0082	.00	1.75	1.37	.85	.013	.00	.00	PIPE
950.670	3418.678	1.818	3420.496	40.00	8.93	1.24	3421.73	.00	2.06	2.93	3.000	.000	.00	1 .0
.340	.1176					.0073	.00	1.82	1.27	.85	.013	.00	.00	PIPE
951.011	3418.718	1.893	3420.611	40.00	8.51	1.13	3421.74	.00	2.06	2.90	3.000	.000	.00	1 .0
.202	.1176					.0065	.00	1.89	1.18	.85	.013	.00	.00	PIPE
951.212	3418.742	1.973	3420.715	40.00	8.12	1.02	3421.74	.00	2.06	2.85	3.000	.000	.00	1 .0
.068	.1176					.0057	.00	1.97	1.09	.85	.013	.00	.00	PIPE
951.280	3418.750	2.059	3420.809	40.00	7.73	.93	3421.74	.00	2.06	2.78	3.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR INTERIM CONDITION LATERAL 68+31 EAST
SO   1351.2903416.670  1                          3419.051
R    1422.9803420.270  1      .013                                .000    .000 0
SH   1422.9803420.270  1                          3420.270
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             3.000   .0
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FILE: LATERAL-68+31E-INT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:29:34

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM CONDITION LATERAL 68+31 EAST

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
1351.290	3416.670	2.381	3419.051	3.00	.95	.01	3419.07	.00	.60	.00	2.000	.000	.00	1 .0
7.616	.0502					.0002	.00	2.38	.00	.33	.013	.00	.00	PIPE
1358.906	3417.052	2.000	3419.052	3.00	.95	.01	3419.07	.00	.60	.00	2.000	.000	.00	1 .0
3.656	.0502					.0002	.00	2.00	.00	.33	.013	.00	.00	PIPE
1362.561	3417.236	1.815	3419.051	3.00	1.00	.02	3419.07	.00	.60	1.16	2.000	.000	.00	1 .0
2.120	.0502					.0002	.00	1.81	.11	.33	.013	.00	.00	PIPE
1364.682	3417.342	1.707	3419.049	3.00	1.05	.02	3419.07	.00	.60	1.41	2.000	.000	.00	1 .0
1.740	.0502					.0002	.00	1.71	.13	.33	.013	.00	.00	PIPE
1366.422	3417.430	1.618	3419.048	3.00	1.10	.02	3419.07	.00	.60	1.57	2.000	.000	.00	1 .0
1.517	.0502					.0002	.00	1.62	.15	.33	.013	.00	.00	PIPE
1367.939	3417.506	1.540	3419.046	3.00	1.16	.02	3419.07	.00	.60	1.68	2.000	.000	.00	1 .0
1.358	.0502					.0002	.00	1.54	.16	.33	.013	.00	.00	PIPE
1369.298	3417.574	1.470	3419.044	3.00	1.21	.02	3419.07	.00	.60	1.77	2.000	.000	.00	1 .0
1.237	.0502					.0002	.00	1.47	.18	.33	.013	.00	.00	PIPE
1370.534	3417.636	1.406	3419.042	3.00	1.27	.03	3419.07	.00	.60	1.83	2.000	.000	.00	1 .0
1.137	.0502					.0003	.00	1.41	.20	.33	.013	.00	.00	PIPE
1371.671	3417.693	1.347	3419.040	3.00	1.33	.03	3419.07	.00	.60	1.88	2.000	.000	.00	1 .0
1.052	.0502					.0003	.00	1.35	.21	.33	.013	.00	.00	PIPE

FILE: LATERAL-68+31E-INT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:29:34

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR INTERIM CONDITION LATERAL 68+31 EAST

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
1372.724	3417.746	1.292	3419.037	3.00	1.40	.03	3419.07	.00	.60	1.91	2.000	.000	.00	1 .0
.978	.0502					.0003	.00	1.29	.23	.33	.013	.00	.00	PIPE
1373.701	3417.795	1.240	3419.035	3.00	1.47	.03	3419.07	.00	.60	1.94	2.000	.000	.00	1 .0
.912	.0502					.0004	.00	1.24	.25	.33	.013	.00	.00	PIPE
1374.613	3417.841	1.191	3419.032	3.00	1.54	.04	3419.07	.00	.60	1.96	2.000	.000	.00	1 .0
.850	.0502					.0004	.00	1.19	.27	.33	.013	.00	.00	PIPE
1375.464	3417.884	1.145	3419.029	3.00	1.61	.04	3419.07	.00	.60	1.98	2.000	.000	.00	1 .0
.795	.0502					.0005	.00	1.15	.29	.33	.013	.00	.00	PIPE
1376.259	3417.924	1.101	3419.025	3.00	1.69	.04	3419.07	.00	.60	1.99	2.000	.000	.00	1 .0
.744	.0502					.0005	.00	1.10	.32	.33	.013	.00	.00	PIPE
1377.003	3417.961	1.060	3419.021	3.00	1.77	.05	3419.07	.00	.60	2.00	2.000	.000	.00	1 .0
.696	.0502					.0006	.00	1.06	.34	.33	.013	.00	.00	PIPE
1377.699	3417.996	1.021	3419.016	3.00	1.86	.05	3419.07	.00	.60	2.00	2.000	.000	.00	1 .0
.293	.0502					.0007	.00	1.02	.37	.33	.013	.00	.00	PIPE
1377.992	3418.010	.983	3418.994	3.00	1.95	.06	3419.05	.00	.60	2.00	2.000	.000	.00	1 .0
HYDRAULIC JUMP														
1377.992	3418.010	.330	3418.341	3.00	8.84	1.21	3419.55	.00	.60	1.48	2.000	.000	.00	1 .0
13.100	.0502					.0471	.62	.33	3.26	.33	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:29:34

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM CONDITION LATERAL 68+31 EAST

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	
1391.092	3418.669	.341	3419.010	3.00	8.44	1.11	3420.12	.00	.60	1.50	2.000	.000	.00	1 .0
9.971	.0502					.0413	.41	.34	3.06	.33	.013	.00	.00	PIPE
1401.063	3419.170	.352	3419.522	3.00	8.05	1.01	3420.53	.00	.60	1.52	2.000	.000	.00	1 .0
5.627	.0502					.0361	.20	.35	2.87	.33	.013	.00	.00	PIPE
1406.690	3419.452	.364	3419.816	3.00	7.68	.92	3420.73	.00	.60	1.54	2.000	.000	.00	1 .0
3.786	.0502					.0315	.12	.36	2.69	.33	.013	.00	.00	PIPE
1410.475	3419.642	.376	3420.019	3.00	7.32	.83	3420.85	.00	.60	1.56	2.000	.000	.00	1 .0
2.771	.0502					.0275	.08	.38	2.52	.33	.013	.00	.00	PIPE
1413.246	3419.781	.389	3420.170	3.00	6.98	.76	3420.93	.00	.60	1.58	2.000	.000	.00	1 .0
2.122	.0502					.0240	.05	.39	2.36	.33	.013	.00	.00	PIPE
1415.368	3419.888	.402	3420.290	3.00	6.65	.69	3420.98	.00	.60	1.60	2.000	.000	.00	1 .0
1.674	.0502					.0210	.04	.40	2.21	.33	.013	.00	.00	PIPE
1417.042	3419.972	.416	3420.388	3.00	6.34	.62	3421.01	.00	.60	1.62	2.000	.000	.00	1 .0
1.338	.0502					.0184	.02	.42	2.07	.33	.013	.00	.00	PIPE
1418.380	3420.039	.430	3420.469	3.00	6.05	.57	3421.04	.00	.60	1.64	2.000	.000	.00	1 .0
1.084	.0502					.0160	.02	.43	1.94	.33	.013	.00	.00	PIPE
1419.464	3420.094	.445	3420.538	3.00	5.77	.52	3421.05	.00	.60	1.66	2.000	.000	.00	1 .0
.877	.0502					.0140	.01	.44	1.82	.33	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:29:34

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR INTERIM CONDITION LATERAL 68+31 EAST

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
1420.341	3420.137	.460	3420.597	3.00	5.50	.47	3421.07	.00	.60	1.68	2.000	.000	.00	1 .0
.711	.0502					.0123	.01	.46	1.70	.33	.013	.00	.00	PIPE
1421.052	3420.173	.476	3420.649	3.00	5.24	.43	3421.08	.00	.60	1.70	2.000	.000	.00	1 .0
.570	.0502					.0107	.01	.48	1.59	.33	.013	.00	.00	PIPE
1421.622	3420.202	.492	3420.693	3.00	5.00	.39	3421.08	.00	.60	1.72	2.000	.000	.00	1 .0
.450	.0502					.0094	.00	.49	1.49	.33	.013	.00	.00	PIPE
1422.072	3420.224	.509	3420.733	3.00	4.77	.35	3421.09	.00	.60	1.74	2.000	.000	.00	1 .0
.347	.0502					.0082	.00	.51	1.40	.33	.013	.00	.00	PIPE
1422.419	3420.242	.526	3420.768	3.00	4.54	.32	3421.09	.00	.60	1.76	2.000	.000	.00	1 .0
.255	.0502					.0072	.00	.53	1.31	.33	.013	.00	.00	PIPE
1422.673	3420.254	.544	3420.799	3.00	4.33	.29	3421.09	.00	.60	1.78	2.000	.000	.00	1 .0
.173	.0502					.0063	.00	.54	1.22	.33	.013	.00	.00	PIPE
1422.846	3420.263	.563	3420.826	3.00	4.13	.27	3421.09	.00	.60	1.80	2.000	.000	.00	1 .0
.100	.0502					.0055	.00	.56	1.15	.33	.013	.00	.00	PIPE
1422.947	3420.268	.583	3420.851	3.00	3.94	.24	3421.09	.00	.60	1.82	2.000	.000	.00	1 .0
.033	.0502													

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T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR INTERIM CONDITION LATERAL 68+31 WEST
SO   1351.2903416.670  1                          3419.051
R    1406.2903422.890  1      .013                                .000    .000 0
SH   1406.2903422.890  1                          3422.890
CD   1  4   1    .000   2.500     .000  .000  .000   .00
Q            25.000   .0
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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:19:25

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM CONDITION LATERAL 68+31 WEST

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
1351.290	3416.670	.798	3417.468	25.00	18.52	5.32	3422.79	.00	1.70	2.33	2.500	.000	.00	1 .0
4.324	.1131					.0744	.32	.80	4.29	.72	.013	.00	.00	PIPE
1355.614	3417.159	.808	3417.967	25.00	18.21	5.15	3423.12	.00	1.70	2.34	2.500	.000	.00	1 .0
9.802	.1131					.0682	.67	.81	4.19	.72	.013	.00	.00	PIPE
1365.417	3418.268	.836	3419.104	25.00	17.36	4.68	3423.79	.00	1.70	2.36	2.500	.000	.00	1 .0
7.428	.1131					.0598	.44	.84	3.92	.72	.013	.00	.00	PIPE
1372.844	3419.108	.866	3419.974	25.00	16.56	4.26	3424.23	.00	1.70	2.38	2.500	.000	.00	1 .0
5.868	.1131					.0524	.31	.87	3.66	.72	.013	.00	.00	PIPE
1378.712	3419.771	.897	3420.668	25.00	15.79	3.87	3424.54	.00	1.70	2.40	2.500	.000	.00	1 .0
4.760	.1131					.0459	.22	.90	3.42	.72	.013	.00	.00	PIPE
1383.472	3420.310	.929	3421.239	25.00	15.05	3.52	3424.76	.00	1.70	2.42	2.500	.000	.00	1 .0
3.932	.1131					.0403	.16	.93	3.20	.72	.013	.00	.00	PIPE
1387.404	3420.754	.963	3421.717	25.00	14.35	3.20	3424.91	.00	1.70	2.43	2.500	.000	.00	1 .0
3.292	.1131					.0353	.12	.96	2.99	.72	.013	.00	.00	PIPE
1390.696	3421.126	.997	3422.124	25.00	13.68	2.91	3425.03	.00	1.70	2.45	2.500	.000	.00	1 .0
2.778	.1131					.0310	.09	1.00	2.79	.72	.013	.00	.00	PIPE
1393.474	3421.441	1.034	3422.474	25.00	13.05	2.64	3425.12	.00	1.70	2.46	2.500	.000	.00	1 .0
2.357	.1131					.0272	.06	1.03	2.61	.72	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:19:25

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM CONDITION LATERAL 68+31 WEST

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
1395.831	3421.707	1.072	3422.779	25.00	12.44	2.40	3425.18	.00	1.70	2.47	2.500	.000	.00	1 .0
2.005	.1131					.0239	.05	1.07	2.43	.72	.013	.00	.00	PIPE
1397.836	3421.934	1.111	3423.045	25.00	11.86	2.18	3425.23	.00	1.70	2.48	2.500	.000	.00	1 .0
1.708	.1131					.0210	.04	1.11	2.27	.72	.013	.00	.00	PIPE
1399.544	3422.127	1.152	3423.280	25.00	11.31	1.99	3425.27	.00	1.70	2.49	2.500	.000	.00	1 .0
1.452	.1131					.0185	.03	1.15	2.12	.72	.013	.00	.00	PIPE
1400.996	3422.291	1.196	3423.487	25.00	10.78	1.81	3425.29	.00	1.70	2.50	2.500	.000	.00	1 .0
1.227	.1131					.0163	.02	1.20	1.97	.72	.013	.00	.00	PIPE
1402.223	3422.430	1.241	3423.671	25.00	10.28	1.64	3425.31	.00	1.70	2.50	2.500	.000	.00	1 .0
1.030	.1131					.0143	.01	1.24	1.84	.72	.013	.00	.00	PIPE
1403.253	3422.546	1.288	3423.835	25.00	9.80	1.49	3425.33	.00	1.70	2.50	2.500	.000	.00	1 .0
.853	.1131					.0126	.01	1.29	1.71	.72	.013	.00	.00	PIPE
1404.106	3422.643	1.338	3423.981	25.00	9.35	1.36	3425.34	.00	1.70	2.49	2.500	.000	.00	1 .0
.695	.1131					.0111	.01	1.34	1.59	.72	.013	.00	.00	PIPE
1404.801	3422.721	1.391	3424.112	25.00	8.91	1.23	3425.35	.00	1.70	2.48	2.500	.000	.00	1 .0
.550	.1131					.0098	.01	1.39	1.48	.72	.013	.00	.00	PIPE
1405.351	3422.784	1.446	3424.230	25.00	8.50	1.12	3425.35	.00	1.70	2.47	2.500	.000	.00	1 .0
.417	.1131					.0087	.00	1.45	1.37	.72	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:19:25

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM CONDITION LATERAL 68+31 WEST

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1405.768	3422.831	1.504	3424.335	25.00	8.10	1.02	3425.35	.00	1.70	2.45	2.500	.000	.00	1 .0
.292	.1131					.0077	.00	1.50	1.27	.72	.013	.00	.00	PIPE
1406.059	3422.864	1.566	3424.430	25.00	7.72	.93	3425.36	.00	1.70	2.42	2.500	.000	.00	1 .0
.173	.1131					.0068	.00	1.57	1.18	.72	.013	.00	.00	PIPE
1406.233	3422.883	1.632	3424.515	25.00	7.36	.84	3425.36	.00	1.70	2.38	2.500	.000	.00	1 .0
.057	.1131					.0061	.00	1.63	1.09	.72	.013	.00	.00	PIPE
1406.290	3422.890	1.704	3424.594	25.00	7.02	.76	3425.36	.00	1.70	2.33	2.500	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR INTERIM CONDITION  LATERAL 69+01
SO   1420.5703423.000  1                          3423.219
R    1429.5603424.700  1      .013                                .000    .000 0
SH   1429.5603424.700  1                          3424.700
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             3.000   .0
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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:19:41

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR INTERIM CONDITION LATERAL 69+01

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	
1420.570	3423.000	.289	3423.289	3.00	10.74	1.79	3425.08	.00	.60	1.41	2.000	.000	.00	1 .0
.083	.1891					.0871	.01	.29	4.25	.24	.013	.00	.00	PIPE
1420.652	3423.016	.289	3423.305	3.00	10.72	1.78	3425.09	.00	.60	1.41	2.000	.000	.00	1 .0
1.415	.1891					.0813	.12	.29	4.23	.24	.013	.00	.00	PIPE
1422.067	3423.284	.299	3423.582	3.00	10.22	1.62	3425.20	.00	.60	1.43	2.000	.000	.00	1 .0
1.163	.1891					.0710	.08	.30	3.97	.24	.013	.00	.00	PIPE
1423.230	3423.504	.309	3423.812	3.00	9.74	1.47	3425.29	.00	.60	1.44	2.000	.000	.00	1 .0
.973	.1891					.0620	.06	.31	3.72	.24	.013	.00	.00	PIPE
1424.203	3423.688	.319	3424.006	3.00	9.29	1.34	3425.35	.00	.60	1.46	2.000	.000	.00	1 .0
.823	.1891					.0541	.04	.32	3.49	.24	.013	.00	.00	PIPE
1425.026	3423.843	.330	3424.173	3.00	8.86	1.22	3425.39	.00	.60	1.48	2.000	.000	.00	1 .0
.702	.1891					.0473	.03	.33	3.27	.24	.013	.00	.00	PIPE
1425.728	3423.976	.341	3424.317	3.00	8.44	1.11	3425.42	.00	.60	1.50	2.000	.000	.00	1 .0
.603	.1891					.0413	.02	.34	3.06	.24	.013	.00	.00	PIPE
1426.331	3424.090	.352	3424.442	3.00	8.05	1.01	3425.45	.00	.60	1.52	2.000	.000	.00	1 .0
.521	.1891					.0361	.02	.35	2.87	.24	.013	.00	.00	PIPE
1426.852	3424.188	.364	3424.552	3.00	7.68	.92	3425.47	.00	.60	1.54	2.000	.000	.00	1 .0
.450	.1891					.0315	.01	.36	2.69	.24	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:19:41

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR INTERIM CONDITION LATERAL 69+01

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
1427.302	3424.273	.376	3424.649	3.00	7.32	.83	3425.48	.00	.60	1.56	2.000	.000	.00	1 .0
.389	.1891					.0275	.01	.38	2.52	.24	.013	.00	.00	PIPE
1427.691	3424.347	.389	3424.736	3.00	6.98	.76	3425.49	.00	.60	1.58	2.000	.000	.00	1 .0
.337	.1891					.0240	.01	.39	2.36	.24	.013	.00	.00	PIPE
1428.028	3424.411	.402	3424.813	3.00	6.65	.69	3425.50	.00	.60	1.60	2.000	.000	.00	1 .0
.291	.1891					.0210	.01	.40	2.21	.24	.013	.00	.00	PIPE
1428.319	3424.466	.416	3424.881	3.00	6.34	.62	3425.51	.00	.60	1.62	2.000	.000	.00	1 .0
.250	.1891					.0184	.00	.42	2.07	.24	.013	.00	.00	PIPE
1428.568	3424.513	.430	3424.943	3.00	6.05	.57	3425.51	.00	.60	1.64	2.000	.000	.00	1 .0
.214	.1891					.0160	.00	.43	1.94	.24	.013	.00	.00	PIPE
1428.782	3424.553	.445	3424.998	3.00	5.77	.52	3425.51	.00	.60	1.66	2.000	.000	.00	1 .0
.181	.1891					.0140	.00	.44	1.82	.24	.013	.00	.00	PIPE
1428.964	3424.587	.460	3425.047	3.00	5.50	.47	3425.52	.00	.60	1.68	2.000	.000	.00	1 .0
.153	.1891					.0123	.00	.46	1.70	.24	.013	.00	.00	PIPE
1429.116	3424.616	.476	3425.092	3.00	5.24	.43	3425.52	.00	.60	1.70	2.000	.000	.00	1 .0
.126	.1891					.0107	.00	.48	1.59	.24	.013	.00	.00	PIPE
1429.243	3424.640	.492	3425.132	3.00	5.00	.39	3425.52	.00	.60	1.72	2.000	.000	.00	1 .0
.102	.1891					.0094	.00	.49	1.49	.24	.013	.00	.00	PIPE

FILE: lateral-69+01-int.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:10:19:41

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR INTERIM CONDITION LATERAL 69+01

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	
1429.345	3424.659	.509	3425.168	3.00	4.77	.35	3425.52	.00	.60	1.74	2.000	.000	.00	1 .0
.081	.1891					.0082	.00	.51	1.40	.24	.013	.00	.00	PIPE
1429.426	3424.675	.526	3425.201	3.00	4.54	.32	3425.52	.00	.60	1.76	2.000	.000	.00	1 .0
.060	.1891					.0072	.00	.53	1.31	.24	.013	.00	.00	PIPE
1429.486	3424.686	.544	3425.230	3.00	4.33	.29	3425.52	.00	.60	1.78	2.000	.000	.00	1 .0
.042	.1891					.0063	.00	.54	1.22	.24	.013	.00	.00	PIPE
1429.527	3424.694	.563	3425.257	3.00	4.13	.27	3425.52	.00	.60	1.80	2.000	.000	.00	1 .0
.025	.1891					.0055	.00	.56	1.15	.24	.013	.00	.00	PIPE
1429.552	3424.698	.583	3425.281	3.00	3.94	.24	3425.52	.00	.60	1.82	2.000	.000	.00	1 .0
.008	.1891					.0048	.00	.58	1.07	.24	.013	.00	.00	PIPE
1429.560	3424.700	.604	3425.304	3.00	3.75	.22	3425.52	.00	.60	1.84	2.000	.000	.00	1 .0

