HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Lark Hill (aka Summerlin Village 22 - Parcel QR) Date: 08/12/2022

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

East/West: Kindle Rise Way

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

c) APN : 137-23-212-001

Name of Owner: Howard Hughes Company, LLC

Telephone No.: 702-791-4000 Fax No.: N/A E-Mail Address: SSwapp@taylormorrison.com

Address: 10801 W. Charleston Blvd., Suite #300, Las Vegas, NV 89135

Contact Person-Name: Roshan Poudel **Telephone No.:** (702) 586-9296

* **E-Mail Address:** roshan.poudel@actus-nv.com **Fax No.:** N/A

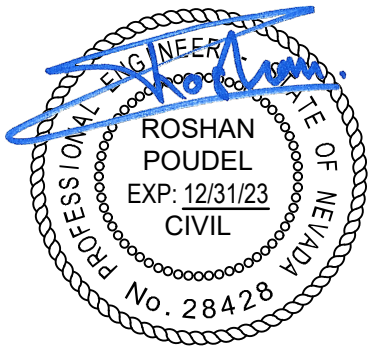
Firm: Actus

Address: 3283 E. Warm Springs Road Suite 300, Las Vegas, NV 89120

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: 9.55+/- Being Developed/Disturbed: 9.55+/-
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.): Single Family Residential
5. Approximate upstream land area which drains to the subject site: 0 +/-
6. Has the site drainage been evaluated in the past? ■ **YES** ☐ **NO** If yes, please identify documentation: Upd#2 and Upd#3 to the Master Conceptual Study for the Summerlin West Village 22
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: To the east into the existing 30" RCB SD in Kettle Bend Road.
8. Briefly describe your proposed schedule for the subject project: ASAP



Engineer's Seal 8/12/2022

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

***New Required Field**

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

Roshan Poudel Digitally signed by Roshan Poudel DN: C=US, E=roshan.poudel@actus-nv.com, O=Actus, CN=Roshan Poudel Date: 2022.08.15 08:07:24-07'00'

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

3283 Warm Springs Road Suite 300
Las Vegas, NV 89120
(702) 586-9296

Aug 12, 2022

City of Las Vegas,
Department of Public Works, Engg. Divison,
Land Devlopment and Flood Control

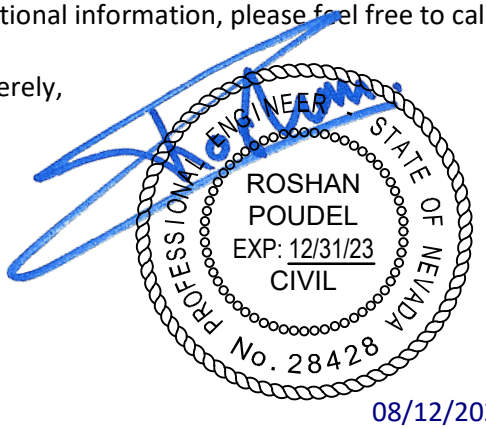
Re.: CD Certification for TDS for Lark Hill.

Dear Staff,

The pdfs on the submittal package CD matches the original submittal package.

We hope the above responses satisfy any concerns. If you have any questions or need any additional information, please feel free to call our office at (702) 586-9296.

Sincerely,



08/12/2022

Roshan Poudel, PE

TECHNICAL DRAINAGE STUDY

For

LARK HILL (aka SUMMERLIN VILLAGE 22 - PARCEL QR)

(APN: 137-23-212-001)

Kindle Rise Way and Kettle Bend Ave

City of Las Vegas

Date: Aug 12, 2022

Prepared for:

Taylor Morrison Homes
c/o Scott Swap
1980 Festival Plaza Dr.
Las Vegas, NV 89135

Prepared by: Roshan Poudel, PE
Assisted by: Adrian Gebilaguin, EI

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Lark Hill (aka V22 Parcel QR)	Map ID:
Firm Name: Actus	Engineer: Roshan Poudel
Address: 3283 E. Warm Springs Road, Suite 300	
City: Las Vegas	State: NV Zip: 89120
Phone Number: (702) 586-9296	Fax Number: N/A
Property Owner: Howard Hughes Company LLC	
Address: 10801 W. Charleston Blvd., Suite #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	
	N/A	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.
	N/A	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.
x		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.
x		Perimeter retaining wall locations. All existing and proposed walls (retaining screen and flood) must be shown with adjacent ground elevations. Flood walls with 8-inch concrete masonry unit.
x		Building and/or lot numbers.
x		Alignment of all existing, proposed, or future Regional Facilities adjacent to the site.
	N/A	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.
x		Appropriately elevated "humps" 6 inches above the 100 year water surface elevation at site accesses where the intent is to protect the site from the Q_{100} flows.
x		Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.
	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.)
x		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.
x		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. _____ 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.
X		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.)
N/A		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.
N/A		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	
X		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.
N/A		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.
X		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.
X		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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I. INTRODUCTION

A. Study Overview and Purpose

This study is intended to serve as the technical drainage study for Lark Hill (aka Summerlin Village 22 – Parcel QR), the proposed 9.55± acres multi-family residential development project, located to the northwest of the intersection of Kindle Rise Way and Kettle Bend Road. *See Figure 1*, *Vicinity Map*. The proposed project is planned to be developed in one phase. This study is a stand alone document, and presents the findings of a detailed hydrologic analysis of the project site, and the contributing watersheds. Please note that this study provides the hydrological summations for the Existing, and the Interim/Ultimate conditions to meet the mandated City of Las Vegas drainage study requirements.

B. Location

The project site is a portion of the South Half (S ½) of the Northwest Quarter (NW ¼) of Section 23, Township 20 South, Range 59 East, M.D.M., City of Las Vegas, Nevada commonly known as APNs: 137-23-212-001. *See Figure 2, Assessor's Map.*

C. FEMA Flood Plain Information

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community-Panel Number 32003C 2150E, effective September 27, 2002, the site is located within unshaded Zone 'X'. Unshaded Zone 'X' is described as an area outside of the 0.2% annual chance floodplain. Figure 3, *Flood Insurance Rate Map*, provided in the Appendix of this report depicts the FEMA flood zones within proximity of the site.

D. CCRFCD Master Plan Information

Figure F-22 of the 2018 Las Vegas Valley Flood Control Master Plan Update (Figures 4 and Figure 5 of this report) have been referenced within this study. The figures show the subject site is not adjacent to any existing or proposed master plan facilities.

E. Reference Studies

The following studies were reviewed to prepare our study, and relevant materials from these studies have been referenced within our study.

- *Update#2 and Update#3 to the Master Conceptual Drainage Study for Summerlin West Village 22 (DS#5005),* prepared by VTN Nevada, hereinafter referred to as the ***Village 22 MCDS Update#2***. The *Village 22 MCDS Update#3,* is the most up-to-date drainage study relevant to our site, and so, was reviewed to get an understanding of the overall intended drainage for parcels in and around our site. We currently don't have the approval letter for Village 22 MCDS Update#3, however upon reviewing the proposed changes in Update#3 and comparing the same to Update#2, it was found that the changes proposed within Update#3 are not relevant to our site. Hence, basins maps and relevant hydrological parameters from the **approved** Village 22 MCDS Update#2 have been referenced within our study.

- *Improvement Plans for Summerlin West Village 22 Desert Foothills Drive (Sunset Run Drive to Fleet Wing Avenue), DS#5344, VTN (2020)* and addenda*,* herein referred to as the "***DFD Study***". These plans were looked at to get an understanding of the intended drainage improvement along Desert Foothills Drive to the west of our site. Note that we could locate the drainage study for Desert Foothills Drive despite repeated request with CLV, however the DFD Improvement plan set has already been approved. Hence, it is assumed within our study that the drainage improvements along Desert Foothill Drive are complete or substantially complete within the existing condition and that the surface runoff being conveyed along Desert Foothills Dr in the existing condition is the same as that shown in the ultimate condition map of ***Village 22 MCDS Update#2***.

- *Technical Drainage study for Summerlin West Village 22 Kindle Rise Way (from Kettle Bend to Desert Foothills), DS#5243, prepared by VTN (2020), herein referred to as the "KRW Study".* This study was looked at to get an understanding of the historical runoff conveyed along Fleet Wing Avenue to the north of our site. Figure 8 – Ultimate Condition Basin Map from this study has been referenced within our study to provide the reviewer with an idea about the 100-yr surface runoff and 100-yr surface runoff depth along Kindle Rise Avenue. Note that the approved improvement plans for Fleet Wing Avenue was done along with this study and so the existing storm drains/drainage improvement in Kindle Rise Way are based on this study.

- *Technical Drainage study for Summerlin West Village 22 Fleet Wing Avenue (from Kettle Bend to Desert Foothills), DS#5247, prepared by VTN (2020), herein referred to as the "FWA Study".* This study was looked at to get an understanding of the historical runoff conveyed along Fleet Wing Avenue to the north of our site. Figure 7 – Ultimate Condition Basin Map from this study has been referenced within our study to provide the reviewer with an idea about the 100-yr surface runoff and 100-yr surface runoff depth along Fleet Wing Avenue. Note that the approved improvement plans for Fleet Wing Avenue was done along with this study and so the existing storm drains/drainage improvement in Fleet Wing Avenue are based on this study.

- *Technical Drainage study for Summerlin West Village 22 Kettle Bend Road – Update#2 (Sunset Run Drive to Krestel Creek Road), DS#5204, prepared by VTN (2020), herein referred to as the "KBR study".* This study was looked at to get an understanding of the historical runoff conveyed along Kettle Bend Road to the east of our site. Figure 8 – Ultimate Condition Basin Map from this study has been referenced within our study to provide the reviewer with an idea about the 100-yr surface runoff and 100-yr surface runoff depth along Kettle Bend Road. Note that the approved improvement plans for Kettle Bend Road was done along with this study and so the existing storm drains/drainage improvement in Kettle Bend Road are based on this study.

The Engineer has reviewed the referenced studies with addenda and concurs that the current drainage conditions are nearly the same as those anticipated in the referenced studies.

II. DRAINAGE BASIN DESCRIPTIONS

A. Site Description

The overall site consists of approximately 9.55± acres, and is surrounded by undeveloped parcels on all sides. However, given that the improvement plans for all of the streets adjacent to the site has already been approved, all exterior streets are considered to be developed within the existing condition itself. The project site generally slopes from west to east at approximately %.

B. Offsite Drainage Description

Please see Figure 7 Existing Conditions Basins Map in the Appendix. The assumptions prior to construction of the current Lark Hill project are:

Onsite: All existing runoff generated within the site is discharged towards the low point in the middle of the site near Kettle Bend Road into the existing 30" lateral.

KRW Study: The Kettle Bend Road improvements (downstream storm-drains) and the roadway are complete or substantially complete. Said drainage improvements will accept runoff from the current project site via RCP stub installed specifically to collect runoff from our project site while runoff surface runoff within Kettle Bend Road will be intercepted by existing DIs in the road.

FWA Study: The Fleet Wing Avenue improvements and the roadway are complete or substantially complete. Said drainage improvements (RCPS, DI's, stubs etc.) will accept all runoff from parcels towards further northwest and so cutoff all offsite runoff from north.

DFD Study: The Desert Foothills Drive improvements and the roadway are complete or substantially complete. Said drainage improvements (RCPS, DI's, stubs etc.) will accept all runoff from parcels further west and so cutoff all offsite runoff from west.

KRA Study: The Kindle Rise Avenue improvements and the roadway are complete or substantially complete. Said drainage improvements (RCPS, DI's, stubs etc.) will accept all runoff from parcels further west and so cutoff all offsite runoff from west.

C. Existing Condition Drainage Description

Please see Figure 7 Existing Condition Basins Map in the Appendix. Runoff from the site is conveyed into the existing 30" RCP lateral protruding into our site from Kettle Bend Road.

D. Interim/Ultimate Condition Drainage Description

Please see Figure 8 Ultimate Condition Basins Map in the Appendix. A description of the Interim/Ultimate Condition flows is as follows:

Runoff from the site will be collected by a combination of interior streets, proposed swales, and DI's. The grading has been laid out in a manner that developed runoff collected by interior streets is distributed equally. Runoff collected by proposed DIs will be conveyed by the proposed storm-drain system into the existing storm drain system in Kettle Bend Road. Note that the proposed lot density of our site is same as that anticipated in the Village 22 MCDS Update#2, and hence we agree with the developed condition HEC-1 in Village 22 MCDS Update#2 for our site. Said HEC-1 has been provided as reference material in the Appendix.

Note that runoff from a small portion of our entry way (DON12) will be discharged towards Kettle Bend Road. This will cause an negligible (0.5 cfs 100-yr runoff) increase in the surface runoff being conveyed in Kettle Bend Road.

III. HYDROLOGIC CRITERIA

A. Method of Analysis

The U.S. Army Corps of Engineers HEC-1 flood hydrograph package was used to determine the peak runoff generated by the 100-year, 6-hour storm event. The HEC-1 computer model can simulate the surface runoff response of a given basin and smaller sub-basins to rainfall. The computed hydrographs from each sub-basin are then combined at the appropriate locations, from which a final discharge hydrograph is obtained. The HEC-1 analysis for the Existing Condition has been provided in the Appendix while the HEC-1 analysis for the Ultimate condition was referenced from the Village 22 MCDS Update#2.

B. Precipitation

The project site is located **outside** of the McCarran Airport Rainfall Area. The rainfall depths for the 6-hour, 10-year and 100-year storm events were obtained per the *CCRFCD Hydrologic Criteria and Drainage Design Manual (1999), Section 500, Table 505*, and are 1.83" and 3.38" respectively. Since the site encompasses less than 8 square miles, a Storm Distribution Number three (SDN #3) was used for the HEC-1 model.

C. Hydrologic Abstractions

The SCS curve number method was used to determine the infiltration rates for the drainage basins. The engineer has furnished a site-specific Custom Soil Resource Report from the FloodView Advanced – Clark County Regional Flood Control Districts website (see Appendix). The site consists of Soils Type 1155 – Cave gravelly fine sand loam, 4 to 15 percent slopes (hydrological soils group D) and Soils Type 1502 – Canutio-Cave gravelly fine sandy loams, 2 to 8 percent slopes (hydrological soils group A).

D. Basin Area

Basin areas for the offsite drainage basins were delineated based on the referenced studies.

E. SCS Lag-Time with Time of Concentration

Lag-time, T_L, is defined as the time measured from the centroid of effective rainfall to the peak of the outflow hydrograph. Lag times for this study were estimated by calculating the drainage basins' time of concentration, T_C. The time of concentration is defined as the time required for runoff to flow from the hydraulically most distant point of a subbasin to the outlet point of the subbasin. The equation for lag-time is: $T_L=0.6T_C$. Standard Form 4 as included in the CCRFCD Manual was utilized to determine the lag times for subbasins modeled. A copy of the referenced lag time computations is included in the Appendix.

IV. MODEL RESULTS

A. Peak Flows

Interim/Ultimate Condition:

TABLE 2
Flow Summary (Ultimate Condition)

CONCENTRATION POINT	Reference	Q_{100} cfs
CP1	*DON1 + DON2*	8.3
CP2	*CP1 + DON19*	9.2
CP3	*CP2 + DON18*	10.13
CP4	*CP3 + DON17*	11.13
CP5	*CP4 + DON14 + DON15*	13.93
CP6	*DON3 + DON4 + DON5 + DON20*	8.2
CP7	*1/2 DON7 + DON8*	2.6
CP8	*CP3 + DON11*	3.2
CP9	*1/2 DON7 + DON9*	2.5

TABLE 3				
Flow Summary (Ultimate Condition)				
BASIN ID	**DRAINAGE AREA**	**Reference**	**Pro-rate factor**	**Q_{100}**
	(acres)		**cfs**	**cfs**
Parcel QR	**9.55**	***Pro-rated from referenced basin QR***		**37.0**
DON1	0.84	*Pro-rated from referenced basin QR*	3.8743	3.3
DON2	1.30	*Pro-rated from referenced basin QR*	3.8743	5.0
DON3	0.46	*Pro-rated from referenced basin QR*	3.8743	1.8
DON4	0.54	*Pro-rated from referenced basin QR*	3.8743	2.1
DON5	0.78	*Pro-rated from referenced basin QR*	3.8743	3.0
DON6	0.84	*Pro-rated from referenced basin QR*	3.8743	3.3
DON7	0.54	*Pro-rated from referenced basin QR*	3.8743	2.1
DON8	0.38	*Pro-rated from referenced basin QR*	3.8743	1.5
DON9	0.35	*Pro-rated from referenced basin QR*	3.8743	1.4
DON10	0.42	*Pro-rated from referenced basin QR*	3.8743	1.6
DON11	0.17	*Pro-rated from referenced basin QR*	3.8743	0.7
DON12	0.14	*Pro-rated from referenced basin QR*	3.8743	0.5
DON13	0.40	*Pro-rated from referenced basin QR*	3.8743	1.5
DON14	0.37	*Pro-rated from referenced basin QR*	3.8743	1.4
DON15	0.35	*Pro-rated from referenced basin QR*	3.8743	1.4
DON16	0.56	*Pro-rated from referenced basin QR*	3.8743	2.2
DON17	0.32	*Pro-rated from referenced basin QR*	3.8743	1.2
DON18	0.24	*Pro-rated from referenced basin QR*	3.8743	0.9
DON19	0.22	*Pro-rated from referenced basin QR*	3.8743	0.9
DON20	0.33	*Pro-rated from referenced basin QR*	3.8743	1.3

B. Hydraulic Calculations

Street Flow Calculations:

Table 4					
100-year Street Flow Analysis (ULT Condition)					
Section	**Slope (%)**	**Flow (100 year) (cfs)**	**Velocity (ft/s)**	**Flow Depth (ft)**	**VxD**
d2	2.50	5.00	3.14	0.30	0.94
d5	2.00	3.00	2.60	0.27	0.70
d8	1.90	2.60	2.85	0.31	0.88
d9	1.90	2.50	2.83	0.31	0.88
d14	1.90	1.40	2.52	0.27	0.68
d15	1.90	1.40	2.52	0.27	0.68
*STKB2-A	3.60	2.00	3.50	0.25	0.88
*STKB2-B	0.70	3.00	1.74	0.35	0.61
**STG3	9.67	3.00	5.23	0.22	1.15
'DES3	1.90	1.40	2.52	0.27	0.68
"STF2	5.00	1.45	2.09	0.29	0.61
*Referenced from the KBR study (DS#5204)					
**Referenced from the FWA study (DS#5247)					
'Q_{100} referenced from the Village 22 MCDS Update#2					
"Referenced from the KRW study (DS#5243)					

The major storm (100-yr) criteria for all ROW's are as follows: VxD product shall be less than or equal to 8 and the depth of flow in the street from the gutter flowline should be less than 2'.

The minor storm (10-yr) criteria for ROW's less than 80's is as follows: VxD product shall be less than or equal to 6 and the depth of flow in the street from the gutter flowline should be less than 1'.

All interior streets meet the above criteria for the 100-yr storm event itself, and thus for 10-yr storm event by default. Note that our site upon development will not discharge any surface runoff onto the exterior street (except 0.5 cfs from the entrance area onto Kettle Bend Road). The ultimate condition runoff discharge point from our site is exactly the same as anticipated in the already approved Village 22 MCDS Update#2 as our proposed strom drain system will connect to the existing 30" RCP lateral from Kettle Bend Road. Hence, we are not altering drainage pattern or runoff of any of the exterior streets. However, cross-sections for the exterior street has been

referenced for all exterior streets adjacent to the project site to give the reviewer an idea on the existing and the ultimate 100-yr runoff depth in those streets.

Finished Floor Analysis

A finished floor analysis table depicting the proposed lot finished floor elevations, high side TCs, and correlating street flow depths has been utilized to check that the finished floors for the proposed buildings reside above the following criteria:

1) Finished Floor elevation to reside a minimum of twice the depth of flow measured from the swale flowline at the rear of the lot.
2) Garage finished floor to reside a minimum of twice the depth of flow measured from the gutterline flowline (at the center of the lot) of the street fronting the lot.

Note that we also checked the Finished floor elevations of the proposed Lots at the T-intersection against 100-yr runoff EGL in the street. The FFE of the proposed lots at the corners (there are no T-intersections in our proposed design) all reside above the 100-yr runoff EGL.

Fleet Wing Avenue (Exterior Street):

Per the approved FWA study, the 100-yr runoff depth for runoff being conveyed in Fleet Wing Avenue is 0.22'. Twice the depth of 100-yr runoff in Fleet Wing Avenue is contained within the L-curb of the street itself. Hence, lots adjacent to Fleet Wing Avenue have adequate flood protection.

Desert Foothills Drive (Exterior Street):

Per the approved DFD study, the 100-yr runoff depth for runoff being conveyed in Fleet Wing Avenue is 0.27'. Twice the depth of 100-yr runoff in Desert Foothills Drive will be below the existing grade against the proposed wall on the west side of the project. Hence, lots adjacent to Desert Foothills Drive have adequate flood protection.

Kindle Rise Way (Exterior Street):

Per the approved KRW study, the 100-yr runoff depth for runoff being conveyed in Kindle Rise Way is 0.29'. Twice the depth of 100-yr runoff in Kindle Rise Way will be below the existing grade against the proposed wall on the south side of the project. Hence, lots adjacent to Kindle Rise Way have adequate flood protection.

Kettle Bend Road (Exterior Street):

Per the approved KBR study, the worst-case 100-yr runoff depth for runoff being conveyed in Kettle Bend Road is 0.35'. The Finished floor elevation of proposed lots adjacent to Kettle Bend Road are all 3' to 8.7' higher than Kettle Bend Road. Hence, lots adjacent to Kettle Bend Road have adequate flood-protection.

Drop-Inlet Calculations and WSPG Calculations:

Drop-inlet calculations for the proposed Area-grate inlets and the Type CM2 drop inlets have been provided in the Appendix. Note that all proposed drop-inlets were sized considering 50% clogging factor. In case the proposed drop-inlets get fully, the emergency overflow will be towards area of nearest low elevation.

The WSPG calculations for the proposed storm-drains has been provided in the Appendix. Note the 100-yr runoff HGLs along the storm drain are all at-least 1' below the proposed manhole rim and drop-inlet grate elevations.

V. CONCLUSIONS

This Technical Drainage Study for Lark Hill (aka Parcel QR) has been developed in accordance with Criteria established in the Clark County Regional Flood Control District Hydrologic Criteria and Drainage Design Manual. The proposed development does not adversely impact any proposed or existing Clark County Regional Flood Control District Master Plan Update facilities.

VI. REFERENCES

1. *CCRFCD Hydrologic Criteria and Drainage Design Manual and Addenda*, WRC Engineering, 1999.

2. *2008 Las Vegas Valley Flood Control Master Plan Update, PBJ*.

3. *Flood Insurance Rate Map, Community Panel Number 32003C* 2615F*, Clark County, Nevada*, Federal Emergency Management Agency, November 16, 2011.

4. *Update#2 and Update#3 to the Master Conceptual Drainage Study for Summerlin West Village 22 (DS#5005),* prepared by VTN Nevada*.*

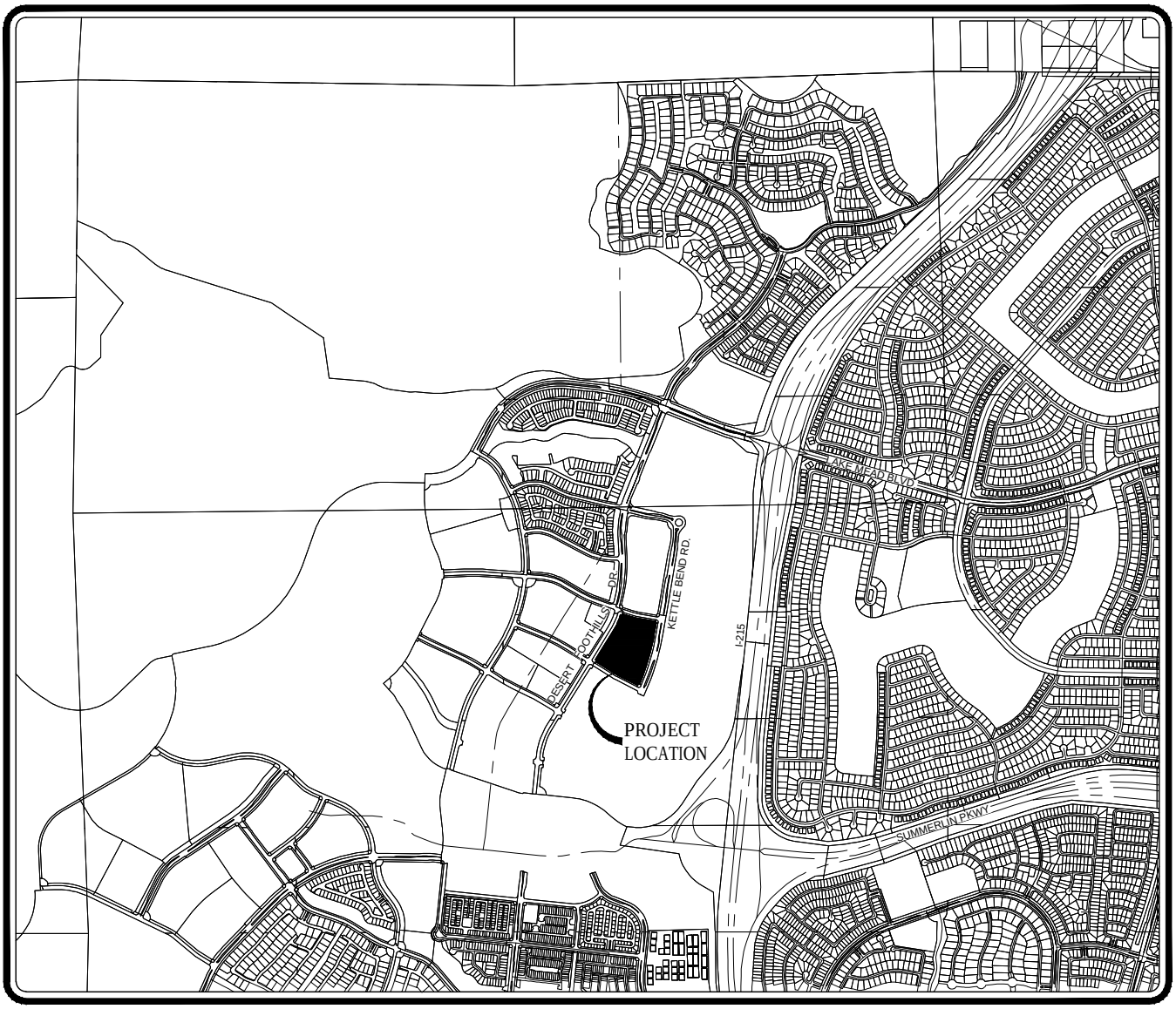
5. *Improvement Plans for Summerlin West Village 22 Desert Foothills Drive (Sunset Run Drive to Fleet Wing Avenue), DS#5344, VTN (2020)* and addenda.

6. *Technical Drainage study for Summerlin West Village 22 Kindle Rise Way (from Kettle Bend to Desert Foothills), DS#5243, prepared by VTN (2020)*.

7. *Technical Drainage study for Summerlin West Village 22 Fleet Wing Avenue (from Kettle Bend to Desert Foothills), DS#5247, prepared by VTN (2020).*

8. *Technical Drainage study for Summerlin West Village 22 Kettle Bend Road – Update#2 (Sunset Run Drive to Kristel Creek Road), DS#5204, prepared by VTN (2020).*

APPENDIX



VICINITY MAP

SCALE: NTS

Actus
3283 E. Warm Springs Road Suite 300
Las Vegas, NV 89120
www. Actus-NV.com
(702) 586-9296
Consulting- Planning- Engineering - Surveying

LARK HILL
(aka Summerlin Village 22 - Parcel QR)
VICINITY MAP

DATE	05/17/2022
DRAWN	JDA
DESIGNED	JDA
CHECKED	DCL
PROJECT #	TMH012201
SHEET NUMBER	FIGURE 1a

NOTES

This map is for assessment use only and does NOT represent a survey.

No liability is assumed for the accuracy of the data deliniated herein. Information on roads and other non-assessed parcels may be obtained from the Road Document Listing in the Assessor's Office.

This map is compiled from official records, including surveys and deeds, but only contains the information required for assessment. See the recorded documents for more detailed legal information.

USE THIS SCALE(FEET) WHEN MAP REDUCED FROM 11X17 ORIGINAL

0 100 200 400 600 800

MAP LEGEND

PARCEL BOUNDARY
SUB BOUNDARY
PM/LD BOUNDARY
ROAD EASEMENT
MATCH / LEADER LINE
HISTORIC LOT LINE
HISTORIC SUB BOUNDARY
HISTORIC PM/LD BOUNDARY
SECTION LINE

CONDOMINIUM UNIT
AIR SPACE PCL
RIGHT OF WAY PCL
SUB-SURFACE PCL

001 ROAD PARCEL NUMBER
001 PARCEL NUMER
1.00 ACREAGE
202 PARCEL SUB/SEQ NUMBER
PB 24-45 PLAT RECORDING NUMBER
5 BLOCK NUMBER
5 LOT NUMBER
GL5 GOV. LOT NUMBER

ASSESSOR'S PARCELS - CLARK COUNTY, NV.
Briana Johnson - Assessor

BOOK T20S R59E

127	126	12512
136	137	13813
165	164	16316

Scale: 1" = 200'

SEC. 23

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Rev: 3/9/2022

MAP S 2 NW 4

8	4	8	4
5	1	5	1
6	2	6	2
7	3	7	3
8	4	8	4
5	1	5	1

137-23-2

CLARK COUNTY NEVADA

SUMMERLIN WEST VILLAGE 22 UNIT 6
PB 166-80
PT LOT NOP
PT LOT NP-1
PT 137-23-213-001
PT 137-23-115-003
PT 137-23-115-001
PT137-22-512-001
PT LOT LM
213
212
SUMMERLIN VILLAGE 22 UNIT 5
PB 166-60
PROJECT SITE
SUMMERLIN WEST VILLAGE 22 - UNIT 2
PB 163-43
211
PT LOT 1
KETTLE RIDGE DR
KINDLE RISE WAY
DESERT FOOTHILLS DR
FLEET WING AVE
KETTLE BEND RD
FLIGHT RANGE AVE
LOT S
LOT T
LOT U
QR
PT137-23-213-003

TAX DIST 200

National Flood Hazard Layer FIRMette

FEMA

115°21'5"W 36°12'9"N



115°20'28"W 36°11'40"N

Feet 1:6,000

0 250 500 1,000 1,500 2,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/17/2022 at 12:32 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
APAD		**ANGEL PARK - ALTA DRIVE BRANCH**						
0203	E	2: 7' X 5.5' RCB	1104	2200	CSWAA-1	GOW3A	6.95	5.28
0225	E	2: 7' X 5.5' RCB OUTLET	360	2137	SUM5DB	GOW3A	6.73	3.40
APBE		**ANGEL PARK - BELTWAY BRANCH**						
0022	E	CONC CHNL 20'W 7'D 2:1 SS	1556	3366	CCSWFH15	GOW3A	3.39	1.81
0051	E	CONC CHNL 20'W 7'D 2:1 SS	1583	3366	CCSWFH15	GOW3A	3.39	2.77
0081	E	8' X 8' RCBC @ FAR HILLS	777	1048	CSWFH-15	GOW3A	0.59	2.32
0094	E	CONC CHNL 10'W 5'D 2:1 SS	1465	1048	CSWFH-15	GOW3A	0.59	1.88
0122	E	CONC CHNL 10'W 4'D 2:1 SS	1685	1048	CSWFH-15	GOW3A	0.59	0.80
0154	P0	8' X 6' RCB	5012	781	CSWFH-12	GOW3A	0.41	1.30
0249	P0	6' X 5' RCB	2858	606	CSWFH-11	GOW3A	0.31	3.00
APCH		**ANGEL PARK - CARRIAGE HILL BRANCH**						
0000	E	8' X 6' RCB	152	399	CSWFH-14	GOW3A	0.21	0.87
0003	P0	72" RCP	1685	399	CSWFH-14	GOW3A	0.21	2.00
0031	P0	60" RCP	2008	206	SWFH-13	GOW3A	0.10	1.38
APD2		**ANGEL PARK - DESERT FOOTHILLS 2 BRANCH**						
0002	E	7' X 6' RCB	883	674	SWAA-2	GOW3A	0.68	1.08
APDF		**ANGEL PARK - DESERT FOOTHILLS BRANCH**						
0000	P0	10' X 6' RCB	1788	1428	CSWFH-9	GOW3B	0.80	3.55
0026	P0	8' X 6' RCB	1813	968	CSWFH-8	GOW3A	1.80	2.00
0073	P0	6' X 4' RCB	1922	486	CSWFH-4	GOW3A	1.52	4.40
0123	P0	42" RCP	1076	141	GPDB	GOW3A	1.29	6.00
0125	P0	130 AC-FT GRAND PARK DETENTION BASIN		1543	CSWFH-3	GOW3A	1.29	
0127	P0	6' X 6' RCB	2977	853	SWFH-1	GOW3A	0.69	3.80
0128	P0	5' X 4' RCB	2197	509	SWFH-2	GOW3A	0.37	5.70
APFH		**ANGEL PARK - FAR HILLS BRANCH**						
0000	E	2: 8' X 8' RCB	1070	2494	CCSWFH14	GOW3B	1.51	3.50
0019	E	2: 8' X 8' RCB	250	2149	CCSWFH-9	GOW3B	1.30	4.19
0024	E	16' X 8' RCAP	1951	2149	CCSWFH-9	GOW3B	1.30	5.10
0061	E	8' X 6' RCB	1435	839	CSWFH-7	GOW3A	0.50	2.00
0089	E	8' X 6' RCB	2946	839	CSWFH-7	GOW3A	0.50	2.00
0144	P0	5' X 4' RCB	2497	456	SWFH-6	GOW3A	0.28	5.50
APM5		**DETENTION BASIN #5**						
0000	E	384 AC-FT DETENTION BASIN #5		6856	SUM5IN	GOW3A	6.73	
0008	P0	CONC CHNL 50'W 4.5'D 2:1 SS	2102	3634	CCDB54-7	GOW3A	4.13	5.20
0009	P0	CONC CHNL 50'W 4'D 2:1 SS	4180	3495	CDB55-7	GOW3A	2.60	5.80
0047	E	DIVERSION BERM WITH GABION BANK PROTECTION	1000	3634	CCDB54-7	GOW3A	4.13	1.30
0056	P0	CONC CHNL 80'W 4'D 2:1 SS	264	3634	CCDB54-7	GOW3A	4.13	1.30
0057	P0	CONC CHNL 50'W 3'D 2:1 SS	9922	1664	CDB54-4	GOW3A	0.81	6.80
0059	P0	CONC CHNL 100'W 3'D 2:1 SS	9075	2606	CDB54-7	GOW3A	3.31	7.00
0212	P0	CONC CHNL 30'W 3'D 2:1 SS	6695	1092	DB55-1	GOW3A	0.64	7.50
0213	P0	CONC CHNL 50'W 3'D 2:1 SS	6522	1729	CDB55-5	GOW3A	1.30	7.30
APSP		**ANGEL PARK - SUMMERLIN PARKWAY**						
0183	E	CONC CHNL 10'W 6'D 2:1 SS	1680	884	C11B-1	GOW3A	0.84	1.70
GOB3		**GOWAN LONE MOUNTAIN SYST. 3 BELTWAY**						
0000	E	66" RCP	1370	341	SV22-1	GOW3A	0.18	4.50
GOBE		**GOWAN LONE MOUNTAIN SYST. BELTWAY**						
0000	E	20' X 10' RCBC @ ACCESS RD	30	1044	CSV22	GOW3A	0.67	5.67
0001	E	CONC CHNL 20'W 5'D 2:1 SS	1100	1044	CSV22	GOW3A	0.67	6.50
0021	E	CONC CHNL 11'W 6.8'D 0:1 SS	2143	1044	CSV22	GOW3A	0.67	6.50
0058	E	CONC CHNL 15'W 7.5'D 0:1 SS	487	1044	CSV22	GOW3A	0.67	3.93
0065	E	CONC CHNL 17'W 7.5'D 0:1 SS	844	1044	CSV22	GOW3A	0.67	0.76
0088	E	2: 10' X 9' RCBC @ LAKE MEAD	400	782	SV22-2	GOW3A	0.49	0.50
0096	E	CONC CHNL 20'W 9'D 2:1 SS	627	782	SV22-2	GOW3A	0.49	0.50
0108	E	CONC CHNL 20'W 6'D 2:1 SS	1021	782	SV22-2	GOW3A	0.49	0.50
0127	E	CONC CHNL 20'W 6'D 2:1 SS	638	782	SV22-2	GOW3A	0.49	0.50
0139	E	CONC CHNL 10'W 5.5'D 2:1 SS	1500	782	SV22-2	GOW3A	0.49	1.02
GOL3		**GOWAN LONE MOUNTAIN SYSTEM-BRANCH 3**						
0010	E	CONC CHNL 20'W 10'D 0:1 SS	3037	3277	CRCLMT1R	GOW3A	7.31	2.78
0068	E	TRANSITION STRUCTURE	100	3277	CRCLMT1R	GOW3A	7.31	3.50
0070	E	20' X 6' RCBC @ CLIFF SHADOWS	350	1271	CRCSV22	GOW3A	4.99	2.44
0077	E	CONC CHNL 20'W 6'D 0:1 SS	1229	1271	CRCSV22	GOW3A	4.99	6.11

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
GOL3		**GOWAN LONE MOUNTAIN SYSTEM-BRANCH 3**						
0100	E	CONC CHNL 20'W 10'D 0:1 SS	200	1271	CRCSV22	GOW3A	4.99	5.67
0115	E	96" RCP OUTLET	670	666	DET26	GOW3A	4.31	0.29
0128	E	305 AC-FT VILLAGE 26 DETENTION BASIN		3615	VIL26IN	GOW3A	4.31	
0137	E	CONC CHNL 20'W 7.5'D 0:1 SS	2720	3615	VIL26IN	GOW3A	4.31	6.50
0188	E	CONC CHNL 20'W 8'D 0:1 SS	563	3615	VIL26IN	GOW3A	4.31	3.91
0197	E	14' X 14' RCB	890	3615	VIL26IN	GOW3A	4.31	0.88
0214	E	Dual 10' X 14' RCB	124	3615	VIL26IN	GOW3A	4.31	0.57
0216	P0	CONC CHNL 50'W 4'D 2:1 SS	4060	3524	CSV26-1	GOW3A	4.02	6.08
0289	P0	CONC CHNL 50'W 3.5'D 2:1 SS	6215	2281	30	GOW3A	2.44	7.95
0290	E	NATURAL WASH 363'W	4850	1410	SV26-1	GOW3A	1.59	22.50
0370	E	NATURAL WASH 450'W	7000	2281	30	GOW3A	2.44	8.50
GOL4		**GOWAN LONE MOUNTAIN SYSTEM-BRANCH 4**						
0000	E	14' X 8' RCB	554	2243	CLMT1R	GOW3A	2.33	2.50
0010	E	2: 9' X 8' RCB	820	2243	CLMT1R	GOW3A	2.33	4.74
0025	E	SOIL CEMENT CHNL 60'W 8'D 3-4:1 SS	320	2243	CLMT1R	GOW3A	2.33	2.00
0026	E	SOIL CEMENT CHNL 42'W 6'D 3-4:1 SS	700	2243	CLMT1R	GOW3A	2.33	1.00

*The HEC-1 node shown identifies the controlling concentration point for the associated facility and is located upstream of this facility due to decreasing peak flow with increasing tributary area caused by storm distribution transitions, depth area reduction factors, or attenuation of flow from routing.
**As-built or design slopes were used when available. All other slopes are based on existing topography. The user should verify the facility slope listed prior to performing any facility specific analysis.
^ For parallel facilities, the existing facility flow equals its normal depth capacity, and the proposed parallel facility flow equals the remaining flow (i.e. HEC-1 Node flow = existing facility normal depth capacity + proposed parallel facility flow).

REGIONAL FLOOD CONTROL DISTRICT

2018 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

FACILITY INVENTORY FIGURE F-22

LEGEND

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

Existing Facility.....E
Proposed or Modified Facility.....P
Contingency Level
Category A.....P
Category B.....P0

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

Construction Features

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

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FIGURE 4

REGIONAL FLOOD CONTROL DISTRICT

2018
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F-22
FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Detention Basin
- Culvert or Bridge Crossing
- Stormdrain
- Lined Channel
- Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain
Crossing	Crossing

FIGURE 5

N

0 500 1,000 2,000 3,000
Feet

Scale: 1 inch = 2,000 feet

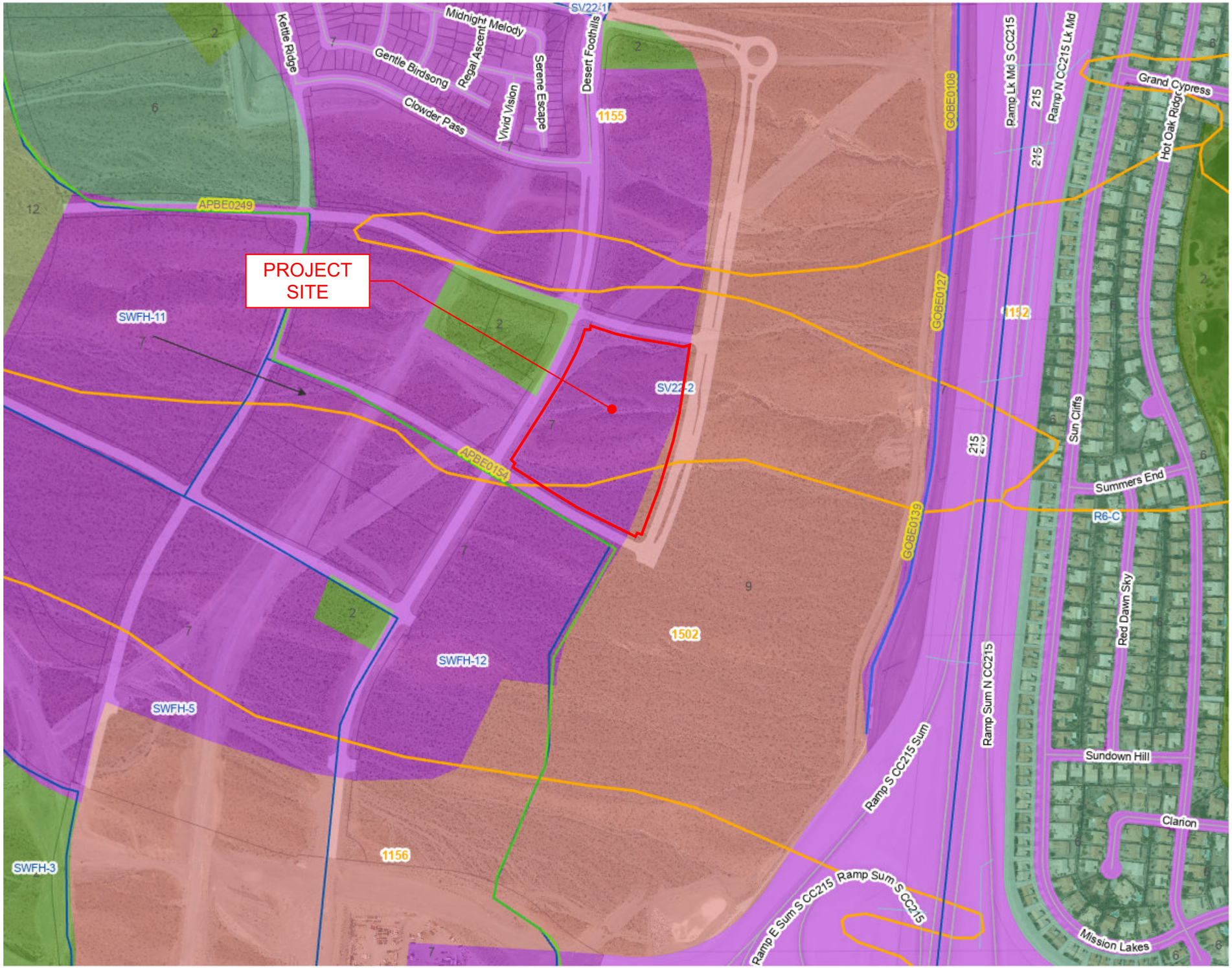
AerialSource:Esri World Imagery 2017

US95 I-15 CC-215 I-215

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54

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Legend

- Flow Arrows
- NodeID flow(cfs) Concentration Points
- Facility: Complete
- Facility: Under Construction
- Facility: Ten-Year First Five
- Facility: Ten-Year Second Five
- Facility: Proposed
- Ultimate Development Boundary
- Watershed
- BasinID Subbasins
- MUSYM Soils
- 1: Undeveloped Land, Open desert
- 2: Parks, Golf Courses
- 3: Rural, 0.5-1 units per acre (uses 1 unit/acre)
- 4: Low-Density Residential, 1-2 units per acre (uses 2 units/acre)
- 5: Medium-Density Residential, 2-4 units per acre (uses 3 units/acre)
- 6: High-Density Residential, 4-8 units per acre (uses 6 units/acre)
- 7: Public Facility and Residential, 8-12 units/acre
- 8: Very High-Density Residential, 12 units/acre or more
- 9: Commercial, Retail, Casino, High Rise Condominiums
- 10: Light Industrial
- 11: Heavy Industrial
- 12: Schools
- 13: Lakes
- SFHA Zone AE
- SFHA Zone A
- SFHA Zone AO
- Zone X (Shaded)

1 inch = 417 feet

N

0 215 430 860 Feet

REGIONAL FLOOD CONTROL DISTRICT

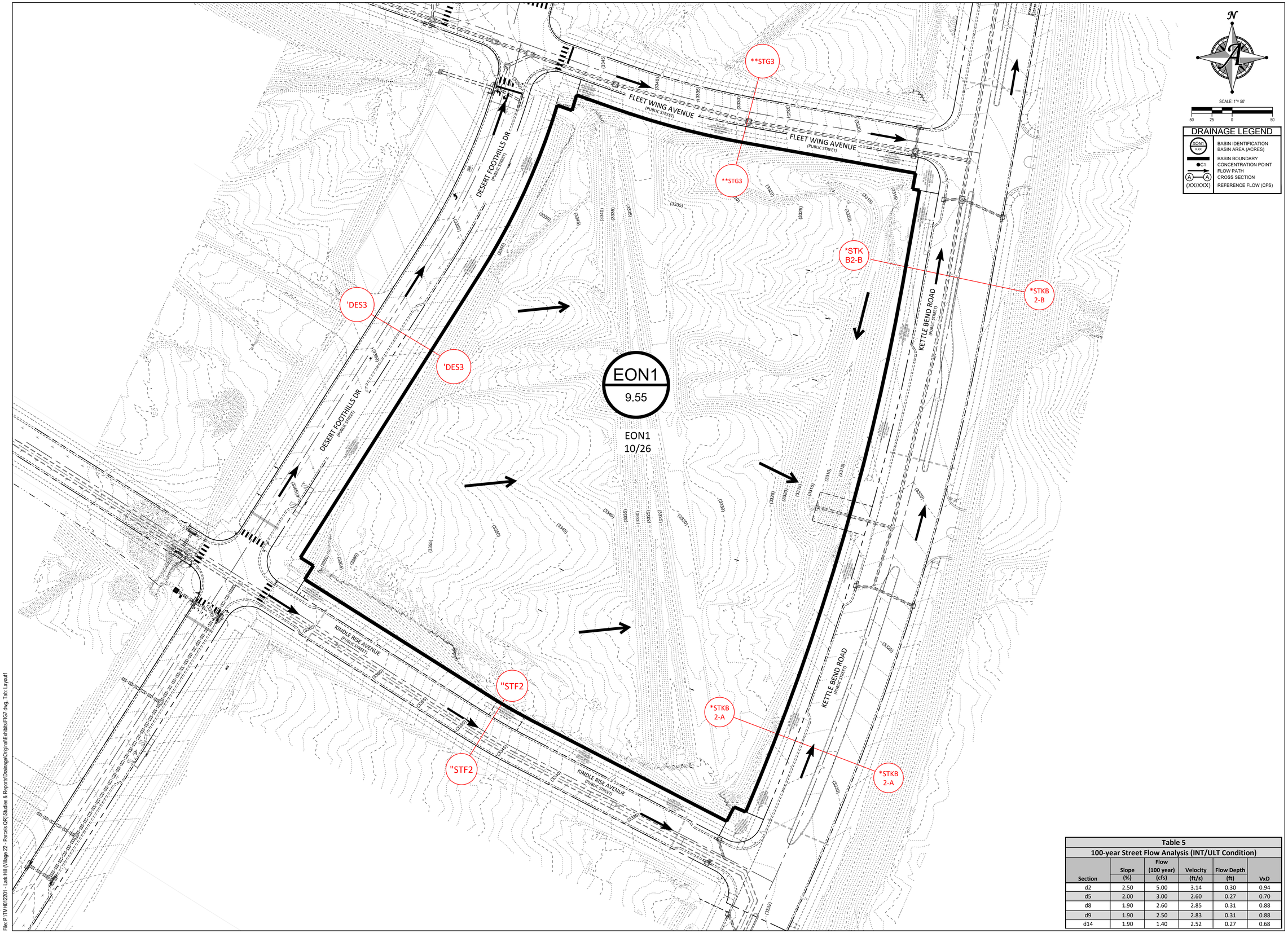


Table 5

100-year Street Flow Analysis (INT/ULT Condition)

Section	Slope (%)	Flow (100 year) (cfs)	Velocity (ft/s)	Flow Depth (ft)	VxD
d2	2.50	5.00	3.14	0.30	0.94
d5	2.00	3.00	2.60	0.27	0.70
d8	1.90	2.60	2.85	0.31	0.88
d9	1.90	2.50	2.83	0.31	0.88
d14	1.90	1.40	2.52	0.27	0.68

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FIGURE 7 - EXISTING CONDITION BASINS MAP

LARK HILL

TAYLOR MORRISON HOMES

CITY OF LAS VEGAS

BY	DATE	DESCRIPTION
A		

DATE	AUG-10-2022
DRAWN	RO. PO.
DESIGNED	JA
CHECKED	RO. PO.
PROJECT #	TMH012201

SHEET GROUP
FIG 7

SHEET NUMBER
1

SHEET 1 OF 1

Plot Stamp: 8/11/2022 4:22:13 PM - Roshan Poudel
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TABLE 3				
Flow Summary (Ultimate Condition)				
BASIN ID	DRAINAGE AREA (acres)	Reference	Pro-rate factor cfs	Q_{100} cfs
Parcel QR	**9.55**	***Pro-rated from referenced basin QR***		**37.0**
DON1	0.84	*Pro-rated from referenced basin QR*	3.8743	3.3
DON2	1.30	*Pro-rated from referenced basin QR*	3.8743	5.0
DON3	0.46	*Pro-rated from referenced basin QR*	3.8743	1.8
DON4	0.54	*Pro-rated from referenced basin QR*	3.8743	2.1
DON5	0.78	*Pro-rated from referenced basin QR*	3.8743	3.0
DON6	0.84	*Pro-rated from referenced basin QR*	3.8743	3.3
DON7	0.54	*Pro-rated from referenced basin QR*	3.8743	2.1
DON8	0.38	*Pro-rated from referenced basin QR*	3.8743	1.5
DON9	0.35	*Pro-rated from referenced basin QR*	3.8743	1.4
DON10	0.42	*Pro-rated from referenced basin QR*	3.8743	1.6
DON11	0.17	*Pro-rated from referenced basin QR*	3.8743	0.7
DON12	0.14	*Pro-rated from referenced basin QR*	3.8743	0.5
DON13	0.40	*Pro-rated from referenced basin QR*	3.8743	1.5
DON14	0.37	*Pro-rated from referenced basin QR*	3.8743	1.4
DON15	0.35	*Pro-rated from referenced basin QR*	3.8743	1.4
DON16	0.56	*Pro-rated from referenced basin QR*	3.8743	2.2
DON17	0.32	*Pro-rated from referenced basin QR*	3.8743	1.2
DON18	0.24	*Pro-rated from referenced basin QR*	3.8743	0.9
DON19	0.22	*Pro-rated from referenced basin QR*	3.8743	0.9
DON20	0.33	*Pro-rated from referenced basin QR*	3.8743	1.3

TABLE 2		
Flow Summary (Ultimate Condition)		
CONCENTRATION POINT	Reference	Q_{100} cfs
CP1	*DON1 + DON2*	8.3
CP2	*CP1 + DON19*	9.2
CP3	*CP2 + DON18*	10.13
CP4	*CP3 + DON17*	11.13
CP5	*CP4 + DON14 + DON15*	13.93
CP6	*DON3 + DON4 + DON5 + DON20*	8.2
CP7	*1/2 DON7 + DON8*	2.6
CP8	*CP3 + DON11*	3.2
CP9	*1/2 DON7 + DON9*	2.5

DON18
0.24 AC
Q100 = 0.93 CFS

DON17
0.32 AC
Q100 = 1.2 CFS

CP3 = CP2 + DON18
= 10.13 CFS

DON16
0.56 AC
Q100 = 2.2 CFS

CP2 = CP1 + DON19
= 9.2 CFS

**STG3

CP4 = CP3 + DON17
= 11.13 CFS

CP1 = DON1 + DON2
= 8.3 CFS

CP5 = CP4 + DON14 + DON15
= 13.93 CFS

DON19
0.22 AC
Q100 = 0.9 CFS

DON20
0.33 AC
Q100 = 1.3 CFS

'DES3

DON15
0.35 AC
Q100 = 1.4 CFS

DON14
0.37 AC
Q100 = 1.4 CFS

DON13
0.40 AC
Q100 = 1.5 CFS

*STKB
2-B

DON1
0.84 AC
Q100 = 3.3 CFS

CP6 = DON3 + DON4 + DON5 + DON20
= 8.2 CFS

DON2
1.30 AC
Q100 = 5 CFS

DON12
0.13 AC
Q100 = 0.5 CFS

CP7 = 1/2 DON7 + DON8
= 2.6 CFS

DON11
0.17 AC
Q100 = 0.7 CFS

CP8 = CP3 + DON11
= 3.2 CFS

CP9 = 1/2 DON7 + DON9
= 2.5 CFS

DON3
0.46 AC
Q100 = 1.8 CFS

"STF2

DON10
0.42 AC
Q100 = 1.6 CFS

DON4
0.54 AC
Q100 = 2.1 CFS

DON9
0.35 AC
Q100 = 1.4 CFS

*STKB
2-A

DON5
0.78 AC
Q100 = 3 CFS

"STF2

DON6
0.84 AC
Q100 = 3.3 CFS

DON7
0.54 AC
Q100 = 2.1 CFS

DON8
0.38 AC
Q100 = 1.5 CFS

Table 4					
100-year Street Flow Analysis (ULT Condition)					
Section	Slope (%)	Flow (100 year) (cfs)	Velocity (ft/s)	Flow Depth (ft)	VxD
d2	2.50	5.00	3.14	0.30	0.94
d5	2.00	3.00	2.60	0.27	0.70
d8	1.90	2.60	2.85	0.31	0.88
d9	1.90	2.50	2.83	0.31	0.88
d14	1.90	1.40	2.52	0.27	0.68
d15	1.90	1.40	2.52	0.27	0.68
*STKB2-A	3.60	2.00	3.50	0.25	0.88
*STKB2-B	0.70	3.00	1.74	0.35	0.61
**STG3	9.67	3.00	5.23	0.22	1.15
'DES3	1.90	1.40	2.52	0.27	0.68
"STF2	5.00	1.45	2.09	0.29	0.61
*Referenced from the KBR study (DS#5204)					
**Referenced from the FWA study (DS#5247)					
'Q_{100} referenced from the Village 22 MCDS Update#2					
"Referenced from the KRW study (DS#5243)					

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FIGURE 8 - ULTIMATE CONDITION BASINS MAP

LARK HILL

TAYLOR MORRISON HOMES

CITY OF LAS VEGAS

#	DATE	DESCRIPTION	BY
A			

DATE	AUG-10-2022
DRAWN	RO. PO.
DESIGNED	JA
CHECKED	RO. PO.
PROJECT #	TMH012201
SHEET GROUP	FIG 8
SHEET NUMBER	1

SHEET 1 OF 1

Plot Stamp: 8/10/2022 2:40:15 PM - Roshen Poudel
File: P:\TMH012201 - Lark Hill (Village 22 - Parcels QR)\Studies & Reports\Drainage\Original\Exhibits\FIG8.dwg, Tab: Layout1

HYDROLOGIC PARAMETERS



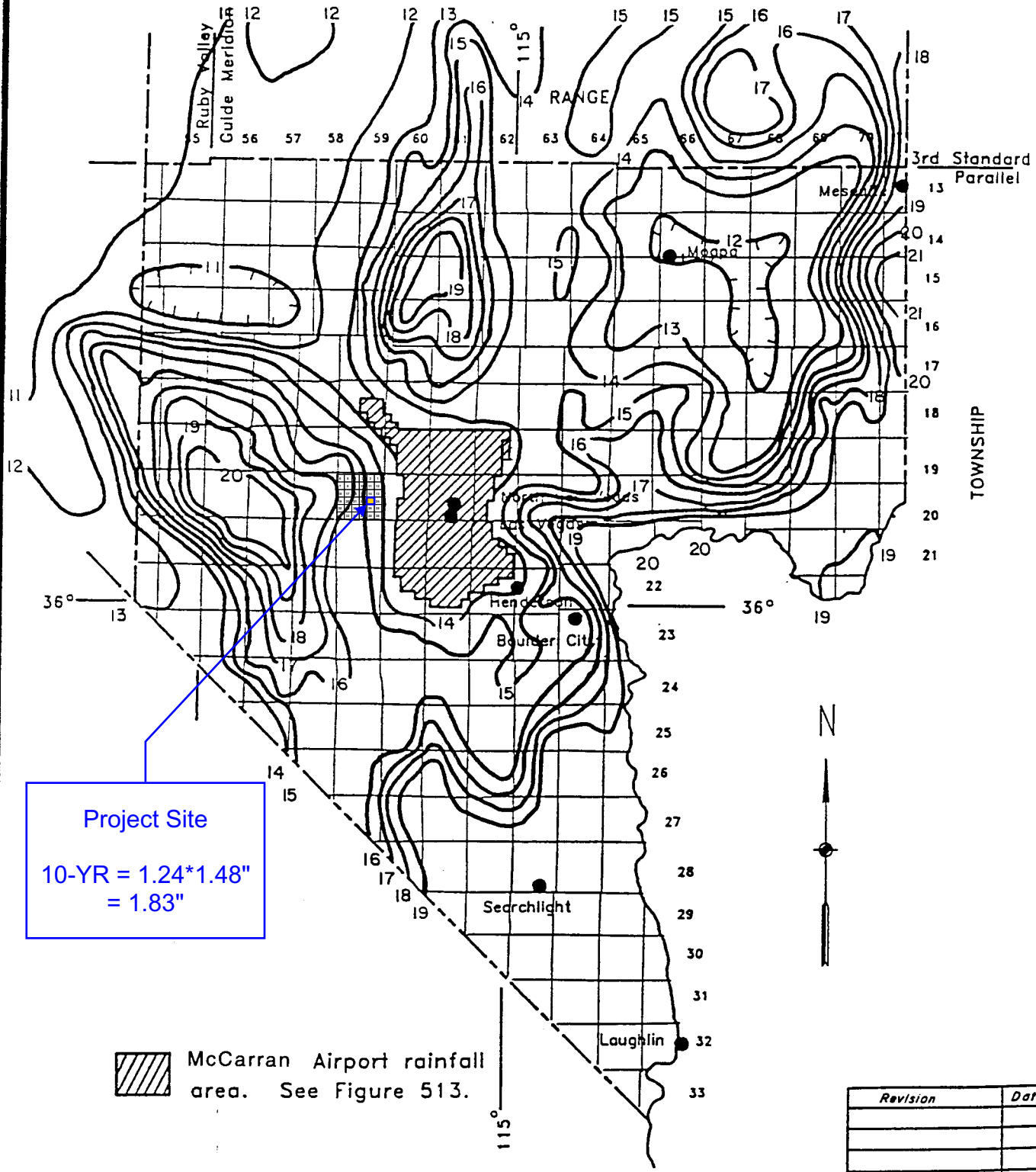
PRECIPITATION ADJUSTMENT RATIOS

Recurrence Interval	Ratio to NOAA Atlas 2
2-year	1.00
5-year	1.16
10-year	1.24
25-year	1.33
50-year	1.39
100-year	1.43

NOTE:
1. Multiply the values obtained from the NOAA Atlas 2 by the above ratios to obtain the adjusted precipitation values.
2. NOAA Atlas 2 values for use with TR-55 shall not be adjusted by the above ratios.
3. Tables 505 and 506 require no adjustments.

Revision	Date

RAINFALL DEPTH-DURATION-FREQUENCY
10-YEAR, 6-HOUR
(DEPTHS IN TENTHS OF INCHES)



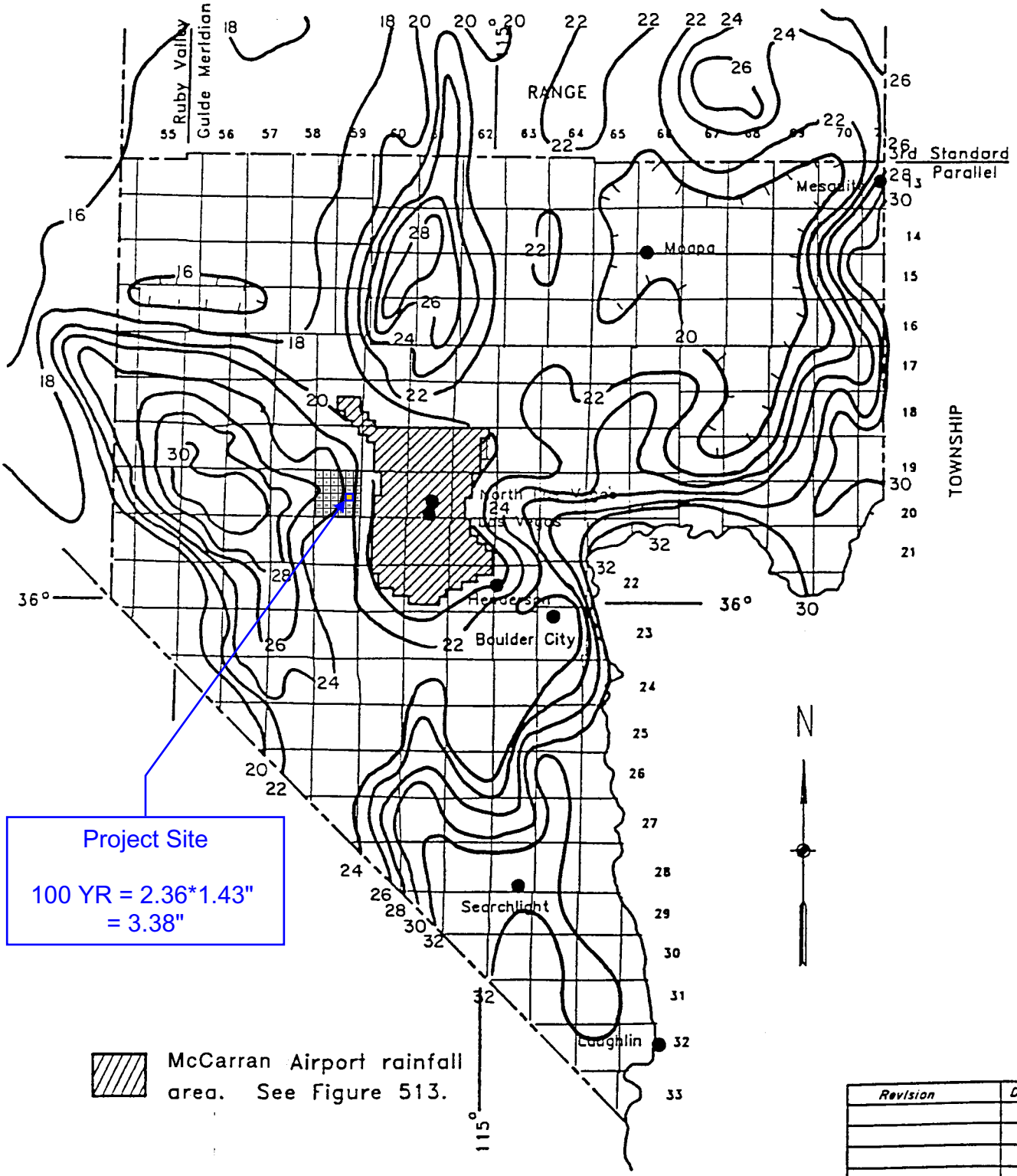
Revision	Date

WRC ENGINEERING

REFERENCE:
NOAA ATLAS 2, VOLUME VII NEVADA, 1973

FIGURE 503

RAINFALL DEPTH-DURATION-FREQUENCY
100-YEAR, 6-HOUR
(DEPTHS IN TENTHS OF INCHES)



Revision	Date

WRC ENGINEERING

REFERENCE:
NOAA ATLAS 2, VOLUME VII NEVADA, 1973

FIGURE 506

Curve Number Matrix

SOIL MAP UNIT	HYDROLOGIC SOIL GROUP					LAND USE CATEGORY INDEX NUMBER												
	A	B	C	D	ROCK OUTCROP	1	2	3	4	5	6	7	8	9	10	11	12	13
	CN --->					63	47	57	60	62	74	84	89	92	86	92	71	30
		CN --->				77	66	73	74	76	83	89	93	94	91	94	81	30
			CN --->			85	77	82	83	84	88	92	95	95	93	95	87	30
				CN --->		88	83	86	87	88	91	94	96	96	95	96	90	30
					CN --->	90	90	92	92	92	94	96	96	97	96	97	94	30
	%	%	%	%	%	SOIL TYPE COMPOSITE CN FOR LAND USE CATEGORY												
1100	6	0	0	59	35	87.0	83.0	86.0	87.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1105	55	40	0	5	0	70.0	56.0	65.0	67.0	69.0	78.0	86.0	91.0	93.0	88.0	93.0	76.0	30.0
1107	0	100	0	0	0	77.0	66.0	73.0	74.0	76.0	83.0	89.0	93.0	94.0	91.0	94.0	81.0	30.0
1112	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1113	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1117	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1120	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1127	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1129	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1130	65	0	25	10	0	71.0	58.0	66.0	68.0	70.0	79.0	87.0	91.0	93.0	89.0	93.0	77.0	30.0
1132	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1133	70	0	10	0	20	71.0	58.0	67.0	68.0	70.0	79.0	87.0	91.0	93.0	89.0	93.0	77.0	30.0
1134	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1135	84	0	0	16	0	67.0	52.0	62.0	64.0	66.0	76.0	85.0	90.0	92.0	87.0	92.0	74.0	30.0
1140	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1141	8	0	2	70	20	86.0	81.0	85.0	86.0	86.0	90.0	93.0	95.0	96.0	94.0	96.0	89.0	30.0
1150	0	0	0	100	0	88.0	83.0	86.0	87.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1151	41	0	0	59	0	78.0	68.0	74.0	76.0	77.0	84.0	90.0	93.0	94.0	91.0	94.0	82.0	30.0
1152	0	0	0	100	0	88.0	83.0	86.0	87.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1155	0	0	0	100	0	88.0	83.0	86.0	87.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1156	1	10	0	89	0	87.0	81.0	84.0	85.0	86.0	90.0	93.0	95.0	96.0	94.0	96.0	89.0	30.0
1160	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1160dn	46	1	0	53	0	76.0	66.0	73.0	74.0	76.0	83.0	89.0	93.0	94.0	91.0	94.0	81.0	30.0
1165	32	40	15	13	0	75.0	64.0	71.0	73.0	74.0	82.0	88.0	92.0	94.0	90.0	94.0	80.0	30.0
1181	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1182	95	0	5	0	0	64.0	48.0	58.0	61.0	63.0	74.0	84.0	90.0	92.0	86.0	92.0	72.0	30.0
1183	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1184	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1187	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1190	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1191	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1192	55	35	0	10	0	70.0	57.0	66.0	68.0	70.0	79.0	87.0	91.0	93.0	88.0	93.0	76.0	30.0
1200	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1206	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1207	3	85	5	7	0	78.0	67.0	74.0	75.0	77.0	83.0	89.0	93.0	94.0	91.0	94.0	82.0	30.0
1222	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1225	9	20	50	21	0	82.0	73.0	79.0	80.0	81.0	86.0	91.0	94.0	95.0	92.0	95.0	85.0	30.0
1230	54	0	0	46	0	75.0	63.0	70.0	72.0	74.0	81.0	88.0	92.0	94.0	90.0	94.0	80.0	30.0
1235	66	25	0	9	0	69.0	55.0	64.0	66.0	68.0	77.0	86.0	91.0	93.0	88.0	93.0	75.0	30.0
1236	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1237	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1240	0	0	0	100	0	88.0	83.0	86.0	87.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1252	0	100	0	0	0	77.0	66.0	73.0	74.0	76.0	83.0	89.0	93.0	94.0	91.0	94.0	81.0	30.0
1255	0	100	0	0	0	77.0	66.0	73.0	74.0	76.0	83.0	89.0	93.0	94.0	91.0	94.0	81.0	30.0
1260	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1262	75	0	0	25	0	69.0	56.0	64.0	67.0	69.0	78.0	86.0	91.0	93.0	88.0	93.0	76.0	30.0
1263	95	0	0	5	0	64.0	48.0	59.0	61.0	64.0	74.0	84.0	90.0	92.0	86.0	92.0	72.0	30.0
1264	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1270	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1278	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1282	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1300	0	0	0	100	0	88.0	83.0	86.0	87.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0

Curve Number Matrix

SOIL MAP UNIT	HYDROLOGIC SOIL GROUP					LAND USE CATEGORY INDEX NUMBER												
	A	B	C	D	ROCK OUTCROP	1	2	3	4	5	6	7	8	9	10	11	12	13
	CN --->					63	47	57	60	62	74	84	89	92	86	92	71	30
		CN --->				77	66	73	74	76	83	89	93	94	91	94	81	30
			CN --->			85	77	82	83	84	88	92	95	95	93	95	87	30
				CN --->		88	83	86	87	88	91	94	96	96	95	96	90	30
					CN --->	90	90	92	92	92	94	96	96	97	96	97	94	30
	%	%	%	%	%	SOIL TYPE COMPOSITE CN FOR LAND USE CATEGORY												
1301	0	0	0	100	0	88.0	83.0	86.0	87.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1302	35	20	0	45	0	77.0	67.0	73.0	75.0	76.0	83.0	89.0	93.0	94.0	91.0	94.0	82.0	30.0
1305	5	0	35	60	0	86.0	79.0	83.0	84.0	85.0	89.0	93.0	95.0	96.0	94.0	96.0	88.0	30.0
1307	10	0	30	60	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	96.0	93.0	96.0	87.0	30.0
1313	8	68	0	24	0	79.0	68.0	75.0	76.0	78.0	84.0	90.0	93.0	94.0	91.0	94.0	82.0	30.0
1314	80	5	0	15	0	67.0	53.0	62.0	65.0	67.0	77.0	86.0	91.0	92.0	88.0	92.0	74.0	30.0
1320	0	2	0	83	15	88.0	83.0	87.0	87.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1323	0	0	0	85	15	88.0	84.0	87.0	88.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	91.0	30.0
1325	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1326	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1340	9	0	0	71	20	86.0	81.0	85.0	85.0	86.0	90.0	93.0	95.0	96.0	94.0	96.0	89.0	30.0
1341	0	100	0	0	0	77.0	66.0	73.0	74.0	76.0	83.0	89.0	93.0	94.0	91.0	94.0	81.0	30.0
1342	0	7	0	78	15	88.0	83.0	86.0	87.0	87.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1360	15	0	0	35	50	85.0	81.0	84.0	85.0	86.0	90.0	93.0	95.0	96.0	94.0	96.0	89.0	30.0
1380	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1390	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1400	0	0	0	100	0	88.0	83.0	86.0	87.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1415	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1417	5	0	55	10	30	86.0	80.0	84.0	85.0	86.0	89.0	93.0	95.0	96.0	94.0	96.0	89.0	30.0
1419	35	0	55	10	0	78.0	67.0	74.0	75.0	77.0	83.0	89.0	93.0	94.0	91.0	94.0	82.0	30.0
1440	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1450	1	0	0	89	10	88.0	83.0	86.0	87.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1484	0	0	0	100	0	88.0	83.0	86.0	87.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1500	60	0	0	35	5	73.0	61.0	69.0	71.0	73.0	81.0	88.0	92.0	93.0	89.0	93.0	79.0	30.0
1501	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1502	60	0	0	40	0	73.0	61.0	69.0	71.0	72.0	80.0	88.0	92.0	93.0	89.0	93.0	79.0	30.0
1505	55	0	0	40	5	74.0	63.0	70.0	72.0	74.0	81.0	88.0	92.0	94.0	90.0	94.0	80.0	30.0
1506	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1508	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1510	10	0	0	55	35	86.0	82.0	85.0	86.0	87.0	90.0	93.0	95.0	96.0	94.0	96.0	89.0	30.0
1540	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0
1541	4	0	0	76	20	87.0	83.0	86.0	87.0	87.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1542	60	0	30	10	0	72.0	59.0	67.0	69.0	71.0	80.0	87.0	92.0	93.0	89.0	93.0	78.0	30.0
1545	60	0	10	30	0	73.0	60.0	68.0	70.0	72.0	80.0	88.0	92.0	93.0	89.0	93.0	78.0	30.0
1600	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1605	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1610	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1615	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1630	0	0	0	100	0	88.0	83.0	86.0	87.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1635	7	0	5	63	25	87.0	82.0	85.0	86.0	87.0	90.0	94.0	95.0	96.0	94.0	96.0	89.0	30.0
1640	0	0	0	10	90	90.0	90.0	91.0	91.0	92.0	94.0	96.0	96.0	97.0	96.0	97.0	94.0	30.0
1645	0	0	100	0	0	85.0	77.0	82.0	83.0	84.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1674	27	26	0	45	2	78.0	69.0	75.0	76.0	78.0	84.0	90.0	93.0	94.0	91.0	94.0	83.0	30.0
1700	0	0	3	93	4	88.0	83.0	86.0	87.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1710	2	89	0	9	0	78.0	67.0	74.0	75.0	77.0	83.0	89.0	93.0	94.0	91.0	94.0	82.0	30.0
1731	10	2	0	88	0	85.0	79.0	83.0	84.0	85.0	89.0	93.0	95.0	96.0	94.0	96.0	88.0	30.0
1732	3	0	0	96	1	87.0	82.0	85.0	86.0	87.0	90.0	94.0	95.0	96.0	94.0	96.0	89.0	30.0
1753	0	8	0	90	2	87.0	81.0	85.0	86.0	87.0	90.0	93.0	95.0	96.0	94.0	96.0	89.0	30.0
1850	0	0	0	94	6	88.0	83.0	86.0	87.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	90.0	30.0
1853	0	0	0	85	15	88.0	84.0	87.0	88.0	88.0	91.0	94.0	96.0	96.0	95.0	96.0	91.0	30.0
1871	17	0	0	83	0	84.0	76.0	81.0	82.0	83.0	88.0	92.0	95.0	95.0	93.0	95.0	87.0	30.0
1999	100	0	0	0	0	63.0	47.0	57.0	60.0	62.0	74.0	84.0	89.0	92.0	86.0	92.0	71.0	30.0

Curve Number Calculator

Company:	Actus
By:	Actus
Date:	8/11/2022
Project Name:	Lark Hill

EXISTING BASINS

BASIN	Percentage of Basin (%)						Composite CN
	Existing Soil # 1155	Existing Soil # 1502	Existing Soil # --	Existing Soil # --	Existing Soil # --	Existing Soil # --	
Landuse	1	1					
	CN 88.00	CN 73.00	CN 0.00	CN 0.00	CN 0.00	CN 0.00	
EON1	79%	21%					84.85

DEVELOPED BASINS

BASIN	Percentage of Basin (%)						Composite CN
	Developed Soil # --	Developed Soil # --	Developed Soil # --	Developed Soil # --	Developed Soil # --	Developed Soil # --	
Landuse							
	CN 0.00	CN 0.00	CN 0.00	CN 0.00	CN 0.00	CN 0.00	

Note: Please refer to Figure 6 Hydrologic Basins Map for Landuse Index.