C.2 Ultimate Condition

```
T1 SUMMERLIN WEST VILLAGE 22                                                    0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR ULTIMATE CONDITION
SO       .00 3404.320  1                         3411.735
R     191.77 3405.330  1      .013                                -5.587    .000 0
JX    193.77 3405.340  1  4   .013    3.000         3412.780        -90.0         .000
R     226.86 3405.505  1      .013                                 .000    .000 1
REM  *****  SDMH#1
JX    230.86 3405.525  1  2   .013  260.000         3405.720        -45.8         .000
REM  *****  FLEET WING AVENUE
R     246.12 3405.601  1      .013                                 .000    .000 0
TS    296.42 3409.850  3      .013                                 .000
JX    298.42 3409.860  3  4   .013    2.000         3409.970         90.0         .000
REM  *****
R     325.70 3410.010  3      .013                                 .000    .000 0
JX    327.70 3410.020  3  4   .013    2.000         3413.500        -90.0         .000
REM  *****  SDDI#1
R     412.82 3410.440  3      .013                                 .000    .000 1
REM  *****  SDMH#2
R     502.84 3410.900  3      .013                                -0.058    .000 0
JX    504.84 3410.900  3  5   .013   59.000         3411.090        -90.0       -5.000
REM  *****  SDDI#2
R     718.03 3411.980  3      .013                                -6.208    .000 1
REM  *****  SDMH#3
R     821.25 3412.500  3      .013                                 .000    .000 0
JX    823.25 3412.700  3  4   .013    2.000         3412.700         85.0         .000
REM  *****  SDDI#3
R     892.26 3412.850  3      .013                                 .000    .000 0
JX    895.26 3412.865  3  5   .013    9.000         3413.050        -90.0         .000
REM  *****  SDDI#4 & SDDI#5
R     913.57 3412.950  3      .013                                -8.345    .000 1
REM  *****  SDMH#4
TS    918.57 3413.980  6      .013                                 .000
REM  *****  SDMH#5
R    1130.70 3415.070  6      .013                                 .000    .000 0
R    1135.70 3415.270  6      .013                                 .000    .000 1
R    1346.29 3416.410  6      .013                                 .000    .000 0
JX   1351.29 3416.610  8  4  5.013    3.000   58.0003416.6703416.670 85.0-90.0    .000
REM  *****  SDDI#7 & SDDI#6
R    1415.57 3420.640  8      .013                                 .000    .000 0
JX   1420.57 3420.810  8  4   .013    3.000         3423.000        -90.0         .000
REM  *****  SDDI#8
R    1574.56 3430.070  8      .013                                 .000    .000 0
R    1579.56 3430.250  8      .013                                -.528    .000 0
R    1870.76 3447.340  8      .013                                 .000    .000 0
SH   1870.76 3447.340  8                        3449.340
CD   1  3   0    .000   6.000   10.000  .000  .000   .00
CD   2  4   1    .000   4.000     .000  .000  .000   .00
CD   3  3   0    .000   6.000    6.000  .000  .000   .00
CD   4  4   1    .000   2.000     .000  .000  .000   .00
CD   5  4   1    .000   3.000     .000  .000  .000   .00
CD   6  4   1    .000   5.000     .000  .000  .000   .00
CD   7  4   1    .000   4.500     .000  .000  .000   .00
CD   8  4   1    .000   4.500     .000  .000  .000   .00
Q           269.000   .0
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FILE: KETTLE-RIDGE-ULT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time: 9:43:14

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
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	3404.320	7.415	3411.735	670.00	11.17	1.94	3413.67	.00	5.19	10.00	6.000	10.000	.00	0 .0
191.770	.0053					.0041	.79	.00	.80	4.53	.013	.00	.00	BOX
191.770	3405.330	7.293	3412.623	670.00	11.17	1.94	3414.56	.00	5.19	10.00	6.000	10.000	.00	0 .0
JUNCT STR	.0050					.0041	.01	7.29	.80		.013	.00	.00	BOX
193.770	3405.340	7.326	3412.666	667.00	11.12	1.92	3414.58	.00	5.17	10.00	6.000	10.000	.00	0 .0
33.090	.0050					.0041	.14	7.33	.80	4.61	.013	.00	.00	BOX
226.860	3405.505	7.392	3412.897	667.00	11.12	1.92	3414.82	.00	5.17	10.00	6.000	10.000	.00	0 .0
JUNCT STR	.0050					.0015	.01	7.39	.80		.013	.00	.00	BOX
230.860	3405.525	8.588	3414.113	407.00	6.78	.71	3414.83	.00	3.72	10.00	6.000	10.000	.00	0 .0
15.260	.0050					.0015	.02	8.59	.49	3.22	.013	.00	.00	BOX
246.120	3405.601	8.535	3414.136	407.00	6.78	.71	3414.85	.00	3.72	10.00	6.000	10.000	.00	0 .0
TRANS STR	.0845							8.54	.49		.013	.00	.00	BOX
296.420	3409.850	5.227	3415.077	407.00	12.98	2.61	3417.69	.00	5.23	6.00	6.000	6.000	.00	0 .0
JUNCT STR	.0050					.0045	.01	5.23	1.00		.013	.00	.00	BOX
298.420	3409.860	5.645	3415.505	405.00	11.96	2.22	3417.73	.00	5.21	6.00	6.000	6.000	.00	0 .0
27.280	.0055					.0045	.12	5.64	.89	5.19	.013	.00	.00	BOX

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

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time: 9:43:14

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
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	
325.700	3410.010	5.512	3415.522	405.00	12.25	2.33	3417.85	.00	5.21	6.00	6.000	6.000	.00	0 .0
JUNCT STR	.0050					.0043	.01	5.51	.92		.013	.00	.00	BOX
		---------- WARNING - Flow depth near top of box conduit ----------												
327.700	3410.020	5.722	3415.742	403.00	11.74	2.14	3417.88	.00	5.19	6.00	6.000	6.000	.00	0 .0
85.120	.0049					.0043	.36	5.72	.86	5.40	.013	.00	.00	BOX
		---------- WARNING - Flow depth near top of box conduit ----------												
412.820	3410.440	5.533	3415.973	403.00	12.14	2.29	3418.26	.00	5.19	6.00	6.000	6.000	.00	0 .0
90.020	.0051					.0046	.42	5.53	.91	5.32	.013	.00	.00	BOX
		---------- WARNING - Flow depth near top of box conduit ----------												
502.840	3410.900	5.350	3416.250	403.00	12.55	2.45	3418.70	6.00	5.19	6.00	6.000	6.000	.00	0 .0
JUNCT STR	.0000					.0041	.01	6.00	.96		.013	.00	.00	BOX
504.840	3410.900	6.976	3417.875	344.00	9.56	1.42	3419.29	.00	4.67	6.00	6.000	6.000	.00	0 .0
213.190	.0051					.0041	.87	.00	.69	4.71	.013	.00	.00	BOX
718.030	3411.980	6.909	3418.888	344.00	9.56	1.42	3420.31	.00	4.67	6.00	6.000	6.000	.00	0 .0
103.220	.0050					.0041	.42	6.91	.69	4.72	.013	.00	.00	BOX

FILE: KETTLE-RIDGE-ULT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time: 9:43:14

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
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
821.250	3412.500	6.809	3419.309	344.00	9.56	1.42	3420.73	.00	4.67	6.00	6.000	6.000	.00	0 .0
JUNCT STR	.1000					.0041	.01	6.81	.69		.013	.00	.00	BOX
823.250	3412.700	6.649	3419.349	342.00	9.50	1.40	3420.75	.00	4.66	6.00	6.000	6.000	.00	0 .0
52.165	.0022					.0040	.21	6.65	.68	6.00	.013	.00	.00	BOX
875.415	3412.813	6.745	3419.559	342.00	9.50	1.40	3420.96	.00	4.66	6.00	6.000	6.000	.00	0 .0
HYDRAULIC JUMP														
875.415	3412.813	2.868	3415.681	342.00	19.88	6.13	3421.82	.00	4.66	6.00	6.000	6.000	.00	0 .0
16.845	.0022					.0189	.32	2.87	2.07	6.00	.013	.00	.00	BOX
892.260	3412.850	2.789	3415.639	342.00	20.44	6.49	3422.13	.00	4.66	6.00	6.000	6.000	.00	0 .0
JUNCT STR	.0050					.0210	.06	3.41	2.16		.013	.00	.00	BOX
895.260	3412.865	2.598	3415.463	333.00	21.37	7.09	3422.55	.34	4.57	6.00	6.000	6.000	.00	0 .0
18.310	.0046					.0234	.43	2.94	2.34	4.75	.013	.00	.00	BOX
913.570	3412.950	2.524	3415.474	333.00	21.98	7.50	3422.98	.00	4.57	6.00	6.000	6.000	.00	0 .0
TRANS STR	.2060					.0192	.10	2.52	2.44		.013	.00	.00	BOX
918.570	3413.980	4.770	3418.750	333.00	17.24	4.62	3423.37	.00	4.77	2.09	5.000	.000	.00	1 .0
8.018	.0051					.0150	.12	4.77	1.00	5.00	.013	.00	.00	PIPE
926.588	3414.021	5.000	3419.021	333.00	16.96	4.47	3423.49	.00	4.77	.00	5.000	.000	.00	1 .0
204.112	.0051					.0160	3.27	5.00	.00	5.00	.013	.00	.00	PIPE

FILE: KETTLE-RIDGE-ULT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 4

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time: 9:43:14

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
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
1130.700	3415.070	7.288	3422.358	333.00	16.96	4.47	3426.82	.00	4.77	.00	5.000	.000	.00	1 .0
5.000	.0400					.0163	.08	7.29	.00	2.91	.013	.00	.00	PIPE
1135.700	3415.270	7.393	3422.663	333.00	16.96	4.47	3427.13	.00	4.77	.00	5.000	.000	.00	1 .0
210.590	.0054					.0163	3.44	7.39	.00	5.00	.013	.00	.00	PIPE
1346.290	3416.410	9.696	3426.106	333.00	16.96	4.47	3430.57	.00	4.77	.00	5.000	.000	.00	1 .0
JUNCT STR	.0400					.0177	.09	9.70	.00		.013	.00	.00	PIPE
1351.290	3416.610	11.324	3427.934	272.00	17.10	4.54	3432.48	.00	4.34	.00	4.500	.000	.00	1 .0
23.260	.0627					.0191	.45	11.32	.00	2.39	.013	.00	.00	PIPE
1374.550	3418.068	10.311	3428.379	272.00	17.10	4.54	3432.92	.00	4.34	.00	4.500	.000	.00	1 .0
HYDRAULIC JUMP														
1374.550	3418.068	2.419	3420.487	272.00	31.22	15.14	3435.63	.00	4.34	4.49	4.500	.000	.00	1 .0
41.020	.0627					.0598	2.45	2.42	3.95	2.39	.013	.00	.00	PIPE
1415.570	3420.640	2.427	3423.067	272.00	31.09	15.01	3438.07	.00	4.34	4.49	4.500	.000	.00	1 .0
JUNCT STR	.0340					.0610	.31	2.43	3.92		.013	.00	.00	PIPE
1420.570	3420.810	2.373	3423.183	269.00	31.63	15.53	3438.72	.00	4.33	4.49	4.500	.000	.00	1 .0
153.990	.0601					.0646	9.95	2.37	4.05	2.40	.013	.00	.00	PIPE
1574.560	3430.070	2.329	3432.399	269.00	32.38	16.28	3448.68	.27	4.33	4.50	4.500	.000	.00	1 .0
5.000	.0360					.0671	.34	2.60	4.20	2.83	.013	.00	.00	PIPE

FILE: KETTLE-RIDGE-ULT.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 5

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time: 9:43:14

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
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	
1579.560	3430.250	2.320	3432.570	269.00	32.55	16.45	3449.02	.00	4.33	4.50	4.500	.000	.00	1 .0
.513	.0587					.0676	.03	2.32	4.23	2.42	.013	.00	.00	PIPE
1580.073	3430.280	2.319	3432.599	269.00	32.55	16.45	3449.05	.00	4.33	4.50	4.500	.000	.00	1 .0
115.933	.0587					.0721	8.36	2.32	4.23	2.42	.013	.00	.00	PIPE
1696.006	3437.084	2.234	3439.318	269.00	34.14	18.10	3457.42	.00	4.33	4.50	4.500	.000	.00	1 .0
74.362	.0587					.0819	6.09	2.23	4.55	2.42	.013	.00	.00	PIPE
1770.368	3441.448	2.152	3443.600	269.00	35.81	19.91	3463.51	.00	4.33	4.50	4.500	.000	.00	1 .0
55.572	.0587					.0931	5.17	2.15	4.88	2.42	.013	.00	.00	PIPE
1825.939	3444.710	2.074	3446.784	269.00	37.56	21.90	3468.68	.00	4.33	4.49	4.500	.000	.00	1 .0
44.821	.0587					.1059	4.75	2.07	5.24	2.42	.013	.00	.00	PIPE
1870.760	3447.340	2.000	3449.340	269.00	39.39	24.09	3473.43	.00	4.33	4.47	4.500	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR ULTIMATE CONDITION - LATERAL 56+94
SO    230.8603405.525  1                          3414.113
R     260.2603410.630  1      .013                                .000    .000 0
SH    260.2603410.630  1                          3410.630
CD   1  4   1    .000   4.000     .000  .000  .000   .00
Q           260.000   .0
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FILE: lateral-56+94.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:18:23

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR ULTIMATE CONDITION - LATERAL 56+94

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
230.860	3405.525	8.588	3414.113	260.00	20.69	6.65	3420.76	.00	3.94	.00	4.000	.000	.00	1 .0
29.400	.1736					.0328	.96	8.59	.00	1.84	.013	.00	.00	PIPE
260.260	3410.630	4.446	3415.076	260.00	20.69	6.65	3421.72	.00	3.94	.00	4.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIVE (J) - FLEET WIND AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 57+39
SO    298.4203409.970  1                          3415.505
R     328.4603411.040  1      .013                              .000    .000 0
SH    328.4603411.040  1                          3411.040
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             2.000   .0
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FILE: LATERAL-57+39.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:22:32

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WIND AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 57+39

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				
298.420	3409.970	5.535	3415.505	2.00	.64	.01	3415.51	.00	.49	.00	2.000	.000	.00	1	.0	
30.040	.0356					.0001	.00	5.53	.00	.29	.013	.00	.00			PIPE
328.460	3411.040	4.467	3415.507	2.00	.64	.01	3415.51	.00	.49	.00	2.000	.000	.00	1	.0	

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T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 57+89
SO    327.5003413.500  1                          3415.742
R     360.2903415.440  1      .013                                .000    .000 0
SH    360.2903415.440  1                          3415.440
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             2.000   .0
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FILE: LATERAL-57+89.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:28: 5

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 57+89

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
327.500	3413.500	2.242	3415.742	2.00	.64	.01	3415.75	.00	.49	.00	2.000	.000	.00	1 .0
4.095	.0592					.0001	.00	2.24	.00	.26	.013	.00	.00	PIPE
331.595	3413.742	2.000	3415.742	2.00	.64	.01	3415.75	.00	.49	.00	2.000	.000	.00	1 .0
3.110	.0592					.0001	.00	2.00	.00	.26	.013	.00	.00	PIPE
334.705	3413.926	1.815	3415.741	2.00	.67	.01	3415.75	.00	.49	1.16	2.000	.000	.00	1 .0
1.811	.0592					.0001	.00	1.81	.07	.26	.013	.00	.00	PIPE
336.516	3414.033	1.707	3415.740	2.00	.70	.01	3415.75	.00	.49	1.41	2.000	.000	.00	1 .0
1.490	.0592					.0001	.00	1.71	.09	.26	.013	.00	.00	PIPE
338.006	3414.122	1.618	3415.740	2.00	.73	.01	3415.75	.00	.49	1.57	2.000	.000	.00	1 .0
1.303	.0592					.0001	.00	1.62	.10	.26	.013	.00	.00	PIPE
339.308	3414.199	1.540	3415.739	2.00	.77	.01	3415.75	.00	.49	1.68	2.000	.000	.00	1 .0
1.169	.0592					.0001	.00	1.54	.11	.26	.013	.00	.00	PIPE
340.478	3414.268	1.470	3415.738	2.00	.81	.01	3415.75	.00	.49	1.77	2.000	.000	.00	1 .0
1.068	.0592					.0001	.00	1.47	.12	.26	.013	.00	.00	PIPE
341.546	3414.331	1.406	3415.737	2.00	.85	.01	3415.75	.00	.49	1.83	2.000	.000	.00	1 .0
.985	.0592					.0001	.00	1.41	.13	.26	.013	.00	.00	PIPE
342.531	3414.389	1.347	3415.736	2.00	.89	.01	3415.75	.00	.49	1.88	2.000	.000	.00	1 .0
.916	.0592					.0001	.00	1.35	.14	.26	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:28: 5

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 57+89

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
343.447	3414.444	1.292	3415.735	2.00	.93	.01	3415.75	.00	.49	1.91	2.000	.000	.00	1 .0
.855	.0592					.0001	.00	1.29	.16	.26	.013	.00	.00	PIPE
344.302	3414.494	1.240	3415.734	2.00	.98	.01	3415.75	.00	.49	1.94	2.000	.000	.00	1 .0
.802	.0592					.0002	.00	1.24	.17	.26	.013	.00	.00	PIPE
345.104	3414.542	1.191	3415.732	2.00	1.03	.02	3415.75	.00	.49	1.96	2.000	.000	.00	1 .0
.752	.0592					.0002	.00	1.19	.18	.26	.013	.00	.00	PIPE
345.857	3414.586	1.145	3415.731	2.00	1.08	.02	3415.75	.00	.49	1.98	2.000	.000	.00	1 .0
.709	.0592					.0002	.00	1.15	.20	.26	.013	.00	.00	PIPE
346.566	3414.628	1.101	3415.729	2.00	1.13	.02	3415.75	.00	.49	1.99	2.000	.000	.00	1 .0
.669	.0592					.0002	.00	1.10	.21	.26	.013	.00	.00	PIPE
347.235	3414.667	1.060	3415.728	2.00	1.18	.02	3415.75	.00	.49	2.00	2.000	.000	.00	1 .0
.632	.0592					.0003	.00	1.06	.23	.26	.013	.00	.00	PIPE
347.867	3414.705	1.021	3415.725	2.00	1.24	.02	3415.75	.00	.49	2.00	2.000	.000	.00	1 .0
.597	.0592					.0003	.00	1.02	.24	.26	.013	.00	.00	PIPE
348.464	3414.740	.983	3415.723	2.00	1.30	.03	3415.75	.00	.49	2.00	2.000	.000	.00	1 .0
.564	.0592					.0004	.00	.98	.26	.26	.013	.00	.00	PIPE
349.028	3414.774	.947	3415.721	2.00	1.36	.03	3415.75	.00	.49	2.00	2.000	.000	.00	1 .0
.533	.0592					.0004	.00	.95	.28	.26	.013	.00	.00	PIPE

FILE: LATERAL-57+89.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:28: 5

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 57+89

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
349.561	3414.805	.913	3415.718	2.00	1.43	.03	3415.75	.00	.49	1.99	2.000	.000	.00	1 .0
.503	.0592					.0005	.00	.91	.30	.26	.013	.00	.00	PIPE
350.063	3414.835	.880	3415.715	2.00	1.50	.03	3415.75	.00	.49	1.99	2.000	.000	.00	1 .0
.474	.0592					.0005	.00	.88	.32	.26	.013	.00	.00	PIPE
350.538	3414.863	.849	3415.712	2.00	1.57	.04	3415.75	.00	.49	1.98	2.000	.000	.00	1 .0
.445	.0592					.0006	.00	.85	.35	.26	.013	.00	.00	PIPE
350.982	3414.889	.819	3415.708	2.00	1.65	.04	3415.75	.00	.49	1.97	2.000	.000	.00	1 .0
.420	.0592					.0007	.00	.82	.37	.26	.013	.00	.00	PIPE
351.402	3414.914	.790	3415.705	2.00	1.73	.05	3415.75	.00	.49	1.96	2.000	.000	.00	1 .0
.391	.0592					.0008	.00	.79	.40	.26	.013	.00	.00	PIPE
351.794	3414.938	.763	3415.700	2.00	1.82	.05	3415.75	.00	.49	1.94	2.000	.000	.00	1 .0
.227	.0592					.0009	.00	.76	.43	.26	.013	.00	.00	PIPE
352.021	3414.951	.736	3415.687	2.00	1.91	.06	3415.74	.00	.49	1.93	2.000	.000	.00	1 .0
HYDRAULIC JUMP														
352.021	3414.951	.297	3415.248	2.00	6.86	.73	3415.98	.00	.49	1.42	2.000	.000	.00	1 .0
.557	.0592					.0321	.02	.30	2.67	.26	.013	.00	.00	PIPE
352.578	3414.984	.307	3415.291	2.00	6.54	.66	3415.95	.00	.49	1.44	2.000	.000	.00	1 .0
1.608	.0592					.0281	.05	.31	2.50	.26	.013	.00	.00	PIPE

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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:28: 5

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 57+89

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
354.185	3415.079	.318	3415.397	2.00	6.23	.60	3416.00	.00	.49	1.46	2.000	.000	.00	1 .0
1.273	.0592					.0245	.03	.32	2.34	.26	.013	.00	.00	PIPE
355.458	3415.154	.328	3415.482	2.00	5.94	.55	3416.03	.00	.49	1.48	2.000	.000	.00	1 .0
1.029	.0592					.0214	.02	.33	2.20	.26	.013	.00	.00	PIPE
356.487	3415.215	.339	3415.554	2.00	5.67	.50	3416.05	.00	.49	1.50	2.000	.000	.00	1 .0
.838	.0592					.0187	.02	.34	2.06	.26	.013	.00	.00	PIPE
357.324	3415.265	.351	3415.615	2.00	5.40	.45	3416.07	.00	.49	1.52	2.000	.000	.00	1 .0
.686	.0592					.0163	.01	.35	1.93	.26	.013	.00	.00	PIPE
358.011	3415.305	.362	3415.667	2.00	5.15	.41	3416.08	.00	.49	1.54	2.000	.000	.00	1 .0
.562	.0592					.0143	.01	.36	1.81	.26	.013	.00	.00	PIPE
358.573	3415.338	.375	3415.713	2.00	4.91	.37	3416.09	.00	.49	1.56	2.000	.000	.00	1 .0
.457	.0592					.0125	.01	.37	1.69	.26	.013	.00	.00	PIPE
359.030	3415.365	.387	3415.753	2.00	4.68	.34	3416.09	.00	.49	1.58	2.000	.000	.00	1 .0
.370	.0592					.0109	.00	.39	1.59	.26	.013	.00	.00	PIPE
359.400	3415.387	.400	3415.788	2.00	4.46	.31	3416.10	.00	.49	1.60	2.000	.000	.00	1 .0
.293	.0592					.0095	.00	.40	1.49	.26	.013	.00	.00	PIPE
359.692	3415.405	.414	3415.819	2.00	4.26	.28	3416.10	.00	.49	1.62	2.000	.000	.00	1 .0
.228	.0592					.0083	.00	.41	1.39	.26	.013	.00	.00	PIPE

FILE: LATERAL-57+89.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 5

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:28: 5

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 57+89

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	
359.920	3415.418	.428	3415.846	2.00	4.06	.26	3416.10	.00	.49	1.64	2.000	.000	.00	1 .0
.167	.0592					.0073	.00	.43	1.31	.26	.013	.00	.00	PIPE
360.087	3415.428	.443	3415.871	2.00	3.87	.23	3416.10	.00	.49	1.66	2.000	.000	.00	1 .0
.114	.0592					.0063	.00	.44	1.22	.26	.013	.00	.00	PIPE
360.201	3415.435	.458	3415.893	2.00	3.69	.21	3416.10	.00	.49	1.68	2.000	.000	.00	1 .0
.067	.0592					.0055	.00	.46	1.14	.26	.013	.00	.00	PIPE
360.268	3415.439	.473	3415.912	2.00	3.52	.19	3416.10	.00	.49	1.70	2.000	.000	.00	1 .0
.022	.0592					.0048	.00	.47	1.07	.26	.013	.00	.00	PIPE
360.290	3415.440	.491	3415.931	2.00	3.34	.17	3416.10	.00	.49	1.72	2.000	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 59+67
SO    504.8403411.090  1                          3417.875
R     556.8303416.290  1      .013                                .000    .000 0
SH    556.8303416.290  1                          3416.290
CD   1  4   1    .000   3.000     .000  .000  .000   .00
Q            59.000   .0
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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:23:43

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 59+67

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
504.840	3411.090	6.785	3417.875	59.00	8.35	1.08	3418.96	.00	2.48	.00	3.000	.000	.00	1 .0
32.517	.1000					.0078	.25	6.78	.00	1.09	.013	.00	.00	PIPE
537.357	3414.342	3.784	3418.126	59.00	8.35	1.08	3419.21	.00	2.48	.00	3.000	.000	.00	1 .0
HYDRAULIC JUMP														
537.357	3414.342	1.563	3415.905	59.00	15.85	3.90	3419.81	.00	2.48	3.00	3.000	.000	.00	1 .0
3.337	.1000					.0258	.09	1.56	2.51	1.09	.013	.00	.00	PIPE
540.694	3414.676	1.616	3416.292	59.00	15.19	3.59	3419.88	.00	2.48	2.99	3.000	.000	.00	1 .0
3.406	.1000					.0230	.08	1.62	2.35	1.09	.013	.00	.00	PIPE
544.100	3415.017	1.680	3416.697	59.00	14.49	3.26	3419.96	.00	2.48	2.98	3.000	.000	.00	1 .0
2.877	.1000					.0203	.06	1.68	2.18	1.09	.013	.00	.00	PIPE
546.977	3415.304	1.747	3417.051	59.00	13.81	2.96	3420.01	.00	2.48	2.96	3.000	.000	.00	1 .0
2.419	.1000					.0179	.04	1.75	2.03	1.09	.013	.00	.00	PIPE
549.395	3415.546	1.818	3417.364	59.00	13.17	2.69	3420.06	.00	2.48	2.93	3.000	.000	.00	1 .0
2.019	.1000					.0159	.03	1.82	1.88	1.09	.013	.00	.00	PIPE
551.414	3415.748	1.893	3417.641	59.00	12.56	2.45	3420.09	.00	2.48	2.90	3.000	.000	.00	1 .0
1.662	.1000					.0141	.02	1.89	1.74	1.09	.013	.00	.00	PIPE
553.076	3415.915	1.972	3417.887	59.00	11.97	2.23	3420.11	.00	2.48	2.85	3.000	.000	.00	1 .0
1.337	.1000					.0125	.02	1.97	1.60	1.09	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:23:43

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 59+67

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	
554.412	3416.048	2.058	3418.106	59.00	11.42	2.02	3420.13	.00	2.48	2.78	3.000	.000	.00	1 .0
1.036	.1000					.0111	.01	2.06	1.48	1.09	.013	.00	.00	PIPE
555.448	3416.152	2.150	3418.302	59.00	10.88	1.84	3420.14	.00	2.48	2.70	3.000	.000	.00	1 .0
.750	.1000					.0100	.01	2.15	1.35	1.09	.013	.00	.00	PIPE
556.198	3416.227	2.249	3418.476	59.00	10.38	1.67	3420.15	.00	2.48	2.60	3.000	.000	.00	1 .0
.466	.1000					.0089	.00	2.25	1.24	1.09	.013	.00	.00	PIPE
556.664	3416.273	2.359	3418.632	59.00	9.90	1.52	3420.15	.00	2.48	2.46	3.000	.000	.00	1 .0
.166	.1000					.0081	.00	2.36	1.12	1.09	.013	.00	.00	PIPE
556.830	3416.290	2.483	3418.773	59.00	9.43	1.38	3420.15	.00	2.48	2.27	3.000	.000	.00	1 .0

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T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 62+86
SO    823.2503412.700  1                          3419.349
R     892.5703415.550  1      .013                              .000    .000 0
SH    892.5703415.550  1                          3415.550
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             2.000   .0
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FILE: LATERAL-62+86.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:25:25

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 62+86

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	
823.250	3412.700	6.649	3419.349	2.00	.64	.01	3419.36	.00	.49	.00	2.000	.000	.00	1 .0
69.320	.0411				.0001	.01	6.65	.00	.28	.013	.00	.00	PIPE	
892.570	3415.550	3.804	3419.354	2.00	.64	.01	3419.36	.00	.49	.00	2.000	.000	.00	1 .0

```
T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR ULTIMATE CONDITION  LATERAL 63+58
SO    895.2603413.050  1                          3415.463
R     907.2603413.610  1      .013                                .000    .000 0
JX    909.2603413.810  1  2   .013    3.000          3413.810      90.0         .000
R     951.2803418.750  1      .013                                .000    .000 0
SH    951.2803418.750  1                          3418.750
CD   1  4   1    .000   3.000     .000  .000  .000   .00
CD   2  2   0    .000  13.000    3.000  .000  .000   .00
Q             6.000   .0
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Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:26: 6

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 63+58

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
895.260	3413.050	2.413	3415.463	9.00	1.48	.03	3415.50	.00	.95	2.38	3.000	.000	.00	1 .0
2.405	.0467					.0002	.00	2.41	.16	.51	.013	.00	.00	PIPE
897.665	3413.162	2.298	3415.460	9.00	1.55	.04	3415.50	.00	.95	2.54	3.000	.000	.00	1 .0
2.157	.0467					.0002	.00	2.30	.18	.51	.013	.00	.00	PIPE
899.821	3413.263	2.194	3415.457	9.00	1.62	.04	3415.50	.00	.95	2.66	3.000	.000	.00	1 .0
1.964	.0467					.0002	.00	2.19	.20	.51	.013	.00	.00	PIPE
901.786	3413.355	2.099	3415.453	9.00	1.70	.05	3415.50	.00	.95	2.75	3.000	.000	.00	1 .0
1.802	.0467					.0003	.00	2.10	.22	.51	.013	.00	.00	PIPE
903.587	3413.439	2.010	3415.449	9.00	1.79	.05	3415.50	.00	.95	2.82	3.000	.000	.00	1 .0
1.668	.0467					.0003	.00	2.01	.24	.51	.013	.00	.00	PIPE
905.255	3413.517	1.928	3415.445	9.00	1.87	.05	3415.50	.00	.95	2.88	3.000	.000	.00	1 .0
1.547	.0467					.0003	.00	1.93	.26	.51	.013	.00	.00	PIPE
906.802	3413.589	1.851	3415.440	9.00	1.97	.06	3415.50	.00	.95	2.92	3.000	.000	.00	1 .0
.458	.0467					.0004	.00	1.85	.28	.51	.013	.00	.00	PIPE
907.260	3413.610	1.828	3415.438	9.00	1.99	.06	3415.50	.00	.95	2.93	3.000	.000	.00	1 .0
JUNCT STR	.1000					.0003	.00	1.83	.28		.013	.00	.00	PIPE
909.260	3413.810	1.695	3415.505	6.00	1.46	.03	3415.54	.00	.77	2.97	3.000	.000	.00	1 .0
.520	.1176					.0002	.00	1.70	.22	.33	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:26: 6

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 63+58

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
909.780	3413.871	1.631	3415.502	6.00	1.53	.04	3415.54	.00	.77	2.99	3.000	.000	.00	1 .0
.489	.1176					.0003	.00	1.63	.23	.33	.013	.00	.00	PIPE
910.270	3413.929	1.570	3415.499	6.00	1.60	.04	3415.54	.00	.77	3.00	3.000	.000	.00	1 .0
.461	.1176					.0003	.00	1.57	.25	.33	.013	.00	.00	PIPE
910.731	3413.983	1.512	3415.495	6.00	1.68	.04	3415.54	.00	.77	3.00	3.000	.000	.00	1 .0
.166	.1176					.0003	.00	1.51	.27	.33	.013	.00	.00	PIPE
910.897	3414.003	1.490	3415.493	6.00	1.71	.05	3415.54	.00	.77	3.00	3.000	.000	.00	1 .0
HYDRAULIC JUMP														
910.897	3414.003	.344	3414.347	6.00	13.34	2.76	3417.11	.00	.77	1.91	3.000	.000	.00	1 .0
2.463	.1176					.1028	.25	.34	4.85	.33	.013	.00	.00	PIPE
913.360	3414.292	.347	3414.638	6.00	13.19	2.70	3417.34	.00	.77	1.92	3.000	.000	.00	1 .0
10.192	.1176					.0946	.96	.35	4.77	.33	.013	.00	.00	PIPE
923.552	3415.490	.358	3415.848	6.00	12.57	2.45	3418.30	.00	.77	1.95	3.000	.000	.00	1 .0
6.036	.1176					.0826	.50	.36	4.47	.33	.013	.00	.00	PIPE
929.588	3416.199	.370	3416.570	6.00	11.99	2.23	3418.80	.00	.77	1.97	3.000	.000	.00	1 .0
4.188	.1176					.0721	.30	.37	4.19	.33	.013	.00	.00	PIPE
933.776	3416.692	.383	3417.074	6.00	11.43	2.03	3419.10	.00	.77	2.00	3.000	.000	.00	1 .0
3.141	.1176					.0629	.20	.38	3.93	.33	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:26: 6

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 63+58

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	
936.917	3417.061	.395	3417.456	6.00	10.90	1.84	3419.30	.00	.77	2.03	3.000	.000	.00	1 .0
2.466	.1176					.0549	.14	.40	3.69	.33	.013	.00	.00	PIPE
939.383	3417.351	.408	3417.759	6.00	10.39	1.68	3419.44	.00	.77	2.06	3.000	.000	.00	1 .0
1.993	.1176					.0479	.10	.41	3.46	.33	.013	.00	.00	PIPE
941.376	3417.585	.422	3418.007	6.00	9.91	1.52	3419.53	.00	.77	2.09	3.000	.000	.00	1 .0
1.643	.1176					.0418	.07	.42	3.24	.33	.013	.00	.00	PIPE
943.019	3417.778	.436	3418.214	6.00	9.45	1.39	3419.60	.00	.77	2.11	3.000	.000	.00	1 .0
1.374	.1176					.0365	.05	.44	3.04	.33	.013	.00	.00	PIPE
944.393	3417.940	.451	3418.391	6.00	9.01	1.26	3419.65	.00	.77	2.14	3.000	.000	.00	1 .0
1.161	.1176					.0319	.04	.45	2.85	.33	.013	.00	.00	PIPE
945.555	3418.076	.466	3418.542	6.00	8.59	1.14	3419.69	.00	.77	2.17	3.000	.000	.00	1 .0
.986	.1176					.0278	.03	.47	2.67	.33	.013	.00	.00	PIPE
946.541	3418.192	.481	3418.674	6.00	8.19	1.04	3419.71	.00	.77	2.20	3.000	.000	.00	1 .0
.841	.1176					.0243	.02	.48	2.50	.33	.013	.00	.00	PIPE
947.382	3418.291	.497	3418.789	6.00	7.81	.95	3419.73	.00	.77	2.23	3.000	.000	.00	1 .0
.720	.1176					.0212	.02	.50	2.34	.33	.013	.00	.00	PIPE
948.101	3418.376	.514	3418.890	6.00	7.44	.86	3419.75	.00	.77	2.26	3.000	.000	.00	1 .0
.615	.1176					.0185	.01	.51	2.20	.33	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 63+58

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	
948.716	3418.448	.531	3418.980	6.00	7.10	.78	3419.76	.00	.77	2.29	3.000	.000	.00	1 .0
.525	.1176					.0162	.01	.53	2.06	.33	.013	.00	.00	PIPE
949.241	3418.510	.549	3419.059	6.00	6.77	.71	3419.77	.00	.77	2.32	3.000	.000	.00	1 .0
.446	.1176					.0142	.01	.55	1.93	.33	.013	.00	.00	PIPE
949.687	3418.563	.568	3419.130	6.00	6.45	.65	3419.78	.00	.77	2.35	3.000	.000	.00	1 .0
.376	.1176					.0124	.00	.57	1.81	.33	.013	.00	.00	PIPE
950.063	3418.607	.587	3419.194	6.00	6.15	.59	3419.78	.00	.77	2.38	3.000	.000	.00	1 .0
.314	.1176					.0108	.00	.59	1.69	.33	.013	.00	.00	PIPE
950.377	3418.644	.607	3419.250	6.00	5.86	.53	3419.78	.00	.77	2.41	3.000	.000	.00	1 .0
.260	.1176					.0094	.00	.61	1.59	.33	.013	.00	.00	PIPE
950.637	3418.674	.627	3419.302	6.00	5.59	.49	3419.79	.00	.77	2.44	3.000	.000	.00	1 .0
.208	.1176					.0082	.00	.63	1.49	.33	.013	.00	.00	PIPE
950.845	3418.698	.649	3419.347	6.00	5.33	.44	3419.79	.00	.77	2.47	3.000	.000	.00	1 .0
.163	.1176					.0072	.00	.65	1.39	.33	.013	.00	.00	PIPE
951.008	3418.718	.671	3419.389	6.00	5.08	.40	3419.79	.00	.77	2.50	3.000	.000	.00	1 .0
.122	.1176					.0063	.00	.67	1.30	.33	.013	.00	.00	PIPE
951.130	3418.732	.694	3419.426	6.00	4.85	.36	3419.79	.00	.77	2.53	3.000	.000	.00	1 .0
.084	.1176					.0055	.00	.69	1.22	.33	.013	.00	.00	PIPE

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SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 63+58

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					
951.215	3418.742	.718	3419.460	6.00	4.62	.33	3419.79	.00	.77	2.56	3.000	.000	.00	1	.0	
.049	.1176					.0048	.00	.72	1.14	.33	.013	.00	.00	PIPE		
951.264	3418.748	.742	3419.490	6.00	4.41	.30	3419.79	.00	.77	2.59	3.000	.000	.00	1	.0	
.016	.1176															

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T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 68+31 EAST
SO   1351.2903416.670  1                          3427.934
R    1422.9803420.270  1      .013                                .000    .000 0
SH   1422.9803420.270  1                          3420.270
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             3.000   .0
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SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 68+31 EAST

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				
1351.290	3416.670	11.264	3427.934	3.00	.95	.01	3427.95	.00	.60	.00	2.000	.000	.00	1	.0	
71.690	.0502					.0002	.01	11.26	.00	.33	.013	.00	.00	PIPE		
1422.980	3420.270	7.677	3427.947	3.00	.95	.01	3427.96	.00	.60	.00	2.000	.000	.00	1	.0	

```
T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 68+31 WEST
SO   1351.2903416.670  1                          3427.934
R    1406.2903422.890  1      .013                              .000    .000 0
SH   1406.2903422.890  1                          3422.890
CD   1  4   1    .000   2.500     .000  .000  .000   .00
Q            58.000   .0
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WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:29:55

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 68+31 WEST

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
1351.290	3416.670	11.264	3427.934	58.00	11.82	2.17	3430.10	.00	2.38	.00	2.500	.000	.00	1	.0
55.000	.1131					.0200	1.10	11.26	.00	1.13	.013	.00	.00	PIPE	
1406.290	3422.890	6.144	3429.034	58.00	11.82	2.17	3431.20	.00	2.38	.00	2.500	.000	.00	1	.0