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL
TIME OF CONCENTRATION

Company:	Actus	**Project Name:**	Lark Hill
By:	Actus	**Description:**	Existing Basins
Date:	08/11/22	**File Name:**	TMH012201

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc	Tc Check Urbanized Basins		Tlag
DESIG:	DEV./EX. (D or E)	CN	K [1]	AREA Ac	AREA Mi^2 [2]	INITIAL LENGTH Feet	SLOPE %	Ti Min [3]	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY FPS [4]	V2 VELOCITY FPS [5]	Tt Min [6]	Tc Calc. [7]	Total Length Feet [8]	Tc Check [9]	Tlag Hours [10]
Existing Basins																	
EON1	E	84.85	0.7300	9.55	**0.0149**	100	1.00	6.66	630	8.73	4.37	8.69	2.16	8.81			**0.100**
Developed Basins																	

[1] K = 0.0132 (CN) - 0.39

[2] A = Area/640

[3] Ti = (1.8 (1.1-K) L^0.5)/S^0.33

[4] For Existing Conditions: V1 = 14.8 * (S/100)^0.5
For Developed Conditions: V1 = 20.2 * (S/100)^0.5

[5] For Existing Conditions: V2 = 29.4 * (S/100)^0.5
For Developed Conditions: V2 = 30.6 * (S/100)^0.5

[6] Tt = L/(60*V)

[7] Tc = Ti + Tt

[8] Total L = Initial L + Travel L

[9] Tc = (L/180) + 10

[10] Tlag = (0.6*Tc)/60

[11] Min Tlag =0.05

Note: For Travel Time Calcs: V1 applies to first 500 feet and V2 applies to remaining distance.

REFERENCE :

STANDARD FORM 4

EXISTING CONDITION HEC-1

```
1****************************************
****************************************
 *                                      *                                                *
*                                                
```

```
    24      EON1

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
****************************************
 *                                      *                                                *
*
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                *    U.S. ARMY CORPS OF ENGINEERS
*
 *               JUN   1998             *                                                *    HYDROLOGIC ENGINEERING CENTER
*
 *            VERSION 4.1               *                                                *          609 SECOND STREET
*
 *                                      *                                                *       DAVIS, CALIFORNIA 95616
*
 *  RUN DATE   11AUG22  TIME  17:00:45  *                                                *            (916) 756-1104
*
 *                                      *                                                *
*
 ****************************************
****************************************
```

PREPARED FOR
LARK HILL
10-Y & 100-Y, 6 Hour Storm
EXISTING CONDITION
@@@

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

PLEASE SEE REFERENCED HEC-1 FROM VILLAGE 22 MCDS FOR ULTIMATE CONDITION HEC-1

HYDRAULIC CALCULATIONS

100-yr flow calculations - Interior Streets



Rating Table for Section d2 - 30' Drive - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.50	%
Discharge	5.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.37	0.37
0+01.50	0.00
0+02.50	0.13
0+02.50	0.17
0+15.00	0.42
0+27.50	0.17
0+27.50	0.13
0+28.50	0.00
0+29.63	0.37
0+30.00	0.38

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.13)	0.013
(0+02.50, 0.13)	(0+27.50, 0.13)	0.016
(0+27.50, 0.13)	(0+30.00, 0.38)	0.013

Discharge (ft³/s)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.70	0.14	3.19	0.22	2.97	2.88

Rating Table for Section d2 - 30' Drive - 100 yr

Input Data

Discharge (ft³/s)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
1.40	0.21	2.65	0.53	7.80	7.63
2.10	0.24	2.71	0.78	10.69	10.51
2.80	0.26	2.83	0.99	12.66	12.48
3.50	0.27	2.95	1.19	14.26	14.07
4.20	0.29	3.04	1.38	15.67	15.48
4.90	0.30	3.13	1.57	16.88	16.69

Worksheet for Section d2 - 30' Drive - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.50	%
Discharge	5.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.37	0.37
0+01.50	0.00
0+02.50	0.13
0+02.50	0.17
0+15.00	0.42
0+27.50	0.17
0+27.50	0.13
0+28.50	0.00
0+29.63	0.37
0+30.00	0.38

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.13)	0.013
(0+02.50, 0.13)	(0+27.50, 0.13)	0.016
(0+27.50, 0.13)	(0+30.00, 0.38)	0.013

Options

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

Worksheet for Section d2 - 30' Drive - 100 yr

Results

Normal Depth		0.30	ft
Elevation Range	0.00 to 0.42 ft		
Flow Area		1.59	ft²
Wetted Perimeter		17.04	ft
Hydraulic Radius		0.09	ft
Top Width		16.84	ft
Normal Depth		0.30	ft
Critical Depth		0.35	ft
Critical Slope		0.00713	ft/ft
Velocity		3.14	ft/s
Velocity Head		0.15	ft
Specific Energy		0.45	ft
Froude Number		1.80	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.30	ft
Critical Depth	0.35	ft
Channel Slope	2.50	%
Critical Slope	0.00713	ft/ft

Cross Section for Section d2 - 30' Drive - 100 yr

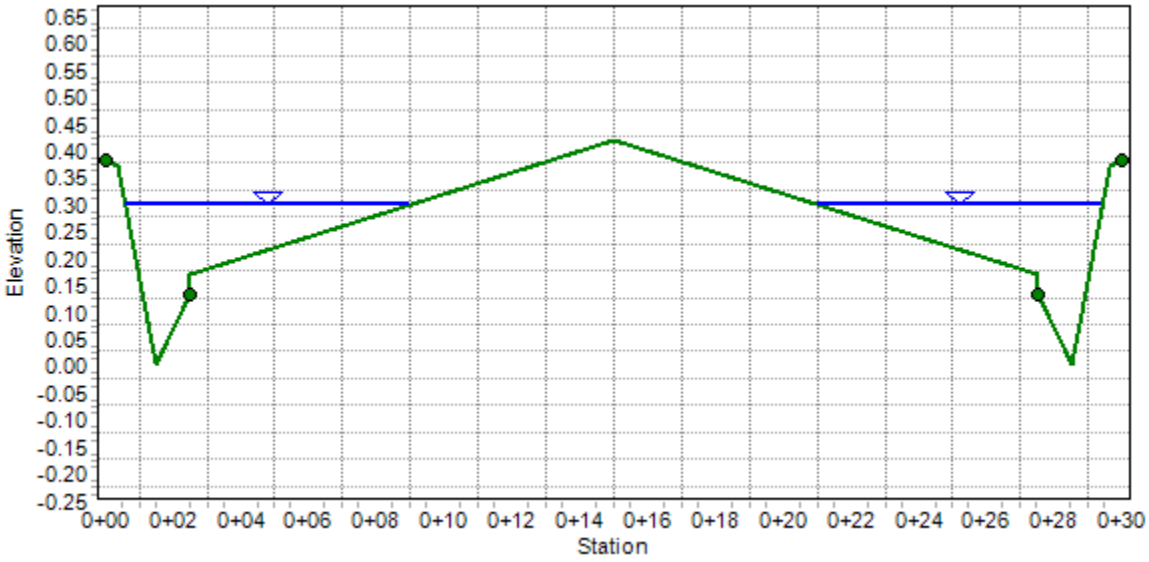
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.50	%
Normal Depth	0.30	ft
Discharge	5.00	ft³/s

Cross Section Image



Worksheet for Section d5 - 30' Drive - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.00	%
Discharge	3.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.37	0.37
0+01.50	0.00
0+02.50	0.13
0+02.50	0.17
0+15.00	0.42
0+27.50	0.17
0+27.50	0.13
0+28.50	0.00
0+29.63	0.37
0+30.00	0.38

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.13)	0.013
(0+02.50, 0.13)	(0+27.50, 0.13)	0.016
(0+27.50, 0.13)	(0+30.00, 0.38)	0.013

Options

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

Worksheet for Section d5 - 30' Drive - 100 yr

Results

Normal Depth		0.27	ft
Elevation Range	0.00 to 0.42 ft		
Flow Area		1.15	ft²
Wetted Perimeter		13.98	ft
Hydraulic Radius		0.08	ft
Top Width		13.80	ft
Normal Depth		0.27	ft
Critical Depth		0.31	ft
Critical Slope		0.00749	ft/ft
Velocity		2.60	ft/s
Velocity Head		0.11	ft
Specific Energy		0.38	ft
Froude Number		1.59	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.27	ft
Critical Depth	0.31	ft
Channel Slope	2.00	%
Critical Slope	0.00749	ft/ft

Cross Section for Section d5 - 30' Drive - 100 yr

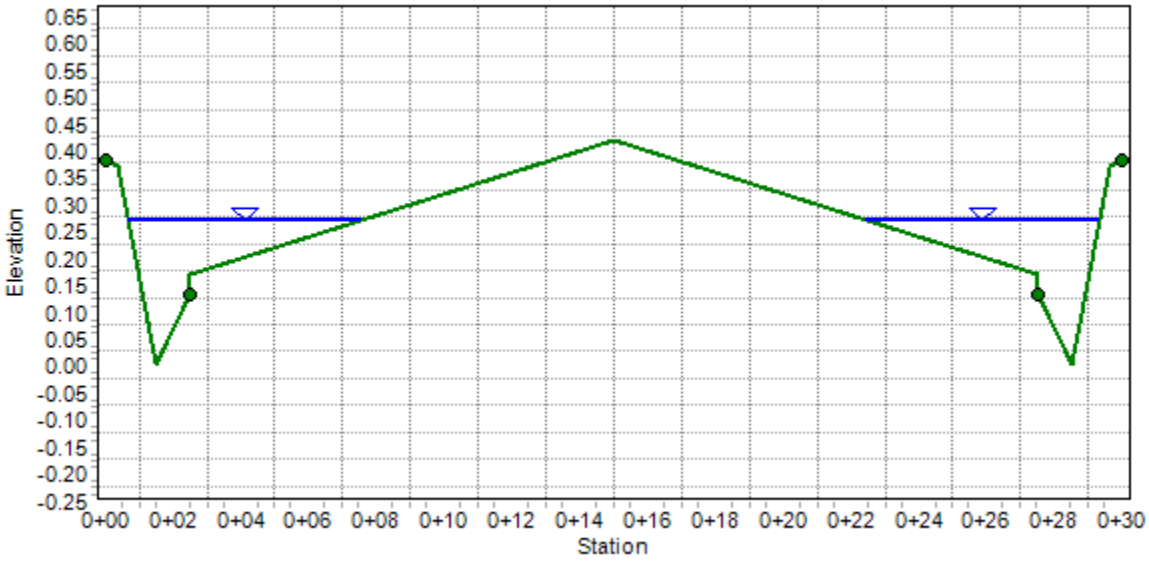
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.00	%
Normal Depth	0.27	ft
Discharge	3.00	ft³/s

Cross Section Image



Rating Table for Section d5 - 30' Drive - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.00	%
Discharge	3.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.37	0.37
0+01.50	0.00
0+02.50	0.13
0+02.50	0.17
0+15.00	0.42
0+27.50	0.17
0+27.50	0.13
0+28.50	0.00
0+29.63	0.37
0+30.00	0.38

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.13)	0.013
(0+02.50, 0.13)	(0+27.50, 0.13)	0.016
(0+27.50, 0.13)	(0+30.00, 0.38)	0.013

Discharge (ft³/s)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.60	0.14	2.81	0.21	2.95	2.86

Rating Table for Section d5 - 30' Drive - 100 yr

Input Data

Discharge (ft³/s)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
1.20	0.21	2.38	0.50	7.45	7.28
1.80	0.24	2.41	0.75	10.38	10.20
2.40	0.26	2.51	0.96	12.39	12.21
3.00	0.27	2.60	1.15	13.98	13.80

Worksheet for Section d5 - 30' Drive - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.00	%
Discharge	3.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.37	0.37
0+01.50	0.00
0+02.50	0.13
0+02.50	0.17
0+15.00	0.42
0+27.50	0.17
0+27.50	0.13
0+28.50	0.00
0+29.63	0.37
0+30.00	0.38

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.13)	0.013
(0+02.50, 0.13)	(0+27.50, 0.13)	0.016
(0+27.50, 0.13)	(0+30.00, 0.38)	0.013

Options

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

Worksheet for Section d5 - 30' Drive - 100 yr

Results

Normal Depth		0.27	ft
Elevation Range	0.00 to 0.42 ft		
Flow Area		1.15	ft²
Wetted Perimeter		13.98	ft
Hydraulic Radius		0.08	ft
Top Width		13.80	ft
Normal Depth		0.27	ft
Critical Depth		0.31	ft
Critical Slope		0.00749	ft/ft
Velocity		2.60	ft/s
Velocity Head		0.11	ft
Specific Energy		0.38	ft
Froude Number		1.59	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.27	ft
Critical Depth	0.31	ft
Channel Slope	2.00	%
Critical Slope	0.00749	ft/ft

Cross Section for Section d5 - 30' Drive - 100 yr

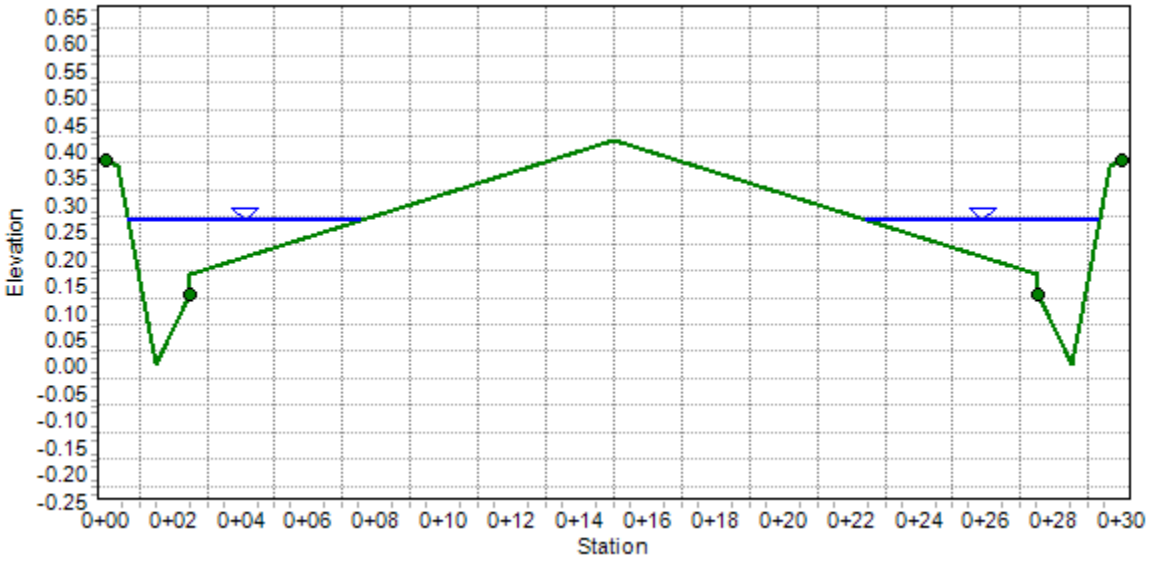
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.00	%
Normal Depth	0.27	ft
Discharge	3.00	ft³/s

Cross Section Image



Rating Table for Section d8 - 30' Drive (Half St) - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Discharge	2.60	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.37	0.37
0+01.50	0.00
0+02.50	0.13
0+02.50	0.17
0+15.00	0.42

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.13)	0.013
(0+02.50, 0.13)	(0+15.00, 0.42)	0.016

Discharge (ft³/s)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
1.05	0.25	2.41	0.44	5.82	5.73
1.43	0.27	2.53	0.57	6.91	6.82
1.81	0.29	2.64	0.69	7.79	7.69
2.19	0.30	2.74	0.80	8.54	8.44
2.57	0.31	2.84	0.90	9.18	9.08

Worksheet for Section d8 - 30' Drive (Half St) - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Discharge	2.60	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.37	0.37
0+01.50	0.00
0+02.50	0.13
0+02.50	0.17
0+15.00	0.42

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.13)	0.013
(0+02.50, 0.13)	(0+15.00, 0.42)	0.016

Options

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

Results

Normal Depth	0.31	ft
Elevation Range	0.00 to 0.42 ft	
Flow Area	0.91	ft²
Wetted Perimeter	9.22	ft
Hydraulic Radius	0.10	ft
Top Width	9.12	ft

Worksheet for Section d8 - 30' Drive (Half St) - 100 yr

Results

Normal Depth		0.31	ft
Critical Depth		0.35	ft
Critical Slope		0.00713	ft/ft
Velocity		2.85	ft/s
Velocity Head		0.13	ft
Specific Energy		0.44	ft
Froude Number		1.59	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.31	ft
Critical Depth	0.35	ft
Channel Slope	1.90	%
Critical Slope	0.00713	ft/ft

Cross Section for Section d8 - 30' Drive (Half St) - 100 yr

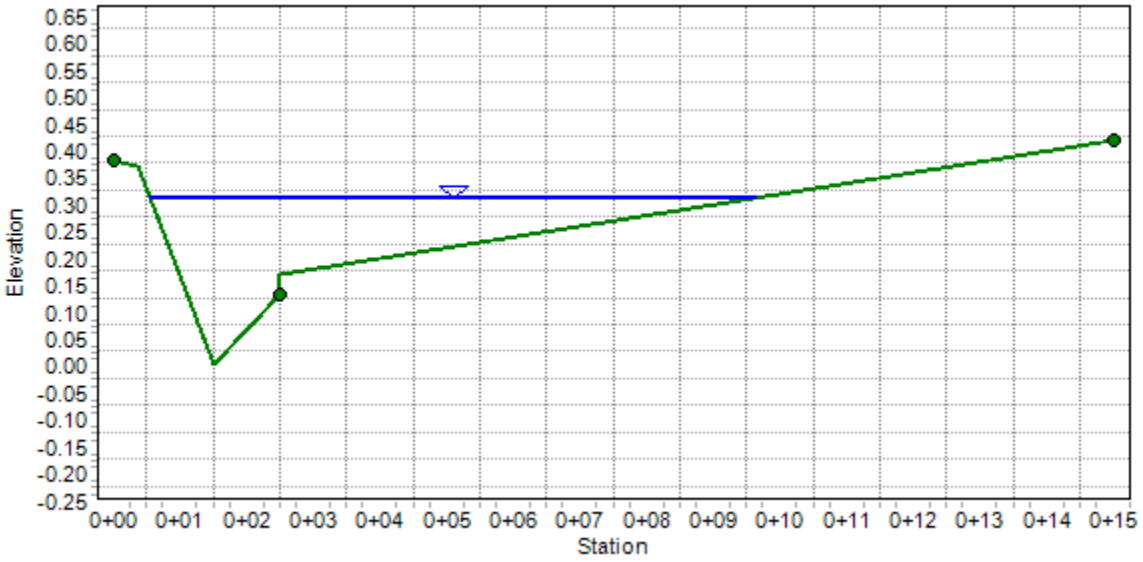
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Normal Depth	0.31	ft
Discharge	2.60	ft³/s

Cross Section Image



Rating Table for Section d9 - 30' Drive (Half St) - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Discharge	2.50	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.37	0.37
0+01.50	0.00
0+02.50	0.13
0+02.50	0.17
0+15.00	0.42

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.13)	0.013
(0+02.50, 0.13)	(0+15.00, 0.42)	0.016

Discharge (ft³/s)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
1.05	0.25	2.41	0.44	5.82	5.73
1.40	0.27	2.52	0.56	6.83	6.74
1.75	0.28	2.62	0.67	7.66	7.57
2.10	0.30	2.73	0.77	8.35	8.25
2.45	0.31	2.81	0.87	8.98	8.88

Worksheet for Section d9 - 30' Drive (Half St) - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Discharge	2.50	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.37	0.37
0+01.50	0.00
0+02.50	0.13
0+02.50	0.17
0+15.00	0.42

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.13)	0.013
(0+02.50, 0.13)	(0+15.00, 0.42)	0.016

Options

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

Results

Normal Depth	0.31	ft
Elevation Range	0.00 to 0.42 ft	
Flow Area	0.88	ft²
Wetted Perimeter	9.06	ft
Hydraulic Radius	0.10	ft
Top Width	8.96	ft

Worksheet for Section d9 - 30' Drive (Half St) - 100 yr

Results

Normal Depth		0.31	ft
Critical Depth		0.35	ft
Critical Slope		0.00716	ft/ft
Velocity		2.83	ft/s
Velocity Head		0.12	ft
Specific Energy		0.43	ft
Froude Number		1.59	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.31	ft
Critical Depth	0.35	ft
Channel Slope	1.90	%
Critical Slope	0.00716	ft/ft

Cross Section for Section d9 - 30' Drive (Half St) - 100 yr

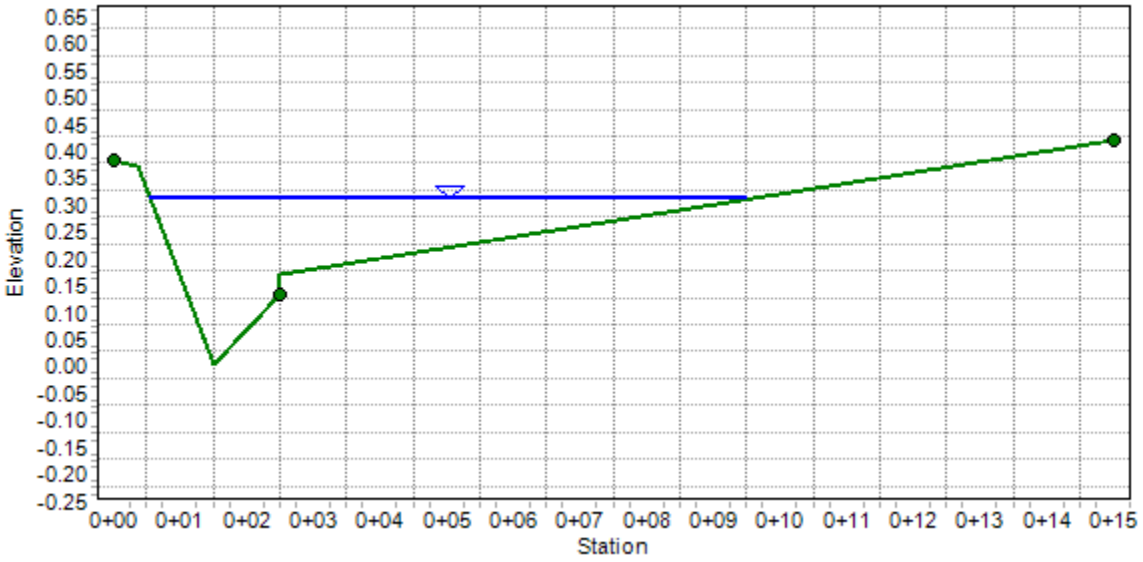
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Normal Depth	0.31	ft
Discharge	2.50	ft³/s

Cross Section Image



Rating Table for Section d14 - 30' Drive (Half St) - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Discharge	1.40	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.37	0.37
0+01.50	0.00
0+02.50	0.13
0+02.50	0.17
0+15.00	0.42

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.13)	0.013
(0+02.50, 0.13)	(0+15.00, 0.42)	0.016

Discharge (ft³/s)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.35	0.15	2.91	0.12	1.51	1.46
0.70	0.22	2.31	0.30	4.40	4.32
1.05	0.25	2.41	0.44	5.82	5.73
1.40	0.27	2.52	0.56	6.83	6.74

Worksheet for Section d14 - 30' Drive (Half St) - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Discharge	1.40	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.37	0.37
0+01.50	0.00
0+02.50	0.13
0+02.50	0.17
0+15.00	0.42

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.13)	0.013
(0+02.50, 0.13)	(0+15.00, 0.42)	0.016

Options

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

Results

Normal Depth	0.27	ft
Elevation Range	0.00 to 0.42 ft	
Flow Area	0.56	ft²
Wetted Perimeter	6.83	ft
Hydraulic Radius	0.08	ft
Top Width	6.74	ft

Worksheet for Section d14 - 30' Drive (Half St) - 100 yr

Results

Normal Depth		0.27	ft
Critical Depth		0.30	ft
Critical Slope		0.00754	ft/ft
Velocity		2.52	ft/s
Velocity Head		0.10	ft
Specific Energy		0.37	ft
Froude Number		1.55	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.27	ft
Critical Depth	0.30	ft
Channel Slope	1.90	%
Critical Slope	0.00754	ft/ft

Cross Section for Section d14 - 30' Drive (Half St) - 100 yr

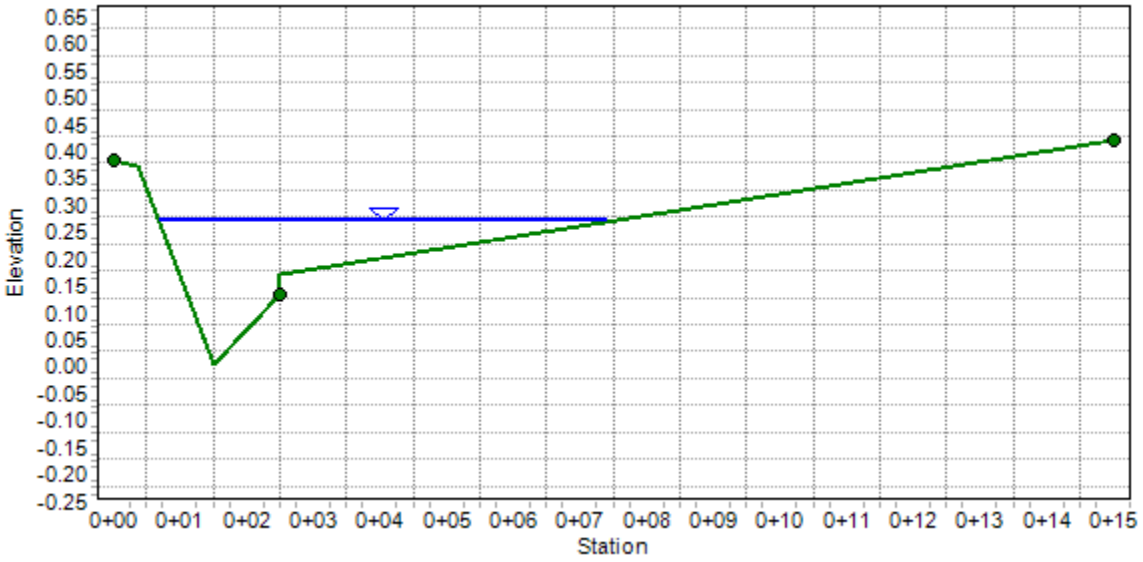
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Normal Depth	0.27	ft
Discharge	1.40	ft³/s

Cross Section Image



Rating Table for Section d15 - 30' Drive (Half St) - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Discharge	1.40	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.37	0.37
0+01.50	0.00
0+02.50	0.13
0+02.50	0.17
0+15.00	0.42

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.13)	0.013
(0+02.50, 0.13)	(0+15.00, 0.42)	0.016

Discharge (ft³/s)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.35	0.15	2.91	0.12	1.51	1.46
0.70	0.22	2.31	0.30	4.40	4.32
1.05	0.25	2.41	0.44	5.82	5.73
1.40	0.27	2.52	0.56	6.83	6.74

Rating Table for Section d15 - 30' Drive (Half St) - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Discharge	1.40	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.37	0.37
0+01.50	0.00
0+02.50	0.13
0+02.50	0.17
0+15.00	0.42

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.13)	0.013
(0+02.50, 0.13)	(0+15.00, 0.42)	0.016

Discharge (ft³/s)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.35	0.15	2.91	0.12	1.51	1.46
0.70	0.22	2.31	0.30	4.40	4.32
1.05	0.25	2.41	0.44	5.82	5.73
1.40	0.27	2.52	0.56	6.83	6.74

Worksheet for Section d15 - 30' Drive (Half St) - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Discharge	1.40	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.37	0.37
0+01.50	0.00
0+02.50	0.13
0+02.50	0.17
0+15.00	0.42

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.13)	0.013
(0+02.50, 0.13)	(0+15.00, 0.42)	0.016

Options

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

Results

Normal Depth	0.27	ft
Elevation Range	0.00 to 0.42 ft	
Flow Area	0.56	ft²
Wetted Perimeter	6.83	ft
Hydraulic Radius	0.08	ft
Top Width	6.74	ft

Worksheet for Section d15 - 30' Drive (Half St) - 100 yr

Results

Normal Depth		0.27	ft
Critical Depth		0.30	ft
Critical Slope		0.00754	ft/ft
Velocity		2.52	ft/s
Velocity Head		0.10	ft
Specific Energy		0.37	ft
Froude Number		1.55	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.27	ft
Critical Depth	0.30	ft
Channel Slope	1.90	%
Critical Slope	0.00754	ft/ft

Cross Section for Section d15 - 30' Drive (Half St) - 100 yr

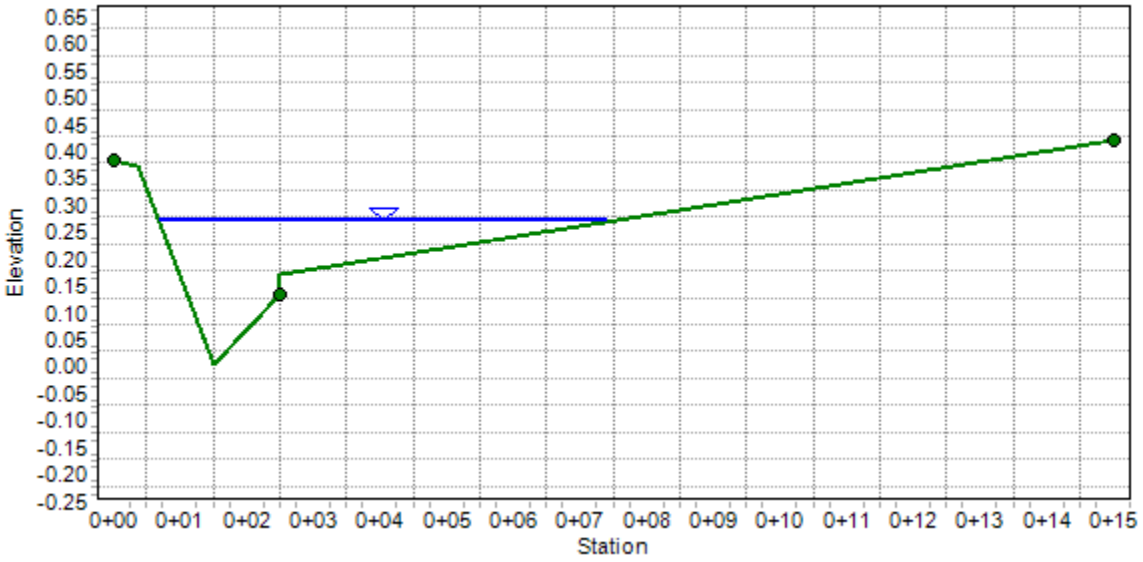
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Normal Depth	0.27	ft
Discharge	1.40	ft³/s

Cross Section Image



HYDRAULIC CALCULATIONS

HYDRAULIC CALCULATIONS

Drop Inlet Calculations
Nomographs
WSPG for internal SDs
Emergency weir overflow into C.E. "H"

Project Name:	LARK HILL
By:	ACTUS ENGINEERING
Date:	AUG-10-2022

Notes:

Facility ID:	**SDDI#2**
Drainage Condition	**PROPOSED**
Source of Flow	**CP4**
Design Flow (cfs)	**2.6**
Inlet Type:	**Type DM2 (Continuous Grade)**
Inlet Length:	15 ft
Number of Grates:	**5**

	Input:	**Variable:**	**Input:**	
	Street Flow (cfs)	Q	2.60	
	Longitudinal Slope (ft/ft)	S_o	0.0190	
	Manning's Coefficient	n	0.0160	
	Street Flow Velocity (fps)	V	2.84	
	Street Flow Depth (ft)	D	0.32	
	Street Cross Slope (ft/ft)	S_x	0.0200	
	Grate Width (ft)	W	1.50	
	Grate Depression (ft)	D_g	0.1667	2 inches
	Length of Grate (ft)	L_g	12.50	
	Length of Curb Opening (ft)	L_c	15.00	
	Clogging Factor - Grate (%)	CF_g	50.00	
	Clogging Factor - Curb (%)	CF_c	50.00	
	Effective Grate Length (ft)	L_{ge}	6.25	
	Effective Curb Opening Length (ft)	L_{ce}	7.50	

	Output (Grate):	**Equation:**	**Output (Grate):**	
1	R_f - Frontal Flow Factor	1-0.09*(V-V_x) if V>V_x; else Frontal Flow Factor = 1	1.0000	
2	V_o - Splash Over Velocity (fps)	V_x=p+q*L_{ge}-r*L_{ge}^2+sy*L_{ge}^3 ; where	16.06	
		p=0.30,q=4.85,r=1.31,sy=0.15 (for Vane Grate)		
1	E - Grate Flow Ratio	Frontal Flow/Side Flow	0.44	
2	Q_w - Frontal Flow (cfs)	$Q_w = Q[1-(1-(W/T))^{2.67}]$	1.15	
1	Q_s - Side Flow (cfs)	$Q_s = Q-Q_w$	1.45	
	T - Side Flow Spread (ft)	$(D-D_g)/S_x$	7.67	
1	R_s - Side Flow Factor	$1/(1+(0.15*V^{1.8})/(S_x*L_{ge}^{2.3})$	0.58	
1	Q_{gi} - Intercepted Flow (cfs)	$(R_f*E+R_s*(1-E))*Q$	2.0	

	Output (Curb):	**Equation:**	**Output (Curb):**	
1	S_e - Equivalent Cross Slope (ft/ft)	S_x+S_g*E	0.069	
	Q_{sx} - Remaining Flow After Grate Interception (cfs)	$Q-Q_{gi}$	0.611	
	S_g - Gutter Cross Slope (ft/ft)	D_g/W	0.1111	
1	L_t - Effective Interception Length (ft)	$0.60*Q_{sx}^{0.42}*S_o^{0.30}*(1/(n*S_e))^{0.6}$	8.84	
1	Q_{ci} - Intercepted Flow (cfs)	$(1-(1-L_{ce}/L_t)^{1.8})*Q_{sx}$	0.6	
		or Q_{sx} if L_t is less than L_{ce}		

Output (Total):	**Equation:**	**Output (Total):**	
Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	2.6	
Bypass Flow (cfs)	Street Flow - Total Intercepted Flow	0.0	

1 Formula referenced from the CCRFCD Manual
2 Formula referenced from FHWA Urban Drainage Design Manual (HEC-22)

Worksheet for Section d8 @ DI - 30' Drive (Half St) - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Discharge	2.60	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+15.00	0.43

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.50)	(0+02.00, 0.13)	0.013
(0+02.00, 0.13)	(0+15.00, 0.43)	0.016

Options

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

Results

Normal Depth		0.32	ft
Elevation Range	0.00 to 0.50 ft		
Flow Area		0.91	ft²
Wetted Perimeter		9.19	ft
Hydraulic Radius		0.10	ft
Top Width		8.83	ft

Worksheet for Section d8 @ DI - 30' Drive (Half St) - 100 yr

Results

Normal Depth		0.32	ft
Critical Depth		0.36	ft
Critical Slope		0.00738	ft/ft
Velocity		2.84	ft/s
Velocity Head		0.13	ft
Specific Energy		0.44	ft
Froude Number		1.56	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth		0.00	ft
Length		0.00	ft
Number Of Steps		0	

GVF Output Data

Upstream Depth		0.00	ft
Profile Description			
Profile Headloss		0.00	ft
Downstream Velocity		Infinity	ft/s
Upstream Velocity		Infinity	ft/s
Normal Depth		0.32	ft
Critical Depth		0.36	ft
Channel Slope		1.90	%
Critical Slope		0.00738	ft/ft

Cross Section for Section d8 @ DI - 30' Drive (Half St) - 100 yr

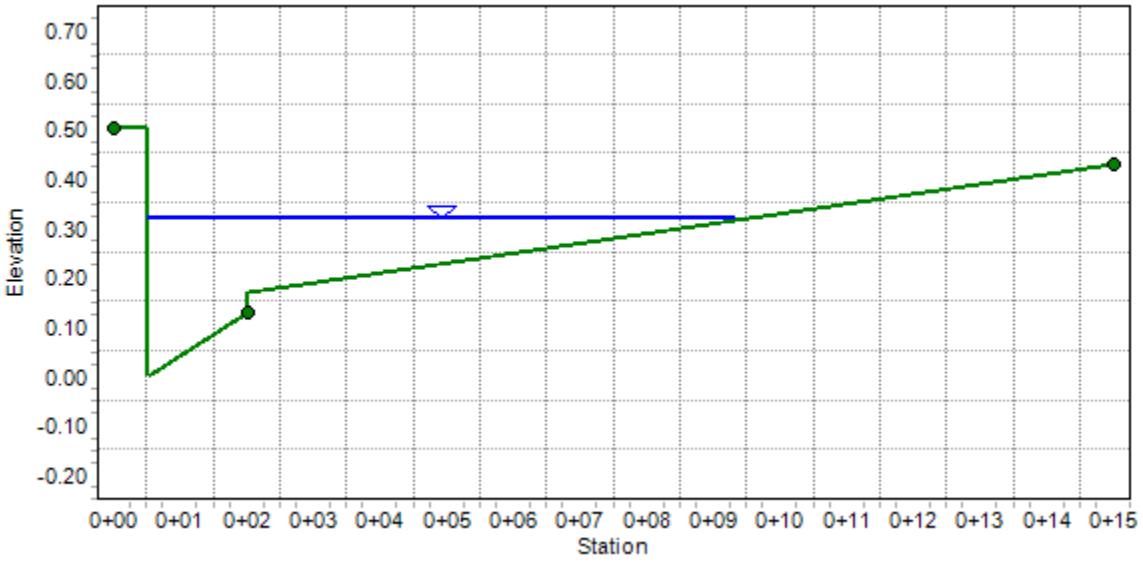
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.90	%
Normal Depth	0.32	ft
Discharge	2.60	ft³/s

Cross Section Image



Project Name:	LARK HILL
By:	ACTUS ENGINEERING
Date:	AUG-10-2022

Notes:

Facility ID:	**SDDI#3**
Drainage Condition	**Ultimate**
Source of Flow	**CP6**
Design Flow (cfs)	**8.2**
Inlet Type:	**Type CM2 (Sump)**
Inlet Length:	7.5 ft
Number of Grates:	**2**

Input:	**Variable:**	**Input:**
Depth at Inlet (ft)	D	0.50
Grate Width (ft)	W	1.50
Length of Grate (ft)	L_g	5.00
Length of Curb Opening (ft)	L_c	7.50
Height of Curb Opening (ft)	H	0.50
Weir Coef. - Curb Opening	W_c	2.30
Weir Coef. - Grate	W_g	3.00
Orifice Coef.	O_c	0.67
Grate Coef.	G_c	0.60
Clogging Factor - Grate (%)	CF_g	50.00
Clogging Factor - Curb (%)	CF_c	50.00

Output (Grate):	**Equation:**	**Output (Grate):**
Effective Weir Length (ft)	$2*W+L_g$	8.00
Adjusted Effective Weir Length(ft)	$2*(1-CF_g/100)*W+(1-CF_g/100)*L_g$	4.00
Grate Open Area (sf)	$W*L_g$	7.50
Adjusted Grate Open Area (sf)	Grate Open Area * G_c * $(1-CF_g/100)$	2.25
Controlling Flow Type (weir/orifice)	If D<1.792*(Adj. Grate Open Area/Adj. Eff. Length) use weir, else orifice	weir
Intercepted Flow (cfs)	weir: $W_g*(\text{Adj. Eff. Weir Length}) * D^{1.5}$ orifice: $O_c*(\text{Adj. Grate Open Area})*(64.4*D)^{0.5}$	4.24

Output (Curb):	**Equation:**	**Output (Curb):**
Effective Weir Length (ft)	L+1.8*W	10.20
Adjusted Effective Weir Length (ft)	$L+1.8*(1-CF_c/100)*W$	8.85
Curb Open Area (sf)	L*H	3.75
Adjusted Curb Open Area (sf)	Curb Open Area*$(1-CF_c/100)$	1.88
Controlling Flow Type (weir/orifice)	If D<H, weir, else orifice	orifice
Intercepted Flow (cfs)	weir: $W_c*(\text{Adj. Eff. Weir Length})*D^{1.5}$ orifice: $O_c*(\text{Adj. Curb Open Area})*(64.4*(D-H/2))^{0.5}$	5.04

Output (Total):	**Equation:**	**Output (Total):**
Capacity Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	9.28

Project Name:	LARK HILL	
By:	ACTUS ENGINEERING	
Date:	AUG-10-2022	
Notes:		
Facility ID:	**LSDI#1, 2, 3, 4, AND 5**	
Drainage Condition	**PROPOSED**	
Source of Flow		
Design Flow (cfs)		
Inlet Type:	**Area Grate**	

Grate:	**Variable:**	**Input:**
Length of Opening	L	2.00 ft
Orifice Coefficient	C	0.65
Clogging factor	K	50.00 %

Effective Area of Grate: **A** = $0.73(L)^2$ =	2.92 sq. ft	Orifice Equation: **Q** = $KCA(2gh)^{0.5}$

Head Above Grate (h) (ft)	**Flow into Grate (Q) (cfs)**	**Head Above Grate (h) (ft)**	**Flow into Grate (Q) (cfs)**
0.1	2.4	0.2	3.4
0.3	4.2	0.4	4.8
0.5	5.4	0.6	5.9
0.7	6.4	0.8	6.8
0.9	7.2	1.0	7.6
1.1	8.0	1.2	8.3
1.3	8.7	1.4	9.0
1.5	9.3	1.6	9.6
1.7	9.9	1.8	10.2
1.9	10.5	2.0	10.8
2.1	11.0	2.2	11.3
2.3	11.5	2.4	11.8
2.5	12.0	2.6	12.3
2.7	12.5	2.8	12.7

Weir Depth Calculator

Company:	Actus
By:	Actus
Date:	8/11/2022
Project Name:	Lark Hill
Description	Weir depth
Location	Weir over DI#4

Q	13.93	cfs
C	3.0	
L	20.0	ft

Weir Flow = Q = C*L*H^(3/2)

$$H = \left(\frac{Q}{C * L}\right)^{(2/3)}$$

H = 0.378 ft

[1]	Q = Flow (cfs)	13.93 cfs	[4]	H = Weir Height (ft)
[2]	C = Weir Coefficient			
[3]	L = Weir Length (ft)			

EMERGENCY WEIR OVERFLOW DEPTH IF DI#4 GETS CLOGGED.

EMERGENCY WEIR FLOW WILL BE TOWARDS EAST ONTO C.E. B, INCASE THE DI GETS FULLY CLOGGED.

Weir Depth Calculator

Company:	Actus
By:	Actus
Date:	8/11/2022
Project Name:	Lark Hill
Description	Weir depth
Location	Weir over LSDI#1

Q	1.6	cfs
C	3.0	
L	5.0	ft

Weir Flow = Q = C*L*H^(3/2)

$$H = \left(\frac{Q}{C * L}\right)^{(2/3)}$$

H = 0.225 ft

[1]	Q = Flow (cfs)	1.6 cfs	[4]	H = Weir Height (ft)
[2]	C = Weir Coefficient			
[3]	L = Weir Length (ft)			

EMERGENCY WEIR OVERFLOW DEPTH IF LSDI1 GETS CLOGGED.

EMERGENCY WEIR FLOW WILL BE TOWARDS EAST ONTO C.E. C, INCASE THE DI GETS FULLY CLOGGED.

Weir Depth Calculator

Company:	Actus
By:	Actus
Date:	8/11/2022
Project Name:	Lark Hill
Description	Weir depth
Location	Weir over LSDI#2

Q	3.3	cfs
C	3.0	
L	5.0	ft

Weir Flow = Q = C*L*H^(3/2)

$$H = \left(\frac{Q}{C * L}\right)^{(2/3)}$$

H = 0.364 ft

[1] Q = Flow (cfs) 3.3 cfs

[2] C = Weir Coefficient

[3] L = Weir Length (ft)

[4] H = Weir Height (ft)

EMERGENCY WEIR OVERFLOW DEPTH IF LSDI2 GETS CLOGGED.

EMERGENCY WEIR FLOW WILL BE TOWARDS SOUTH ONTO SONG LARK ST, INCASE THE DI GETS FULLY CLOGGED.

Weir Depth Calculator

Company:	Actus
By:	Actus
Date:	8/11/2022
Project Name:	Lark Hill
Description	Weir depth
Location	Weir over LSDI#3

Q	2.2	cfs
C	3.0	
L	5.0	ft

Weir Flow = Q = C*L*H^(3/2)

$$H = \left(\frac{Q}{C * L}\right)^{(2/3)}$$

H = 0.278 ft

[1] Q = Flow (cfs) 2.2 cfs

[2] C = Weir Coefficient

[3] L = Weir Length (ft)

[4] H = Weir Height (ft)

EMERGENCY WEIR OVERFLOW DEPTH IF LSDI3 GETS CLOGGED.

EMERGENCY WEIR FLOW WILL BE TOWARDS SOUTH ONTO SONG LARK ST, INCASE THE DI GETS FULLY CLOGGED.

Weir Depth Calculator

Company:	Actus
By:	Actus
Date:	8/11/2022
Project Name:	Lark Hill
Description	Weir depth
Location	Weir over LSDI#4

Q	1.5	cfs
C	3.0	
L	5.0	ft

Weir Flow = Q = C*L*H^(3/2)

$$H = \left(\frac{Q}{C * L}\right)^{(2/3)}$$

H = 0.215 ft

[1] Q = Flow (cfs) 1.5 cfs

[2] C = Weir Coefficient

[3] L = Weir Length (ft)

[4] H = Weir Height (ft)

EMERGENCY WEIR OVERFLOW DEPTH IF LSDI4 GETS CLOGGED.

EMERGENCY WEIR FLOW WILL BE TOWARDS EAST ONTO C.E. B, INCASE THE DI GETS FULLY CLOGGED.

Weir Depth Calculator

Company:	Actus
By:	Actus
Date:	8/11/2022
Project Name:	Lark Hill
Description	Weir depth
Location	Weir over LSDI#5

Q	0.93	cfs
C	3.0	
L	5.0	ft

Weir Flow = Q = C*L*H^(3/2)

$$H = \left(\frac{Q}{C * L}\right)^{(2/3)}$$

H = 0.157 ft

[1] Q = Flow (cfs) 0.93 cfs

[2] C = Weir Coefficient

[3] L = Weir Length (ft)

[4] H = Weir Height (ft)

EMERGENCY WEIR OVERFLOW DEPTH IF LSDI5 GETS CLOGGED.

EMERGENCY WEIR FLOW WILL BE TOWARDS EAST ONTO LARK SPIRIT ST, INCASE THE DI GETS FULLY CLOGGED.

Project Name:	LARK HILL
By:	ACTUS ENGINEERING
Date:	AUG-10-2022

Notes:

Facility ID:	**SDDI#1**
Drainage Condition	**PROPOSED**
Source of Flow	**CP4**
Design Flow (cfs)	**3.2**
Inlet Type:	**Type DM2 (Continuous Grade)**
Inlet Length:	20 ft
Number of Grates:	**7**

	Input:	**Variable:**	**Input:**	
	Street Flow (cfs)	Q	3.20	
	Longitudinal Slope (ft/ft)	S_o	0.0871	
	Manning's Coefficient	n	0.0160	
	Street Flow Velocity (fps)	V	5.48	
	Street Flow Depth (ft)	D	0.27	
	Street Cross Slope (ft/ft)	S_x	0.0200	
	Grate Width (ft)	W	1.50	
	Grate Depression (ft)	D_g	0.1667	2 inches
	Length of Grate (ft)	L_g	17.50	
	Length of Curb Opening (ft)	L_c	20.00	
	Clogging Factor - Grate (%)	CF_g	50.00	
	Clogging Factor - Curb (%)	CF_c	50.00	
	Effective Grate Length (ft)	L_{ge}	8.75	
	Effective Curb Opening Length (ft)	L_{ce}	10.00	

	Output (Grate):	**Equation:**	**Output (Grate):**	
1	R_f - Frontal Flow Factor	1-0.09*(V-V_x) if V>V_x; else Frontal Flow Factor = 1	1.0000	
2	V_o - Splash Over Velocity (fps)	V_x=p+q*L_{ge}-r*L_{ge}^2+sy*L_{ge}^3 ; where	42.93	
		p=0.30,q=4.85,r=1.31,sy=0.15 (for Vane Grate)		
1	E - Grate Flow Ratio	Frontal Flow/Side Flow	0.60	
2	Q_w - Frontal Flow (cfs)	$Q_w = Q[1-(1-(W/T))^{2.67}]$	1.92	
1	Q_s - Side Flow (cfs)	$Q_s = Q-Q_w$	1.28	
	T - Side Flow Spread (ft)	$(D-D_g)/S_x$	5.17	
1	R_s - Side Flow Factor	$1/(1+(0.15*V^{1.8})/(S_x*L_{ge}^{2.3})$	0.48	
1	Q_{gi} - Intercepted Flow (cfs)	$(R_f*E+R_s*(1-E))*Q$	2.5	

	Output (Curb):	**Equation:**	**Output (Curb):**	
1	S_e - Equivalent Cross Slope (ft/ft)	S_x+S_g*E	0.087	
	Q_{sx} - Remaining Flow After Grate Interception (cfs)	$Q-Q_{gi}$	0.669	
	S_g - Gutter Cross Slope (ft/ft)	D_g/W	0.1111	
1	L_t - Effective Interception Length (ft)	$0.60*Q_{sx}^{0.42}*S_o^{0.30}*(1/(n*S_e))^{0.6}$	12.64	
1	Q_{ci} - Intercepted Flow (cfs)	$(1-(1-L_{ce}/L_t)^{1.8})*Q_{sx}$	0.6	
		or Q_{sx} if L_t is less than L_{ce}		

Output (Total):	**Equation:**	**Output (Total):**
Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	3.2
Bypass Flow (cfs)	Street Flow - Total Intercepted Flow	0.0

1 Formula referenced from the CCRFCD Manual
2 Formula referenced from FHWA Urban Drainage Design Manual (HEC-22)

Worksheet for Section DI#1 - Entrance (Half St) - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	8.71	%
Discharge	3.20	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+24.50	0.62
0+24.50	1.12
0+30.00	1.22

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.50)	(0+02.00, 0.13)	0.013
(0+02.00, 0.13)	(0+24.50, 0.62)	0.016
(0+24.50, 0.62)	(0+30.00, 1.22)	0.013

Options

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

Results

Normal Depth		0.27	ft
Elevation Range	0.00 to 1.22 ft		
Flow Area		0.58	ft²

Worksheet for Section DI#1 - Entrance (Half St) - 100 yr

Results

Wetted Perimeter		7.02	ft
Hydraulic Radius		0.08	ft
Top Width		6.70	ft
Normal Depth		0.27	ft
Critical Depth		0.38	ft
Critical Slope		0.00704	ft/ft
Velocity		5.48	ft/s
Velocity Head		0.47	ft
Specific Energy		0.74	ft
Froude Number		3.27	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.27	ft
Critical Depth	0.38	ft
Channel Slope	8.71	%
Critical Slope	0.00704	ft/ft

Cross Section for Section DI#1 - Entrance (Half St) - 100 yr

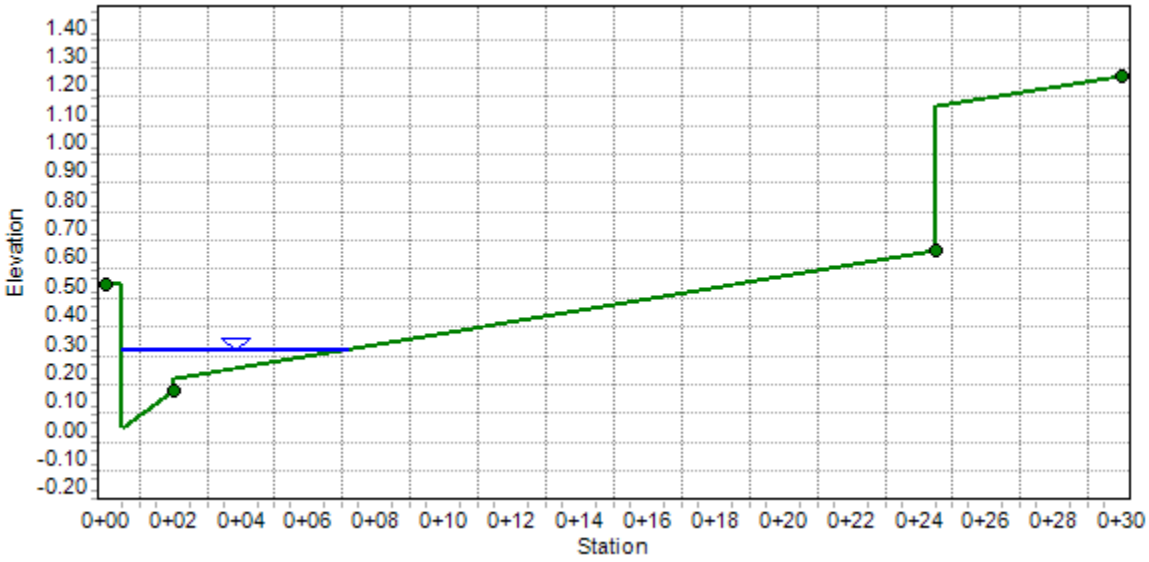
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

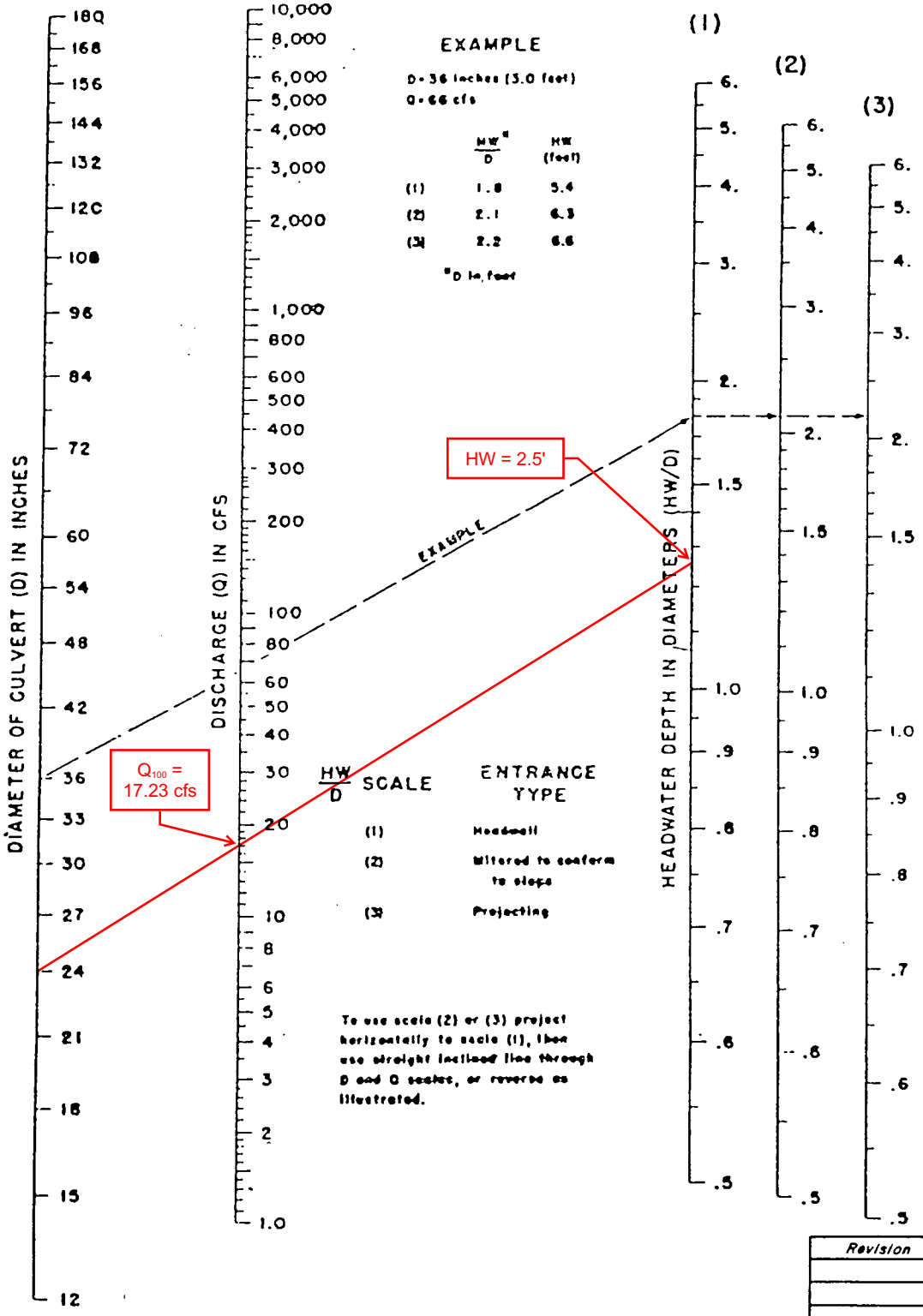
Input Data

Channel Slope	8.71	%
Normal Depth	0.27	ft
Discharge	3.20	ft³/s

Cross Section Image



NOMOGRAPH – INLET CONTROL CMP



Revision	Date

WRC ENGINEERING

REFERENCE: USDOT, FHWA, HDS No. 5, 1985

FIGURE 1007

INPUT

```
T1 Lark Hill (aka Summerlin Village 22 Parcel QR)                              0
T2 By ACTUS ENGINEERING
T3 SD DESIGN (ULTIMATE CONDITION)
SO   1000.0003304.100  1                          3306.500
R    1000.0003304.100  1      .013                                .000    .000 0
R    1060.3103306.240  1      .013                                .000    .000 1
JX   1061.3103306.340  1  1   .013    4.800         3307.440       -90.0         .000
R    1062.3103306.440  1      .013                                .000    .000 0
R    1145.3603308.920  1      .013                                .000    .000 0
JX   1146.3603308.930  2  3   .013    5.900         3309.930        20.0         .000
R    1147.3603308.940  2      .013                                .000  15.000 1
R    1148.3603309.030  2      .013                                .000  15.000 0
R    1149.3603309.130  2      .013                                .000  15.000 0
R    1150.3603309.230  2      .013                                .000  15.000 0
R    1151.3603309.330  2      .013                                .000  15.000 0
R    1152.3603309.430  2      .013                                .000  15.000 0
R    1236.9203309.880  2      .013                                .000    .000 0
JX   1237.9203309.890  2  3   .013    8.200         3310.090       -90.0         .000
R    1238.9203309.900  2      .013                                .000    .000 1
R    1288.7803310.140  2      .013                                .000    .000 1
R    1289.7803310.340  2      .013                                .000  -3.000 1
R    1431.2003311.050  2      .013                                .000   0.000 0
R    1432.2003311.250  2      .013                                .000  -1.000 1
R    1558.5203311.890  2      .013                                .000  00.000 0
SH   1558.5203311.890  2                          3314.390
CD   1  4   1    .000   2.500     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   1.500     .000  .000  .000   .00
Q            17.630   .0
```

STARTING HGL OBTAINED FROM THE APPROVED KETTLE BEND ROAD IMPROVEMENT PLANS

OBTAINED FROM NOMOGRAPH

13.93 CFS (INLFOW INTO DI#4)
+ 1.5 CFS (INFLOW FROM LATERAL TO LSDI#4)
+ 2.2 CFS (INFLOW FROM LATERAL TO LSDI#3)

3.2 CFS (INFLOW INTO DI#1)
+ 1.6 CFS (INFLOW FROM LATERAL TO LSDI#1)

OUTPUT

Program Package Serial Number: 7156

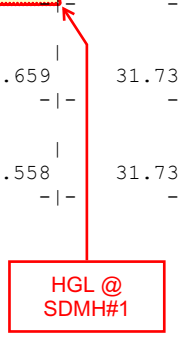
WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time:11:43:22

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD DESIGN (ULTIMATE CONDITION)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	3304.100	1.318	3305.418	36.53	13.92	3.01	3308.43	.00	2.05	2.50	2.500	.000	.00	1 .0
21.081	.0355					.0250	.53	1.32	2.39	1.21	.013	.00	.00	PIPE
1021.081	3304.848	1.369	3306.217	36.53	13.28	2.74	3308.96	.00	2.05	2.49	2.500	.000	.00	1 .0
14.555	.0355					.0221	.32	1.37	2.23	1.21	.013	.00	.00	PIPE
1035.636	3305.364	1.423	3306.787	36.53	12.66	2.49	3309.28	.00	2.05	2.48	2.500	.000	.00	1 .0
10.608	.0355					.0195	.21	1.42	2.07	1.21	.013	.00	.00	PIPE
1046.244	3305.741	1.480	3307.220	36.53	12.07	2.26	3309.48	.00	2.05	2.46	2.500	.000	.00	1 .0
7.980	.0355					.0173	.14	1.48	1.92	1.21	.013	.00	.00	PIPE
1054.224	3306.024	1.540	3307.564	36.53	11.51	2.06	3309.62	.00	2.05	2.43	2.500	.000	.00	1 .0
6.086	.0355					.0153	.09	1.54	1.78	1.21	.013	.00	.00	PIPE
1060.310	3306.240	1.604	3307.844	36.53	10.98	1.87	3309.71	.00	2.05	2.40	2.500	.000	.00	1 .0
JUNCT STR	.1001					.0208	.02	1.60	1.64		.013	.00	.00	PIPE
1061.310	3306.340	1.204	3307.544	31.73	13.56	2.85	3310.40	.00	1.92	2.50	2.500	.000	.00	1 .0
1.000	.0999					.0266	.03	1.20	2.47	.84	.013	.00	.00	PIPE
1062.310	3306.440	1.219	3307.659	31.73	13.35	2.77	3310.43	.00	1.92	2.50	2.500	.000	.00	1 .0
29.114	.0299					.0250	.73	1.22	2.41	1.17	.013	.00	.00	PIPE
1091.424	3307.309	1.249	3308.558	31.73	12.94	2.60	3311.16	.00	1.92	2.50	2.500	.000	.00	1 .0
25.855	.0299					.0226	.58	1.25	2.30	1.17	.013	.00	.00	PIPE



Program Package Serial Number: 7156

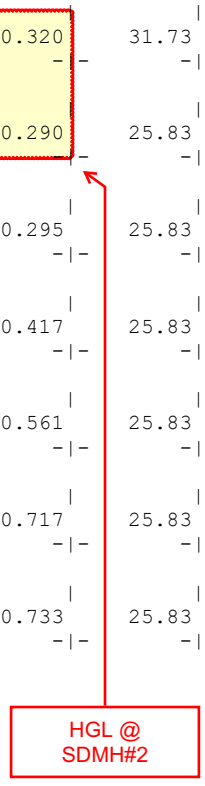
WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time:11:43:22

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD DESIGN (ULTIMATE CONDITION)

Station / L/Elem	Invert Elev / Ch Slope	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
1117.279	3308.081	1.297	3309.378	31.73	12.34 / 2.36 /	3311.74 /	.00 /	1.92 /	2.50 /	2.500 /	.000 /	.00 /	1 / .0
16.513	.0299				.0199 /	.33 /	1.30 /	2.14 /	1.17 /	.013 /	.00 /	.00 /	PIPE
1133.792	3308.574	1.347	3309.922	31.73	11.76 / 2.15 /	3312.07 /	.00 /	1.92 /	2.49 /	2.500 /	.000 /	.00 /	1 / .0
11.568	.0299				.0175 /	.20 /	1.35 /	1.99 /	1.17 /	.013 /	.00 /	.00 /	PIPE
1145.360	3308.920	1.400	3310.320	31.73	11.22 / 1.95 /	3312.27 /	.00 /	1.92 /	2.48 /	2.500 /	.000 /	.00 /	1 / .0
JUNCT STR	.0100				.0183 /	.02 /	1.40 /	1.85 /		.013 /	.00 /	.00 /	PIPE
1146.360	3308.930	1.360	3310.290	25.83	11.36 / 2.00 /	3312.29 /	.00 /	1.78 /	1.87 /	2.000 /	.000 /	.00 /	1 / .0
1.000	.0100				.0202 /	.02 /	1.36 /	1.81 /	2.00 /	.013 /	.00 /	.00 /	PIPE
1147.360	3308.940	1.355	3310.295	25.83	11.40 / 2.02 /	3312.31 /	.00 /	1.78 /	1.87 /	2.000 /	.000 /	.00 /	1 / .0
1.000	.0901				.0197 /	.02 /	1.36 /	1.82 /	.86 /	.013 /	.00 /	.00 /	PIPE
1148.360	3309.030	1.387	3310.417	25.83	11.11 / 1.92 /	3312.33 /	.00 /	1.78 /	1.84 /	2.000 /	.000 /	.00 /	1 / .0
1.000	.0999				.0183 /	.02 /	1.39 /	1.74 /	.83 /	.013 /	.00 /	.00 /	PIPE
1149.360	3309.130	1.431	3310.561	25.83	10.74 / 1.79 /	3312.35 /	.00 /	1.78 /	1.80 /	2.000 /	.000 /	.00 /	1 / .0
1.000	.1001				.0168 /	.02 /	1.43 /	1.64 /	.83 /	.013 /	.00 /	.00 /	PIPE
1150.360	3309.230	1.487	3310.717	25.83	10.32 / 1.65 /	3312.37 /	.00 /	1.78 /	1.75 /	2.000 /	.000 /	.00 /	1 / .0
.103	.1001				.0159 /	.00 /	1.49 /	1.52 /	.83 /	.013 /	.00 /	.00 /	PIPE
1150.463	3309.240	1.493	3310.733	25.83	10.27 / 1.64 /	3312.37 /	.00 /	1.78 /	1.74 /	2.000 /	.000 /	.00 /	1 / .0
.897	.1001				.0151 /	.01 /	1.49 /	1.50 /	.83 /	.013 /	.00 /	.00 /	PIPE



Program Package Serial Number: 7156

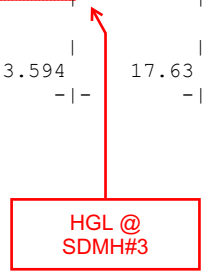
WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time:11:43:22

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD DESIGN (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
1151.360	3309.330	1.566	3310.896	25.83	9.79	1.49	3312.38	.00	1.78	1.65	2.000	.000	.00	1 .0
.273	.0999					.0140	.00	1.57	1.36	.83	.013	.00	.00	PIPE
1151.633	3309.357	1.595	3310.952	25.83	9.62	1.44	3312.39	.00	1.78	1.61	2.000	.000	.00	1 .0
.524	.0999					.0131	.01	1.59	1.31	.83	.013	.00	.00	PIPE
1152.157	3309.410	1.680	3311.090	25.83	9.17	1.31	3312.40	.00	1.78	1.47	2.000	.000	.00	1 .0
.203	.0999					.0120	.00	1.68	1.17	.83	.013	.00	.00	PIPE
1152.360	3309.430	1.782	3311.212	25.83	8.74	1.19	3312.40	.00	1.78	1.25	2.000	.000	.00	1 .0
5.056	.0053					.0115	.06	1.78	1.00	2.00	.013	.00	.00	PIPE
1157.416	3309.457	1.921	3311.377	25.83	8.33	1.08	3312.46	.00	1.78	.78	2.000	.000	.00	1 .0
7.862	.0053					.0118	.09	1.92	.74	2.00	.013	.00	.00	PIPE
1165.278	3309.499	2.000	3311.499	25.83	8.22	1.05	3312.55	.00	1.78	.00	2.000	.000	.00	1 .0
71.642	.0053					.0126	.91	2.00	.00	2.00	.013	.00	.00	PIPE
1236.920	3309.880	2.553	3312.433	25.83	8.22	1.05	3313.48	.00	1.78	.00	2.000	.000	.00	1 .0
JUNCT STR	.0100					.0096	.01	2.55	.00		.013	.00	.00	PIPE
1237.920	3309.890	3.674	3313.563	17.63	5.61	.49	3314.05	.00	1.51	.00	2.000	.000	.00	1 .0
1.000	.0100					.0061	.01	3.67	.00	1.33	.013	.00	.00	PIPE
1238.920	3309.900	3.694	3313.594	17.63	5.61	.49	3314.08	.00	1.51	.00	2.000	.000	.00	1 .0
49.860	.0048					.0061	.30	3.69	.00	2.00	.013	.00	.00	PIPE



Program Package Serial Number: 7156

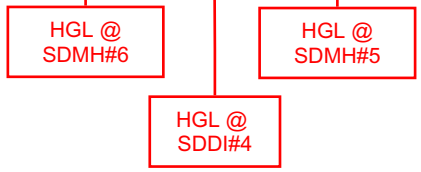
WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time:11:43:22

Lark Hill (aka Summerlin Village 22 Parcel QR)

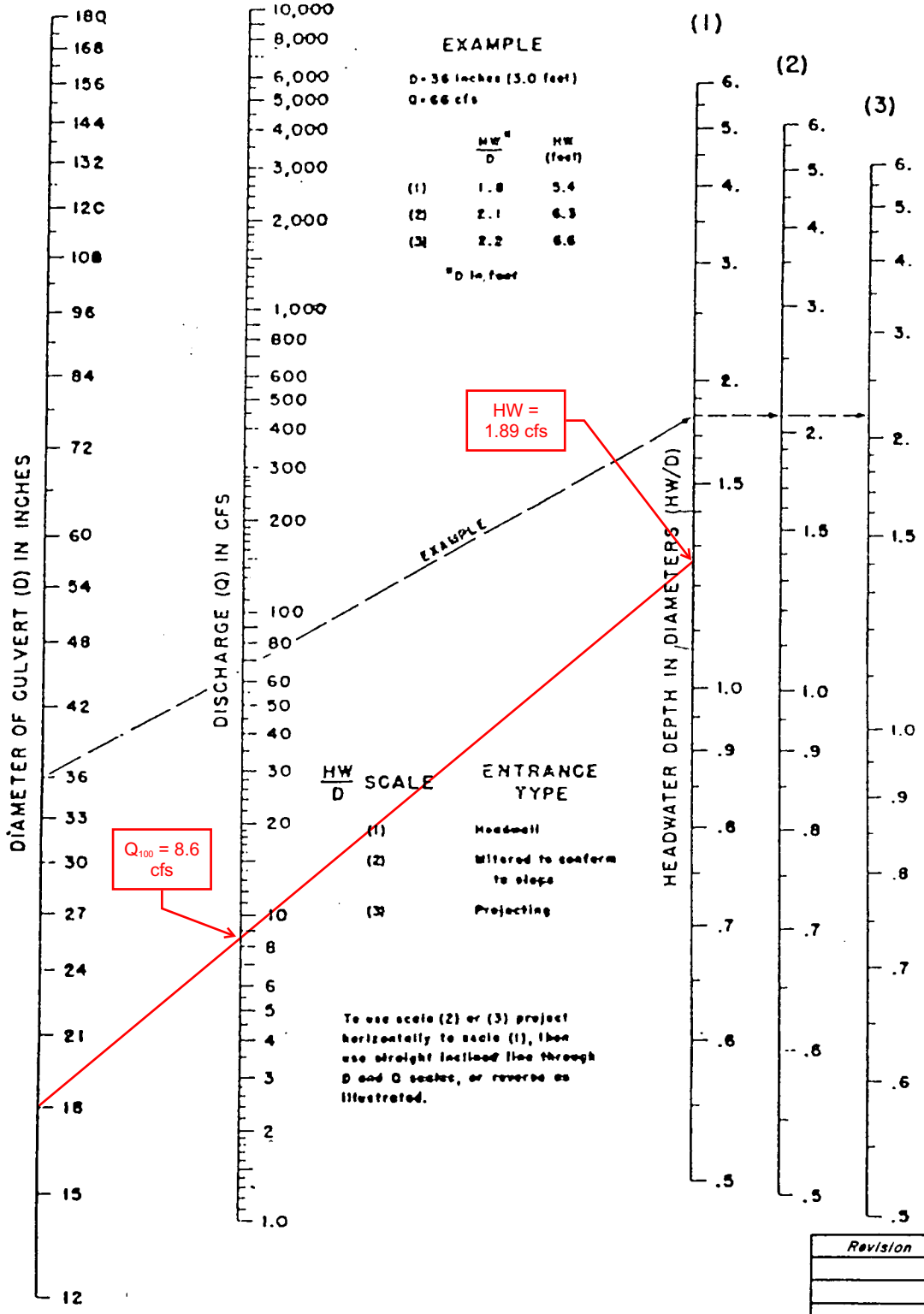
By ACTUS ENGINEERING

SD DESIGN (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	
1288.780	3310.140	3.781	3313.921	17.63	5.61	.49	3314.41	.00	1.51	.00	2.000	.000	.00	1 .0
1.000	.2002				.0061	.01	3.78	.00	.56	.013	.00	.00	PIPE	
1289.780	3310.340	3.616	3313.957	17.63	5.61	.49	3314.45	.00	1.51	.00	2.000	.000	.00	1 .0
141.420	.0050				.0061	.86	3.62	.00	2.00	.013	.00	.00	PIPE	
1431.200	3311.050	3.765	3314.815	17.63	5.61	.49	3315.30	.00	1.51	.00	2.000	.000	.00	1 .0
1.000	.2000				.0061	.01	3.77	.00	.57	.013	.00	.00	PIPE	
1432.200	3311.250	3.598	3314.848	17.63	5.61	.49	3315.34	.00	1.51	.00	2.000	.000	.00	1 .0
126.320	.0051				.0061	.77	3.60	.00	2.00	.013	.00	.00	PIPE	
1558.520	3311.890	3.725	3315.615	17.63	5.61	.49	3316.10	.00	1.51	.00	2.000	.000	.00	1 .0



NOMOGRAPH – INLET CONTROL CMP

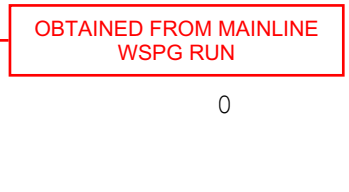


Revision	Date

WRC ENGINEERING

REFERENCE: USDOT, FHWA, HDS No. 5, 1985

FIGURE 1007




```
T1 Lark Hill (aka Summerlin Village 22 Parcel QR)                              0
T2 By ACTUS ENGINEERING
T3 SD Design (Ultimate Condition) - SDMH#3 TO SDDI#3
SO   1237.9203310.090  1                          3313.563
R    1237.9203310.090  1      .013                                .000  00.000 0
R    1342.6703323.600  1      .013                                .000  15.000 1
R    1343.6703323.700  1      .013                                .000  15.000 0
R    1344.6703323.800  1      .013                                .000  15.000 0
R    1345.6703323.900  1      .013                                .000  15.000 0
R    1385.3803331.780  1      .013                                .000  00.000 0
WE   1385.3803331.780  1
.200
SH   1385.3803331.780  1                          3333.670
CD   1  4   1    .000   1.500     .000  .000  .000   .00
Q            08.600   .0
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Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 1:29:11

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#3 TO SDDI#3

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
1237.920	3310.090	3.473	3313.563	8.60	4.87	.37	3313.93	.00	1.14	.00	1.500	.000	.00	1 .0
6.513	.1290					.0067	.04	3.47	.00	.49	.013	.00	.00	PIPE
1244.433	3310.930	2.684	3313.614	8.60	4.87	.37	3313.98	.00	1.14	.00	1.500	.000	.00	1 .0
HYDRAULIC JUMP														
1244.433	3310.930	.487	3311.417	8.60	17.29	4.64	3316.06	.00	1.14	1.40	1.500	.000	.00	1 .0
49.251	.1290					.1290	6.35	.49	5.12	.49	.013	.00	.00	PIPE
1293.684	3317.282	.487	3317.769	8.60	17.29	4.64	3322.41	.00	1.14	1.40	1.500	.000	.00	1 .0
48.986	.1290					.1380	6.76	.49	5.12	.49	.013	.00	.00	PIPE
1342.670	3323.600	.471	3324.071	8.60	18.13	5.10	3329.18	.00	1.14	1.39	1.500	.000	.00	1 .0
1.000	.0999					.1484	.15	.47	5.47	.52	.013	.00	.00	PIPE
1343.670	3323.700	.468	3324.168	8.60	18.24	5.17	3329.34	.00	1.14	1.39	1.500	.000	.00	1 .0
1.000	.1001					.1510	.15	.47	5.52	.52	.013	.00	.00	PIPE
1344.670	3323.800	.466	3324.266	8.60	18.36	5.24	3329.50	.00	1.14	1.39	1.500	.000	.00	1 .0
1.000	.0999					.1538	.15	.47	5.57	.52	.013	.00	.00	PIPE
1345.670	3323.900	.464	3324.364	8.60	18.49	5.31	3329.67	.00	1.14	1.39	1.500	.000	.00	1 .0
6.056	.1984					.1492	.90	.46	5.62	.44	.013	.00	.00	PIPE
1351.725	3325.102	.474	3325.576	8.60	17.95	5.00	3330.58	.00	1.14	1.39	1.500	.000	.00	1 .0
6.817	.1984					.1342	.91	.47	5.40	.44	.013	.00	.00	PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 1:29:11

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#3 TO SDDI#3

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
1358.542	3326.454	.491	3326.945	8.60	17.11	4.55	3331.49	.00	1.14	1.41	1.500	.000	.00	1 .0
4.894	.1984					.1175	.58	.49	5.05	.44	.013	.00	.00	PIPE
1363.437	3327.426	.508	3327.934	8.60	16.32	4.13	3332.07	.00	1.14	1.42	1.500	.000	.00	1 .0
3.749	.1984					.1030	.39	.51	4.72	.44	.013	.00	.00	PIPE
1367.185	3328.169	.526	3328.696	8.60	15.56	3.76	3332.45	.00	1.14	1.43	1.500	.000	.00	1 .0
2.985	.1984					.0903	.27	.53	4.41	.44	.013	.00	.00	PIPE
1370.170	3328.762	.545	3329.307	8.60	14.83	3.42	3332.72	.00	1.14	1.44	1.500	.000	.00	1 .0
2.440	.1984					.0791	.19	.54	4.12	.44	.013	.00	.00	PIPE
1372.610	3329.246	.564	3329.810	8.60	14.14	3.11	3332.92	.00	1.14	1.45	1.500	.000	.00	1 .0
2.031	.1984					.0694	.14	.56	3.85	.44	.013	.00	.00	PIPE
1374.641	3329.649	.585	3330.233	8.60	13.49	2.82	3333.06	.00	1.14	1.46	1.500	.000	.00	1 .0
1.712	.1984					.0609	.10	.58	3.60	.44	.013	.00	.00	PIPE
1376.353	3329.989	.606	3330.594	8.60	12.86	2.57	3333.16	.00	1.14	1.47	1.500	.000	.00	1 .0
1.457	.1984					.0535	.08	.61	3.36	.44	.013	.00	.00	PIPE
1377.810	3330.278	.628	3330.906	8.60	12.26	2.33	3333.24	.00	1.14	1.48	1.500	.000	.00	1 .0
1.248	.1984					.0469	.06	.63	3.14	.44	.013	.00	.00	PIPE
1379.058	3330.525	.651	3331.177	8.60	11.69	2.12	3333.30	.00	1.14	1.49	1.500	.000	.00	1 .0
1.074	.1984					.0412	.04	.65	2.93	.44	.013	.00	.00	PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 1:29:11

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#3 TO SDDI#3

Station / L/Elem	Invert Elev / Ch Slope	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
1380.132	3330.739	.675	3331.414	8.60	11.15	1.93	3333.34	.00	1.14	1.49	1.500	.000	.00	1 .0
.926	.1984					.0363	.03	.68	2.73	.44	.013	.00	.00	PIPE
1381.058	3330.922	.700	3331.623	8.60	10.63	1.75	3333.38	.00	1.14	1.50	1.500	.000	.00	1 .0
.799	.1984					.0319	.03	.70	2.55	.44	.013	.00	.00	PIPE
1381.857	3331.081	.727	3331.807	8.60	10.13	1.59	3333.40	.00	1.14	1.50	1.500	.000	.00	1 .0
.689	.1984					.0281	.02	.73	2.37	.44	.013	.00	.00	PIPE
1382.545	3331.217	.754	3331.972	8.60	9.66	1.45	3333.42	.00	1.14	1.50	1.500	.000	.00	1 .0
.591	.1984					.0247	.01	.75	2.21	.44	.013	.00	.00	PIPE
1383.137	3331.335	.783	3332.118	8.60	9.21	1.32	3333.44	.00	1.14	1.50	1.500	.000	.00	1 .0
.506	.1984					.0218	.01	.78	2.06	.44	.013	.00	.00	PIPE
1383.642	3331.435	.814	3332.249	8.60	8.78	1.20	3333.45	.00	1.14	1.49	1.500	.000	.00	1 .0
.428	.1984					.0192	.01	.81	1.91	.44	.013	.00	.00	PIPE
1384.071	3331.520	.846	3332.366	8.60	8.37	1.09	3333.45	.00	1.14	1.49	1.500	.000	.00	1 .0
.359	.1984					.0170	.01	.85	1.78	.44	.013	.00	.00	PIPE
1384.430	3331.591	.880	3332.471	8.60	7.98	.99	3333.46	.00	1.14	1.48	1.500	.000	.00	1 .0
.296	.1984					.0150	.00	.88	1.65	.44	.013	.00	.00	PIPE
1384.726	3331.650	.915	3332.566	8.60	7.61	.90	3333.47	.00	1.14	1.46	1.500	.000	.00	1 .0
.237	.1984					.0133	.00	.92	1.53	.44	.013	.00	.00	PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 1:29:11

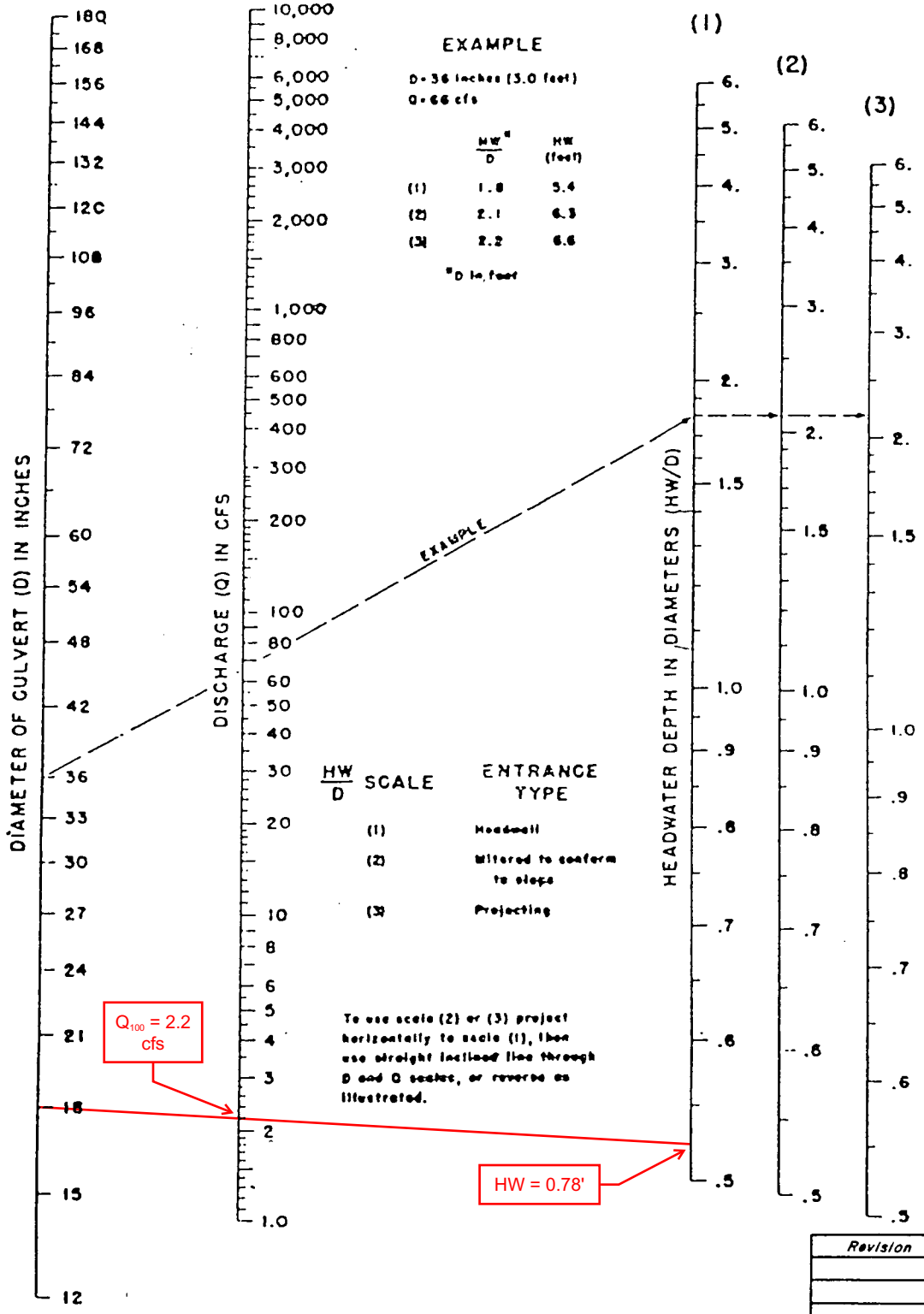
Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#3 TO SDDI#3

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
1384.963	3331.697	.953	3332.651	8.60	7.26	.82	3333.47	.00	1.14	1.44	1.500	.000	.00	1 .0
.182	.1984					.0118	.00	.95	1.41	.44	.013	.00	.00	PIPE
1385.145	3331.733	.994	3332.727	8.60	6.92	.74	3333.47	.00	1.14	1.42	1.500	.000	.00	1 .0
.129	.1984					.0105	.00	.99	1.30	.44	.013	.00	.00	PIPE
1385.274	3331.759	1.037	3332.796	8.60	6.60	.68	3333.47	.00	1.14	1.39	1.500	.000	.00	1 .0
.079	.1984					.0094	.00	1.04	1.20	.44	.013	.00	.00	PIPE
1385.353	3331.775	1.084	3332.858	8.60	6.29	.61	3333.47	.00	1.14	1.34	1.500	.000	.00	1 .0
.027	.1984					.0084	.00	1.08	1.10	.44	.013	.00	.00	PIPE
WALL	ENTRANCE													
1385.380	3331.780	1.136	3332.916	8.60	5.99	.56	3333.47	.00	1.14	1.29	1.500	.000	.00	0 .0

NOMOGRAPH – INLET CONTROL CMP



Revision	Date

WRC ENGINEERING

REFERENCE:
USDOT, FHWA, HDS No. 5, 1985

FIGURE 1007

INPUT

OBTAINED FROM THE MAINLINE WSPG RUN

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T1 Lark Hill (aka Summerlin Village 22 Parcel QR)                              0
T2 By ACTUS ENGINEERING
T3 SD Design (Ultimate Condition) - LSDI#3 TO SDDI#4
SO   1000.0003312.860  1                          3315.615
R    1000.0003312.860  1      .013                                 .000  00.000 0
R    1037.8503318.080  1      .013                                 .000  00.000 0
WE   1037.8503318.080  1      .200
SH   1037.8503318.080  1                          3318.860
CD   1  4   1    .000   1.500     .000  .000  .000   .00
Q            02.200   .0
```

100YR INLFOW INTO LSDI#3

OUTPUT

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time:10:22:53

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - LSDI#3 TO SDDI#4

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS) / SF Ave	Vel Head / HF	Energy Grd.El. / SE Dpth	Super Elev / Froude N	Critical Depth / Norm Dp	Flow Top Width / "N"	Height/ Dia.-FT / X-Fall	Base Wt or I.D. / ZR	ZL	No Wth Prs/Pip / Type Ch
1000.000	3312.860	2.755	3315.615	2.20	1.24	.02	3315.64	.00	.56	.00	1.500	.000	.00	1 .0
9.128	.1379				.0004	.00	2.75	.00	.24	.013		.00	.00	PIPE
1009.128	3314.119	1.500	3315.619	2.20	1.24	.02	3315.64	.00	.56	.00	1.500	.000	.00	1 .0
.987	.1379				.0004	.00	1.50	.00	.24	.013		.00	.00	PIPE
1010.115	3314.255	1.361	3315.616	2.20	1.31	.03	3315.64	.00	.56	.87	1.500	.000	.00	1 .0
.568	.1379				.0004	.00	1.36	.17	.24	.013		.00	.00	PIPE
1010.683	3314.333	1.280	3315.613	2.20	1.37	.03	3315.64	.00	.56	1.06	1.500	.000	.00	1 .0
.463	.1379				.0004	.00	1.28	.20	.24	.013		.00	.00	PIPE
1011.146	3314.397	1.214	3315.611	2.20	1.44	.03	3315.64	.00	.56	1.18	1.500	.000	.00	1 .0
.401	.1379				.0005	.00	1.21	.22	.24	.013		.00	.00	PIPE
1011.547	3314.452	1.155	3315.608	2.20	1.51	.04	3315.64	.00	.56	1.26	1.500	.000	.00	1 .0
.325	.1379				.0005	.00	1.16	.25	.24	.013		.00	.00	PIPE
1011.872	3314.497	1.103	3315.600	2.20	1.58	.04	3315.64	.00	.56	1.32	1.500	.000	.00	1 .0
HYDRAULIC JUMP														
1011.872	3314.497	.248	3314.745	2.20	11.50	2.05	3316.80	.00	.56	1.11	1.500	.000	.00	1 .0
6.767	.1379				.1166	.79	.25	4.89	.24	.013		.00	.00	PIPE
1018.639	3315.430	.256	3315.687	2.20	10.96	1.87	3317.55	.00	.56	1.13	1.500	.000	.00	1 .0
4.454	.1379				.1017	.45	.26	4.58	.24	.013		.00	.00	PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time:10:22:53

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - LSDI#3 TO SDDI#4

Station / L/Elem	Invert Elev / Ch Slope	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
1023.093	3316.045	.265	3316.310	2.20	10.45	1.70	3318.01	.00	.56	1.14	1.500	.000	.00	1 .0
2.963	.1379					.0889	.26	.26	4.29	.24	.013	.00	.00	PIPE
1026.056	3316.453	.274	3316.727	2.20	9.97	1.54	3318.27	.00	.56	1.16	1.500	.000	.00	1 .0
2.173	.1379					.0776	.17	.27	4.02	.24	.013	.00	.00	PIPE
1028.229	3316.753	.283	3317.036	2.20	9.50	1.40	3318.44	.00	.56	1.17	1.500	.000	.00	1 .0
1.682	.1379					.0678	.11	.28	3.77	.24	.013	.00	.00	PIPE
1029.911	3316.985	.293	3317.278	2.20	9.06	1.27	3318.55	.00	.56	1.19	1.500	.000	.00	1 .0
1.347	.1379					.0593	.08	.29	3.53	.24	.013	.00	.00	PIPE
1031.258	3317.171	.303	3317.473	2.20	8.64	1.16	3318.63	.00	.56	1.20	1.500	.000	.00	1 .0
1.103	.1379					.0518	.06	.30	3.31	.24	.013	.00	.00	PIPE
1032.361	3317.323	.313	3317.636	2.20	8.24	1.05	3318.69	.00	.56	1.22	1.500	.000	.00	1 .0
.919	.1379					.0453	.04	.31	3.10	.24	.013	.00	.00	PIPE
1033.280	3317.450	.323	3317.773	2.20	7.85	.96	3318.73	.00	.56	1.23	1.500	.000	.00	1 .0
.773	.1379					.0396	.03	.32	2.90	.24	.013	.00	.00	PIPE
1034.054	3317.556	.334	3317.891	2.20	7.49	.87	3318.76	.00	.56	1.25	1.500	.000	.00	1 .0
.656	.1379					.0346	.02	.33	2.72	.24	.013	.00	.00	PIPE
1034.709	3317.647	.346	3317.992	2.20	7.14	.79	3318.78	.00	.56	1.26	1.500	.000	.00	1 .0
.558	.1379					.0302	.02	.35	2.55	.24	.013	.00	.00	PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time:10:22:53

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - LSDI#3 TO SDDI#4

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1035.267	3317.724	.358	3318.081	2.20	6.81	.72	3318.80	.00	.56	1.28	1.500	.000	.00	1 .0
.477	.1379					.0264	.01	.36	2.39	.24	.013	.00	.00	PIPE
1035.744	3317.790	.370	3318.159	2.20	6.49	.65	3318.81	.00	.56	1.29	1.500	.000	.00	1 .0
.407	.1379					.0231	.01	.37	2.23	.24	.013	.00	.00	PIPE
1036.151	3317.846	.383	3318.228	2.20	6.19	.59	3318.82	.00	.56	1.31	1.500	.000	.00	1 .0
.347	.1379					.0202	.01	.38	2.09	.24	.013	.00	.00	PIPE
1036.499	3317.894	.396	3318.289	2.20	5.90	.54	3318.83	.00	.56	1.32	1.500	.000	.00	1 .0
.295	.1379					.0177	.01	.40	1.96	.24	.013	.00	.00	PIPE
1036.793	3317.934	.410	3318.344	2.20	5.63	.49	3318.84	.00	.56	1.34	1.500	.000	.00	1 .0
.249	.1379					.0155	.00	.41	1.83	.24	.013	.00	.00	PIPE
1037.042	3317.969	.424	3318.393	2.20	5.36	.45	3318.84	.00	.56	1.35	1.500	.000	.00	1 .0
.208	.1379					.0135	.00	.42	1.72	.24	.013	.00	.00	PIPE
1037.250	3317.997	.439	3318.436	2.20	5.11	.41	3318.84	.00	.56	1.36	1.500	.000	.00	1 .0
.172	.1379					.0119	.00	.44	1.61	.24	.013	.00	.00	PIPE
1037.421	3318.021	.454	3318.475	2.20	4.88	.37	3318.84	.00	.56	1.38	1.500	.000	.00	1 .0
.139	.1379					.0104	.00	.45	1.50	.24	.013	.00	.00	PIPE
1037.560	3318.040	.470	3318.510	2.20	4.65	.34	3318.85	.00	.56	1.39	1.500	.000	.00	1 .0
.109	.1379					.0091	.00	.47	1.40	.24	.013	.00	.00	PIPE

Program Package Serial Number: 7156

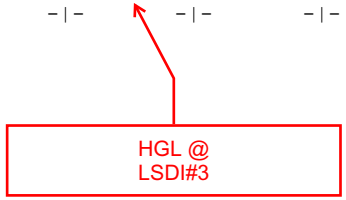
WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time:10:22:53

Lark Hill (aka Summerlin Village 22 Parcel QR)

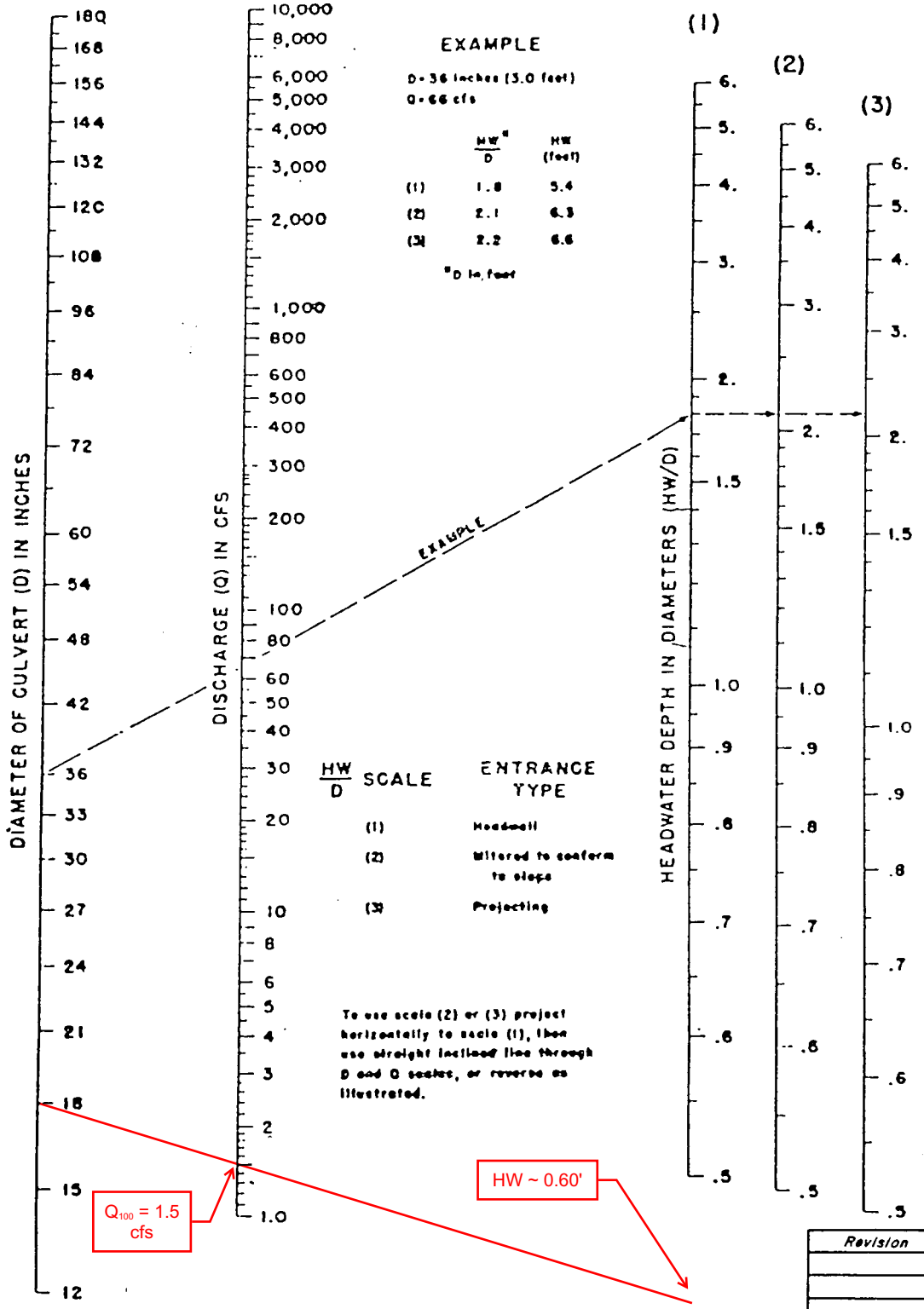
By ACTUS ENGINEERING

SD Design (Ultimate Condition) - LSDI#3 TO SDDI#4

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
1037.669	3318.055	.486	3318.541	2.20	4.43	.31	3318.85	.00	.56	1.40	1.500	.000	.00	1 .0
.081	.1379					.0080	.00	.49	1.31	.24	.013	.00	.00	PIPE
1037.750	3318.066	.503	3318.570	2.20	4.23	.28	3318.85	.00	.56	1.42	1.500	.000	.00	1 .0
.057	.1379					.0070	.00	.50	1.23	.24	.013	.00	.00	PIPE
1037.806	3318.074	.521	3318.595	2.20	4.03	.25	3318.85	.00	.56	1.43	1.500	.000	.00	1 .0
.033	.1379					.0061	.00	.52	1.15	.24	.013	.00	.00	PIPE
1037.839	3318.079	.540	3318.618	2.20	3.84	.23	3318.85	.00	.56	1.44	1.500	.000	.00	1 .0
.011	.1379					.0053	.00	.54	1.07	.24	.013	.00	.00	PIPE
WALL	ENTRANCE													
1037.850	3318.080	.561	3318.641	2.20	3.65	.21	3318.85	.00	.56	1.45	1.500	.000	.00	0 .0



NOMOGRAPH – INLET CONTROL CMP



Revision	Date

WRC ENGINEERING

REFERENCE:
USDOT, FHWA, HDS No. 5, 1985

FIGURE 1007

OBTAINED FROM THE MAINLINE WSPG RUN

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T1 Lark Hill (aka Summerlin Village 22 Parcel QR)                              0
T2 By ACTUS ENGINEERING
T3 SD Design (Ultimate Condition) - LSDI#4 TO SDDI#4
SO   1000.0003317.590  1                          3315.615
R    1000.0003317.590  1      .013                                .000  00.000 0
R    1069.4303318.010  1      .013                                .000 -15.000 1
R    1070.4303318.020  1      .013                                .000 -15.000 0
R    1071.4303318.030  1      .013                                .000 -15.000 0
R    1072.4303318.040  1      .013                                .000 -08.000 0
R    1090.1803318.130  1      .013                                .000    .000 0
WE   1090.1803318.130  1      .200
SH   1090.1803318.130  1                          3318.730
CD   1  4   1    .000   1.500     .000  .000  .000   .00
Q             1.500   .0
```

100-YR INFLOW INTO LSDI#4

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 1:59:56

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - LSDI#4 TO SDDI#4

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS) / SF Ave	Vel Head / HF	Energy Grd.El. / SE Dpth	Super Elev / Froude N	Critical Depth / Norm Dp	Flow Top Width / "N"	Height/Dia.-FT / X-Fall	Base Wt or I.D. / ZR	ZL	No Wth Prs/Pip / Type Ch
1000.000	3317.590	.435	3318.025	1.50	3.52	.19	3318.22	.00	.46	1.36	1.500	.000	.00	1 .0
52.955	.0060				.0060	.32	.44	1.11	.44	.013	.00	.00		PIPE
1052.955	3317.910	.435	3318.345	1.50	3.52	.19	3318.54	.00	.46	1.36	1.500	.000	.00	1 .0
9.631	.0060				.0062	.06	.44	1.11	.44	.013	.00	.00		PIPE
1062.587	3317.969	.429	3318.397	1.50	3.60	.20	3318.60	.00	.46	1.36	1.500	.000	.00	1 .0
6.843	.0060				.0069	.05	.43	1.14	.44	.013	.00	.00		PIPE
1069.430	3318.010	.414	3318.424	1.50	3.78	.22	3318.65	.00	.46	1.34	1.500	.000	.00	1 .0
1.000	.0100				.0071	.01	.41	1.22	.38	.013	.00	.00		PIPE
1070.430	3318.020	.420	3318.440	1.50	3.70	.21	3318.65	.00	.46	1.35	1.500	.000	.00	1 .0
1.000	.0100				.0067	.01	.42	1.19	.38	.013	.00	.00		PIPE
1071.430	3318.030	.429	3318.459	1.50	3.59	.20	3318.66	.00	.46	1.36	1.500	.000	.00	1 .0
.670	.0100				.0061	.00	.43	1.14	.38	.013	.00	.00		PIPE
1072.100	3318.037	.440	3318.477	1.50	3.47	.19	3318.66	.00	.46	1.37	1.500	.000	.00	1 .0
.330	.0100				.0054	.00	.44	1.09	.38	.013	.00	.00		PIPE
1072.430	3318.040	.456	3318.496	1.50	3.31	.17	3318.67	.00	.46	1.38	1.500	.000	.00	1 .0
16.798	.0051				.0051	.09	.46	1.02	.46	.013	.00	.00		PIPE
1089.228	3318.125	.456	3318.581	1.50	3.31	.17	3318.75	.00	.46	1.38	1.500	.000	.00	1 .0
.952	.0051				.0050	.00	.46	1.02	.46	.013	.00	.00		PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 1:59:56

Lark Hill (aka Summerlin Village 22 Parcel QR)

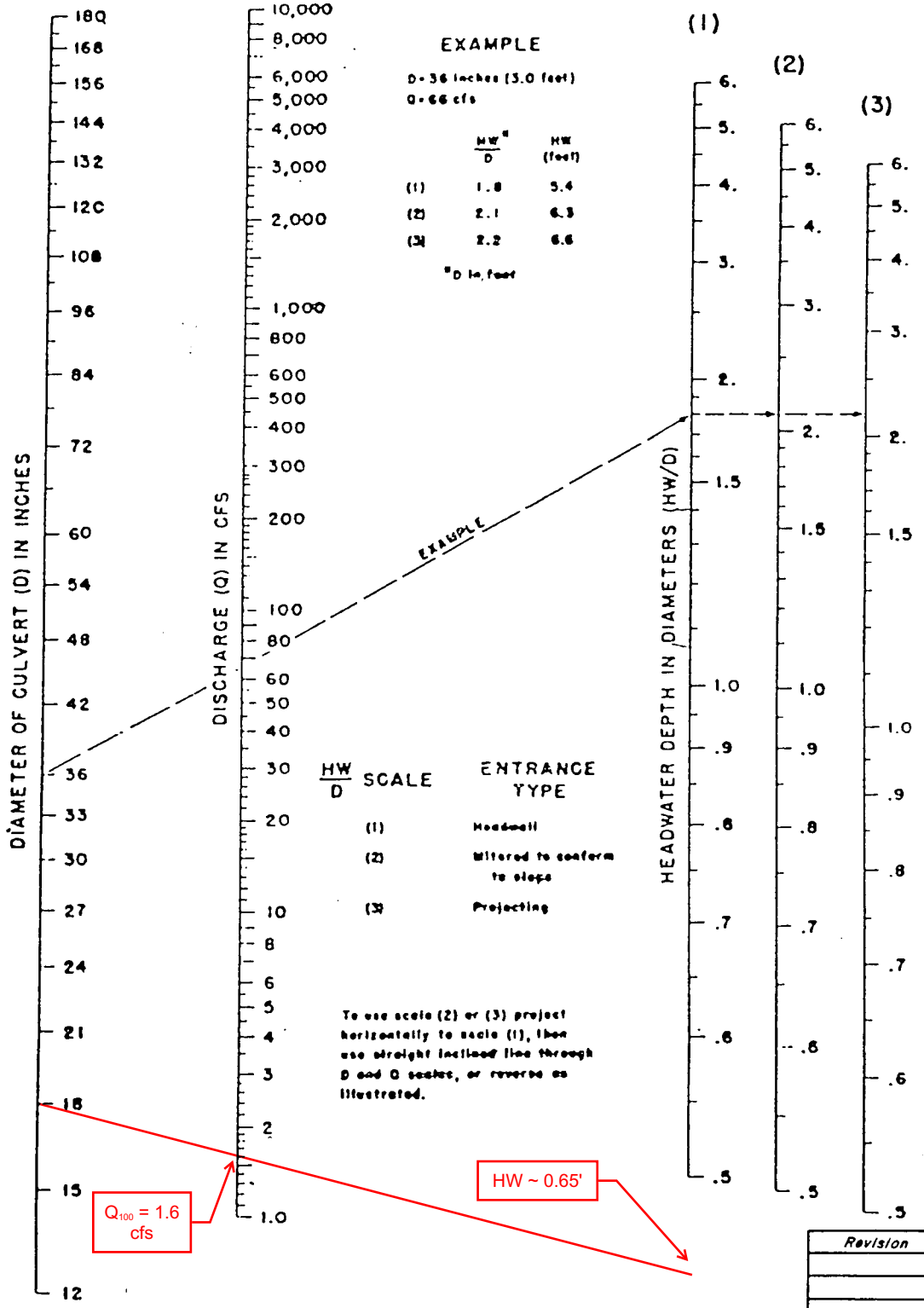
By ACTUS ENGINEERING

SD Design (Ultimate Condition) - LSDI#4 TO SDDI#4

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
WALL ENTRANCE														
1090.180	3318.130	.460	3318.590	1.50	3.26	.16	3318.76	.00	.46	1.38	1.500	.000	.00	0 .0

HGL @ LSDI#4

NOMOGRAPH – INLET CONTROL CMP

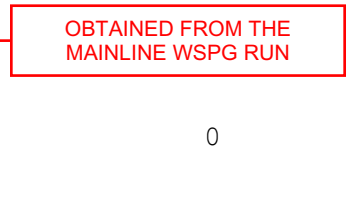


Revision	Date

WRC ENGINEERING

REFERENCE: USDOT, FHWA, HDS No. 5, 1985

FIGURE 1007




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T1 Lark Hill (aka Summerlin Village 22 Parcel QR)                              0
T2 By ACTUS ENGINEERING
T3 SD Design (Ultimate Condition) - SDMH#1 TO LSDI#1
SO   1061.3103307.240  1                          3307.844
R    1061.3103307.240  1      .013                                .000  00.000 0
R    1077.3203310.630  1      .013                                .000  00.000 0
JX   1078.3203310.640  1  1   .013    3.200         3311.640        0.0         .000
R    1079.3203310.650  1      .013                                .000  00.000 0
R    1129.4303320.870  1      .013                                .000  00.000 0
WE   1129.4303320.870  1      .200
SH   1129.4303320.870  1                          3321.520
CD   1  4   1    .000   1.500     .000  .000  .000   .00
Q            01.600   .0
```

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 2:25:14

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#1 TO LSDI#1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1061.310	3307.240	.370	3307.609	4.80	14.17	3.12	3310.73	.00	.84	1.29	1.500	.000	.00	1 .0
.481	.2117					.1167	.06	.37	4.88	.32	.013	.00	.00	PIPE
1061.791	3307.341	.371	3307.713	4.80	14.09	3.08	3310.79	.00	.84	1.29	1.500	.000	.00	1 .0
2.586	.2117					.1084	.28	.37	4.84	.32	.013	.00	.00	PIPE
1064.377	3307.889	.384	3308.273	4.80	13.43	2.80	3311.07	.00	.84	1.31	1.500	.000	.00	1 .0
2.064	.2117					.0948	.20	.38	4.53	.32	.013	.00	.00	PIPE
1066.440	3308.326	.397	3308.723	4.80	12.80	2.55	3311.27	.00	.84	1.32	1.500	.000	.00	1 .0
1.691	.2117					.0829	.14	.40	4.24	.32	.013	.00	.00	PIPE
1068.131	3308.684	.411	3309.095	4.80	12.21	2.31	3311.41	.00	.84	1.34	1.500	.000	.00	1 .0
1.409	.2117					.0726	.10	.41	3.97	.32	.013	.00	.00	PIPE
1069.540	3308.982	.425	3309.407	4.80	11.64	2.10	3311.51	.00	.84	1.35	1.500	.000	.00	1 .0
1.191	.2117					.0635	.08	.43	3.71	.32	.013	.00	.00	PIPE
1070.731	3309.234	.440	3309.675	4.80	11.10	1.91	3311.59	.00	.84	1.37	1.500	.000	.00	1 .0
1.016	.2117					.0556	.06	.44	3.48	.32	.013	.00	.00	PIPE
1071.746	3309.449	.456	3309.905	4.80	10.58	1.74	3311.64	.00	.84	1.38	1.500	.000	.00	1 .0
.871	.2117					.0487	.04	.46	3.25	.32	.013	.00	.00	PIPE
1072.618	3309.634	.472	3310.105	4.80	10.09	1.58	3311.69	.00	.84	1.39	1.500	.000	.00	1 .0
.752	.2117					.0426	.03	.47	3.04	.32	.013	.00	.00	PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 2:25:14

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#1 TO LSDI#1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1073.370	3309.793	.488	3310.281	4.80	9.62	1.44	3311.72	.00	.84	1.41	1.500	.000	.00	1 .0
.650	.2117					.0373	.02	.49	2.85	.32	.013	.00	.00	PIPE
1074.019	3309.931	.505	3310.436	4.80	9.17	1.31	3311.74	.00	.84	1.42	1.500	.000	.00	1 .0
.563	.2117					.0327	.02	.51	2.66	.32	.013	.00	.00	PIPE
1074.583	3310.050	.523	3310.573	4.80	8.75	1.19	3311.76	.00	.84	1.43	1.500	.000	.00	1 .0
.488	.2117					.0287	.01	.52	2.49	.32	.013	.00	.00	PIPE
1075.071	3310.154	.542	3310.696	4.80	8.34	1.08	3311.78	.00	.84	1.44	1.500	.000	.00	1 .0
.422	.2117					.0251	.01	.54	2.33	.32	.013	.00	.00	PIPE
1075.493	3310.243	.561	3310.804	4.80	7.95	.98	3311.79	.00	.84	1.45	1.500	.000	.00	1 .0
.364	.2117					.0221	.01	.56	2.17	.32	.013	.00	.00	PIPE
1075.857	3310.320	.582	3310.902	4.80	7.58	.89	3311.79	.00	.84	1.46	1.500	.000	.00	1 .0
.312	.2117					.0193	.01	.58	2.03	.32	.013	.00	.00	PIPE
1076.169	3310.386	.603	3310.989	4.80	7.23	.81	3311.80	.00	.84	1.47	1.500	.000	.00	1 .0
.266	.2117					.0170	.00	.60	1.90	.32	.013	.00	.00	PIPE
1076.434	3310.442	.625	3311.067	4.80	6.89	.74	3311.80	.00	.84	1.48	1.500	.000	.00	1 .0
.224	.2117					.0149	.00	.62	1.77	.32	.013	.00	.00	PIPE
1076.659	3310.490	.648	3311.138	4.80	6.57	.67	3311.81	.00	.84	1.49	1.500	.000	.00	1 .0
.187	.2117					.0131	.00	.65	1.65	.32	.013	.00	.00	PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 2:25:14

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#1 TO LSDI#1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1076.845	3310.530	.672	3311.201	4.80	6.27	.61	3311.81	.00	.84	1.49	1.500	.000	.00	1 .0
.151	.2117					.0115	.00	.67	1.54	.32	.013	.00	.00	PIPE
1076.996	3310.562	.697	3311.258	4.80	5.97	.55	3311.81	.00	.84	1.50	1.500	.000	.00	1 .0
.120	.2117					.0101	.00	.70	1.44	.32	.013	.00	.00	PIPE
1077.117	3310.587	.723	3311.310	4.80	5.70	.50	3311.81	.00	.84	1.50	1.500	.000	.00	1 .0
.090	.2117					.0089	.00	.72	1.34	.32	.013	.00	.00	PIPE
1077.207	3310.606	.750	3311.356	4.80	5.43	.46	3311.81	.00	.84	1.50	1.500	.000	.00	1 .0
.063	.2117					.0078	.00	.75	1.25	.32	.013	.00	.00	PIPE
1077.270	3310.619	.779	3311.398	4.80	5.18	.42	3311.81	.00	.84	1.50	1.500	.000	.00	1 .0
.037	.2117					.0069	.00	.78	1.16	.32	.013	.00	.00	PIPE
1077.307	3310.627	.809	3311.437	4.80	4.94	.38	3311.81	.00	.84	1.50	1.500	.000	.00	1 .0
.013	.2117					.0061	.00	.81	1.08	.32	.013	.00	.00	PIPE
1077.320	3310.630	.842	3311.472	4.80	4.70	.34	3311.81	.00	.84	1.49	1.500	.000	.00	1 .0
JUNCT STR	.0100					.0030	.00	.84	1.00		.013	.00	.00	PIPE
1078.320	3310.640	1.168	3311.808	1.60	1.08	.02	3311.83	.00	.48	1.25	1.500	.000	.00	1 .0
1.000	.0100					.0003	.00	1.17	.18	.40	.013	.00	.00	PIPE
1079.320	3310.650	1.158	3311.808	1.60	1.09	.02	3311.83	.00	.48	1.26	1.500	.000	.00	1 .0
.250	.2040					.0003	.00	1.16	.18	.19	.013	.00	.00	PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 2:25:14

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#1 TO LSDI#1

Station / L/Elem	Invert Elev / Ch Slope	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
1079.570	3310.701	1.105	3311.806	1.60	1.15	.02	3311.83	.00	.48	1.32	1.500	.000	.00	1 .0
.227	.2040					.0003	.00	1.11	.20	.19	.013	.00	.00	PIPE
1079.797	3310.747	1.057	3311.804	1.60	1.20	.02	3311.83	.00	.48	1.37	1.500	.000	.00	1 .0
.205	.2040					.0003	.00	1.06	.21	.19	.013	.00	.00	PIPE
1080.002	3310.789	1.012	3311.802	1.60	1.26	.02	3311.83	.00	.48	1.41	1.500	.000	.00	1 .0
HYDRAULIC JUMP														
1080.002	3310.789	.189	3310.978	1.60	12.44	2.40	3313.38	.00	.48	.99	1.500	.000	.00	1 .0
10.446	.2040					.2040	2.13	.19	6.10	.19	.013	.00	.00	PIPE
1090.448	3312.920	.189	3313.108	1.60	12.44	2.40	3315.51	.00	.48	.99	1.500	.000	.00	1 .0
16.244	.2040					.1960	3.18	.19	6.10	.19	.013	.00	.00	PIPE
1106.692	3316.233	.192	3316.425	1.60	12.09	2.27	3318.70	.00	.48	1.00	1.500	.000	.00	1 .0
7.186	.2040					.1761	1.27	.19	5.87	.19	.013	.00	.00	PIPE
1113.878	3317.698	.199	3317.897	1.60	11.53	2.06	3319.96	.00	.48	1.02	1.500	.000	.00	1 .0
3.604	.2040					.1537	.55	.20	5.50	.19	.013	.00	.00	PIPE
1117.483	3318.433	.205	3318.639	1.60	10.99	1.88	3320.51	.00	.48	1.03	1.500	.000	.00	1 .0
2.347	.2040					.1342	.31	.21	5.16	.19	.013	.00	.00	PIPE
1119.830	3318.912	.212	3319.124	1.60	10.48	1.71	3320.83	.00	.48	1.05	1.500	.000	.00	1 .0
1.704	.2040					.1171	.20	.21	4.83	.19	.013	.00	.00	PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 2:25:14

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#1 TO LSDI#1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1121.534	3319.260	.219	3319.479	1.60	9.99	1.55	3321.03	.00	.48	1.06	1.500	.000	.00	1 .0
1.314	.2040					.1023	.13	.22	4.53	.19	.013	.00	.00	PIPE
1122.848	3319.528	.227	3319.754	1.60	9.53	1.41	3321.16	.00	.48	1.07	1.500	.000	.00	1 .0
1.051	.2040					.0893	.09	.23	4.25	.19	.013	.00	.00	PIPE
1123.900	3319.742	.234	3319.976	1.60	9.08	1.28	3321.26	.00	.48	1.09	1.500	.000	.00	1 .0
.862	.2040					.0780	.07	.23	3.98	.19	.013	.00	.00	PIPE
1124.762	3319.918	.242	3320.160	1.60	8.66	1.16	3321.32	.00	.48	1.10	1.500	.000	.00	1 .0
.720	.2040					.0681	.05	.24	3.73	.19	.013	.00	.00	PIPE
1125.482	3320.065	.250	3320.315	1.60	8.26	1.06	3321.37	.00	.48	1.12	1.500	.000	.00	1 .0
.608	.2040					.0595	.04	.25	3.50	.19	.013	.00	.00	PIPE
1126.090	3320.189	.259	3320.447	1.60	7.87	.96	3321.41	.00	.48	1.13	1.500	.000	.00	1 .0
.519	.2040					.0519	.03	.26	3.28	.19	.013	.00	.00	PIPE
1126.608	3320.294	.267	3320.562	1.60	7.51	.88	3321.44	.00	.48	1.15	1.500	.000	.00	1 .0
.445	.2040					.0454	.02	.27	3.07	.19	.013	.00	.00	PIPE
1127.053	3320.385	.276	3320.661	1.60	7.16	.80	3321.46	.00	.48	1.16	1.500	.000	.00	1 .0
.384	.2040					.0396	.02	.28	2.88	.19	.013	.00	.00	PIPE
1127.437	3320.463	.286	3320.749	1.60	6.83	.72	3321.47	.00	.48	1.18	1.500	.000	.00	1 .0
.331	.2040					.0346	.01	.29	2.70	.19	.013	.00	.00	PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 2:25:14

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#1 TO LSDI#1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1127.768	3320.531	.295	3320.826	1.60	6.51	.66	3321.48	.00	.48	1.19	1.500	.000	.00	1 .0
.287	.2040					.0303	.01	.30	2.53	.19	.013	.00	.00	PIPE
1128.054	3320.589	.305	3320.895	1.60	6.20	.60	3321.49	.00	.48	1.21	1.500	.000	.00	1 .0
.248	.2040					.0264	.01	.31	2.37	.19	.013	.00	.00	PIPE
1128.303	3320.640	.316	3320.955	1.60	5.92	.54	3321.50	.00	.48	1.22	1.500	.000	.00	1 .0
.214	.2040					.0231	.00	.32	2.22	.19	.013	.00	.00	PIPE
1128.517	3320.684	.326	3321.010	1.60	5.64	.49	3321.50	.00	.48	1.24	1.500	.000	.00	1 .0
.183	.2040					.0202	.00	.33	2.08	.19	.013	.00	.00	PIPE
1128.700	3320.721	.337	3321.058	1.60	5.38	.45	3321.51	.00	.48	1.25	1.500	.000	.00	1 .0
.157	.2040					.0177	.00	.34	1.94	.19	.013	.00	.00	PIPE
1128.858	3320.753	.349	3321.102	1.60	5.13	.41	3321.51	.00	.48	1.27	1.500	.000	.00	1 .0
.134	.2040					.0154	.00	.35	1.82	.19	.013	.00	.00	PIPE
1128.991	3320.781	.361	3321.141	1.60	4.89	.37	3321.51	.00	.48	1.28	1.500	.000	.00	1 .0
.112	.2040					.0135	.00	.36	1.71	.19	.013	.00	.00	PIPE
1129.103	3320.803	.373	3321.177	1.60	4.66	.34	3321.51	.00	.48	1.30	1.500	.000	.00	1 .0
.093	.2040					.0118	.00	.37	1.60	.19	.013	.00	.00	PIPE
1129.196	3320.822	.386	3321.208	1.60	4.44	.31	3321.52	.00	.48	1.31	1.500	.000	.00	1 .0
.075	.2040					.0103	.00	.39	1.50	.19	.013	.00	.00	PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 2:25:14

Lark Hill (aka Summerlin Village 22 Parcel QR)

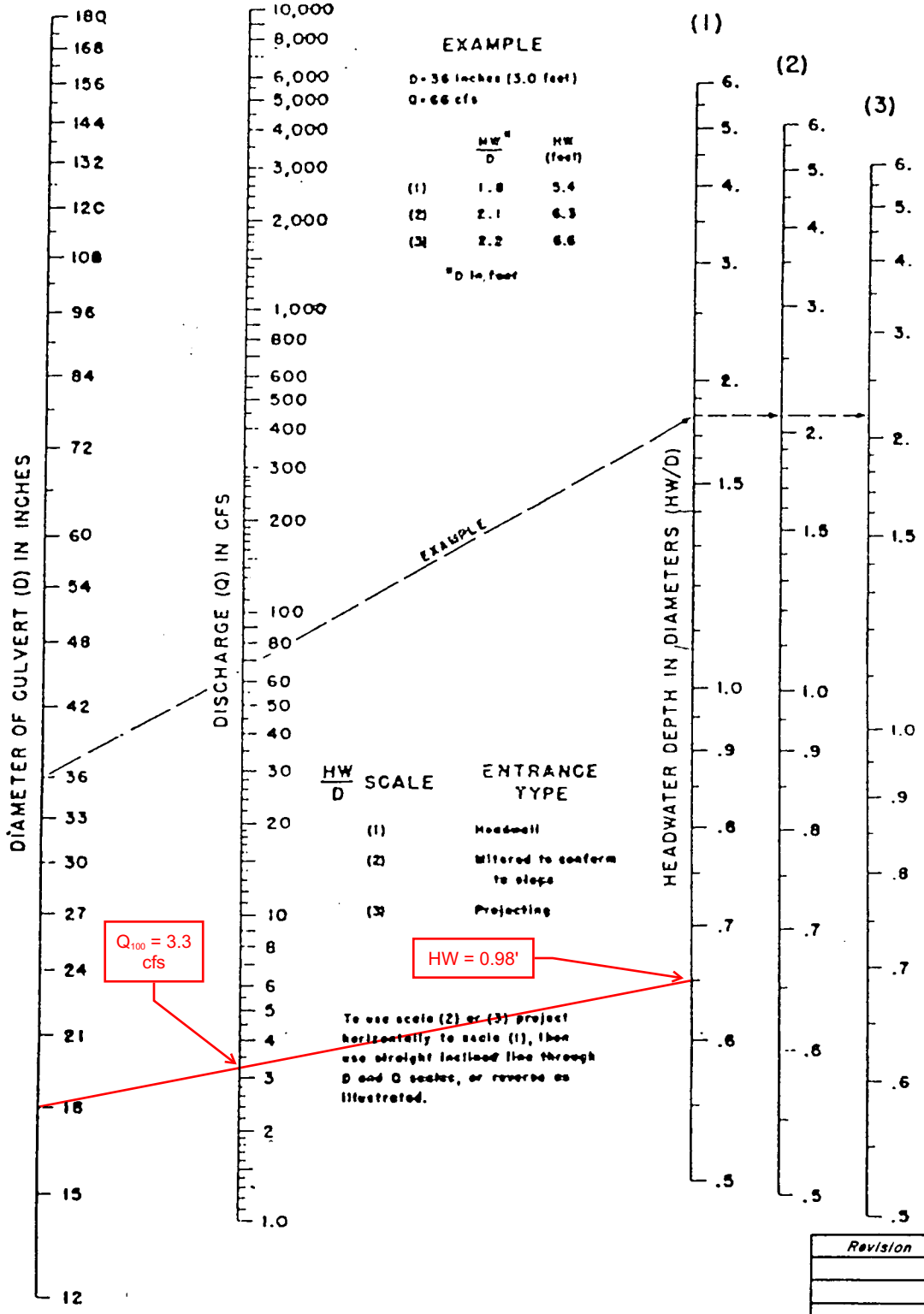
By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#1 TO LSDI#1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1129.271	3320.838	.399	3321.237	1.60	4.24	.28	3321.52	.00	.48	1.33	1.500	.000	.00	1 .0
.059	.2040					.0090	.00	.40	1.40	.19	.013	.00	.00	PIPE
1129.331	3320.850	.413	3321.263	1.60	4.04	.25	3321.52	.00	.48	1.34	1.500	.000	.00	1 .0
.045	.2040					.0079	.00	.41	1.31	.19	.013	.00	.00	PIPE
1129.375	3320.859	.428	3321.286	1.60	3.85	.23	3321.52	.00	.48	1.35	1.500	.000	.00	1 .0
.031	.2040					.0069	.00	.43	1.23	.19	.013	.00	.00	PIPE
1129.406	3320.865	.442	3321.308	1.60	3.67	.21	3321.52	.00	.48	1.37	1.500	.000	.00	1 .0
.018	.2040					.0061	.00	.44	1.15	.19	.013	.00	.00	PIPE
1129.424	3320.869	.458	3321.327	1.60	3.50	.19	3321.52	.00	.48	1.38	1.500	.000	.00	1 .0
.006	.2040					.0053	.00	.46	1.07	.19	.013	.00	.00	PIPE
WALL	ENTRANCE													
1129.430	3320.870	.476	3321.346	1.60	3.32	.17	3321.52	.00	.48	1.40	1.500	.000	.00	0 .0



NOMOGRAPH – INLET CONTROL CMP

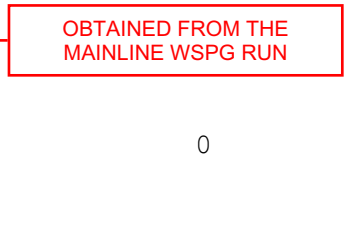


Revision	Date

WRC ENGINEERING

REFERENCE:
USDOT, FHWA, HDS No. 5, 1985

FIGURE 1007




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T1 Lark Hill (aka Summerlin Village 22 Parcel QR)                              0
T2 By ACTUS ENGINEERING
T3 SD Design (Ultimate Condition) - SDMH#2 TO LSDI#2
SO   1146.3603309.930  1                          3310.320
R    1146.3603309.930  1      .013                                .000  15.000 0
R    1147.3603309.940  1      .013                                .000  05.000 0
R    1171.2203314.700  1      .013                                .000  00.000 0
JX   1174.7203319.740  1  1   .013    2.600         3329.180      -45.0         .000
R    1178.2203324.780  1      .013                                .000  00.000 0
R    1182.3603324.820  1      .013                                .000  00.000 0
WE   1182.3603324.820  1
.200
SH   1182.3603324.820  1                          3325.800
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Q            03.300   .0
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Program Package Serial Number: 7156

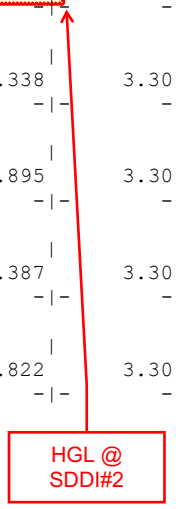
WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 2:53:36

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#2 TO LSDI#2

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1146.360	3309.930	.371	3310.301	5.90	17.37	4.68	3314.98	.00	.94	1.29	1.500	.000	.00	1 .0
1.000	.0100					.1809	.18	.37	5.97	.80	.013	.00	.00	PIPE
1147.360	3309.940	.366	3310.306	5.90	17.69	4.86	3315.17	.00	.94	1.29	1.500	.000	.00	1 .0
14.256	.1995					.1771	2.52	.37	6.13	.36	.013	.00	.00	PIPE
1161.616	3312.784	.375	3313.159	5.90	17.09	4.54	3317.69	.00	.94	1.30	1.500	.000	.00	1 .0
9.604	.1995					.1579	1.52	.37	5.84	.36	.013	.00	.00	PIPE
1171.220	3314.700	.388	3315.088	5.90	16.29	4.12	3319.21	.00	.94	1.31	1.500	.000	.00	1 .0
JUNCT STR	1.4400					.2397	.84	.39	5.47		.013	.00	.00	PIPE
1174.720	3319.740	.238	3319.978	3.30	18.31	5.21	3325.19	.00	.69	1.10	1.500	.000	.00	1 .0
.247	1.4400					.3194	.08	.24	7.96	.17	.013	.00	.00	PIPE
1174.967	3320.095	.242	3320.338	3.30	17.82	4.93	3325.27	.00	.69	1.10	1.500	.000	.00	1 .0
.382	1.4400					.2874	.11	.24	7.67	.17	.013	.00	.00	PIPE
1175.348	3320.645	.251	3320.895	3.30	16.99	4.48	3325.38	.00	.69	1.12	1.500	.000	.00	1 .0
.336	1.4400					.2510	.08	.25	7.18	.17	.013	.00	.00	PIPE
1175.684	3321.128	.259	3321.387	3.30	16.20	4.07	3325.46	.00	.69	1.13	1.500	.000	.00	1 .0
.296	1.4400					.2193	.06	.26	6.73	.17	.013	.00	.00	PIPE
1175.980	3321.554	.268	3321.822	3.30	15.44	3.70	3325.53	.00	.69	1.15	1.500	.000	.00	1 .0
.262	1.4400					.1915	.05	.27	6.31	.17	.013	.00	.00	PIPE



Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 2:53:36

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#2 TO LSDI#2

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1176.242	3321.932	.277	3322.209	3.30	14.72	3.37	3325.58	.00	.69	1.16	1.500	.000	.00	1 .0
.233	1.4400					.1673	.04	.28	5.91	.17	.013	.00	.00	PIPE
1176.475	3322.268	.286	3322.554	3.30	14.04	3.06	3325.61	.00	.69	1.18	1.500	.000	.00	1 .0
.208	1.4400					.1461	.03	.29	5.54	.17	.013	.00	.00	PIPE
1176.683	3322.567	.296	3322.863	3.30	13.39	2.78	3325.64	.00	.69	1.19	1.500	.000	.00	1 .0
.185	1.4400					.1277	.02	.30	5.19	.17	.013	.00	.00	PIPE
1176.868	3322.833	.306	3323.139	3.30	12.76	2.53	3325.67	.00	.69	1.21	1.500	.000	.00	1 .0
.165	1.4400					.1116	.02	.31	4.86	.17	.013	.00	.00	PIPE
1177.033	3323.072	.316	3323.388	3.30	12.17	2.30	3325.69	.00	.69	1.22	1.500	.000	.00	1 .0
.148	1.4400					.0975	.01	.32	4.55	.17	.013	.00	.00	PIPE
1177.181	3323.284	.327	3323.611	3.30	11.60	2.09	3325.70	.00	.69	1.24	1.500	.000	.00	1 .0
.132	1.4400					.0853	.01	.33	4.27	.17	.013	.00	.00	PIPE
1177.313	3323.474	.338	3323.812	3.30	11.06	1.90	3325.71	.00	.69	1.25	1.500	.000	.00	1 .0
.118	1.4400					.0745	.01	.34	4.00	.17	.013	.00	.00	PIPE
1177.431	3323.644	.350	3323.994	3.30	10.55	1.73	3325.72	.00	.69	1.27	1.500	.000	.00	1 .0
.106	1.4400					.0652	.01	.35	3.74	.17	.013	.00	.00	PIPE
1177.537	3323.796	.362	3324.158	3.30	10.06	1.57	3325.73	.00	.69	1.28	1.500	.000	.00	1 .0
.094	1.4400					.0570	.01	.36	3.50	.17	.013	.00	.00	PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 2:53:36

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#2 TO LSDI#2

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1177.631	3323.932	.374	3324.306	3.30	9.59	1.43	3325.73	.00	.69	1.30	1.500	.000	.00	1 .0
.084	1.4400					.0498	.00	.37	3.28	.17	.013	.00	.00	PIPE
1177.715	3324.053	.387	3324.440	3.30	9.14	1.30	3325.74	.00	.69	1.31	1.500	.000	.00	1 .0
.075	1.4400					.0436	.00	.39	3.07	.17	.013	.00	.00	PIPE
1177.790	3324.161	.400	3324.561	3.30	8.72	1.18	3325.74	.00	.69	1.33	1.500	.000	.00	1 .0
.067	1.4400					.0381	.00	.40	2.88	.17	.013	.00	.00	PIPE
1177.857	3324.257	.414	3324.671	3.30	8.31	1.07	3325.74	.00	.69	1.34	1.500	.000	.00	1 .0
.059	1.4400					.0334	.00	.41	2.69	.17	.013	.00	.00	PIPE
1177.916	3324.342	.428	3324.771	3.30	7.92	.98	3325.75	.00	.69	1.36	1.500	.000	.00	1 .0
.052	1.4400					.0292	.00	.43	2.52	.17	.013	.00	.00	PIPE
1177.968	3324.417	.443	3324.861	3.30	7.56	.89	3325.75	.00	.69	1.37	1.500	.000	.00	1 .0
.046	1.4400					.0256	.00	.44	2.36	.17	.013	.00	.00	PIPE
1178.014	3324.483	.459	3324.942	3.30	7.20	.81	3325.75	.00	.69	1.38	1.500	.000	.00	1 .0
.040	1.4400					.0224	.00	.46	2.21	.17	.013	.00	.00	PIPE
1178.054	3324.542	.475	3325.016	3.30	6.87	.73	3325.75	.00	.69	1.40	1.500	.000	.00	1 .0
.035	1.4400					.0196	.00	.47	2.06	.17	.013	.00	.00	PIPE
1178.089	3324.592	.492	3325.084	3.30	6.55	.67	3325.75	.00	.69	1.41	1.500	.000	.00	1 .0
.030	1.4400					.0172	.00	.49	1.93	.17	.013	.00	.00	PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 2:53:36