```
T1 SUMMERLIN WEST VILLAGE 22                                                0
T2 KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
T3 ATKINS - 100 YEAR ULTIMATE CONDITION  LATERAL 69+01
SO   1420.5703423.000  1                          3423.183
R    1429.5603424.700  1      .013                                .000    .000 0
SH   1429.5603424.700  1                          3424.700
CD   1  4   1    .000   2.000     .000  .000  .000   .00
Q             3.000   .0
```

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SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 69+01

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
1420.570	3423.000	.289	3423.289	3.00	10.74	1.79	3425.08	.00	.60	1.41	2.000	.000	.00	1 .0
.083	.1891					.0871	.01	.29	4.25	.24	.013	.00	.00	PIPE
1420.652	3423.016	.289	3423.305	3.00	10.72	1.78	3425.09	.00	.60	1.41	2.000	.000	.00	1 .0
1.415	.1891					.0813	.12	.29	4.23	.24	.013	.00	.00	PIPE
1422.067	3423.284	.299	3423.582	3.00	10.22	1.62	3425.20	.00	.60	1.43	2.000	.000	.00	1 .0
1.163	.1891					.0710	.08	.30	3.97	.24	.013	.00	.00	PIPE
1423.230	3423.504	.309	3423.812	3.00	9.74	1.47	3425.29	.00	.60	1.44	2.000	.000	.00	1 .0
.973	.1891					.0620	.06	.31	3.72	.24	.013	.00	.00	PIPE
1424.203	3423.688	.319	3424.006	3.00	9.29	1.34	3425.35	.00	.60	1.46	2.000	.000	.00	1 .0
.823	.1891					.0541	.04	.32	3.49	.24	.013	.00	.00	PIPE
1425.026	3423.843	.330	3424.173	3.00	8.86	1.22	3425.39	.00	.60	1.48	2.000	.000	.00	1 .0
.702	.1891					.0473	.03	.33	3.27	.24	.013	.00	.00	PIPE
1425.728	3423.976	.341	3424.317	3.00	8.44	1.11	3425.42	.00	.60	1.50	2.000	.000	.00	1 .0
.603	.1891					.0413	.02	.34	3.06	.24	.013	.00	.00	PIPE
1426.331	3424.090	.352	3424.442	3.00	8.05	1.01	3425.45	.00	.60	1.52	2.000	.000	.00	1 .0
.521	.1891					.0361	.02	.35	2.87	.24	.013	.00	.00	PIPE
1426.852	3424.188	.364	3424.552	3.00	7.68	.92	3425.47	.00	.60	1.54	2.000	.000	.00	1 .0
.450	.1891					.0315	.01	.36	2.69	.24	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:31: 3

SUMMERLIN WEST VILLAGE 22

KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD

ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 69+01

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	
1427.302	3424.273	.376	3424.649	3.00	7.32	.83	3425.48	.00	.60	1.56	2.000	.000	.00	1 .0
.389	.1891					.0275	.01	.38	2.52	.24	.013	.00	.00	PIPE
1427.691	3424.347	.389	3424.736	3.00	6.98	.76	3425.49	.00	.60	1.58	2.000	.000	.00	1 .0
.337	.1891					.0240	.01	.39	2.36	.24	.013	.00	.00	PIPE
1428.028	3424.411	.402	3424.813	3.00	6.65	.69	3425.50	.00	.60	1.60	2.000	.000	.00	1 .0
.291	.1891					.0210	.01	.40	2.21	.24	.013	.00	.00	PIPE
1428.319	3424.466	.416	3424.881	3.00	6.34	.62	3425.51	.00	.60	1.62	2.000	.000	.00	1 .0
.250	.1891					.0184	.00	.42	2.07	.24	.013	.00	.00	PIPE
1428.568	3424.513	.430	3424.943	3.00	6.05	.57	3425.51	.00	.60	1.64	2.000	.000	.00	1 .0
.214	.1891					.0160	.00	.43	1.94	.24	.013	.00	.00	PIPE
1428.782	3424.553	.445	3424.998	3.00	5.77	.52	3425.51	.00	.60	1.66	2.000	.000	.00	1 .0
.181	.1891					.0140	.00	.44	1.82	.24	.013	.00	.00	PIPE
1428.964	3424.587	.460	3425.047	3.00	5.50	.47	3425.52	.00	.60	1.68	2.000	.000	.00	1 .0
.153	.1891					.0123	.00	.46	1.70	.24	.013	.00	.00	PIPE
1429.116	3424.616	.476	3425.092	3.00	5.24	.43	3425.52	.00	.60	1.70	2.000	.000	.00	1 .0
.126	.1891					.0107	.00	.48	1.59	.24	.013	.00	.00	PIPE
1429.243	3424.640	.492	3425.132	3.00	5.00	.39	3425.52	.00	.60	1.72	2.000	.000	.00	1 .0
.102	.1891					.0094	.00	.49	1.49	.24	.013	.00	.00	PIPE

FILE: LATERAL-69+01.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 3

Program Package Serial Number: 7271

WATER SURFACE PROFILE LISTING Date: 2-25-2020 Time:11:31: 3

SUMMERLIN WEST VILLAGE 22
KETTLE RIDGE DRIVE (J) - FLEET WING AVE TO LAKE MEAD BLVD
ATKINS - 100 YEAR ULTIMATE CONDITION LATERAL 69+01

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
1429.345	3424.659	.509	3425.168	3.00	4.77	.35	3425.52	.00	.60	1.74	2.000	.000	.00	1 .0
.081	.1891					.0082	.00	.51	1.40	.24	.013	.00	.00	PIPE
1429.426	3424.675	.526	3425.201	3.00	4.54	.32	3425.52	.00	.60	1.76	2.000	.000	.00	1 .0
.060	.1891					.0072	.00	.53	1.31	.24	.013	.00	.00	PIPE
1429.486	3424.686	.544	3425.230	3.00	4.33	.29	3425.52	.00	.60	1.78	2.000	.000	.00	1 .0
.042	.1891					.0063	.00	.54	1.22	.24	.013	.00	.00	PIPE
1429.527	3424.694	.563	3425.257	3.00	4.13	.27	3425.52	.00	.60	1.80	2.000	.000	.00	1 .0
.025	.1891					.0055	.00	.56	1.15	.24	.013	.00	.00	PIPE
1429.552	3424.698	.583	3425.281	3.00	3.94	.24	3425.52	.00	.60	1.82	2.000	.000	.00	1 .0
.008	.1891					.0048	.00	.58	1.07	.24	.013	.00	.00	PIPE
1429.560	3424.700	.604	3425.304	3.00	3.75	.22	3425.52	.00	.60	1.84	2.000	.000	.00	1 .0

Appendix D. CD-ROM

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10	ROUGH GRADING PLAN AND PROFILE	SCURRY BEND DRIVE STA. 27+50 TO STA. 33+00
11	ROUGH GRADING PLAN AND PROFILE	SCURRY BEND DRIVE BEGIN TO STA. 27+50
12	ROADWAY GRADING PLAN	KETTLE RIDGE DRIVE STA. 72+00 TO END
13	ROADWAY PLAN AND PROFILE	KETTLE RIDGE DRIVE STA. 72+00 TO END
14	ROADWAY GRADING PLAN	KETTLE RIDGE DRIVE STA. 67+50 TO STA. 72+00
15	ROADWAY PLAN AND PROFILE	KETTLE RIDGE DRIVE STA. 67+50 TO STA. 72+00
16	ROADWAY GRADING PLAN	KETTLE RIDGE DRIVE STA. 64+50 TO STA. 67+50
17	ROADWAY PLAN AND PROFILE	KETTLE RIDGE DRIVE STA. 64+50 TO STA. 67+50
18	ROADWAY GRADING PLAN	KETTLE RIDGE DRIVE STA. 60+50 TO STA. 64+50
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SUMMERLIN VILLAGE 22
IMPROVEMENT PLANS FOR:

KETTLE RIDGE DRIVE (STREET J)
FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
FUTURE SID PROJECT

SCURRY BEND DRIVE (STREET N) ROUGH GRADE
FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
APN: 137-14-401-006 AND 137-23-101-002

NOTE:
THIS PROJECT PLAN APPROVAL CONTINGENT ON LVVWD #136893, SUMMERLIN VILLAGE 22, LAKE MEAD BLVD. PLAN APPROVAL

SUMMERLIN®

OWNER /DEVELOPER

OWNER

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

ENGINEER / CONSULTANT

CIVIL

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

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.

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.

DISCLAIMER NOTE

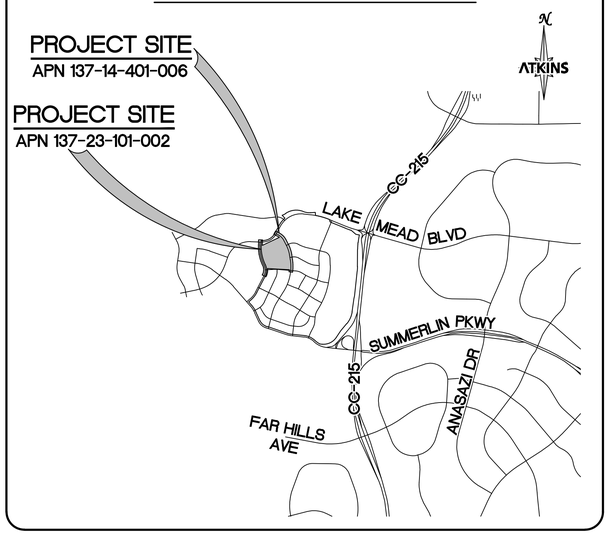
EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON,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

PROPOSED RIGHT-OF-WAY ACREAGE
1.56 AC

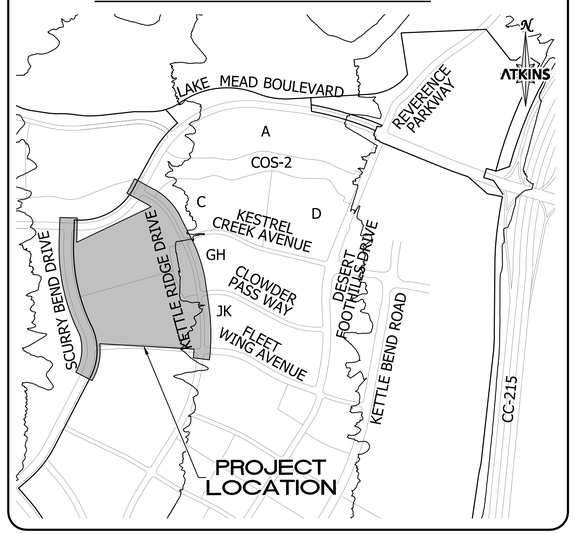
PROPOSED DISTURBED AREA ACREAGE
36.32 AC

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

LOCATION MAP



VICINITY MAP



APPROVALS

HOWARD HUGHES COMPANY LLC, A DELAWARE LIMITED LIABILITY COMPANY

KEVIN T. ORROCK, VICE PRESIDENT — DATE

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

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

CITY OF LAS VEGAS PLANNING DEVELOPMENT — DATE

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

LAS VEGAS FIRE AND RESCUE — DATE

CENTRAL TELEPHONE COMPANY d/b/a CENTURYLINK — DATE

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

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. 136892 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

SHEETS: 1-3, 7, 13, 15, 17, 19, 21, 23-28, 40

NV ENERGY — DATE

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

SOUTHWEST GAS CORPORATION — DATE

COX COMMUNICATIONS OF LAS VEGAS, INC — DATE

BASIS OF BEARING

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

LINEAR UNIT: US SURVEY FOOT (FTUS)
DATUM (REFERENCE FRAME): NAD 83 (2011) EPOCH 2010.00
SYSTEM: NEVADA COORDINATE REFERENCE SYSTEM (NCRS)
ZONE: LAS VEGAS HIGH ELEVATION ZONE
PROJECTION: TRANSVERSE MERCATOR
STANDARD PARALLEL (AND LATITUDE OF GRID ORIGIN): 36°15'00"N
LONGITUDE OF CENTRAL MERIDIAN: 114°58'00"W
NORTHING AT GRID 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 2 AS SHOWN ON THE MAP THEREOF IN BOOK 123 OF PLATS, PAGE 36, OFFICIAL RECORDS, CITY OF LAS VEGAS CLARK COUNTY, NEVADA

FAST Call before you UnderGround 1-702-432-5300 — NEVADA ONE-CALL SYSTEM OF TRANSPORTATION

Call before you Dig — AVOID OUTAGES UNDERGROUND UTILITY LINES IN THE COUNTY. Call 811 OR 1-800-642-2444

AVOID VICTIMS OVERHEAD POWER LINES IN THE COUNTY. CALL BEFORE YOU DIG OVERHEAD 1-702-227-2929

PROFESSIONAL ENGINEER - STATE OF NEVADA — PAUL BATES — EXP. 12-31-20 — CIVIL — No. 18723 — 2/25/20

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN®

SUMMERLIN VILLAGE 22
KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

COVER SHEET

DESIGNED BY: N. BARCOS
DRAWN BY: O. QUASSANI
CHECKED BY: P. BATES
HORIZ.: NONE
VERT.: NONE

JOB NO. 10718097 L19-02915
DATE: FEBRUARY, 2020
DRAWING NO. 1 / 43

100060655

X:\Projects\SummWest\Village 22\100060655 - V22N Street J (Lake Mead to Street G)_Sheets\60655-01-1111-C1.dwg LAYOUT: C1 Feb 25, 2020 - 2:40PM

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

	EXISTING	PROPOSED
DAYLIGHT LINE		
FLOWLINE		
CENTERLINE		
PARCEL LINE		
RIGHT OF WAY		
PAVEMENT STRIPING		
OVERHEAD POWER	—OHP—	—OHP—
UNDERGROUND POWER	—UGP—	—UGP—
SANITARY SEWER	—S—	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
CURB AND GUTTER		
EDGE OF PAVEMENT		
EASEMENT		
MATCHLINE		
SIGN		
DOUBLE POST SIGN		
STORM DRAIN MANHOLE	SD	
STORM DRAIN STRUCTURE		
DROP INLET		
BEEHIVE INLET		
SEWER MANHOLE	S	S
FIRE HYDRANT		
CAP AND BLOWOFF		
GATE VALVE		
REDUCER		
STREETLIGHT	OR	
PULLBOX		
SIGNAL POLE		
ELEVATION	(0000.0) FG	0000.0 FG
WATER PRESSURE ZONE BOUNDARY		
WATER PRESSURE ZONE		3550
RIP–RAP		
		FUTURE
HARDSCAPE		

ROADWAY ALIGNMENT DESIGNATIONS

"LMB" = LAKE MEAD BOULEVARD
"FWA" = FLEET WING AVENUE (STREET G)
"CPW" = CLOWDER PASS WAY (STREET H)
"KCA" = KESTREL CREEK AVENUE (STREET I)
"KRD" = KETTLE RIDGE DIVE (STREET J)
"SBD" = SCURRY BEND DRIVE (STREET N)
"KBR" = KETTLE BEND ROAD

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. 136892 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 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 — PAUL A. BATES — No. 18725 — CIVIL — 2/25/20

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
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Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 22
KETTLE RIDGE DRIVE (STREET J) – FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE – FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

LEGEND AND ABBREVIATIONS

DESIGNED BY: N. BARCOS
DRAWN BY: O. QUASSANI
CHECKED BY: P. BATES
HORIZ.: NONE
VERT.: NONE

JOB NO. 107/6097 L19-02516
DATE: FEBRUARY, 2020
DRAWING NO. 2 /43
100060655

X:\Projects\SummitWest\Village 22\100060655 – V22N Street J (Lake Mead to Street G)_Sheets\60655-02-LGND-G2.dwg LAYOUT: C-2 Feb 25, 2020 – 2:10PM

CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE S WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
5. TYPE V CEMENT SHALL BE USED IN ALL OFF–SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.
6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT–OF–WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300´ IN EXTRUDED–TYPE CURB.
8. AC PAVEMENT TO BE ONE–HALF INCH (½") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS.
9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 216.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE AS SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY THE (COMPANY, REPORT #, DATE) APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOWLINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.

WALL NOTES:

16. ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.
17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC, THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.
21. 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.
22. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST EDITION.
23. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

REVISED 06/04/2018

CITY OF LAS VEGAS GRADING NOTES

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

		HORIZONTAL	VERTICAL	COMPACTION
A.	PAVEMENT AREA SUBGRADE	0.1'+	+0.0' TO –0.1'	SEE SOILS REPORT
B.	ENGINEERED FILL	0.5'+	+0.1' TO –0.1'	SEE SOILS REPORT

COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE.

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

REVISED 04/15/10

PLAN CONCURRENCE NOTE

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

1. *LAKE MEAD BOULEVARD (DESERT FOOTHILLS DRIVE TO SCURRY BEND DRIVE)*
2. *DESERT FOOTHILLS DRIVE (FLEET WING AVENUE (STREET G) TO LAKE MEAD BLVD)*
3. *KESTREL CREEK AVENUE (STREET I) (DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J))*
4. *CLOWDER PASS WAY (STREET H) (DESERT FOOTHILLS DRIVE TO KETTLE RIDGE DRIVE (STREET J))*

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 § 66.1 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS.