Lark Hill (aka Summerlin Village 22 Parcel QR)

By ACTUS ENGINEERING

SD Design (Ultimate Condition) - SDMH#2 TO LSDI#2

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1178.120	3324.636	.509	3325.145	3.30	6.24	.61	3325.75	.00	.69	1.42	1.500	.000	.00	1 .0
.026	1.4400					.0150	.00	.51	1.80	.17	.013	.00	.00	PIPE
1178.146	3324.673	.527	3325.200	3.30	5.95	.55	3325.75	.00	.69	1.43	1.500	.000	.00	1 .0
.022	1.4400					.0132	.00	.53	1.69	.17	.013	.00	.00	PIPE
1178.167	3324.705	.546	3325.250	3.30	5.68	.50	3325.75	.00	.69	1.44	1.500	.000	.00	1 .0
.018	1.4400					.0116	.00	.55	1.58	.17	.013	.00	.00	PIPE
1178.186	3324.731	.566	3325.296	3.30	5.41	.45	3325.75	.00	.69	1.45	1.500	.000	.00	1 .0
.015	1.4400					.0101	.00	.57	1.47	.17	.013	.00	.00	PIPE
1178.200	3324.752	.586	3325.338	3.30	5.16	.41	3325.75	.00	.69	1.46	1.500	.000	.00	1 .0
.011	1.4400					.0089	.00	.59	1.38	.17	.013	.00	.00	PIPE
1178.212	3324.768	.607	3325.375	3.30	4.92	.38	3325.75	.00	.69	1.47	1.500	.000	.00	1 .0
.008	1.4400					.0078	.00	.61	1.28	.17	.013	.00	.00	PIPE
1178.220	3324.780	.629	3325.409	3.30	4.69	.34	3325.75	.00	.69	1.48	1.500	.000	.00	1 .0
1.934	.0097					.0070	.01	.63	1.20	.58	.013	.00	.00	PIPE
1180.154	3324.799	.643	3325.441	3.30	4.56	.32	3325.76	.00	.69	1.48	1.500	.000	.00	1 .0
1.731	.0097					.0064	.01	.64	1.15	.58	.013	.00	.00	PIPE
1181.886	3324.815	.666	3325.482	3.30	4.35	.29	3325.78	.00	.69	1.49	1.500	.000	.00	1 .0
.474	.0097					.0056	.00	.67	1.08	.58	.013	.00	.00	PIPE

Program Package Serial Number: 7156

WATER SURFACE PROFILE LISTING Date: 8-11-2022 Time: 2:53:36

Lark Hill (aka Summerlin Village 22 Parcel QR)
By ACTUS ENGINEERING
SD Design (Ultimate Condition) - SDMH#2 TO LSDI#2

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
WALL ENTRANCE														
1182.360	3324.820	.693	3325.513	3.30	4.13	.27	3325.78	.00	.69	1.50	1.500	.000	.00	0 .0

HGL @ LSD#2

Rating Table for 5' Swale - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.00	%
Discharge	1.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.83
0+02.50	0.00
0+05.00	0.83

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.83)	(0+05.00, 0.83)	0.022

Discharge (ft³/s)	Channel Slope (%)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.20	1.00	0.21	1.46	0.14	1.35	1.28
0.20	1.20	0.21	1.57	0.13	1.30	1.24
0.20	1.40	0.20	1.66	0.12	1.27	1.20
0.20	1.60	0.20	1.75	0.11	1.24	1.17
0.20	1.80	0.19	1.83	0.11	1.21	1.15
0.20	2.00	0.19	1.90	0.11	1.18	1.12
0.20	2.20	0.18	1.97	0.10	1.17	1.11
0.20	2.40	0.18	2.03	0.10	1.15	1.09
0.20	2.60	0.18	2.10	0.10	1.13	1.07
0.20	2.80	0.18	2.16	0.09	1.11	1.06
0.20	3.00	0.17	2.21	0.09	1.10	1.04

Rating Table for 5' Swale - 100 yr

Input Data

Discharge (ft³/s)	Channel Slope (%)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.20	3.20	0.17	2.26	0.09	1.09	1.03
0.20	3.40	0.17	2.33	0.09	1.07	1.02
0.20	3.60	0.17	2.37	0.08	1.06	1.01
0.20	3.80	0.17	2.42	0.08	1.05	1.00
0.20	4.00	0.16	2.47	0.08	1.04	0.99
0.40	1.00	0.28	1.75	0.23	1.75	1.66
0.40	1.20	0.27	1.87	0.21	1.69	1.60
0.40	1.40	0.26	1.97	0.20	1.64	1.56
0.40	1.60	0.25	2.08	0.19	1.60	1.52
0.40	1.80	0.25	2.18	0.18	1.57	1.49
0.40	2.00	0.24	2.26	0.18	1.54	1.46
0.40	2.20	0.24	2.34	0.17	1.51	1.43
0.40	2.40	0.23	2.42	0.17	1.49	1.41
0.40	2.60	0.23	2.50	0.16	1.46	1.39
0.40	2.80	0.23	2.57	0.16	1.44	1.37
0.40	3.00	0.23	2.63	0.15	1.43	1.35
0.40	3.20	0.22	2.69	0.15	1.41	1.34
0.40	3.40	0.22	2.76	0.15	1.39	1.32
0.40	3.60	0.22	2.82	0.14	1.38	1.31
0.40	3.80	0.22	2.87	0.14	1.36	1.29
0.40	4.00	0.21	2.93	0.14	1.35	1.28
0.60	1.00	0.32	1.93	0.31	2.04	1.94
0.60	1.20	0.31	2.07	0.29	1.97	1.87
0.60	1.40	0.30	2.19	0.27	1.91	1.82
0.60	1.60	0.29	2.30	0.26	1.87	1.77
0.60	1.80	0.29	2.41	0.25	1.82	1.73
0.60	2.00	0.28	2.50	0.24	1.79	1.70
0.60	2.20	0.28	2.59	0.23	1.76	1.67
0.60	2.40	0.27	2.68	0.22	1.73	1.64
0.60	2.60	0.27	2.76	0.22	1.70	1.62
0.60	2.80	0.27	2.83	0.21	1.68	1.60
0.60	3.00	0.26	2.91	0.21	1.66	1.57
0.60	3.20	0.26	2.98	0.20	1.64	1.56
0.60	3.40	0.26	3.05	0.20	1.62	1.54
0.60	3.60	0.25	3.12	0.19	1.60	1.52
0.60	3.80	0.25	3.18	0.19	1.59	1.51
0.60	4.00	0.25	3.25	0.18	1.57	1.49

Rating Table for 5' Swale - 100 yr

Input Data

Discharge (ft³/s)	Channel Slope (%)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.80	1.00	0.36	2.07	0.39	2.27	2.15
0.80	1.20	0.35	2.22	0.36	2.19	2.08
0.80	1.40	0.34	2.35	0.34	2.13	2.02
0.80	1.60	0.33	2.48	0.32	2.08	1.97
0.80	1.80	0.32	2.58	0.31	2.03	1.93
0.80	2.00	0.31	2.69	0.30	1.99	1.89
0.80	2.20	0.31	2.79	0.29	1.96	1.86
0.80	2.40	0.30	2.87	0.28	1.93	1.83
0.80	2.60	0.30	2.96	0.27	1.90	1.80
0.80	2.80	0.30	3.05	0.26	1.87	1.78
0.80	3.00	0.29	3.13	0.26	1.85	1.75
0.80	3.20	0.29	3.21	0.25	1.82	1.73
0.80	3.40	0.29	3.27	0.24	1.81	1.71
0.80	3.60	0.28	3.35	0.24	1.79	1.70
0.80	3.80	0.28	3.41	0.23	1.77	1.68
0.80	4.00	0.28	3.49	0.23	1.75	1.66
1.00	1.00	0.39	2.19	0.46	2.47	2.34
1.00	1.20	0.38	2.35	0.43	2.39	2.26
1.00	1.40	0.37	2.49	0.40	2.32	2.20
1.00	1.60	0.36	2.62	0.38	2.26	2.14
1.00	1.80	0.35	2.74	0.37	2.21	2.10
1.00	2.00	0.34	2.84	0.35	2.17	2.06
1.00	2.20	0.34	2.95	0.34	2.13	2.02
1.00	2.40	0.33	3.05	0.33	2.09	1.99
1.00	2.60	0.33	3.13	0.32	2.07	1.96
1.00	2.80	0.32	3.22	0.31	2.04	1.93
1.00	3.00	0.32	3.31	0.30	2.01	1.91
1.00	3.20	0.31	3.39	0.29	1.98	1.88
1.00	3.40	0.31	3.47	0.29	1.96	1.86
1.00	3.60	0.31	3.55	0.28	1.94	1.84
1.00	3.80	0.30	3.61	0.28	1.92	1.82
1.00	4.00	0.30	3.68	0.27	1.90	1.81
1.20	1.00	0.42	2.29	0.52	2.64	2.51
1.20	1.20	0.40	2.46	0.49	2.55	2.42
1.20	1.40	0.39	2.60	0.46	2.48	2.35
1.20	1.60	0.38	2.74	0.44	2.42	2.30
1.20	1.80	0.37	2.86	0.42	2.37	2.25

Rating Table for 5' Swale - 100 yr

Input Data

Discharge (ft³/s)	Channel Slope (%)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
1.20	2.00	0.37	2.98	0.40	2.32	2.20
1.20	2.20	0.36	3.09	0.39	2.28	2.16
1.20	2.40	0.35	3.18	0.38	2.24	2.13
1.20	2.60	0.35	3.29	0.37	2.21	2.10
1.20	2.80	0.34	3.37	0.36	2.18	2.07
1.20	3.00	0.34	3.47	0.35	2.15	2.04
1.20	3.20	0.34	3.55	0.34	2.12	2.02
1.20	3.40	0.33	3.63	0.33	2.10	1.99
1.20	3.60	0.33	3.71	0.32	2.08	1.97
1.20	3.80	0.33	3.78	0.32	2.06	1.95
1.20	4.00	0.32	3.85	0.31	2.04	1.94
1.40	1.00	0.44	2.38	0.59	2.80	2.66
1.40	1.20	0.43	2.55	0.55	2.71	2.57
1.40	1.40	0.41	2.71	0.52	2.63	2.49
1.40	1.60	0.40	2.85	0.49	2.56	2.43
1.40	1.80	0.40	2.97	0.47	2.51	2.38
1.40	2.00	0.39	3.10	0.45	2.46	2.33
1.40	2.20	0.38	3.21	0.44	2.41	2.29
1.40	2.40	0.37	3.31	0.42	2.38	2.25
1.40	2.60	0.37	3.41	0.41	2.34	2.22
1.40	2.80	0.36	3.51	0.40	2.31	2.19
1.40	3.00	0.36	3.60	0.39	2.28	2.16
1.40	3.20	0.36	3.69	0.38	2.25	2.14
1.40	3.40	0.35	3.77	0.37	2.23	2.11
1.40	3.60	0.35	3.86	0.36	2.20	2.09
1.40	3.80	0.34	3.93	0.36	2.18	2.07
1.40	4.00	0.34	4.02	0.35	2.16	2.05
1.60	1.00	0.46	2.46	0.65	2.94	2.79
1.60	1.20	0.45	2.64	0.61	2.84	2.70
1.60	1.40	0.44	2.80	0.57	2.76	2.62
1.60	1.60	0.43	2.94	0.54	2.70	2.56
1.60	1.80	0.42	3.07	0.52	2.64	2.50
1.60	2.00	0.41	3.20	0.50	2.58	2.45
1.60	2.20	0.40	3.32	0.48	2.54	2.41
1.60	2.40	0.39	3.42	0.47	2.50	2.37
1.60	2.60	0.39	3.53	0.45	2.46	2.33
1.60	2.80	0.38	3.63	0.44	2.43	2.30

Rating Table for 5' Swale - 100 yr

Input Data

Discharge (ft³/s)	Channel Slope (%)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
1.60	3.00	0.38	3.72	0.43	2.40	2.27
1.60	3.20	0.37	3.81	0.42	2.37	2.25
1.60	3.40	0.37	3.90	0.41	2.34	2.22
1.60	3.60	0.37	3.99	0.40	2.31	2.20
1.60	3.80	0.36	4.07	0.39	2.29	2.17
1.60	4.00	0.36	4.15	0.39	2.27	2.15
1.80	1.00	0.49	2.54	0.71	3.08	2.92
1.80	1.20	0.47	2.72	0.66	2.97	2.82
1.80	1.40	0.46	2.88	0.63	2.89	2.74
1.80	1.60	0.44	3.02	0.60	2.82	2.67
1.80	1.80	0.43	3.16	0.57	2.76	2.62
1.80	2.00	0.43	3.29	0.55	2.70	2.56
1.80	2.20	0.42	3.41	0.53	2.65	2.52
1.80	2.40	0.41	3.53	0.51	2.61	2.48
1.80	2.60	0.41	3.64	0.49	2.57	2.44
1.80	2.80	0.40	3.74	0.48	2.54	2.41
1.80	3.00	0.40	3.83	0.47	2.50	2.38
1.80	3.20	0.39	3.93	0.46	2.47	2.35
1.80	3.40	0.39	4.02	0.45	2.44	2.32
1.80	3.60	0.38	4.11	0.44	2.42	2.30
1.80	3.80	0.38	4.19	0.43	2.40	2.27
1.80	4.00	0.37	4.27	0.42	2.37	2.25
2.00	1.00	0.51	2.61	0.77	3.20	3.04
2.00	1.20	0.49	2.79	0.72	3.09	2.93
2.00	1.40	0.47	2.96	0.68	3.01	2.85
2.00	1.60	0.46	3.11	0.64	2.93	2.78
2.00	1.80	0.45	3.25	0.62	2.87	2.72
2.00	2.00	0.44	3.38	0.59	2.81	2.67
2.00	2.20	0.44	3.50	0.57	2.76	2.62
2.00	2.40	0.43	3.62	0.55	2.72	2.58
2.00	2.60	0.42	3.73	0.54	2.68	2.54
2.00	2.80	0.42	3.83	0.52	2.64	2.50
2.00	3.00	0.41	3.94	0.51	2.60	2.47
2.00	3.20	0.41	4.04	0.50	2.57	2.44
2.00	3.40	0.40	4.13	0.48	2.54	2.41
2.00	3.60	0.40	4.21	0.47	2.52	2.39
2.00	3.80	0.39	4.30	0.46	2.49	2.36

Rating Table for 5' Swale - 100 yr

Input Data

Discharge (ft³/s)	Channel Slope (%)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
2.00	4.00	0.39	4.39	0.46	2.47	2.34
2.20	1.00	0.52	2.67	0.82	3.32	3.15
2.20	1.20	0.51	2.86	0.77	3.21	3.04
2.20	1.40	0.49	3.03	0.73	3.12	2.96
2.20	1.60	0.48	3.19	0.69	3.04	2.88
2.20	1.80	0.47	3.33	0.66	2.97	2.82
2.20	2.00	0.46	3.46	0.64	2.91	2.77
2.20	2.20	0.45	3.59	0.61	2.86	2.71
2.20	2.40	0.44	3.70	0.59	2.82	2.67
2.20	2.60	0.44	3.82	0.58	2.77	2.63
2.20	2.80	0.43	3.93	0.56	2.74	2.60
2.20	3.00	0.43	4.03	0.55	2.70	2.56
2.20	3.20	0.42	4.13	0.53	2.67	2.53
2.20	3.40	0.42	4.23	0.52	2.64	2.50
2.20	3.60	0.41	4.32	0.51	2.61	2.48
2.20	3.80	0.41	4.41	0.50	2.58	2.45
2.20	4.00	0.40	4.49	0.49	2.56	2.43
2.40	1.00	0.54	2.73	0.88	3.43	3.25
2.40	1.20	0.52	2.92	0.82	3.31	3.14
2.40	1.40	0.51	3.09	0.78	3.22	3.05
2.40	1.60	0.50	3.25	0.74	3.14	2.98
2.40	1.80	0.48	3.40	0.71	3.07	2.91
2.40	2.00	0.48	3.54	0.68	3.01	2.86
2.40	2.20	0.47	3.67	0.65	2.96	2.81
2.40	2.40	0.46	3.79	0.63	2.91	2.76
2.40	2.60	0.45	3.91	0.61	2.86	2.72
2.40	2.80	0.45	4.02	0.60	2.82	2.68
2.40	3.00	0.44	4.12	0.58	2.79	2.65
2.40	3.20	0.43	4.22	0.57	2.76	2.62
2.40	3.40	0.43	4.32	0.56	2.72	2.59
2.40	3.60	0.43	4.41	0.54	2.70	2.56
2.40	3.80	0.42	4.51	0.53	2.67	2.53
2.40	4.00	0.42	4.59	0.52	2.64	2.51
2.60	1.00	0.56	2.78	0.93	3.53	3.35
2.60	1.20	0.54	2.98	0.87	3.41	3.24
2.60	1.40	0.52	3.15	0.82	3.32	3.15
2.60	1.60	0.51	3.32	0.78	3.24	3.07

Rating Table for 5' Swale - 100 yr

Input Data

Discharge (ft³/s)	Channel Slope (%)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
2.60	1.80	0.50	3.47	0.75	3.16	3.00
2.60	2.00	0.49	3.61	0.72	3.10	2.94
2.60	2.20	0.48	3.74	0.69	3.05	2.89
2.60	2.40	0.47	3.86	0.67	3.00	2.84
2.60	2.60	0.47	3.98	0.65	2.95	2.80
2.60	2.80	0.46	4.09	0.64	2.91	2.76
2.60	3.00	0.45	4.21	0.62	2.87	2.73
2.60	3.20	0.45	4.31	0.60	2.84	2.69
2.60	3.40	0.44	4.40	0.59	2.81	2.67
2.60	3.60	0.44	4.50	0.58	2.78	2.64
2.60	3.80	0.43	4.59	0.57	2.75	2.61
2.60	4.00	0.43	4.68	0.56	2.72	2.58
2.80	1.00	0.57	2.83	0.99	3.63	3.45
2.80	1.20	0.55	3.04	0.92	3.51	3.33
2.80	1.40	0.54	3.22	0.87	3.41	3.24
2.80	1.60	0.53	3.38	0.83	3.33	3.16
2.80	1.80	0.51	3.54	0.79	3.25	3.09
2.80	2.00	0.50	3.68	0.76	3.19	3.03
2.80	2.20	0.49	3.81	0.74	3.13	2.97
2.80	2.40	0.49	3.94	0.71	3.08	2.92
2.80	2.60	0.48	4.06	0.69	3.03	2.88
2.80	2.80	0.47	4.17	0.67	2.99	2.84
2.80	3.00	0.47	4.28	0.65	2.96	2.80
2.80	3.20	0.46	4.38	0.64	2.92	2.77
2.80	3.40	0.46	4.48	0.62	2.89	2.74
2.80	3.60	0.45	4.58	0.61	2.86	2.71
2.80	3.80	0.45	4.68	0.60	2.83	2.68
2.80	4.00	0.44	4.77	0.59	2.80	2.66
3.00	1.00	0.59	2.89	1.04	3.73	3.54
3.00	1.20	0.57	3.09	0.97	3.60	3.42
3.00	1.40	0.55	3.27	0.92	3.50	3.32
3.00	1.60	0.54	3.44	0.87	3.41	3.24
3.00	1.80	0.53	3.59	0.83	3.34	3.17
3.00	2.00	0.52	3.74	0.80	3.27	3.11
3.00	2.20	0.51	3.87	0.77	3.22	3.05
3.00	2.40	0.50	4.00	0.75	3.16	3.00
3.00	2.60	0.49	4.12	0.73	3.12	2.96

Rating Table for 5' Swale - 100 yr

Input Data

Discharge (ft³/s)	Channel Slope (%)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
3.00	2.80	0.48	4.25	0.71	3.07	2.92
3.00	3.00	0.48	4.36	0.69	3.03	2.88
3.00	3.20	0.47	4.46	0.67	3.00	2.84
3.00	3.40	0.47	4.56	0.66	2.96	2.81
3.00	3.60	0.46	4.66	0.64	2.93	2.78
3.00	3.80	0.46	4.76	0.63	2.90	2.75
3.00	4.00	0.45	4.85	0.62	2.87	2.73
3.20	1.00	0.60	2.93	1.09	3.82	3.62
3.20	1.20	0.58	3.14	1.02	3.69	3.50
3.20	1.40	0.57	3.32	0.96	3.59	3.40
3.20	1.60	0.55	3.50	0.91	3.50	3.32
3.20	1.80	0.54	3.65	0.88	3.42	3.25
3.20	2.00	0.53	3.80	0.84	3.35	3.18
3.20	2.20	0.52	3.94	0.81	3.29	3.12
3.20	2.40	0.51	4.07	0.79	3.24	3.07
3.20	2.60	0.50	4.19	0.76	3.19	3.03
3.20	2.80	0.50	4.31	0.74	3.15	2.99
3.20	3.00	0.49	4.42	0.72	3.11	2.95
3.20	3.20	0.48	4.54	0.71	3.07	2.91
3.20	3.40	0.48	4.64	0.69	3.03	2.88
3.20	3.60	0.47	4.74	0.68	3.00	2.85
3.20	3.80	0.47	4.84	0.66	2.97	2.82
3.20	4.00	0.46	4.93	0.65	2.94	2.79
3.40	1.00	0.62	2.97	1.14	3.91	3.71
3.40	1.20	0.60	3.19	1.07	3.78	3.58
3.40	1.40	0.58	3.38	1.01	3.67	3.48
3.40	1.60	0.56	3.55	0.96	3.58	3.39
3.40	1.80	0.55	3.71	0.92	3.50	3.32
3.40	2.00	0.54	3.86	0.88	3.43	3.26
3.40	2.20	0.53	4.00	0.85	3.37	3.20
3.40	2.40	0.52	4.13	0.82	3.32	3.15
3.40	2.60	0.52	4.26	0.80	3.26	3.10
3.40	2.80	0.51	4.38	0.78	3.22	3.06
3.40	3.00	0.50	4.49	0.76	3.18	3.02
3.40	3.20	0.50	4.60	0.74	3.14	2.98
3.40	3.40	0.49	4.71	0.72	3.11	2.95
3.40	3.60	0.48	4.81	0.71	3.07	2.91

Rating Table for 5' Swale - 100 yr

Input Data

Discharge (ft³/s)	Channel Slope (%)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
3.40	3.80	0.48	4.91	0.69	3.04	2.88
3.40	4.00	0.48	5.00	0.68	3.01	2.86
3.60	1.00	0.63	3.02	1.19	3.99	3.79
3.60	1.20	0.61	3.23	1.11	3.86	3.66
3.60	1.40	0.59	3.42	1.05	3.75	3.56
3.60	1.60	0.58	3.60	1.00	3.66	3.47
3.60	1.80	0.56	3.76	0.96	3.57	3.39
3.60	2.00	0.55	3.92	0.92	3.50	3.32
3.60	2.20	0.54	4.05	0.89	3.44	3.27
3.60	2.40	0.53	4.19	0.86	3.39	3.21
3.60	2.60	0.53	4.32	0.83	3.34	3.17
3.60	2.80	0.52	4.44	0.81	3.29	3.12
3.60	3.00	0.51	4.56	0.79	3.25	3.08
3.60	3.20	0.51	4.67	0.77	3.21	3.05
3.60	3.40	0.50	4.78	0.75	3.17	3.01
3.60	3.60	0.50	4.88	0.74	3.14	2.98
3.60	3.80	0.49	4.98	0.72	3.11	2.95
3.60	4.00	0.49	5.08	0.71	3.08	2.92
3.80	1.00	0.64	3.06	1.24	4.07	3.86
3.80	1.20	0.62	3.28	1.16	3.93	3.73
3.80	1.40	0.60	3.47	1.10	3.82	3.63
3.80	1.60	0.59	3.65	1.04	3.73	3.54
3.80	1.80	0.58	3.81	1.00	3.65	3.46
3.80	2.00	0.56	3.97	0.96	3.58	3.39
3.80	2.20	0.55	4.12	0.92	3.51	3.33
3.80	2.40	0.55	4.25	0.89	3.45	3.28
3.80	2.60	0.54	4.38	0.87	3.41	3.23
3.80	2.80	0.53	4.50	0.84	3.36	3.19
3.80	3.00	0.52	4.62	0.82	3.32	3.15
3.80	3.20	0.52	4.74	0.80	3.27	3.11
3.80	3.40	0.51	4.84	0.79	3.24	3.07
3.80	3.60	0.51	4.95	0.77	3.20	3.04
3.80	3.80	0.50	5.05	0.75	3.17	3.01
3.80	4.00	0.50	5.14	0.74	3.14	2.98
4.00	1.00	0.66	3.10	1.29	4.15	3.94
4.00	1.20	0.63	3.32	1.21	4.01	3.81
4.00	1.40	0.62	3.52	1.14	3.90	3.70

Rating Table for 5' Swale - 100 yr

Input Data

Discharge (ft³/s)	Channel Slope (%)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
4.00	1.60	0.60	3.70	1.08	3.80	3.61
4.00	1.80	0.59	3.87	1.03	3.72	3.53
4.00	2.00	0.58	4.02	1.00	3.65	3.46
4.00	2.20	0.57	4.16	0.96	3.58	3.40
4.00	2.40	0.56	4.31	0.93	3.52	3.34
4.00	2.60	0.55	4.44	0.90	3.47	3.29
4.00	2.80	0.54	4.56	0.88	3.42	3.25
4.00	3.00	0.53	4.68	0.85	3.38	3.21
4.00	3.20	0.53	4.79	0.83	3.34	3.17
4.00	3.40	0.52	4.91	0.81	3.30	3.13
4.00	3.60	0.52	5.01	0.80	3.26	3.10
4.00	3.80	0.51	5.11	0.78	3.23	3.07
4.00	4.00	0.51	5.21	0.77	3.20	3.04
4.20	1.00	0.67	3.14	1.34	4.23	4.01
4.20	1.20	0.64	3.36	1.25	4.08	3.88
4.20	1.40	0.63	3.56	1.18	3.97	3.77
4.20	1.60	0.61	3.74	1.12	3.87	3.67
4.20	1.80	0.60	3.91	1.07	3.79	3.59
4.20	2.00	0.59	4.07	1.03	3.71	3.52
4.20	2.20	0.58	4.21	1.00	3.65	3.46
4.20	2.40	0.57	4.36	0.96	3.59	3.41
4.20	2.60	0.56	4.49	0.94	3.54	3.36
4.20	2.80	0.55	4.62	0.91	3.48	3.31
4.20	3.00	0.54	4.73	0.89	3.44	3.27
4.20	3.20	0.54	4.85	0.87	3.40	3.23
4.20	3.40	0.53	4.96	0.85	3.36	3.19
4.20	3.60	0.53	5.07	0.83	3.33	3.16
4.20	3.80	0.52	5.18	0.81	3.29	3.12
4.20	4.00	0.51	5.28	0.80	3.26	3.09
4.40	1.00	0.68	3.18	1.39	4.30	4.08
4.40	1.20	0.66	3.40	1.29	4.16	3.94
4.40	1.40	0.64	3.60	1.22	4.04	3.83
4.40	1.60	0.62	3.79	1.16	3.94	3.74
4.40	1.80	0.61	3.95	1.11	3.85	3.66
4.40	2.00	0.60	4.11	1.07	3.78	3.59
4.40	2.20	0.59	4.27	1.03	3.71	3.52
4.40	2.40	0.58	4.40	1.00	3.65	3.47

Rating Table for 5' Swale - 100 yr

Input Data

Discharge (ft³/s)	Channel Slope (%)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
4.40	2.60	0.57	4.54	0.97	3.60	3.41
4.40	2.80	0.56	4.67	0.94	3.55	3.37
4.40	3.00	0.55	4.79	0.92	3.50	3.32
4.40	3.20	0.55	4.91	0.90	3.46	3.28
4.40	3.40	0.54	5.02	0.88	3.42	3.25
4.40	3.60	0.53	5.13	0.86	3.38	3.21
4.40	3.80	0.53	5.23	0.84	3.35	3.18
4.40	4.00	0.52	5.33	0.82	3.32	3.15
4.60	1.00	0.69	3.21	1.43	4.37	4.15
4.60	1.20	0.67	3.44	1.34	4.23	4.01
4.60	1.40	0.65	3.64	1.26	4.11	3.90
4.60	1.60	0.63	3.83	1.20	4.01	3.80
4.60	1.80	0.62	4.00	1.15	3.92	3.72
4.60	2.00	0.61	4.16	1.11	3.84	3.65
4.60	2.20	0.60	4.31	1.07	3.77	3.58
4.60	2.40	0.59	4.46	1.03	3.71	3.52
4.60	2.60	0.58	4.60	1.00	3.66	3.47
4.60	2.80	0.57	4.72	0.97	3.61	3.42
4.60	3.00	0.56	4.84	0.95	3.56	3.38
4.60	3.20	0.55	4.97	0.93	3.52	3.34
4.60	3.40	0.55	5.08	0.91	3.48	3.30
4.60	3.60	0.54	5.18	0.89	3.44	3.27
4.60	3.80	0.54	5.29	0.87	3.41	3.23
4.60	4.00	0.53	5.40	0.85	3.37	3.20
4.80	1.00	0.70	3.24	1.48	4.45	4.22
4.80	1.20	0.68	3.48	1.38	4.29	4.08
4.80	1.40	0.66	3.68	1.31	4.18	3.96
4.80	1.60	0.64	3.87	1.24	4.07	3.86
4.80	1.80	0.63	4.04	1.19	3.98	3.78
4.80	2.00	0.62	4.21	1.14	3.90	3.70
4.80	2.20	0.61	4.36	1.10	3.84	3.64
4.80	2.40	0.60	4.50	1.07	3.77	3.58
4.80	2.60	0.59	4.64	1.03	3.72	3.53
4.80	2.80	0.58	4.78	1.01	3.66	3.48
4.80	3.00	0.57	4.90	0.98	3.62	3.43
4.80	3.20	0.56	5.02	0.96	3.57	3.39
4.80	3.40	0.56	5.13	0.94	3.54	3.35

Rating Table for 5' Swale - 100 yr

Input Data

Discharge (ft³/s)	Channel Slope (%)	Water Surface Elevation (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
4.80	3.60	0.55	5.25	0.91	3.50	3.32
4.80	3.80	0.55	5.36	0.90	3.46	3.28
4.80	4.00	0.54	5.45	0.88	3.43	3.25
5.00	1.00	0.71	3.28	1.53	4.51	4.28
5.00	1.20	0.69	3.51	1.42	4.36	4.14
5.00	1.40	0.67	3.72	1.35	4.24	4.02
5.00	1.60	0.65	3.91	1.28	4.13	3.92
5.00	1.80	0.64	4.08	1.22	4.04	3.84
5.00	2.00	0.63	4.25	1.18	3.97	3.76
5.00	2.20	0.61	4.41	1.13	3.89	3.69
5.00	2.40	0.60	4.55	1.10	3.83	3.64
5.00	2.60	0.60	4.69	1.07	3.77	3.58
5.00	2.80	0.59	4.82	1.04	3.72	3.53
5.00	3.00	0.58	4.95	1.01	3.67	3.48
5.00	3.20	0.57	5.07	0.99	3.63	3.44
5.00	3.40	0.57	5.18	0.96	3.59	3.41
5.00	3.60	0.56	5.30	0.94	3.55	3.37
5.00	3.80	0.55	5.41	0.92	3.51	3.33
5.00	4.00	0.55	5.51	0.91	3.48	3.30

Cross Section for 5' Swale - 100 yr

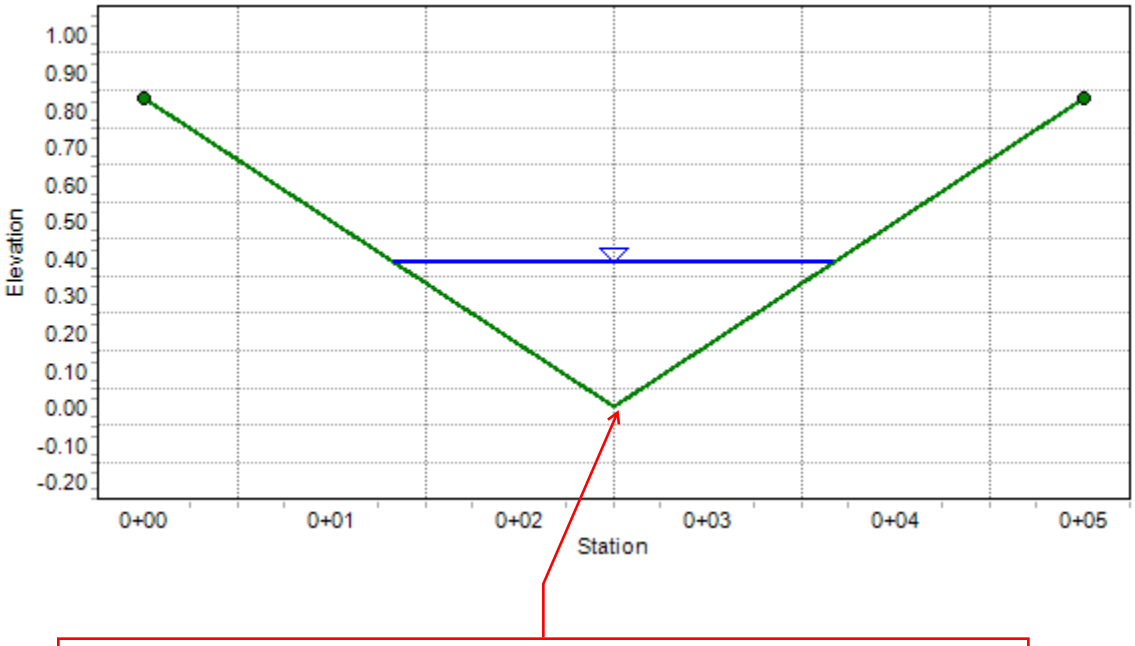
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.00	%
Normal Depth	0.39	ft
Discharge	1.00	ft³/s

Cross Section Image



TYPICAL CROSS-SECTION FOR THE 5-FOOT SWALE AT THE REAR SIDE OF THE LOT.

HYDRAULIC CALCULATIONS

HYDRAULIC CALCULATIONS

Finish Floor Analysis

Lark Hill

FINISH FLOOR ANALYSIS (OVERALL) - GARAGE FINISH FLOOR CHECK - CITY OF LAS VEGAS JURISDICTION

INPUT INFORMATION										NOTES
Lot Number	Hydraulic Section Utilized	T/C[1] (ft)	Mod Roll, Roll, or L Curb? Type	F/L[2] (ft)	(Conservatively Pro-rated) Q_{100}	D_{100} Obtained from the Rating Table (ft)	GFF Needed (ft)	GFF Desgined (ft)	Flowline Check (ft)	See References on Last Sheet (ft)
1	d9	3336.91	Mod Roll	3336.53	1.05 cfs	0.25	3337.0	3337.03	OK	
2	d9	3336.47	Mod Roll	3336.09	1.4 cfs	0.27	3336.6	3336.70	OK	
3	d9	3335.25	Mod Roll	3334.87	1.4 cfs	0.27	3335.4	3336.20	OK	t/c taken @ center of the lot
4	d9	3335.20	Mod Roll	3334.82	1.75 cfs	0.28	3335.4	3335.53	OK	t/c taken @ center of the lot
5	d9	3334.99	Mod Roll	3334.61	1.75 cfs	0.28	3335.2	3335.20	OK	
6	d9	3334.25	Mod Roll	3333.87	1.75 cfs	0.28	3334.4	3334.70	OK	t/c taken @ center of the lot
7	d9	3333.58	Mod Roll	3333.20	2.1 cfs	0.3	3333.8	3333.93	OK	t/c taken @ center of the lot
8	d9	3333.36	Mod Roll	3332.98	2.1 cfs	0.3	3333.6	3333.60	OK	
9	d9	3332.70	Mod Roll	3332.32	2.1 cfs	0.3	3332.9	3333.10	OK	t/c taken @ center of the lot
10	d9	3332.10	Mod Roll	3331.72	2.5 cfs	0.31	3332.3	3332.43	OK	t/c taken @ center of the lot
11	d9	3331.67	Mod Roll	3331.29	2.5 cfs	0.31	3331.9	3332.10	OK	t/c taken @ center of the lot
12	d9	3331.20	Mod Roll	3330.82	2.5 cfs	0.31	3331.4	3331.60	OK	t/c taken @ center of the lot
13	d14	3327.97	Mod Roll	3327.59	0.35 cfs	0.15	3327.9	3328.33	OK	t/c taken @ center of the lot
14	d14	3327.54	Mod Roll	3327.16	0.35 cfs	0.15	3327.5	3328.00	OK	t/c taken @ center of the lot
15	d14	3327.03	Mod Roll	3326.65	0.35 cfs	0.15	3326.9	3327.50	OK	t/c taken @ center of the lot
16	d14	3326.50	Mod Roll	3326.12	0.7 cfs	0.22	3326.6	3326.83	OK	t/c taken @ center of the lot
17	d14	3326.08	Mod Roll	3325.70	0.7 cfs	0.22	3326.1	3326.50	OK	t/c taken @ center of the lot
18	d14	3325.49	Mod Roll	3325.11	0.7 cfs	0.22	3325.5	3326.00	OK	t/c taken @ center of the lot
19	d14	3324.98	Mod Roll	3324.60	1.05 cfs	0.25	3325.1	3325.40	OK	t/c taken @ center of the lot
20	d14	3324.59	Mod Roll	3324.21	1.05 cfs	0.25	3324.7	3324.90	OK	t/c taken @ center of the lot
21	d14	3323.66	Mod Roll	3323.28	1.05 cfs	0.25	3323.8	33240.90	OK	t/c taken @ center of the lot
22	d14	3323.87	Mod Roll	3323.49	1.4 cfs	0.27	3324.0	3324.20	OK	t/c taken @ center of the lot
23	d14	3323.59	Mod Roll	3323.21	1.4 cfs	0.27	3323.8	3323.95	OK	t/c taken @ center of the lot
24	d14	3323.31	Mod Roll	3322.93	1.4 cfs	0.27	3323.5	3323.70	OK	t/c taken @ center of the lot
25	d15	3323.08	Mod Roll	3322.70	1.4 cfs	0.22	3323.1	3323.40	OK	t/c taken @ center of the lot
26	d15	3323.52	Mod Roll	3323.14	1.4 cfs	0.22	3323.6	3323.90	OK	t/c taken @ center of the lot
27	d15	3323.95	Mod Roll	3323.57	1.4 cfs	0.22	3324.0	3324.23	OK	t/c taken @ center of the lot
28	d15	3324.50	Mod Roll	3324.12	1.05 cfs	0.25	3324.6	3325.00	OK	t/c taken @ center of the lot
29	d15	3325.05	Mod Roll	3324.67	1.05 cfs	0.25	3325.2	3325.50	OK	t/c taken @ center of the lot
30	d15	3325.48	Mod Roll	3325.10	1.05 cfs	0.25	3325.6	3325.83	OK	t/c taken @ center of the lot
31	d15	3326.05	Mod Roll	3325.67	0.7 cfs	0.15	3326.0	3326.50	OK	t/c taken @ center of the lot
32	d15	3326.61	Mod Roll	3326.23	0.7 cfs	0.15	3326.5	3327.00	OK	t/c taken @ center of the lot
33	d15	3327.04	Mod Roll	3326.66	0.7 cfs	0.15	3327.0	3327.33	OK	t/c taken @ center of the lot
34	d8	3330.17	Mod Roll	3329.79	2.6 cfs	0.31	3330.4	3330.50	OK	t/c taken @ center of the lot
35	d8	3330.38	Mod Roll	3330.00	2.6 cfs	0.31	3330.6	3331.00	OK	t/c taken @ center of the lot
36	d8	3330.60	Mod Roll	3330.22	2.6 cfs	0.31	3330.8	3331.33	OK	t/c taken @ center of the lot
37	d8	3331.66	Mod Roll	3331.28	2.19 cfs	0.3	3331.9	3332.00	OK	t/c taken @ center of the lot

Lark Hill

FINISH FLOOR ANALYSIS (OVERALL) - GARAGE FINISH FLOOR CHECK - CITY OF LAS VEGAS JURISDICTION

INPUT INFORMATION										NOTES
Lot Number	Hydraulic Section Utilized	T/C[1] (ft)	Mod Roll, Roll, or L Curb? Type	F/L[2] (ft)	(Conservatively Pro-rated) Q_{100}	D_{100} Obtained from the Rating Table (ft)	GFF Needed (ft)	GFF Desgined (ft)	Flowline Check (ft)	See References on Last Sheet (ft)
38	d8	3332.12	Mod Roll	3331.74	2.19 cfs	0.3	3332.3	3332.50	OK	t/c taken @ center of the lot
39	d8	3332.55	Mod Roll	3332.17	2.19 cfs	0.3	3332.8	3332.83	OK	t/c taken @ center of the lot
40	d8	3332.93	Mod Roll	3332.55	1.81 cfs	0.29	3333.1	3333.70	OK	t/c taken @ center of the lot
41	d8	3333.39	Mod Roll	3333.01	1.81 cfs	0.29	3333.6	3334.20	OK	t/c taken @ center of the lot
42	d8	3334.23	Mod Roll	3333.85	1.81 cfs	0.29	3334.4	3334.53	OK	t/c taken @ center of the lot
43	d8	3334.90	Mod Roll	3334.52	1.43 cfs	0.27	3335.1	3335.30	OK	t/c taken @ center of the lot
44	d8	3335.57	Mod Roll	3335.19	1.43 cfs	0.27	3335.7	3335.80	OK	
45	d8	3335.80	Mod Roll	3335.42	1.05 cfs	0.27	3336.0	3336.13	OK	t/c taken @ center of the lot
46	d5	3349.39	Mod Roll	3349.01	0.60	0.25	3349.5	3350.13	OK	t/c taken @ center of the lot
47	d5	3348.95	Mod Roll	3348.57	0.60	0.25	3349.1	3349.72	OK	t/c taken @ center of the lot
48	d5	3349.17	Mod Roll	3348.79	0.60	0.25	3349.3	3349.30	OK	
49	d5	3343.23	Mod Roll	3342.85	3.00	0.21	3343.3	3343.40	OK	
50	d5	3343.59	Mod Roll	3343.21	3.00	0.21	3343.6	3343.82	OK	
51	d5	3343.73	Mod Roll	3343.35	3.00	0.21	3343.8	3344.23	OK	
52	d5	3344.80	Mod Roll	3344.42	2.40	0.27	3345.0	3345.00	OK	
53	d5	3345.24	Mod Roll	3344.86	2.40	0.27	3345.4	3345.42	OK	
54	d5	3345.47	Mod Roll	3345.09	2.40	0.27	3345.6	3345.83	OK	t/c taken @ center of the lot
55	d5	3346.39	Mod Roll	3346.01	1.80	0.26	3346.5	3346.60	OK	
56	d5	3346.83	Mod Roll	3346.45	1.80	0.26	3347.0	3347.02	OK	
57	d5	3347.29	Mod Roll	3346.91	1.80	0.26	3347.4	3347.43	OK	
58	d5	3348.02	Mod Roll	3347.64	1.20	0.24	3348.1	3348.20	OK	
59	d5	3348.48	Mod Roll	3348.10	1.20	0.24	3348.6	3348.62	OK	
60	d5	0.00	Mod Roll	-0.38	1.20	0.24	0.1	3349.03	OK	t/c taken @ center of the lot
61	d5	3349.63	Mod Roll	3349.25	0.60	0.21	3349.7	3349.80	OK	
62	d5	3350.07	Mod Roll	3349.69	0.60	0.21	3350.1	3350.22	OK	
63	d5	3350.53	Mod Roll	3350.15	0.60	0.21	3350.6	3350.63	OK	
64	d2	3361.12	Mod Roll	3360.74	0.70	0.14	3361.0	3361.23	OK	
65	d2	3360.62	Mod Roll	3360.24	0.70	0.14	3360.5	3360.7.3	OK	
66	d2	3360.07	Mod Roll	3359.69	0.70	0.14	3360.0	3360.15	OK	
67	d2	3358.92	Mod Roll	3358.54	1.40	0.21	3359.0	3359.23	OK	t/c taken @ center of the lot
68	d2	3358.36	Mod Roll	3357.98	1.40	0.21	3358.4	3358.73	OK	t/c taken @ center of the lot
69	d2	3357.75	Mod Roll	3357.37	1.40	0.21	3357.8	3358.15	OK	t/c taken @ center of the lot
70	d2	3356.93	Mod Roll	3356.55	2.10	0.24	3357.0	3357.33	OK	t/c taken @ center of the lot
71	d2	3356.64	Mod Roll	3356.26	2.10	0.24	3356.7	3356.83	OK	
72	d2	3356.09	Mod Roll	3355.71	2.10	0.24	3356.2	3356.25	OK	
73	d2	3354.76	Mod Roll	3354.38	2.80	0.26	3354.9	3355.13	OK	t/c taken @ center of the lot
74	d2	3354.47	Mod Roll	3354.09	2.80	0.26	3354.6	3354.63	OK	

Lark Hill

FINISH FLOOR ANALYSIS (OVERALL) - GARAGE FINISH FLOOR CHECK - CITY OF LAS VEGAS JURISDICTION

INPUT INFORMATION										NOTES
Lot Number	Hydraulic Section Utilized	T/C[1] (ft)	Mod Roll, Roll, or L Curb? Type	F/L[2] (ft)	(Conservatively Pro-rated) Q_{100}	D_{100} Obtained from the Rating Table (ft)	GFF Needed (ft)	GFF Desgined (ft)	Flowline Check (ft)	See References on Last Sheet (ft)
75	d2	3353.59	Mod Roll	3353.21	2.80	0.26	3353.7	3354.05	OK	t/c taken @ center of the lot
76	d2	3352.50	Mod Roll	3352.12	3.50	0.27	3352.7	3353.13	OK	t/c taken @ center of the lot
77	d2	3351.60	Mod Roll	3351.22	3.50	0.27	3351.8	3352.63	OK	t/c taken @ center of the lot
78	d2	3351.26	Mod Roll	3350.88	3.50	0.27	3351.4	3352.05	OK	t/c taken @ center of the lot
79	d2	3349.51	Mod Roll	3349.13	4.20	0.29	3349.7	3349.83	OK	t/c taken @ center of the lot
80	d2	3348.95	Mod Roll	3348.57	4.20	0.29	3349.2	3349.33	OK	t/c taken @ center of the lot
81	d2	3348.35	Mod Roll	3347.97	4.20	0.29	3348.6	3348.75	OK	t/c taken @ center of the lot
82	d2	3347.57	Mod Roll	3347.19	4.90	0.3	3347.8	3347.93	OK	t/c taken @ center of the lot
83	d2	3347.02	Mod Roll	3346.64	4.90	0.3	3347.2	3347.43	OK	t/c taken @ center of the lot
84	d2	3346.42	Mod Roll	3346.04	4.90	0.3	3346.6	3346.85	OK	t/c taken @ center of the lot
85	d2	3345.95	Mod Roll	3345.57	4.90	0.3	3346.2	3346.45	OK	t/c taken @ center of the lot
86	d2	3346.62	Mod Roll	3346.24	4.90	0.3	3346.8	3347.03	OK	t/c taken @ center of the lot
87	d2	3347.19	Mod Roll	3346.81	4.90	0.3	3347.4	3347.53	OK	t/c taken @ center of the lot
88	d2	3348.17	Mod Roll	3347.79	4.20	0.29	3348.4	3348.65	OK	t/c taken @ center of the lot
89	d2	3348.79	Mod Roll	3348.41	4.20	0.29	3349.0	3349.23	OK	t/c taken @ center of the lot
90	d2	3349.36	Mod Roll	3348.98	4.20	0.29	3349.6	3349.73	OK	t/c taken @ center of the lot
91	d2	3350.60	Mod Roll	3350.22	3.50	0.27	3350.8	3351.05	OK	t/c taken @ center of the lot
92	d2	3351.18	Mod Roll	3350.80	3.50	0.27	3351.3	3351.63	OK	t/c taken @ center of the lot
93	d2	3351.74	Mod Roll	3351.36	3.50	0.27	3351.9	3352.13	OK	t/c taken @ center of the lot
94	d2	3352.63	Mod Roll	3352.25	2.80	0.26	3352.8	3353.05	OK	t/c taken @ center of the lot
95	d2	3353.24	Mod Roll	3352.86	2.80	0.26	3353.4	3353.63	OK	t/c taken @ center of the lot
96	d2	3353.80	Mod Roll	3353.42	2.80	0.26	3353.9	3354.13	OK	t/c taken @ center of the lot
97	d2	3356.62	Mod Roll	3356.24	2.10	0.24	3356.7	3356.75	OK	
98	d2	3357.17	Mod Roll	3356.79	2.10	0.24	3357.3	3357.33	OK	
99	d2	3357.46	Mod Roll	3357.08	2.10	0.24	3357.6	3357.83	OK	t/c taken @ center of the lot
100	d2	3358.61	Mod Roll	3358.23	1.40	0.21	3358.7	3358.75	OK	
101	d2	3359.16	Mod Roll	3358.78	1.40	0.21	3359.2	3359.33	OK	
102	d2	3359.74	Mod Roll	3359.36	1.40	0.21	3359.8	3359.83	OK	
103	d2	3360.60	Mod Roll	3360.22	0.70	0.14	3360.5	3361.05	OK	
104	d2	3361.15	Mod Roll	3360.77	0.70	0.14	3361.1	3361.63	OK	
105	d2	3361.95	Mod Roll	3361.57	0.70	0.14	3361.9	3362.13	OK	

Where:

1: Top of Curb at High Side of Lot

2: Flowline = TC - 0.38 feet (for Roll)

3: Minimum Allowable Garage Finished Floor Elevation above flowline @ high side of lot = (2 x D_{100}) + F/L

Lark Hill											
FINISH FLOOR ANALYSIS (OVERALL) - CITY OF LAS VEGAS JURISDICTION											
INPUT INFORMATION						FINISHED FLOORS					NOTES
Lot Number	Hydraulic Section Utilized	T/C[1] (ft)	Mod Roll, Roll, or L Curb? Type	F/L[2] (ft)	D_{100} (ft)	Flowline FF min[3] (ft)	Pad (ft)	Section (ft)	FF Design (ft)	Flowline Check (ft)	See References on Last Sheet (ft)
1	d9	3336.91	Mod Roll	3336.53	0.31	3337.15	3337.1	1.00	3338.10	OK	
2	d9	3336.47	Mod Roll	3336.09	0.31	3336.71	3337.1	1.00	3338.10	OK	
3	d9	3336.05	Mod Roll	3335.67	0.31	3336.29	3337.1	1.00	3338.10	OK	
4	d9	3335.54	Mod Roll	3335.16	0.31	3335.78	3335.6	1.00	3336.60	OK	
5	d9	3334.99	Mod Roll	3334.61	0.31	3335.23	3335.6	1.00	3336.60	OK	
6	d9	3334.57	Mod Roll	3334.19	0.31	3334.81	3335.6	1.00	3336.60	OK	
7	d9	3333.80	Mod Roll	3333.42	0.31	3334.04	3334.0	1.00	3335.00	OK	
8	d9	3333.36	Mod Roll	3332.98	0.31	3333.60	3334.0	1.00	3335.00	OK	
9	d9	3332.95	Mod Roll	3332.57	0.31	3333.19	3334.0	1.00	3335.00	OK	
10	d9	3332.31	Mod Roll	3331.93	0.31	3332.55	3332.5	1.00	3333.50	OK	
11	d9	3331.88	Mod Roll	3331.50	0.31	3332.12	3332.5	1.00	3333.50	OK	
12	d9	3331.46	Mod Roll	3331.08	0.31	3331.70	3332.5	1.00	3333.50	OK	
13	d14	3328.19	Mod Roll	3327.81	0.27	3328.35	3328.4	1.00	3329.40	OK	
14	d14	3327.75	Mod Roll	3327.37	0.27	3327.91	3328.4	1.00	3329.40	OK	
15	d14	3327.33	Mod Roll	3326.95	0.27	3327.49	3328.4	1.00	3329.40	OK	
16	d14	3326.72	Mod Roll	3326.34	0.27	3326.88	3326.9	1.00	3327.90	OK	
17	d14	3326.28	Mod Roll	3325.90	0.27	3326.44	3326.9	1.00	3327.90	OK	
18	d14	3325.87	Mod Roll	3325.49	0.27	3326.03	3326.9	1.00	3327.90	OK	
19	d14	3325.10	Mod Roll	3324.72	0.27	3325.26	3325.3	1.00	3326.30	OK	
20	d14	3324.66	Mod Roll	3324.28	0.27	3324.82	3325.3	1.00	3326.30	OK	
21	d14	3324.31	Mod Roll	3323.93	0.27	3324.47	3325.3	1.00	3326.30	OK	
22	d14	3323.87	Mod Roll	3323.49	0.27	3324.03	3324.1	1.00	3325.10	OK	
23	d14	3323.59	Mod Roll	3323.21	0.27	3323.75	3324.1	1.00	3325.10	OK	
24	d14	3323.31	Mod Roll	3322.93	0.27	3323.47	3324.1	1.00	3325.10	OK	
25	d15	3323.31	Mod Roll	3322.93	0.27	3323.47	3324.3	1.00	3325.30	OK	
26	d15	332.73	Mod Roll	332.35	0.27	332.89	3324.3	1.00	3325.30	OK	
27	d15	3324.16	Mod Roll	3323.78	0.27	3324.32	3324.3	1.00	3325.30	OK	
28	d15	3324.84	Mod Roll	3324.46	0.27	3325.00	3325.9	1.00	3326.90	OK	
29	d15	3325.26	Mod Roll	3324.88	0.27	3325.42	3325.9	1.00	3326.90	OK	
30	d15	3325.70	Mod Roll	3325.32	0.27	3325.86	3325.9	1.00	3326.90	OK	
31	d15	3326.40	Mod Roll	3326.02	0.27	3326.56	3327.4	1.00	3328.40	OK	
32	d15	3326.82	Mod Roll	3326.44	0.27	3326.98	3327.4	1.00	3328.40	OK	
33	d15	3327.26	Mod Roll	3326.88	0.27	3327.42	3327.4	1.00	3328.40	OK	
34	d8	3330.35	Mod Roll	3329.97	0.31	3330.59	3331.4	1.00	3332.40	OK	
35	d8	3330.77	Mod Roll	3330.39	0.31	3331.01	3331.4	1.00	3332.40	OK	
36	d8	3331.21	Mod Roll	3330.83	0.31	3331.45	3331.4	1.00	3332.40	OK	

37	d8	3331.91	Mod Roll	3331.53	0.31	3332.15	3332.9	1.00	3333.90	OK	
38	d8	3332.33	Mod Roll	3331.95	0.31	3332.57	3332.9	1.00	3333.90	OK	
39	d8	3332.77	Mod Roll	3332.39	0.31	3333.01	3332.9	1.00	3333.90	OK	
40	d8	3333.59	Mod Roll	3333.21	0.31	3333.83	3334.6	1.00	3335.60	OK	
41	d8	3334.01	Mod Roll	3333.63	0.31	3334.25	3334.6	1.00	3335.60	OK	
42	d8	3334.45	Mod Roll	3334.07	0.31	3334.69	3334.6	1.00	3335.60	OK	
43	d8	3335.15	Mod Roll	3334.77	0.31	3335.39	3336.2	1.00	3337.20	OK	
44	d8	3335.57	Mod Roll	3335.19	0.31	3335.81	3336.2	1.00	3337.20	OK	
45	d8	3336.02	Mod Roll	3335.64	0.31	3336.26	3336.2	1.00	3337.20	OK	
46	d5	3350.07	Mod Roll	3349.69	0.27	3350.23	3350.2	1.00	3351.20	OK	
47	d5	3349.61	Mod Roll	3349.23	0.27	3349.77	3350.2	1.00	3351.20	OK	
48	d5	3349.17	Mod Roll	3348.79	0.27	3349.33	3350.2	1.00	3351.20	OK	
49	d5	3343.20	Mod Roll	3342.82	0.27	3343.36	3344.3	1.00	3345.30	OK	
50	d5	3343.64	Mod Roll	3343.26	0.27	3343.80	3344.3	1.00	3345.30	OK	
51	d5	3344.10	Mod Roll	3343.72	0.27	3344.26	3344.3	1.00	3345.30	OK	
52	d5	3344.80	Mod Roll	3344.42	0.27	3344.96	3345.9	1.00	3346.90	OK	
53	d5	3345.24	Mod Roll	3344.86	0.27	3345.40	3345.9	1.00	3346.90	OK	
54	d5	3345.70	Mod Roll	3345.32	0.27	3345.86	3345.9	1.00	3346.90	OK	
55	d5	3346.39	Mod Roll	3346.01	0.27	3346.55	3347.5	1.00	3348.50	OK	
56	d5	3346.83	Mod Roll	3346.45	0.27	3346.99	3347.5	1.00	3348.50	OK	
57	d5	3347.29	Mod Roll	3346.91	0.27	3347.45	3347.5	1.00	3348.50	OK	
58	d5	3348.02	Mod Roll	3347.64	0.27	3348.18	3349.1	1.00	3350.10	OK	
59	d5	3348.48	Mod Roll	3348.10	0.27	3348.64	3349.1	1.00	3350.10	OK	
60	d5	3348.94	Mod Roll	3348.56	0.27	3349.10	3349.1	1.00	3350.10	OK	
61	d5	3349.63	Mod Roll	3349.25	0.27	3349.79	3350.7	1.00	3351.70	OK	
62	d5	3350.07	Mod Roll	3349.69	0.27	3350.23	3350.7	1.00	3351.70	OK	
63	d5	3350.53	Mod Roll	3350.15	0.27	3350.69	3350.7	1.00	3351.70	OK	
64	d2	3361.12	Mod Roll	3360.74	0.3	3361.34	3361.3	1.00	3362.30	OK	
65	d2	3360.62	Mod Roll	3360.24	0.3	3360.84	3361.3	1.00	3362.30	OK	
66	d2	3360.07	Mod Roll	3359.69	0.3	3360.29	3361.3	1.00	3362.30	OK	
67	d2	3359.21	Mod Roll	3358.83	0.3	3359.43	3359.3	1.00	3360.30	OK	
68	d2	3358.63	Mod Roll	3358.25	0.3	3358.85	3359.3	1.00	3360.30	OK	
69	d2	3358.08	Mod Roll	3357.70	0.3	3358.30	3359.3	1.00	3360.30	OK	
70	d2	3357.22	Mod Roll	3356.84	0.3	3357.44	3357.4	1.00	3358.40	OK	
71	d2	3356.64	Mod Roll	3356.26	0.3	3356.86	3357.4	1.00	3358.40	OK	
72	d2	3356.09	Mod Roll	3355.71	0.3	3356.31	3357.4	1.00	3358.40	OK	
73	d2	3355.05	Mod Roll	3354.67	0.3	3355.27	3355.2	1.00	3356.20	OK	
74	d2	3354.47	Mod Roll	3354.09	0.3	3354.69	3355.2	1.00	3356.20	OK	
75	d2	3353.92	Mod Roll	3353.54	0.3	3354.14	3355.2	1.00	3356.20	OK	
76	d2	3353.06	Mod Roll	3352.68	0.3	3353.28	3353.2	1.00	3354.20	OK	
77	d2	3352.48	Mod Roll	3352.10	0.3	3352.70	3353.2	1.00	3354.20	OK	
78	d2	3351.93	Mod Roll	3351.55	0.3	3352.15	3353.2	1.00	3354.20	OK	
79	d2	3349.79	Mod Roll	3349.41	0.3	3350.01	3349.9	1.00	3350.90	OK	

80	d2	3349.22	Mod Roll	3348.84	0.3	3349.44	3349.9	1.00	3350.90	OK	
81	d2	3348.68	Mod Roll	3348.30	0.3	3348.90	3349.9	1.00	3350.90	OK	
82	d2	3347.85	Mod Roll	3347.47	0.3	3348.07	3348.0	1.00	3349.00	OK	
83	d2	3347.29	Mod Roll	3346.91	0.3	3347.51	3348.0	1.00	3349.00	OK	
84	d2	3346.75	Mod Roll	3346.37	0.3	3346.97	3348.0	1.00	3349.00	OK	
85	d2	3346.34	Mod Roll	3345.96	0.3	3346.56	3347.6	1.00	3348.60	OK	
86	d2	3346.89	Mod Roll	3346.51	0.3	3347.11	3347.6	1.00	3348.60	OK	
87	d2	3347.48	Mod Roll	3347.10	0.3	3347.70	3347.6	1.00	3348.60	OK	
88	d2	3348.51	Mod Roll	3348.13	0.3	3348.73	3349.8	1.00	3350.80	OK	
89	d2	3349.07	Mod Roll	3348.69	0.3	3349.29	3349.8	1.00	3350.80	OK	
90	d2	3349.65	Mod Roll	3349.27	0.3	3349.87	3349.8	1.00	3350.80	OK	
91	d2	3350.94	Mod Roll	3350.56	0.3	3351.16	3352.2	1.00	3353.20	OK	
92	d2	3351.49	Mod Roll	3351.11	0.3	3351.71	3352.2	1.00	3353.20	OK	
93	d2	3352.07	Mod Roll	3351.69	0.3	3352.29	3352.2	1.00	3353.20	OK	
94	d2	3352.96	Mod Roll	3352.58	0.3	3353.18	3354.2	1.00	3355.20	OK	
95	d2	3353.51	Mod Roll	3353.13	0.3	3353.73	3354.2	1.00	3355.20	OK	
96	d2	3354.08	Mod Roll	3353.70	0.3	3354.30	3354.2	1.00	3355.20	OK	
97	d2	3356.62	Mod Roll	3356.24	0.3	3356.84	3357.9	1.00	3358.90	OK	
98	d2	3357.17	Mod Roll	3356.79	0.3	3357.39	3357.9	1.00	3358.90	OK	
99	d2	3357.75	Mod Roll	3357.37	0.3	3357.97	3357.9	1.00	3358.90	OK	
100	d2	3358.61	Mod Roll	3358.23	0.3	3358.83	3359.9	1.00	3360.90	OK	
101	d2	3359.16	Mod Roll	3358.78	0.3	3359.38	3359.9	1.00	3360.90	OK	
102	d2	3359.74	Mod Roll	3359.36	0.3	3359.96	3359.9	1.00	3360.90	OK	
103	d2	3360.60	Mod Roll	3360.22	0.3	3360.82	3361.7	1.00	3362.70	OK	
104	d2	3361.15	Mod Roll	3360.77	0.3	3361.37	3361.7	1.00	3362.70	OK	
105	d2	3361.95	Mod Roll	3361.57	0.3	3362.17	3361.7	1.00	3362.70	OK	

Where:

1: Top of Curb at High Side of Lot

2: Flowline = TC - 0.38 feet (for Roll)

3: Minimum Allowable Finished Floor Elevation above flowline @ high side of lot = $(2 \times D_{100}) + F/L$

LARK HILL (aka PARCEL QR)										
FINISH FLOOR ANALYSIS FOR 2 * d_{100} IN THE SWALE										
INPUT INFORMATION					FINISHED FLOORS					NOTES
Swale behind Lot Number	Swale Flowline	Conservative Pro-rated Q_{100}	Flowline Slope	Conservative D_{100} (obtained from the Rating table)	Flowline FF min[3]	Pad	Section	FF Design	Flowline Check	See References on Last Sheet
	(ft)			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
1	3336.16	0.40	1.50%	0.26	3336.68	3337.1	1.00	3338.10	OK	
2	3335.78	0.40	1.50%	0.26	3336.30	3337.1	1.00	3338.10	OK	
3	3335.45	0.40	1.50%	0.26	3335.97	3337.1	1.00	3338.10	OK	
4	3334.66	0.80	1.50%	0.34	3335.34	3335.6	1.00	3336.60	OK	
5	3334.28	0.80	1.50%	0.34	3334.96	3335.6	1.00	3336.60	OK	
6	3333.95	0.80	1.50%	0.34	3334.63	3335.6	1.00	3336.60	OK	
7	3333.06	1.20	1.50%	0.39	3333.84	3334.0	1.00	3335.00	OK	
8	3332.68	1.20	1.50%	0.39	3333.46	3334.0	1.00	3335.00	OK	
9	3332.35	1.20	1.50%	0.39	3333.13	3334.0	1.00	3335.00	OK	
10	3331.55	1.60	1.50%	0.44	3332.43	3332.5	1.00	3333.50	OK	
11	3331.04	1.60	1.50%	0.44	3331.92	3332.5	1.00	3333.50	OK	
12	3330.60	1.60	1.50%	0.44	3331.48	3332.5	1.00	3333.50	OK	
13	3327.34	0.38	2.14%	0.24	3327.82	3328.4	1.00	3329.40	OK	
14	3327.12	0.38	2.14%	0.24	3327.60	3328.4	1.00	3329.40	OK	
15	3326.65	0.38	2.14%	0.24	3327.13	3328.4	1.00	3329.40	OK	
16	3325.96	0.75	1.82%	0.32	3326.60	3326.9	1.00	3327.90	OK	
17	3325.50	0.75	1.82%	0.32	3326.14	3326.9	1.00	3327.90	OK	
18	3325.10	0.75	1.82%	0.32	3325.74	3326.9	1.00	3327.90	OK	
19	3324.36	1.13	1.71%	0.38	3325.12	3325.3	1.00	3326.30	OK	
20	3323.93	1.13	1.71%	0.38	3324.69	3325.3	1.00	3326.30	OK	
21	3323.55	1.13	1.71%	0.38	3324.31	3325.3	1.00	3326.30	OK	
22	3323.00	1.50	1.72%	0.43	3323.86	3324.1	1.00	3325.10	OK	
23	3322.56	1.50	0.89%	0.46	3323.48	3324.1	1.00	3325.10	OK	
24	3322.34	1.50	0.89%	0.46	3323.26	3324.1	1.00	3325.10	OK	
25	3322.82	2.20	1.00%	0.51	3323.84	3324.3	1.00	3325.30	OK	
26	3323.04	2.20	1.00%	0.51	3324.06	3324.3	1.00	3325.30	OK	
27	3323.30	2.20	1.00%	0.51	3324.32	3324.3	1.00	3325.30	OK	
28	3323.97	1.47	2.09%	0.39	3324.75	3325.9	1.00	3326.90	OK	
29	3324.43	1.47	2.09%	0.39	3325.21	3325.9	1.00	3326.90	OK	
30	3324.96	1.47	2.09%	0.39	3325.74	3325.9	1.00	3326.90	OK	
31	3325.66	0.73	2.17%	0.31	3326.28	3327.4	1.00	3328.40	OK	
32	3326.14	0.73	2.17%	0.31	3326.76	3327.4	1.00	3328.40	OK	
33	3326.52	0.73	2.17%	0.31	3327.14	3327.4	1.00	3328.40	OK	
34	3329.34	3.30	1.00%	0.62	3330.58	3331.4	1.00	3332.40	OK	

LARK HILL (aka PARCEL QR)										
FINISH FLOOR ANALYSIS FOR 2 * d_{100} IN THE SWALE										
INPUT INFORMATION					FINISHED FLOORS					NOTES
Swale behind Lot Number	Swale Flowline	Conservative Pro-rated Q_{100}	Flowline Slope	Conservative D_{100} (obtained from the Rating table)	Flowline FF min[3]	Pad	Section	FF Design	Flowline Check	See References on Last Sheet
	(ft)			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
35	3329.80	3.30	2.09%	0.54	3330.88	3331.4	1.00	3332.40	OK	
36	3330.24	3.30	1.72%	0.56	3331.36	3331.4	1.00	3332.40	OK	
37	3331.12	2.48	1.98%	0.49	3332.10	3332.9	1.00	3333.90	OK	
38	3331.56	2.48	1.98%	0.49	3332.54	3332.9	1.00	3333.90	OK	
39	3332.06	2.48	1.98%	0.49	3333.04	3332.9	1.00	3333.90	OK	
40	3332.83	1.65	1.98%	0.41	3333.65	3334.6	1.00	3335.60	OK	
41	3333.26	1.65	1.98%	0.41	3334.08	3334.6	1.00	3335.60	OK	
42	3333.76	1.65	1.98%	0.41	3334.58	3334.6	1.00	3335.60	OK	
43	3334.37	0.83	1.88%	0.35	3335.07	3336.2	1.00	3337.20	OK	
44	3334.78	0.83	1.88%	0.35	3335.48	3336.2	1.00	3337.20	OK	
45	3335.26	0.83	1.88%	0.35	3335.96	3336.2	1.00	3337.20	OK	
46	3349.36	0.83	1.00%	0.35	3350.06	3350.2	1.00	3351.20	OK	
47	3349.11	0.83	1.00%	0.35	3349.81	3350.2	1.00	3351.20	OK	
48	3348.89	0.83	1.00%	0.35	3349.59	3350.2	1.00	3351.20	OK	
49	3343.38	2.10	1.00%	0.52	3344.42	3344.3	1.00	3345.30	OK	
50	3343.60	2.10	1.00%	0.52	3344.64	3344.3	1.00	3345.30	OK	
51	3343.85	2.10	1.00%	0.52	3344.89	3344.3	1.00	3345.30	OK	
52	3344.30	1.68	1.39%	0.46	3345.22	3345.9	1.00	3346.90	OK	
53	3344.61	1.68	1.39%	0.46	3345.53	3345.9	1.00	3346.90	OK	
54	3344.96	1.68	1.39%	0.46	3345.88	3345.9	1.00	3346.90	OK	
55	3345.62	1.26	2.03%	0.39	3346.40	3347.5	1.00	3348.50	OK	
56	3346.07	1.26	2.03%	0.39	3346.85	3347.5	1.00	3348.50	OK	
57	3346.56	1.26	2.03%	0.39	3347.34	3347.5	1.00	3348.50	OK	
58	3347.70	0.84	1.20%	0.38	3348.46	3349.1	1.00	3350.10	OK	
59	3347.96	0.84	1.20%	0.38	3348.72	3349.1	1.00	3350.10	OK	
60	3348.26	0.84	1.20%	0.38	3349.02	3349.1	1.00	3350.10	OK	
61	3348.89	0.42	1.94%	0.24	3349.37	3350.7	1.00	3351.70	OK	
62	3349.31	0.42	1.94%	0.24	3349.79	3350.7	1.00	3351.70	OK	
63	3349.81	0.42	1.94%	0.24	3350.29	3350.7	1.00	3351.70	OK	
64	3360.36	0.36	2.51%	0.23	3360.82	3361.3	1.00	3362.30	OK	
65	3359.72	0.36	2.51%	0.23	3360.18	3361.3	1.00	3362.30	OK	
66	3359.17	0.36	2.51%	0.23	3359.63	3361.3	1.00	3362.30	OK	
67	3358.36	0.72	2.51%	0.30	3358.96	3359.3	1.00	3360.30	OK	
68	3357.72	0.72	2.51%	0.30	3358.32	3359.3	1.00	3360.30	OK	

LARK HILL (aka PARCEL QR)										
FINISH FLOOR ANALYSIS FOR 2 * d_{100} IN THE SWALE										
INPUT INFORMATION					FINISHED FLOORS					NOTES
Swale behind Lot Number	Swale Flowline	Conservative Pro-rated Q_{100}	Flowline Slope	Conservative D_{100} (obtained from the Rating table)	Flowline FF min[3]	Pad	Section	FF Design	Flowline Check	See References on Last Sheet
	(ft)			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
69	3357.17	0.72	2.51%	0.30	3357.77	3359.3	1.00	3360.30	OK	
70	3356.36	1.08	1.16%	0.40	3357.16	3357.4	1.00	3358.40	OK	
71	3356.07	1.08	1.16%	0.40	3356.87	3357.4	1.00	3358.40	OK	
72	3355.81	1.08	1.16%	0.40	3356.61	3357.4	1.00	3358.40	OK	
73	3354.26	1.44	2.51%	0.37	3355.00	3355.2	1.00	3356.20	OK	
74	3353.62	1.44	2.51%	0.37	3354.36	3355.2	1.00	3356.20	OK	
75	3353.07	1.44	2.51%	0.37	3353.81	3355.2	1.00	3356.20	OK	
76	3352.26	1.80	2.50%	0.41	3353.08	3353.2	1.00	3354.20	OK	
77	3351.63	1.80	2.50%	0.41	3352.45	3353.2	1.00	3354.20	OK	
78	3351.08	1.80	2.50%	0.41	3351.90	3353.2	1.00	3354.20	OK	
79	3348.96	0.45	2.23%	0.24	3349.44	3349.9	1.00	3350.90	OK	
80	3348.39	0.45	2.23%	0.24	3348.87	3349.9	1.00	3350.90	OK	
81	3347.90	0.45	2.23%	0.24	3348.38	3349.9	1.00	3350.90	OK	
82	3347.06	0.90	1.00%	0.39	3347.84	3348.0	1.00	3349.00	OK	
83	3346.81	0.90	1.00%	0.39	3347.59	3348.0	1.00	3349.00	OK	
84	3346.59	0.90	1.00%	0.39	3347.37	3348.0	1.00	3349.00	OK	
85	3346.19	3.30	1.00%	0.62	3347.43	3347.6	1.00	3348.60	OK	
86	3346.41	3.30	1.00%	0.62	3347.65	3347.6	1.00	3348.60	OK	
87	3346.66	3.30	1.00%	0.62	3347.90	3347.6	1.00	3348.60	OK	
88	3347.53	2.83	2.81%	0.47	3348.47	3349.8	1.00	3350.80	OK	
89	3348.15	2.83	2.81%	0.47	3349.09	3349.8	1.00	3350.80	OK	
90	3348.87	2.83	2.81%	0.47	3349.81	3349.8	1.00	3350.80	OK	
91	3350.72	2.36	1.17%	0.52	3351.76	3352.2	1.00	3353.20	OK	
92	3350.98	2.36	1.17%	0.52	3352.02	3352.2	1.00	3353.20	OK	
93	3351.27	2.36	1.17%	0.52	3352.31	3352.2	1.00	3353.20	OK	
94	3352.07	1.89	2.52%	0.42	3352.91	3354.2	1.00	3355.20	OK	
95	3352.62	1.89	2.52%	0.42	3353.46	3354.2	1.00	3355.20	OK	
96	3353.26	1.89	2.52%	0.42	3354.10	3354.2	1.00	3355.20	OK	
97	3355.77	1.42	2.52%	0.37	3356.51	3357.9	1.00	3358.90	OK	
98	3356.32	1.42	2.52%	0.37	3357.06	3357.9	1.00	3358.90	OK	
99	3356.96	1.42	2.52%	0.37	3357.70	3357.9	1.00	3358.90	OK	
100	3357.77	0.95	2.51%	0.33	3358.43	3359.9	1.00	3360.90	OK	
101	3358.32	0.95	2.51%	0.33	3358.98	3359.9	1.00	3360.90	OK	
102	3358.96	0.95	2.51%	0.33	3359.62	3359.9	1.00	3360.90	OK	

LARK HILL (aka PARCEL QR)										
FINISH FLOOR ANALYSIS FOR 2 * d_{100} IN THE SWALE										
INPUT INFORMATION					FINISHED FLOORS					NOTES
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	(ft)			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
103	3359.69	0.48	2.26%	0.28	3360.25	3361.7	1.00	3362.70	OK	
104	3360.19	0.48	2.26%	0.28	3360.75	3361.7	1.00	3362.70	OK	
105	3360.76	0.48	2.26%	0.28	3361.32	3361.7	1.00	3362.70	OK	

REFERENCES

Summerlin West Village 22 - Kettle Bend Road - Update#2 (Sunset Run Drive to Krestel Creek Road), DS#5204, VTN (2020) and addenda

Approval Letters
Excerpts (*Update#2*)
Approved Improvement Plans

Excerpts *(1st Submittal)*
Figure 8 Ultimate Condition Basin Map *(1st Submittal)*
Standard Form 4 (1st Submittal)
Ultimate Condition HEC-1 (1st submittal)
Street Depth Calculations (1st Submittal)

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: October 15, 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 – Update #2 (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\DS5204F.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-23-101-002		CCRFCD
Zoning Action:	N/A		
FEMA Flood Zone	YES	NO **X**	APPROVAL LETTER
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	Conditional Approval	N/C	N/C
CCRFCD	8/3/2020	8/17/2020	Concurrence Recv'd	N/C	N/C
3rd Submittal	9/1/2020	9/17/2020	Approved	$100.00	3975318: $100
4th Submittal	9/29/2020	10/15/2020	See Comments Below	$100.00	4005384: $100
			TOTAL FEES (LDDRS):	**$1,000.00**	----

REMARKS:

4th Submittal: Update #2 to address minor deviation of the connection point of the 8'x8'-RCB into the existing RCB of the Beltway Channel

3rd Submittal: Update #1 to package the portion of 8'x8' RCB west of I-215 from Summerlin West V21 Summerlin Parkway Extension Project to the subject Kettle Bend Road (Sunset Run Drive to Kestrel Creek Road) Improvement Project

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.