2. ONLY FIRE HYDRANTS THAT ARE ON THE LAS VEGAS VALLEY WATER DISTRICT'S –APPROVED PRODUCTS LIST ARE ALLOWED TO BE INSTALLED.
3. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON–SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK. IFC § 105.6.15
4. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. IFC § 3310, § 3311
5. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. IFC § 507.5.7.3
6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL. IFC § 106.3
7. ALL ON–SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. IFC § 507.2.1, NFPA 24
8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. IFC § 507
9. PRIVATE HYDRANTS SHALL BE PAINTED RED. IFC § 507.5.7.1
10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. IFC § 507
11. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: IFC § C102
    - RESIDENTIAL –500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
    - COMMERCIAL –300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
12. WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. IFC § C102.8
13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL–DE–SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL–DE–SAC.
14. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. IFC § C102.10
15. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE–TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. IFC § C102.4
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. IFC § C102.7
17. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD–END STREET SHALL NOT EXCEED 200 FT. IFC § C102.6
18. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD–INS ARE INSTALLED ON A SINGLE SYSTEM. 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–INS 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 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 DEADENDS 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 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 BEING 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

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 STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
4. WHEN A DESIGNATED "SUGGESTED ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD". THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.
5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW TRAFFIC SIGNS SHALL UTILIZE TYPE XI RETROREFLECTIVE SHEETING IN ACCORDANCE WITH CCAUSS 627 AND 716 AND SHALL HAVE AN ANTI–GRAFFITI PROTECTIVE OVERLAY FILM THAT IS A MATCHING COMPONENT TO, AND OF THE SAME MANUFACTURER AS THE RETROREFLECTIVE SHEETING TO WHICH IT IS APPLIED. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.
7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5') FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.
8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF–SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.
9. STREET SIGNS AND STOP SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.
10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR IMSA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT OF WAY.
11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA (RTC). IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.
13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828–3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.
14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.
15. THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPICTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

REVISED JUNE 4, 2018

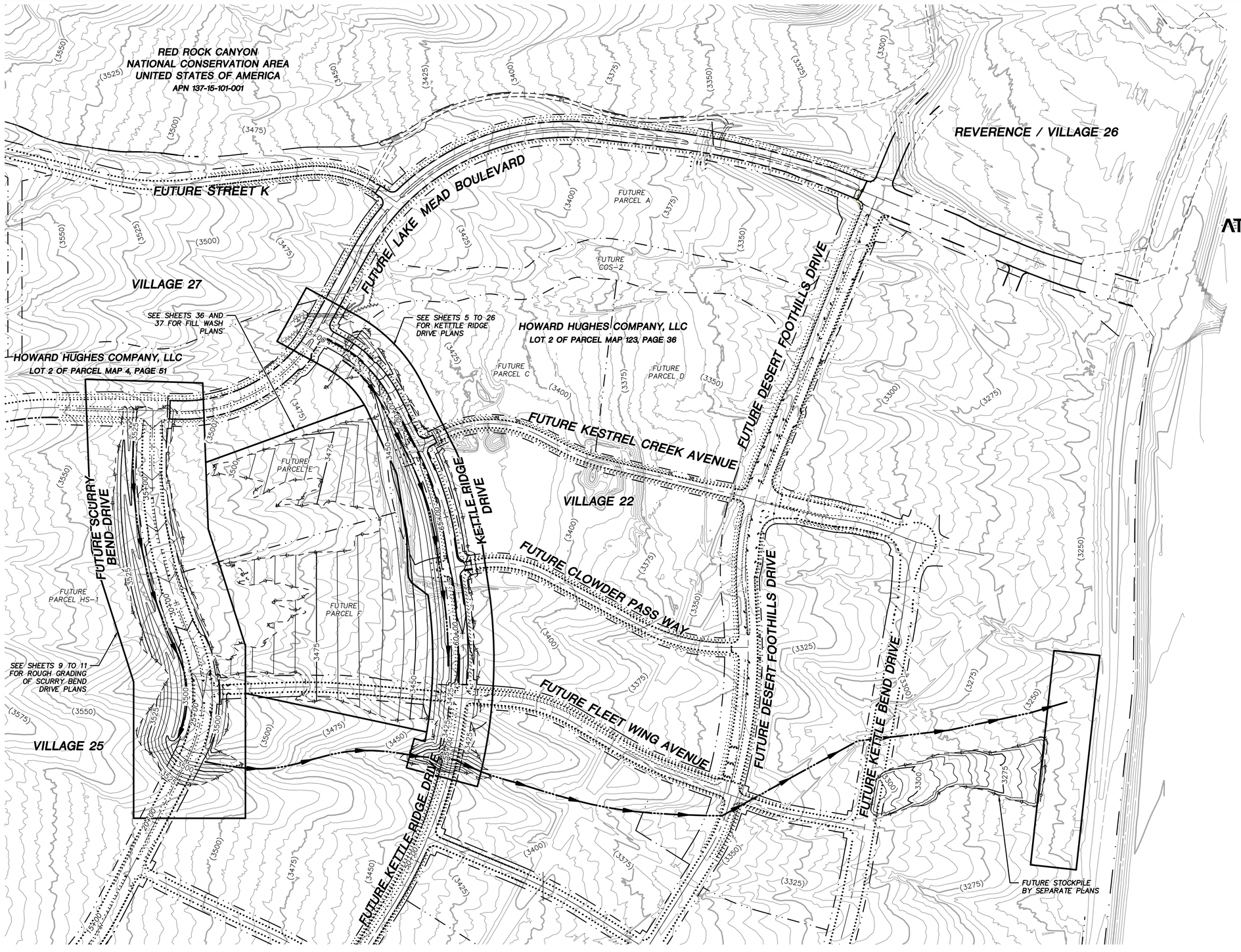
CITY OF LAS VEGAS SEWER NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS. ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEER.
3. CHISEL "S" OR "G" IN CURBS WHERE SEWER OR GAS LATERALS PASS UNDER THE CURB.
4. POLYVINYL (PVC) SEWER PIPE SHALL MEET ASTM D–3034 SDR 35 SPECIFICATIONS, INSTALLED WITH SAND BEDDING AND BACKFILL OF TYPE II AGGREGATE BASE.
5. ALL MANHOLES PAVED IN STREETS EIGHTY (80') FOOT R/W AND LARGER SHALL HAVE CONCRETE COLLARS. STREETS LESS THAN EIGHTY (80') FOOT R/W WILL REQUIRE RETROFIT IF PAVING DOES NOT CONFORM TO CITY STANDARDS AT THE MANHOLE.
6. TEE SADDLES SHALL BE USED TO CONNECT SEWER LATERALS TO EXISTING MAIN LINES UP TO TWELVE INCH (12") DIAMETER. CONNECTIONS TO FIFTEEN INCH (15") OR LARGER MAINS SHALL REQUIRE SPECIAL PROCEDURES. IN LINE "Y"'S SHALL BE USED ON LINES TWELVE INCHES (12") OR ABOVE.
7. WATER MAINS SHALL BE PROTECTED IN ACCORDANCE WITH LVVWD STANDARDS WHENEVER A SEWER MAIN CROSSES OVER A WATER MAIN OR THE SEWER IS LESS THAN EIGHTEEN INCH (18") UNDER A WATER MAIN.
8. ALL CONTRACTORS INSTALLING SEWER MAINS THAT WILL BE UNDER THE JURISDICTION OF THE CITY OF LAS VEGAS MUST BE STATE OF NEVADA CLASS "A" CONTRACTORS.
9. THE CITY OF LAS VEGAS WILL NOT ACCEPT ANY SEWER MAINS WHICH HAVE A VERTICAL DEFLECTION OF MORE THAN ONE TENTH (0.1) OF A FOOT FROM THE APPROVED CONSTRUCTION PLANS AT ANY LOCATION. SEWER MAINS FOUND TO EXCEED THIS TOLERANCE WILL HAVE TO BE REPAIRED OR REMOVED OR REPLACED TO THE SATISFACTION OF THE CITY ENGINEER PRIOR TO ACCEPTANCE BY THE CITY OF LAS VEGAS.
10. INSTALLATION OF CURVED SEWER REQUIRES THE USE OF C–900 PIPE WHICH ALLOWS FOR PIPE DEFLECTION AT THE JOINTS.

REVISED 04/15/10

CITY OF LAS VEGAS STREET LIGHT NOTES

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION (USS), AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" (USD), LATEST REVISION.
2. DESIGN PROFESSIONAL AND CONTRACTOR SHALL VERIFY CITY'S LATEST LED FIXTURE SPECIFICATIONS AND APPROVED FIXTURES PER CLV WEBSITE, UNDER BUILDING AND SAFETY FORMS, PRIOR TO ORDERING MATERIALS.
3. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS, ETC., LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE TRAFFIC AND CITY ENGINEER. ANY DEVIATION FROM THE PLAN LOCATION WILL REQUIRE COMPLIANCE WITH SECTION 623 OF THE USS.
4. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION IN ACCORDANCE WITH SECTION 623 G.03.01 OF THE USS.
5. ALL EMPTY CONDUIT SHALL HAVE AT LEAST ONE GREEN NO. #8 AWG WIRE INSTALLED AS TRACER WIRE IN ACCORDANCE WITH SECTION 623 G.02.01 OF THE USS PRIOR TO BACKFILLING AND FINAL INSPECTION.
6. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, SHALL LE



MASTER PLAN NOTE

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LEGEND

FLOW LINE

GRAPHIC SCALE
100 0 100 200' 400
HORIZONTAL: 1"= 200'

SOILS REPORT

BY NOVA
PROJECT NO. G-18-176
DATED 12/03/18
EARTHWORK QUANTITIES (RAW):
CUT= 231,700 CU YDS
FILL= 206,600 CU YDS

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

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

DS#5156

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 PRIMARY AND ARTERIAL SYSTEMS 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

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
PAUL A. BATES
No. 18723
CIVIL
2/25/20

REV.	DESCRIPTION	BY	DATE	APPROVAL

REVISIONS

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

SUMMERLIN

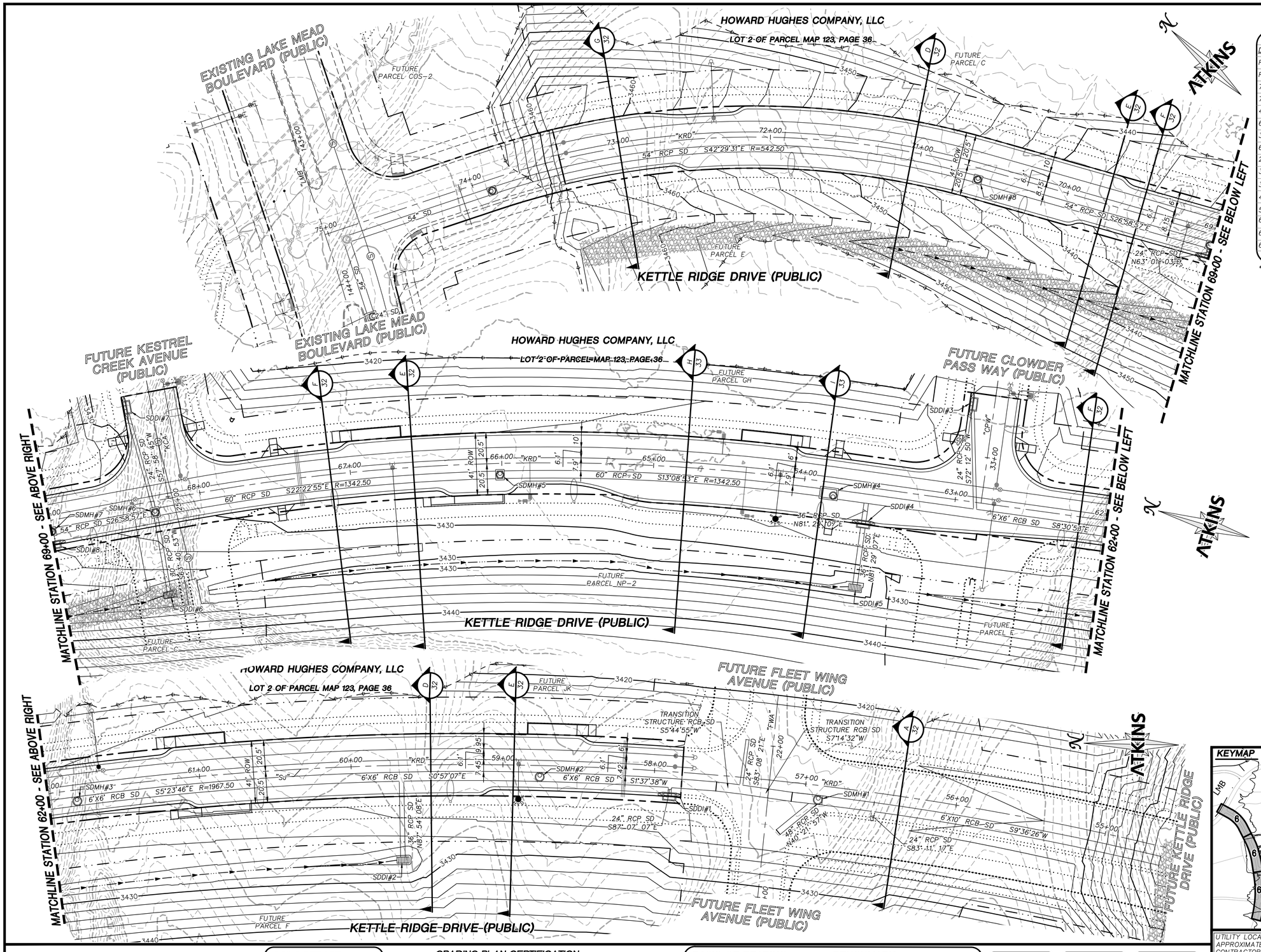
SUMMERLIN VILLAGE 22
KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

MASTER GRADING PLAN

JOB NO. 10Y16087
L19-02315
DATE: FEBRUARY, 2020
DESIGNED BY: N. BARCOS
DRAWN BY: O. QUASSANI
CHECKED BY: P. BATES
DRAWING NO. 4 / 43
HORIZ.: 1"=200'
VERT.: NONE

100060655

X:\Projects\SummitWest\Village 22\100060655 - V22N Street J (Lake Mead to Street G)_Sheets\60655-06-OVERALL DRAIN.dwg LAYOUT: MASTER GRADING PLAN Feb 25, 2020 - 2:10PM



SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY	UNIT
DRAINAGE		
RIP-RAP (D50=8")	1890	CY
RIP-RAP (D50=24")	488	CY
7.5' TYPE "CM2" DROP INLET	3	EACH
7.5' TYPE "CM" DROP INLET	2	EACH
4' X 8' NDOT TYPE II DROP INLET	3	EACH
60" TYPE I RISER	3	EACH
30" TYPE II MANHOLE	1	EACH
60" TYPE III MANHOLE	4	EACH
24" CLASS III RCP SD	192	LF
30" CLASS III RCP SD	55	LF
36" CLASS III RCP SD	104	LF
48" CLASS III RCP SD	30	LF
54" CLASS IV RCP SD*	522	LF
60" CLASS IV RCP SD	446	LF
6' X 6' CONCRETE BOX CULVERT	860	LF
6' X 10' CONCRETE BOX CULVERT	243	LF

*WITH 1" SACRIFICIAL CONCRETE

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. SEE SHEET 34 FOR REINFORCED CONCRETE BOX INFORMATION.
3. CONTRACTOR TO PROVIDE 6" MINIMUM OF CLEARANCE BETWEEN OUTSIDE OF PIPE TO INSIDE WALL OF STORM DRAIN STRUCTURES.
4. CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT FACILITY ID (APBE 0249)

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

SOILS REPORT

BY NOVA
PROJECT NO. G-18-176
DATED 12/03/18 AND
SUBSEQUENT UPDATE LETTER
DATED 12/30/19
EARTHWORK QUANTITIES (RAW):
CUT= 231,700 CU YDS
FILL= 206,600 CU YDS

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

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

DS#5156

BASIS OF BEARING

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T21S,R59E,S03

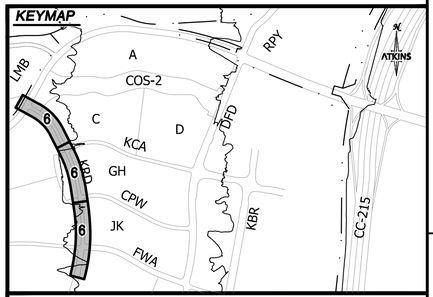
Call before you UnderGround 1-702-432-5300 NEVADA'S ONE CALL SYSTEM OF TRANSPORTATION

Call before you Dig AVOID OUTAGES, HAZARDOUS UTILITY STRIKES & DOWNTIME. Call 811 or 1-800-642-2444

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

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KEYMAP



PROFESSIONAL ENGINEER - STATE OF NEVADA
PAUL A. BATES
No. 18723
CIVIL
2/25/20

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7375
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 22
KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

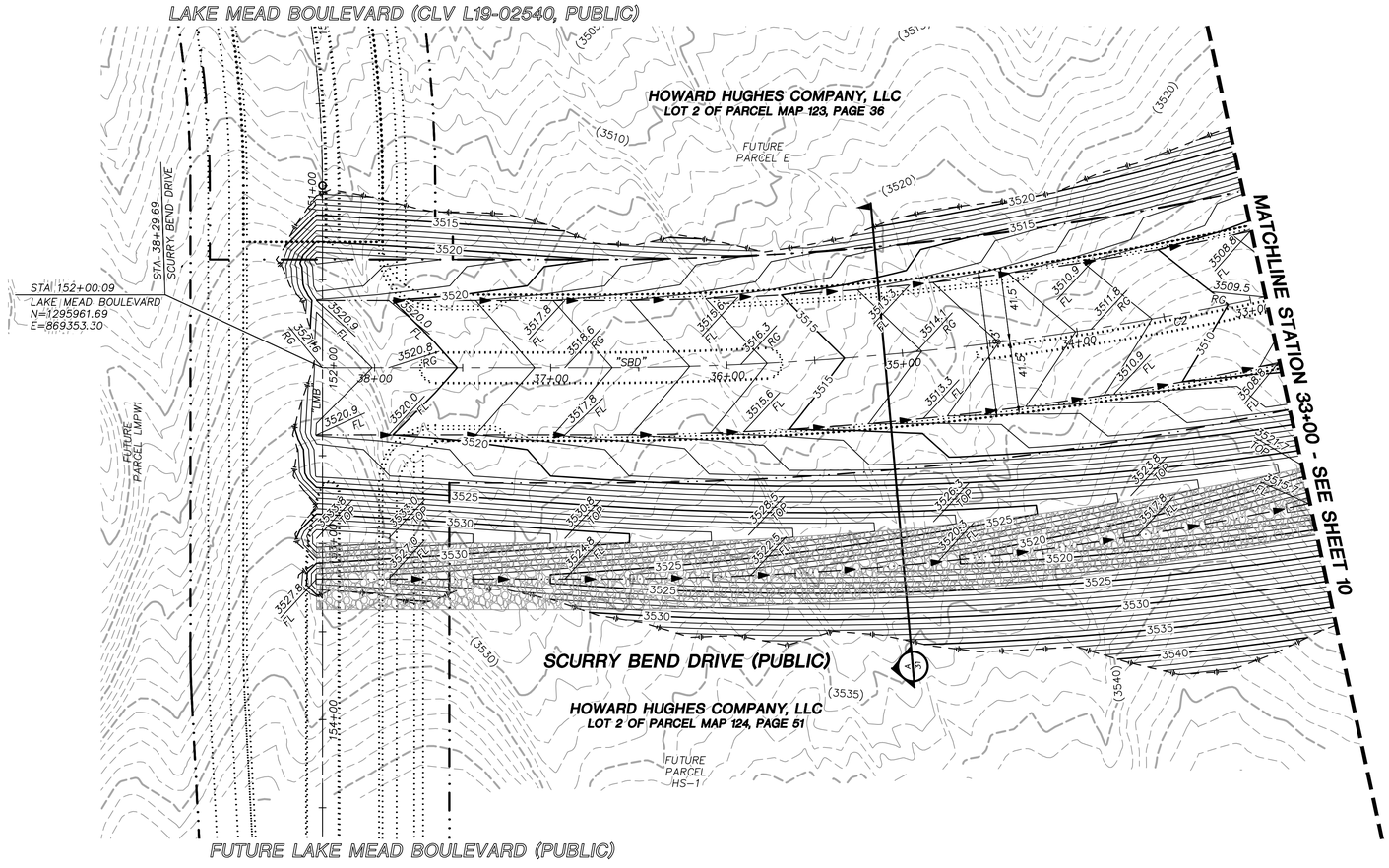
MASTER DRAINAGE PLAN
KETTLE RIDGE DRIVE

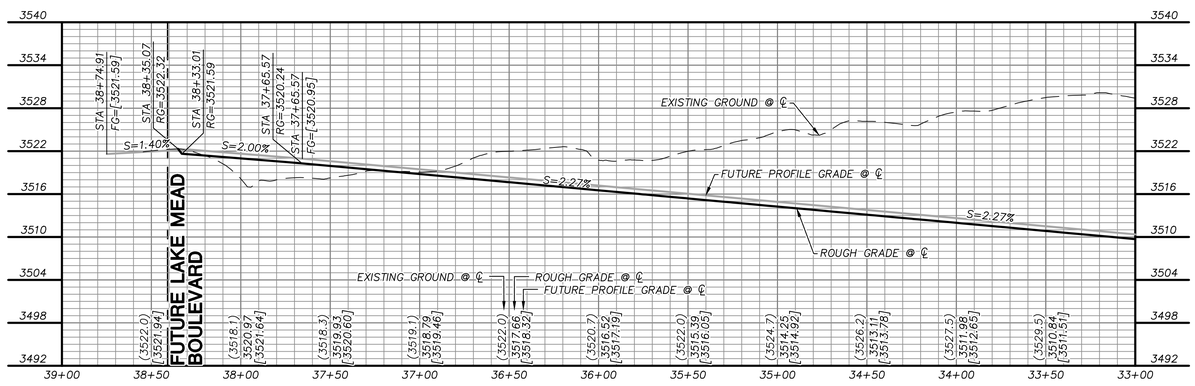
DESIGNED BY: N. BARCOS
DRAWN BY: O. QUASSANI
CHECKED BY: P. BATES
HORZ.: 1"=30'
VERT.: NONE

JOB NO. 1079087
L19-02916
DATE: FEBRUARY, 2020
DRAWING NO. 6 / 43
100060655

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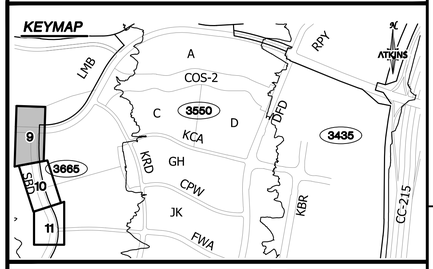
CENTERLINE CURVE TABLE				
NO.	RADIUS	DELTA	LENGTH	TANGENT
C2	1803.50'	26°17'46"	827.72'	421.28'





ROUGH GRADE

THE PROPOSED ROUGH GRADE IN PAVEMENT IS 8" BELOW THE FINISH GRADE SHOWN WITHIN THESE PLANS.



GRAPHIC SCALE

40 0 20 40 80

HORIZONTAL: 1"=40'

10 0 5 10 20

VERTICAL: 1"=10'

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT. DS#5156

BASIS OF BEARING

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

BENCHMARK

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

FAST Call before you UnderGround 1-702-432-6300 FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you Dig AVOID CUTTING UNDERGROUND UTILITY LINES, ITS QUICK & EASY. Call 811 or 1-800-642-2444

AVOID HITTING OVERHEAD POWER LINES, ITS QUICK & EASY. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

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PROFESSIONAL ENGINEER-STATE OF NEVADA PAUL A. BATES EXP. 12-31-20 CIVIL No. 18723 2/25/20

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN VILLAGE 22
KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

ROUGH GRADING PLAN AND PROFILE
SCURRY BEND DRIVE STA. 33+00 TO END

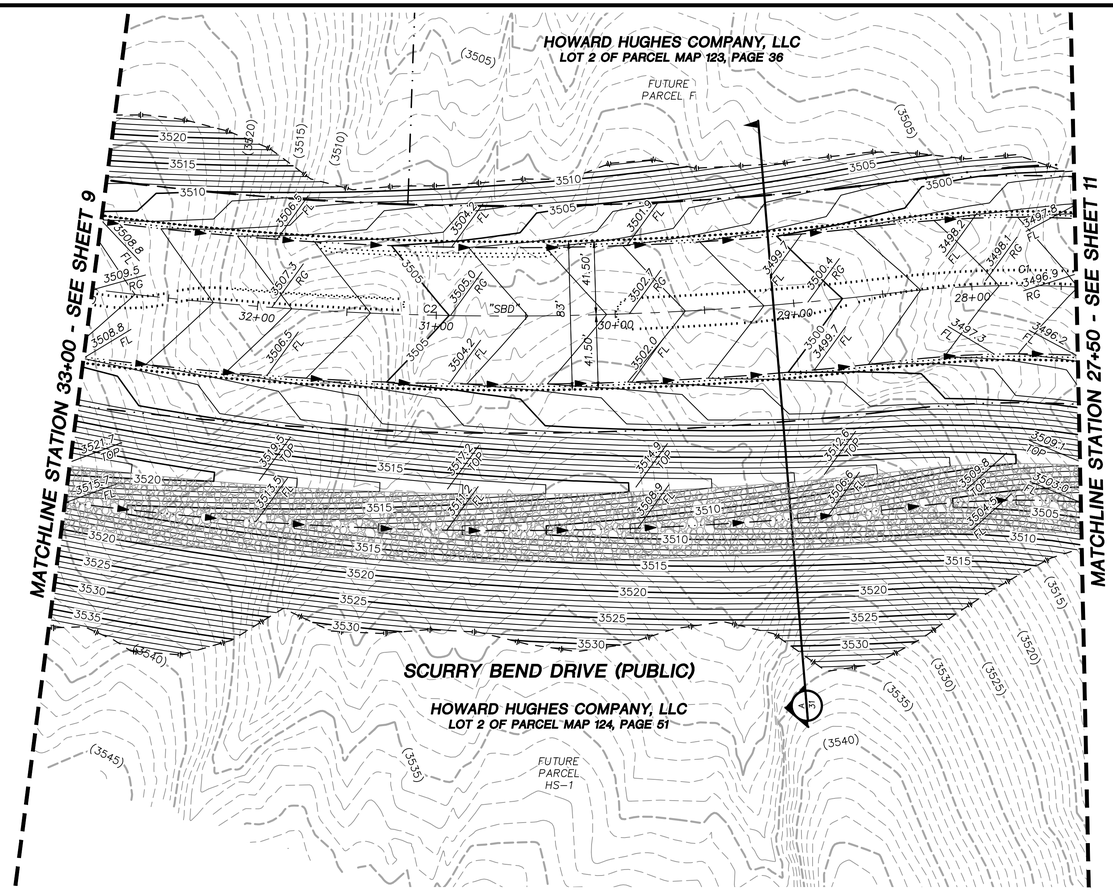
DESIGNED BY: N. BARCOS
DRAWN BY: L. MAMACLAY
CHECKED BY: P. BATES
HORIZ.: 1"=40'
VERT.: 1"=8'

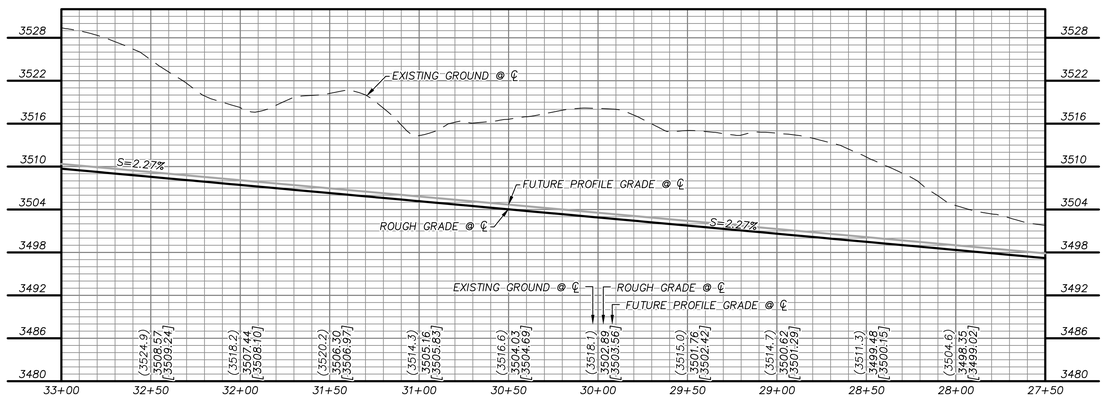
JOB NO. 107V8087 L19-02516
DATE FEBRUARY, 2020
DRAWING NO. 9 /43

100060655

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CENTERLINE CURVE TABLE				
NO.	RADIUS	DELTA	LENGTH	TANGENT
C1	610.00'	48°26'31"	515.74'	274.41'
C2	1803.50'	26°17'46"	827.72'	421.28'





GRAPHIC SCALE

HORIZONTAL: 1"=40'

VERTICAL: 1"=10'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT

PROJECT NO. 136892 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

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

DS#5156

BASIS OF BEARING

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T21S,R59E,S03

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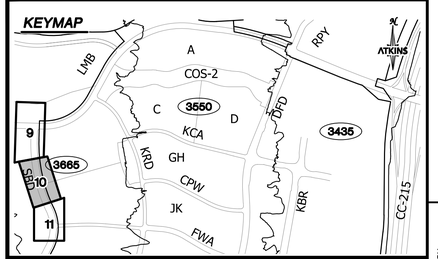
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KEYMAP



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PROFESSIONAL ENGINEER-STATE OF NEVADA
PAUL A. BATES
Exp. 12-31-20
CIVIL
No. 18729
2/25/20

REVISIONS			
REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

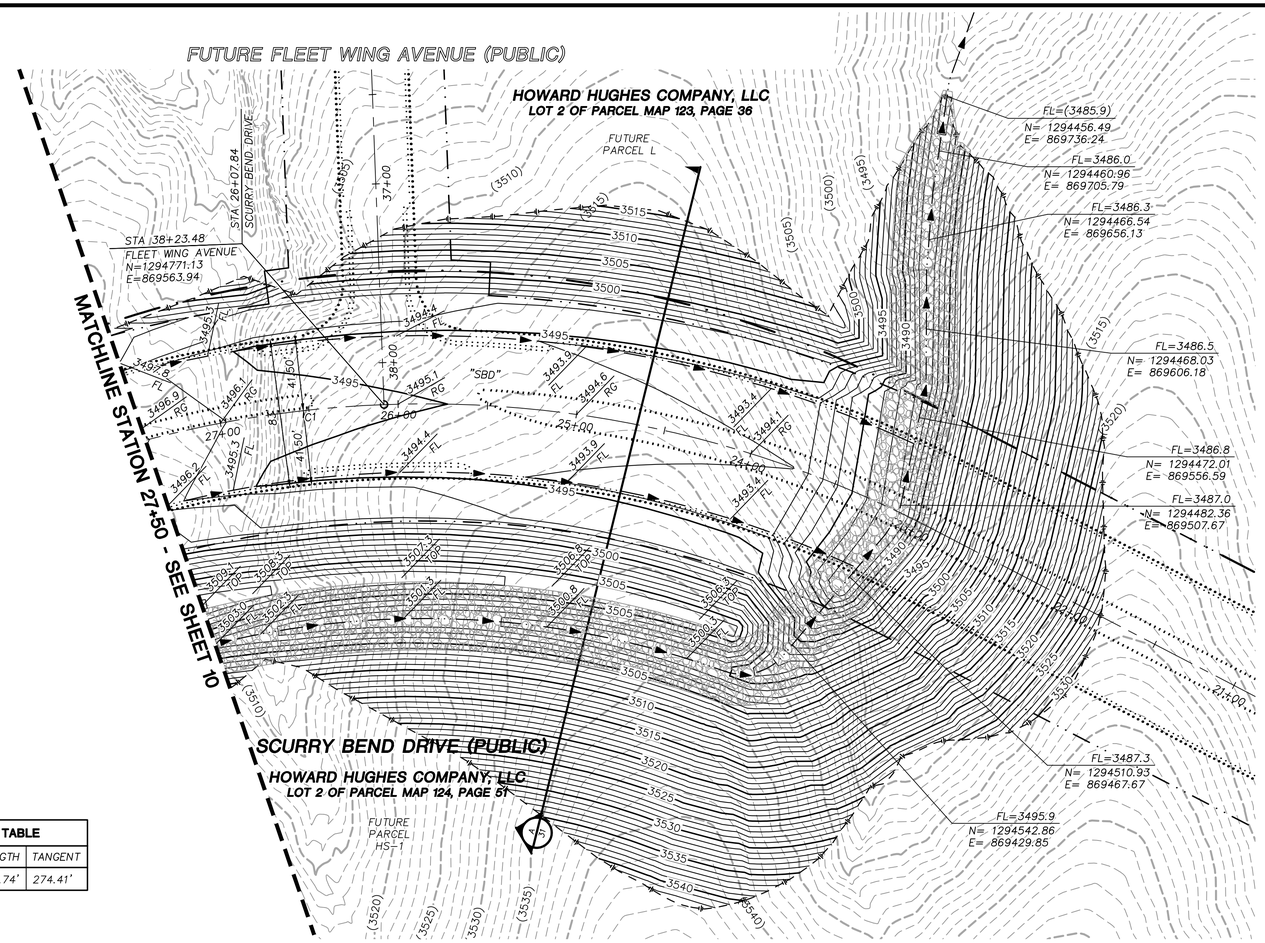
SUMMERLIN VILLAGE 22
KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

ROUGH GRADING PLAN AND PROFILE
SCURRY BEND DRIVE STA. 27+50 TO STA. 33+00

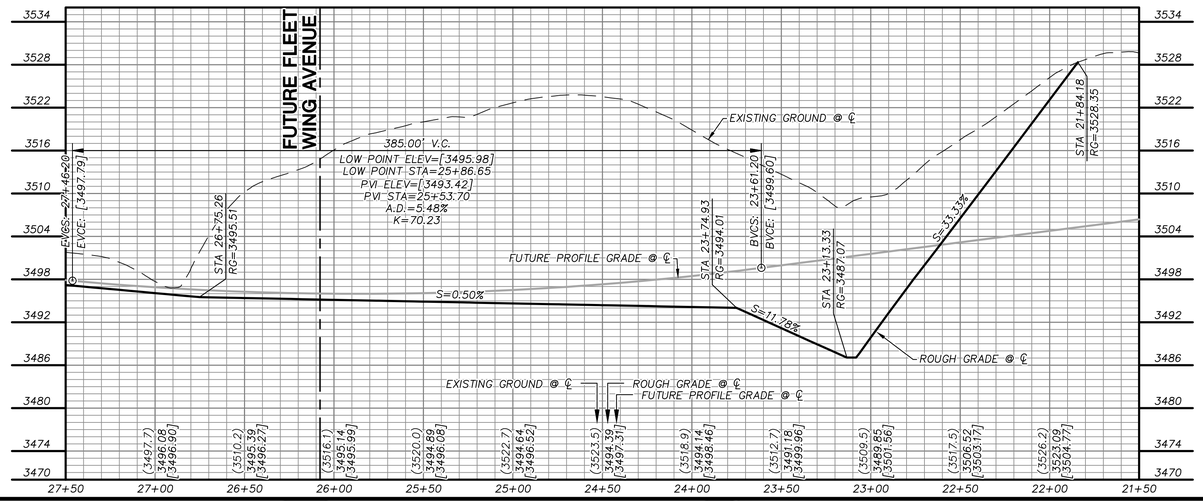
DESIGNED BY: N. BARCOS
DRAWN BY: L. MAMACLAY
CHECKED BY: P. BATES
HORIZ.: 1"=40'
VERT.: 1"=8'

JOB NO. 1071.8087 L16-02516
DATE: FEBRUARY, 2020
DRAWING NO. 10/43
100060655

X:\Projects\SummerWest\Village 22\100060655 - V22N Street J (Lake Mead to Street G)_Sheets\60655-13-GRAD-02.dwg LAYOUT: 10 Feb 25, 2020 - 2:13PM



CENTERLINE CURVE TABLE				
NO.	RADIUS	DELTA	LENGTH	TANGENT
C1	610.00'	48°26'31"	515.74'	274.41'



GRAPHIC SCALE

40 0 20 40 80

HORIZONTAL: 1"=40'

10 0 5 10 20

VERTICAL: 1"=10'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT

PROJECT NO. 136892 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

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

DS#5156

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 OUTAGES, INTERRUPTIONS OR UTILITY LINES. IT'S COSTLY. Call 811 OR 1-800-642-2444

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

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Fax: +1.702.263.7200

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SCURRY BEND DRIVE (STREET N) ROUGH GRADE – FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

ROUGH GRADING PLAN AND PROFILE
SCURRY BEND DRIVE BEGIN TO STA 27+50

ROUGH GRADE

THE PROPOSED ROUGH GRADE IN PAVEMENT IS 8" BELOW THE FINISH GRADE SHOWN WITHIN THESE PLANS.

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.

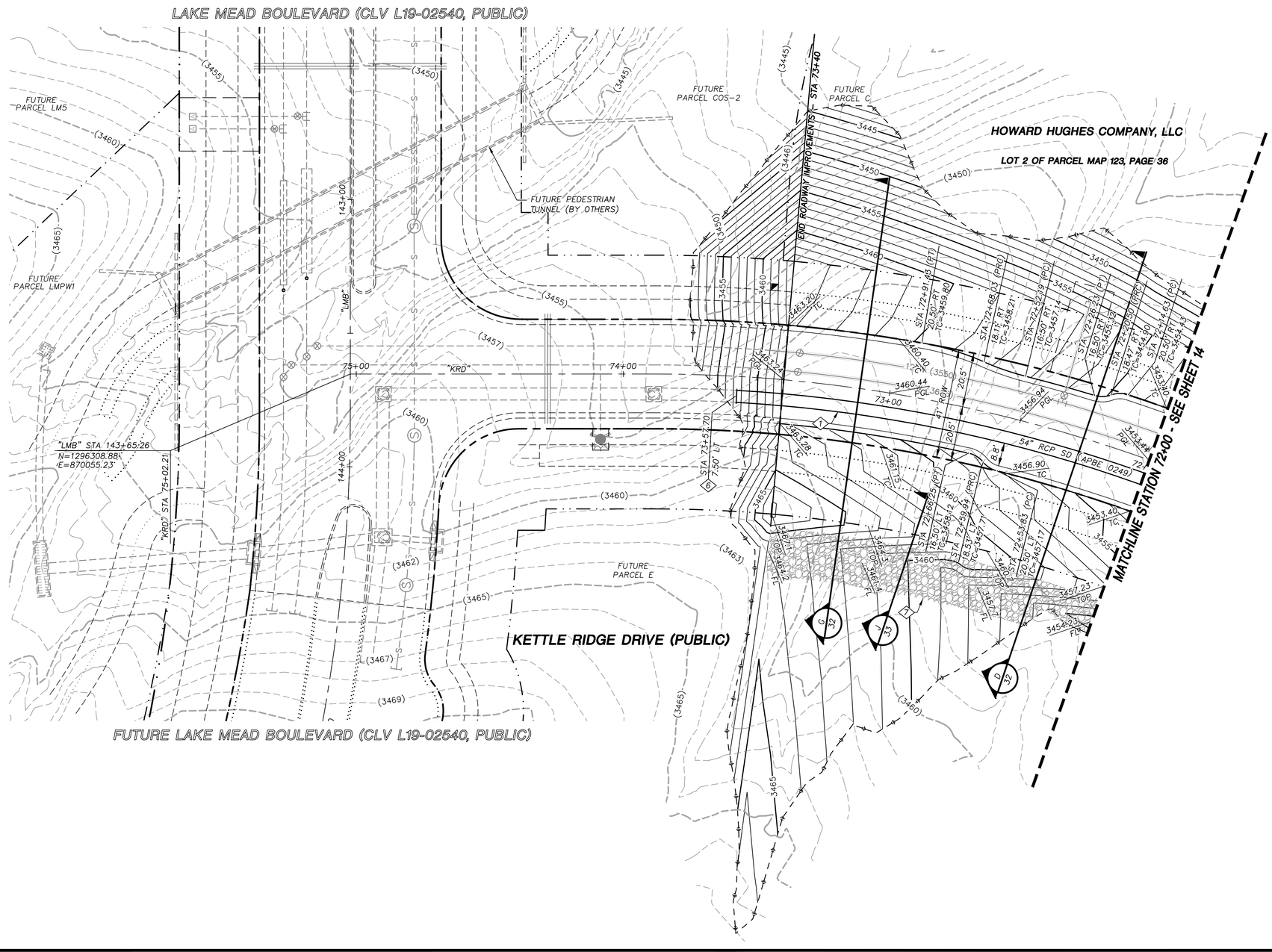
PROFESSIONAL ENGINEER – STATE OF NEVADA
PAUL A. BATES
No. 18723
CIVIL
2/25/20

JOB NO.	107/1808/L19-02315
DATE:	FEBRUARY, 2020
DRAWING NO.	11/43

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

100060655

X:\Projects\SummitWest\Village 22\100060655 – V22N Street J (Lake Mead to Street G)_Sheets\60655-13-GRAD-02.dwg LAYOUT: 11 Feb 25, 2020 – 2:14PM



STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 3 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 #405.2
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. INSTALL NDOT TYPE 2 DROP INLET PER NDOT R-4.2.1 (SEE SHEET 29)
6. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL (SEE SHEET 34)
7. INSTALL RIP-RAP (D50=8", THICKNESS=16") PER DETAIL H ON SHEET 32
8. INSTALL SD JUNCTION STRUCTURE
9. DIRECT CONNECTION INTO RCB SEE SHEET 34 FOR DETAIL
10. INSTALL TYPE I SD RISER PER CCAUSD #403.1
11. INSTALL TYPE "CM" DROP INLET PER CCAUSD #421 & #422
12. INSTALL PRECAST REINFORCED CONCRETE BOX PER NDOT STANDARD 502 AND 503 SEE SHEET 34 FOR RCB INFORMATION

REVISIONS				
REV.	DESCRIPTION	BY	DATE	APPROVAL

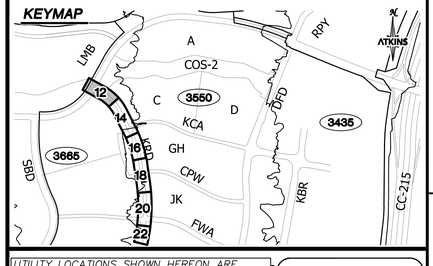
ATKINS
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ROADWAY GRADING PLAN
KETTLE RIDGE DRIVE STA. 72+00 TO END

KEYMAP



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

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT

PROJECT NO. 136892 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT. DS#5156

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 REGIONAL AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you Dig AVOID CUTTING HYDROCARBON UTILITY LINES. ITS COURTLY. Call 811 OR 1-800-642-2444

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

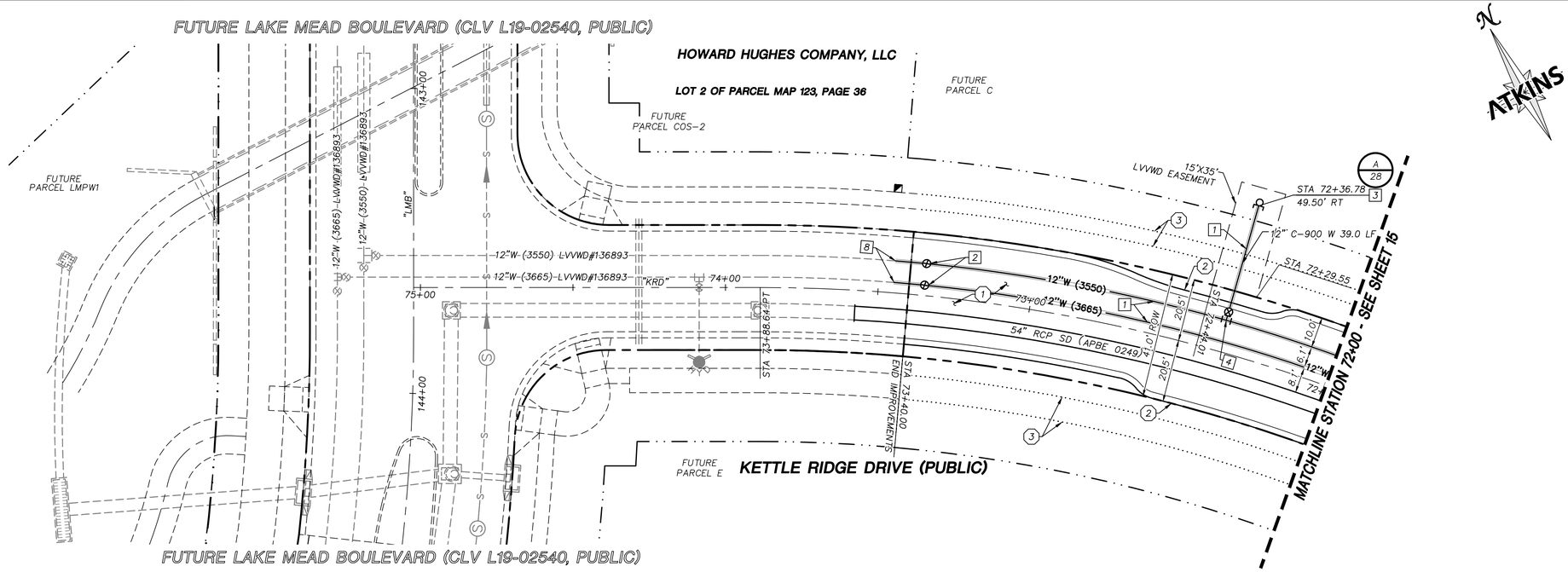
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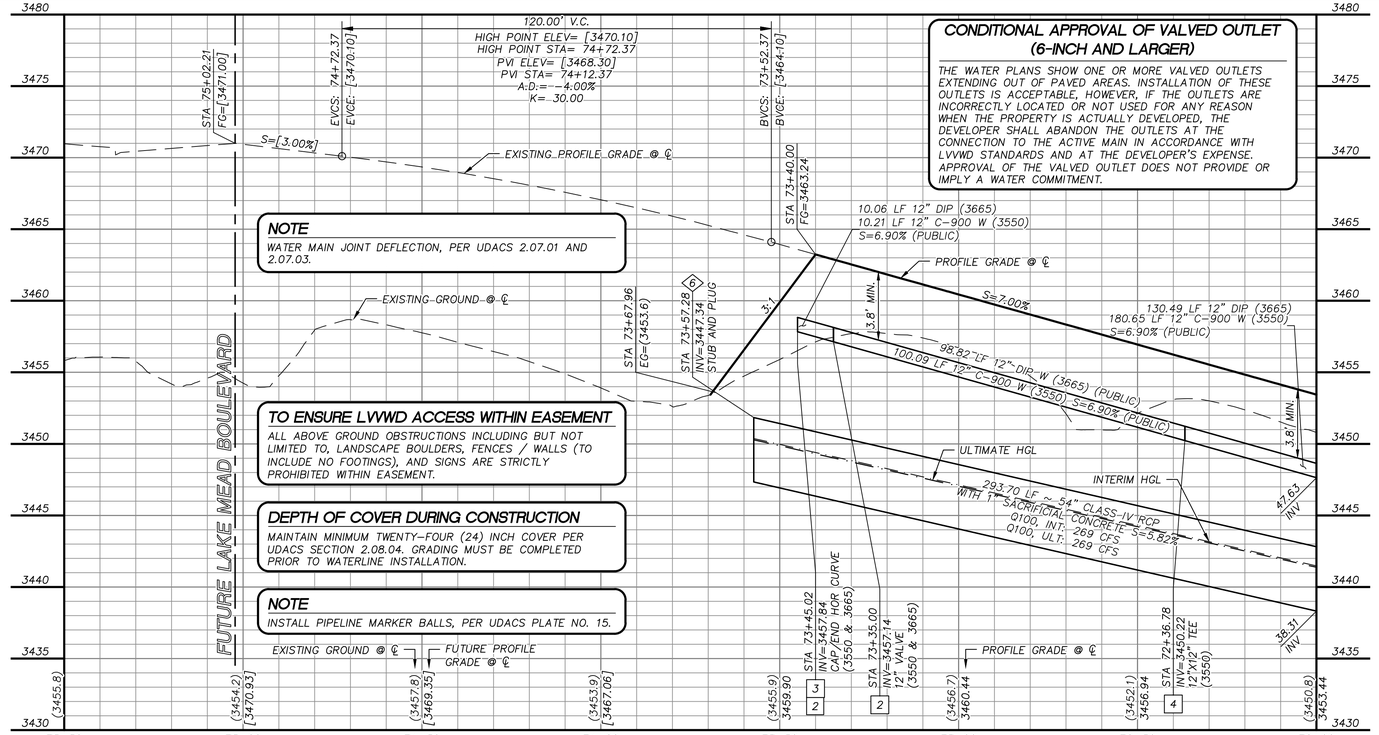
PROFESSIONAL ENGINEER STATE OF NEVADA PAUL A. BATES Exp. 12-31-20 CIVIL No. 18723 2/25/20

JOB NO.	10718097 L19-02515
DATE:	FEBRUARY, 2020
DRAWING NO.	12/43
DESIGNED BY:	N. BARCOS
DRAWN BY:	O. QUASSANI
CHECKED BY:	P. BATES
HORIZ.:	1"=20'
VERT.:	NONE

100060655

K:\Projects\SummWest\Village 22\100060655 - V22N Street J (Lake Mead to Street G)_Sheets\60655-09-GRAD-G1.dwg LAYOUT: 12 Feb 25, 2020 - 2:14PM





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

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

NOTE

WATER MAIN JOINT DEFLECTION, PER UDACS 2.07.01 AND 2.07.03.

TO ENSURE LVVWD ACCESS WITHIN EASEMENT

ALL ABOVE GROUND OBSTRUCTIONS INCLUDING BUT NOT LIMITED TO, LANDSCAPE BOULDERS, FENCES / WALLS (TO INCLUDE NO FOOTINGS), AND SIGNS ARE STRICTLY PROHIBITED WITHIN EASEMENT.

DEPTH OF COVER DURING CONSTRUCTION

MAINTAIN MINIMUM TWENTY-FOUR (24) INCH COVER PER UDACS SECTION 2.08.04. GRADING MUST BE COMPLETED PRIOR TO WATERLINE INSTALLATION.

NOTE

INSTALL PIPELINE MARKER BALLS, PER UDACS PLATE NO. 15.

GRAPHIC SCALE

20 0 10 20 40

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT

PROJECT NO. 136892 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT. DS#5156

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 ONE CALL AND ARIZONA BLUE STAKE 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. IT'S SCARY. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 3 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 #405.2
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12. INSTALL PRECAST REINFORCED CONCRETE BOX PER NDOT STANDARD 502 AND 503 SEE SHEET 34 FOR RCB INFORMATION

SEWER CONSTRUCTION NOTES

1. INSTALL SEWER MANHOLE WITH SINGLE 24" LID PER DCSWCS SD-1, SD-3, SD-4 PER 2019 DCSWCS 4TH EDITION
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).

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 CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
4. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, AND #39 (PER UDACS PLATE #31 FOR C900 JOINTS, PER UDACS 2.15 AND RESTRAINT JOINTS TABLE ON SHEET 9 FOR DIP JOINTS)
5. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #39, AND #40. (PER UDACS PLATE #31 FOR C900 JOINTS, PER UDACS 2.15 AND RESTRAINT JOINTS TABLE ON SHEET 9 FOR DIP JOINTS)
6. INSTALL DEFLECTION AT PIPE JOINTS (MAXIMUM OF 1°)
7. INSTALL 1.5" METER WITH RPPA PER UDACS PLATES #4 AND #8 OR INSTALL 6" STUB WITH 3' MINIMUM CLEARANCE ON ALL SIDES
8. CONNECT TO EXISTING 12" WATERLINE
9. INSTALL STEEL SLEEVE PER UDACS PLATES #22 AND #23

ROADWAY CONSTRUCTION NOTES

1. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 32 FOR TYPICAL PAVEMENT SECTION.
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN R-5.2.1.
5. CONSTRUCT 0" FLUSH CURB
6. TRANSITION CURB FROM FULL HEIGHT (6") TO FLUSH (0")
7. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4",1-6") PER DETAIL C ON SHEET 38.

KEYMAP



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PROFESSIONAL ENGINEER - STATE OF NEVADA - PAUL BATES - No. 18723 - CIVIL - 2/25/20

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

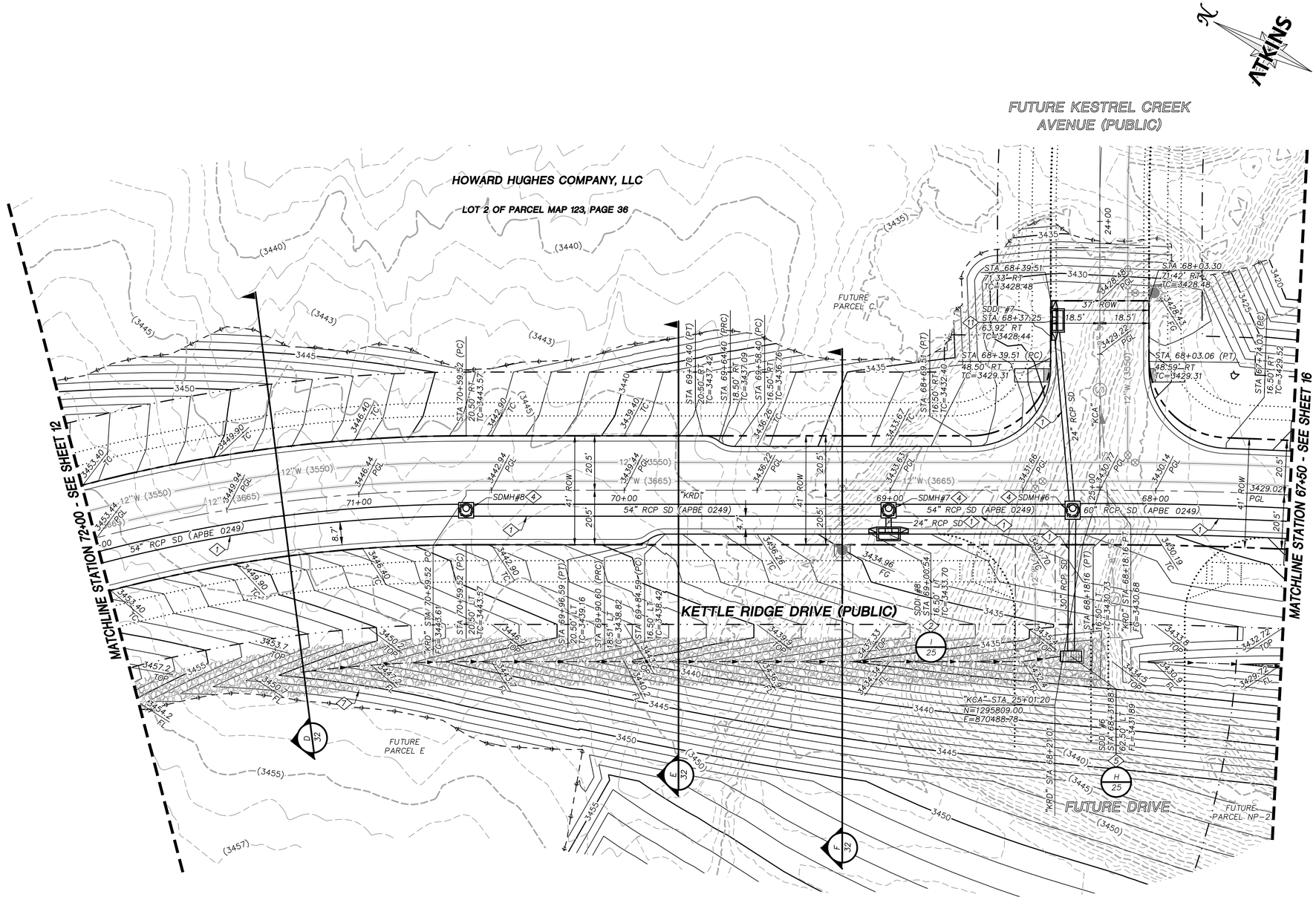
SUMMERLIN VILLAGE 22
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ROADWAY PLAN AND PROFILE
KETTLE RIDGE DRIVE STA. 72+00 TO END

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

JOB NO. 10748087 L19-02516
DATE: FEBRUARY, 2020
DRAWING NO. 13/43
100060655

X:\Projects\SummitWest\Village 22\100060655 - Y22N Street J (Lake Mead to Street G)_Sheets\60655-11-PLAN-P1.dwg LAYOUT: 13 Feb 25, 2020 - 2:14PM



STORM DRAIN CONSTRUCTION NOTES

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

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT

PROJECT NO. 136892 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

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PROFESSIONAL ENGINEER - STATE OF NEVADA - PAUL BATES - Exp: 12-31-20 - CIVIL - No. 18723
2/25/20

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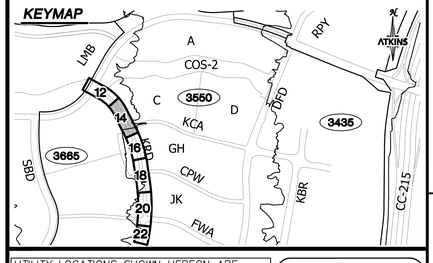
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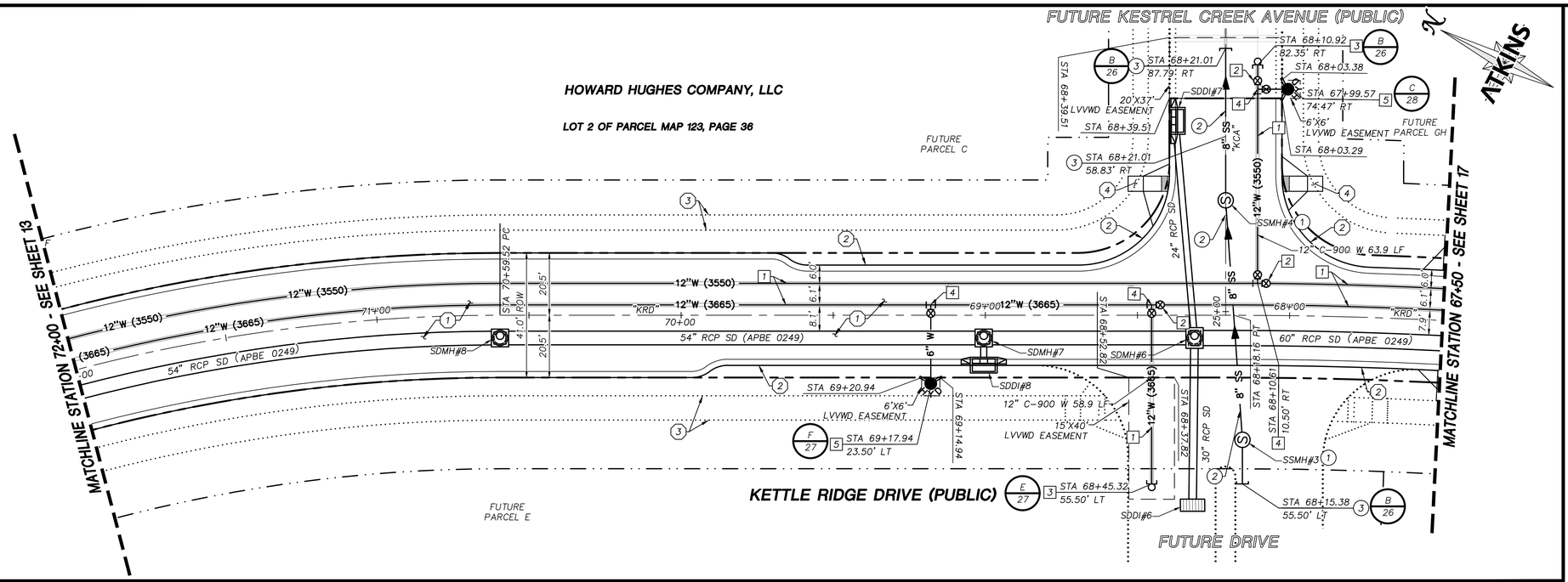
KEYMAP

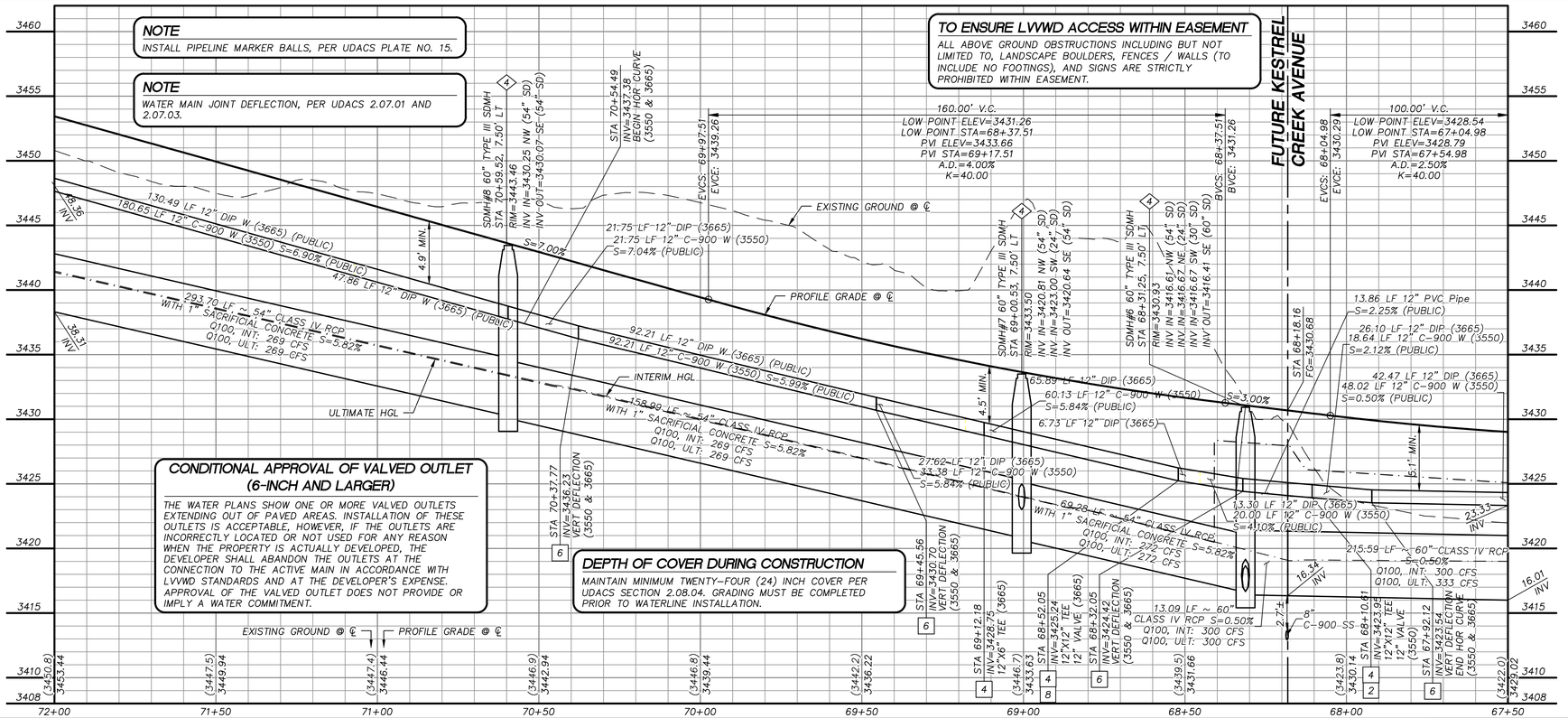


JOB NO.	1071/8087 L19-02515
DATE:	FEBRUARY, 2020
DRAWING NO.	14/43
	100060655

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

K:\Projects\SummitWest\Village 22\100060655 - Y22N Street J (Lake Mead to Street G)_Sheets\60655-09-GRAD-01.dwg LAYOUT: 14 Feb 25, 2020 - 2:14PM





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9. DIRECT CONNECTION INTO RCB SEE SHEET 34 FOR DETAIL
10. INSTALL TYPE I SD RISER PER CCAUSD #403.1
11. INSTALL TYPE "CM" DROP INLET PER CCAUSD #421 & #422
12. INSTALL PRECAST REINFORCED CONCRETE BOX PER NDOT STANDARD 502 AND 503 SEE SHEET 34 FOR RCB INFORMATION

SEWER CONSTRUCTION NOTES

1. INSTALL SEWER MANHOLE WITH SINGLE 24" LID PER DCSWCS SD-1, SD-3, SD-4 PER 2019 DCSWCS 4TH EDITION
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).

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 CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
4. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, AND #39 (PER UDACS PLATE #31 FOR C900 JOINTS, PER UDACS 2.15 AND RESTRAINT JOINTS TABLE ON SHEET 9 FOR DIP JOINTS)
5. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #39, AND #40. (PER UDACS PLATE #31 FOR C900 JOINTS, PER UDACS 2.15 AND RESTRAINT JOINTS TABLE ON SHEET 9 FOR DIP JOINTS)
6. INSTALL DEFLECTION AT PIPE JOINTS (MAXIMUM OF 1°)
7. INSTALL 1.5" METER WITH RPPA PER UDACS PLATES #4 AND #8 OR INSTALL 6" STUB WITH 3' MINIMUM CLEARANCE ON ALL SIDES
8. CONNECT TO EXISTING 12" WATERLINE
9. INSTALL STEEL SLEEVE PER UDACS PLATES #22 AND #23

ROADWAY CONSTRUCTION NOTES

1. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 32 FOR TYPICAL PAVEMENT SECTION.
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN R-5.2.1.
5. CONSTRUCT 0" FLUSH CURB
6. TRANSITION CURB FROM FULL HEIGHT (6") TO FLUSH (0")
7. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4",1-6") PER DETAIL C ON SHEET 38.

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

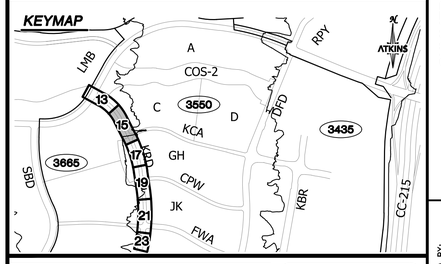
ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 22
KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

ROADWAY PLAN AND PROFILE
KETTLE RIDGE DRIVE STA. 67+50 TO STA. 72+00

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
PAUL A. BATES
Exp. 12-31-20
CIVIL
No. 18723
2/25/20

GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"=20'
5 0 2.5 5 10
VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION
LAS VEGAS VALLEY WATER DISTRICT
PROJECT NO. 136892 FIRST APPROVED DATE: _____
LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION
PAUL A. BATES PE#18723 DATE
CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.
DS#5156

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

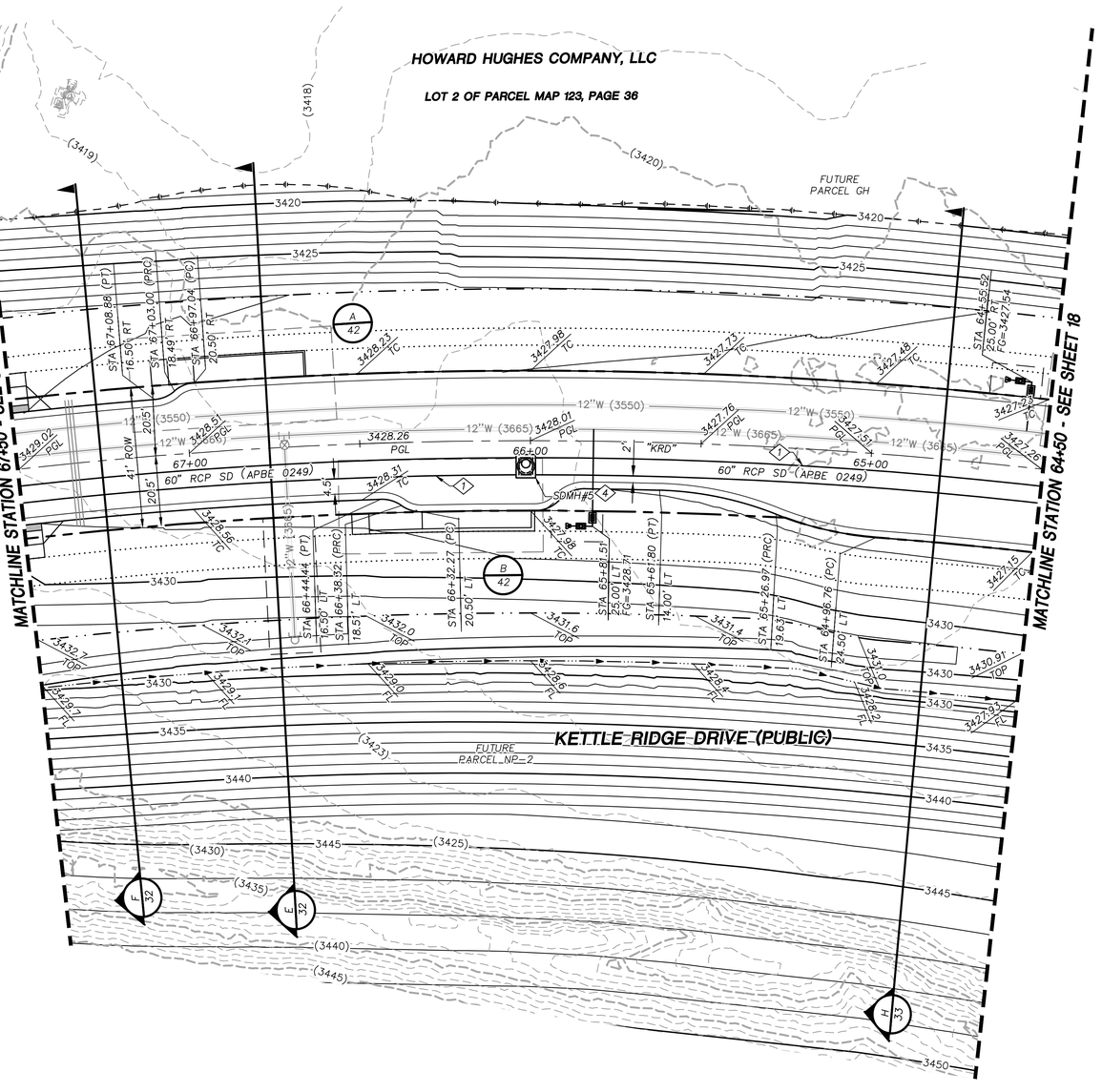
FAST Call before you UnderGround 1-702-432-5300 EMERGENCY AND NOTIFICATION SYSTEM OF TRANSPORTATION
Call before you Dig AVOID CUTTING UNDERGROUND UTILITY LINES, ITS QUICK! Call 811 OR 1-800-642-2444
AVOID HITTING OVERHEAD POWER LINES, ITS QUICK! CALL BEFORE YOU DIG OVERHEAD 1-702-227-2929

JOB NO.	107V0087 L19-02516
DATE	FEBRUARY, 2020
DRAWING NO.	15/43

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

100060655

X:\Projects\SummitWest\Village 22\100060655 - V22N Street J (Lake Mead to Street G)_Sheets\60655-11-PLAN-P1.dwg LAYOUT: 15 Feb 25, 2020 - 2:15PM



STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 3 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 #405.2
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. INSTALL NDOT TYPE 2 DROP INLET PER NDOT R-4.2.1 (SEE SHEET 29)
6. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL (SEE SHEET 34)
7. INSTALL RIP-RAP (D50=8", THICKNESS=16") PER DETAIL H ON SHEET 32
8. INSTALL SD JUNCTION STRUCTURE
9. DIRECT CONNECTION INTO RCB SEE SHEET 34 FOR DETAIL
10. INSTALL TYPE I SD RISER PER CCAUSD #403.1
11. INSTALL TYPE "CM" DROP INLET PER CCAUSD #421 & #422
12. INSTALL PRECAST REINFORCED CONCRETE BOX PER NDOT STANDARD 502 AND 503 SEE SHEET 34 FOR RCB INFORMATION

REVISIONS			
REV.	DESCRIPTION	BY	DATE	APPROVAL

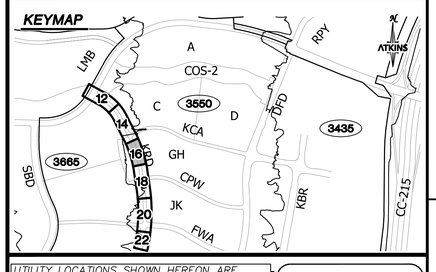
ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 22
KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

ROADWAY GRADING PLAN
KETTLE RIDGE DRIVE STA. 64+50 TO STA. 67+50

KEYMAP



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

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT

PROJECT NO. 136892 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

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

DS#5156

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 UNDERGROUND UTILITY LINES. IT'S COURTLY. Call 811 OR 1-800-642-2444

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

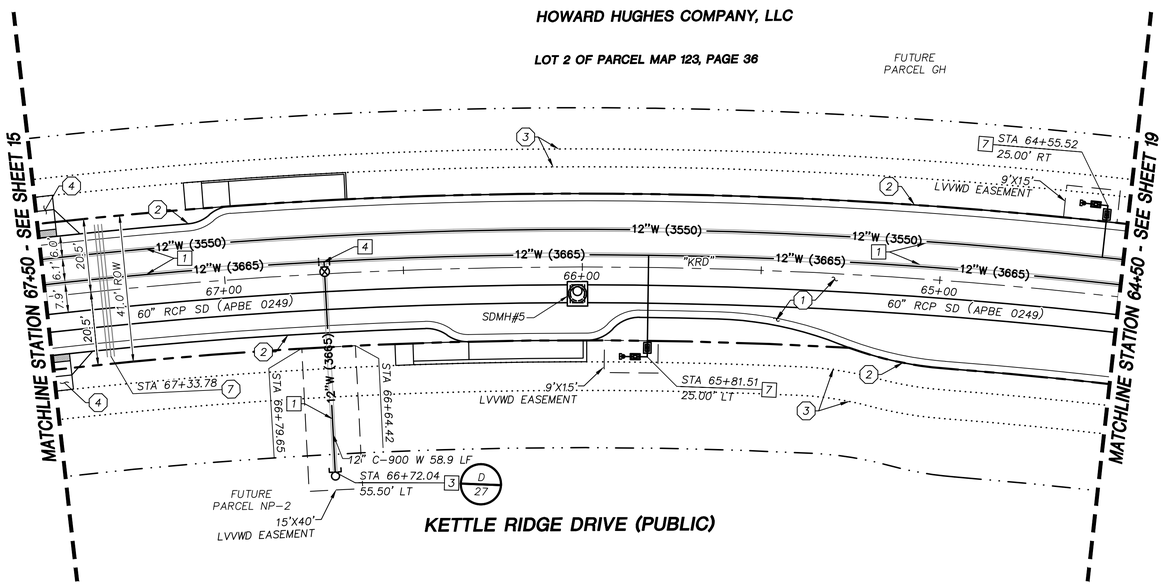
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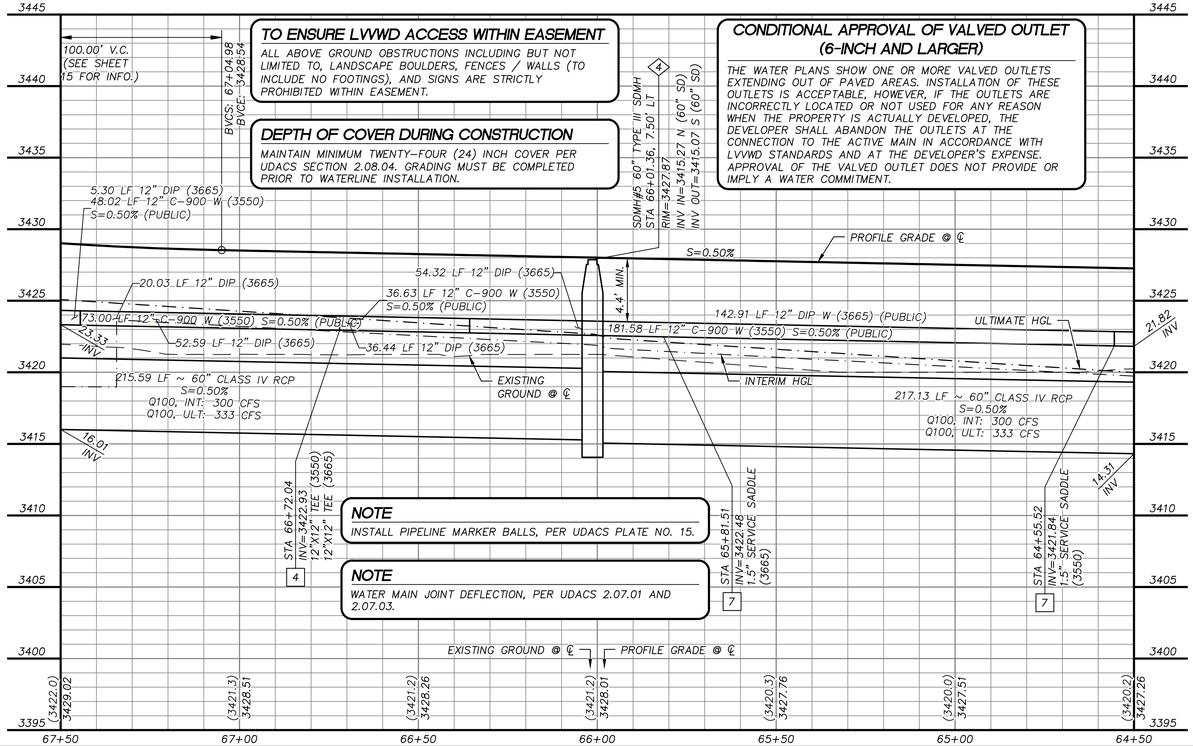
PROFESSIONAL ENGINEER - STATE OF NEVADA
PAUL A. BATES
Exp. 12-31-20
CIVIL
No. 18723
2/25/20

JOB NO.	107/8087 L19-02315
DATE:	FEBRUARY, 2020
DRAWING NO.	16/43
DESIGNED BY:	N. BARCOS
DRAWN BY:	O. QUASSANI
CHECKED BY:	P. BATES
HORIZ.:	1"=20'
VERT.:	NONE

100060655

K:\Projects\SummitWest\Village 22\100060655 - V22N Street J (Lake Mead to Street G)_Sheets\60655-09-GRAD-01.dwg LAYOUT: 16 Feb 25, 2020 - 2:15PM





GRAPHIC SCALE

20 0 10 20 40

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT

PROJECT NO. 136892 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT. DS#5156

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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 CLARK COUNTY REGIONAL AND INTERSTATE SYSTEMS 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. IT'S COSTLY. CALL BEFORE YOU DO OVERHEAD 1-702-227-2929

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 3 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 #405.2