The following comments are repeated until they are complete:

1. 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.

2. Since the portion of 8'x8' RCB is re-packaged from the Summerlin West V21 Summerlin Parkway Extension project to the subject project, the pertinent residual condition related to the regional box in *Sunset Run Drive* is transferred and repeated as below:

   Sheet UT1 to Sheet UT5: *The regional facility 8'x8' RCB in Sunset Run Drive is too close to the northern curb. In case of needing repair and maintenance in the future, the staging area will break into the curb area which is costly and problematic. Relocate the RCB to the center of the street as far as possible.*

   The response was to maintain the original proposed location for the proposed regional facility 8'x8' RCB in *Sunset Run Drive*.

   In the final map, dedicate the amenity zone behind the northern curb of *Sunset Run Drive* and east of *Kettle Bend Road* as a Public Drainage Easement to be Privately Maintained by the *Summerlin Master HOA*.

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.

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

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

END OF REMARKS
HDR/AYS

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

Update #2 to the Technical Drainage Study for

Summerlin West Village 22
Kettle Bend Road

Las Vegas, Nevada

Prepared for:
Howard Hughes Company, LLC

Submitted to:
City of Las Vegas
Public Works

PROVIDING QUALITY PROFESSIONAL
SERVICE SINCE 1960

September 23, 2020
W.O. #7861

City of Las Vegas
Department of Public Works
333 N. Rancho Blvd, 7th Floor
Las Vegas, NV 89106

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

SUBJECT: UPDATE #2 TO THE TECHNICAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 22 KETTLE BEND ROAD (SUNSET RUN DRIVE TO KESTREL CREEK ROAD)

Mr. Sung:

This *Update #2 to the Technical Drainage Study for Village 22 Kettle Bend Road (Sunset Run Drive to Kestrel Creek Road)* is being submitted to the City of Las Vegas Department of Public Works to address improvement plan revisions. The alignment of the 8'x8' RCB storm drain west of the I-215 has been revised to match the connection point of the RCB proposed by the *Update #2 to the Technical Drainage Study for Summerlin West Village 21 Beltway Channel Improvements* (DS#5139) based on field survey of the as-built storm drain which deviated slightly from the design grades. The connection location of the 8'x8' RCB into the existing RCB of the Beltway Channel study has been revised from alignment station 16+01.28 at an invert of 3250.32' to alignment station 16+01.50 at an invert of 3250.23'.

This plan revision does not alter the previously approved drainage patterns. Per correspondence with the City of Las Vegas Department of Public Works, the proposed revisions are not significant enough to warrant providing revised hydraulic models with this update. As the portion of the affected 8'x8' RCB was re-packaged from the Summerlin West V21 Summerlin Parkway Extension project, it is requested that CCPW concurrence not be required as was the case for Update #1. CCPW had indicated previously that the storm drain included in the Summerlin Parkway Extension alignment does not need to be submitted to CCPW for concurrence.

I hope this addresses your concerns regarding this project. If there are any questions or any additional information is required, please contact this office.

Respectfully Submitted,

VTN Consulting

Aaron Yup, E.I.

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

APN: 137-23-211-001, 137-23-411-001,
137-23-499-001 & 137-14-411-001

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

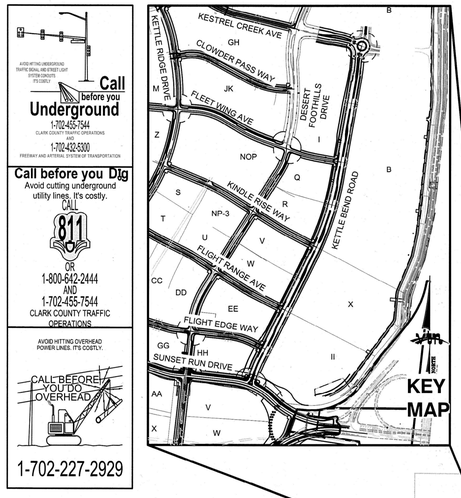
SHEET #	SHEET	DESCRIPTION	STATION
1	CV	COVER SHEET	
2	NT	NOTE SHEET	
3	HC1	HORIZONTAL CONTROL PLAN 1	
4	HC2	HORIZONTAL CONTROL PLAN 2	
5	HC3	HORIZONTAL CONTROL PLAN 3	
6	HC4	HORIZONTAL CONTROL PLAN 4	
7	HC5	HORIZONTAL CONTROL PLAN 5	
8	HC6	HORIZONTAL CONTROL PLAN 6	
9	HC7	HORIZONTAL CONTROL PLAN 7	
10	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	MGR1	MASTER GRADING PLAN 1	
18	MGR2	MASTER GRADING PLAN 2	
19	MGR3	MASTER GRADING PLAN 3	
20	GR1	GRADING PLAN 1	
21	GR2	GRADING PLAN 2	
22	GR3	GRADING PLAN 3	
23	GR4	GRADING PLAN 4	
24	GR5	GRADING PLAN 5	
25	GR6	GRADING PLAN 6	
26	GR7	GRADING PLAN 7	
27	GR8	GRADING PLAN 8	
28	GR9	GRADING PLAN 9	
29	GR10	GRADING PLAN 10	
30	GR11	GRADING PLAN 11	
31	GR12	GRADING PLAN 12	
32	GR13	GRADING PLAN 13	
33	GR14	GRADING PLAN 14	
34	GR15	GRADING PLAN 15	
35	DT1	DETAIL SHEET 1	
36	DT2	DETAIL SHEET 2	
37	DT3	DETAIL SHEET 3	
38	DT4	DETAIL SHEET 4	
39	DT5	DETAIL SHEET 5	
40	DT6	DETAIL SHEET 6	
41	UT1	UTILITY PLAN & PROFILE 1	16+20 TO 13+50
42	UT2	UTILITY PLAN & PROFILE 2	13+50 TO 9+75
43	UT3	UTILITY PLAN & PROFILE 3	82+00 TO 86+00
44	UT4	UTILITY PLAN & PROFILE 4	52+00 TO 82+00
45	UT5	UTILITY PLAN & PROFILE 5	79+50 TO 54+00
46	UT6	UTILITY PLAN & PROFILE 6	54+00 TO 59+00
47	UT7	UTILITY PLAN & PROFILE 7	59+00 TO 64+25
48	UT8	UTILITY PLAN & PROFILE 8	64+25 TO 68+50
49	UT9	UTILITY PLAN & PROFILE 9	68+50 TO 72+80
50	UT10	UTILITY PLAN & PROFILE 10	72+80 TO 77+40
51	UT11	UTILITY PLAN & PROFILE 11	77+40 TO 81+00
52	UT12	UTILITY PLAN & PROFILE 12	81+00 TO 84+20
53	UT13	UTILITY PLAN & PROFILE 13	84+20 TO 87+75
54	UT14	UTILITY PLAN & PROFILE 14	10+00 TO 14+19
55	UT15	UTILITY PLAN & PROFILE 15	10+00 TO 12+20
56	UT16	UTILITY PLAN & PROFILE 16	7+50 TO 4+40.98
57	UT17	UTILITY PLAN & PROFILE 17	7+50 TO 10+00
58	UT18	UTILITY PLAN & PROFILE 18	SEWER LATERAL
59	UT19	UTILITY PLAN & PROFILE 19	SEWER & WATER LATERAL
60	UT20	UTILITY PLAN & PROFILE 20	SEWER & WATER LATERAL
61	UT21	UTILITY PLAN & PROFILE 21	SEWER LATERAL
62	UT22	UTILITY PLAN & PROFILE 22	WATER LATERAL
63	UT23	UTILITY PLAN & PROFILE 23	SEWER LATERAL
64	UT24	UTILITY PLAN & PROFILE 24	WATER LATERAL
65	UT25	UTILITY PLAN & PROFILE 25	SEWER LATERAL
66	UT26	UTILITY PLAN & PROFILE 26	WATER LATERAL
67	UT27	UTILITY PLAN & PROFILE 27	WATER LATERAL
68	UT28	UTILITY PLAN & PROFILE 28	SEWER & WATER LATERAL
69	UT29	UTILITY PLAN & PROFILE 29	SEWER & WATER LATERAL
70	UT30	UTILITY PLAN & PROFILE 30	WATER LATERAL
71	UT31	UTILITY PLAN & PROFILE 31	WATER LATERAL
72	UT32	UTILITY PLAN & PROFILE 32	STORM DRAIN LATERAL
73	UT33	UTILITY PLAN & PROFILE 33	STORM DRAIN LATERAL
74	UT34	UTILITY PLAN & PROFILE 34	STORM DRAIN LATERAL
75	UT35	UTILITY PLAN & PROFILE 35	STORM DRAIN LATERAL
76	UT36	UTILITY PLAN & PROFILE 36	STORM DRAIN LATERAL
77	UT37	UTILITY PLAN & PROFILE 37	STORM DRAIN LATERAL
78	UT38	UTILITY PLAN & PROFILE 38	STORM DRAIN LATERAL
79	UT39	UTILITY PLAN & PROFILE 39	STORM DRAIN LATERAL
80	UT40	UTILITY PLAN & PROFILE 40	STORM DRAIN LATERAL
81	UT41	UTILITY PLAN & PROFILE 41	STORM DRAIN LATERAL
82	UT42	UTILITY PLAN & PROFILE 42	STORM DRAIN LATERAL
83	UT43	UTILITY PLAN & PROFILE 43	STORM DRAIN LATERAL
84	UT44	UTILITY PLAN & PROFILE 44	STORM DRAIN LATERAL
85	UT45	UTILITY PLAN & PROFILE 45	STORM DRAIN LATERAL
86	UT46	UTILITY PLAN & PROFILE 46	STORM DRAIN LATERAL
87	UT47	UTILITY PLAN & PROFILE 47	STORM DRAIN LATERAL
88	UT48	UTILITY PLAN & PROFILE 48	STORM DRAIN LATERAL
89	UT49	UTILITY PLAN & PROFILE 49	STORM DRAIN LATERAL
90	UT50	UTILITY PLAN & PROFILE 50	STORM DRAIN LATERAL
91	UT51	UTILITY PLAN & PROFILE 51	STORM DRAIN LATERAL
92	UT52	UTILITY PLAN & PROFILE 52	STORM DRAIN LATERAL
93	UT53	UTILITY PLAN & PROFILE 53	STORM DRAIN LATERAL
94	TR1	TRAFFIC AND STREET LIGHTING PLAN 1	
95	TR2	TRAFFIC AND STREET LIGHTING PLAN 2	
96	TR3	TRAFFIC AND STREET LIGHTING PLAN 3	
97	TR4	TRAFFIC AND STREET LIGHTING PLAN 4	
98	TR5	TRAFFIC AND STREET LIGHTING PLAN 5	
99	TR6	TRAFFIC AND STREET LIGHTING PLAN 6	
100	SL1	STREET LIGHTING PLAN 1	
101	SL2	STREET LIGHTING PLAN 2	
102	SL3	STREET LIGHTING PLAN 3	
103	SL4	STREET LIGHTING PLAN 4	
104	SL5	STREET LIGHTING PLAN 5	
105	SL6	STREET LIGHTING PLAN 6	
106	TS1	TRAFFIC SIGNAL PLAN 1	
107	TS2	TRAFFIC SIGNAL PLAN 2	
108	TS3	TRAFFIC SIGNAL PLAN 3	
109	TS4	TRAFFIC SIGNAL PLAN 4	
110	TS5	TRAFFIC SIGNAL NOTES	
111	S1	STRUCTURAL SHEET 1	
112	S2	STRUCTURAL SHEET 2	

NOTE:
THIS PROJECT PLAN APPROVAL CONTINGENT ON CON-1573 PLAN APPROVAL / BEING OPERATIONAL.

SUMMERLIN VILLAGE 22 CONSTRUCTION NOTE:
THE FOLLOWING SUMMERLIN VILLAGE 21/VILLAGE 22 ROADWAY INFRASTRUCTURE PLANS ARE TO BE CONSTRUCTED CONCURRENTLY:
1. SUMMERLIN PARKWAY EXTENSION (LVVWD#137706) (PW#20-17228)
2. KETTLE BEND ROAD (LVVWD #137333)

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

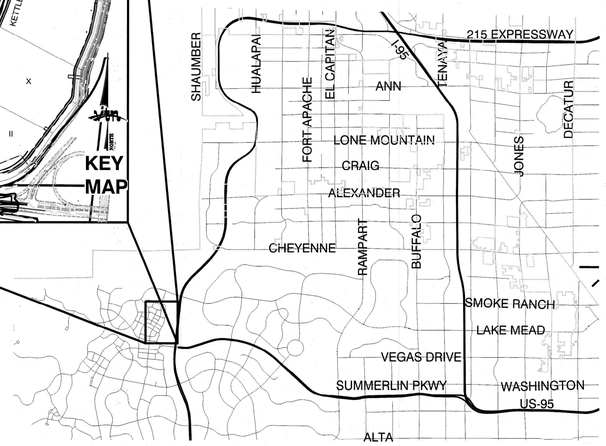
PWDR PRE-CONSTRUCTION NOTE
PRE-DEVELOPMENT MEETING WITH PUBLIC WORKS DEVELOPMENT REVIEW OFF-SITE INSPECTOR REQUIRED.
CONTACT CCPWDR INSPECTIONS SCHEDULING AT 702-455-4610



NORTH

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

APPROVALS

CITY OF LAS VEGAS NEVADA
PLANS APPROVED
BY LAND DEVELOPMENT ON BEHALF OF THE CITY ENGINEERS OFFICE
dguerra
Jul 20 2021
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 THE ADOPTED STANDARDS AND/OR SPECIFICATIONS, EXCEPT THOSE SPECIFICALLY LISTED UNDER DEVIATIONS FROM STANDARD. THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN THE DEVIATIONS FROM STANDARD IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATION, CLARK COUNTY AREA, NEVADA.

CITY OF LAS VEGAS ENGINEERING — DATE

Not Required per INFOR Review 856752

CITY OF LAS VEGAS DEPARTMENT OF PLANNING — DATE

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

REVIEWED BY
LAS VEGAS FIRE & RESCUE
RELEASE FOR INSTALLATION AS SUBMITTED
This review does not constitute permission to violate any City, State, or Federal Laws or Ordinances. Ultimate responsibility for compliance rests with the Owner.
Final acceptance of installation is based upon field inspection and acceptance testing.
REVIEWED BY
pharrison 05/25/2021

LAS VEGAS FIRE & RESCUE — DATE

Brad Hester 5-24-21
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."

Barbara Garrison 5.4.2021
B.Garrison
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.

Eric Klette 5-4-2021
COX COMMUNICATIONS LAS VEGAS, INC. — DATE

JORDYN PENNIMAN 2020JNP15483 09/30/2020
SOUTHWEST GAS CORPORATION SWG UID DATE

OWNER/DEVELOPER

5/3/21
BRIAN WALSH, VICE PRESIDENT — DATE

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY

APPROVED FOR CONSTRUCTION

Mao Fang
LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT:137333 FIRST APPROVED DATE: 06/02/2021

LVVWD APPROVED FIRE FLOW: TOTAL 1,500 GPM / ONSITE N/A GPM
SHEETS: 1, 2, 14-16, 35, 40-93

BASIS OF BEARING

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

LINEAR UNIT: US SURVEY FOOT (FTUS)

DATUM (REFERENCE FRAME): NAD 83 (2011) EPOCH 2010.00

SYSTEM: NEVADA COORDINATE REFERENCE SYSTEM (NCRS)

ZONE: LAS VEGAS HIGH ELEVATION ZONE

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

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

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

BENCHMARK

PROJECT DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

CITY OF LAS VEGAS BENCHMARK: D368 (REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS (3,246.63 FEET)

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

FOR CIVIL PLAN SHEETS 1, 2, 14-93 (CV, NT, MUTW, MUTSS, MUTSD, MGR 1-3, GR 1-15, DT 1-6, UT 1-53)	FOR HORIZONTAL CONTROL PLAN SHEETS 3-13 (HC1-11)	FOR TRAFFIC PLAN SHEETS 94-110 (TR 1-6, SL 1-6, TS 1-5)	FOR STRUCTURAL PLAN SHEETS 111-112 (S1-S2)

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.

Mao Fang — Digitally signed by Mao Fang, DN: C=US, E=Mao.fang@lvvwd.com, O=Las Vegas Valley Water District, OU=Planning and Engineering Services, CN=Mao Fang, Date: 2021.06.22 05:39:06+07'00'

Mao Fang — Digitally signed by Mao Fang, DN: C=US, E=Mao.fang@lvvwd.com, O=Las Vegas Valley Water District, OU=Planning and Engineering Services, CN=Mao Fang, Date: 2021.07.15 07:44:09+07'00'

REV	DATE	BY	REVISION
1	7-07-21	BCC	SEWER REVISION TO APPROVED LVVWD PLAN
		MF	LVVWD
			07/15/2021

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

CITY OF LAS VEGAS

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

COVER SHEET

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

DRAWN BY:	DESIGNED BY:	CHECKED BY:	PROJECT NO:
BCC 05/28/2019	BCC 05/28/2019	MJM 11/20/2020	7881

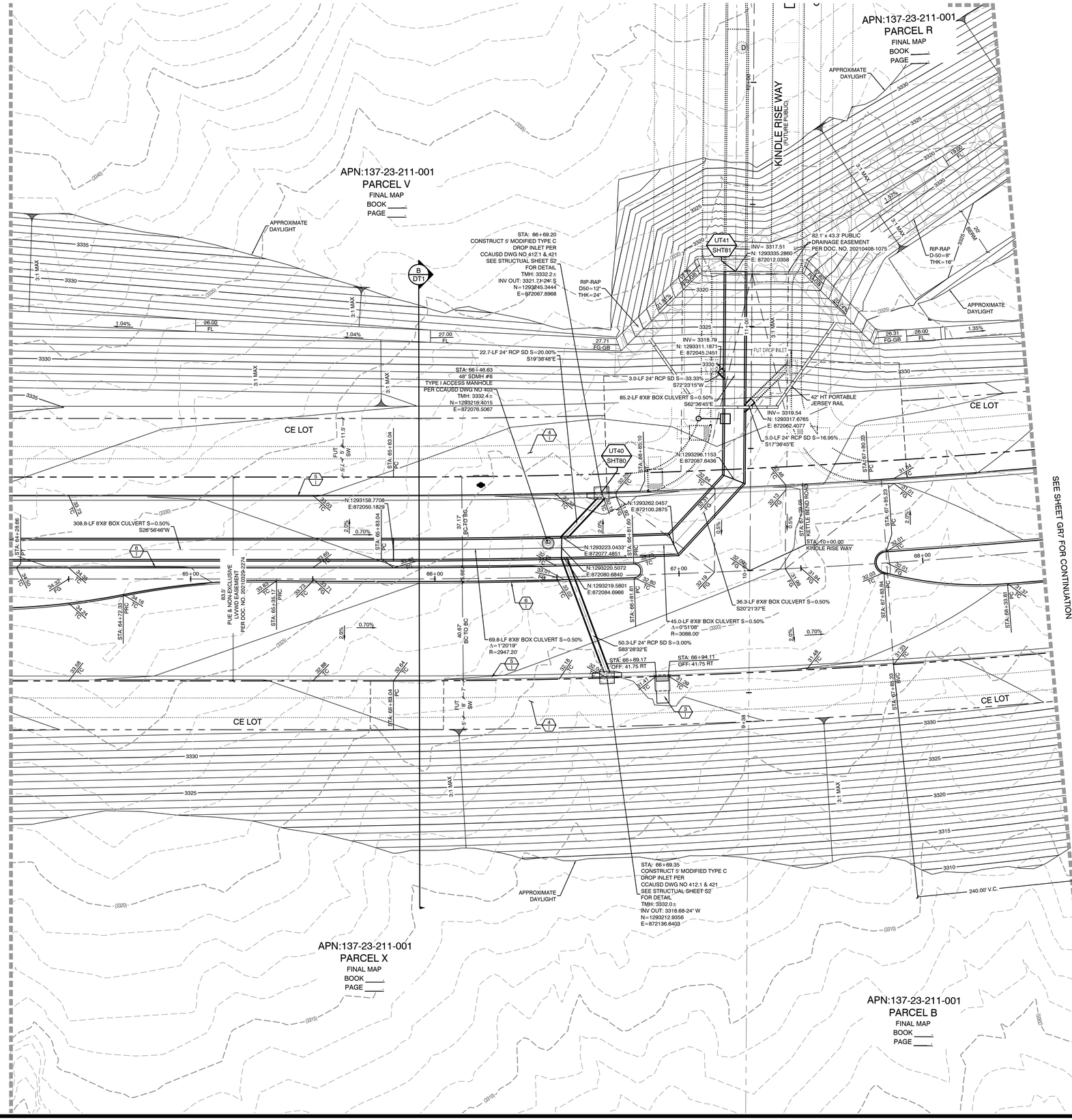
SCALE: — HORIZ. N/A VERT.

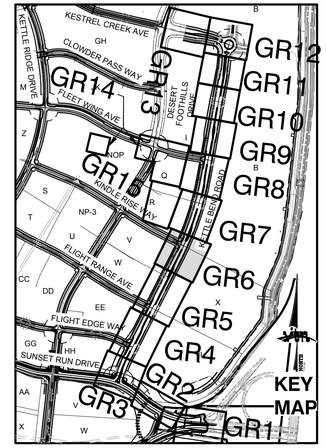
PROFESSIONAL ENGINEER STATE OF NEVADA
DAVID J. EDWARDS
EXP: 12/31/21
No. 17860
05/04/2021

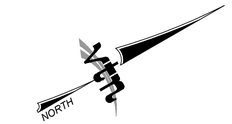
SHEET
CV
1 OF 112 SHEETS

DRAWING NO.
PW20-20781
107V8449, L20-01282

H:\7881\Kettle Bend Road\Sheet Set\7881 CV.dwg 6/28/2021 4:44 PM Acampbell







CONSTRUCTION NOTES

1. FUTURE 24' TYPE "L" CURB & GUTTER
2. FUTURE TYPE "A" CURB
3. FUTURE HANDICAP RAMP
4. FUTURE SIDEWALK
5. CONSTRUCT 24" TYPE "L" CURB & GUTTER PER STD. DWG. 216.
6. CONSTRUCT TYPE "A" CURB PER STD. DWG. 219.
7. CONSTRUCT HANDICAP RAMP SEE DETAIL ON SHEET DT 2, 3, 4 & 5
8. SAWCUT AND REMOVE ASPHALT PAVING AND MATCH WITH NEW CONSTRUCTION PER CCAUSD #500.5 & #503.
9. FIELD VERIFY AND MATCH EXISTING
10. CONSTRUCT APRON CURB SEE SHEET DT1

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

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

GEOTECHNICAL NOTE:

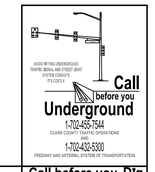
REFER TO SOILS REPORT: NOVA GEOTECHNICAL PROJECT #G-18-176, DATED DECEMBER 30, 2019

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.

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.





Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811
OR
1-800-642-2444
AND
1-702-455-7544
CLARK COUNTY TRAFFIC OPERATIONS

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE WITH CITY OF LAS VEGAS, #DS05004

DAVID L EDWARDS , P.E. No. 17860 DATE 05/13/2021

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
702-791-4000

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

GRADING PLAN 6

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

DRAWN BY: BCC	06/25/2020	SCALE: 1"=20'	HORIZ
DESIGNED BY: BCC	06/25/2020		VERT: N/A
CHECKED BY: MJM	11/20/2020		
PROJECT NO: 7961			

PROFESSIONAL ENGINEER STATE OF NEVADA DAVID L EDWARDS No. 17860 CIVIL
05/13/2021

SHEET
GR6
25 OF **112** SHEETS

DRAWING NO.
PW20-20781
107V8449, L20-01282

H:\7961 Kettle Bend Road\Sheet Set\7961 GR6-1.dwg-4/21/2021 8:02 AM drew.olson

SEE SHEET GR15 FOR CONTINUATION

SEE SHEET GR6 FOR CONTINUATION

SEE SHEET GR8 FOR CONTINUATION

APN:137-23-211-001
PARCEL R
FINAL MAP
BOOK ____.
PAGE ____.

APN:137-23-211-001
PARCEL B
FINAL MAP
BOOK ____.
PAGE ____.

RIP-RAP D50=8" THK=16"

RIP-RAP D50=12" THK=24"

APPROXIMATE DAYLIGHT

STA: 71+93.32
60" SDMH #8
TYPE III ACCESS MANHOLE
PER CCAUSD DWG NO 406
TMH: 3320.9 ±
INV IN: 3304.01-36" W
INV IN: 3304.01-24" S
INV OUT: 3304.01-36" N
N=1293723.9266
E=872271.7843

STA: 71+11.09
CONSTRUCT 5' MODIFIED TYPE C
DROP INLET PER
CCAUSD DWG NO 412.1 & 421
SEE STRUCTUAL SHEET S2
FOR DETAIL
TMH: 3323.1 ±
INV OUT: 3305.97-24" E
N=1293652.2357
E=872226.2906

STA: 71+15.29
60" SDMH #7
TYPE III ACCESS MANHOLE
PER CCAUSD DWG NO 406
TMH: 3323.1 ±
INV IN: 3305.07-24" W
INV IN: 3305.07-24" SE
INV OUT: 3305.07-24" N
N=1293649.8308
E=872248.2358

STA: 71+08.41
CONSTRUCT 5' MODIFIED TYPE C
DROP INLET PER
CCAUSD DWG NO 412.1 & 421
SEE STRUCTUAL SHEET S2
FOR DETAIL
TMH: 3323.1 ±
INV OUT: 3310.33-24" NW
N=1293627.1871
E=872298.0943

INV= 3307.82
N: 1293750.3527
E: 872177.5586

67' x 37.1' PUBLIC DRAINAGE EASEMENT PER DOC. NO. 20210408-1075

42" HT PORTABLE JERSEY RAIL

FUTURE PARCEL ENTRY

CE LOT

97.9-LF 30" RCP SD S=3.90% ±
S74°20'01"E

20.0-LF 24" RCP SD S=4.51%
N84°55'34"W

77.7-LF 24" RCP SD S=1.37%
S17°37'51"W

142.0-LF 36" RCP SD S=1.37%
S13°37'26"W

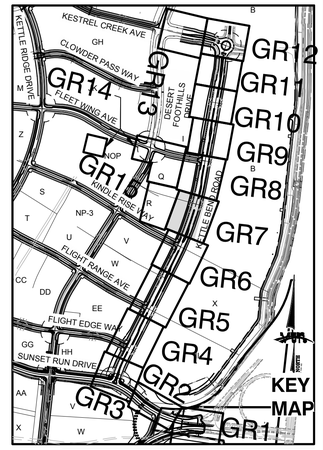
52.6-LF 24" RCP SD S=10.00%
S65°16'45"E

220.00' V.C.

240.00' V.C.

PUE & NON-EXCLUSIVE LVWD EASEMENT PER DOC. NO. 20050609-2274

KEY MAP





GRAPHIC SCALE

-20 0 10 20 40

1" = 20'

CONSTRUCTION NOTES

1. FUTURE 24" TYPE "L" CURB & GUTTER
2. FUTURE TYPE "A" CURB
3. FUTURE HANDICAP RAMP
4. FUTURE SIDEWALK
5. CONSTRUCT 24" TYPE "L" CURB & GUTTER PER STD. DWG. 216.
6. CONSTRUCT TYPE "A" CURB PER STD. DWG. 219.
7. CONSTRUCT HANDICAP RAMP SEE DETAIL ON SHEET DT 2, 3, 4 & 5
8. SAWCUT AND REMOVE ASPHALT PAVING AND MATCH WITH NEW CONSTRUCTION PER CCAUSD #500.5 & #503.
9. FIELD VERIFY AND MATCH EXISTING
10. CONSTRUCT APRON CURB SEE SHEET DT1

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

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GEOTECHNICAL NOTE:

REFER TO SOILS REPORT: NOVA GEOTECHNICAL PROJECT #G-18-176, DATED DECEMBER 30, 2019

SIGHT VISIBILITY ZONES:

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AVOID HITTING UNDERGROUND TRAFFIC SIGNAL AND ITS/ITS JOINT SYSTEM CONDUITS. IT'S DISTRICT

Call before you Underground
1-702-455-7544
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

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Avoid cutting underground utility lines. It's costly.
CALL 811
OR
1-800-642-2444
AND
1-702-455-7544
CLARK COUNTY TRAFFIC OPERATIONS

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

05/13/2021
DAVID L EDWARDS , P.E. No. 17860 DATE

REV	DATE	BY	REVISION

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

CITY OF LAS VEGAS

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

GRADING PLAN 7

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

DRAWN BY: BCC 08/25/2020
DESIGNED BY: BCC 08/25/2020
CHECKED BY: MJM 11/20/2020
SCALE: 1"=20' HORIZ. N/A VERT.
PROJECT NO: 7861

PROFESSIONAL ENGINEER - STATE OF NEVADA
DAVID L. EDWARDS
No. 17860
CIVIL
05/13/2021

SHEET
GR7
26 OF 112 SHEETS

DRAWING NO.
PW20-20781
107V8449, L20-01282

H:\7861-Kettle Bend Road\Sheet Set\7861 GRD-1.dwg-4/21/2021 8:02 AM-drew.dixon





NORTH

GRAPHIC SCALE

-20 0 10 20 40

1" = 20'

CONSTRUCTION NOTES

1. FUTURE 24" TYPE "L" CURB & GUTTER
2. FUTURE TYPE "A" CURB
3. FUTURE HANDICAP RAMP
4. FUTURE SIDEWALK
5. CONSTRUCT 24" TYPE "L" CURB & GUTTER PER STD. DWG. 216.
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7. CONSTRUCT HANDICAP RAMP SEE DETAIL ON SHEET DT 2, 3, 4 & 5
8. SAWCUT AND REMOVE ASPHALT PAVING AND MATCH WITH NEW CONSTRUCTION PER CCAUSD #500.5 & #503.
9. FIELD VERIFY AND MATCH EXISTING
10. CONSTRUCT APRON CURB SEE SHEET DT1

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

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GEOTECHNICAL NOTE:

REFER TO SOILS REPORT: NOVA GEOTECHNICAL PROJECT #G-18-176, DATED DECEMBER 30, 2019

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FS-0200-X

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CLARK COUNTY TRAFFIC OPERATIONS
AND
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OR
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AND
1-702-455-7544
CLARK COUNTY TRAFFIC OPERATIONS

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

DAVID L EDWARDS , P.E. No. 17860 — DATE 05/13/2021

REV	DATE	BY	REVISION

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

CITY OF LAS VEGAS

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
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CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

GRADING PLAN 8

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

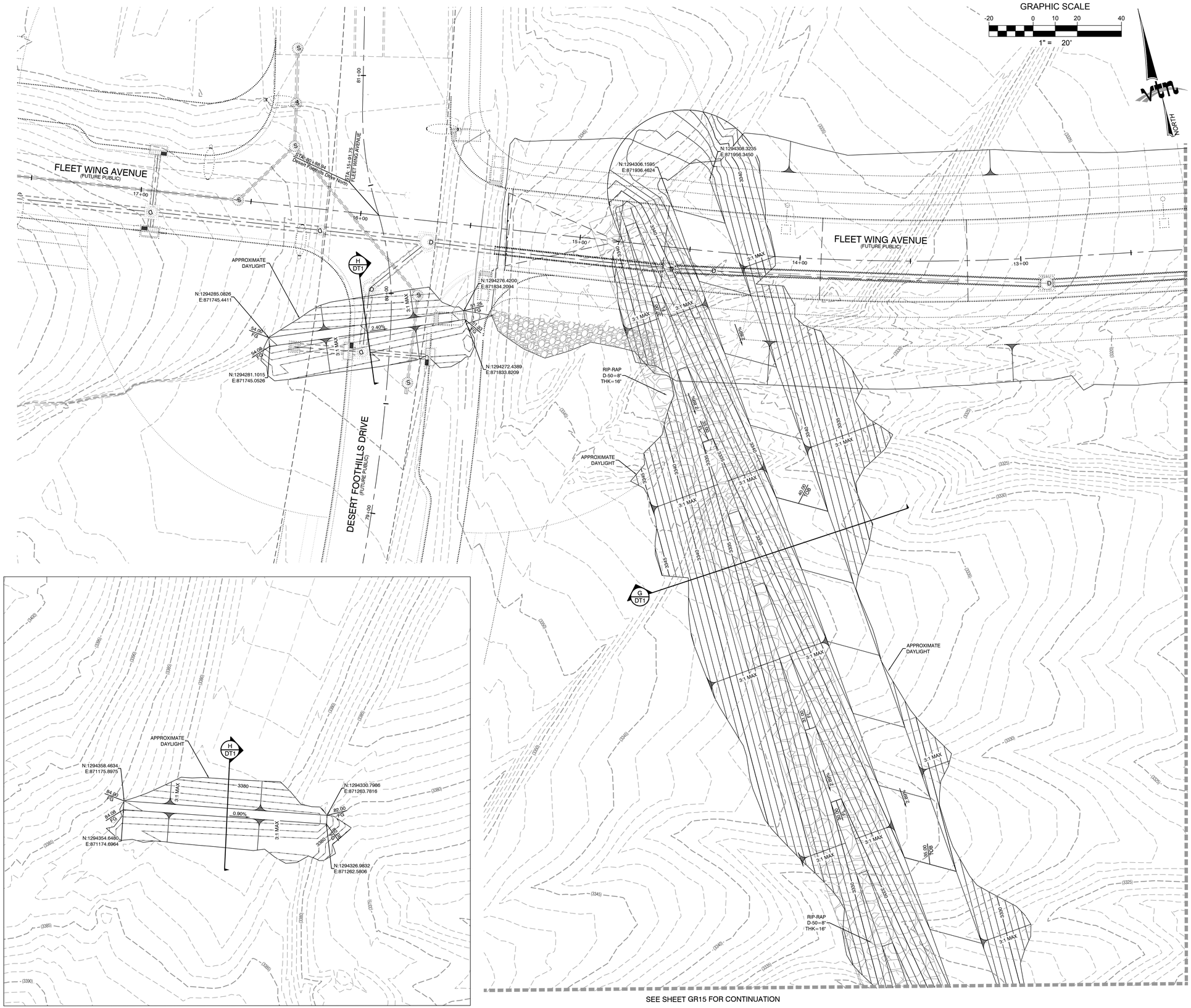
DRAWN BY:	DESIGNED BY:	CHECKED BY:	PROJECT NO:	SCALE:	HORIZ.
BCC 08/25/2020	BCC 08/25/2020	JMR 11/23/2020	7981	1"=20'	VERT. N/A

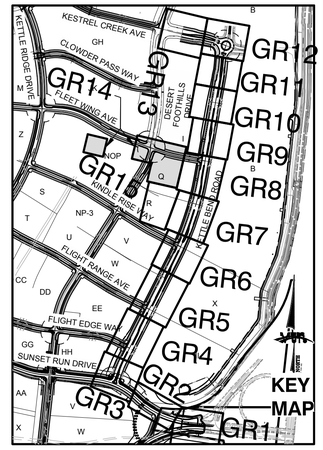
NATIONAL ENGINEER-STATE OF NEVADA DAVID L EDWARDS No. 17860 CIVIL
05/13/2021

SHEET
GR8
27 OF 112 SHEETS

DRAWING NO.
PW20-20781
107V8449, L20-01282

H:\7981\Kettle Bend Road\Sheet Set\7981_GR0-2.dwg 4/21/2021 9:02 AM drew.dixon





CONSTRUCTION NOTES

1. FUTURE 24" TYPE "L" CURB & GUTTER
2. FUTURE TYPE "A" CURB
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4. FUTURE SIDEWALK
5. CONSTRUCT 24" TYPE "L" CURB & GUTTER PER STD. DWG. 216.
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9. FIELD VERIFY AND MATCH EXISTING
10. CONSTRUCT APRON CURB SEE SHEET DT1

STORM DRAIN DROP INLET NOTE:

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OFFSITE FLOOD CONTROL NOTE:

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OR
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1-702-455-7544
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DAVID L EDWARDS , P.E. No. 17860 — DATE 05/13/2021

REV	DATE	BY	REVISION

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

CITY OF LAS VEGAS

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
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GRADING PLAN 14

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

DRAWN BY: BCC	08/25/2020	SCALE:	HORIZ. 1"=20'
DESIGNED BY: BCC	08/25/2020		VERT. N/A
CHECKED BY: JuM	11/20/2020		
PROJECT NO: 7861			

NATIONAL ENGINEER-SAMPLE
DAVID L. EDWARDS
No. 17860
CIVIL
REGISTERED PROFESSIONAL ENGINEER
05/13/2021

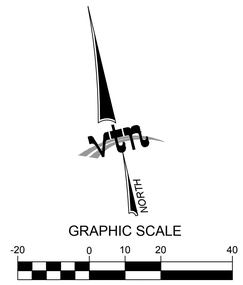
SHEET
GR14
33 OF **112** SHEETS

DRAWING NO.
PW20-20781
107/8449, L20-01282

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SEE SHEET GR12 FOR CONTINUATION

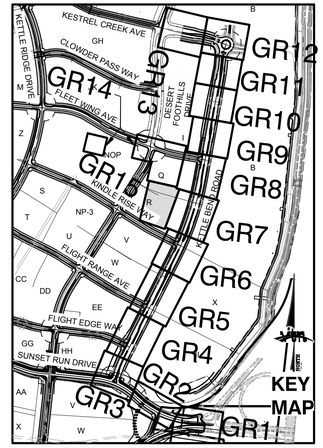




GRAPHIC SCALE

-20 0 10 20 40

1" = 20'



CONSTRUCTION NOTES

1. FUTURE 24" TYPE "L" CURB & GUTTER
2. FUTURE TYPE "A" CURB
3. FUTURE HANDICAP RAMP
4. FUTURE SIDEWALK
5. CONSTRUCT 24" TYPE "L" CURB & GUTTER PER STD. DWG. 216.
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8. SAWCUT AND REMOVE ASPHALT PAVING AND MATCH WITH NEW CONSTRUCTION PER CCAUSD #500.5 & #503.
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STORM DRAIN DROP INLET NOTE:

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OFFSITE FLOOD CONTROL NOTE:

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AND
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CLARK COUNTY TRAFFIC OPERATIONS

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

05/13/2021

DAVID L EDWARDS , P.E. No. 17860 DATE

REV	DATE	BY	REVISION

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

CITY OF LAS VEGAS

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

GRADING PLAN 15

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

DRAWN BY: BCC	06/25/2020	SCALE:	1"=20' HORZ. N/A VERT.
DESIGNED BY: BCC	08/25/2020		
CHECKED BY: MJM	11/20/2020		
PROJECT NO: 7861			

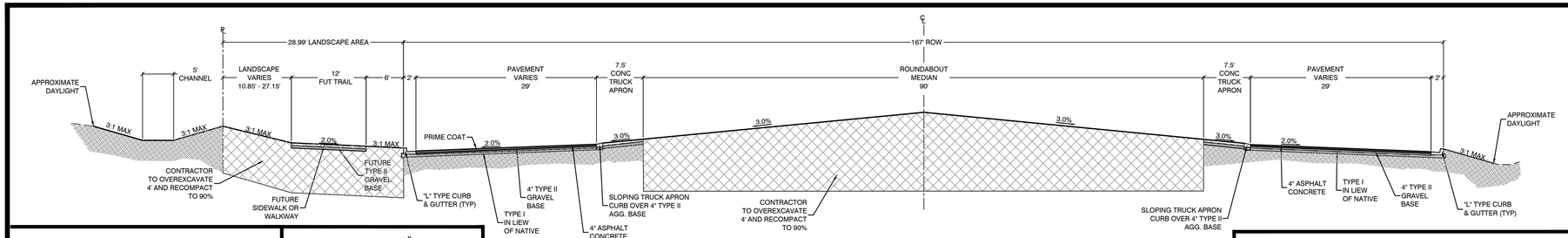


05/13/2021

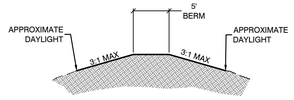
SHEET
GR15
34 OF **112** SHEETS

DRAWING NO
PW20-20781
107V8449, L20-01282

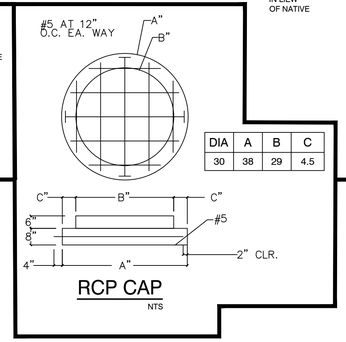
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D DT1 ROUND-A-BOUT SECTION
NTS

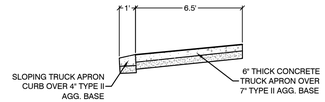


H DT1 BERM DETAIL
NTS

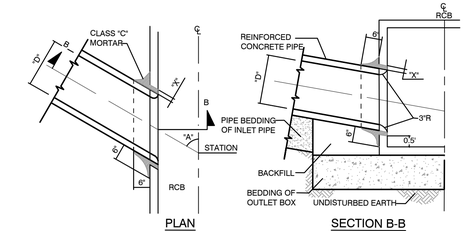


DIA	A	B	C
30	38	29	4.5

RCP CAP
NTS



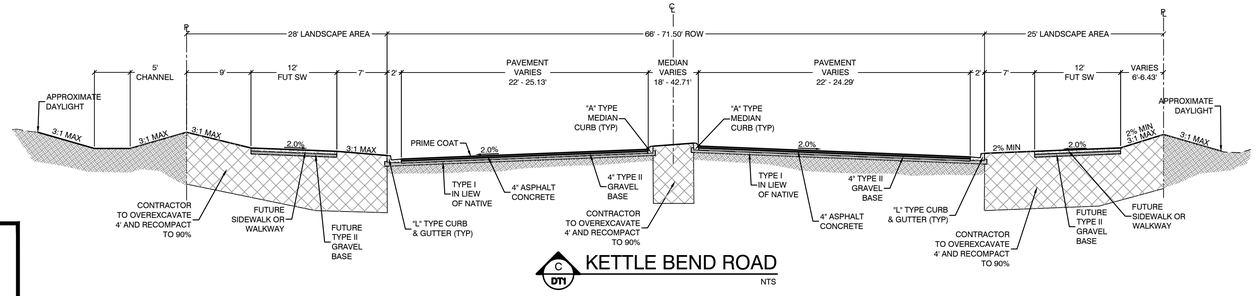
TRUCK APRON BLOW-UP
NTS



NOTES:

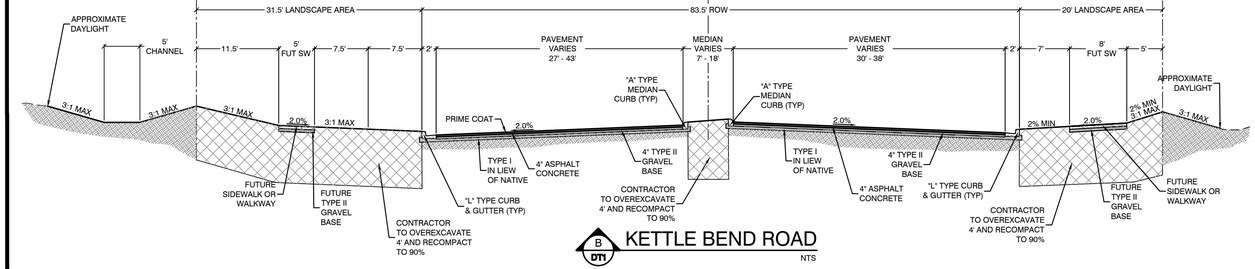
1. SEE PLAN FOR ANGLE "A"
2. DIMENSION "X" SHALL BE 2" MINIMUM AND 4" MAXIMUM
3. BURN OR CHIP END OF INLET PIPE FLUSH WITH INNER SURFACE OF MAINLINE. ROUND EDGES OF MAINLINE AND INLET PIPE.

RCB PENETRATION DETAIL
NTS

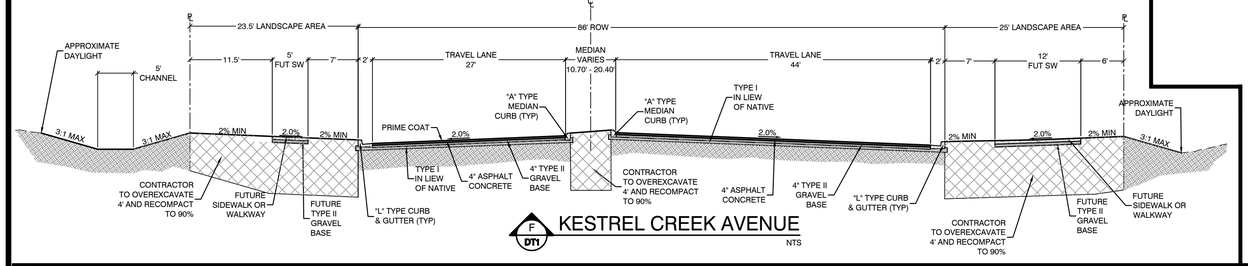


C DT1 KETTLE BEND ROAD
NTS

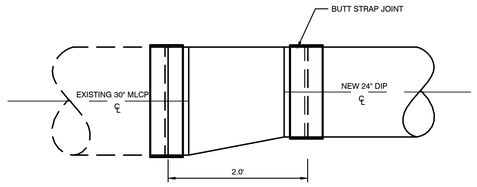
E DT1 KESTREL CREEK AVENUE
NTS



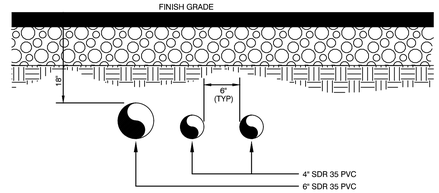
B DT1 KETTLE BEND ROAD
NTS



F DT1 KESTREL CREEK AVENUE
NTS

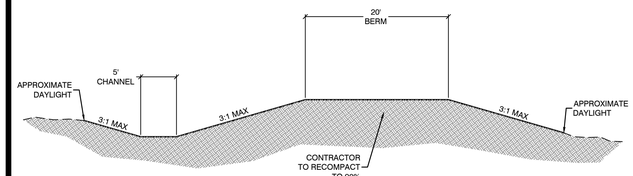


CONNECTION WITH ECCENTRIC REDUCER
NTS

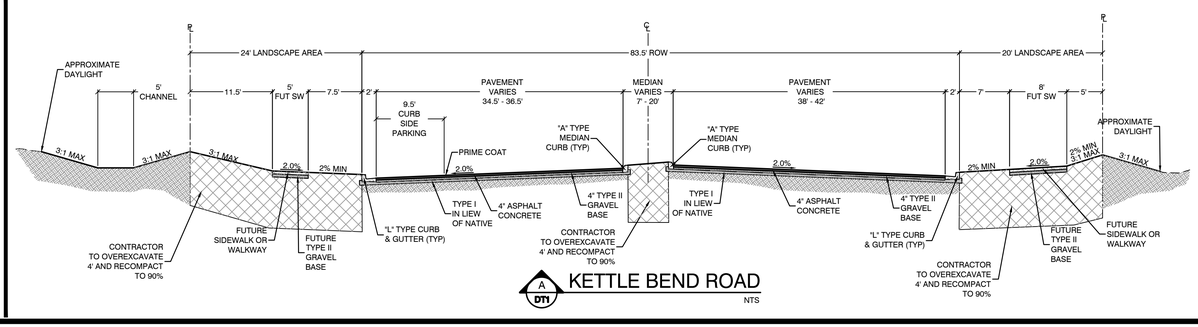


NOTE:
CONTRACTOR TO EXTEND SLEEVES 1' (12") BEHIND BACK OF CURB, TYP.

IRRIGATION SLEEVE BANK
SCALE: N.T.S.



G DT1 TYPICAL GRADING SECTION
NTS



A DT1 KETTLE BEND ROAD
NTS

APPROVED FOR CONSTRUCTION

Mao Fang

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT: 137333 FIRST APPROVED DATE: 06/02/2021

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
702-791-4000

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

DETAIL SHEET 1

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

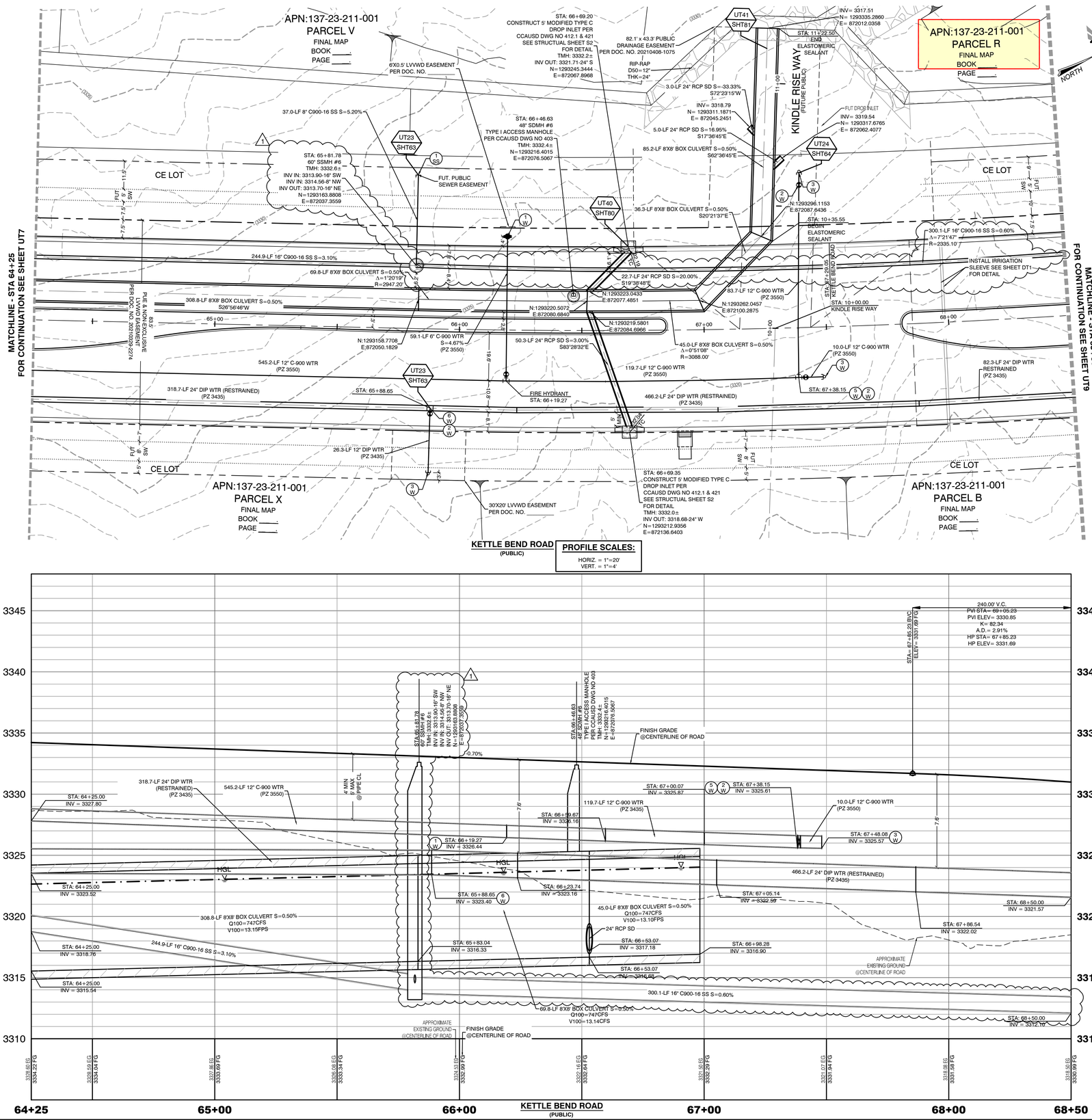
DRAWN BY:	06/04/2019
	BCC
DESIGNED BY:	06/04/2019
	BCC
CHECKED BY:	11/23/2020
	MJM
PROJECT NO:	
	7961
SCALE:	— HORIZ
	N/A VERT

NATIONAL ENGINEER STATE OF NEVADA DAVID J. EDWARDS No. 17850 CIVIL PROFESSIONAL
05/13/2021

SHEET
DT1
35 OF **112** SHEETS

DRAWING NO.
PW20-20781
107V8449, L20-01282

H:\7961\Kettle Bend Road\Sheet Set\7961 DT.dwg,4/21/2021 11:34 AM,drew.dixon



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

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3435 & 3550 PRESSURE ZONES.

DROP INLET SEPARATION NOTE

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

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.

WATER MAIN JOINT DEFLECTION

WATER MAIN JOINT DEFLECTION, PER UDACS 2.07.01 AND 2.07.03.

WATERLINE TRENCH NOTE:

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

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.

CONTRACTOR NOTE:

LVVWD CANNOT GUARANTEE A WATERTIGHT SHUTDOWN WHERE CONNECTIONS OR REPAIRS TO EXISTING FACILITIES ARE REQUIRED. THE CONTRACTOR SHALL ENSURE ALL LABOR AND EQUIPMENT IS AVAILABLE TO REMOVE REMAINING WATER. COORDINATION WITH INSPECTION DIVISION MUST TAKE PLACE PRIOR TO ANY TRIAL SHUTDOWN.

CONTRACTOR TO INSTALL TEMPORARY SERVICE TO ENSURE PROPER SHUTDOWN IN THE EVENT NO OTHER APPURTENANCES ARE AVAILABLE.

LVVWD EXISTING FACILITIES NOTE:

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NOTE:

5' MINIMUM HORIZONTAL SEPARATION FROM OUTSIDE EDGE OF THE WATER MAIN TO OUTSIDE EDGE OF DROP INLET

WATER LINE MARKER BALLS NOTE

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

FIRE HYDRANT MARKER NOTES

BLUE COLORED REFLECTIVE RAISED
PAVEMENT MARKERS ARE TO BE INSTALLED:

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

TO ENSURE LVVWD ACCESS WITHIN EASEMENT

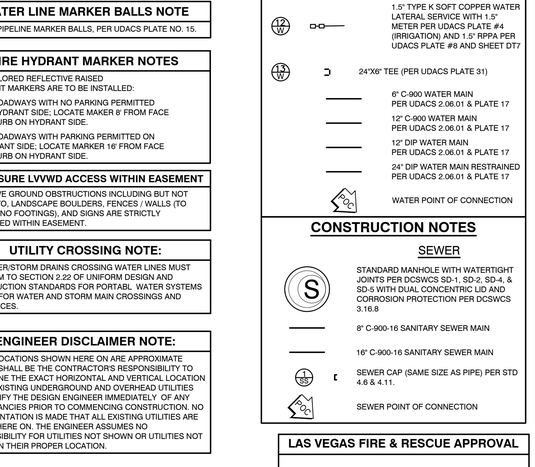
ALL ABOVE GROUND OBSTRUCTIONS INCLUDING BUT NOT LIMITED TO, LANDSCAPE BOULDERS, FENCES / WALLS (TO INCLUDE NO FOOTINGS), AND SIGNS ARE STRICTLY PROHIBITED WITHIN EASEMENT.

UTILITY CROSSING NOTE:

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ENGINEER DISCLAIMER NOTE:

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



CONSTRUCTION NOTES

WATER

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2 W	12" GATE VALVE (PER UDACS PLATE 30 & 39)
3 W	12" CAP & BLOW OFF (PER UDACS PLATE 36)
4 W	24" CAP & BLOW OFF (PER UDACS PLATE 36)
5 W	12"X12" TEE (PER UDACS PLATE 31)
6 W	24"X12" TEE (PER UDACS PLATE 31)
7 W	24° 5' BEND (PER UDACS PLATE 31)
8 W	24° 11" BEND (PER UDACS PLATE 31)
9 W	24° 22' BEND (PER UDACS PLATE 31)
10 W	12° 45' BEND (PER UDACS PLATE 31)
11 W	12° 5' BEND (PER UDACS PLATE 31)
12 W	1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" METER PER UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #8 AND SHEET DT7
13 W	24"X6" TEE (PER UDACS PLATE 31)
	6" C-900 WATER MAIN PER UDACS 2.06.01 & PLATE 17
	12" C-900 WATER MAIN PER UDACS 2.06.01 & PLATE 17
	12" DIP WATER MAIN PER UDACS 2.06.01 & PLATE 17
	24" DIP WATER MAIN RESTRAINED PER UDACS 2.06.01 & PLATE 17
POC	WATER POINT OF CONNECTION

CONSTRUCTION NOTES

SEWER

S	STANDARD MANHOLE WITH WATERTIGHT JOINTS PER DCSWCS SD-1, SD-2, SD-4, & SD-5 WITH DUAL CONCENTRIC LID AND CORROSION PROTECTION PER DCSWCS 3.16.8
	8" C-900-16 SANITARY SEWER MAIN
	16" C-900-16 SANITARY SEWER MAIN
SS	SEWER CAP (SAME SIZE AS PIPE) PER STD 4.6 & 4.11.
POC	SEWER POINT OF CONNECTION

LAS VEGAS FIRE & RESCUE APPROVAL

REVIEWED BY
LAS VEGAS FIRE & RESCUE

RELEASE FOR INSTALLATION AS SUBMITTED

This review does not constitute permission to violate any City, State, or Federal Laws or Ordinances. Ultimate responsibility for compliance rests with the Owner.

Final acceptance of installation is based upon field inspection and acceptance testing.

REVIEWED BY
pharrison 07/13/2021

BY: _____ DATE: _____

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1,500 GPM AT 20 P.S.I. RESIDUAL.

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

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811
OR
1-800-642-2444
AND
1-702-455-7544
CLARK COUNTY TRAFFIC OPERATIONS

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL AND STREET LIGHT SYSTEM CONDUITS (TYP.)
Call before you Underground
1-702-455-7544
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

APPROVED FOR CONSTRUCTION

Mao Fang 07/15/2021

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT:137333 FIRST APPROVED DATE: 06/02/2021

REV	DATE	BY	REVISION
1	7-07-21	BCC	SEWER REVISION TO APPROVED LVVWD PLAN

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

CITY OF LAS VEGAS

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

UTILITY PLAN & PROFILE 8
64+25 TO 68+50

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

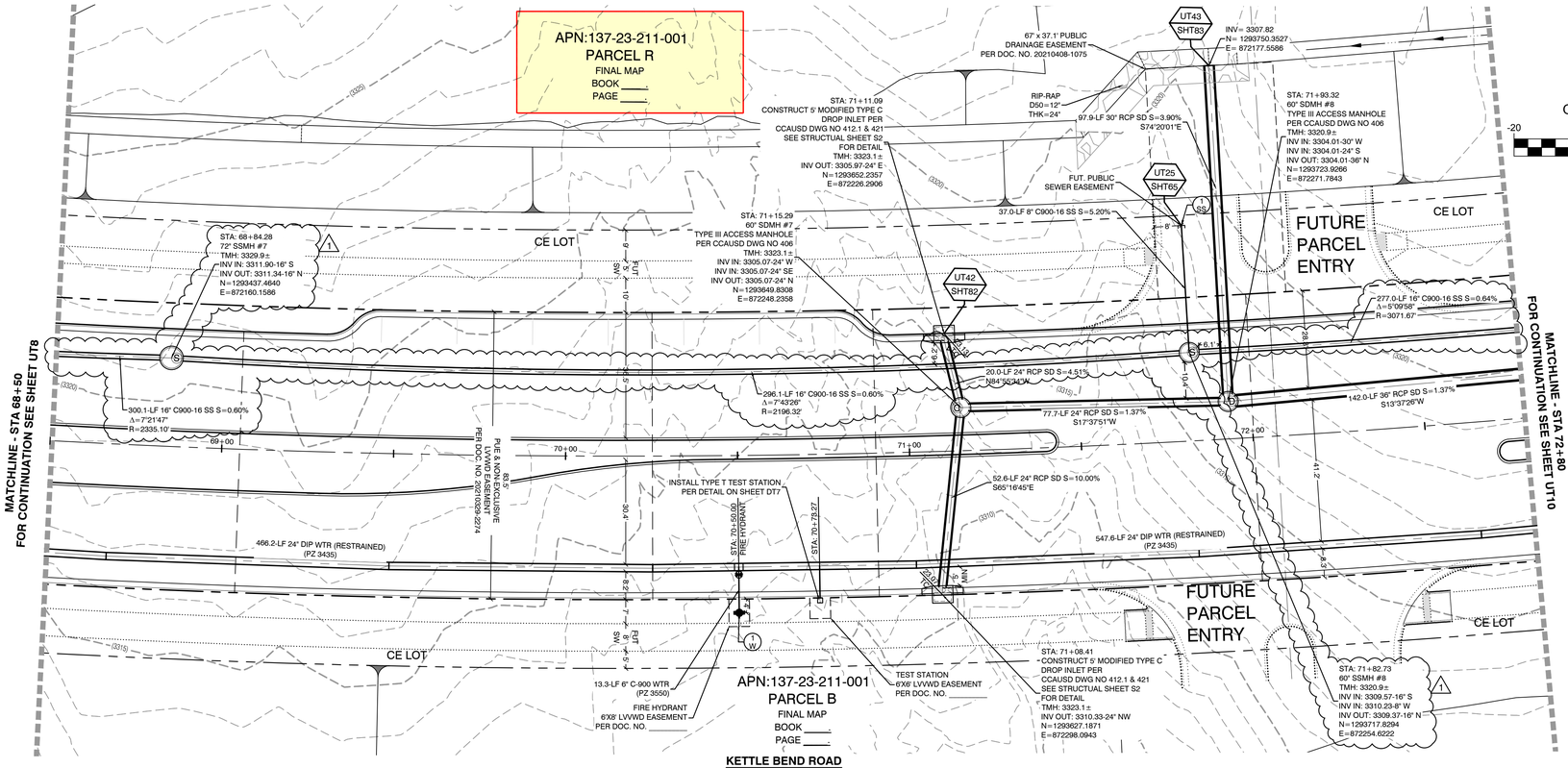
DRAWN BY: BCC 05/28/2019
DESIGNED BY: BCC 05/28/2019
CHECKED BY: MJM 11/20/2020
PROJECT NO: 7861
SCALE: HORIZ. 1"=20' VERT. 1"=4"

PROFESSIONAL ENGINEER-STATE OF NEVADA
MICHAEL J. MARCHESE
EXP: 12/31/22
CIVIL
No. 17860
07/12/2021

SHEET
UT8
48 OF 112 SHEETS

DRAWING NO.
PW20-20781
107V8449, L20-01282

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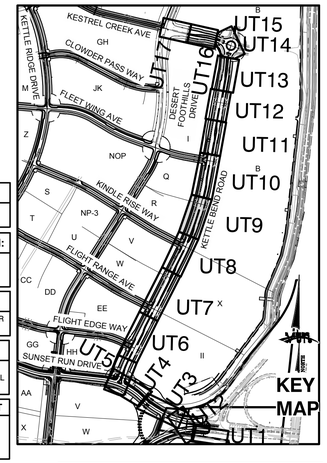
PROFILE SCALES:

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

GRAPHIC SCALE

-20 0 10 20 40

1" = 20'



WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3435 & 3550 PRESSURE ZONES.