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. INSTALL NDOT TYPE 2 DROP INLET PER NDOT R-4.2.1 (SEE SHEET 29)
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7. INSTALL RIP-RAP (D50=8", THICKNESS=16") PER DETAIL H ON SHEET 32
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9. DIRECT CONNECTION INTO RCB SEE SHEET 34 FOR DETAIL
10. INSTALL TYPE I SD RISER PER CCAUSD #403.1
11. INSTALL TYPE "CM" DROP INLET PER CCAUSD #421 & #422
12. INSTALL PRECAST REINFORCED CONCRETE BOX PER NDOT STANDARD 502 AND 503 SEE SHEET 34 FOR RCB INFORMATION

SEWER CONSTRUCTION NOTES

1. INSTALL SEWER MANHOLE WITH SINGLE 24" LID PER DCSWCS SD-1, SD-3, SD-4 PER 2019 DCSWCS 4TH EDITION
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).

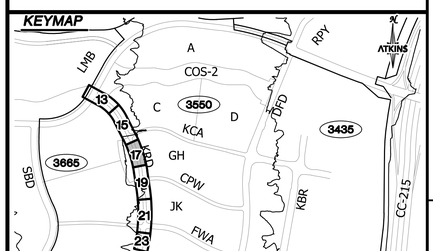
WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN PER UDACS PLATES #17 AND PLATE #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
4. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, AND #39 (PER UDACS PLATE #31 FOR C900 JOINTS, PER UDACS 2.15 AND RESTRAINT JOINTS TABLE ON SHEET 9 FOR DIP JOINTS)
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6. INSTALL DEFLECTION AT PIPE JOINTS (MAXIMUM OF 1°)
7. INSTALL 1.5" METER WITH RPPA PER UDACS PLATES #4 AND #8 OR INSTALL 6" STUB WITH 3' MINIMUM CLEARANCE ON ALL SIDES
8. CONNECT TO EXISTING 12" WATERLINE
9. INSTALL STEEL SLEEVE PER UDACS PLATES #22 AND #23

ROADWAY CONSTRUCTION NOTES

1. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 32 FOR TYPICAL PAVEMENT SECTION.
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN R-5.2.1.
5. CONSTRUCT 0" FLUSH CURB
6. TRANSITION CURB FROM FULL HEIGHT (6") TO FLUSH (0")
7. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4",1-6") PER DETAIL C ON SHEET 38.

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 - PAUL BATES - No. 18723 - CIVIL - 2/25/20

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN VILLAGE 22

KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

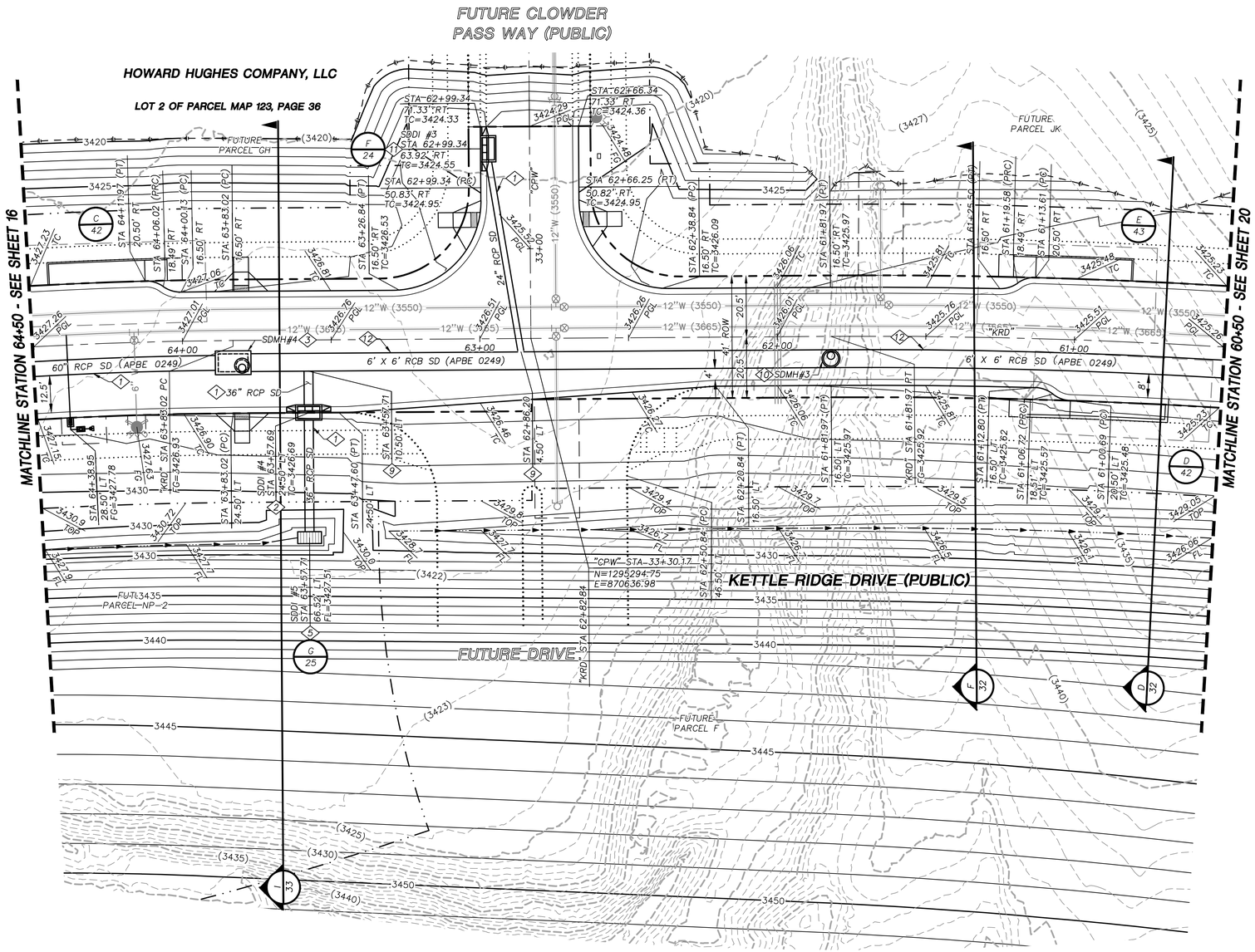
ROADWAY PLAN AND PROFILE
KETTLE RIDGE DRIVE STA. 64+50 TO STA. 67+50

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

JOB NO. 10718087 L19-02516
DATE: FEBRUARY, 2020
DRAWING NO. 17/43

100060655

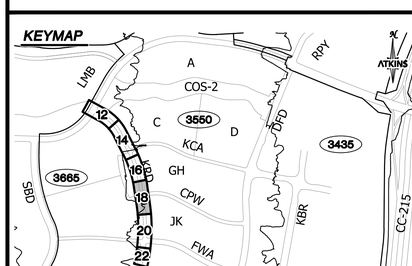
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STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 3 FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
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12. INSTALL PRECAST REINFORCED CONCRETE BOX PER NDOT STANDARD 502 AND 503 SEE SHEET 34 FOR RCB INFORMATION

REVISIONS			
REV.	DESCRIPTION	BY	DATE	APPROVAL



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

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT

PROJECT NO. 136892 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT. DS#5156

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)
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T21S,R59E,S03

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

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PROFESSIONAL ENGINEER - STATE OF NEVADA - PAUL A. BATES - EXP: 12-31-20 - CIVIL - No. 18723 - 2/25/20

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

SUMMERLIN

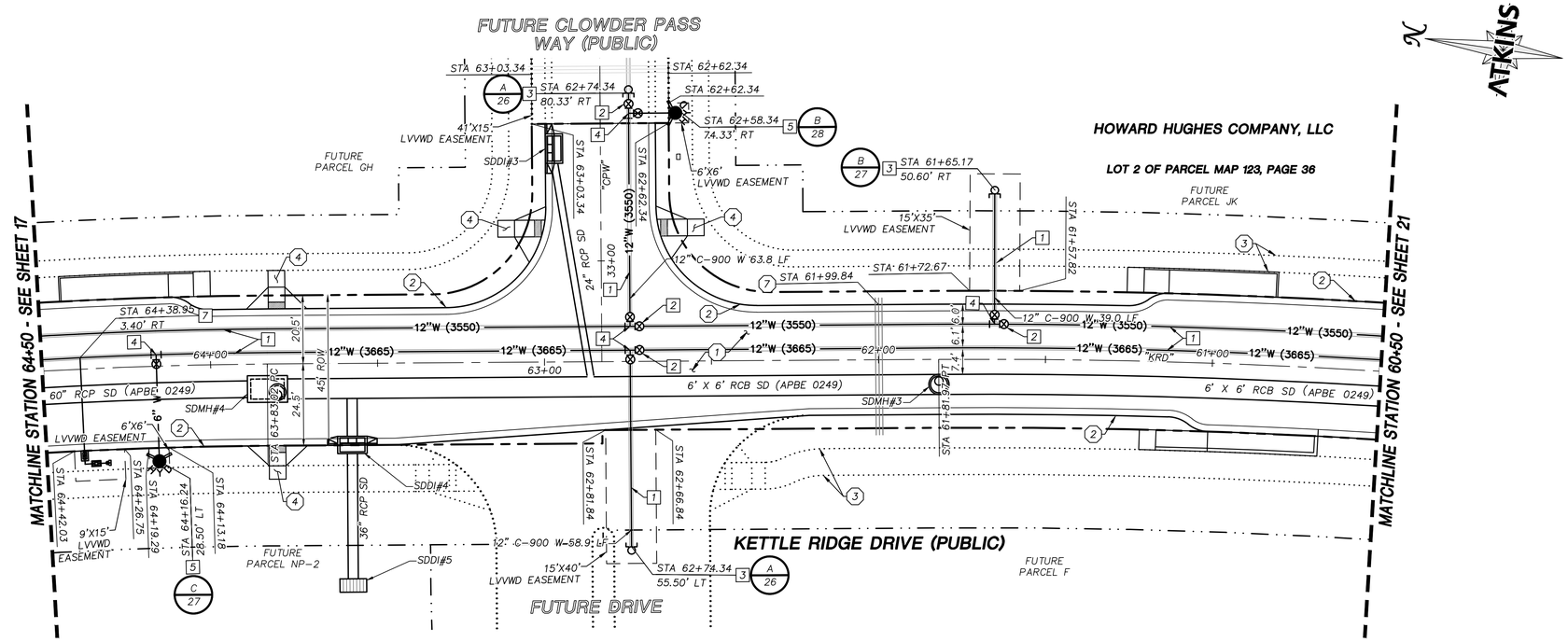
SUMMERLIN VILLAGE 22
KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

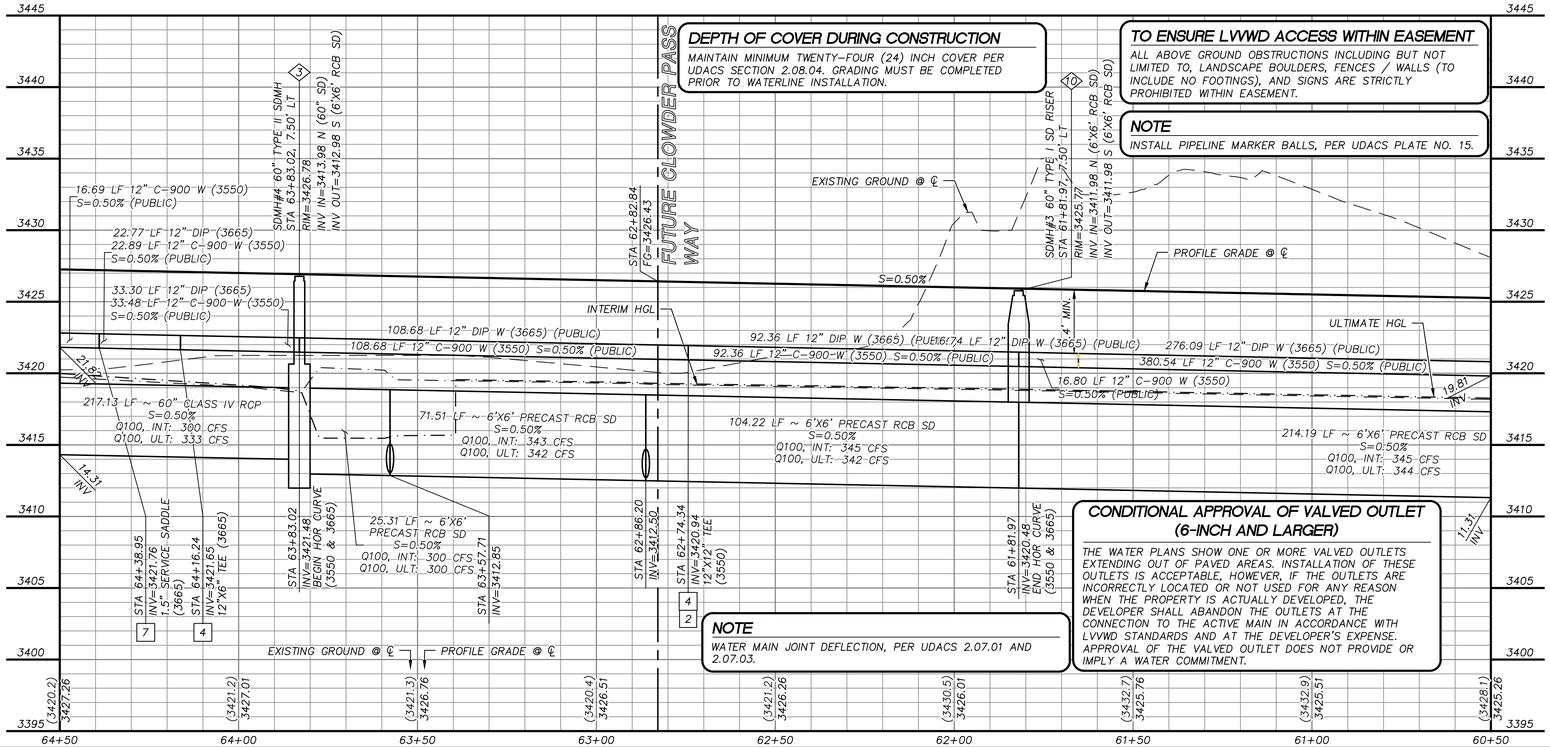
ROADWAY GRADING PLAN
KETTLE RIDGE DRIVE STA. 60+50 TO STA. 64+50

JOB NO.	10719097 L19-02315
DATE:	FEBRUARY, 2020
DRAWING NO.	18/43
DESIGNED BY:	N. BARCOS
DRAWN BY:	O. QUASSANI
CHECKED BY:	P. BATES
HORIZ.:	1"=20'
VERT.:	NONE

100060655

X:\Projects\SummitWest\Village 22\100060655 - Y22N Street J (Lake Mead to Street G)_Sheets\60655-09-GRAD-G1.dwg LAYOUT: 18 Feb 25, 2020 - 2:16PM





GRAPHIC SCALE

20 0 10 20 40

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT

PROJECT NO. 136892 FIRST APPROVED DATE: _____

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PAUL A. BATES PE#18723 DATE

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

DS#5156

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

BENCHMARK

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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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SEWER CONSTRUCTION NOTES

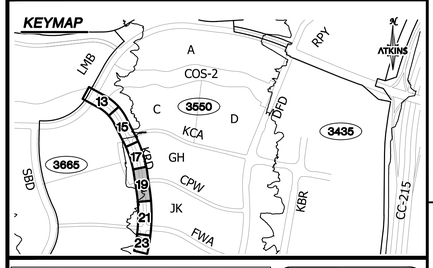
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2. INSTALL SEWER MAIN PER DCSWCS SD-17
3. STUB AND CAP SEWER PIPE. PLACE 4"X4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).

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 CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
4. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, AND #39 (PER UDACS PLATE #31 FOR C900 JOINTS, PER UDACS 2.15 AND RESTRAINT JOINTS TABLE ON SHEET 9 FOR DIP JOINTS)
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9. INSTALL STEEL SLEEVE PER UDACS PLATES #22 AND #23

ROADWAY CONSTRUCTION NOTES

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4. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN R-5.2.1.
5. CONSTRUCT 0" FLUSH CURB
6. TRANSITION CURB FROM FULL HEIGHT (6") TO FLUSH (0")
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PROFESSIONAL ENGINEER-STATE OF NEVADA PAUL A. BATES EXP: 12-31-20 CIVIL No. 18723 2/25/20

REVISIONS			
REV.	DESCRIPTION	BY	DATE

APPROVAL

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

SUMMERLIN

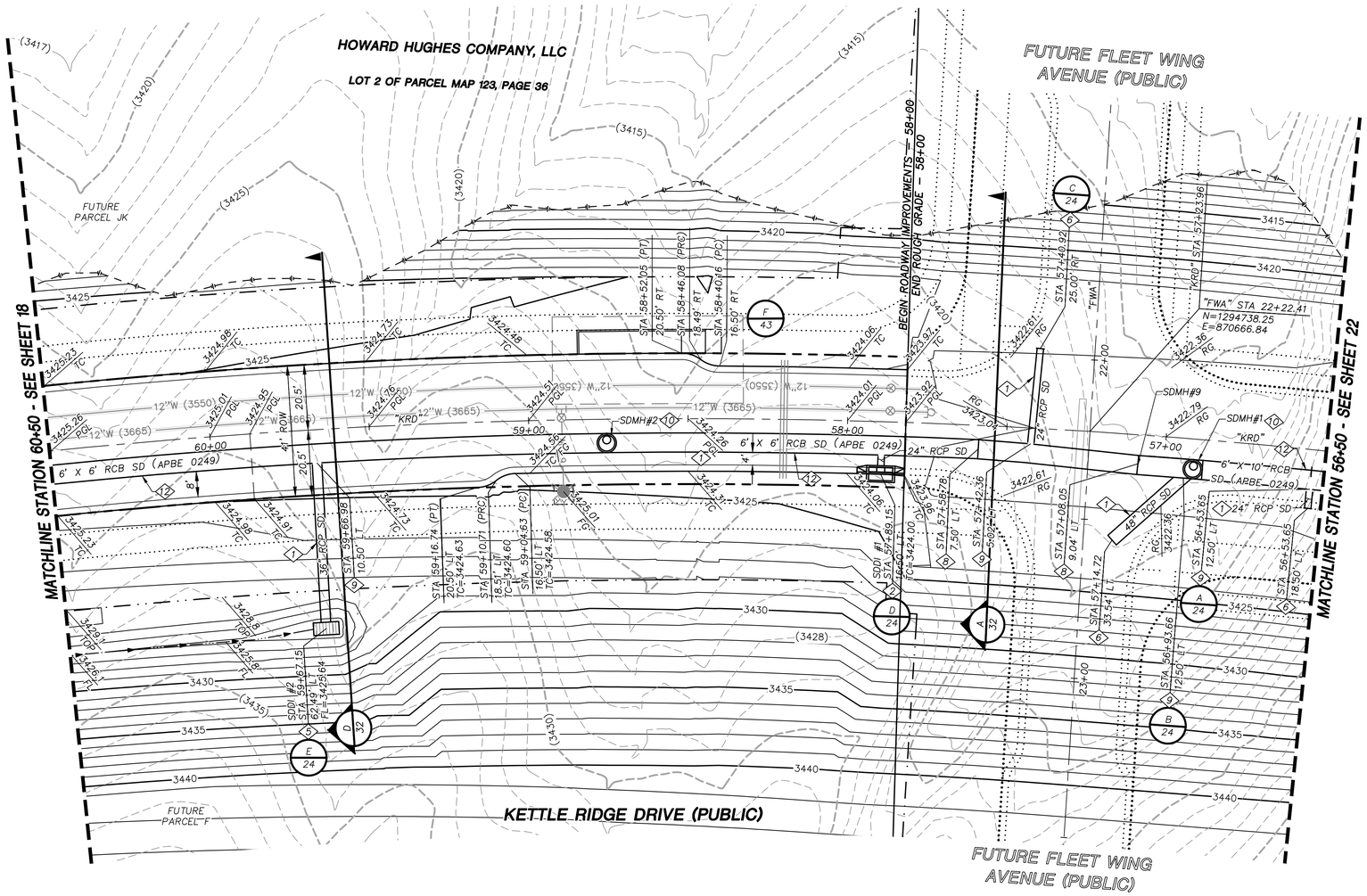
SUMMERLIN VILLAGE 22
KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

ROADWAY PLAN AND PROFILE
KETTLE RIDGE DRIVE STA. 60+50 TO STA. 64+50

DESIGNED BY:	N. BARCOS
DRAWN BY:	O. QUASSANI
CHECKED BY:	P. BATES
HORIZ.:	1"=20'
VERT.:	1"=5'
JOB NO.	107/8087 L19-02315
DATE:	FEBRUARY, 2020
DRAWING NO.	19/43

100060655

X:\Projects\SummWest\Village 22\100060655 - V22N Street J (Lake Mead to Street G)_Sheets\60655-11-PLAN-P1.dwg LAYOUT: 19 Feb 25, 2020 - 2:16PM

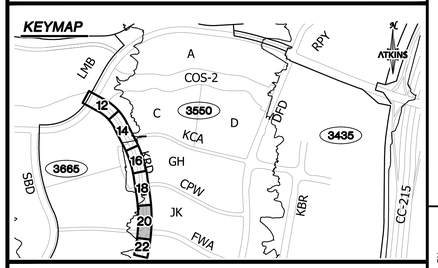


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REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL



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

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT

PROJECT NO. 136892 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

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

DS#5156

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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PROFESSIONAL ENGINEER - STATE OF NEVADA - PAUL A. BATES - Exp. 12-31-20 - CIVIL - No. 18723 - 2/25/20

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7375
Fax: +1.702.263.7200

SUMMERLIN

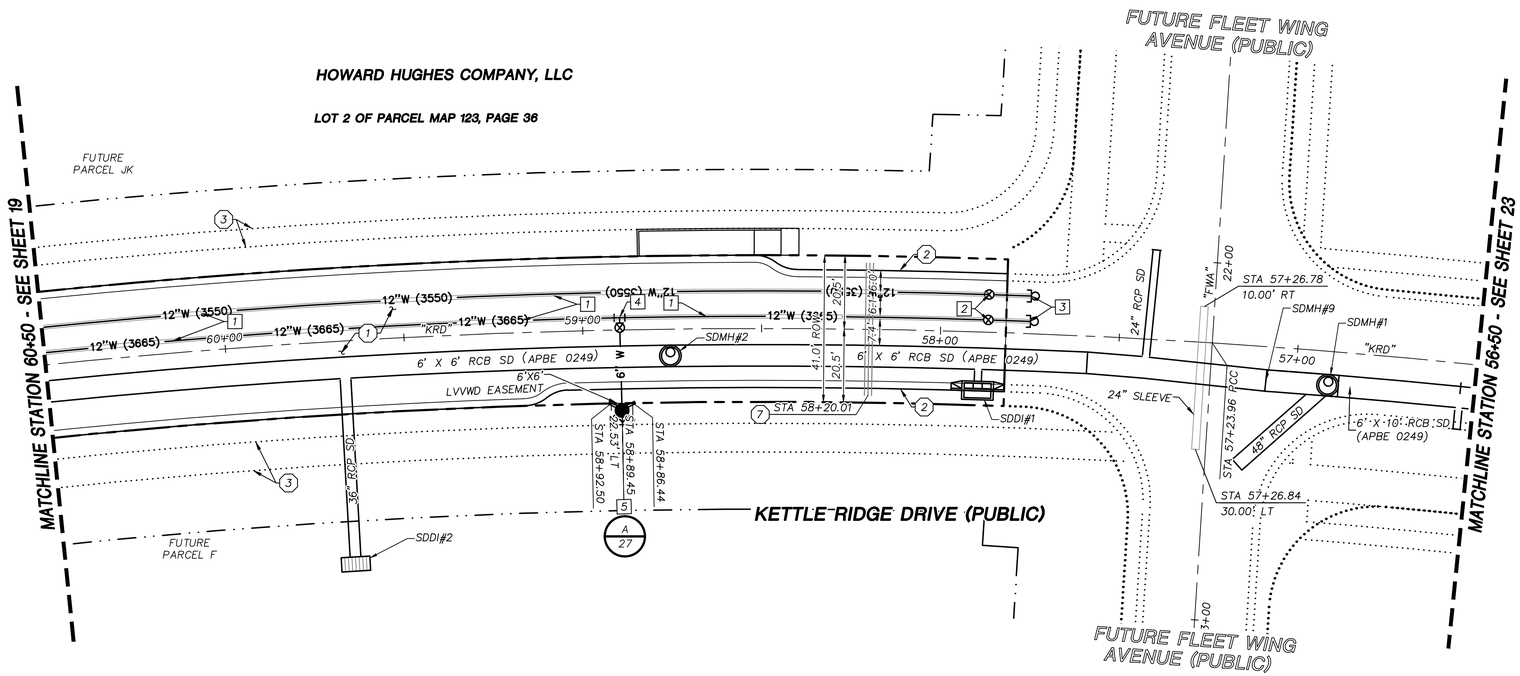
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ROADWAY GRADING PLAN
KETTLE RIDGE DRIVE STA. 56+50 TO STA. 60+50

JOB NO.	10719087 L19-02315
DATE:	FEBRUARY, 2020
DRAWING NO.	20/43
	100060655

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

X:\Projects\SummitWest\Village 22\100060655 - V22N Street J (Lake Mead to Street G)_Sheets\60655-09-GRAD-01.dwg LAYOUT: 20 Feb 25, 2020 - 2:16PM



3440

TO ENSURE LVVWD ACCESS WITHIN EASEMENT

ALL ABOVE GROUND OBSTRUCTIONS INCLUDING BUT NOT LIMITED TO, LANDSCAPE BOULDERS, FENCES / WALLS (TO INCLUDE NO FOOTINGS), AND SIGNS ARE STRICTLY PROHIBITED WITHIN EASEMENT.

NOTE

INSTALL PIPELINE MARKER BALLS, PER UDACS PLATE NO. 15.

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

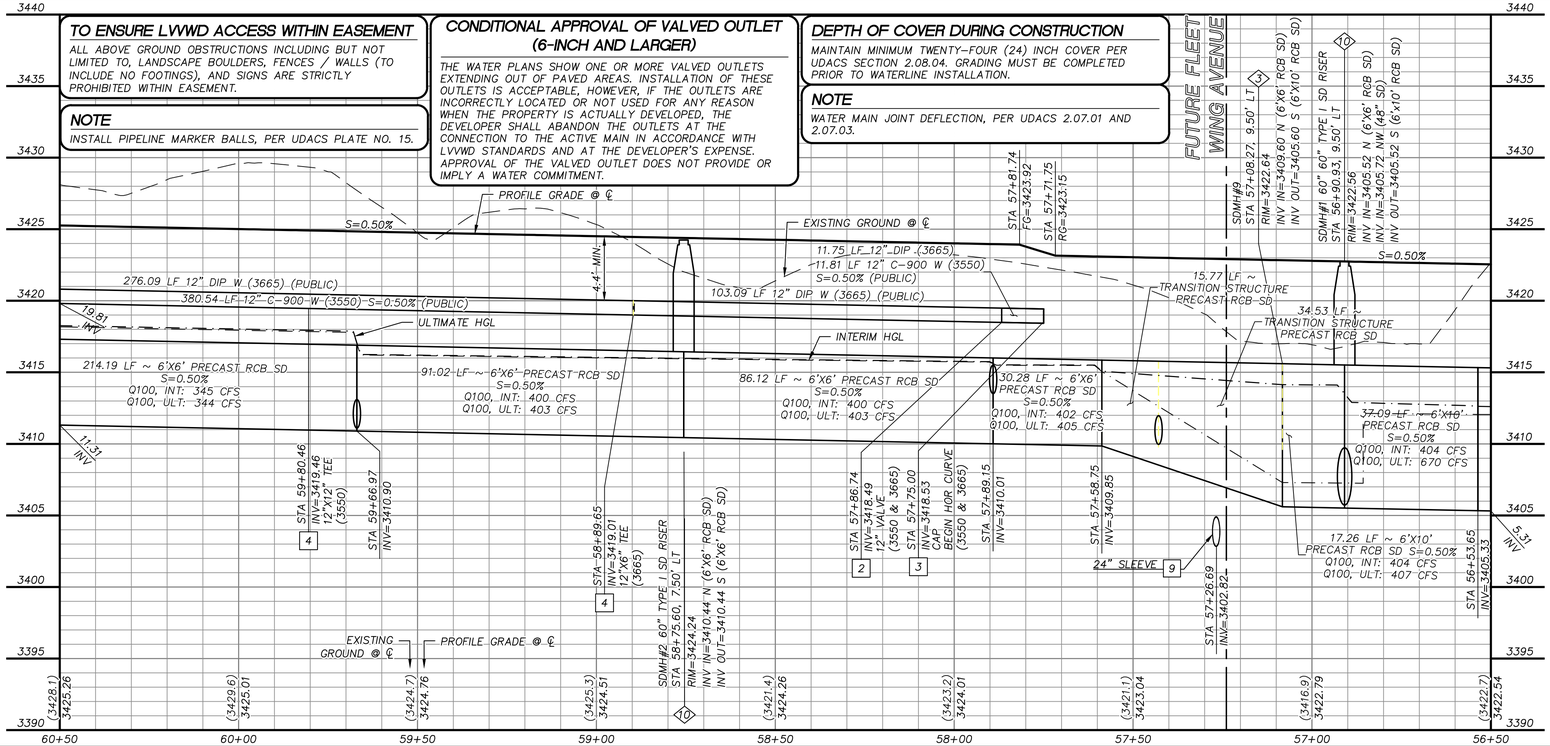
THE WATER PLANS SHOW ONE OR MORE VALVED OUTLETS EXTENDING OUT OF PAVED AREAS. INSTALLATION OF THESE OUTLETS IS ACCEPTABLE, HOWEVER, IF THE OUTLETS ARE INCORRECTLY LOCATED OR NOT USED FOR ANY REASON WHEN THE PROPERTY IS ACTUALLY DEVELOPED, THE DEVELOPER SHALL ABANDON THE OUTLETS AT THE CONNECTION TO THE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

DEPTH OF COVER DURING CONSTRUCTION

MAINTAIN MINIMUM TWENTY-FOUR (24) INCH COVER PER UDACS SECTION 2.08.04. GRADING MUST BE COMPLETED PRIOR TO WATERLINE INSTALLATION.

NOTE

WATER MAIN JOINT DEFLECTION, PER UDACS 2.07.01 AND 2.07.03.



GRAPHIC SCALE

20 0 10 20 40

HORIZONTAL: 1"=20'

5 0 2.5 5 10

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT

PROJECT NO. 136892 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

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PAUL A. BATES PE#18723 DATE

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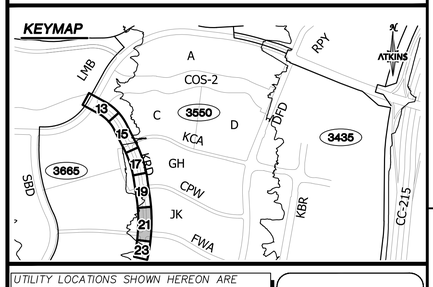
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4. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN R-5.2.1.
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PROFESSIONAL ENGINEER - STATE OF NEVADA - PAUL A. BATES - No. 18723 - CIVIL - 2/25/20

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

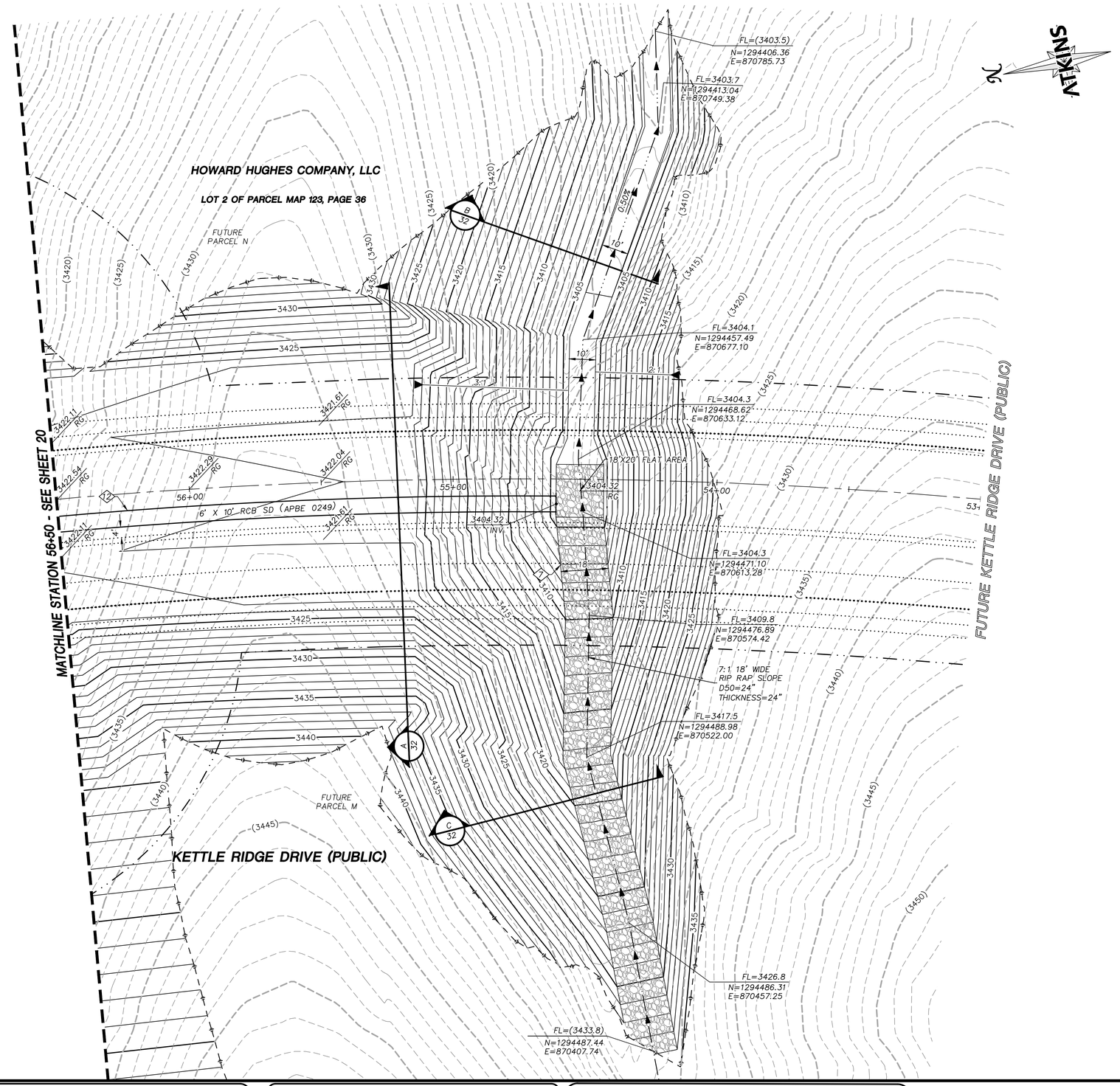
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ROADWAY PLAN AND PROFILE
KETTLE RIDGE DRIVE STA. 56+50 TO STA. 60+50

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

JOB NO. 107/180F, L19-02315
DATE: FEBRUARY, 2020
DRAWING NO. 21/43
100060655

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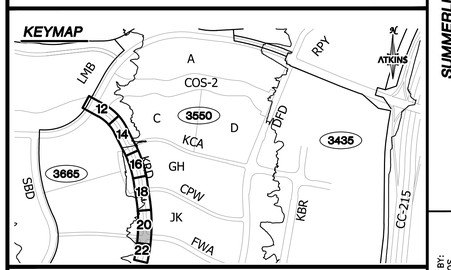
ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7275
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 22
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ROADWAY GRADING PLAN
KETTLE RIDGE DRIVE BEGIN TO STA. 56+50

KEYMAP



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

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT

PROJECT NO. 136892 FIRST APPROVED DATE: _____

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PAUL A. BATES PE#18723 DATE

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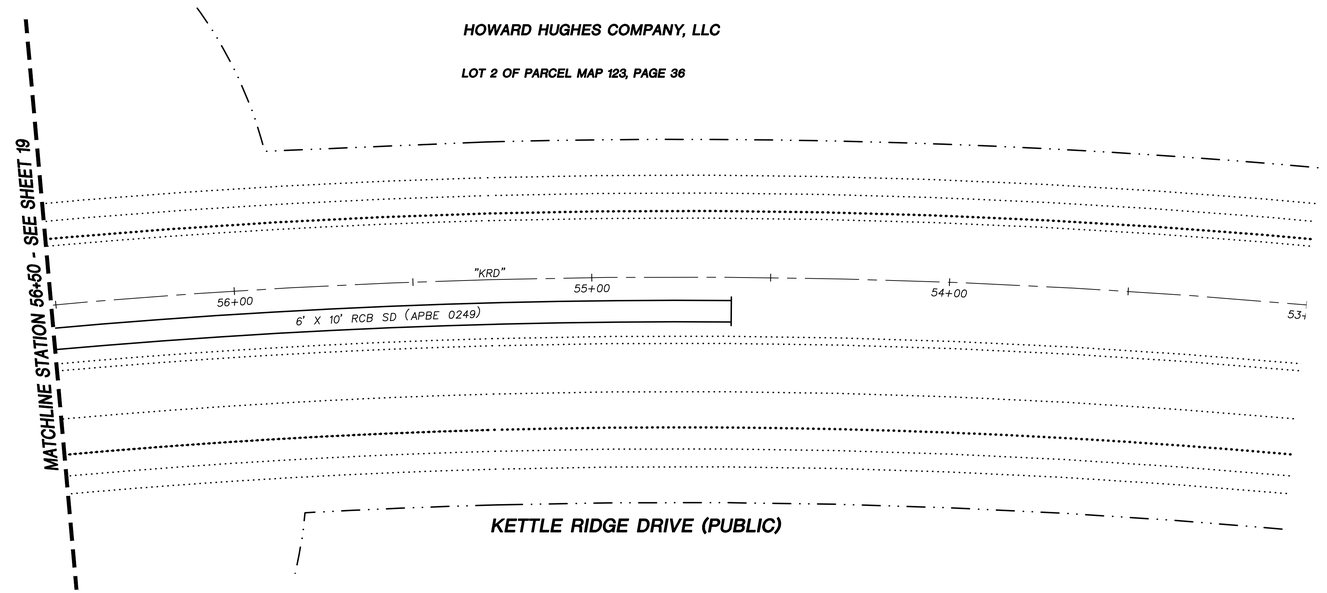
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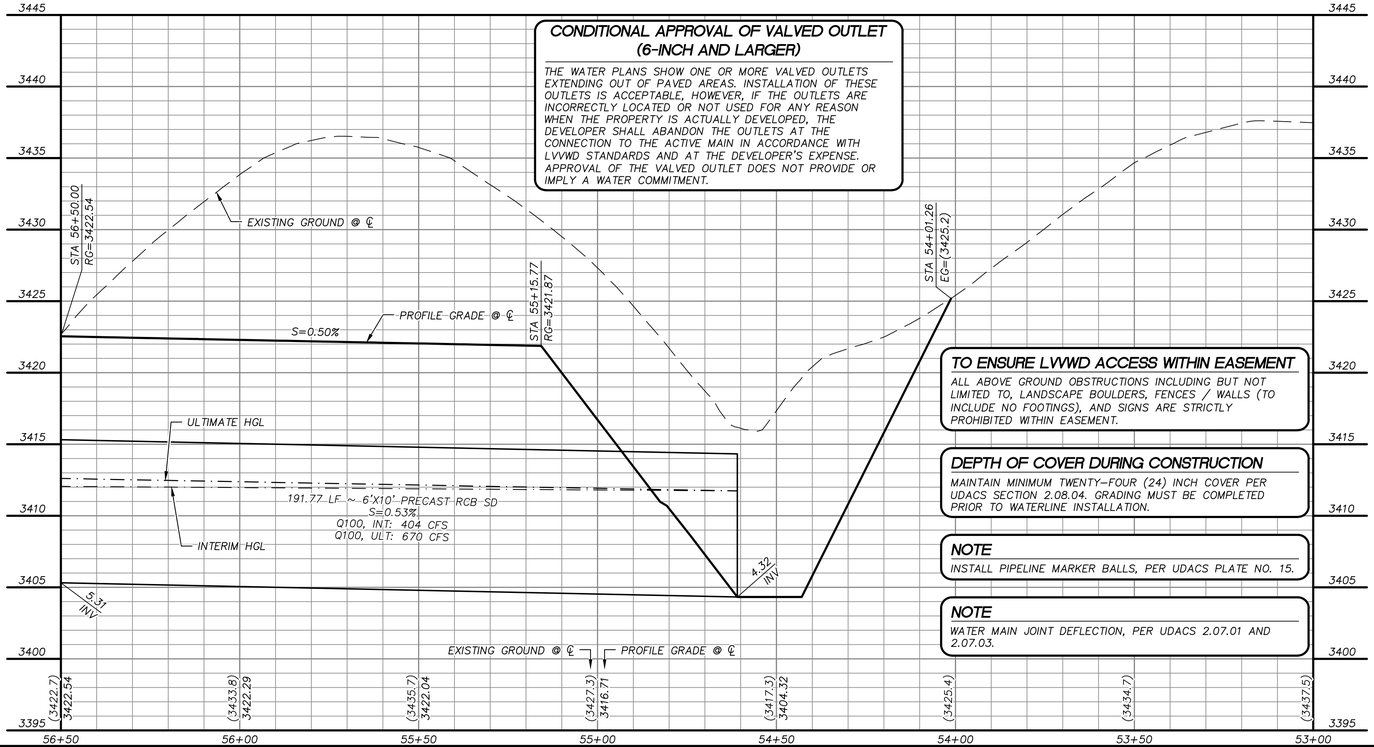
PROFESSIONAL ENGINEER - STATE OF NEVADA - PAUL A. BATES - Exp. 12-31-20 - CIVIL - No. 18723 - 2/25/20

JOB NO.	107V1897 L19-02315
DATE:	FEBRUARY, 2020
DRAWING NO.	22/43
DESIGNED BY:	N. BARCOS
DRAWN BY:	O. QUASSANI
CHECKED BY:	P. BATES
HORIZ.:	1"=20'
VERT.:	NONE

100060655

X:\Projects\SummWest\Village 22\100060655 - V22N Street J (Lake Mead to Street G)_Sheets\60655-09-GRAD-01.dwg LAYOUT: 22 Feb 25, 2020 - 2:17PM





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

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

TO ENSURE LVVWD ACCESS WITHIN EASEMENT

ALL ABOVE GROUND OBSTRUCTIONS INCLUDING BUT NOT LIMITED TO, LANDSCAPE BOULDERS, FENCES / WALLS (TO INCLUDE NO FOOTINGS), AND SIGNS ARE STRICTLY PROHIBITED WITHIN EASEMENT.

DEPTH OF COVER DURING CONSTRUCTION

MAINTAIN MINIMUM TWENTY-FOUR (24) INCH COVER PER UDACS SECTION 2.08.04. GRADING MUST BE COMPLETED PRIOR TO WATERLINE INSTALLATION.

NOTE

INSTALL PIPELINE MARKER BALLS, PER UDACS PLATE NO. 15.

NOTE

WATER MAIN JOINT DEFLECTION, PER UDACS 2.07.01 AND 2.07.03.

GRAPHIC SCALE

HORIZONTAL: 1"=20'

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT

PROJECT NO. 136892 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

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

DS#5156

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 OUTAGES, INJURIES OR 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

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 3 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 #405.2
4. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
5. INSTALL NDOT TYPE 2 DROP INLET PER NDOT R-4.2.1 (SEE SHEET 29)
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7. INSTALL RIP-RAP (D50=8", THICKNESS=16") PER DETAIL H ON SHEET 32
8. INSTALL SD JUNCTION STRUCTURE
9. DIRECT CONNECTION INTO RCB SEE SHEET 34 FOR DETAIL
10. INSTALL TYPE I SD RISER PER CCAUSD #403.1
11. INSTALL TYPE "CM" DROP INLET PER CCAUSD #421 & #422
12. INSTALL PRECAST REINFORCED CONCRETE BOX PER NDOT STANDARD 502 AND 503 SEE SHEET 34 FOR RCB INFORMATION

SEWER CONSTRUCTION NOTES

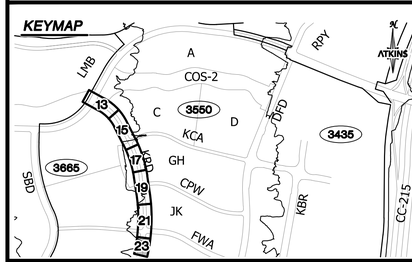
1. INSTALL SEWER MANHOLE WITH SINGLE 24" LID PER DCSWCS SD-1, SD-3, SD-4 PER 2019 DCSWCS 4TH EDITION
2. INSTALL SEWER MAIN PER DCSWCS SD-17
3. STUB AND CAP SEWER PIPE. PLACE 4"X4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).

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 CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
4. INSTALL TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, AND #39 (PER UDACS PLATE #31 FOR C900 JOINTS, PER UDACS 2.15 AND RESTRAINT JOINTS TABLE ON SHEET 9 FOR DIP JOINTS)
5. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #39, AND #40. (PER UDACS PLATE #31 FOR C900 JOINTS, PER UDACS 2.15 AND RESTRAINT JOINTS TABLE ON SHEET 9 FOR DIP JOINTS)
6. INSTALL DEFLECTION AT PIPE JOINTS (MAXIMUM OF 1°)
7. INSTALL 1.5" METER WITH RPPA PER UDACS PLATES #4 AND #8 OR INSTALL 6" STUB WITH 3' MINIMUM CLEARANCE ON ALL SIDES
8. CONNECT TO EXISTING 12" WATERLINE
9. INSTALL STEEL SLEEVE PER UDACS PLATES #22 AND #23

ROADWAY CONSTRUCTION NOTES

1. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 32 FOR TYPICAL PAVEMENT SECTION.
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. FUTURE SIDEWALK BY OTHERS
4. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN R-5.2.1.
5. CONSTRUCT 0" FLUSH CURB
6. TRANSITION CURB FROM FULL HEIGHT (6") TO FLUSH (0")
7. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4",1-6") PER DETAIL C ON SHEET 38.



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 - PAUL A. BATES - No. 18723 - CIVIL - 2/25/20

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

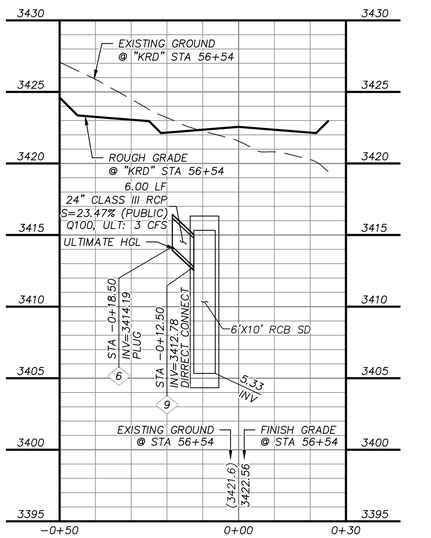
SUMMERLIN

SUMMERLIN VILLAGE 22
KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

ROADWAY PLAN AND PROFILE
KETTLE RIDGE DRIVE BEGIN TO STA. 56+50

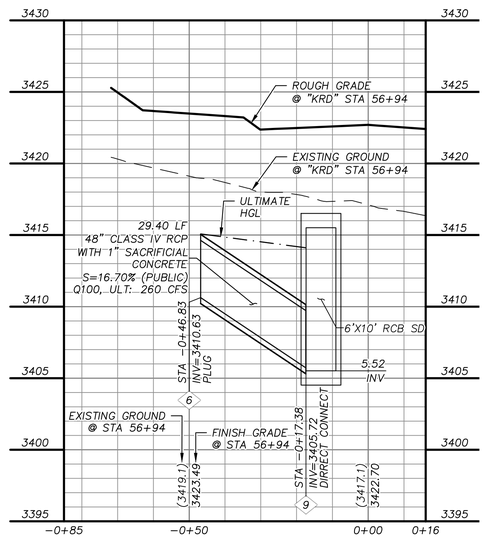
DESIGNED BY:	N. BARCOS
DRAWN BY:	O. QUASSANI
CHECKED BY:	P. BATES
HORIZ.:	1"=20'
VERT.:	1"=5'
JOB NO.	107/1808F L19-02315
DATE:	FEBRUARY, 2020
DRAWING NO.	23/43
	100060655

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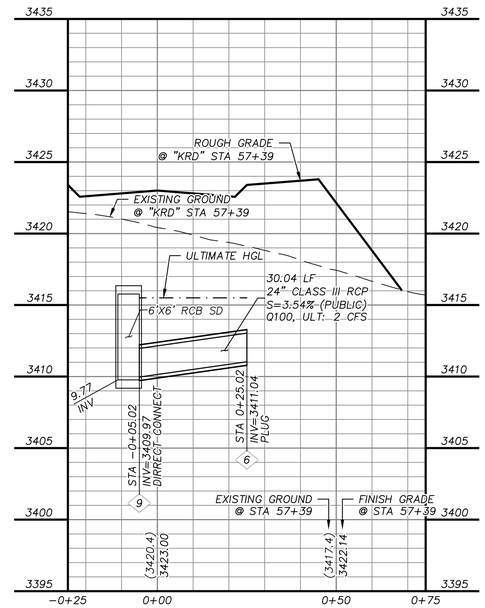
STORM DRAIN LATERAL (A / 24)

"KRD" STA. 56+54 SEE SHEETS 20 AND 21



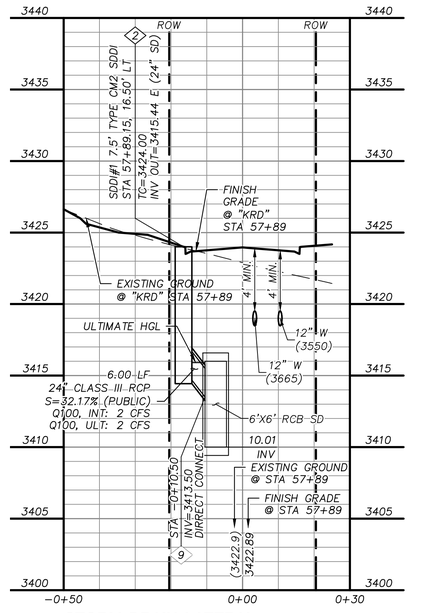
STORM DRAIN LATERAL (B / 24)

"KRD" STA. 56+94 SEE SHEETS 20 AND 21



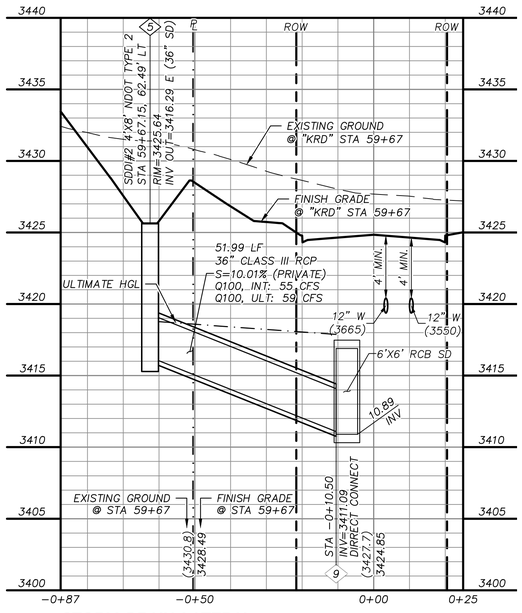
STORM DRAIN LATERAL (C / 24)

"KRD" STA. 57+39 SEE SHEETS 20 AND 21



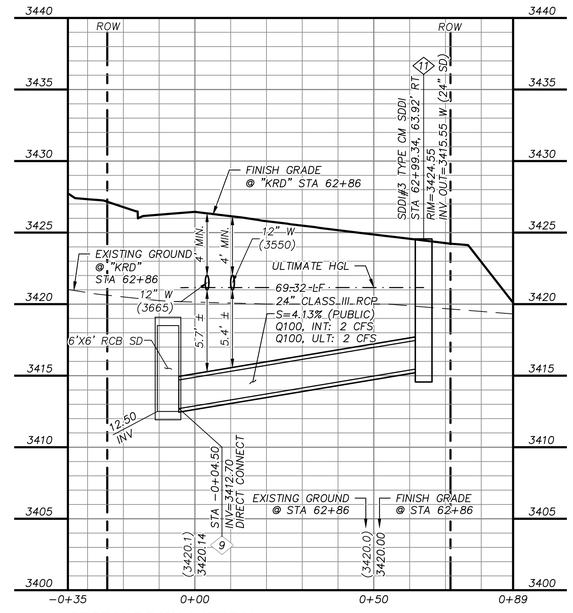
STORM DRAIN LATERAL (D / 24)

"KRD" STA. 58+76 SEE SHEETS 20 AND 21



STORM DRAIN LATERAL (E / 24)

"KRD" STA. 59+67 SEE SHEETS 20 AND 21



STORM DRAIN LATERAL (F / 24)

"KRD" STA. 62+86 SEE SHEETS 18 AND 19

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 3 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 #405.2
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12. INSTALL PRECAST REINFORCED CONCRETE BOX PER NDOT STANDARD 502 AND 503 SEE SHEET 34 FOR RCB INFORMATION

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN VILLAGE 22

KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

STORM DRAIN LATERAL PROFILES

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

JOB NO. 107V8097
LIS-02516
DATE: FEBRUARY, 2020
DRAWING NO. 24/43

100060655

GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"= 20'
5 0 2.5 5 10
VERTICAL: 1"= 5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. 136892 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

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

DS#5156

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)
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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 (FIBEROPTIC AND ARTERIAL SYSTEMS OF TRANSPORTATION)

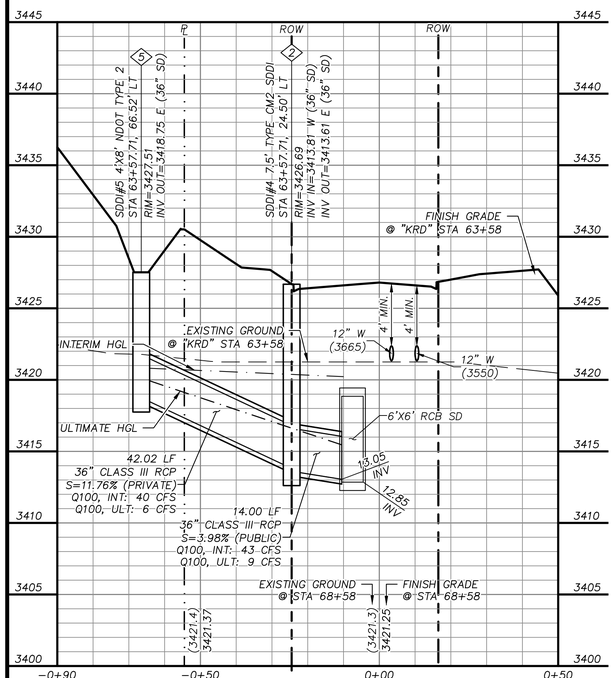
Call before you Dig AVOID CUTTING ELECTRICAL AND TELEPHONE UTILITY LINES IN CLARK COUNTY. Call 811 or 1-800-642-2444

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

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PROFESSIONAL ENGINEER-STATE OF NEVADA — PAUL A. BATES — No. 18723 — CIVIL — 2/25/20

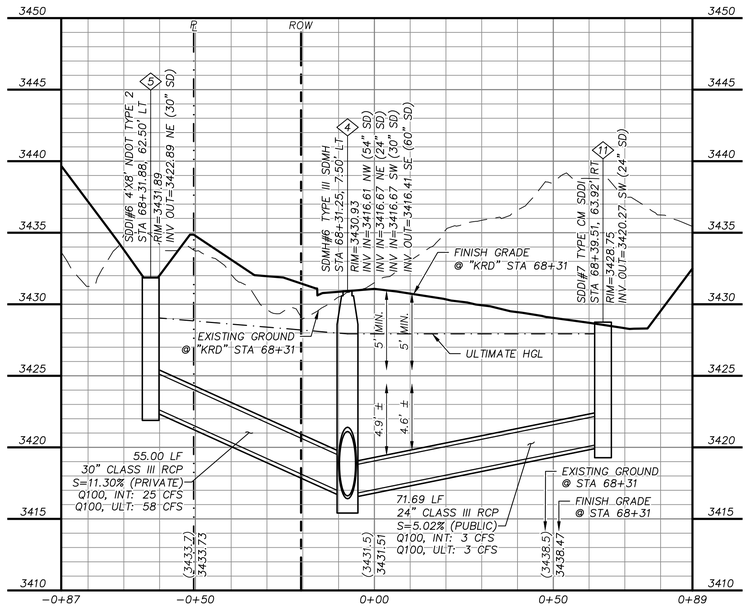
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STORM DRAIN LATERAL

"KRD" STA. 63+58 SEE SHEETS 18 AND 19

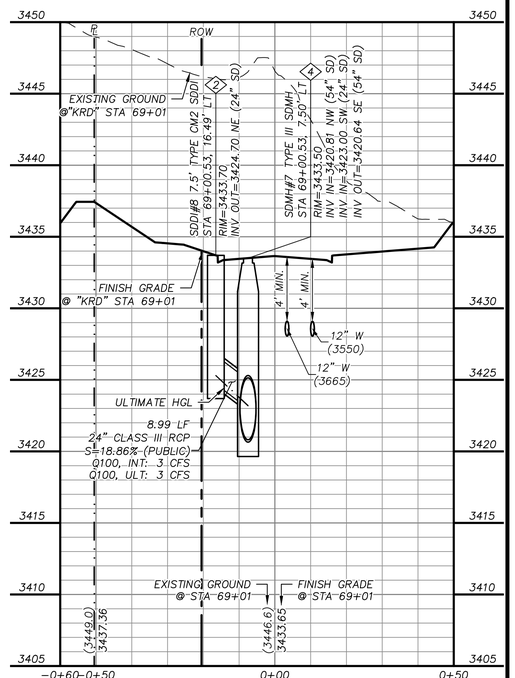
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STORM DRAIN LATERAL

"KRD" STA. 68+31 SEE SHEETS 14 AND 15

H
25



STORM DRAIN LATERAL

"KRD" STA. 69+01 SEE SHEETS 14 AND 15

I
25

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE SHEET 3 FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
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REVISIONS			
REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN VILLAGE 22

KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

STORM DRAIN LATERAL PROFILES

GRAPHIC SCALE
20 0 10 20 40
HORIZONTAL: 1"= 20'
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VERTICAL: 1"= 5'

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. 136892 FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

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

DS#5156

BASIS OF BEARING

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T21S,R59E,S03

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

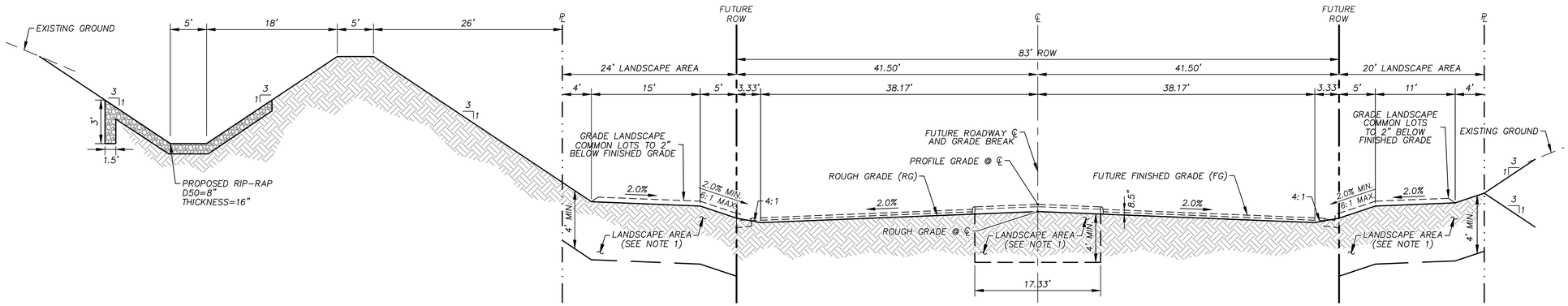
UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER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

PROFESSIONAL ENGINEER-STATE OF NEVADA
PAUL A. BATES
EXP. 12-31-20
CIVIL
No. 18723
2/25/20

JOB NO.	107/6097 L15-062516
DATE:	FEBRUARY, 2020
DRAWING NO.	25/43
DESIGNED BY:	N. BARCOS
DRAWN BY:	O. QUASSANI
CHECKED BY:	P. BATES
HORIZ.:	1"=20'
VERT.:	1"=5'

100060655

X:\Projects\SummitWest\Village 22\100060655 - V22N Street J (Lake Mead to Street G)_Sheets\60655-20-L47L-SD1.dwg LAYOUT: 25 Feb 25, 2020 - 2:18PM



NOTES:

1. EXCAVATE BOTH SIDES TO DEPTH INDICATED PRIOR TO STREET IMPROVEMENTS. SIFT/SCREEN OUT ROCK AND DEBRIS GREATER THAN 6" FROM EXCAVATED MATERIAL, THEN BACKFILL TO 85% COMPACTION. FILL AS NECESSARY TO 2" BELOW THE FINISHED GRADE.

SCURRY BEND DRIVE - ROUGH GRADE SECTION

N.T.S.

A
31

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN VILLAGE 22

KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

TYPICAL SECTIONS

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

Call before you Dig AVOID UTILITY CONFLICTS AND UNPLANNED UTILITY RELOCATIONS 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

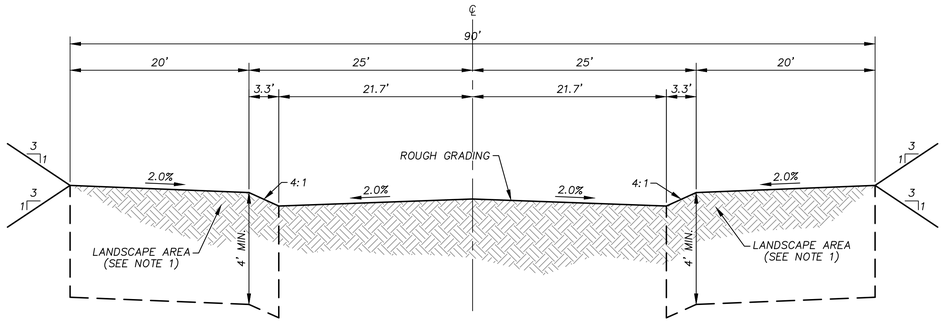
PROFESSIONAL ENGINEER - STATE OF NEVADA
PAUL A. BATES
No. 18723
CIVIL
2/25/20

JOB NO:	1071809F L19-02315
DATE:	FEBRUARY, 2020
DRAWING NO.	31/43

DESIGNED BY: N. BACOS
DRAWN BY: O. QUASSANI
CHECKED BY: J. IZZOLO/P. BATES
HORIZ.: NONE
VERT.: NONE

100060655

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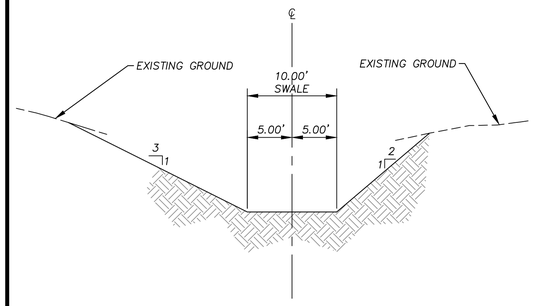
NOTES:

1. EXCAVATE BOTH SIDES TO DEPTH INDICATED PRIOR TO STREET IMPROVEMENTS. SIFT/SCREEN OUT ROCK AND DEBRIS GREATER THAN 6" FROM EXCAVATED MATERIAL, THEN BACKFILL TO 85% COMPACTION. FILL AS NECESSARY TO 2" BELOW THE FINISHED GRADE.

KETTLE RIDGE DRIVE - ROUGH GRADE SECTION

N.T.S.

A 32



KETTLE RIDGE DRIVE - DAYLIGHT SWALE

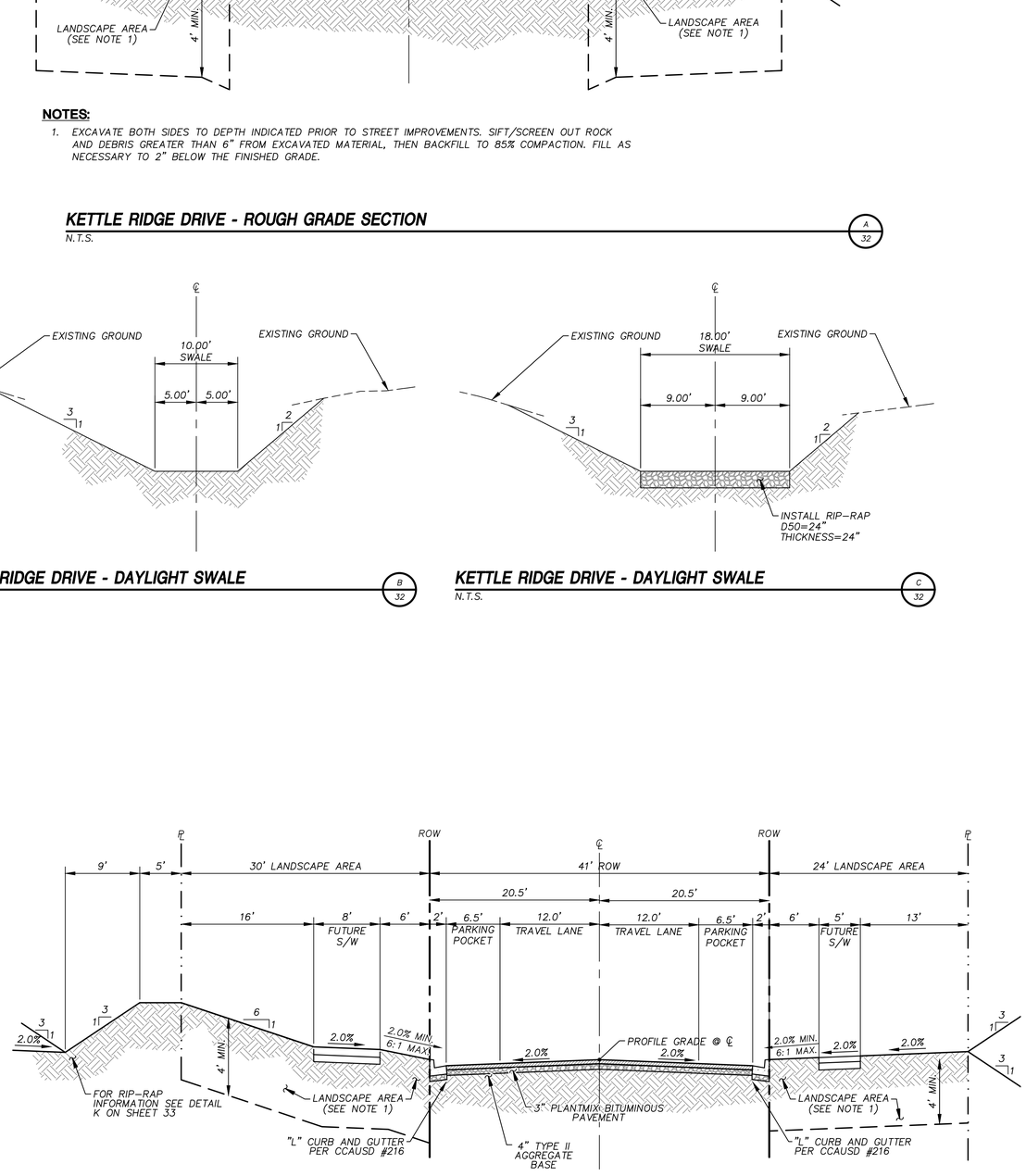
N.T.S.

B 32

KETTLE RIDGE DRIVE - DAYLIGHT SWALE

N.T.S.

C 32



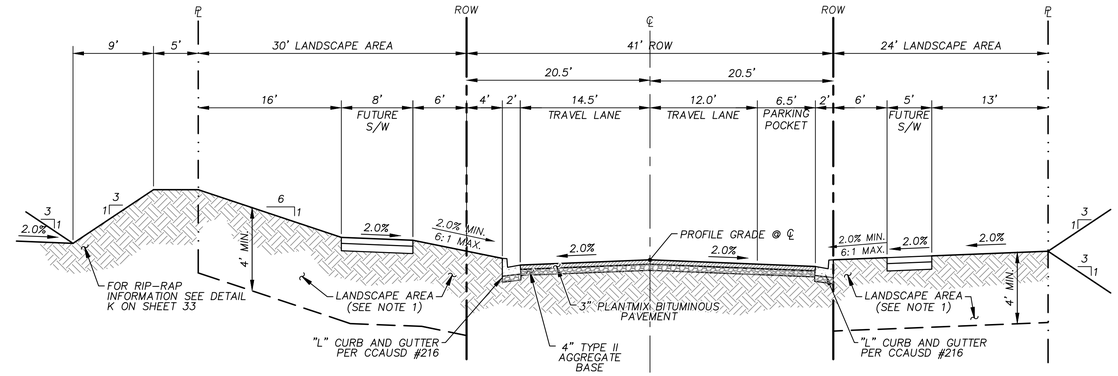
NOTES:

1. EXCAVATE BOTH SIDES TO DEPTH INDICATED PRIOR TO STREET IMPROVEMENTS. SIFT/SCREEN OUT ROCK AND DEBRIS GREATER THAN 6" FROM EXCAVATED MATERIAL, THEN BACKFILL TO 85% COMPACTION. FILL AS NECESSARY TO 2" BELOW THE FINISHED GRADE.

KETTLE RIDGE DRIVE - TYPICAL SECTION

N.T.S.

D 32



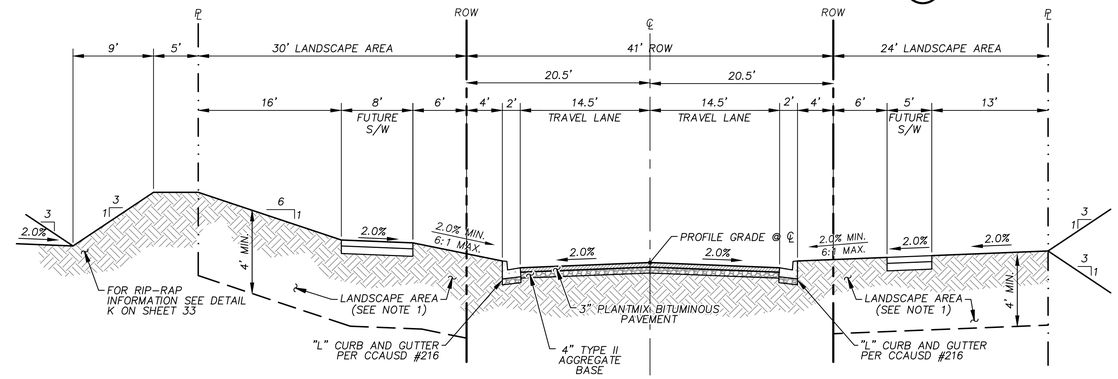
NOTES:

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KETTLE RIDGE DRIVE - TYPICAL SECTION WITH LEFT CURB EXTENSION

N.T.S.

E 32



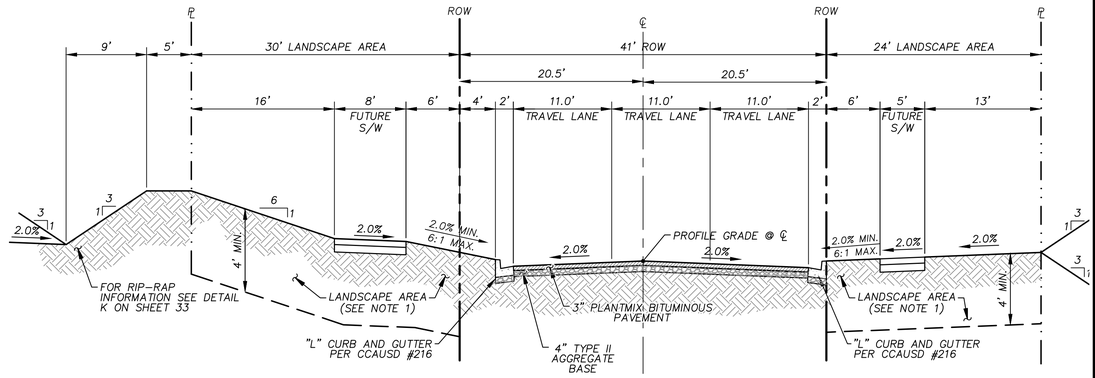
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KETTLE RIDGE DRIVE - TYPICAL SECTION WITH CURB EXTENSIONS

N.T.S.

F 32



NOTES:

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KETTLE RIDGE DRIVE - TYPICAL SECTION WITH CENTER TRAVEL LANE

N.T.S.

G 32

FAST Call before you UnderGround 1-702-432-5300 NEVADA 811 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

PROFESSIONAL ENGINEER, STATE OF NEVADA
PAUL A. BATES
EXP. 12-31-20
CIVIL
No. 19723
2/25/20

REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL

ATKINS
2270 Corporate Circle Suite 200
Henderson, Nevada 89074
Telephone: +1.702.263.7375
Fax: +1.702.263.7200

SUMMERLIN

SUMMERLIN VILLAGE 22

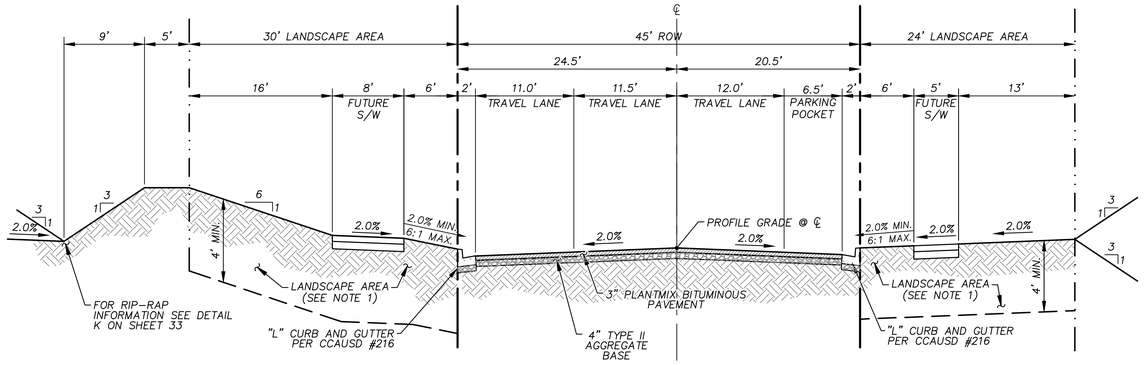
KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

TYPICAL SECTIONS

DESIGNED BY:	N. BARCOS
DRAWN BY:	O. QUASSANI
CHECKED BY:	P. BATES
HORIZ.:	NONE
VERT.:	NONE
JOB NO.	10718097 L19-02515
DATE:	FEBRUARY, 2020
DRAWING NO.	32/43

100060655

K:\Projects\SummitWest\Village 22\100060655 - V22N Street J (Lake Mead to Street G)_Sheets\60655-24-DETL-01.dwg LAYOUT: TYPICAL SECTIONS Feb 25, 2020 - 2:19PM



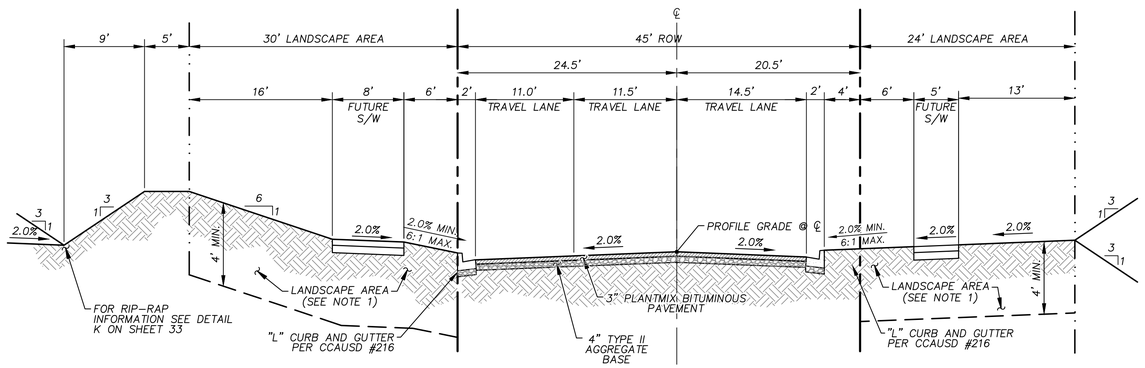
NOTES:

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KETTLE RIDGE DRIVE - TYPICAL SECTION WITH RIGHT TURN LANE AND PARKING

N.T.S.

H / 33



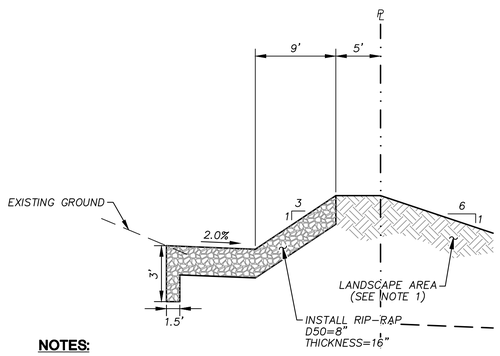
NOTES:

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KETTLE RIDGE DRIVE - TYPICAL SECTION WITH RIGHT TURN NO PARKING

N.T.S.

I / 33



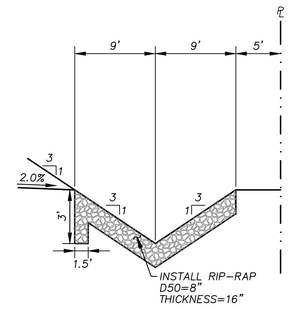
NOTES:

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KETTLE RIDGE DRIVE - SECTION IN FILL

N.T.S.

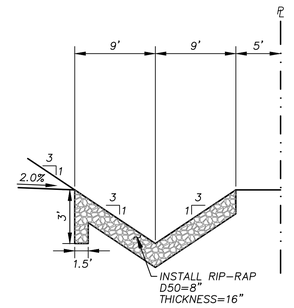
J / 33



KETTLE RIDGE DRIVE - RIP-RAP SWALE SECTION

N.T.S.

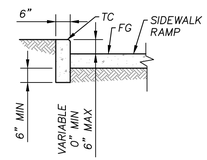
K / 33



KETTLE RIDGE DRIVE - RIP-RAP SWALE SECTION

N.T.S.

K / 33



KETTLE RIDGE DRIVE - 6" CURB SECTION

N.T.S.

L / 33

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN VILLAGE 22

KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

TYPICAL SECTIONS

DESIGNED BY: N. BARCOS
DRAWN BY: O. OUASSANI
CHECKED BY: P. BATES
HORIZ.: NONE
VERT.: NONE

JOB NO. 10719097 L19-02315
DATE: FEBRUARY, 2020
DRAWING NO. 33/43

100060655

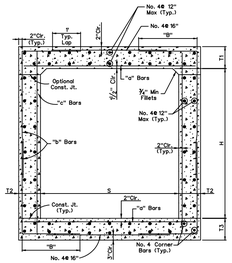
FAST — Call before you UnderGround 1-702-432-5300 (NEVADA AND ARIZONA SYSTEM OF TRANSPORTATION)

Call before you Dig AVOID BURYING YOUR UTILITY LINES. IT'S COSTLY. Call 811 or 1-800-642-2444

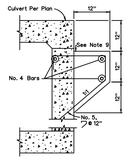
AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY. CALL BEFORE YOU DIG OVERHEAD 1-702-227-2929

PROFESSIONAL ENGINEER - STATE OF NEVADA — PAUL A. BATES — No. 18723 — CIVIL — 2/25/20

X:\Projects\SummWest\Village 22\100060655 - V22N Street J (Lake Mead to Street G)_Sheets\60655-24-DETL-01.dwg LAYOUT: TYPICAL SECTIONS (2) Feb 25, 2020 - 2:19PM



TYPICAL SECTION



PAVING NOTCH DETAIL

BENT BARS



NOTES:

1. DESIGN SPECIFICATIONS: "AASHTO LRFD Bridge Design Specifications 2012"
2. CONSTRUCTION SPECIFICATIONS: "State of Nevada Department of Transportation Standard Specifications for Road and Bridge Construction 2014"
3. LIVE LOADS:
   HS-93 Design Truck (32.0 KIP Axle)
   HL-93 Design Tandem (Two 25.0 KIP Axles Spaced 4 Feet Apart)
   (Live Load Impact Factor for Top Slab is 33% up to 2 Feet of Cover)

   LATERAL LIVE LOAD PRESSURE:
   Equivalent to 2 Feet of Earth Surcharge Applied Horizontally = 240 PSF

   DEAD LOADS:
   Soil Unit Weight = 120 PCF
   Min. Lateral Earth Pressure = 30 PCF
   Max. Lateral Earth Pressure = 60 PCF
4. CONCRETE: Class DA Modified (Mojor)
   F'C=4,500 PSI @ 28 Days.
   (Class D in Clark County)
5. REINFORCING STEEL: All reinforcing steel to be ASTM A615 grade 60 or A706. Dimension relating to bar spacing are center to center.
6. DESIGNATION: Box culverts are shown on plans as span times height times length (10'-x 8'-x 190' RCB).
7. Where traffic loads will be placed directly on the top slab, the minimum top slab thickness is 2 feet of fill, increase top slab thickness by 1½ inch and cover for top reinforcement from 2 inches to 2½ inches. Provide epoxy coated reinforcement in top slab (except in Clark County). Decrease spacing of top slab bottom longitudinal bars (**A**) 6 (2") to 6" inch spacing. Use LA Modified Mojor concrete (Class E in Clark County) in lieu of Class DA. Adjust quantities accordingly.
8. Provide 2 foot wide Type 1 or Type 2 drain backfill wrapped in Class 1 or Class 2 non-woven geotextile along full height of each culvert exterior wall face.
9. Provide paving notch when top slab is exposed and when pavement is concrete. Adjust quantities accordingly.
10. For additional notes, see sheet B-20.1.1

SPAN, "S":	FT.	5			6			7				8				10				
HEIGHT, "H"	FT.	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	9	10
MAXIMUM EARTH COVER	FT.	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20
CONC. ROOF T1	IN.	9½ 9½	9½ 9½	9½ 9½	10 10	10 10	10 10	10 10	10 10	10 10	10 10	10 10	10 10	10½ 10½	10½ 10½	10½ 10½	10½ 10½	10½ 10½	11 11	11 11	11 11	11 11	11 11	11 11
CONC. WALLS T2	IN.	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	10 10	10 10	10 10	10 10	10 10	10 10
CONC. INVERT T3	IN.	8 8	8 8	8 8	8 9	9 9	9 9	9 9	10 10	10 10	10 10	10 10	10 10	10½ 10½	10½ 10½	10½ 10½	10½ 10½	10½ 10½	12 13	12 13	12 13	12 13	12 13	12 13
REINFORCEMENT "a" BAR SIZE		4 5	4 5	4 5	5 5	5 5	5 5	5 5	5 6	5 6	5 6	5 6	5 6	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7
REINFORCEMENT "a" SPACING	IN.	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6
REINFORCEMENT "a" LENGTH	ft-in	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0	8-0 8-0