DEPTH OF COVER DURING CONSTRUCTION:

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NOTE:

5' MINIMUM HORIZONTAL SEPARATION FROM OUTSIDE EDGE OF THE WATER MAIN TO OUTSIDE EDGE OF DROP INLET

WATER LINE MARKER BALLS NOTE

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

FIRE HYDRANT MARKER NOTES

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WATER MAIN JOINT DEFLECTION

WATER MAIN JOINT DEFLECTION, PER UDACS 2.07.01 AND 2.07.03.

UTILITY CROSSING NOTE:

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

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7 W		24" 5° BEND (PER UDACS PLATE 31)
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11 W		12" 5° BEND (PER UDACS PLATE 31)
12 W		1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" METER PER UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #8 AND SHEET DT7
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		WATER POINT OF CONNECTION

SEWER

S		STANDARD MANHOLE WITH WATERTIGHT JOINTS PER DCSWCS SD-1, SD-2, SD-4, & SD-5 WITH DUAL CONCENTRIC LID AND CORROSION PROTECTION PER DCSWCS 3.16.8
		8" C-900-16 SANITARY SEWER MAIN
		16" C-900-16 SANITARY SEWER MAIN
15 S		SEWER CAP (SAME SIZE AS PIPE) PER STD 4.6 & 4.11.
4 S		SEWER POINT OF CONNECTION

LAS VEGAS FIRE & RESCUE APPROVAL

REVIEWED BY
LAS VEGAS FIRE & RESCUE

RELEASE FOR INSTALLATION AS SUBMITTED

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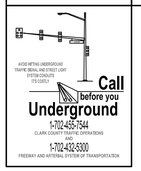
REVIEWED BY
pbattison 07/13/2021

BY: _____ DATE: _____

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1,500 GPM AT 20 P.S.I. RESIDUAL.



Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL
811
OR
1-800-642-2444
AND
1-702-455-7544
CLARK COUNTY TRAFFIC OPERATIONS



APPROVED FOR CONSTRUCTION

Mao Fang 07/15/2021

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT:137333 FIRST APPROVED DATE: 06/02/2021

REV	DATE	BY
1	7-07-21	BCC

REVISION
SEWER REVISION TO APPROVED LVVWD PLAN

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

CITY OF LAS VEGAS

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

UTILITY PLAN & PROFILE 9
68+50 TO 72+80

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

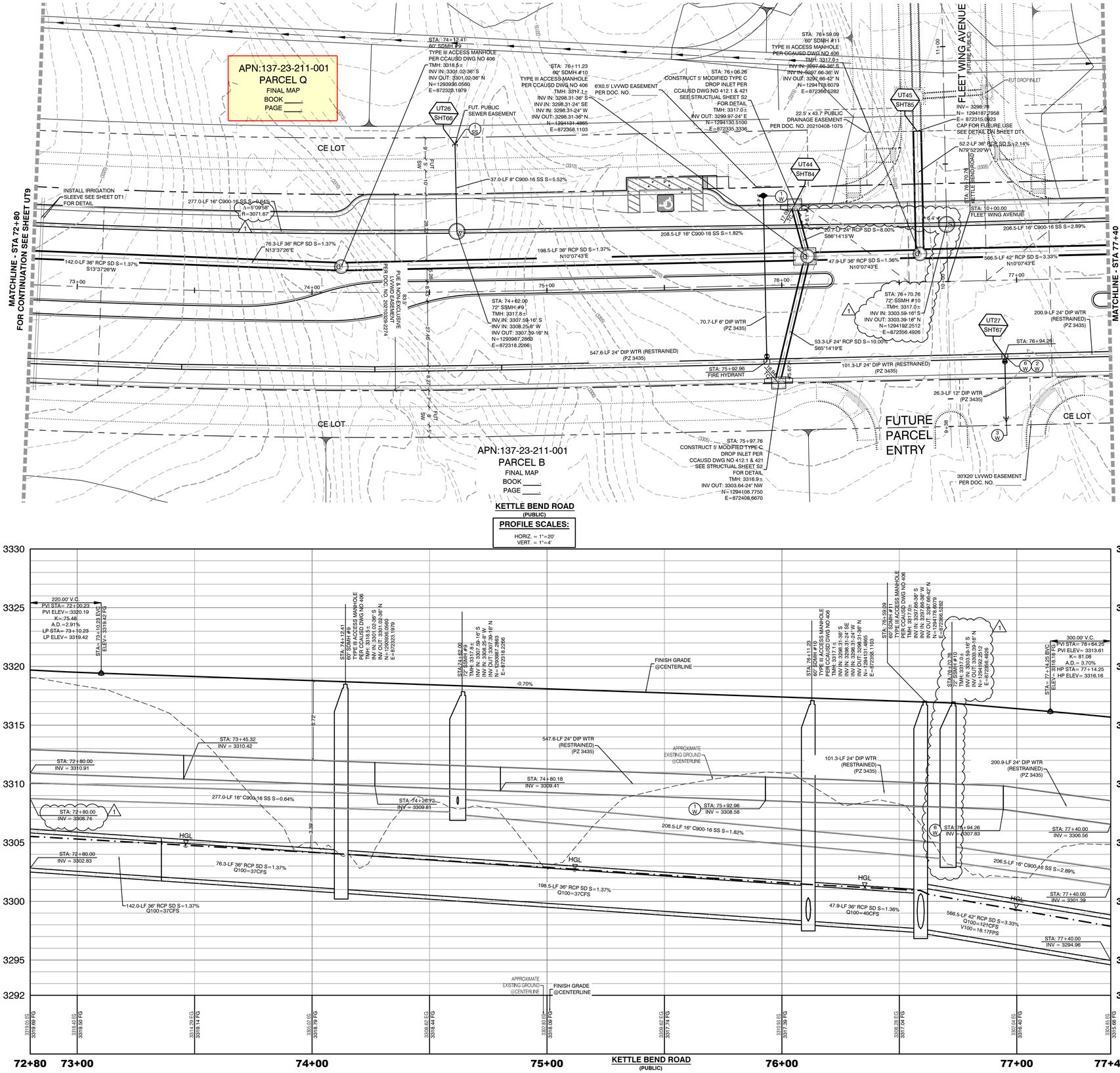
DRAWN BY: BCC 06/28/2019
DESIGNED BY: BCC 06/28/2019
CHECKED BY: MAM 11/20/2020
PROJECT NO: 7861
SCALE: HORIZ. 1"=20' VERT. 1"=4"

PROFESSIONAL ENGINEER STATE OF NEVADA MARK A. MAHAN EXP: 12/31/22 CIVIL No. 17860
REVISED
07/12/2021

SHEET
UT9
49 OF 112 SHEETS

DRAWING NO.
PW20-20781
107W8449, L20-01282

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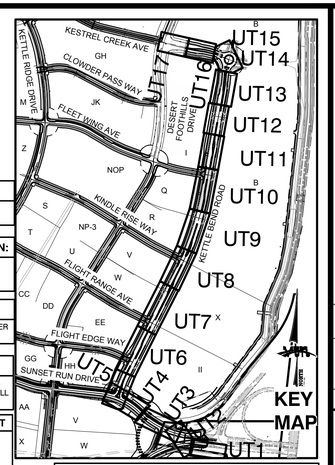




GRAPHIC SCALE

-20 0 10 20 40

1" = 20'



WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3435 & 3550 PRESSURE ZONES.

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CONTRACTOR TO INSTALL TEMPORARY SERVICE TO ENSURE PROPER SHUTDOWN IN THE EVENT NO OTHER APPURTENANCES ARE AVAILABLE.

NOTE:

5' MINIMUM HORIZONTAL SEPARATION FROM OUTSIDE EDGE OF THE WATER MAIN TO OUTSIDE EDGE OF DROP INLET

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FIRE HYDRANT MARKER NOTES

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PAVEMENT MARKERS ARE TO BE INSTALLED:

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

WATER MAIN JOINT DEFLECTION

WATER MAIN JOINT DEFLECTION, PER UDACS 2.07.01 AND 2.07.03.

UTILITY CROSSING NOTE:

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

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CONSTRUCTION NOTES

WATER

1 W	⬬	FIRE HYDRANT ASSEMBLY: INCLUDING 12"X6" OR 24"X6" TEE WITH 6" G.V. (PER UDACS PLATE NO. 39 & 40)
2 W		12" GATE VALVE (PER UDACS PLATE 30 & 39)
3 W		12" CAP & BLOW OFF (PER UDACS PLATE 36)
4 W		24" CAP & BLOW OFF (PER UDACS PLATE 36)
5 W		12"X12" TEE (PER UDACS PLATE 31)
6 W		24"X12" TEE (PER UDACS PLATE 31)
7 W		24" 5° BEND (PER UDACS PLATE 31)
8 W		24" 11° BEND (PER UDACS PLATE 31)
9 W		24" 22° BEND (PER UDACS PLATE 31)
10 W		12" 45° BEND (PER UDACS PLATE 31)
11 W		12" 5° BEND (PER UDACS PLATE 31)
12 W		1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" METER PER UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #8 AND SHEET DT7
13 W		24"X6" TEE (PER UDACS PLATE 31)
		6" C-900 WATER MAIN PER UDACS 2.06.01 & PLATE 17
		12" C-900 WATER MAIN PER UDACS 2.06.01 & PLATE 17
		12" DIP WATER MAIN PER UDACS 2.06.01 & PLATE 17
		24" DIP WATER MAIN RESTRAINED PER UDACS 2.06.01 & PLATE 17
		WATER POINT OF CONNECTION

CONSTRUCTION NOTES

SEWER

S	STANDARD MANHOLE WITH WATERTIGHT JOINTS PER DCSWCS SD-1, SD-2, SD-4, & SD-5 WITH DUAL CONCENTRIC LID AND CORROSION PROTECTION PER DCSWCS 3.16.8
	8" C-900-16 SANITARY SEWER MAIN
	16" C-900-16 SANITARY SEWER MAIN
SC	SEWER CAP (SAME SIZE AS PIPE) PER STD 4.6 & 4.11.
	SEWER POINT OF CONNECTION

LAS VEGAS FIRE & RESCUE APPROVAL

REVIEWED BY
LAS VEGAS FIRE & RESCUE

RELEASE FOR INSTALLATION AS SUBMITTED

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Final acceptance of installation is based upon field inspection and acceptance testing.

REVIEWED BY
pharrison 07/13/2021

BY: _____ DATE: _____

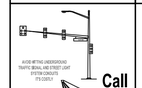
APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1,500 GPM AT 20 P.S.I. RESIDUAL.

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.



1-702-227-2929

Call before you Dig
Avoid cutting underground utility lines, It's costly.
CALL 811
OR
1-800-642-2444
AND
1-702-455-7544
CLARK COUNTY TRAFFIC OPERATIONS



APPROVED FOR CONSTRUCTION

Mao Fang 07/15/2021

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT:137333 FIRST APPROVED DATE: 06/02/2021

1

REV	DATE	BY
1	7-07-21	BCC

REVISION

SEWER REVISION TO APPROVED LVVWD PLAN

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

CITY OF LAS VEGAS

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

UTILITY PLAN & PROFILE 10
72+80 TO 77+40

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

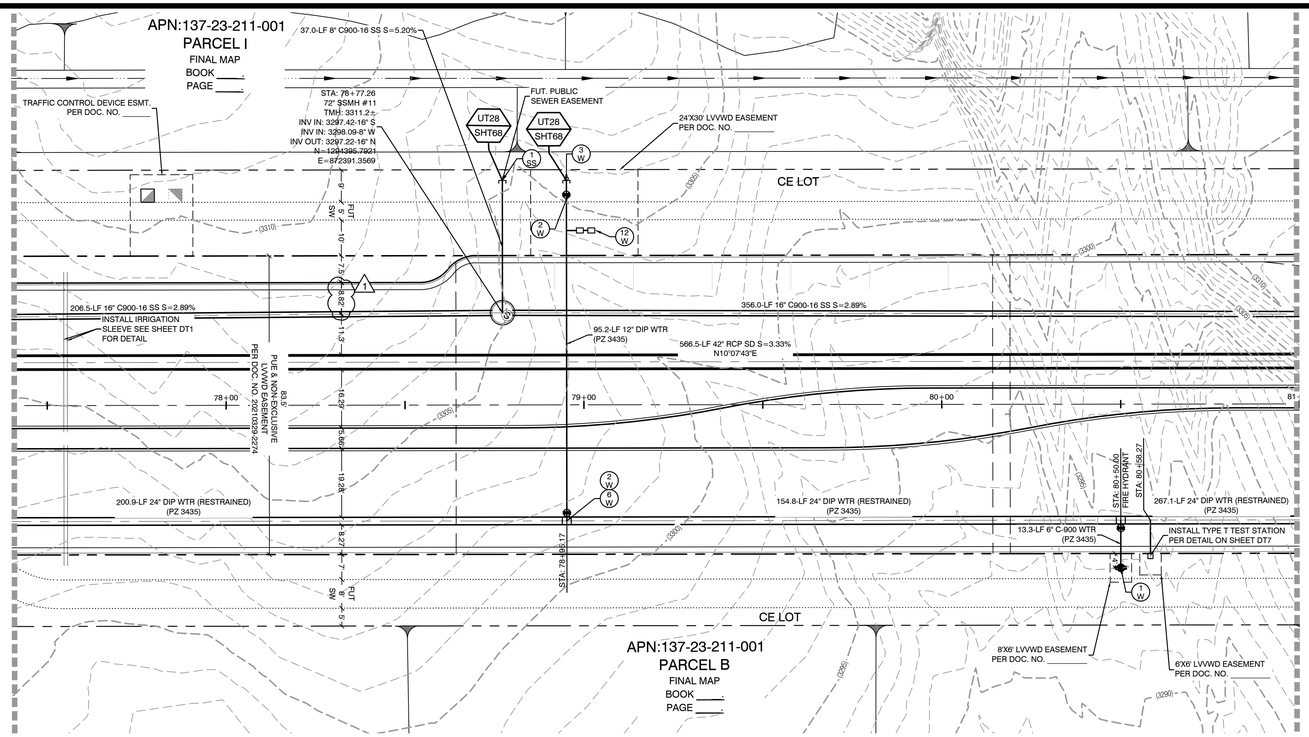
DRAWN BY: BCC 05/28/2019
DESIGNED BY: BCC 05/28/2019
CHECKED BY: MJM 11/20/2020
PROJECT NO: 7861
SCALE: HORIZ 1"=20' VERT 1"=4'

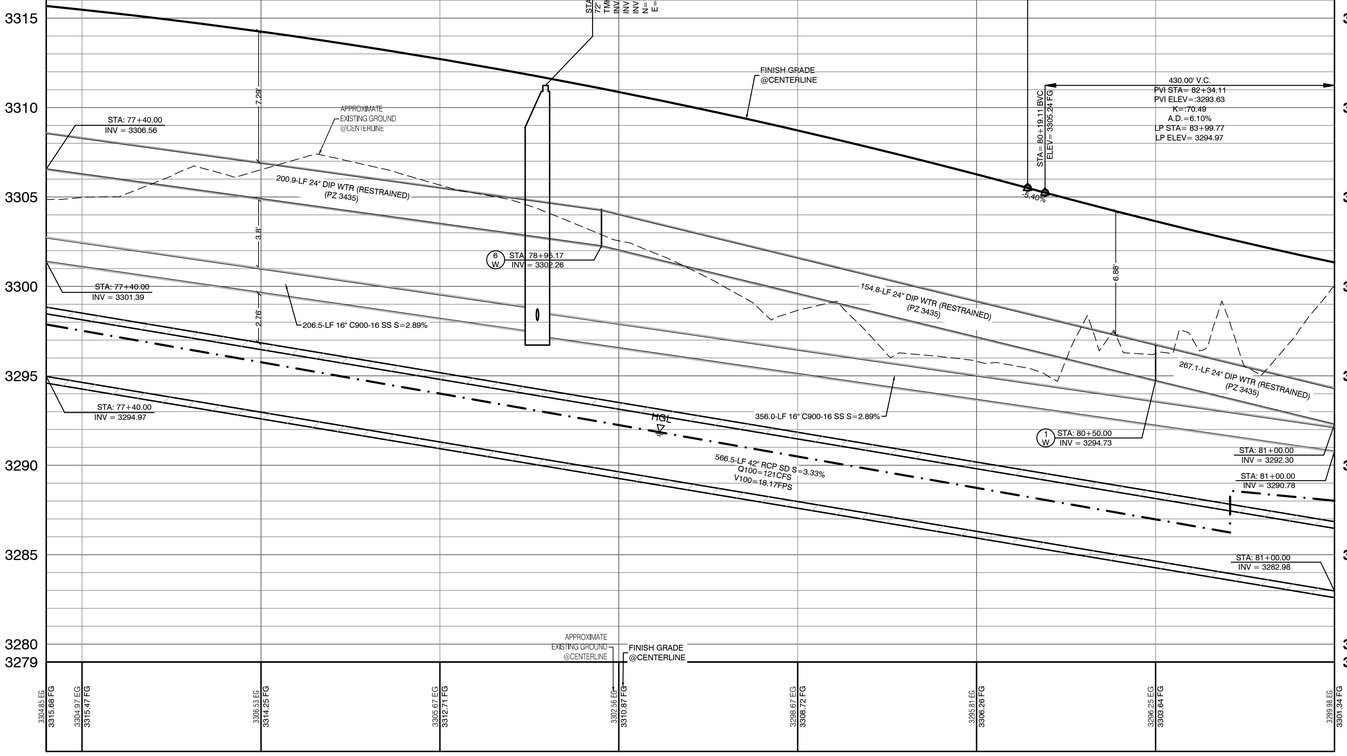
PROFESSIONAL ENGINEER - STATE OF NEVADA
No. 17860
CIVIL
EXP: 12/31/22
07/12/2021

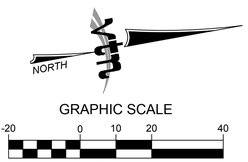
SHEET
UT10
50 OF 112 SHEETS

DRAWING NO.
PW20-20781
107V8449, L20-01282

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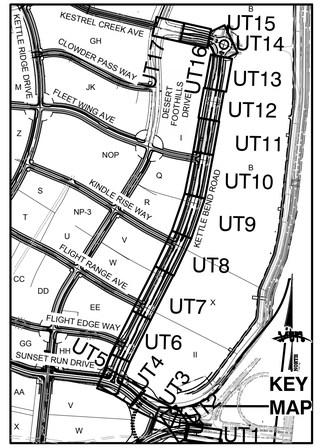




GRAPHIC SCALE

-20 0 10 20 40

1" = 20'



WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3435 & 3550 PRESSURE ZONES.

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.

WATERLINE TRENCH NOTE:

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

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.

DROP INLET SEPARATION NOTE

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

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.

CONTRACTOR NOTE:

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CONTRACTOR TO INSTALL TEMPORARY SERVICE TO ENSURE PROPER SHUTDOWN IN THE EVENT NO OTHER APPURTENANCES ARE AVAILABLE.

NOTE:

5' MINIMUM HORIZONTAL SEPARATION FROM OUTSIDE EDGE OF THE WATER MAIN TO OUTSIDE EDGE OF DROP INLET

WATER LINE MARKER BALLS NOTE

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

FIRE HYDRANT MARKER NOTES

BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKERS ARE TO BE INSTALLED:

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

WATER MAIN JOINT DEFLECTION

WATER MAIN JOINT DEFLECTION, PER UDACS 2.07.01 AND 2.07.03.

LVVWD EXISTING FACILITIES NOTE:

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

UTILITY CROSSING NOTE:

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POC	WATER POINT OF CONNECTION

CONSTRUCTION NOTES

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S	STANDARD MANHOLE WITH WATERTIGHT JOINTS PER DCSWCS SD-1, SD-2, SD-4, & SD-5 WITH DUAL CONCENTRIC LID AND CORROSION PROTECTION PER DCSWCS 3.16.B
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	16" C-900-16 SANITARY SEWER MAIN
	SEWER CAP (SAME SIZE AS PIPE) PER STD 4.6 & 4.11.
POC	SEWER POINT OF CONNECTION

LAS VEGAS FIRE & RESCUE APPROVAL

REVIEWED BY
LAS VEGAS FIRE & RESCUE
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REVIEWED BY
pharrison 07/13/2021

BY: _____ DATE: _____

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APPROVED FOR CONSTRUCTION

Mao Fang 07/15/2021

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT:137333 FIRST APPROVED DATE: 06/02/2021

1

REV	DATE	BY	REVISION
1	7-07-21	BCC	SEWER REVISION TO APPROVED LVVWD PLAN

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

CITY OF LAS VEGAS

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

UTILITY PLAN & PROFILE 11
77+40 TO 81+00

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

DRAWN BY: BCC — 06/28/2019
DESIGNED BY: BCC — 06/28/2019
CHECKED BY: MJM — 11/20/2020
PROJECT NO: 7861
SCALE: HORIZ. 1"=20' VERT. 1"=4'

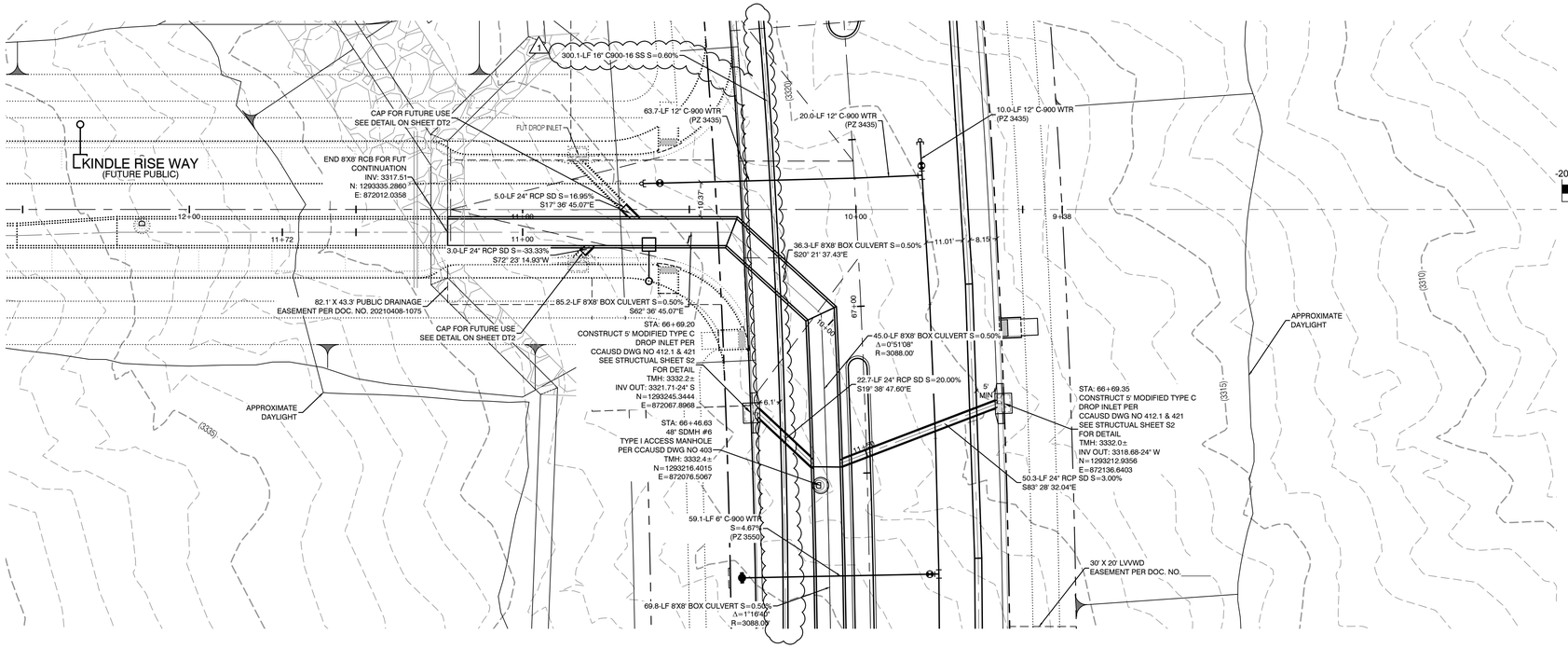
PROFESSIONAL ENGINEER STATE OF NEVADA MARK J. MARCHESE EXP: 12/31/22 CIVIL No. 17860

07/12/2021

SHEET
UT11
51 OF 112 SHEETS

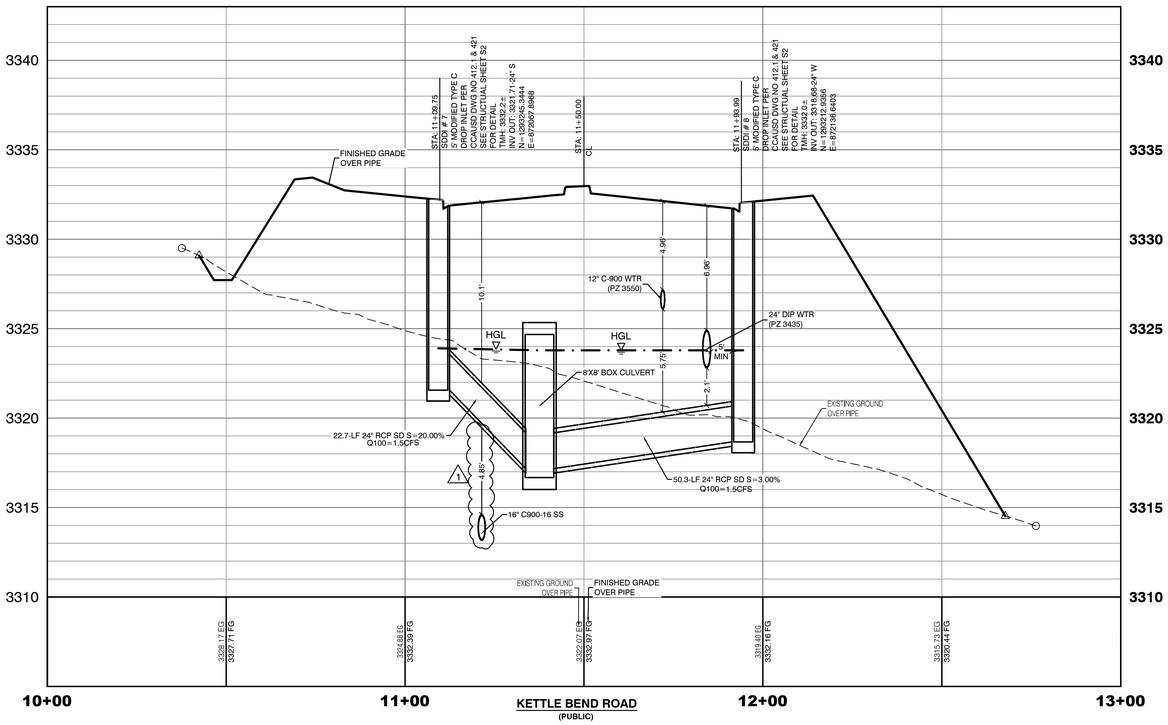
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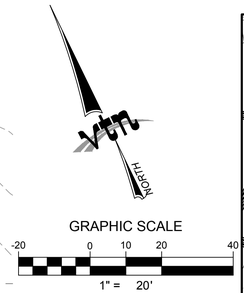


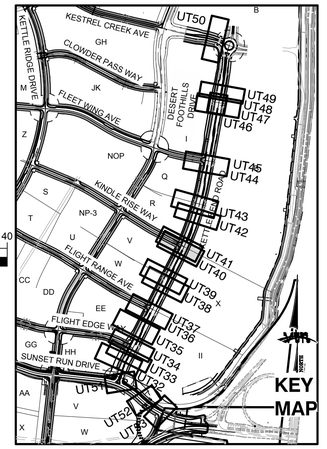
KETTLE BEND ROAD
(PUBLIC)

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



KETTLE BEND ROAD
(PUBLIC)





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

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WATER MAIN JOINT DEFLECTION, PER UDACS 2.07.01 AND 2.07.03.

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LAS VEGAS FIRE & RESCUE APPROVAL

REVIEWED BY
LAS VEGAS FIRE & RESCUE
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REVIEWED BY
pharrison 07/13/2021

BY: _____ DATE: _____

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APPROVED FOR CONSTRUCTION

Mao Fang 07/15/2021

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT:137333 FIRST APPROVED DATE: 06/02/2021

REV	DATE	BY	REVISION
1	7-07-21	BCC	SEWER REVISION TO APPROVED LVVWD PLAN

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

CITY OF LAS VEGAS

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

UTILITY PLAN & PROFILE 40
STORM DRAIN LATERAL

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

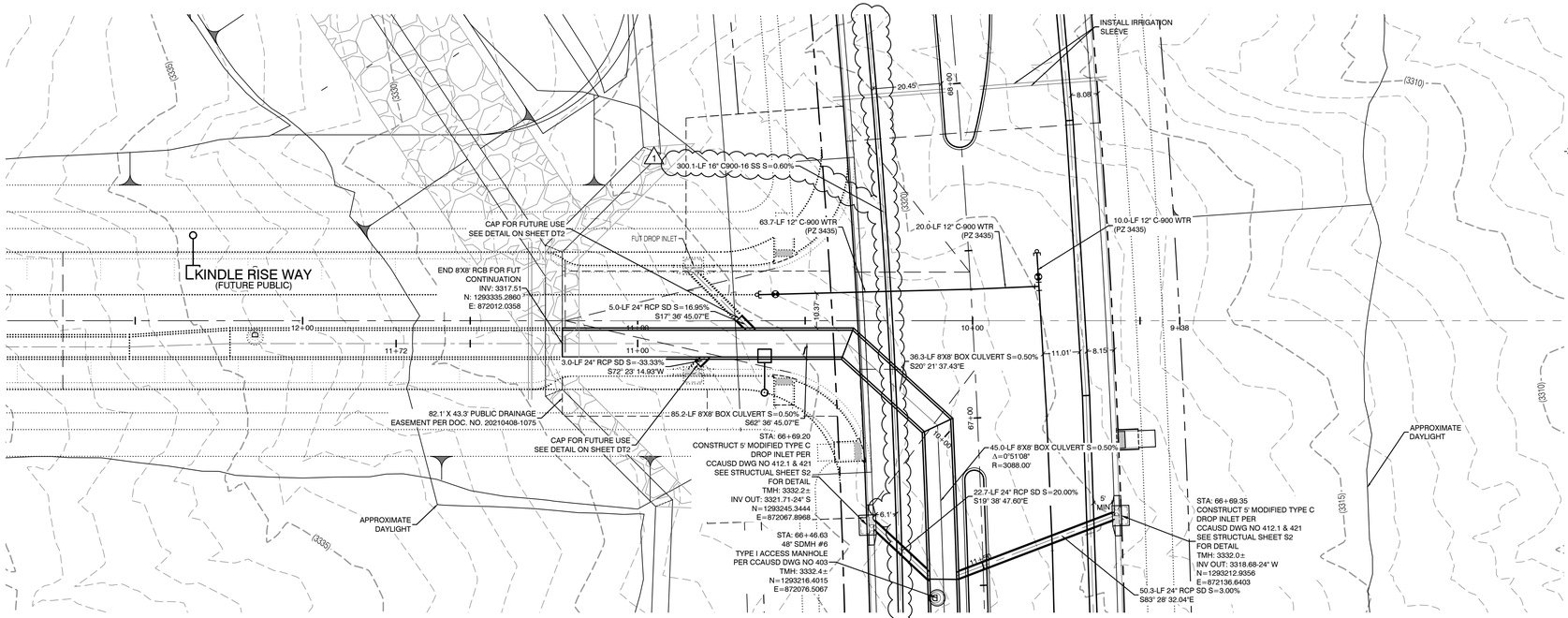
DRAWN BY: BCC 09/10/2019
DESIGNED BY: BCC 09/10/2019
CHECKED BY: MJM 11/20/2020
PROJECT NO: 7861
SCALE: HORIZ. 1"=20' VERT. 1"=4'

PROFESSIONAL ENGINEER-STATE OF NEVADA
No. 17860
EXP: 12/31/22
CIVIL
07/12/2021

SHEET
UT40
80 OF **112** SHEETS

DRAWING NO.
PW20-20781
107V8449, L20-01282

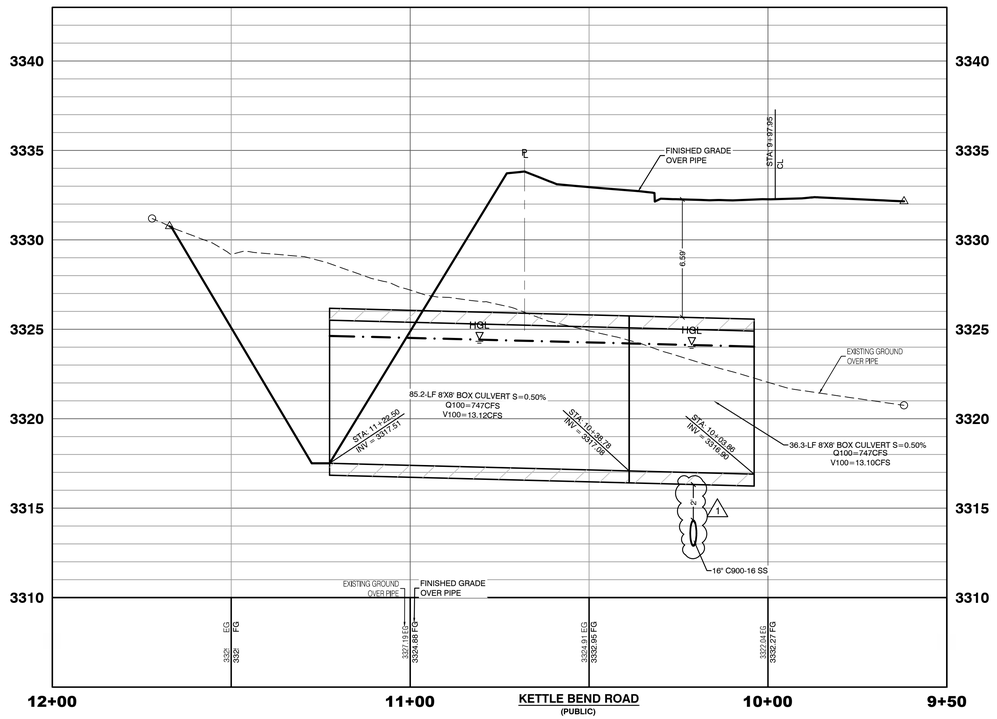
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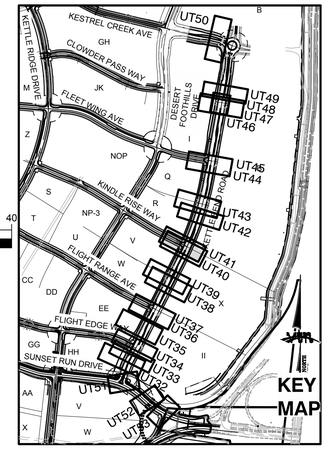


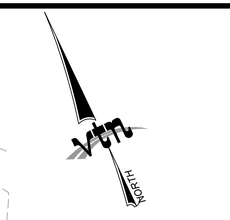
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CONTRACTOR TO INSTALL TEMPORARY SERVICE TO ENSURE PROPER SHUTDOWN IN THE EVENT NO OTHER APPURTENANCES ARE AVAILABLE.

LVVWD EXISTING FACILITIES NOTE:

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NOTE:

5' MINIMUM HORIZONTAL SEPARATION FROM OUTSIDE EDGE OF THE WATER MAIN TO OUTSIDE EDGE OF DROP INLET

WATER LINE MARKER BALLS NOTE

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

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WATER MAIN JOINT DEFLECTION

WATER MAIN JOINT DEFLECTION, PER UDACS 2.07.01 AND 2.07.03.

UTILITY CROSSING NOTE:

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WATERLINE TRENCH NOTE:

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

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3435 & 3550 PRESSURE ZONE.

DEPTH OF COVER DURING CONSTRUCTION:

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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.

LAS VEGAS FIRE & RESCUE APPROVAL

REVIEWED BY
LAS VEGAS FIRE & RESCUE

RELEASE FOR INSTALLATION AS SUBMITTED

This review does not constitute permission to violate any City, State, or Federal Laws or Ordinances. Ultimate responsibility for compliance rests with the Owner.

Final acceptance of installation is based upon field inspection and acceptance testing.

REVIEWED BY
pharrison 07/13/2021

BY: _____ DATE: _____

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 1,500 GPM AT 20 P.S.I. RESIDUAL.



Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811
OR
1-800-642-2444
AND
1-702-455-7544
CLARK COUNTY TRAFFIC OPERATIONS



APPROVED FOR CONSTRUCTION

Mao Fang 07/15/2021

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT: 137333 FIRST APPROVED DATE: 06/02/2021

REV	DATE	BY	REVISION
1	7-07-21	BCC	SEWER REVISION TO APPROVED LVVWD PLAN

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

CITY OF LAS VEGAS

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

UTILITY PLAN & PROFILE 41
STORM DRAIN LATERAL

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

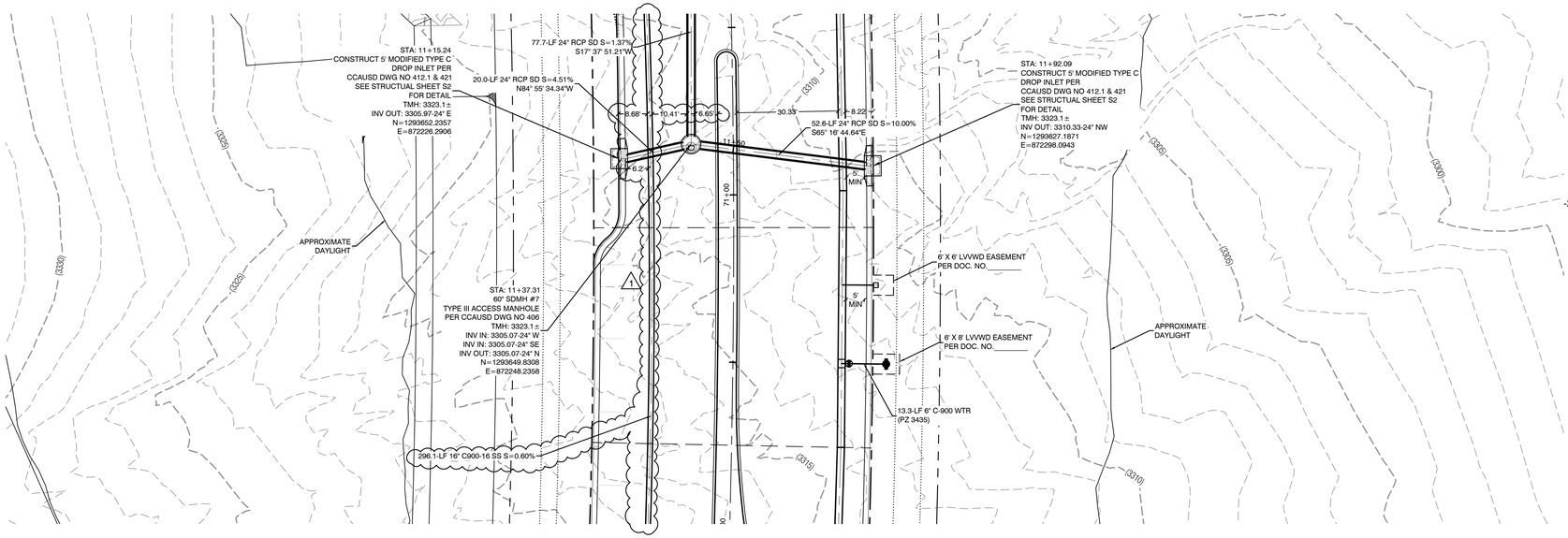
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DESIGNED BY: BCC	09/10/2019
CHECKED BY: MJM	11/20/2020
PROJECT NO: 7861	SCALE: HORZ. 1"=20' VERT. 1"=4'

PROFESSIONAL ENGINEER-STATE OF NEVADA
No. 17860
EXP: 12/31/22
CIVIL
07/12/2021

SHEET
UT41
81 OF **112** SHEETS

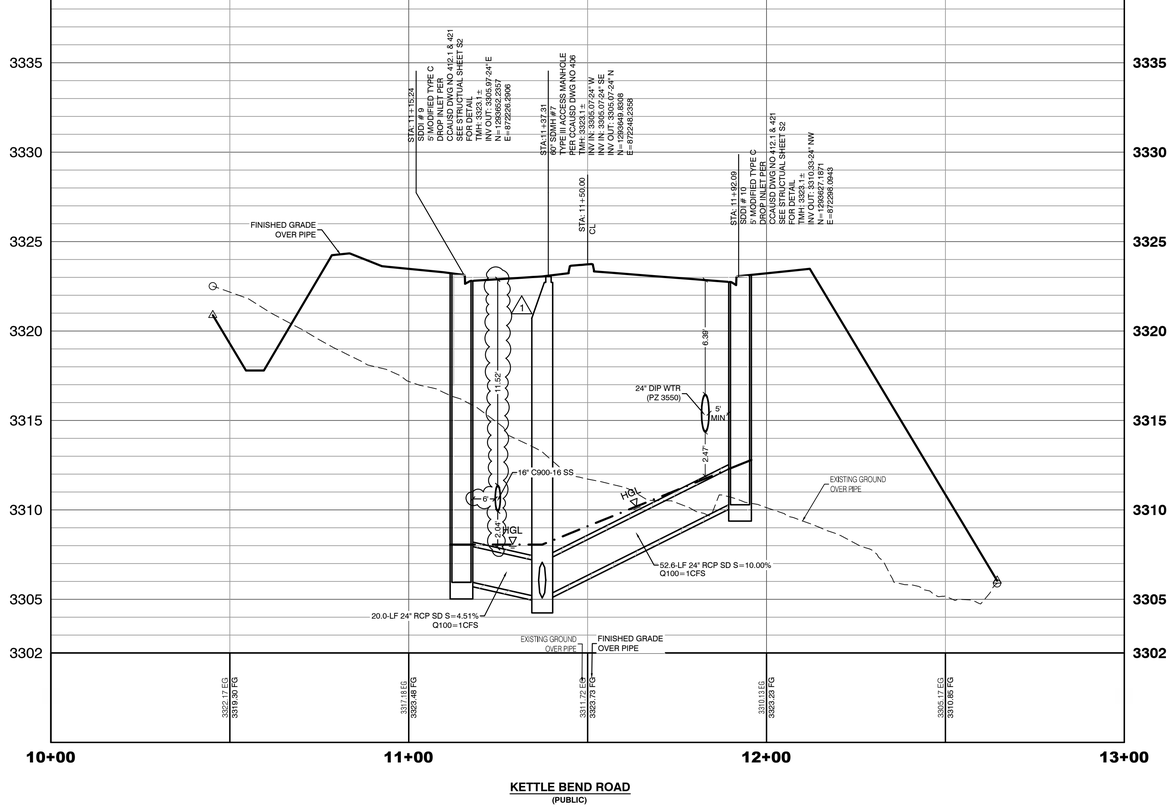
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PW20-20781
107V8449, L20-01282

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KETTLE BEND ROAD
(PUBLIC)

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



KETTLE BEND ROAD
(PUBLIC)

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LAS VEGAS FIRE & RESCUE APPROVAL
REVIEWED BY
LAS VEGAS FIRE & RESCUE
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REVIEWED BY
pharrison 07/13/2021
BY:_____ DATE:_____
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APPROVED FOR CONSTRUCTION
Mao Fang 07/15/2021
LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES
PROJECT: 137333 FIRST APPROVED DATE: 06/02/2021

1

REV	DATE	BY	REVISION
1	7-07-21	BCC	SEWER REVISION TO APPROVED LVVWD PLAN

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

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

UTILITY PLAN & PROFILE 42
STORM DRAIN LATERAL

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

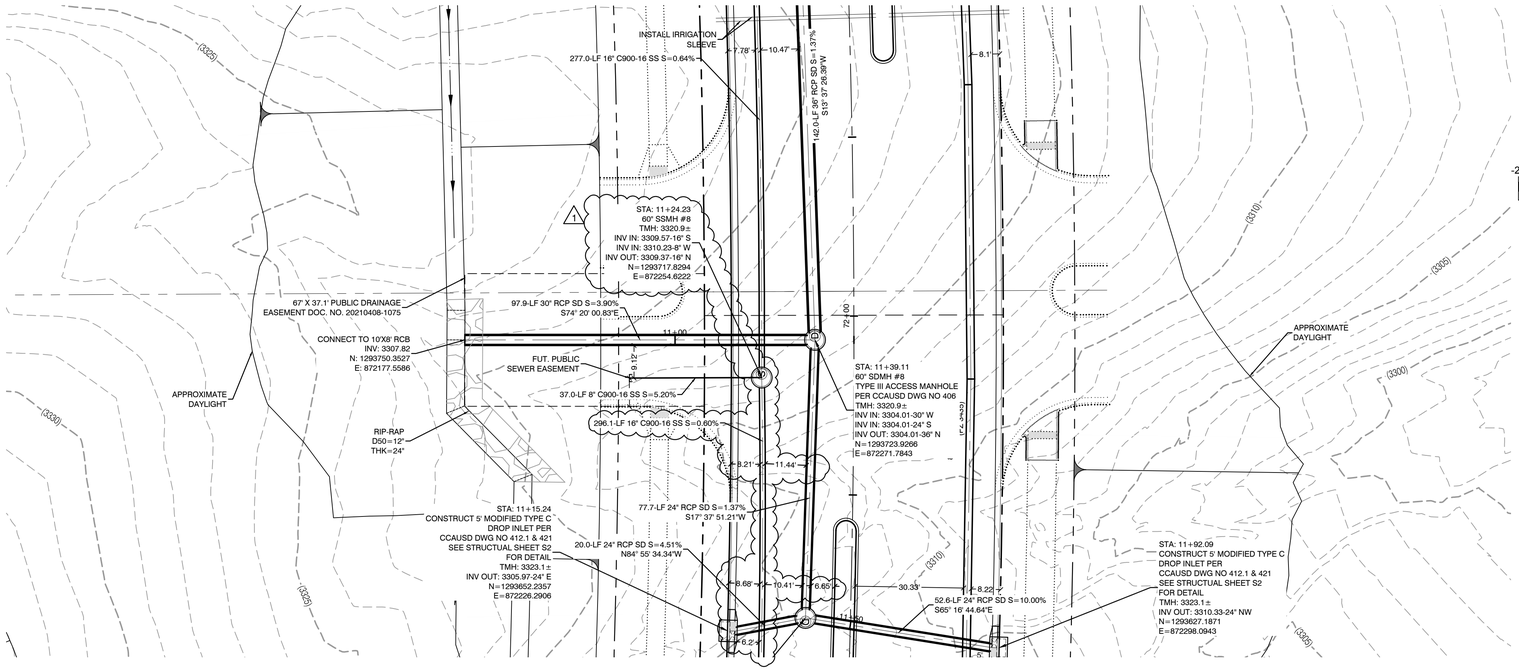
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BCC 09/10/2019	BCC 09/10/2019	MJM 11/23/2020	7961	HORIZ 1"=20' VERT 1"=4'

PROFESSIONAL ENGINEER - STATE OF NEVADA - No. 17860 - DAVID L. SAVAGE - EXP: 12/31/22 - CIVIL
07/12/2021

SHEET
UT42
82 OF 112 SHEETS

DRAWING NO.
PW20-20781
107V8449, L20-01282

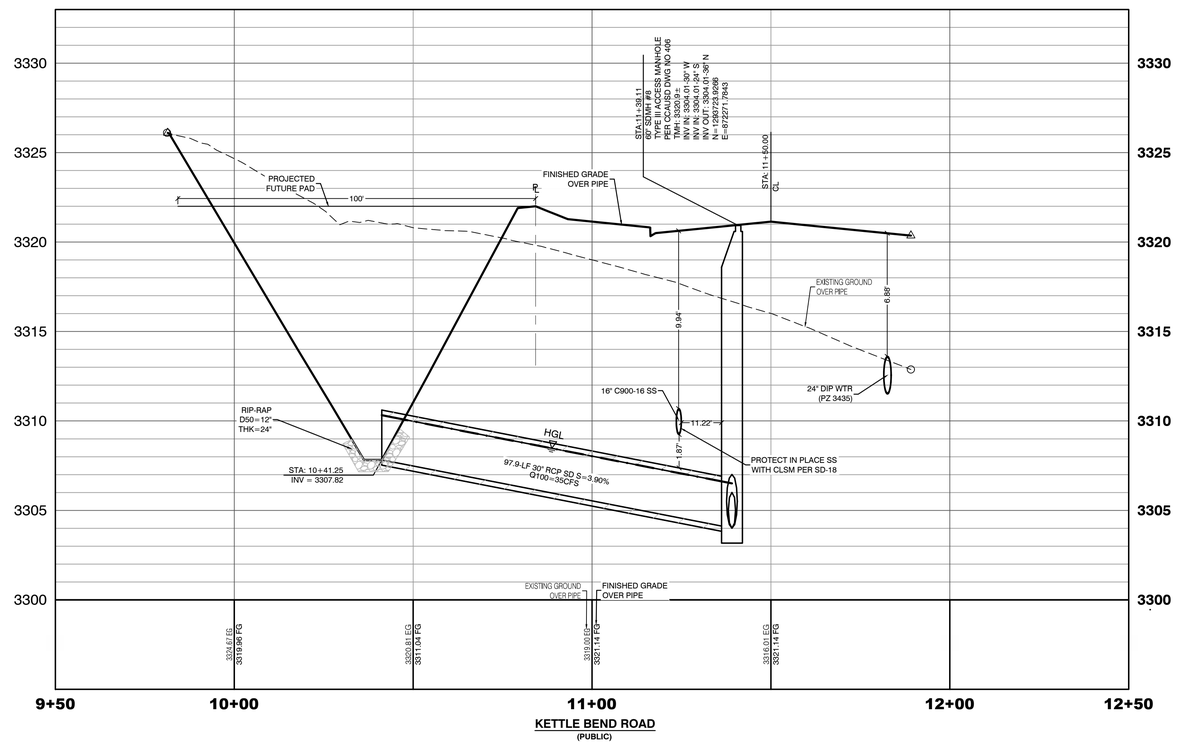
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KETTLE BEND ROAD
(PUBLIC)

PROFILE SCALES:

HORIZ. = 1"=20'
VERT. = 1"=40'



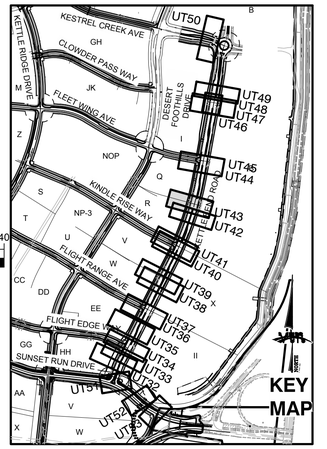
KETTLE BEND ROAD
(PUBLIC)



GRAPHIC SCALE

-20 0 10 20 40

1" = 20'



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WATER MAIN JOINT DEFLECTION

WATER MAIN JOINT DEFLECTION, PER UDACS 2.07.01 AND 2.07.03.

WATERLINE TRENCH NOTE:

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LAS VEGAS FIRE & RESCUE APPROVAL

REVIEWED BY
LAS VEGAS FIRE & RESCUE

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REVIEWED BY
pharrison 07/13/2021

BY: _____ DATE: _____

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APPROVED FOR CONSTRUCTION

Mao Fang 07/15/2021

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT: 137333 FIRST APPROVED DATE: 06/02/2021

1

REV	DATE	BY	REVISION
1	7-07-21	BCC	SEWER REVISION TO APPROVED LVVWD PLAN

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

CITY OF LAS VEGAS

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

UTILITY PLAN & PROFILE 43
STORM DRAIN LATERAL

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

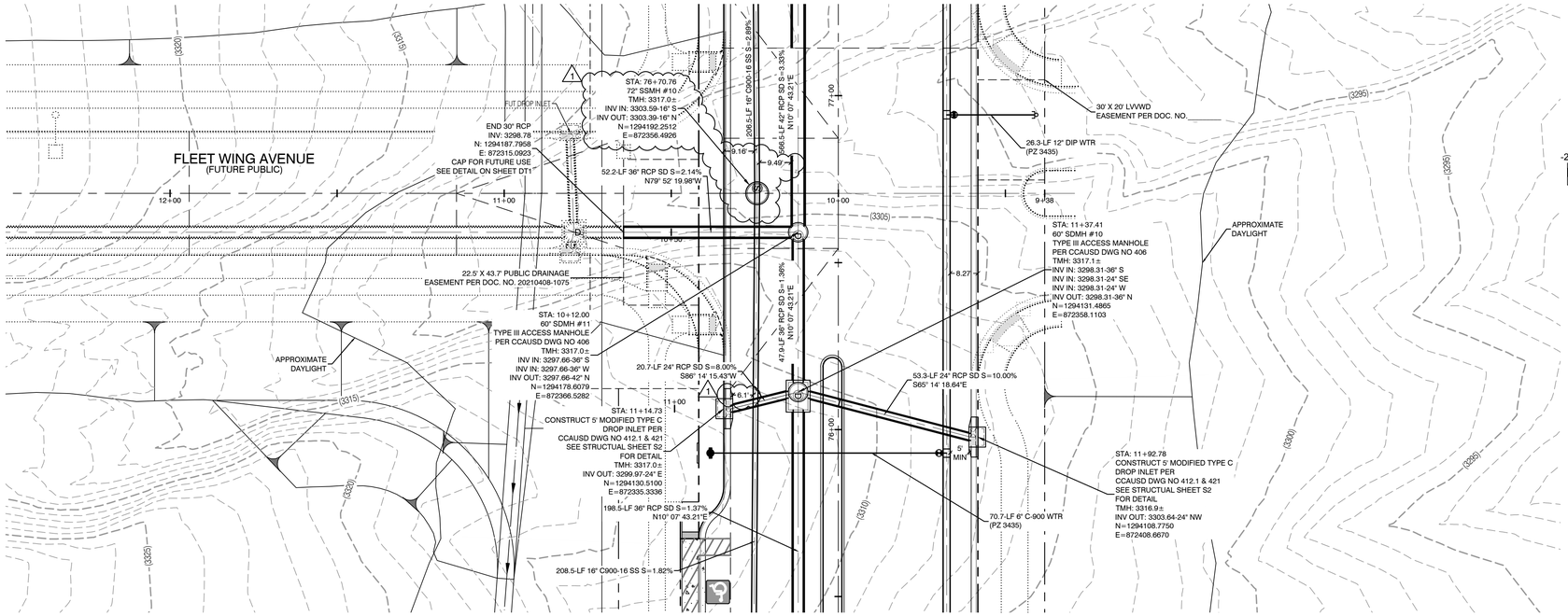
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DESIGNED BY: BCC 09/10/2019
CHECKED BY: MJM 11/20/2020
SCALE: HORIZ 1"=20' VERT 1"=40'
PROJECT NO: 7861

PROFESSIONAL ENGINEER-STATE OF NEVADA
BRIAN C. LEE
No. 17860
EXP: 12/31/22
CIVIL
07/12/2021

SHEET
UT43
83 OF **112** SHEETS

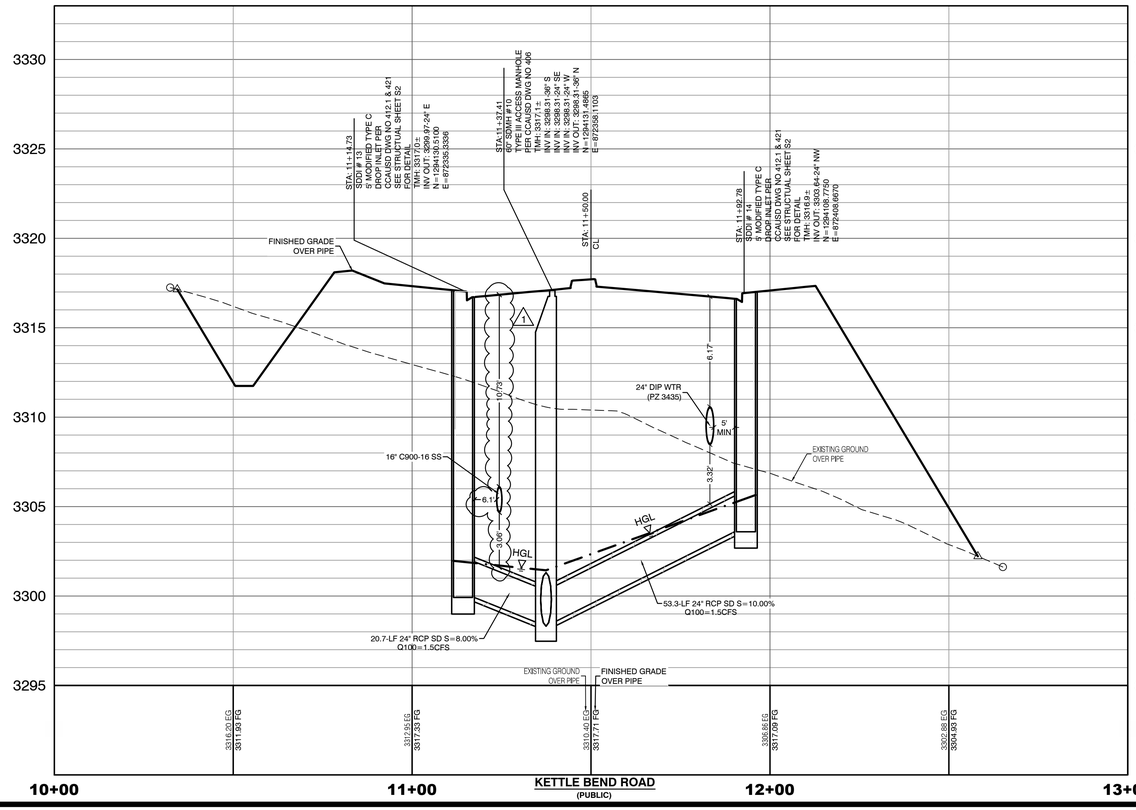
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107V8449, L20-01282

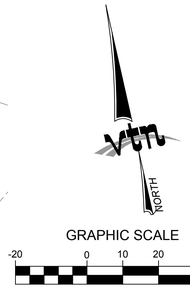
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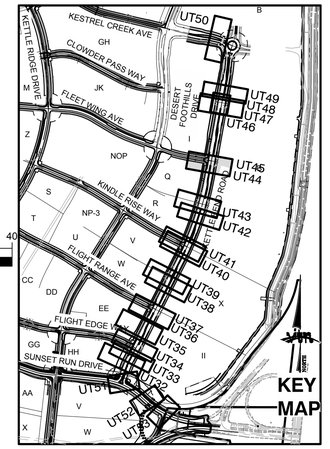


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pharrison 07/13/2021

BY: _____ DATE: _____

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APPROVED FOR CONSTRUCTION

Mao Fang 07/15/2021

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT: 137333 FIRST APPROVED DATE: 06/02/2021

REV	DATE	BY	REVISION
1	7-07-21	BCC	SEWER REVISION TO APPROVED LVVWD PLAN

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

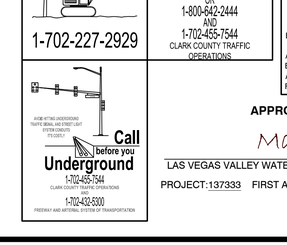
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2727 SOUTH RAINBOW BOULEVARD
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UTILITY PLAN & PROFILE 44
STORM DRAIN LATERAL

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

DRAWN BY: BCC 08/10/2019
DESIGNED BY: BCC 08/10/2019
CHECKED BY: MJM 11/20/2020
PROJECT NO: 7861
SCALE: HORIZ. 1"=20' VERT. 1"=4"

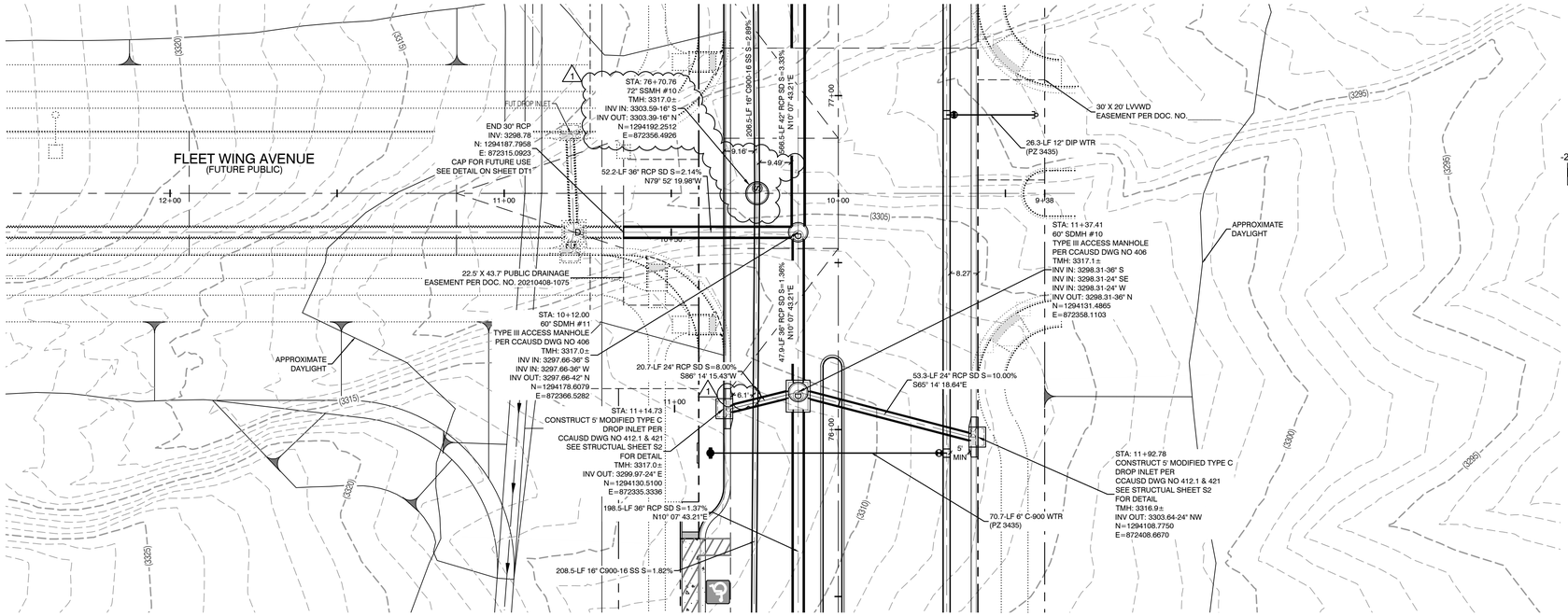


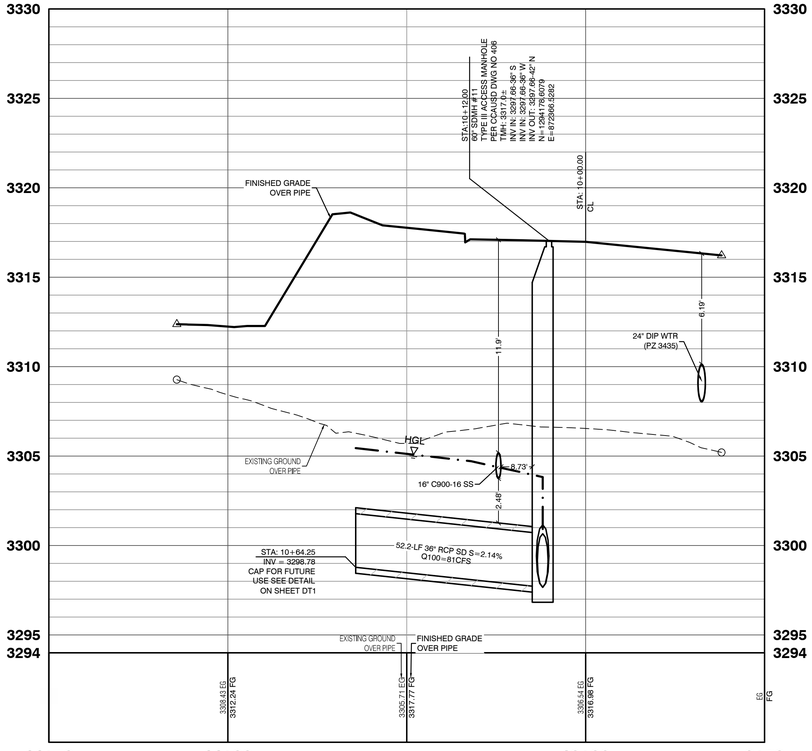
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UT44
84 OF **112** SHEETS

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PW20-20781
107W8449, L20-01282

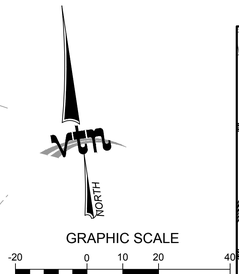
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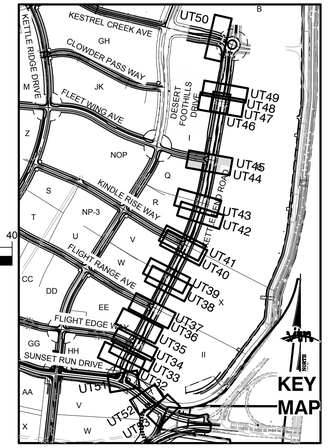




PROFILE SCALES:

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





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

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NOTE:

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WATER LINE MARKER BALLS NOTE

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FIRE HYDRANT MARKER NOTES

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WATERLINE TRENCH NOTE:

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

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3435 & 3550 PRESSURE ZONE.

DEPTH OF COVER DURING CONSTRUCTION:

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TO ENSURE LVVWD ACCESS WITHIN EASEMENT

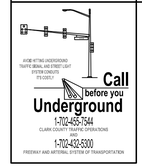
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LAS VEGAS FIRE & RESCUE APPROVAL

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Mao Fang 07/15/2021

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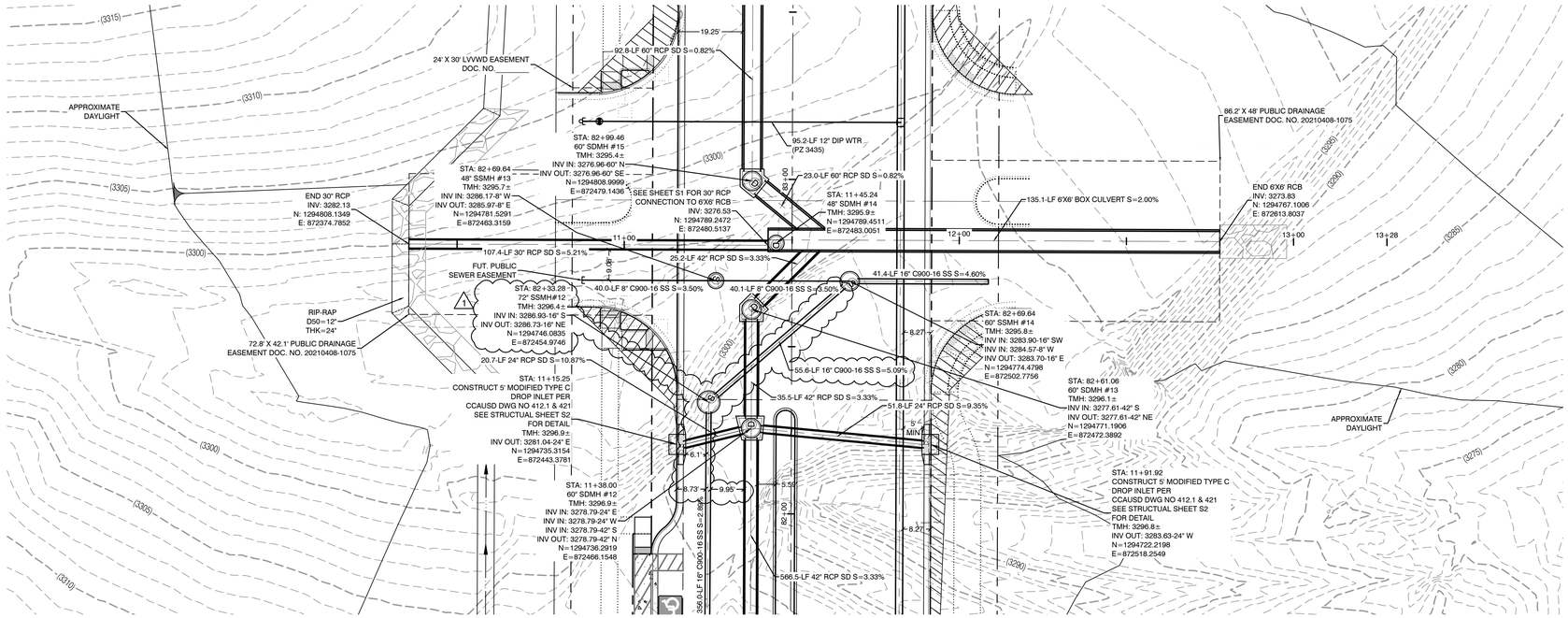
DRAWN BY: BCC 09/10/2019
DESIGNED BY: BCC 09/10/2019
CHECKED BY: MJM 11/20/2020
PROJECT NO: 7961
SCALE: HORIZ 1"=20' VERT 1"=4'

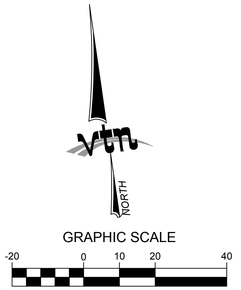


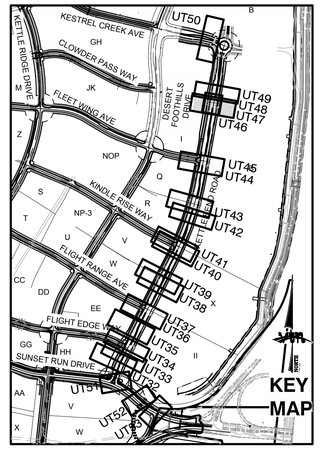
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85 OF **112** SHEETS

DRAWING NO.
PW20-20781
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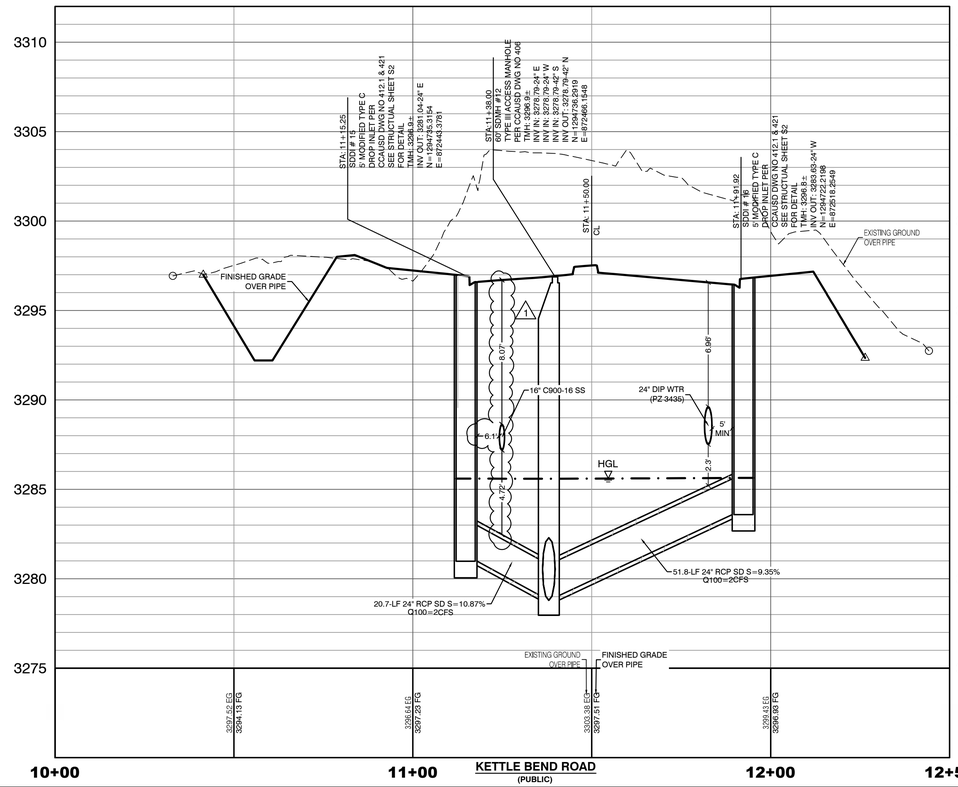






KETTLE BEND ROAD
(PUBLIC)

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UTILITY PLAN & PROFILE 46
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DRAWN BY: BCC 09/10/2019
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PROFESSIONAL ENGINEER-STATE OF NEVADA
MICHAEL J. MARCH
EXP: 12/31/22
CIVIL
No. 17860
07/12/2021

SHEET
UT46
86 OF **112** SHEETS

DRAWING NO
PW20-20781
107V8449, L20-01282

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Technical Drainage Study for

Summerlin West Village 22
Kettle Bend Road

Las Vegas, Nevada

Prepared for:
Howard Hughes Company, LLC

Submitted to:
City of Las Vegas
Public Works

exceeding the capacities of both the Beltway Channel system and the Gowan Lone Mountain Beltway system before construction of the Grand Park Detention Basin. Concentration point COFF2 (76-cfs) represents the total flow conveyed towards the Gowan Lone Mountain Beltway system from a 6'x6' RCB stub on the eastern boundary of the project site.

2. INTERIM CONDITION 2

Interim Condition 2 assumes the Grand Park Detention Basin has been constructed and actively intercepts upstream offsite flows from the project site. As such, the 20' berm is no longer required to redirect flows as flows have been reduced in the Gowan Lone Mountain Beltway system by the Grand Park Detention Basin.

Basin OFF4 and OFF5 are the same as described in the existing condition. Similar to Interim Condition 1, basins OFF4 and OFF5 have been divided into subbasins to delineate flow areas into proposed stubs and swales. Also, Basins OFF4 and OFF5 are tributary to the same systems as Basins OFF1 and OFF2, respectively. Basin OFF6 has been delineated based on the interception of upstream flows by infrastructure related to the construction of the Grand Park Detention basin, but otherwise follows the same drainage patterns as those established for Basin OFF3. STKB1 and STKB2 are as described in Interim Condition 1. Concentration point COFF3 (284-cfs) represents the total flow in the Grand Parkway Beltway system at the intersection of Sunset Run Drive and Kettle Bend Road. Concentration point COFF4 (80-cfs) combined with the reference flow from the Atkins study (461-cfs) represents the total flow (541-cfs) conveyed towards the Gowan Lone Mountain Beltway system from the eastern boundary of the project site.

C. ULTIMATE CONDITION ANALYSIS

(Refer to *Figure 8: Ultimate Condition Drainage Map)*

Ultimate condition assumes that the proposed improvements and offsite areas are fully developed. Onsite and offsite drainage patterns are consistent with the referenced Village 22 Master Study. Referenced drainage basins correspond to the future Summerlin West parcels and roadways. Hydrologic calculations have been included in Appendix B. Pertinent reference material is included in Appendix D.

1. OFFSITE DRAINAGE BASIN DESCRIPTION

Offsite drainage patterns within Village 22 have been referenced from the Village 22 Master Study. The areas of offsite basins NP-4, EE, HH, I, Q, R, W, and V have been revised to reflect the updated Kettle Bend Road alignment from the Village 22 Master Study. Each basin corresponds to the individual developed parcels and are expected to drain to the proposed storm drain. Street basins STFE, STFR, STKR, and STFW represent the remaining street area expected to drain to the proposed storm drain.

2. ONSITE DRAINAGE BASIN DESCRIPTION

The ultimate condition onsite basins are consistent with the interim conditions. Concentration point CPBC (862-cfs) represents the combined offsite and onsite flow in the Beltway Channel system at the intersection of Sunset Run Drive and Kettle

Bend Road. The 862-cfs magnitude of flow is similar to what was calculated in the Village 22 Master Study represented by DUMMY6 (861-cfs). Concentration point CPGW (391-cfs) represents the combined offsite and onsite flow in Kettle Bend Road conveyed easterly towards the Gowan Lone Mountain Beltway system.

D. VILLAGE 22 PARCEL DEVELOPMENT

Currently, future Village 22 parcel development is conditioned upon the construction of the Grand Park Detention Basin and Beltway Channel system due to the capacity of the existing sections of the Gowan Lone Mountain Beltway system. The Grand Park Detention Basin drainage study is currently under review at CLV and is on course to be approved and begin construction prior to the anticipated development of parcels within Village 22. However, since the time span between the detention basin and the anticipated parcel development is less than desired, this study is proposing the use of the Beltway Channel facilities to intercept a portion of the flow impacting Village 22 and route them south within the Beltway Channel. Since the improvements proposed with this study contains a portion of the Beltway Channel system, this can be accomplished by providing the interim berm upstream of the permanent improvements to temporarily capture the additional 461 cfs from the Village 22 area and route the flow into the Beltway Channel system. Hence allowing for increased capacity to initiate development of Village 22 parcels. The purpose of these temporary improvements is to allow for the beginning of development of parcels with Village 22 in case the time for completion of the detention basin and start of parcel development overlap. This analysis is provided to show that there is additional capacity in the Beltway Channel system that can be utilized for offset of developed flow increases of up to approximately 106 acres of parcels within the Village 22 area.

To determine how much can be developed as a result of the diversion of the 461-cfs, the flow per area (4.31-cfs/acre) from Parcel H from the Village 22 Master Study in the developed condition was used as a conservative baseline. Parcel H utilizes commercial curve numbers, hydrologic soil group D, retains the same area and land use as the previous land plan, and is located in the vicinity of the parcels desired to be first developed (Parcel A [17.4-acres], Parcel C [12.0-acres], and Parcel D [12.0-acres]). The location of these parcels and development allowance computation tables is provided on Figure 7A, Interim Condition 1 Map. Due to these characteristics, the actual flow per area contribution of future developed parcels will only be equal to or less than that of what is assumed in this calculation. Also, note that this calculation does not account for the difference between existing condition and developed condition flows which would determine the true difference between existing and developed flows and provide a much less conservative value of developable acreage. This highly conservative methodology ensures the Gowan Lone Mountain Beltway system will not become overtaxed from overdevelopment. The flow of 33-cfs and an area of 7.65-acres from Parcel H has been referenced from the Village 22 Master Study, resulting in a flow per area of 4.31-cfs/acre. Dividing the 461-cfs, a total developable acreage of 106.87-acres was obtained. Even after Parcels A, C, and D are developed, approximately 65.5-acres can still be developed based on the calculation methodology.

This additional capacity will allow initial development of parcels to occur within Village 22 as the detention basin is completed. Once the basin and inflow system are

constructed all of the Village 22 area can be developed per the Summerlin West Overall Master Study Update and the Village 22 Master Study Update.

IV. EXISTING & INTERIM CHANNELS

(Refer to *Figure 7A: Interim Condition 1 Drainage Map and Figure 7B: Interim Condition 2 Drainage Map)*

Temporary offsite channels are proposed to protect the proposed improvements and to direct flows to storm drain laterals. Facility names for the offsite ditches/berms in the calculations correspond to the tributary basin and facility location. Basins OFF1, OFF2, OFF4, and OFF5 have been prorated to determine the specific flow rate impacting each channel. A summary of the offsite berms/ditches are summarized in Table 5 below. Normal depth calculations have been included in Appendix C. Refer to Figure 7A and Figure 7B for the locations of the channels.

Swale Normal Depth Summary Table (Interim Condition - 100-Year)

Swale Designation	Contributing Basin/ Subbasin	Discharge (cfs)	Slope (%)	Velocity (fps)	Flow Depth (ft)	Freeboard Required (ft)	Channel Depth (ft)	V x D	RipRap D50
SW1A	1/2 OFF1-A	6	25.87%	5.76	0.19	1.08	1.27	1.09	12"
SW1B	1/2 OFF1-A	6	20.17%	5.32	0.20	1.08	1.28	1.06	12"
SW2A	1/2 OFF1-B	9	24.27%	6.51	0.24	1.10	1.34	1.56	12"
SW2B	1/2 OFF1-B	9	22.67%	6.35	0.24	1.10	1.34	1.52	12"
SW3	OFF1-C	11	23.04%	6.85	0.28	1.11	1.39	1.92	12"
SW4	OFF1-D	12	22.54%	7.00	0.29	1.12	1.41	2.03	12"
SW5A	1/3 OFF2-A	5	22.59%	5.17	0.18	1.07	1.25	0.93	12"
SW5B	2/3 OFF2-A	9	1.00%	3.07	0.46	1.00	1.46	1.41	N/A
SW6	OFF2-C	18	25.14%	8.31	0.36	1.15	1.51	2.99	12"
SW7	OFF2-D	23	21.85%	8.59	0.43	1.16	1.59	3.69	12"
BERM	CP1	701	1.00%	10.22	4.02	1.41	5.43	41.08	N/A

The 20' berm, represented by BERM, is only proposed for Interim Condition 1 and is not proposed in Interim Condition 2 due to the interception of flow by the Grand Park Detention Basin.

In general, the proposed offsite grading will consist of a D50=12" riprap lined and unlined trapezoidal channels. The proposed offsite channels will have a minimum of 1-foot of freeboard above the calculated water surface elevation. The required riprap protection has been provided along the embankment of the proposed roadways where required for interim protection. Riprap and freeboard calculations have been included in Appendix C.

V. STREET FLOW

A street hydraulic analysis has been provided to determine the normal depth and velocity of the anticipated storm flows within the proposed streets. Please note that all parcels within Summerlin West are required to drain to storm drain stubs provided with the main storm lines in the adjacent Summerlin built streets. No parcel flows will be discharged into

Summerlin streets as surface flow. In addition, it is assumed that no surface flows will enter the proposed streets in any condition.

The results of the street flow analysis are summarized in Table 6. Refer to Figure 8 for the locations of the cross sections used in the analysis. Street hydraulic calculations are included in Appendix C.

TABLE 6
Street Section Normal Depth Summary Table

Cross Section Designation	Contributing Basin/ Subbasin	Discharge (cfs)	Slope (%)	Velocity (fps)	Flow Depth (ft)	V x D
KB1	STKB1-A	4	3.00%	3.33	0.31	1.03
KB2	STKB1-B	3	0.70%	1.74	0.35	0.61
KB3	STKB1-C	2	0.70%	1.62	0.31	0.50
KB4	STKB1-D	3	0.70%	1.74	0.35	0.61
KB5	STKB2-A	2	3.60%	3.50	0.25	0.88
KB6	STKB2-B	3	0.70%	1.74	0.35	0.61
KB7	STKB2-C	4	0.70%	1.83	0.37	0.68
KB8	STKB2-E	5	0.70%	1.93	0.39	0.75
KB9	STKB2-F	2	10.20%	5.47	0.24	1.31

The product V x D has been calculated for each section to show that the flow within the drive aisles meets the Manual requirement. The manual requires the V x D to be less than 6 in the 10-year storm event and less than 8 in the 100-year storm event. The results show that the V x D requirements for both the 10-year and 100-year events have been met. Additionally, all flow depths are contained below top of curb as required by Summerlin criteria.

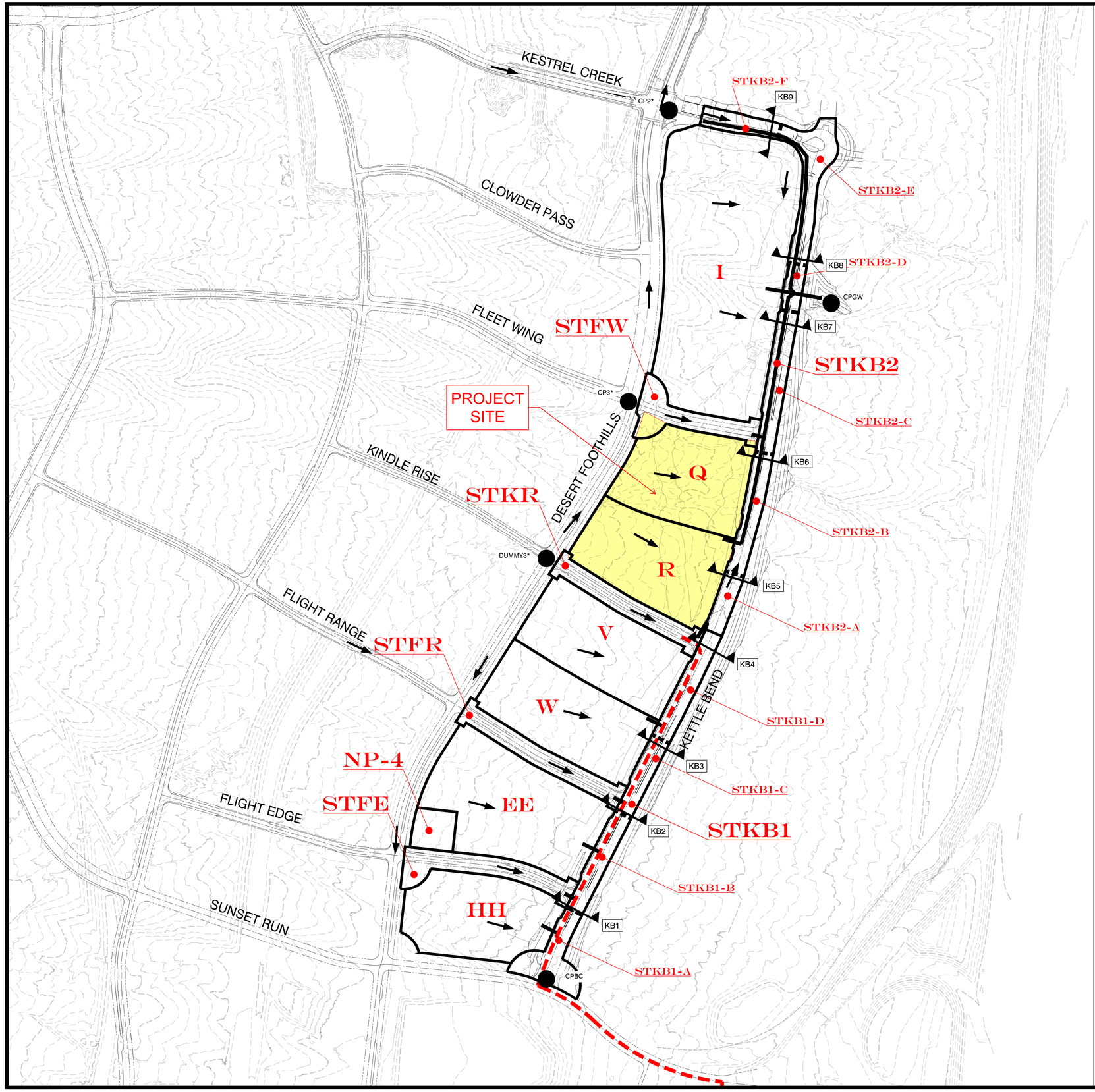
VI. STORM DRAIN FACILITES

A. CLARK COUNTY REGIONAL FLOOD CONTROL MAINLINES

(Refer to *Figure 9: Proposed Storm Drain Facilities Map)*

One CCRFCD storm drain mainline is proposed with this project: an 8'x8' RCB in Kettle Bend Road between Sunset Run Drive and Kindle Rise Way. Within this project, the storm drain system will be referred to as the Beltway Channel system.

The mainline has been modeled in WSPG (KBBC.WSW) for the 100-year ultimate condition storm event only, which presents the worst case flows. With the completion of upstream drainage infrastructure as proposed in the Master Study, a majority of flow from upstream will enter the mainlines as flow are routed along ultimate flow patterns. An ultimate condition flow rate of 861-cfs (DUMMY6) is conveyed by the Beltway Channel. As incoming lateral flows are included in the concentration point referenced from the Village 22 Master Study and lateral flow rates are less than 10% of the main line flow, junctions have not been modeled in WSPG. Concrete with strength of 7000 psi as well as an additional 1-inch sacrificial concrete on the invert slab will be used for storm drains with high velocities



ULTIMATE CONDITION HEC-1 SUMMARY TABLE

BASIN ID	AREA (ac)	Q100 (CFS)
DUMMY3*	-	749
STKR	1.38	6
STKB1	3.58	13
V	5.18	17
W	5.46	17
STFR	1.50	7
EE	7	24
NP-4	0.7	2
STFE	1.63	7
CPFE	-	9
HH	4.73	20
CPBC	-	862
CP2*	-	198
CP3*	-	80
STKB2	5.02	18
I	14.28	54
STFW	1.4	6
Q	4.68	18
R	5.21	18
CPGW	-	391

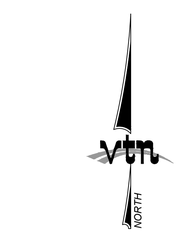
*Referenced from V22 MCDS by VTN (DS#5005)

PRORATED ONSITE SUBBASIN SUMMARY ULTIMATE CONDITION

BASIN	BASIN AREA		Q100
STKB1	3.58		13
STKB2	5.02		18
SUBBASIN	**SUB AREA**	**SUB AREA**	**Q100**
STKB1-A	1.16	32.4%	4
STKB1-B	0.84	23.5%	3
STKB1-C	0.66	18.4%	2
STKB1-D	0.92	25.7%	3
TOTAL	**3.58**	**100.0%**	**13**
STKB2-A	0.49	9.8%	2
STKB2-B	0.95	18.9%	3
STKB2-C	1.13	22.5%	4
STKB2-D	0.37	7.4%	1
STKB2-E	1.48	29.5%	5
STKB2-F	0.60	12.0%	2
TOTAL	**5.02**	**100.0%**	**18**

Street Section Normal Depth Summary Table (100-year)

Cross Section Designation	Contributing Basin/ Subbasin	Discharge (cfs)	Slope (%)	Velocity (fps)	Flow Depth (ft)	V x D
KB1	STKB1-A	4	3.00%	3.33	0.31	1.03
KB2	STKB1-B	3	0.70%	1.74	0.35	0.61
KB3	STKB1-C	2	0.70%	1.62	0.31	0.50
KB4	STKB1-D	3	0.70%	1.74	0.35	0.61
KB5	STKB2-A	2	3.60%	3.50	0.25	0.88
KB6	STKB2-B	3	0.70%	1.74	0.35	0.61
KB7	STKB2-C	4	0.70%	1.83	0.37	0.68
KB8	STKB2-E	5	0.70%	1.93	0.39	0.75
KB9	STKB2-F	2	10.20%	5.47	0.24	1.31



GRAPHIC SCALE

200 0 100 200 400

1" = 200'

LEGEND

- BASIN BOUNDARY
- ST7 BASIN DESIGNATION
- FLOW ARROW
- LOCAL STORM DRAIN ALIGNMENT
- CCRFCD STORM DRAIN ALIGNMENT
- SUBBASIN BOUNDARY
- FLOW CONCENTRATION POINT

REVISION | BY | DATE | REV

####

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

ULTIMATE CONDITION MAP
FIGURE 8

SUMMERLIN WEST VILLAGE 22
KETTLE BEND ROAD

DRAWN BY: RBR 9/12/19
DESIGNED BY: #### ####
CHECKED BY: #### ####
PROJECT NO: 7981-6.2
SCALE: 1"= 200' HORIZ. 1"= 200' VERT.

SHEET
FIG 8
########SHEETS
DRAWING NO.
####

H:\7981\Kettle Bend Road\Drainage\A Figures\Figure 8- Ultimate Condition Map.dwg, Sep 12, 2019

APPENDIX B
HYDROLOGIC CALCULATIONS

TRAVEL TIME CALCULATIONS

DEVELOPMENT: Kettle Bend Road
W.O. # 7851-5.2 **CALCULATED BY:** RBR

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

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

Non-urban		Urbanized	
C1=14.8	C2=29.4	C1=20.2	C2=30.6

					First 500 feet		Remaining Travel Distance	
Basin	**Length** (ft)	**High Elev** (ft)	**Low Elev** (ft)	**Slope** (ft/ft)	**C1**	**V1** (fps)	**C2**	**V2** (fps)
UNDEVELOPED BASINS								
OFF1	1120	3370	3343	0.024	14.8	2.3	29.4	4.6
OFF2	1250	3386	3333	0.043	14.8	3.1	29.4	6.1
OFF3	10931	3956	3380	0.053	14.8	3.4	29.4	6.7
OFF4	1120	3370	3343	0.024	14.8	2.3	29.4	4.6
OFF5	1250	3386	3333	0.042	14.8	3.0	29.4	6.1
OFF6	5021	3655	3380	0.055	14.8	3.5	29.4	6.9
EX1	270	3345	3325	0.074	14.8	4.0	29.4	8.0
EX2	573	3325	3287	0.066	14.8	3.8	29.4	7.6
DEVELOPED BASINS								
STKB1	1640	3354	3331	0.014	20.2	2.4	30.6	3.7
STKB2	1660	3333	3318	0.009	20.2	1.9	30.6	2.9
STFE	685	3384	3340	0.064	20.2	5.1	30.6	7.8
STFR	725	3382	3335	0.065	20.2	5.1	30.6	7.8
STKR	650	3362	3324	0.058	20.2	4.9	30.6	7.4
STFW	490	3343	3304	0.080	20.2	5.7	30.6	8.6
I	1044	3347	3299	0.046	20.2	4.3	30.6	6.6
Q	311	3353	3315	0.122	20.2	7.1	30.6	10.7
R	361	3365	3328	0.102	20.2	6.5	30.6	9.8
V	253	3376	3337	0.154	20.2	7.9	30.6	12.0
W	413	3383	3344	0.094	20.2	6.2	30.6	9.4
EE	555	3393	3341	0.094	20.2	6.2	30.6	9.4
HH	505	3387	3343	0.087	20.2	6.0	30.6	9.0
NP-4	123	3391	3376	0.122	20.2	7.1	30.6	10.7

STANDARD FORM 4

DEVELOPMENT: Kettle Bend Road

CONDITION: Interim

W.O. # 7851-5.2 **CALCULATED BY:** RBR

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

Non-Urban:		Urban	
$V1 = 148 * S^{1/2}$	$V2 = 294 * S^{1/2}$	$V1 = 202 * S^{1/2}$	$V2 = 306 * S^{1/2}$

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

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

SUB-BASIN DATA					INITIAL/OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK (URBANIZED BASINS)		FINAL Tc	LAG TIME	REMARKS
DESIG. (1)	Cn	K (2)	AREA Ac. (3)	AREA Mi^2	LENGTH Ft (4)	SLOPE % (5)	Ti Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	V1 fps (9a)	V2 fps (9b)	Tt Min. (10)	TOTAL LENGTH (11)	Tc Min. (12)	Min.	TLAG Hr.	
UNDEVELOPED BASINS																	
OFF1	77.8	0.637	33.73	0.0527	175	3.0	7.61	1120	2.4	2.3	4.6	5.89	1295	17.19	13.50	0.135	
OFF2	87.1	0.760	20.63	0.0322	240	4.2	5.87	1250	4.3	3.1	6.1	4.77	1490	18.28	10.64	0.106	
OFF3	77.0	0.626	192.50	0.3008	500	3.0	13.29	10931	5.3	3.4	6.7	28.21	11431	73.51	41.50	0.415	
OFF4	77.4	0.631	33.12	0.0518	175	3.0	7.74	1120	2.4	2.3	4.6	5.89	1295	17.19	13.63	0.136	
OFF5	88.0	0.772	21.09	0.0330	240	4.2	5.68	1250	4.2	3.0	6.1	4.80	1490	18.28	10.48	0.105	
OFF6	79.7	0.662	125.32	0.1958	300	3.0	9.47	5021	5.5	3.5	6.9	13.36	5321	39.56	22.83	0.228	
EX1	77.4	0.631	3.58	0.0056	50	3.0	4.14	270	7.4	4.0	8.0	1.12	320	11.78	5.25	0.053	
EX2	86.1	0.746	5.02	0.0078	50	3.0	3.13	573	6.6	3.8	7.6	2.35	623	13.46	5.47	0.055	
DEVELOPED BASINS																	
STKB1	98.0	0.904	3.58	0.0056	42	2.0	1.82	1640	1.4	2.4	3.7	8.63	1682	19.34	10.44	0.104	
STKB2	98.0	0.904	5.02	0.0078	42	2.0	1.82	1660	0.9	1.9	2.9	11.01	1702	19.46	12.83	0.128	
STFE	98.0	0.904	1.63	0.0025	20	2.0	1.25	685	6.4	5.1	7.8	2.03	705	13.92	3.28	0.033	
STFR	98.0	0.904	1.50	0.0023	20	2.0	1.25	725	6.5	5.1	7.8	2.10	745	14.14	3.36	0.034	
STKR	98.0	0.904	1.38	0.0022	20	2.0	1.25	650	5.8	4.9	7.4	2.04	670	13.72	3.30	0.033	
STFW	98.0	0.904	1.40	0.0022	20	2.0	1.25	490	8.0	5.7	8.6	1.43	510	12.83	2.69	0.027	
I	92.0	0.824	14.28	0.0223	100	1.0	4.96	685	6.4	5.1	7.8	2.03	785	14.36	6.99	0.070	
Q	92.2	0.826	4.68	0.0073	100	1.0	4.93	725	6.5	5.1	7.8	2.10	825	14.58	7.03	0.070	
R	90.5	0.805	5.21	0.0081	100	1.0	5.31	650	5.8	4.9	7.4	2.04	750	14.17	7.35	0.074	
V	87.6	0.766	5.18	0.0081	100	1.0	6.02	490	8.0	5.7	8.6	1.43	590	13.28	7.45	0.074	
W	87.6	0.766	5.46	0.0085	100	1.0	6.02	1044	4.6	4.3	6.6	3.31	1144	16.36	9.32	0.093	
EE	88.2	0.775	7.00	0.0109	100	1.0	5.86	311	12.2	7.1	10.7	0.73	411	12.28	6.59	0.066	
HH	93.6	0.845	4.73	0.0074	100	1.0	4.58	361	10.2	6.5	9.8	0.93	461	12.56	5.51	0.055	
NP-4	83.3	0.710	0.70	0.0011	100	1.0	7.02	253	15.4	7.9	12.0	0.53	353	11.96	7.55	0.075	

ULTIMATE CONDITION
HEC-1 ANALYSIS

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1****************************************                    ****************************************
 *                                      *                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                    *   U.S. ARMY CORPS OF ENGINEERS       *
 *              JUN   1998              *                    *   HYDROLOGIC ENGINEERING CENTER      *
 *           VERSION 4.1                *                    *         609 SECOND STREET            *
 *                                      *                    *      DAVIS, CALIFORNIA 95616         *
 *  RUN DATE   11SEP19  TIME  13:30:46  *                    *          (916) 756-1104              *
 *                                      *                    *                                      *
 ****************************************                    ****************************************

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                                        X     X  X       X     X        XX
                                        X     X  X       X              X
                                        XXXXXXX  XXXX    X       XXXXX  X
                                        X     X  X       X              X
                                        X     X  X       X     X        X
                                        X     X  XXXXXXX   XXXXX        XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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

1 HEC-1 INPUT PAGE 1

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

                        *DIAGRAM
 *** FREE ***
             1          ID    ULTIMATE CONDITION HYDROLOGIC MODEL
             2          ID    INPUT FILE DATE = SEPTEMBER 11, 2019
             3          ID    DESIGN STORM = 100-YEAR 6-HR STORM
             4          ID    STORM DISTRIBUTION = SDN #3
             5          ID    MODELED BY VTN (ACY)
             6          ID
             7          ID    ********************************************************
             8          ID    * SUMMERLIN WEST VILLAGE 22                           *
             9          ID    * KETTLE BEND ROAD                                    *
            10          ID    ********************************************************
            11          ID
            12          ID
            13          ID
            14          ID   10YR AND 100YR STORM EVENT FOR 6 HOUR STORM
            15          IT       5       0       0     300
            16          IN       5       0       0
            17          IO       5       0       0
            18          JR    PREC     .59    1.00
                        *

            19          KK    3-O*
            20          KM   REFERENCED FROM THE OVERALL SWPA MPU
            21          BA  0.0805
            22          PB    3.48
            23          PC       0    0.02   0.057    0.07   0.087   0.108   0.124    0.13    0.13   0.130
            24          PC    0.13    0.13    0.13   0.133    0.14   0.142   0.148   0.158   0.172   0.181
            25          PC    0.19   0.197   0.199     0.2   0.201   0.204   0.214   0.229   0.241   0.249
            26          PC   0.251   0.256    0.27   0.278   0.281   0.283   0.295   0.322   0.352   0.409
            27          PC   0.499    0.59    0.71   0.744   0.781   0.812   0.819   0.835   0.851   0.856
            28          PC    0.86   0.868   0.876   0.888    0.91   0.926   0.937    0.95    0.97   0.976
            29          PC   0.982   0.985   0.987   0.989    0.99   0.993   0.993   0.994   0.995   0.998
            30          PC   0.998   0.999       1
            31          LS       0    94.5
            32          UD   0.103
                        *

            33          KKOFF-COS2
            34          KM   OFFSITE BASIN
            35          KM   REFERENCE SWPA V22 MASTER STUDY
            36          BA   .0299
            37          PB    3.45
            38          LS       0    86.0
            39          UD   0.110
                        *

            40          KKCOFFCOS2
            41          KM   COMBINE 3-O AND OFF-COS2
            42          KM   REFERENCE SWPA V22 MASTER STUDY
            43          HC       2
```

```
          343          KM   REFERENCE SWPA V22 MASTER STUDY
          344          BA  0.0053
          345          PB    3.40
          346          LS       0    92.2
          347          UD   0.060
                       *
1                                        HEC-1 INPUT                                          PAGE 10

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          348          KK     COP
          349          KM   COMBINE P AND O
          350          KM   REFERENCE SWPA V22 MASTER STUDY
          351          HC       2
                       *

          352          KK    DES3
          353          KM   REFERENCE SWPA V22 MASTER STUDY
          354          BA  0.0029
          355          PB    3.38
          356          LS       0    98.0
          357          UD   0.069
                       *

          358          KK   CDES3
          359          KM   COMBINE COP & DES3
          360          KM   REFERENCE SWPA V22 MASTER STUDY
          361          HC       2
                       *

          362          KK    CP3*
          363          KM   COMBINES CSTG2 & CDES3
          364          KM   REFERENCE SWPA V22 MASTER STUDY
          365          HC       2
                       *

          366          KK   STKB2
          367          KM   ONSITE BASIN
          368          BA  0.0078
          369          BF       0
          370          PB    3.38
          371          LS       0    98.0
          372          UD   0.128
                       *

          373          KK       I
          374          KM   DEVELOPED PARCEL BASIN
          375          BA  0.0223
          376          PB    3.38
          377          LS       0    92.0
          378          UD   0.070
                       *

          379          KK    STFW
          380          KM   DEVELOPED STREET BASIN
          381          BA  0.0022
          382          PB    3.38
          383          LS       0    98.0
          384          UD   0.050
                       *
1                                        HEC-1 INPUT                                          PAGE 11

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


          385          KK       Q
          386          KM   DEVELOPED PARCEL BASIN
          387          BA  0.0073
          388          PB    3.38
          389          LS       0    92.2
          390          UD   0.070
                       *

          391          KK       R
          392          KM   DEVELOPED PARCEL BASIN
          393          BA  0.0081
          394          PB    3.37
          395          LS       0    90.5
          396          UD   0.074
                       *

          397          KK    CPGW
          398          KM   COMBINE COMBINE CP2*, CP3*, STKB2, I, STFW, Q, AND R
          399          HC       7
                       *
          400          ZZ
1
     SCHEMATIC DIAGRAM OF STREAM NETWORK
```

```
  2 COMBINED AT
+                  CDES3       .01     1   FLOW          18.      34.
                                             TIME          3.50     3.50

  2 COMBINED AT
+                   CP3*       .03     1   FLOW          44.      80.
                                             TIME          3.50     3.50

  HYDROGRAPH AT
+                  STKB2       .01     1   FLOW          10.      18.
                                             TIME          3.58     3.58

  HYDROGRAPH AT
+                      I       .02     1   FLOW          28.      54.
                                             TIME          3.50     3.50

  HYDROGRAPH AT
+                   STFW       .00     1   FLOW           4.       6.
                                             TIME          3.50     3.50

  HYDROGRAPH AT
+                      Q       .01     1   FLOW           9.      18.
                                             TIME          3.50     3.50

  HYDROGRAPH AT
+                      R       .01     1   FLOW           9.      18.
                                             TIME          3.50     3.50

  7 COMBINED AT
+                   CPGW       .15     1   FLOW         214.     391.
                                             TIME          3.50     3.50


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

STREET NORMAL DEPTH CALCULATIONS

Worksheet for KB5 (83.5' ROW)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.03600	ft/ft
Discharge	2.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.65
0+07.50	0.50
0+08.00	0.50
0+08.00	0.00
0+09.50	0.13
0+09.50	0.17
0+36.50	0.71
0+36.50	1.21
0+43.50	1.35
0+43.50	0.85
0+81.50	0.09
0+81.50	0.05
0+83.00	-0.08
0+83.00	0.42
0+83.50	0.42

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.65)	(0+09.50, 0.13)	0.013
(0+09.50, 0.13)	(0+36.50, 0.71)	0.016
(0+36.50, 0.71)	(0+43.50, 0.85)	0.013
(0+43.50, 0.85)	(0+81.50, 0.05)	0.016
(0+81.50, 0.05)	(0+83.50, 0.42)	0.013

Worksheet for KB5 (83.5' ROW)

Options

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

Results

Normal Depth		0.25	ft
Elevation Range	-0.08 to 1.35 ft		
Flow Area		0.57	ft²
Wetted Perimeter		7.33	ft
Hydraulic Radius		0.08	ft
Top Width		6.83	ft
Normal Depth		0.25	ft
Critical Depth		0.31	ft
Critical Slope		0.00743	ft/ft
Velocity		3.50	ft/s
Velocity Head		0.19	ft
Specific Energy		0.44	ft
Froude Number		2.14	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.25	ft
Critical Depth	0.31	ft
Channel Slope	0.03600	ft/ft
Critical Slope	0.00743	ft/ft

Messages

Notes

Worksheet for KB5 (83.5' ROW)

Messages

Q100= 2cfs for STKB2-A

Cross Section for KB5 (83.5' ROW)

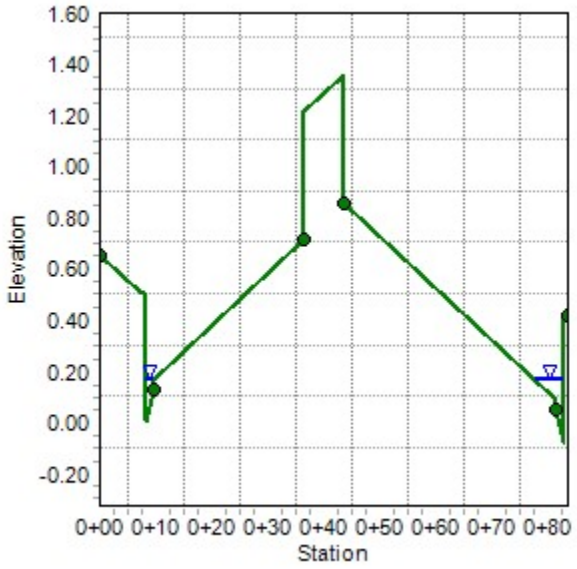
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.03600	ft/ft
Normal Depth	0.25	ft
Discharge	2.00	ft³/s

Cross Section Image



Worksheet for KB6 (83.5' ROW)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00700	ft/ft
Discharge	3.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.65
0+07.50	0.50
0+08.00	0.50
0+08.00	0.00
0+09.50	0.13
0+09.50	0.17
0+36.50	0.71
0+36.50	1.21
0+43.50	1.35
0+43.50	0.85
0+81.50	0.09
0+81.50	0.05
0+83.00	-0.08
0+83.00	0.42
0+83.50	0.42

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.65)	(0+09.50, 0.13)	0.013
(0+09.50, 0.13)	(0+36.50, 0.71)	0.016
(0+36.50, 0.71)	(0+43.50, 0.85)	0.013
(0+43.50, 0.85)	(0+81.50, 0.05)	0.016
(0+81.50, 0.05)	(0+83.50, 0.42)	0.013

Worksheet for KB6 (83.5' ROW)

Options

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

Results

Normal Depth		0.35	ft
Elevation Range	-0.08 to 1.35 ft		
Flow Area		1.73	ft²
Wetted Perimeter		17.31	ft
Hydraulic Radius		0.10	ft
Top Width		16.61	ft
Normal Depth		0.35	ft
Critical Depth		0.34	ft
Critical Slope		0.00784	ft/ft
Velocity		1.74	ft/s
Velocity Head		0.05	ft
Specific Energy		0.39	ft
Froude Number		0.95	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.35	ft
Critical Depth	0.34	ft
Channel Slope	0.00700	ft/ft
Critical Slope	0.00784	ft/ft

Messages

Notes

Worksheet for KB6 (83.5' ROW)

Messages

Q100= 3cfs for STKB2-B

Cross Section for KB6 (83.5' ROW)

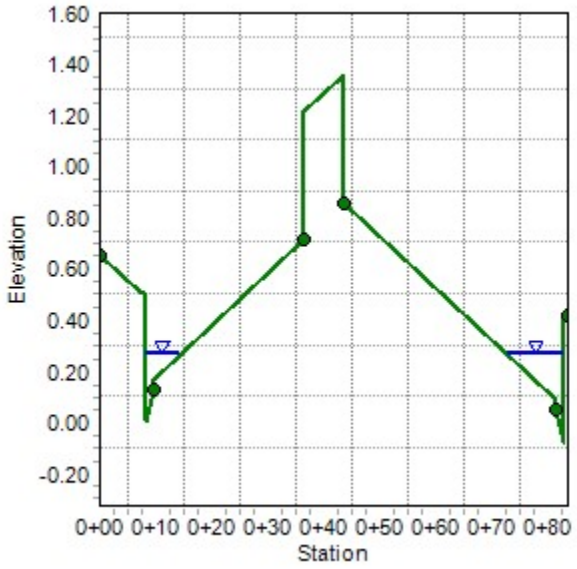
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00700	ft/ft
Normal Depth	0.35	ft
Discharge	3.00	ft³/s

Cross Section Image



REFERENCES

2) Summerlin West Village 22 - Kindle Rise Way (from Kettle Bend Rd. to Desert Foothills Blvd., DS#5243), VTN (2020)

Approval Letters
Excerpts (*Update #1*)
Appendix A - Rainfall Map (*Update #1)*
Appendix A - Figure 6 : Ultimate Condition Basin Map *(Update #1)*
Appendix A - Figure 7 : Local Storm Drain Facilities Map *(Update #1)*
Appendix B - Curve Number Calculations *(Update #1)*
Appendix B - Standard Form 4 *(Update #1)*
Appendix B - Ultimate Condition HEC-1 *(Update #1)*
Appendix C - Hydraulic Calculations - Facility 21A *(Update #1)*
Appendix C - Hydraulic Calculations - Facility 22A *(Update #1)*

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: August 3, 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:			**COPIES TO:**
Summerlin West Village 22 - Kindle Rise Way **(from Kettle Bend Rd. to Desert Foothills Blvd.)**				VTN Nevada
Cross Streets:	Kettle Bend Road and Kindle Rise Way			The Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5243C.doc			Bart Anderson, P.E., DevCo
Parcel Number:	137-23-201-001			CCRFCD
Zoning Action:	N/A			
FEMA Flood Zone	YES	NO **X**		
Proposed Storm Drain	YES **X**	NO		

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	2/5/2020	2/19/2020 & 2/26/2020	Not Approved	$400.00	3735112: $400
2nd Submittal	3/11/2020	4/6/2020	Conditional Approval	$400.00	3776284: $400
Supplement	8/3/2020	8/3/2020	Concurrence Recv'd	N/C	N/C
			TOTAL FEES (LDDRS):	**$800.00**	**----**

REMARKS:

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.

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

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

3. ***Sheet UT2****: Provide a nominal inlet at the south side of Kindle Rise Way at approximate Station 11+50.*

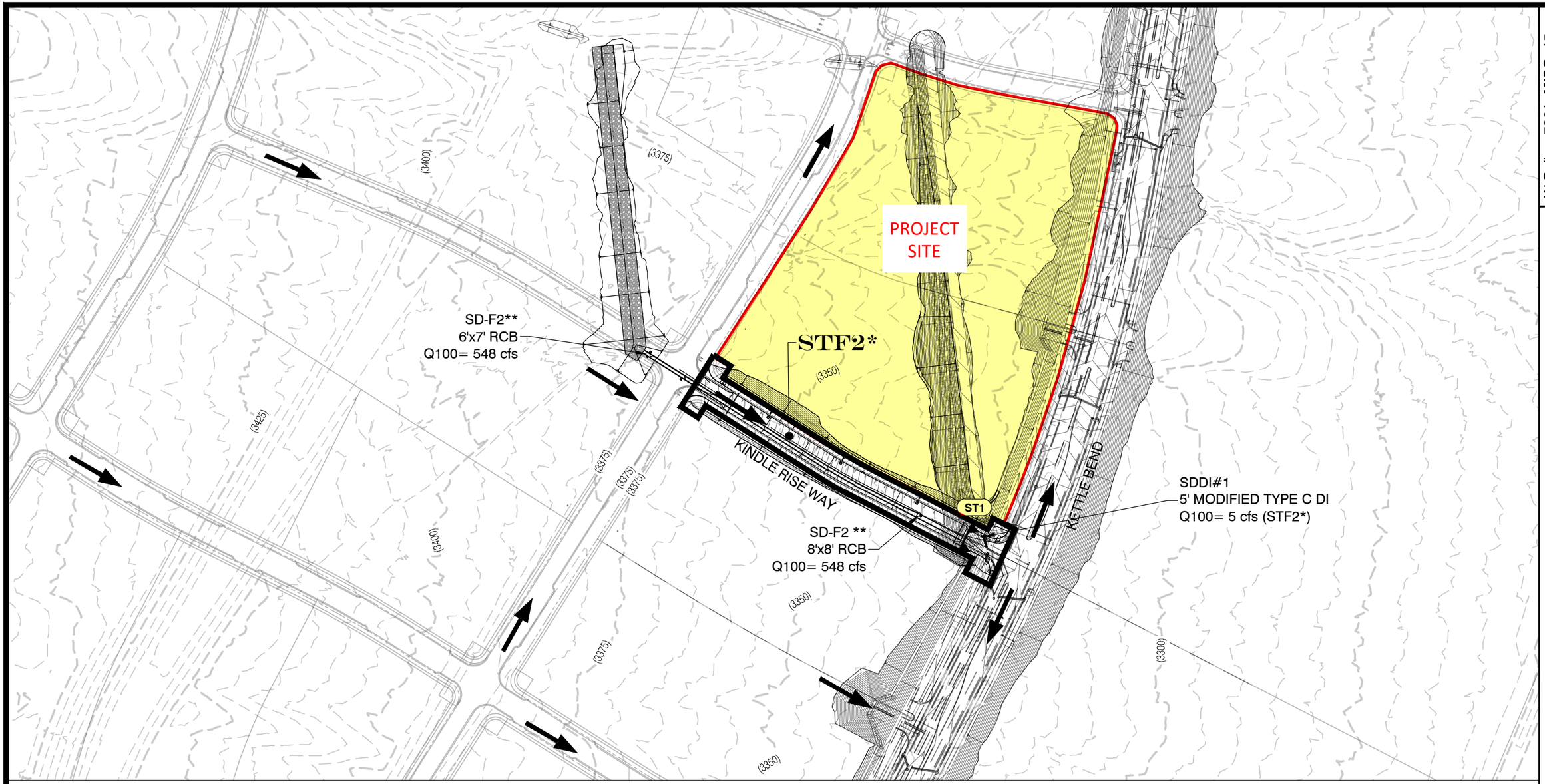
   Note that there are handicap ramps downstream and adjacent to the said location. No nuisance drainage shall be crossing the handicap ramps as possible. Therefore, this drop inlet is required. Provide as such in the improvement plans.

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

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

END OF REMARKS
HDR/AYS

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



LEGEND

- BASIN BOUNDARY
- ST7 — BASIN DESIGNATION
- FLOW ARROW
- FLOW CONCENTRATION POINT
- ST1 — CROSS SECTION DESIGNATION

GRAPHIC SCALE

200 0 100 200 400

1" = 200'

ULTIMATE CONDITION STREET FLOW ANALYSIS SUMMARY

Street Section	Q100 (cfs)	Slope	Velocity (ft/s)	Depth (ft)	V x D	Tributary Basin
ST1 MAX	5	9.13%	4.20	0.24	1.01	STF2*
ST1 MIN	5	1.45%	2.09	0.29	0.61	STF2*

*Referenced from SWPA MPU by VTN (DS# 4926)

ULTIMATE CONDITION HEC-1 SUMMARY TABLE

BASIN ID	AREA (ac)	Q100
STF2*	1.21	5

*Referenced from V22 MCDS by VTN (DS# 5005)

FIGURE 8- ULTIMATE CONDITION BASIN MAP
SUMMERLIN WEST VILLAGE 22
KINDLE RISE WAY (KETTLE BEND TO DESERT FOOTHILLS)

W.O.#:	7861- MISC- 15
DATE:	12/19/2019
BY:	RBR
SCALE:	1"= 200'
SHEET	1 OF 1

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NV 89146-5148

H:\7861\Kindle Rise Way - Kettle Bend to Desert Foothills\Drainage\A Figures\Figure 8- Ultimate Condition Map.dwg,jayson; Feb 04, 2020 - 2:37pm

STREET NORMAL DEPTH CALCULATIONS

Worksheet for ST1 MAX 41' ROW- ULT

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	9.13000	%
Discharge	5.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.58
0+04.00	0.50
0+04.50	0.50
0+04.50	0.00
0+06.00	0.13
0+06.00	0.17
0+20.50	0.29
0+35.00	0.17
0+35.00	0.13
0+36.50	0.00
0+36.50	0.50
0+37.00	0.50
0+41.00	0.58

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.58)	(0+06.00, 0.13)	0.013
(0+06.00, 0.13)	(0+35.00, 0.13)	0.016
(0+35.00, 0.13)	(0+41.00, 0.58)	0.013

Options

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

Worksheet for ST1 MAX 41' ROW- ULT

Results

Normal Depth		0.24	ft
Elevation Range	0.00 to 0.58 ft		
Flow Area		1.19	ft²
Wetted Perimeter		21.38	ft
Hydraulic Radius		0.06	ft
Top Width		20.80	ft
Normal Depth		0.24	ft
Critical Depth		0.31	ft
Critical Slope		0.00805	ft/ft
Velocity		4.20	ft/s
Velocity Head		0.27	ft
Specific Energy		0.52	ft
Froude Number		3.09	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.24	ft
Critical Depth	0.31	ft
Channel Slope	9.13000	%
Critical Slope	0.00805	ft/ft

Cross Section for ST1 MAX 41' ROW- ULT

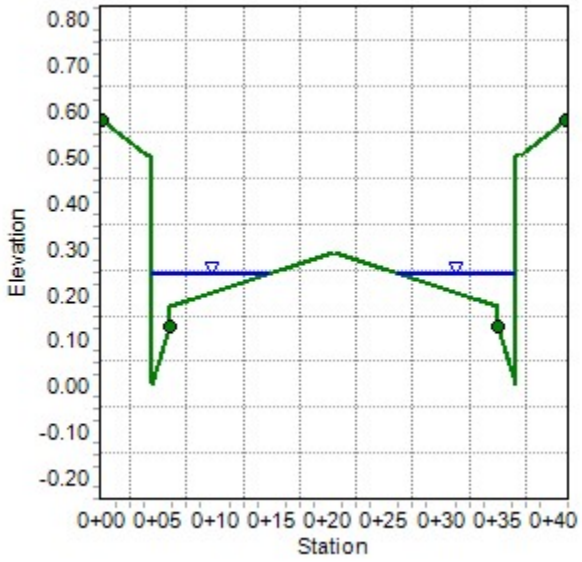
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	9.13000	%
Normal Depth	0.24	ft
Discharge	5.00	ft³/s

Cross Section Image



Worksheet for ST1 MIN 41' ROW- ULT

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.45000	%
Discharge	5.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.58
0+04.00	0.50
0+04.50	0.50
0+04.50	0.00
0+06.00	0.13
0+06.00	0.17
0+20.50	0.29
0+35.00	0.17
0+35.00	0.13
0+36.50	0.00
0+36.50	0.50
0+37.00	0.50
0+41.00	0.58

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.58)	(0+06.00, 0.13)	0.013
(0+06.00, 0.13)	(0+35.00, 0.13)	0.016
(0+35.00, 0.13)	(0+41.00, 0.58)	0.013

Options

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

Worksheet for ST1 MIN 41' ROW- ULT

Results

Normal Depth		0.29	ft
Elevation Range	0.00 to 0.58 ft		
Flow Area		2.40	ft²
Wetted Perimeter		32.52	ft
Hydraulic Radius		0.07	ft
Top Width		31.85	ft
Normal Depth		0.29	ft
Critical Depth		0.31	ft
Critical Slope		0.00821	ft/ft
Velocity		2.09	ft/s
Velocity Head		0.07	ft
Specific Energy		0.36	ft
Froude Number		1.34	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.29	ft
Critical Depth	0.31	ft
Channel Slope	1.45000	%
Critical Slope	0.00821	ft/ft

Cross Section for ST1 MIN 41' ROW- ULT

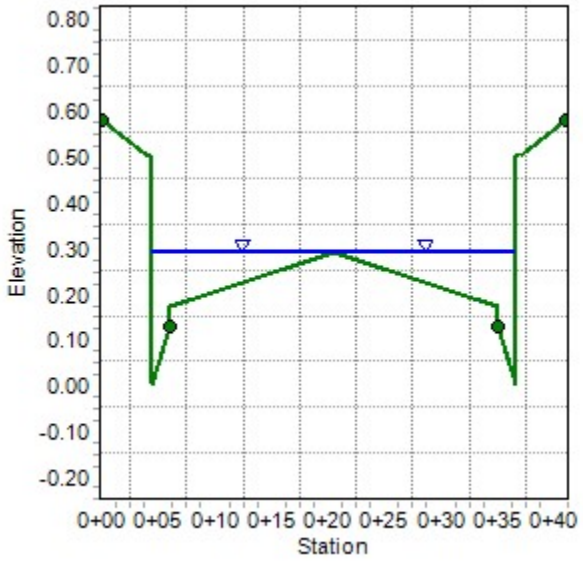
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.45000	%
Normal Depth	0.29	ft
Discharge	5.00	ft³/s

Cross Section Image



DROP INLET CALCULATIONS

Drop Inlet Interception

Project: Kindle Rise Way (Kettle Bend to Desert Foothills)
Work Order no.: 7861-MISC-15
Calculated By: RBR
Date: Dec-19

Inlet ID: SDDI#1
Drainage Condition: Ultimate 100-Year Storm
Flow Summary: STF2
Inlet Description: 5" Modified Type C

Equations referenced from CCRFCD HCDDM and FHWA HEC-22

Input:	**Variable:**	**Input:**
Street Flow (cfs)	Q	5.0
Longitudinal Slope (ft/ft)	S_o	0.0145
Manning's Coefficient	n	0.016
Street Flow Velocity (fps)	V	2.09
Street Flow Depth (ft)	D	0.29
Street Cross Slope (ft/ft)	S_x	0.02
Grate Width (ft)	W	1.5
Grate Depression (in)	D_g	2
Length of Grate (ft)	L_g	2.5
Length of Curb Opening (ft)	L_c	5
Clogging Factor - Grate (%)	CF_g	50%
Clogging Factor - Curb (%)	CF_c	50%
Effective Grate Length (ft)	L_{ge}	1.25
Effective Curb Opening Lenth (ft)	L_{ce}	2.5

Output (Grate):	**Equation:**	**Output (Grate):**
R_f - Frontal Flow Factor	1-0.09*(V-V_x) if V>V_x; else 1	1.00
V_o - Splash Over Velocity (fps)	p+q*L_{ge}-r*L_{ge}^2+sy*L_{ge}^3; where p=0.30, q=4.85, r=1.31, sy=0.15 (vane grate)	4.61
E - grate Flow Ratio	Q_w/Q_s	1.10
Q_w - Frontal Flow (cfs)	$Q[1-(1-(W/T))^{2.67}]$	2.62
Q_s - Side Flow (cfs)	Q-Q_w	2.38
T - Side Flow Spread (ft)	$(D-D_g)/S_x$	6.17
R_s - Side Flow Factor	$1/(1+(0.15*V^{1.8})/(S_x*L_{ge}^{2.3}))$	0.06
Q_{gi} - Intercepted Flow (cfs)	$(R_f*E+R_s*(1-E))*Q$	**5.0**

Output (Curb):	**Equation:**	**Output (Curb):**
S_e - Equivalent Cross Slope (ft/ft)	S_x+S_g*E	0.14
Q_{sx} - Remaining Flow After Grate Interception (cfs)	Q-Q_{gi}	0.00
S_g - Gutter Cross Slope (ft/ft)	D_g/W	0.11
L_t - Effective Interception Length (ft)	$0.60*Q_{sx}^{0.42}*S_o^{0.30}*[1/(n*S_e)]^{0.6}$	0.00
Q_{ci} - Intercepted Flow (cfs)	$(1-(1-L_{ce}/L_t)^{1.8})*Q_{sx}$ or Q_{sx} if $L_t<L_{ce}$	**0.0**

Output (Combination):	**Equation:**	**Output (Combination):**
Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	**5.0**
Bypass Flow (cfs)	Street Flow - Total Intercepted Flow	**0.0**

REFERENCES

Summerlin West Village 22 - Desert Foothills Dr - Sunset Run Drive to Fleet Wing Avenue, DS#5344, VTN (2020)

Improvement Plans Sheets

SUMMERLIN VILLAGE 22
IMPROVEMENT PLANS FOR:

DESERT FOOTHILLS DRIVE

SUNSET RUN DRIVE TO FLEET WING AVENUE
FUTURE SID PROJECT
APN 137-23-211-001

SHEET INDEX

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2	LEGEND AND ABBREVIATIONS	
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11	MASTER SEWER PLAN	
12	MASTER SEWER PLAN	
13	ROADWAY GRADING PLAN	BEGIN TO STA 231+00
14	ROADWAY PLAN AND PROFILE	BEGIN TO STA 231+00
15	ROADWAY GRADING PLAN	STA 231+00 TO STA 235+00
16	ROADWAY PLAN AND PROFILE	STA 231+00 TO STA 235+00
17	ROADWAY GRADING PLAN	STA 235+00 TO STA 239+00
18	ROADWAY PLAN AND PROFILE	STA 235+00 TO STA 239+00
19	ROADWAY GRADING PLAN	STA 239+00 TO STA 243+00
20	ROADWAY PLAN AND PROFILE	STA 239+00 TO STA 243+00
21	ROADWAY GRADING PLAN	STA 243+00 TO STA 247+00
22	ROADWAY PLAN AND PROFILE	STA 243+00 TO STA 247+00
23	ROADWAY GRADING PLAN	STA 247+00 TO STA 251+00
24	ROADWAY PLAN AND PROFILE	STA 247+00 TO STA 251+00
25	ROADWAY GRADING PLAN	STA 251+00 TO END
26	ROADWAY PLAN AND PROFILE	STA 251+00 TO END
27	SWALE GRADING PLAN	STA 18+50 TO 15+50
28	STORM DRAIN LATERAL PROFILES	
29	STORM DRAIN LATERAL PROFILES	
30	WATER LATERAL PROFILES	
31	WATER LATERAL PROFILES	
32	WATER LATERAL PROFILES	
33	WATER LATERAL PROFILES	
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50	TRAFFIC SIGNAL UNDERGROUND SCHEDULES 2	

UTILITY NOTE

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

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

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

NOTICE OF INTENT NOTE

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

NPDES PERMIT NOTE

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

FEMA FLOOD ZONE INFORMATION

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

PROPOSED RIGHT-OF-WAY ACREAGE
3.54 AC.

PROPOSED DISTURBED AREA ACREAGE
8.60 AC.

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

FLOOD - CONDITIONALLY APPROVED, 8/17/2021

1. REVISE GRADING PLAN CERTIFICATION BLOCK TO REFERENCE DS5344

SUMMERLIN®

A Mohotti Alagiyawanna

Digitally signed by A Mohotti Alagiyawanna
DN: cn=A Mohotti Alagiyawanna, o=Atkins North America, ou=Structures, c=N/A
Reason: I agree to specified portions of this document
Date: 2021.08.04 14:24:21-07'00'

Tarin Velotta

Digitally signed by Tarin Velotta
DN: cn=Tarin Velotta, o=Atkins, ou=Atkins, email=tarin.velotta@atkinsglobal.com, c=US
Reason: I agree to specified portions of this document
Date: 2021.08.09 16:50:10-07'00'

OWNER /DEVELOPER

OWNER

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

BRIAN WALSH, SR. VICE PRESIDENT — 6/18/21 DATE

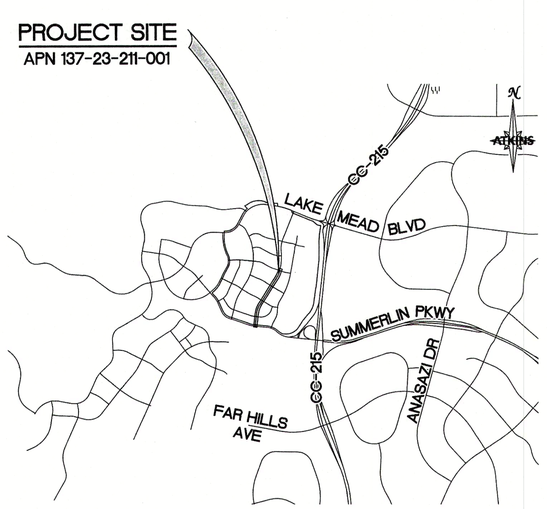
ENGINEER / CONSULTANT

CIVIL

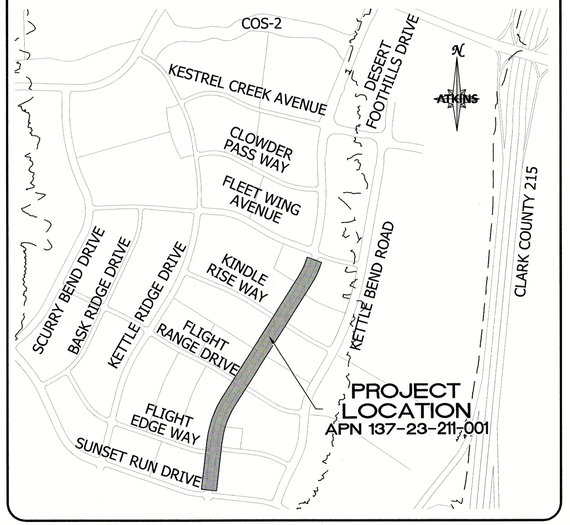
CONTACT: NICOLAS BARCOS, P.E.
ATKINS
2270 CORPORATE CIRCLE SUITE 200
HENDERSON, NEVADA 89074
(702) 263-7275

Nicolas Barcos — Digitally signed by Nicolas Barcos DN: cn=Nicolas Barcos, o=Atkins, ou=Atkins, email=nicolas.barcos@atkinsglobal.com, c=US Reason: I attest to the accuracy and Date: 2021.08.10 14:54:40-07'00'

LOCATION MAP



VICINITY MAP



APPROVALS

CITY OF LAS VEGAS ENGINEERING APPROVAL STAMP

PLANS APPROVED
BY LAND DEVELOPMENT ON BEHALF
OF THE CITY ENGINEERS OFFICE
rkaragdag
Aug 18 2021

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 THE ADOPTED STANDARDS AND/OR SPECIFICATIONS, EXCEPT THOSE SPECIFICALLY LISTED UNDER DEVIATIONS FROM STANDARD. THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN THE DEVIATIONS FROM STANDARD IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATION, CLARK COUNTY AREA, NEVADA.

CITY OF LAS VEGAS DEPARTMENT OF PLANNING

N/A
NOT REQUIRED

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

REVIEWED BY
LAS VEGAS FIRE & RESCUE
RELEASE FOR INSTALLATION AS SUBMITTED
This review does not constitute permission to violate any City, State, or Federal Laws or Ordinances. Ultimate responsibility for compliance rests with the Owner.
Final acceptance of installation is based upon field inspection and acceptance testing.
REVIEWED BY
stacyDoss 07/06/2021

LAS VEGAS FIRE AND RESCUE — DATE

CENTRAL TELEPHONE COMPANY d/b/a CENTURYLINK — Brad Hooton — 6-16-21 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

Mao Fang

LAS VEGAS VALLEY WATER DISTRICT PLANNING & ENGINEERING SERVICES
PROJECT NO. 138549 FIRST APPROVED DATE: 08/04/2021
LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL
SHEETS: 1, 2, 3, 9, 10, 14, 16, 18, 20, 22, 24, 26, 28, 29, 30, 31, 32, 33, 34, 42

NV ENERGY — 06/15/2021 DATE

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

UID: 2021JNP17361
Planner: Jordyn Penniman 06/28/2021
SOUTHWEST GAS CORPORATION — DATE

COX COMMUNICATIONS OF LAS VEGAS, INC — Eric Klette — 6-15-2021 DATE

BASIS OF BEARING

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

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

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

BENCHMARK

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

LEGAL DESCRIPTION

BEING A PORTION OF LOT 1 AS SHOWN ON THE MAP THEREOF IN BOOK 163 OF PLATS, PAGE 43, OFFICIAL RECORDS, CITY OF LAS VEGAS CLARK COUNTY, NEVADA

FAST Call before you UnderGround 1-702-432-5300 — HONESTLY AND ARTISTICALLY SYSTEMS OF TRANSPORTATION

Call before you Dig AVOID OUTAGES, UNDERGROUND UTILITY LINES ARE COMING. Call 811 OR 1-800-642-2444

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

PROFESSIONAL ENGINEER - STATE OF NEVADA — NICOLAS A. BARCOS — EXP. 12-31-22 — CIVIL — No. 29673 — 5/27/21

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

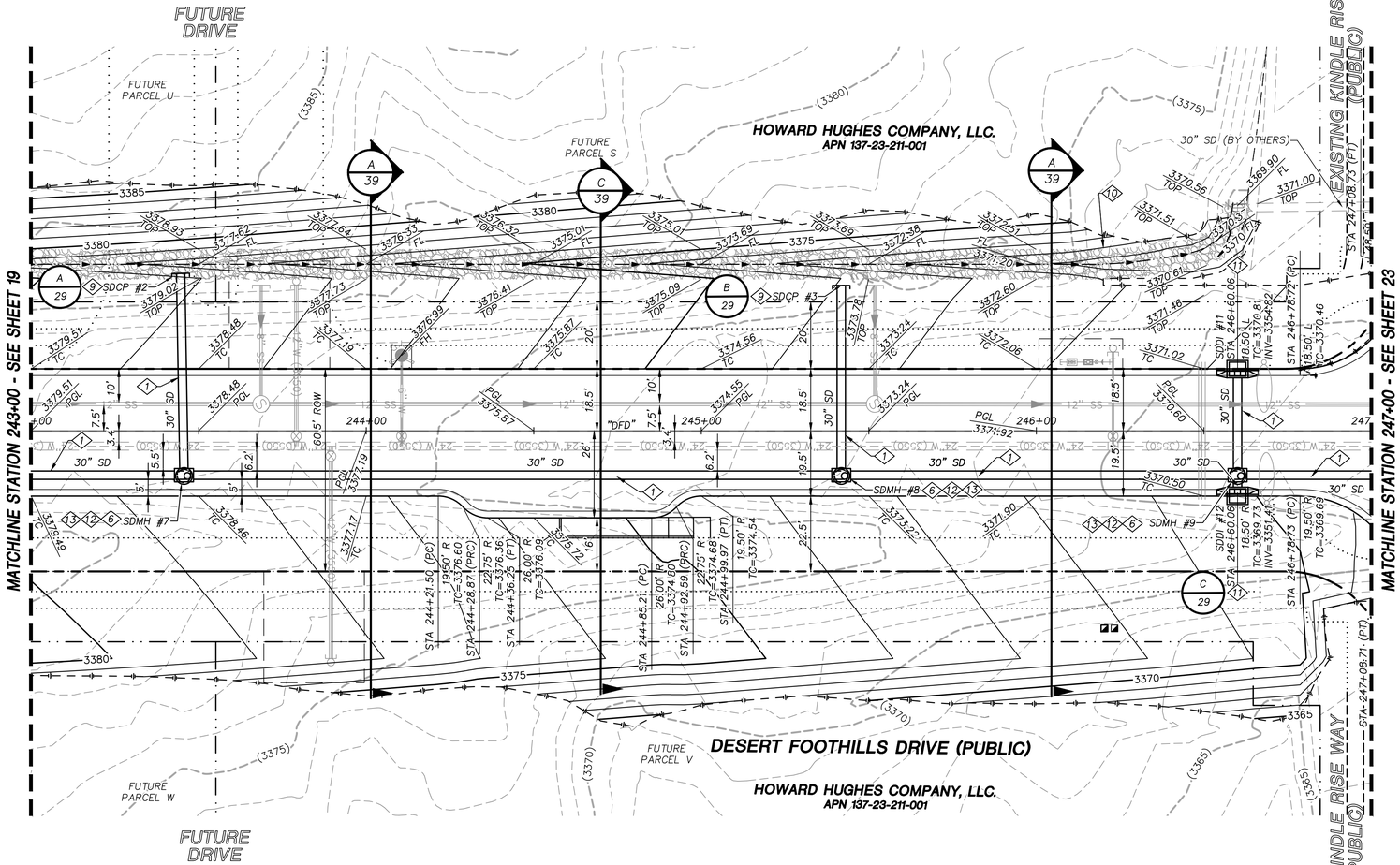
SUMMERLIN®

SUMMERLIN VILLAGE 22
DESERT FOOTHILLS DRIVE
SUNSET RUN DRIVE TO FLEET WING AVENUE (STREET G)

COVER SHEET

DESIGNED BY:	B. MOCHTYAK
DRAWN BY:	L. SOSA
CHECKED BY:	S. BAILEY
HORIZ.:	NONE
VERT.:	NONE
XXXYXXXX	
L21-00307	
DATE:	JUNE, 2021
DRAWING NO.	1/50
JOB NO.	100066774

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STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. INSTALL NDOT TYPE II DROP INLET PER NDOT R-4.2.1 (SEE SHEET 41)
4. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
5. INSTALL TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
7. INSTALL TYPE "A" DROP INLET PER CCAUSED #411 & #421
8. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
10. INSTALL RIP-RAP (D50=12", THICKNESS=24")
11. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421, AND DETAIL C SHEET 40
12. ENCASE STRUCTURE WITH MINIMUM 4" CEMENT SLURRY (CLSM II) PER UDACS 02.22.01B
13. STRUCTURE SHALL BE TREATED WITH WATERTIGHT/EPOXY PER UDACS 02.22.01B

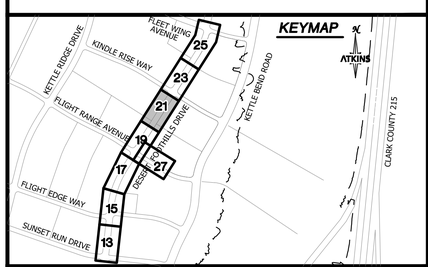
DEPTH OF COVER DURING CONSTRUCTION

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

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.

REVISIONS				
REV.	DESCRIPTION	BY	DATE	APPROVAL



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

GRADING PLAN CERTIFICATION

NICOLAS BARCOS PE#25673 5/27/21 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.