REINFORCEMENT "b" BAR SIZE		4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 5	5 6	5 6	5 6	5 6	5 6	5 6	5 6	5 6	5 6	5 7
REINFORCEMENT "b" SPACING	IN.	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8
REINFORCEMENT "b" LENGTH	ft-in	5-7 5-7	6-1 6-1	6-7 6-7	5-9 5-9	6-3 6-3	6-9 6-9	7-3 7-3	5-11 5-11	6-4 6-4	6-10 6-10	7-4 7-4	7-10 7-10	6-6 6-6	7-0 7-0	7-6 7-6	8-0 8-0	8-6 8-6	8-1 8-1	8-7 8-7	9-1 9-1	9-7 9-7	10-1 10-1	10-8 10-7	11-2 11-2
REINFORCEMENT B	ft-in	2-8 2-8	2-8 2-8	2-8 2-8	2-8 2-8	2-8 2-8	2-8 2-8	2-8 2-8	2-10 2-10	2-10 2-10	2-10 2-10	2-10 2-10	2-10 2-10	2-11 2-11	2-11 2-11	2-11 2-11	2-11 2-11	2-11 2-11	3-0 3-0	3-0 3-0	3-0 3-0	3-0 3-0	3-0 3-0	3-0 3-0	3-0 3-0
REINFORCEMENT "c" BAR SIZE		4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	5 5	5 5	5 5	5 5	5 5	5 5
REINFORCEMENT "c" SPACING	IN.	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12
REINFORCEMENT "c" LENGTH	ft-in	4-0 4-0	5-0 5-0	6-0 6-0	4-2 4-2	5-2 5-2	6-2 6-2	7-2 7-2	4-3 4-3	5-3 5-3	6-3 6-3	7-3 7-3	8-3 8-3	5-4 5-4	6-4 6-4	7-4 7-4	8-4 8-4	9-4 9-4	6-6 6-6	7-6 7-6	8-7 8-7	9-7 9-7	10-8 10-7	11-8 11-7	12-9 12-8
REINFORCEMENT #4@ 12" LENGTH	ft-in	7-7 7-7	8-7 8-7	9-7 9-7	8-1 8-1	9-2 9-2	10-2 10-2	11-2 11-2	8-6 8-6	9-6 9-6	10-6 10-6	11-6 11-6	12-6 12-6	9-10 9-10	11-0 11-0	12-1 12-1	13-2 13-2	14-3 14-3	12-1 12-1	13-3 13-3	14-5 14-5	15-7 15-7	16-9 16-9	17-11 17-11	19-1 19-1
REINFORCEMENT #4@ 12" NUMBER*		40 40	44 44	48 48	44 44	48 48	52 52	56 56	48 48	52 52	56 56	60 60	64 64	56 56	60 60	64 64	68 68	72 72	68 68	72 72	76 76	80 80	84 84	88 88
QUANT. CONCRETE	CY/LF	13.2	13.7	14.3	14.9	15.5	15.8	15.8	16.8	16.9	16.8	16.8	16.8	17.6	17.8	18.2	18.2	20.8	20.8	21.8	21.8	23.1	23.2	23.7
QUANT. REINFORCEMENT	LB/LF	81	90	88	87	95	104	99	99	106	106	113	113	119	119	108	123	115	129	121	136	128	143	135

SPAN, "S":	FT.	12						14						
HEIGHT, "H"	FT.	6	7	8	9	10	11	12	7	8	9	10	11	12	13	14
MAXIMUM EARTH COVER	FT.	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20
CONC. ROOF T1	IN.	11 13	11 13	11 13	11 13	11 13	11 13	11 13	13 15	13 15	13 15	13 15	13 15	13 15	13 15	13 15
CONC. WALLS T2	IN.	10 12	10 12	10 12	10 12	10 12	10 12	10 12	12 13	12 13	12 13	12 13	12 13	12 13	12 13	12 14
CONC. INVERT T3	IN.	12 15	12 15	12 15	12 15	12 15	12 15	12 15	13 16	14 17	14 17	14 17	14 17	14 17	14 17	14 17
REINFORCEMENT "a" BAR SIZE		7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8
REINFORCEMENT "a" SPACING	IN.	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6
REINFORCEMENT "a" LENGTH	ft-in	9-4 10-5	9-11 10-10	10-5 11-3	10-10 11-8	11-4 12-1	11-9 12-6	12-2 12-11	10-5 11-3	11-0 11-8	11-6 12-3	12-0 12-8	12-5 13-1	12-10 13-6	13-3 13-11	13-8 14-4
REINFORCEMENT "a" BAR SIZE		6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7
REINFORCEMENT "a" SPACING	IN.	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6
REINFORCEMENT "a" LENGTH	ft-in	9-4 10-5	9-11 10-10	10-5 11-3	10-10 11-8	11-4 12-1	11-9 12-6	12-2 12-11	10-5 11-3	11-0 11-8	11-6 12-3	12-0 12-8	12-5 13-1	12-10 13-6	13-3 13-11	13-8 14-4
REINFORCEMENT B	ft-in	4-5 5-0	4-5 5-0	4-5 5-0	4-5 5-0	4-5 5-0	4-5 5-0	4-5 5-0	4-9 5-4	4-9 5-4	4-9 5-4	4-9 5-4	4-9 5-4	4-9 5-4	4-9 5-4	4-9 5-4
REINFORCEMENT "c" BAR SIZE		4 5	4 5	4 5	4 5	4 5	4 5	4 5	5 6	4 5	4 6	4 6	4 6	4 6	5 6	6 7
REINFORCEMENT "c" SPACING	IN.	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12
REINFORCEMENT "c" LENGTH	ft-in	7-4 7-11	8-4 8-11	9-4 9-11	10-4 10-11	11-4 11-11	12-4 12-10	13-4 13-10	9-2 9-10	10-1 10-8	11-0 11-8	11-11 12-6	12-9 13-4	13-7 14-2	14-5 15-0	15-3 15-10
REINFORCEMENT #4@ 12" LENGTH	ft-in	8-6 9-2	9-6 10-2	10-6 11-2	11-6 12-2	12-6 13-2	13-6 14-2	14-6 15-2	10-3 11-0	11-3 12-0	12-3 13-0	13-3 14-0	14-3 15-0	15-3 16-0	16-3 17-0	17-3 18-0
REINFORCEMENT #4@ 12" NUMBER*		80 80	84 84	88 88	92 92	96 96	100 100	104 104	92 92	96 96	100 100	104 104	108 108	112 112	116 116	120 120
QUANT. CONCRETE	CY/LF	26.2	26.7	27.3	28.4	29.0	29.3	29.3	30.2	30.5	30.4	30.4	30.4	31.2	31.4	31.4
QUANT. REINFORCEMENT	LB/LF	295	304	309	340	407	411	420	325	433	335	446	345	459	365	485

SPAN, "S":	FT.	14												
HEIGHT, "H"	FT.	8	9	10	11	12	13	14	15	16	17	18	19	20
MAXIMUM EARTH COVER	FT.	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20	10 20
CONC. ROOF T1	IN.	15 17	15 17	15 17	15 17	15 17	15 17	15 17	15 17	15 17	15 17	15 17	15 17	15 17
CONC. WALLS T2	IN.	12 14	12 14	12 14	12 14	12 14	12 14	12 14	12 14	12 14	12 14	12 14	12 14	12 14
CONC. INVERT T3	IN.	14 17	14 17	14 17	14 17	14 17	14 17	14 17	14 17	14 17	14 17	14 17	14 17	14 17
REINFORCEMENT "a" BAR SIZE		7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8
REINFORCEMENT "a" SPACING	IN.	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6
REINFORCEMENT "a" LENGTH	ft-in	10-4 11-3	10-9 11-8	11-3 12-1	11-8 12-6	12-1 12-11	12-6 13-4	12-11 13-9	13-3 14-2	13-8 14-7	14-1 15-0	14-6 15-5	14-11 15-10	15-4 16-3
REINFORCEMENT "b" BAR SIZE		6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7
REINFORCEMENT "b" SPACING	IN.	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6
REINFORCEMENT "b" LENGTH	ft-in	10-4 11-3	10-9 11-8	11-3 12-1	11-8 12-6	12-1 12-11	12-6 13-4	12-11 13-9	13-3 14-2	13-8 14-7	14-1 15-0	14-6 15-5	14-11 15-10	15-4 16-3
REINFORCEMENT B	ft-in	5-0 5-4	5-0 5-4	5-0 5-4	5-0 5-4	5-0 5-4	5-0 5-4	5-0 5-4	5-4 5-8	5-4 5-8	5-4 5-8	5-4 5-8	5-4 5-8	5-4 5-8
REINFORCEMENT "c" BAR SIZE		6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7	6 7
REINFORCEMENT "c" SPACING	IN.	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12	12 12
REINFORCEMENT "c" LENGTH	ft-in	10-4 11-3	10-9 11-8	11-3 12-1	11-8 12-6	12-1 12-11	12-6 13-4	12-11 13-9	13-3 14-2	13-8 14-7	14-1 15-0	14-6 15-5	14-11 15-10	15-4 16-3
REINFORCEMENT #4@ 12" LENGTH	ft-in	13-4 14-2	13-9 14-7	14-2 15-1	14-7 15-6	15-1 16-0	15-6 16-5	15-11 16-10	16-4 17-3	16-9 17-8	17-2 18-1	17-7 18-6	18-0 19-0	18-5 19-4
REINFORCEMENT #4@ 12" NUMBER*		120 120	124 124	128 128	132 132	136 136	140 140	144 144	148 148	152 152	156 156	160 160	164 164	168 168
QUANT. CONCRETE	CY/LF	31.8	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1
QUANT. REINFORCEMENT	LB/LF	510	558	524	409	538	504	668	576	592	608	624	640	656

* QUANTITY INCLUDES #4 CORNER BARS

SHEET 2 OF 2
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
RCB CULVERTS
SINGLE

B-20.1.2.1 (502,505)	Signed Original On File
ADOPTED 11/70	REVISED 10/15	CHIEF BRIDGE ENGR.

RCB DETAILS PER NDOT

N.T.S.

A / 34

BILL OF MATERIALS (RCP HDPE CMP)

PIPE SIZE (INCH)	SINGLE (ONE GRATE) ● CONCRETE (CY)	● REINF. (LB.) ADD QUAN. (H. MIN.)	ADD RATE (CY/FT)	ADD QUAN. (H. MIN.)	ADD RATE (LB/FT)	STR STEEL (LB)	DOUBLE (TWO GRATES) ● CONCRETE (CY)	● REINF. (LB.) ADD QUAN. (H. MIN.)	ADD RATE (CY/FT)	ADD QUAN. (H. MIN.)	ADD RATE (LB/FT)	STR STEEL (LB)	TRIPLE (THREE GRATES) ● CONCRETE (CY)	● REINF. (LB.) ADD QUAN. (H. MIN.)	ADD RATE (CY/FT)	ADD QUAN. (H. MIN.)	ADD RATE (LB/FT)	STR STEEL (LB)
≤15	0.71	0.19	36	10	211	1.06	0.26	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	349	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	0.38	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

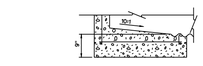
●The Concrete And Reinforcing Quantities Are Based On The H Min. Shown. Increase The Concrete And Reinforcing Base Quantity By The Corresponding Add Rate (Per Foot Of Increase) Hi If The H Specified Is Larger Than H Min.

TABLE OF DIMENSIONS (RCP HDPE CMP)

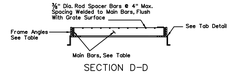
PIPE SIZE (INCH)	A	H Min. (FT)	MAIN BARS (INCH)	FRAME ANGLES (INCH)	FRAME BARS (INCH)	L (FT) SINGLE GRATE	DOUBLE GRATE	TRIPLE GRATE
≤ 15	2'	2.50	3½ x ⅜	4 X 3 X ⅜	4 X ⅜	2'	4'	6'
18	2'-6"	3.00	4½ x ⅜	5 X 3 X ⅜	5 X ⅜	2'	4'	6'
24	3'	3.50	4½ x ⅜	5 X 3 X ⅜	5 X ⅜	2'	4'	6'
30	3'-6"	4.00	4½ x ⅜	5 X 3 X ⅜	5 X 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:

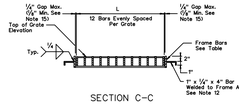
1. All concrete shall be class A or AA.
2. Reinforcing steel shall be No.4 bars with maximum spacing at 18 inch centers, wired tightly at all intersections and embedded 2 inches clear of all concrete surfaces.
3. Exposed edges of concrete shall be chamfered 1 inch.
4. Dimensions may be varied to fit local conditions if ordered by the engineer.
5. Commercial prefabricated gratings approved by the bridge division 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 more than 10:1 from all directions toward inlet. Flat basin is used at junction of two slopes. One slope(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 A+4'-¾".
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 ¼" on each side of the grate, the grate and frame shall be removed and reconstructed to the tolerances specified or, with approval of the engineer, a metal plate ¼" thick may be welded to the grate or frame 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.



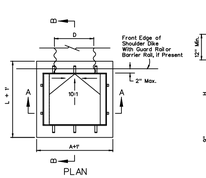
SECTION B-B



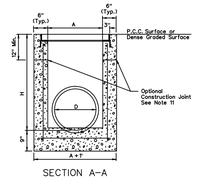
SECTION D-D



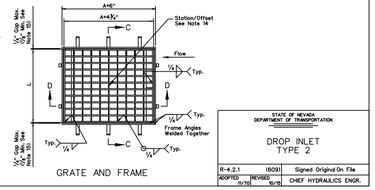
SECTION C-C



PLAN



SECTION A-A



GRATE AND FRAME

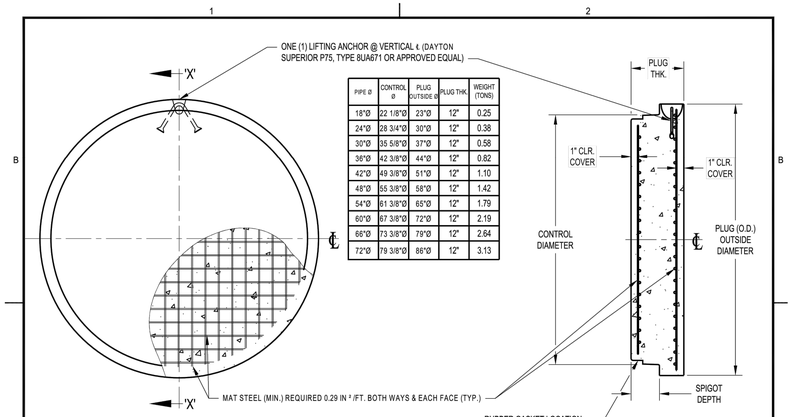
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
DROP INLET
TYPE 2

R-4.2.1 (6019)	Signed Original On File
ADOPTED 11/70	REVISED 10/15	CHIEF HYDRAULICS ENGR.

DROP INLET TYPE 2 PER NDOT

N.T.S.

B / 34



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 6560 LANGFIELD RD., BLDG. 3 HOUSTON, TEXAS 77092 PHONE #: 832-590-5300	FOR APPROVAL SCALE: N. T. S.	GENERAL R.C. PLUG DETAIL (18"Ø TO 72"Ø)
	REVISIONS REV. NO. / DESCRIPTION / BY / DATE	PROJECT: LAS VEGAS AREA; LOCATION: NEVADA; CONTRACTOR:
	DRAWN BY: E. JACKSON; CHECKED BY: T. LOPEZ; DATE: JUNE 7, 2018	DRAWING NO.: A200-CE-731; SHEET NO.: END PLUG; REV:

TYPICAL STORM DRAIN CAP

N.T.S.

C / 34

REV.	DESCRIPTION	BY	DATE	APPROVAL

REVISIONS

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

SUMMERLIN

SUMMERLIN VILLAGE 22
KETTLE RIDGE DRIVE (STREET J) - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE - FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

STORM DRAIN DETAILS

JOB NO. 10760097 L19-02316
DATE: FEBRUARY, 2020
DRAWING NO. 34/43
DESIGNED BY: N. BARCOS
DRAWN BY: O. QUASSANI
CHECKED BY: P. BATES
HORIZ.: NONE
VERT.: NONE
100060655

FAST Call before you UnderGround 1-702-432-5300 NEVADA811 AND ARIZONA811 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
RAUL A. BATES
No. 18723
CIVIL
2/25/20

X:\Projects\SummWest\Village 22\100060655 - V22N Street J (Lake Mead to Street G)_Sheets\60655-28-DETL-STRM.dwg LAYOUT: STORM DRAIN DETAILS Feb 25, 2020 - 2:19PM


FUTURE LAKE MEAD BOULEVARD (PUBLIC)
HOWARD HUGHES COMPANY, LLC
LOT 2 OF PARCEL MAP 123, PAGE 36
FUTURE PARCEL E
FUTURE PARCEL E
FUTURE PARCEL M-3
DAYLIGHT LINE
KETTLE RIDGE DRIVE (PUBLIC)
FUTURE SCURRY BEND DRIVE (PUBLIC)
ROW
75+00
74+00
73+00
72+00
71+00
70+00
69+00
68+00
67+00
39+00
38+00
37+00
52+00
E=869611.93 N=1295728.92
E=869610.44 N=1295684.95
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(3445)
(3440)
6.78%
6.52%
5.84%
3431.68
3430.93
3429.30
3428.26
3427.90
3427.51
3426.90
3426.50
3426.14
3425.80
3425.46
3425.02
3424.58
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3411.82
3411.38
3410.94
3410.50
3410.06
3409.62
3409.18
3408.74
3408.30

MATCHLINE - SEE SHEET 36

N

ATKINS

KETTLE RIDGE DRIVE (PUBLIC)

FUTURE SCURRY BEND DRIVE (PUBLIC)

FUTURE FLEET WING AVENUE (PUBLIC)

FUTURE PARCEL F

FUTURE PARCEL J

FUTURE PARCEL MP-2

HOWARD HUGHES COMPANY, LLC
LOT 2 OF PARCEL MAP 123, PAGE 36

DAYLIGHT LINE

EARTH WORK FOR PARCELS E&F
CUT=7600 CU. YD.
FILL=170200 CU. YD.
NET=162600 CU. YD.

GRAPHIC SCALE
50 0 25 50 100
HORIZONTAL: 1"= 50'

GRADING PLAN CERTIFICATION

PAUL A. BATES PE#18723 DATE

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT. DS#5156

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 ARTHROL 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 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
PAUL A. BATES
No. 18723
CIVIL
2/25/20

KEYMAP

REVISIONS				
REV.	DESCRIPTION	BY	DATE	APPROVAL

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

SUMMERLIN

SUMMERLIN VILLAGE 22
KETTLE RIDGE DRIVE (STREET J) – FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD
SCURRY BEND DRIVE (STREET N) ROUGH GRADE – FLEET WING AVENUE (STREET G) TO LAKE MEAD BOULEVARD

GRADING DETAILS - PARCELS E & F

DESIGNED BY:	N. BARCOS
DRAWN BY:	O. QUASSANI
CHECKED BY:	P. BATES
HORIZ.:	1"=50'
VERT.:	NONE
JOB NO.	10718087 L19-02516
DATE	FEBRUARY, 2020
DRAWING NO.	37/43
	100060655

X:\Projects\SummWest\Village 22\100060655 – V22N Street J (Lake Mead to Street G)_Sheets\60655-29-GRAD-WASH.dwg LAYOUT: GRADING DETAILS – PARCELS E & F 2: Feb 25, 2020 – 2:20PM

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

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