DS5344 ~~DS#3544~~

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

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 - NICOLAS A. BARCOS - EXP. 12-31-22 - CIVIL - No. 25673 - 5/27/21

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

SUMMERLIN

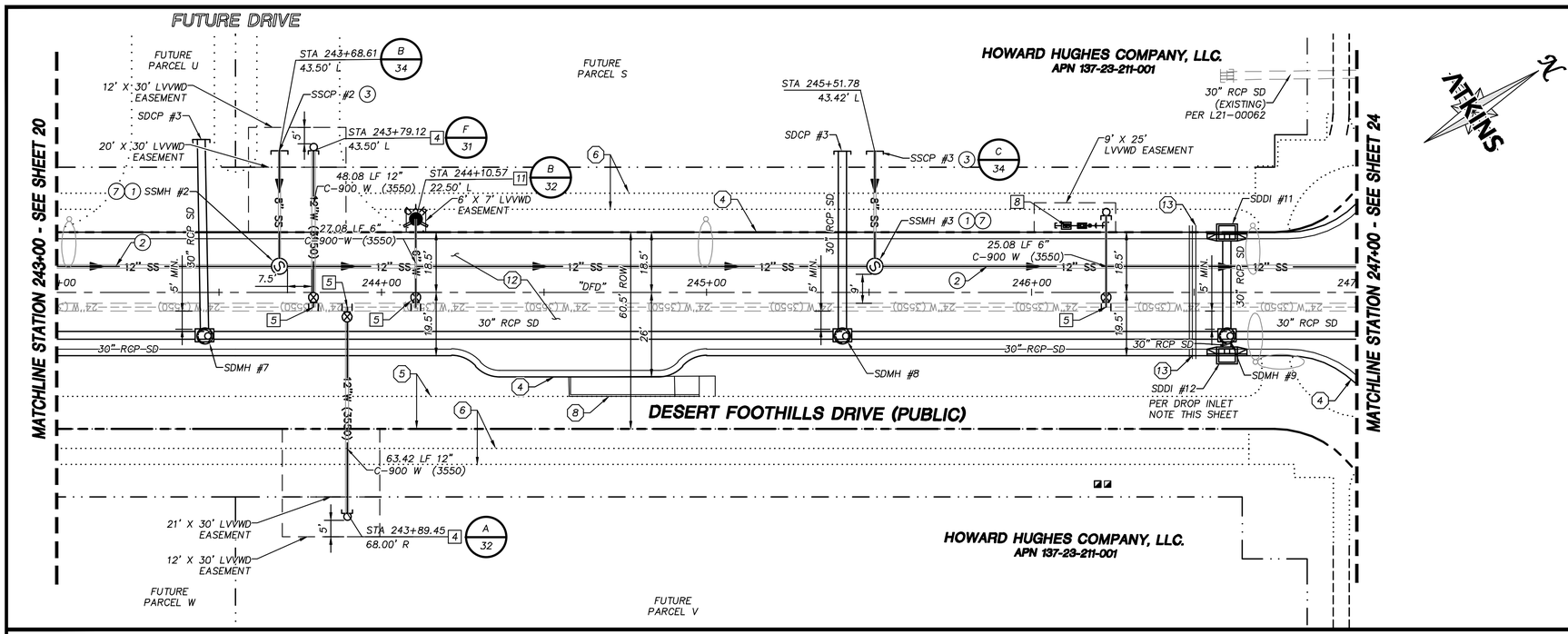
SUMMERLIN VILLAGE 22
DESERT FOOTHILLS DRIVE
SUNSET RUN DRIVE TO FLEET WING AVENUE (STREET G)

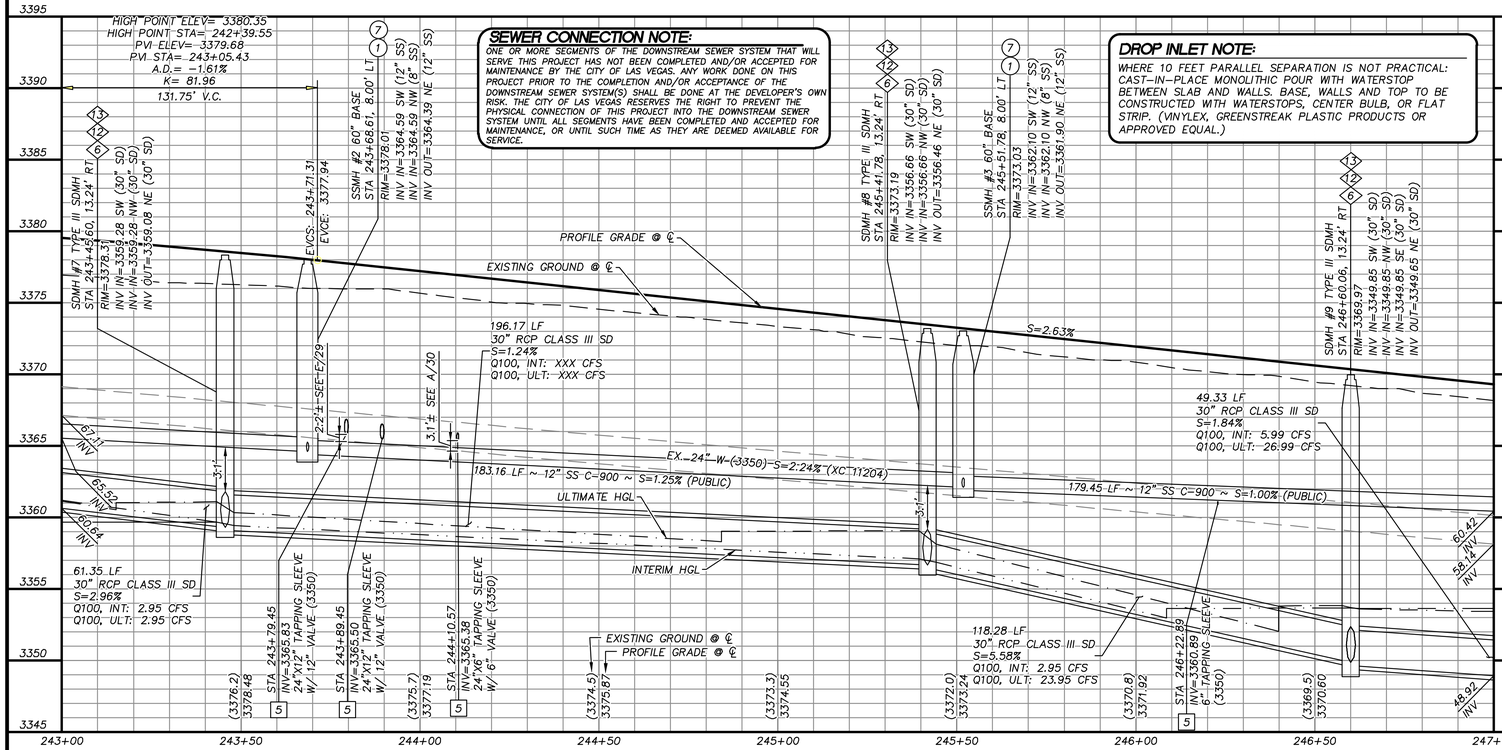
ROADWAY GRADING PLAN
STA 243+00 TO STA 247+00

DESIGNED BY: B. WOCHTYAK
DRAWN BY: L. SOSA
CHECKED BY: P. BATES
HORIZ.: 1"=20'
VERT.: 1"=5'

XXXVXXXX
L21-00307
DATE: JUNE, 2021
DRAWING NO. 21/50
JOB NO. 100066774

C:\Users\EVAN2722\AppData\Local\Temp\AcPublish_19416\66774-12-GRAD-G1.dwg LAYOUT: 21 ROADWAY GRADING PLAN Jun 08, 2021 - 12:05PM





SEWER CONNECTION NOTE:

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

DROP INLET NOTE:

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

VALVED OUTLET: CONDITIONAL APPROVAL FOR 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 THE LVVWD STANDARDS AND AT THE DEVELOPER'S EXPENSE. APPROVAL OF THE VALVED OUTLET DOES NOT PROVIDE OR IMPLY A WATER COMMITMENT.

CAUTION

CATHODIC TEST WIRES AND/OR FIBER OPTIC, RUN ALONG THE SIDE OF THE WATERLINE AT AN UNKNOWN DEPTH. TAKE CAUTION WHEN DIGGING.

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.

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

LVVWD CANNOT GUARANTEE A WATERTIGHT SHUTDOWN WHERE CONNECTIONS OR REPAIRS TO EXISTING FACILITIES ARE REQUIRED. THE CONTRACTOR SHALL ENSURE ALL LABOR AND EQUIPMENT IS AVAILABLE TO REMOVE REMAINING WATER. COORDINATING WITH INSPECTION DIVISION MUST TAKE PLACE PRIOR TO ANY TRIAL SHUTDOWN. CONTRACTOR TO INSTALL TEMPORARY SERVICE TO ENSURE PROPER SHUTDOWN IN THE EVENT NO OTHER APPURTENANCES ARE AVAILABLE.

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.

WATER MAIN JOINT DEFLECTION, PER UDACS 2.07.01 AND 2.07.03.

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

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. INSTALL NDOT TYPE II DROP INLET PER NDOT R-4.2.1 (SEE SHEET 41)
4. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
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12. ENCASE STRUCTURE WITH MINIMUM 4" CEMENT SLURRY (CLSM II) PER UDACS 02.22.01B
13. STRUCTURE SHALL BE TREATED WITH WATERTIGHT/EPOXY PER UDACS 02.22.01B

SEWER CONSTRUCTION NOTES

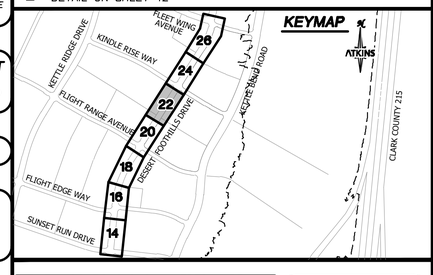
1. INSTALL SEWER MANHOLE WITH WATERTIGHT JOINTS AND SINGLE 24" LID PER DCSWCS SD-1, SD-3, AND SD-4
2. INSTALL SEWER MAIN PER DCSWCS SD-17
3. STUB AND CAP SEWER PIPE. PLACE 4"X4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).
4. REMOVE CAP AND CONNECT TO EXISTING SEWER STUB
5. ADJUST EXISTING MANHOLE TO GRADE PER DCSWCS SD-5.
6. PROTECT SEWER AT UTILITY CROSSING PER DCSWCS SD-19
7. NOT USED
8. INSTALL SEWER MANHOLE WITH WATERTIGHT JOINTS WITH DUAL CONCENTRIC LID PER DCSWCS SD-1, SD-2, SD-4, AND SD-5

WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN PER UDACS PLATES #17 AND PLATE #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL CROSS PER UDACS PLATE #31
4. INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
5. INSTALL TAPPING SLEEVE TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
7. INSTALL 6" SERVICE SADDLE PER UDASC PLATE #4
8. INSTALL 1-1/2" IRRIGATION METER WITH 1-1/2 RPPA PER UDASC PLATES #4 AND #8 WITH CURB STOP
9. INSTALL IN-LINE REDUCER PER UDACS PLATE #30
10. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
11. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, #40, AND #41

ROADWAY CONSTRUCTION NOTES 2,3,7,&11 NOT USED

1. SAWCUT AND MATCH EXISTING
4. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
5. FUTURE BIKE LANE BY OTHERS
6. FUTURE SIDEWALK BY OTHERS
8. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN R-5.2.1 (A=B=6.5').
9. CONSTRUCT 0" FLUSH CURB
10. TRANSITION CURB FROM FULL HEIGHT (6") TO FLUSH (0")
12. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 39 FOR TYPICAL PAVEMENT SECTION.
13. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL ON SHEET 42



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

APPROVED FOR CONSTRUCTION

Mao Fang

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. 138549 FIRST APPROVED DATE: 08/04/2021

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

LAS VEGAS FIRE & RESCUE APPROVAL

REVIEWED BY LAS VEGAS FIRE & RESCUE
RELEASE FOR INSTALLATION AS SUBMITTED
This review does not relieve the applicant of responsibility to obtain any/ all Permits, or to comply with all applicable codes. Officials responsibility for compliance
Final acceptance of installation is based upon field inspection and acceptance testing.
REVIEWED BY
mlardner 08/16/2021

LAS VEGAS FIRE & RESCUE — DATE

BASIS OF BEARING

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

BENCHMARK

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

FAST Call before you UnderGround 1-702-432-5300 (NEVADA 811 ONE CALL AND REGIONAL NOTIFICATION SYSTEM OF TRANSPORTATION)

Call before you Dig (ABOVE NOTIFICATION SYSTEM FOR UTILITY OWNERS IN SOUTHERN NEVADA) Call 811 OR 1-800-642-2444

AVOID POWER OVERHEAD (POWER LINES TO SCALE) CALL BEFORE YOU DIG OVERHEAD 1-702-227-2929

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PROFESSIONAL ENGINEER-SITE CIVIL NICOLAS A. BARCOS EXP. 12-31-22 CIVIL No. 23878 STATE OF NEVADA
5/27/21

REV.	DESCRIPTION	BY	DATE	APPROVAL
	REVISIONS			

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

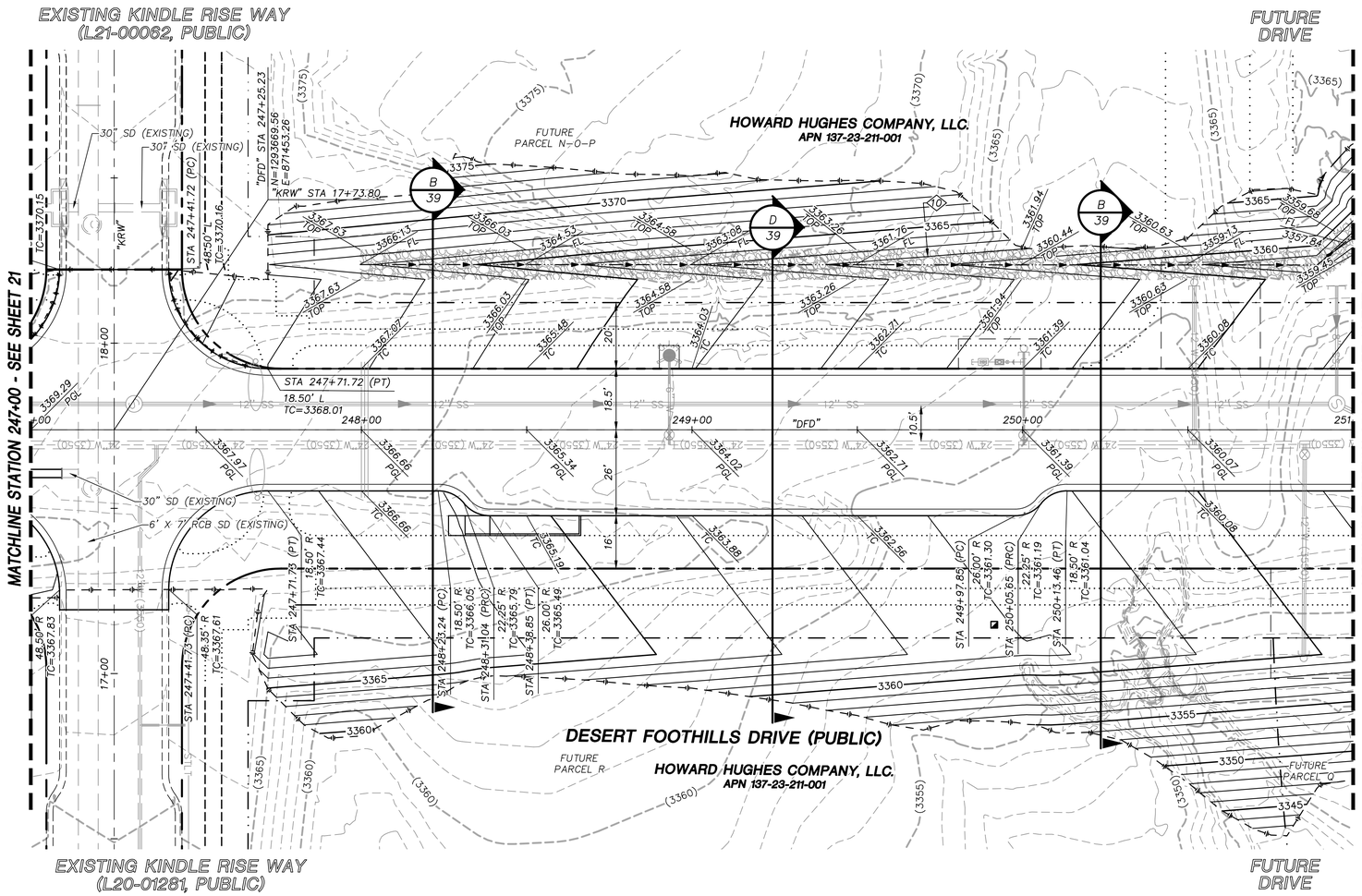
SUMMERLIN

SUMMERLIN VILLAGE 22
DESERT FOOTHILLS DRIVE
SUNSET RUN DRIVE TO FLEET WING AVENUE (STREET G)

ROADWAY PLAN AND PROFILE
STA 243+00 TO STA 247+00

DESIGNED BY: B. MOCHTYAK
DRAWN BY: L. SOSA
CHECKED BY: P. BATES
DATE: JUNE, 2021
DRAWING NO. 22/50
HORIZ.: 1"=20'
VERT.: 1"=5'
XXVVXXXX L21-00307
JOB NO. 100066774

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STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. INSTALL NDOT TYPE II DROP INLET PER NDOT R-4.2.1 (SEE SHEET 41)
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9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
10. INSTALL RIP-RAP (D50=12", THICKNESS=24")
11. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421, AND DETAIL C SHEET 40
12. ENCASE STRUCTURE WITH MINIMUM 4" CEMENT SLURRY (CLSM II) PER UDACS 02.22.01B
13. STRUCTURE SHALL BE TREATED WITH WATERTIGHT/EPOXY PER UDACS 02.22.01B

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.

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.

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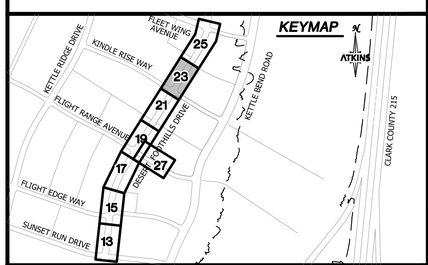
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SUMMERLIN VILLAGE 22
DESERT FOOTHILLS DRIVE
SUNSET RUN DRIVE TO FLEET WING AVENUE (STREET G)

ROADWAY GRADING PLAN
STA 247+00 TO STA 251+00

KEYMAP



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

GRADING PLAN CERTIFICATION

NICOLAS BARCOS PE#25673 — 5/27/21 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.

DS5344 ~~DS#3544~~

BASIS OF BEARING

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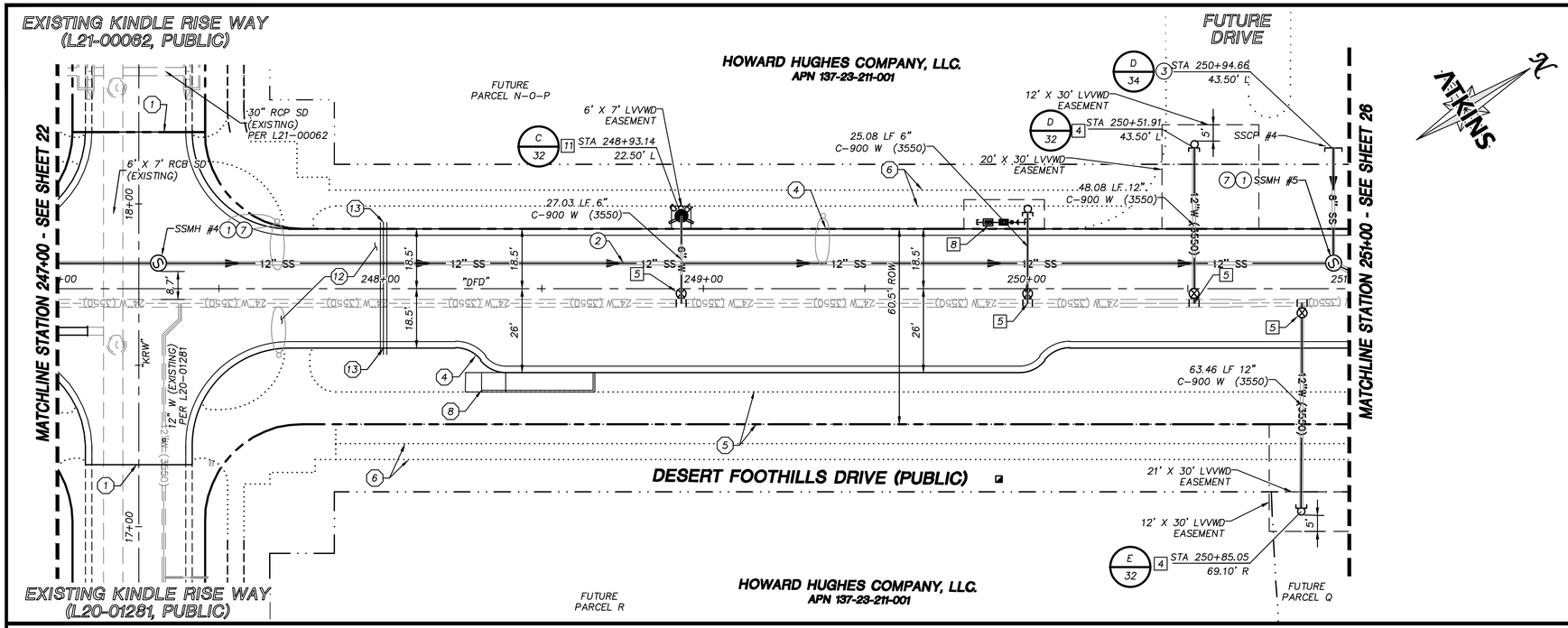
PROFESSIONAL ENGINEER - STATE OF NEVADA
NICOLAS A BARCOS
EXP. 12-31-22
CIVIL
No. 25673
5/27/21

DESIGNED BY: B. MOCHTYAK
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XXVVXXXX
L21-00307
DATE: JUNE, 2021
DRAWING NO. 23/50

JOB NO. 100066774

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SEWER CONSTRUCTION NOTES

1. INSTALL SEWER MANHOLE WITH WATERTIGHT JOINTS AND SINGLE 24" LID PER DCSWCS SD-1, SD-3, AND SD-4
2. INSTALL SEWER MAIN PER DCSWCS SD-17
3. STUB AND CAP SEWER PIPE. PLACE 4"X4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).
4. REMOVE CAP AND CONNECT TO EXISTING SEWER STUB
5. ADJUST EXISTING MANHOLE TO GRADE PER DCSWCS SD-5.
6. PROTECT SEWER AT UTILITY CROSSING PER DCSWCS SD-19
7. NOT USED
8. INSTALL SEWER MANHOLE WITH WATERTIGHT JOINTS WITH DUAL CONCENTRIC LID PER DCSWCS SD-1, SD-2, SD-4, AND SD-5

WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN PER UDACS PLATES #17 AND PLATE #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL CROSS PER UDACS PLATE #31
4. INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
5. INSTALL TAPPING SLEEVE TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
7. INSTALL 6" SERVICE SADDLE PER UDASC PLATE #4
8. INSTALL 1-1/2" IRRIGATION METER WITH 1-1/2 RPPA PER UDASC PLATES #4 AND #8 WITH CURB STOP
9. INSTALL IN-LINE REDUCER PER UDACS PLATE #30
10. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
11. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, #40, AND #41

ROADWAY CONSTRUCTION NOTES 2,3,7,&11 NOT USED

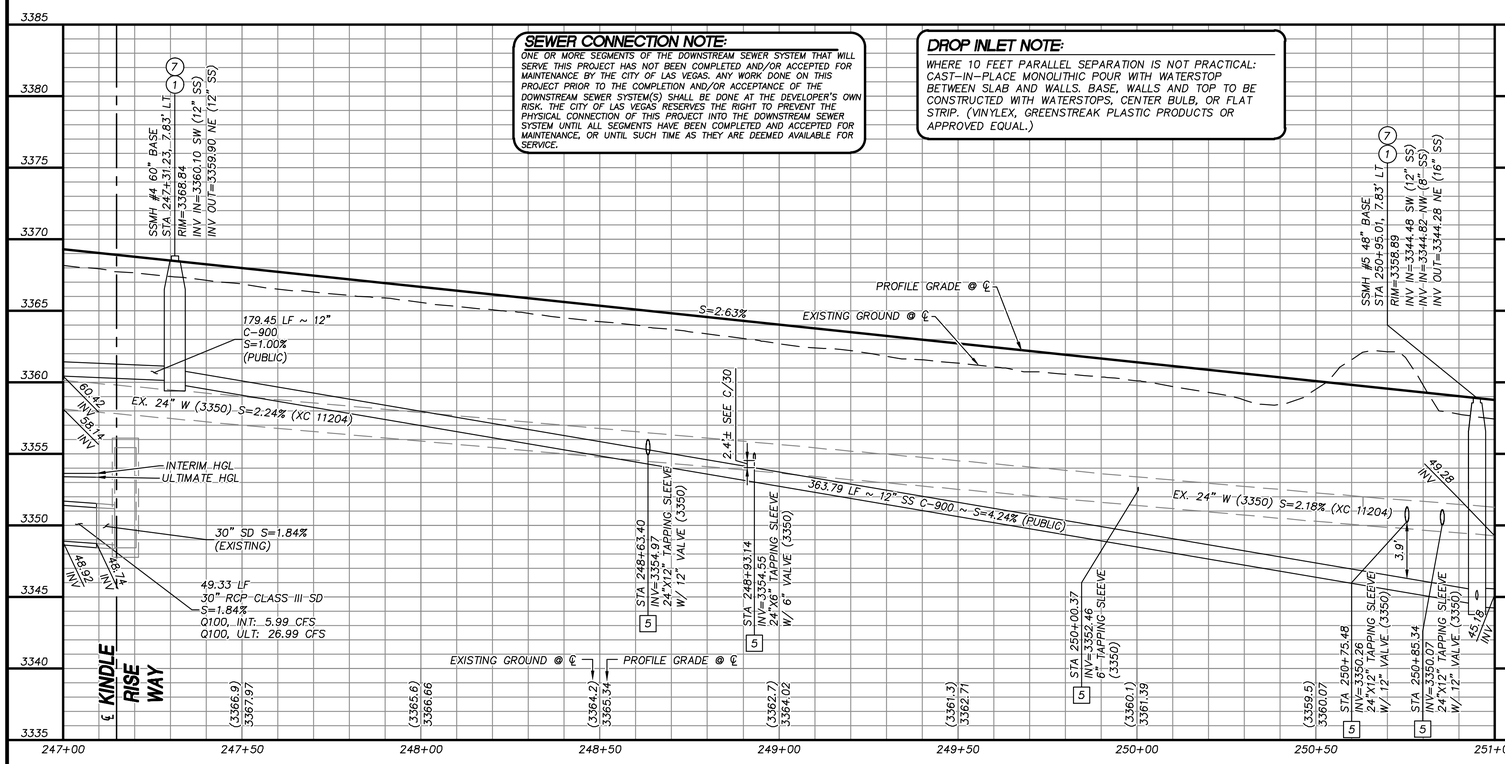
1. SAWCUT AND MATCH EXISTING
4. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
5. FUTURE BIKE LANE BY OTHERS
6. FUTURE SIDEWALK BY OTHERS
8. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN R-5.2.1 (A=B=6.5').
9. CONSTRUCT 0" FLUSH CURB
10. TRANSITION CURB FROM FULL HEIGHT (6") TO FLUSH (0")
12. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 39 FOR TYPICAL PAVEMENT SECTION.
13. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2-4", 1-6") PER DETAIL ON SHEET 42

SEWER CONNECTION NOTE:

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

DROP INLET NOTE:

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



VALVED OUTLET: CONDITIONAL APPROVAL FOR 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 THE LVVWD STANDARDS AND AT THE DEVELOPER'S EXPENSE. APPROVAL OF THE VALVED OUTLET DOES NOT PROVIDE OR IMPLY A WATER COMMITMENT.

CAUTION

CATHODIC TEST WIRES AND/OR FIBER OPTIC, RUN ALONG THE SIDE OF THE WATERLINE AT AN UNKNOWN DEPTH. TAKE CAUTION WHEN DIGGING.

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.

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

LVVWD CANNOT GUARANTEE A WATERTIGHT SHUTDOWN WHERE CONNECTIONS OR REPAIRS TO EXISTING FACILITIES ARE REQUIRED. THE CONTRACTOR SHALL ENSURE ALL LABOR AND EQUIPMENT IS AVAILABLE TO REMOVE REMAINING WATER. COORDINATING WITH INSPECTION DIVISION MUST TAKE PLACE PRIOR TO ANY TRIAL SHUTDOWN. CONTRACTOR TO INSTALL TEMPORARY SERVICE TO ENSURE PROPER SHUTDOWN IN THE EVENT NO OTHER APPURTENANCES ARE AVAILABLE.

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.

WATER MAIN JOINT DEFLECTION, PER UDACS 2.07.01 AND 2.07.03.

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

GRAPHIC SCALE

HORIZONTAL: 1"=20'

VERTICAL: 1"=5'

APPROVED FOR CONSTRUCTION

Mao Fang

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. 138549 FIRST APPROVED DATE: 08/04/2021

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

LAS VEGAS FIRE & RESCUE APPROVAL

REVIEWED BY LAS VEGAS FIRE & RESCUE
RELEASE FOR INSTALLATION AS SUBMITTED

This review does not constitute permission to violate any City, State, or Federal Law or Ordinance. Ultimate responsibility for compliance with code lies with the owner/applicant.

REVIEWED BY
stauffest 09/30/2021

LAS VEGAS FIRE & RESCUE DATE

BASIS OF BEARING

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

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NOVADA ENGINEER-STATE OF NEVADA — NICOLAS A. BACCAS — EXP. 12-31-22 — CIVIL — No. 25878 — PROFESSIONAL ENGINEER — 5/27/21

XXVVXXXX
L21-00307

DATE: JUNE, 2021

DRAWING NO. 24/50

JOB NO. 100066774

DESIGNED BY: B. WOCHTYAK
DRAWN BY: L. SOSA
CHECKED BY: P. BATES
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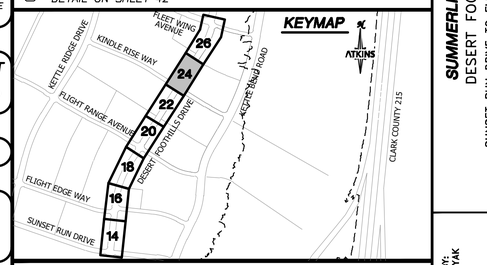
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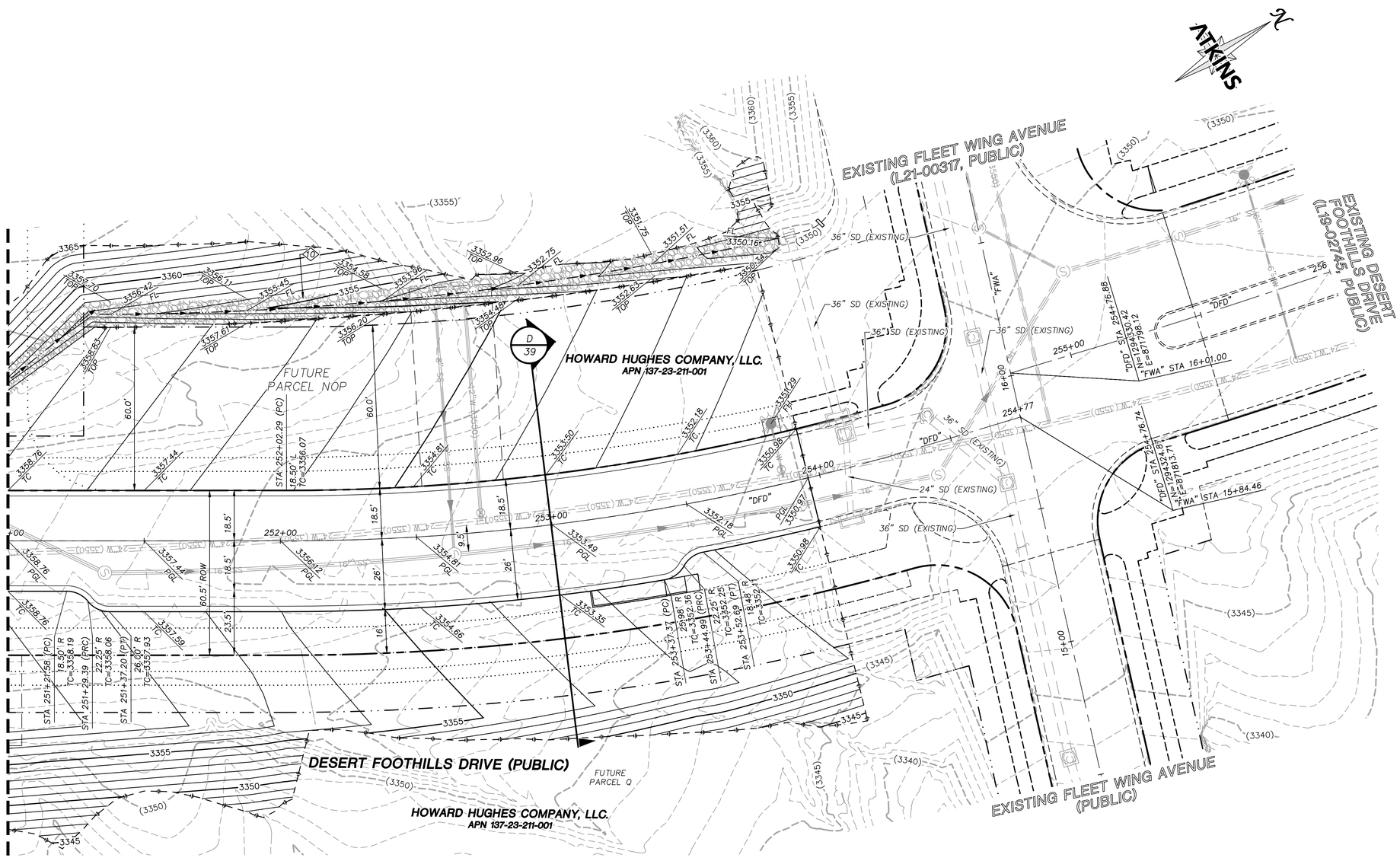
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ROADWAY PLAN AND PROFILE
STA 247+00 TO STA 251+00

KEYMAP



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STORM DRAIN CONSTRUCTION NOTES

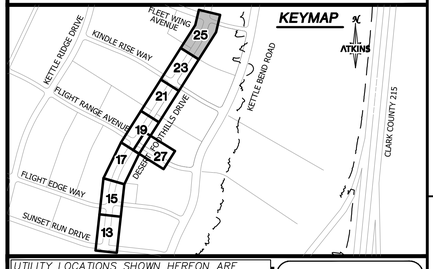
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GRADING PLAN CERTIFICATION

NICOLAS BARCOS PE#25673 — 5/27/21 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.

DS5344 ~~DS#3544~~

BASIS OF BEARING

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PROFESSIONAL ENGINEER-STATE OF NEVADA NICOLAS A. BARCOS EXP. 12-31-22 CIVIL No. 25673 5/27/21

REVISIONS

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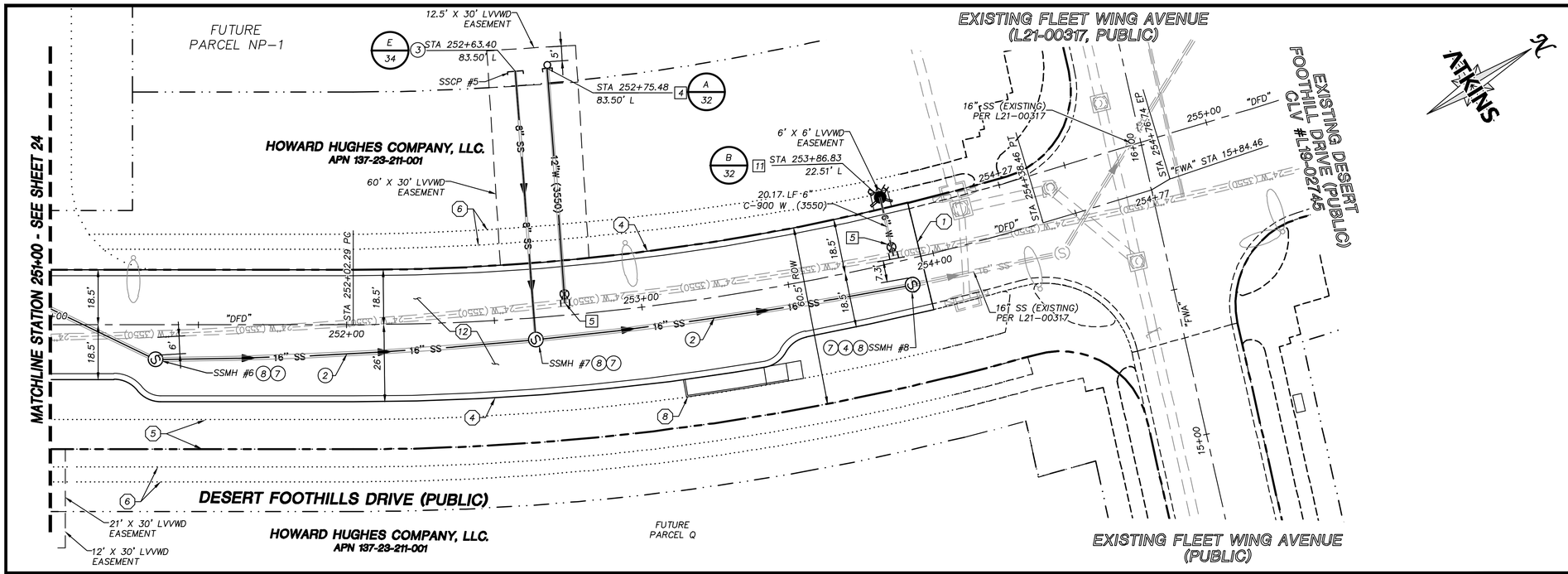
SUMMERLIN

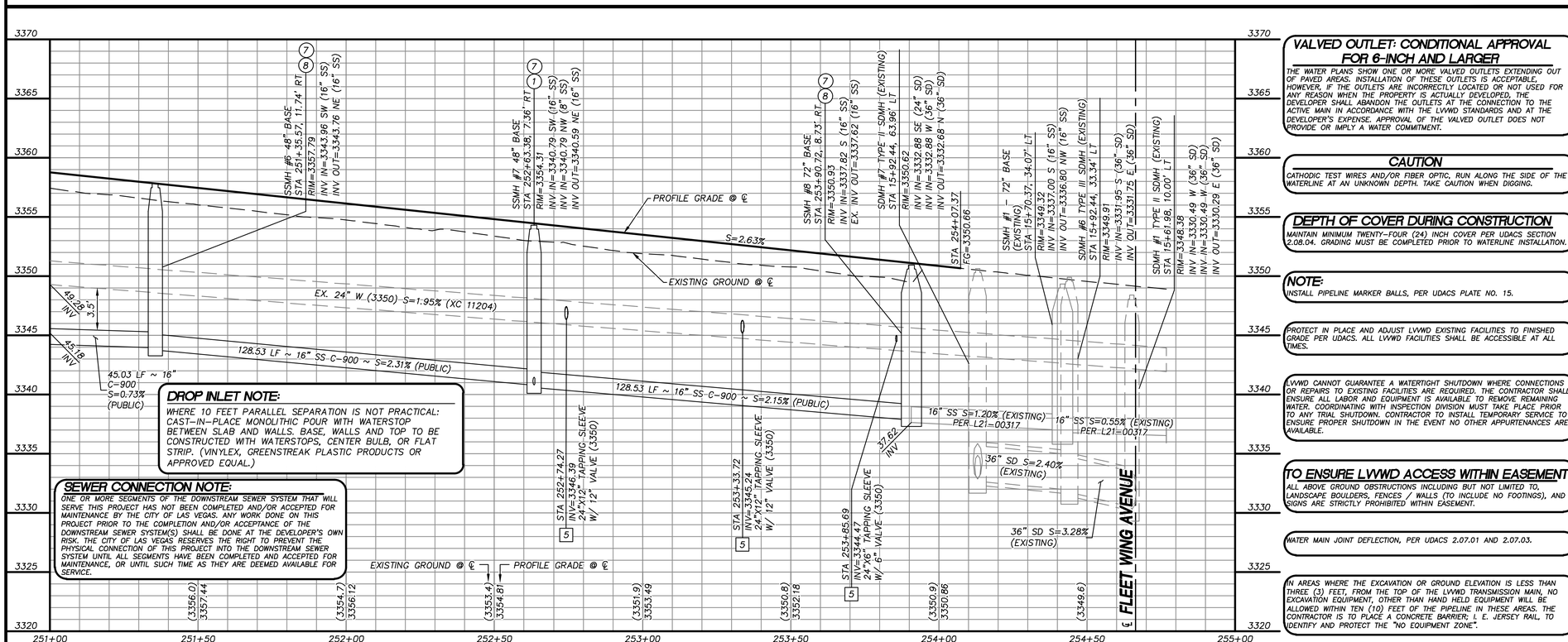
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SUNSET RUN DRIVE TO FLEET WING AVENUE (STREET G)

ROADWAY GRADING PLAN
STA 251+00 TO END

DESIGNED BY:	N. BARCOS
DRAWN BY:	L. MAMACLAY
CHECKED BY:	P. BATES
HORIZ.:	1"=20'
VERT.:	1"=5'
XXVVXXXX	L21-00307
DATE:	JUNE, 2021
DRAWING NO.	25/50
JOB NO.	100066774

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

SEWER CONNECTION NOTE:

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

VALVED OUTLET: CONDITIONAL APPROVAL FOR 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 THE LVVWD STANDARDS AND AT THE DEVELOPER'S EXPENSE. APPROVAL OF THE VALVED OUTLET DOES NOT PROVIDE OR IMPLY A WATER COMMITMENT.

CAUTION

CATHODIC TEST WIRES AND/OR FIBER OPTIC, RUN ALONG THE SIDE OF THE WATERLINE AT AN UNKNOWN DEPTH. TAKE CAUTION WHEN DIGGING.

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.

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

LVVWD CANNOT GUARANTEE A WATERTIGHT SHUTDOWN WHERE CONNECTIONS OR REPAIRS TO EXISTING FACILITIES ARE REQUIRED. THE CONTRACTOR SHALL ENSURE ALL LABOR AND EQUIPMENT IS AVAILABLE TO REMOVE REMAINING WATER. COORDINATING WITH INSPECTION DIVISION MUST TAKE PLACE PRIOR TO ANY TRIAL SHUTDOWN. CONTRACTOR TO INSTALL TEMPORARY SERVICE TO ENSURE PROPER SHUTDOWN IN THE EVENT NO OTHER APPURTENANCES ARE AVAILABLE.

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.

WATER MAIN JOINT DEFLECTION, PER UDACS 2.07.01 AND 2.07.03.

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

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL STORM DRAIN. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL STORM DRAIN NOTES AND INFORMATION.
2. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421
3. INSTALL NDOT TYPE II DROP INLET PER NDOT R–4.2.1 (SEE SHEET 41)
4. INSTALL TYPE I SD MANHOLE PER CCAUSD #403
5. INSTALL TYPE II SD MANHOLE PER CCAUSD #405.2
6. INSTALL TYPE III SD MANHOLE PER CCAUSD #406
7. INSTALL TYPE "A" DROP INLET PER CCAUSED #411 & #421
8. REMOVE CAP AND CONNECT TO EXISTING STORM DRAIN STUB
9. STUB & PLUG STORM DRAIN FOR FUTURE CONNECTION PER MANUFACTURER'S PLUG, OR APPROVED EQUAL
10. INSTALL RIP–RAP (D50=12", THICKNESS=24")
11. INSTALL TYPE "CM2" DROP INLET PER CCAUSD #412.1 & #421, AND DETAIL C SHEET 40
12. ENCASE STRUCTURE WITH MINIMUM 4" CEMENT SLURRY (CLSM II) PER UDACS 02.22.01B
13. STRUCTURE SHALL BE TREATED WITH WATERTIGHT/EPOXY PER UDACS 02.22.01B

SEWER CONSTRUCTION NOTES

1. INSTALL SEWER MANHOLE WITH WATERTIGHT JOINTS AND SINGLE 24" LID PER DCSWCS SD–1, SD–3, AND SD–4
2. INSTALL SEWER MAIN PER DCSWCS SD–17
3. STUB AND CAP SEWER PIPE. PLACE 4"X4" POST, DOUGLAS FIR, OVER END OF PIPE AND INSTALL THRUST BLOCK (1 CUBIC FT. MINIMUM).
4. REMOVE CAP AND CONNECT TO EXISTING SEWER STUB
5. ADJUST EXISTING MANHOLE TO GRADE PER DCSWCS SD–5.
6. PROTECT SEWER AT UTILITY CROSSING PER DCSWCS SD–19
7. NOT USED
8. INSTALL SEWER MANHOLE WITH WATERTIGHT JOINTS WITH DUAL CONCENTRIC LID PER DCSWCS SD–1, SD–2, SD–4, AND SD–5

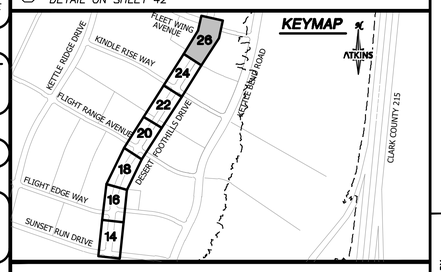
WATERLINE CONSTRUCTION NOTES

1. INSTALL WATER MAIN PER UDACS PLATES #17 AND PLATE #19
2. INSTALL GATE VALVE PER UDACS PLATES #30 AND #39
3. INSTALL CROSS PER UDACS PLATE #31
4. INSTALL CAP AND 2" MANUAL BLOWOFF ASSEMBLY PER UDACS PLATE #36
5. INSTALL TAPPING SLEEVE TEE W/ VALVE AND LATERAL PER UDACS PLATES #17, #19, #30, #31 AND #39
7. INSTALL 6" SERVICE SADDLE PER UDASC PLATE #4
8. INSTALL 1–1/2" IRRIGATION METER WITH 1–1/2 RPPA PER UDASC PLATES #4 AND #8 WITH CURB STOP
9. INSTALL IN–LINE REDUCER PER UDACS PLATE #30
10. REMOVE CAP AND 2" BLOWOFF AND CONNECT TO EXISTING WATERLINE STUB
11. INSTALL FIRE HYDRANT WITH APPURTENANCES (CONCRETE PAD, LATERAL, VALVE, AND TEE) PER UDACS PLATES #30, #31, #39, #40, AND #41

ROADWAY CONSTRUCTION NOTES

2,3,7,&11 NOT USED

1. SAWCUT AND MATCH EXISTING
4. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
5. FUTURE BIKE LANE BY OTHERS
6. FUTURE SIDEWALK BY OTHERS
8. CONSTRUCT CURB RAMP, TYPE A, PER NDOT STANDARD PLAN R–5.2.1 (A=B=6.5').
9. CONSTRUCT 0" FLUSH CURB
10. TRANSITION CURB FROM FULL HEIGHT (6") TO FLUSH (0")
12. CONSTRUCT PLANTMIX BITUMINOUS SURFACE OVER TYPE II AGGREGATE BASE PER SOILS REPORT. SEE SHEET 39 FOR TYPICAL PAVEMENT SECTION.
13. INSTALL SCHEDULE 40 PVC IRRIGATION SLEEVES (2–4", 1–6") PER DETAIL ON SHEET 42



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

APPROVED FOR CONSTRUCTION

Mao Fang

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO. 138549 FIRST APPROVED DATE: 08/04/2021

LVVWD APPROVED FIRE FLOW 1500 GPM AT 20 PSI RESIDUAL

LAS VEGAS FIRE & RESCUE APPROVAL

REVIEWED BY LAS VEGAS FIRE & RESCUE
RELEASE FOR INSTALLATION AS SUBMITTED
This review does not constitute permission to violate any City, State, or Federal Laws or Ordinances. The applicant is responsible for compliance with the Codes.
REVIEWED BY: steadbee 08/18/2021

LAS VEGAS FIRE & RESCUE DATE

BASIS OF BEARING

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

BENCHMARK

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

FAST Call before you UnderGround 1-702-432-5300 NEVADA811 DIVISION OF TRANSPORTATION

Call before you Dig 48 HOURS BEFORE YOU DIG, CALL 811 OR GO ONLINE Call 811 OR 1-800-642-2444

ABOVE UTILITIES OVERHEAD POWER LINES 10K VOLTS+. CALL BEFORE YOU DO OVER 24in. 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 – LUIS A. SOSA – EXP. 12-31-22 – CIVIL – No. 25879 – 5/27/21

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
DESERT FOOTHILLS DRIVE
SUNSET RUN DRIVE TO FLEET WING AVENUE (STREET G)

ROADWAY PLAN AND PROFILE
STA 251+00 TO END

DESIGNED BY: B. MOCHTYAK	DRAWN BY: L. SOSA	CHECKED BY: P. BATES	
XXXVXXXX L21–00307	DATE: JUNE, 2021	DRAWING NO. 26/50	HORIZ.: 1"=20' VERT.: 1"=5'

JOB NO. 100066774

C:\pw_work\atkinsnv01\wsatkins_smit27821\dms57191\66774–13–PLAN–P1.dwg LAYOUT: (25)ROADWAY PLAN AND PROFILE 7 Jun 08, 2021 – 9:28AM

REFERENCES

Summerlin West V22 - Fleet Wing Avenue (from Kettle Bend to Desert Foothills), DS#5401, VTN (2021)

Approval Letters
Excerpts
Approved Improvement Plans

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: June 3, 2021
TO: **Land Development Services** Department of Building & Safety			FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Summerlin West V22 – Fleet Wing Avenue (from Kettle Bend to Desert Foothills)**		**COPIES TO:** GCW, Inc.
Cross Streets:	Desert Foothills Blvd. & Fleet Wing Avenue		Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5401C.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-23-210-001		
Zoning Action:	N/A		
FEMA Flood Zone	YES	NO X	
Proposed Storm Drain	YES X	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	12/30/2020	1/11/2021	Not Approved	$400.00	4120184: $400
2nd Submittal	1/25/2021	2/9/2021	Conditional Approval	N/C	N/C
Structural Review by Building Dept.	6/1/2021	6/3/2021	Approval by Building Dept.	N/C	N/C
			TOTAL FEES (LDDRS):	**$400.00**	**----**

REMARKS:

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.

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

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

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

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

END OF REMARKS
ays

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

62022-217

December 29, 2020

Subject: Technical Drainage Study for Village 22 Fleet Wing Avenue Improvements
Kettle Bend to Desert Foothills DS5247

Since the Subject Study was approved by the City of Las Vegas on April 6, 2020, the Project has switched engineering firms from VTN to GCW, Inc. during the improvement plan approval phase. The purpose of this letter is to show acceptance of the previous study and note any necessary changes or revisions that have been made by GCW. GCW has reviewed and concurs with the previously approved study. The changes made by GCW and any errors found have been outlined below.

- The title of the study and plans have been revised to Summerlin Village 22 Fleet Wing Avenue (Street G) Kettle Bend Road to Desert Foothills Drive.
- The APN numbers presented on the plans have been revised to the current number.
- The order of the plan sheets and names have been revised.
- The overall style of the plans have been changed to match GCW typical standards, such as showing the detailed grading tags and detail sections on the Plan and Profile Sheets etc. Note that all necessary information is still presented in the plan set.
- The class of pipes has been revised due to depth concerns.
- A new manhole is proposed to reduce the length of class V pipe needed.

Overall GCW concurs with the previously approved technical drainage study. The new plans that GCW will submit for the improvement plan approval have been included. Pertinent reference material from the previously approved VTN study has been included in the appendix.

Cordially,

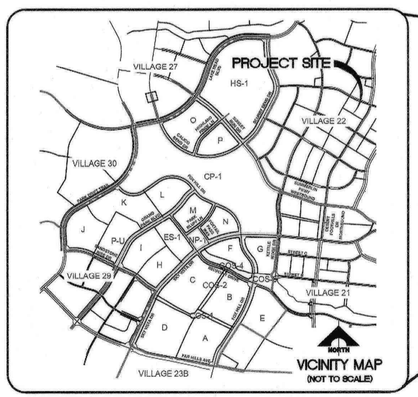
GCW, INC.

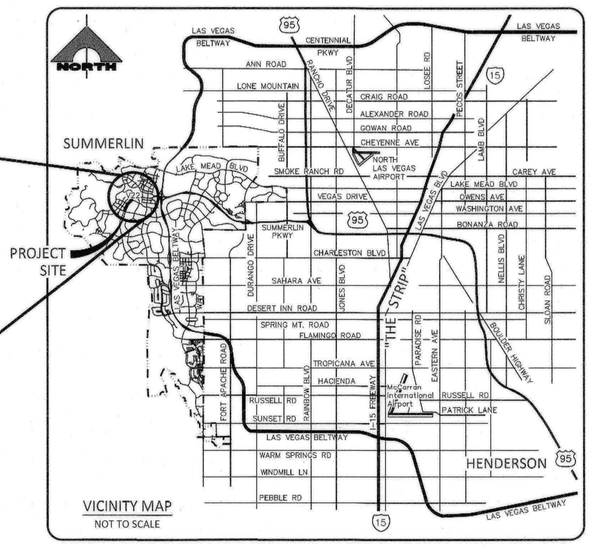
Nelson Baggs, E.I.
Flood Control Division

SUMMERLIN

SM

VILLAGE 22
FLEET WING AVENUE
(STREET G)
KETTLE BEND ROAD TO DESERT FOOTHILLS DRIVE
APN: 137-23-210-001





SHEET INDEX		
NO.	DWG	DESCRIPTION
1	G1	COVER SHEET
2	G2	LEGEND, ABBREVIATIONS, AND GENERAL NOTES
3	G3	GENERAL NOTES
4	HC1	HORIZONTAL CONTROL 1
5	HC2	HORIZONTAL CONTROL 2
6	MU1	MASTER UTILITY PLAN – STORM DRAIN
7	MG1	MASTER GRADING PLAN
8	GD1	GRADING PLAN 1
9	GD2	GRADING PLAN 2
10	PP1	UTILITY PLAN AND PROFILE 1
11	PP2	UTILITY PLAN AND PROFILE 2
12	LP1	LATERAL PLAN AND PROFILE
13	S1	MODIFIED TYPE CM2 DROP INLET DETAIL
14	DT1	HANDICAP RAMP GRADING AND STREET SECTION
15	TR1	SIGNAGE AND STRIPING PLAN
16	SL1	STREETLIGHT, CONDUIT, AND ELECTRICAL PLAN 1
17	SL2	STREETLIGHT, CONDUIT, AND ELECTRICAL PLAN 2

Mao Fang
Digitally signed by Mao Fang
DN: C=US, E=mail:fang@lvvwd.com, O=Las Vegas Valley Water District, OU=Planning and Engineering Services, CN=Mao Fang
Date: 2021.06.21 07:41:35-07'00'

LAS VEGAS FIRE & RESCUE APPROVAL

REVIEWED BY
LAS VEGAS FIRE & RESCUE
RELEASE FOR INSTALLATION AS SUBMITTED
This review does not constitute permission to violate any City, State, or Federal Laws or Ordinances. Ultimate responsibility for compliance rests with the Owner.
Final acceptance of installation is based upon field inspection and acceptance testing.
REVIEWED BY
pharrison 06/14/2021

LAS VEGAS FIRE & RESCUE — DATE

APPROVALS

PLANS APPROVED
BY LAND DEVELOPMENT ON BEHALF
OF THE CITY ENGINEERS OFFICE
rkaragdag
Aug 04 2021
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 THE ADOPTED STANDARDS AND/OR SPECIFICATIONS, EXCEPT THOSE SPECIFICALLY LISTED UNDER DEVIATIONS FROM STANDARD. THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN THE DEVIATIONS FROM STANDARD IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATION, CLARK COUNTY AREA, NEVADA.

CITY OF LAS VEGAS, ENGINEERING — DATE

APPROVED FOR CONSTRUCTION

Mao Fang
LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES
PROJECT NO. 138955 — FIRST APPROVAL DATE: 06/21/2021
SHEETS: G1, & G3 — NO LVVWD FACILITIES

DRY UTILITY APPROVALS

COX COMMUNICATIONS LAS VEGAS, INC. — DATE 5/27/21

CENTRAL TELEPHONE CO., DBA CENTURYLINK — DATE 5-27-21

THE AFFIXED CENTURYLINK 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 5.27.2021

NEVADA POWER COMPANY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NEVADA POWER COMPANY 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.

NV ENERGY – TRANSMISSION ENGINEERING — DATE 6/1/2021

Lee de Brums — SOUTHWEST GAS CORPORATION — 2020lxd66631 SWG UID — DATE 03/30/2021

CAUTION TO CONTRACTOR

THE CONTRACTOR SHALL BE RESPONSIBLE TO INVESTIGATE AND VERIFY THE ACTUAL LOCATION AND DEPTH OF ALL EXISTING UNDERGROUND FACILITIES AT LEAST 48 HOURS IN ADVANCE OF THE PERFORMANCE OF ANY WORK.

THE HOWARD HUGHES COMPANY, LLC

BRIAN P. WALSH, P.E. SR. VICE PRESIDENT — DATE 5/18/21

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLANS ARE IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY: DS5401R ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT #.

TODD KELLEY N. P.E. 14711 — DATE 05/14/2021

OWNER/DEVELOPER

THE HOWARD HUGHES COMPANY, LLC
10845 GRIFFITH PEAK DRIVE, SUITE 160
LAS VEGAS, NEVADA 89135
OFFICE PHONE NO. (702) 791-4300

ENGINEER

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

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

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

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

STATE OF NEVADA — ENGINEER — TODD N. KELLEY — Exp. 6/30/2023 — CIVIL — No. 14711 — PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE	AGEN APP	DATE	CCW APP	DATE
		8/3/2021				

PROJECT NO. 62022-217
DESIGN: MF/DRL
DRAWN: DRL
CHECK: MF/TK
PLOT DATE: 05-14-21
PLOT TIME: 11:59:13

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com
P:\PROJECTS\VAV\62022-217\CWG\PRODUCTION\62022-217_GI-3.DWG
DANIEL LEE

THE HOWARD HUGHES COMPANY, LLC

VILLAGE 22 FLEET WING AVENUE IMPROVEMENTS
KETTLE BEND TO DESERT FOOTHILLS

COVER SHEET

DRAWING
G1
1 OF 17 SHTS

L#: L21-00286 — CLV#: 107V8973

VILLAGE 22
PARCEL K
APN 137-23-210-001

DESERT FOOTHILLS DRIVE
(PUBLIC)

15+91.75
FLEET WING AVENUE

STA: 80+35.87
DESERT FOOTHILLS DRIVE

VILLAGE 22
PARCEL I
APN 137-23-210-001

BCR/END TRANSITION
STA: 15+34.32

BEGIN TRANSITION
STA: 14+82.45

PC
STA: 14+54.46

APPROXIMATE
DAYLIGHT

Δ=8°51'52" T=74.53'
R=961.50' L=148.76'

PT
STA: 12+88.91

FLEET WING AVENUE
(PUBLIC)

INV= 3328.86
CAP FOR FUTURE
CONTINUATION

FUTURE SD
FACILITIES

36" RCP SD

60" SDMH #1

60" SDMH #2

Δ=7°44'14" T=70.23'
R=1038.50' L=140.24'

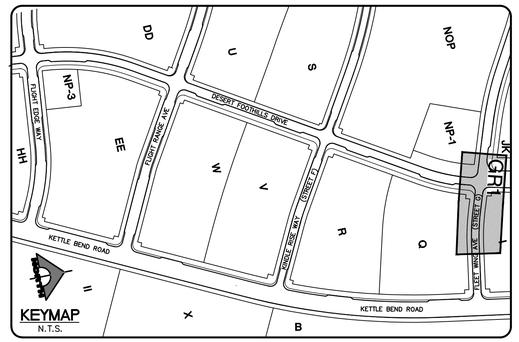
INSTALL
RIP-RAP
D50=12"
THK=24"

EX RIP RAP TO
BE REMOVED

VILLAGE 22
PARCEL O
APN 137-23-210-001

VILLAGE 22
PARCEL Q
APN 137-23-210-001

MATCHLINE 12+54.12 SEE SHEET GD2



NORTH
SCALE: 1"=20'

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

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLANS ARE IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY: DSS401B, ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT #.

Todd Kelley — 07/09/2021

TODD KELLEY N. P.E. 14711 — DATE

BASIS OF BEARING AND COORDINATES

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

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

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

NOTES:
1. ALL DISTANCES AND BEARINGS SHOWN HEREON ARE PROJECTED (GRID) VALUES BASED ON THE PRECEDING PROJECTION. THE PROJECTION WAS DEFINED SUCH THAT PROJECTED (GRID) DISTANCES ARE EQUIVALENT TO "GROUND" DISTANCES IN THE PROJECT AREA.
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1-702-227-2929

FAST
Call before you UnderGround
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FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

L#: L21-00286 | CLV#: 107V8973

PROFESSIONAL ENGINEER STATE OF NEVADA
TODD N. KELLEY
No. 14711
Exp. 6/30/2023
CIVIL
DATE: 07/09/2021

REV	DATE	DESCRIPTION	AGEN APP	DATE	GCW APP

PROJECT NO. 62022-217
DESIGN: MF/DRL
DRAWN: DRL
CHECK: MF/TK
PLOT DATE: 07-09-21
PLOT TIME: 09:18:30
DANIEL LEE

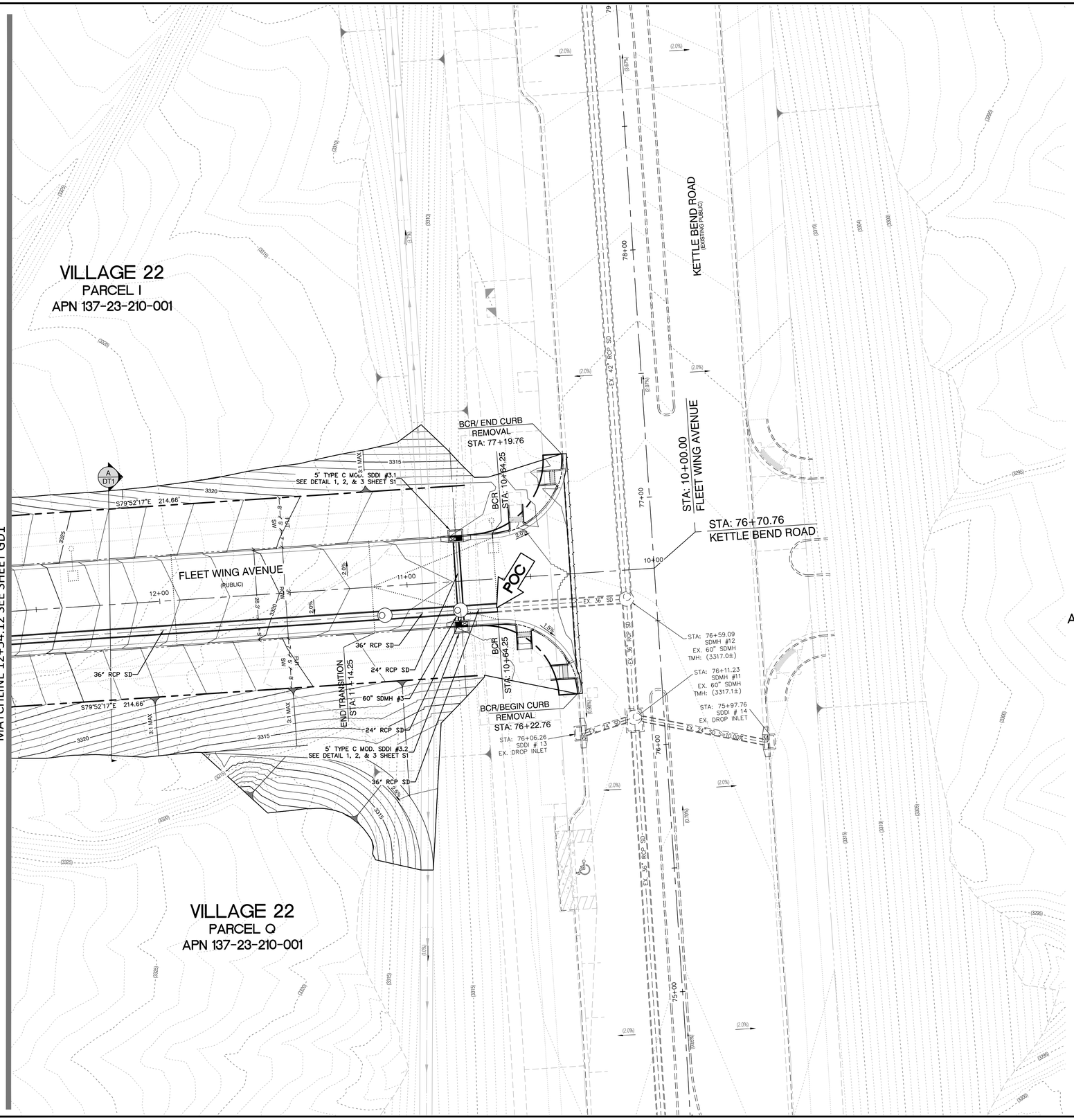
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F:\PROJECTS\600\62022-217\GWC\PRODUCTION\62022-217-GD1.DWG

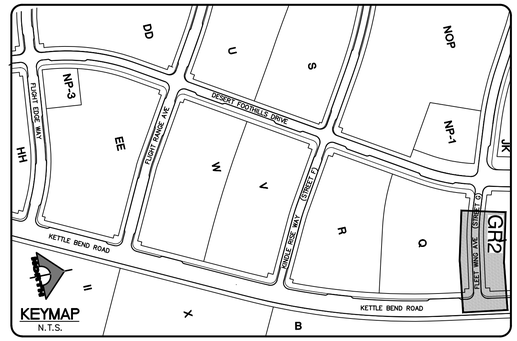
THE HOWARD HUGHES COMPANY. LLC

VILLAGE 22 FLEET WING AVENUE IMPROVEMENTS
KETTLE BEND TO DESERT FOOTHILLS

GRADING PLAN 1

DRAWING
GD1
8 OF 17 SHTS







20' 0' 10' 20' 40'

SCALE: 1" = 20'

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLANS ARE IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY: DS5401B, ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT #.

Todd Kelley 07/09/2021

TODD KELLEY N. P.E. 14711 DATE

BASIS OF BEARING AND COORDINATES

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

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ZONE:LAS VEGAS HIGH ELEVATION ZONE

PROJECTION: TRANSVERSE MERCATOR
STANDARD PARALLEL (AND LATITUDE OF GRID ORIGIN): 36°15'00"N
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REGISTERED PROFESSIONAL ENGINEER STATE OF NEVADA TODD N. KELLEY No. 14711 Exp. 6/30/2023 CIVIL

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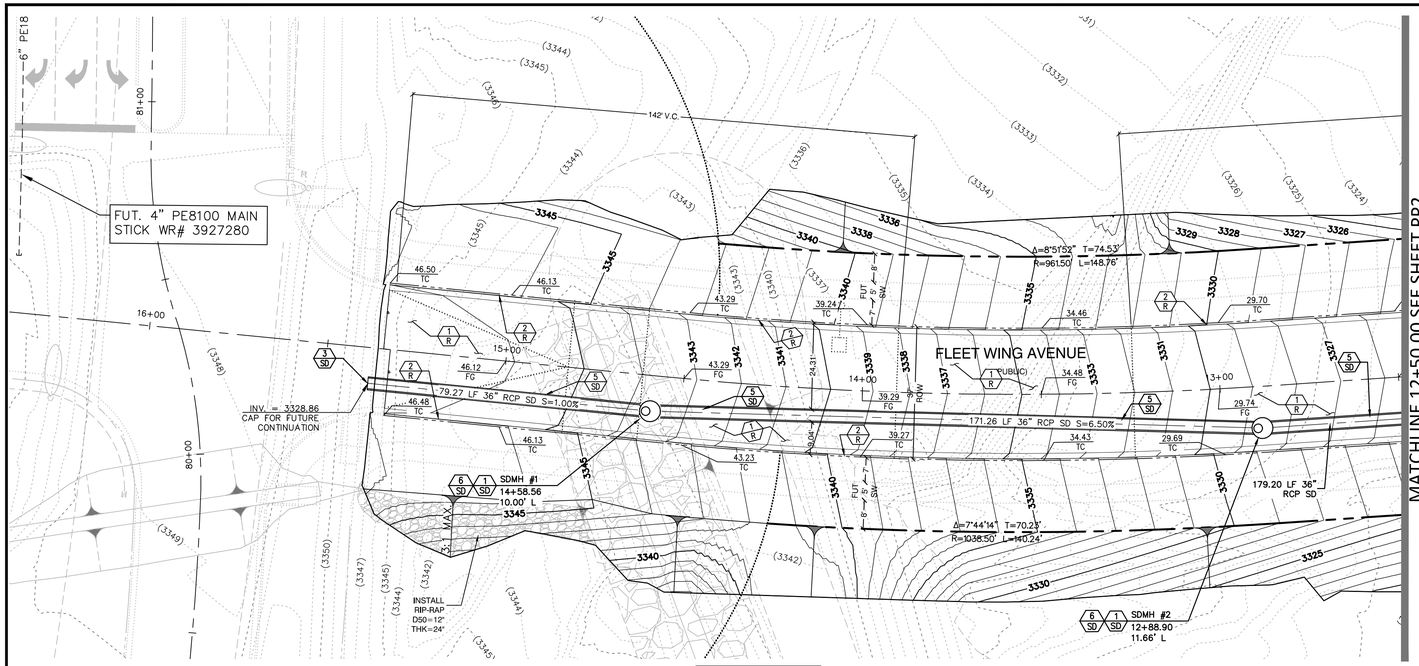
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THE HOWARD HUGHES COMPANY. LLC

VILLAGE 22 FLEET WING AVENUE IMPROVEMENTS
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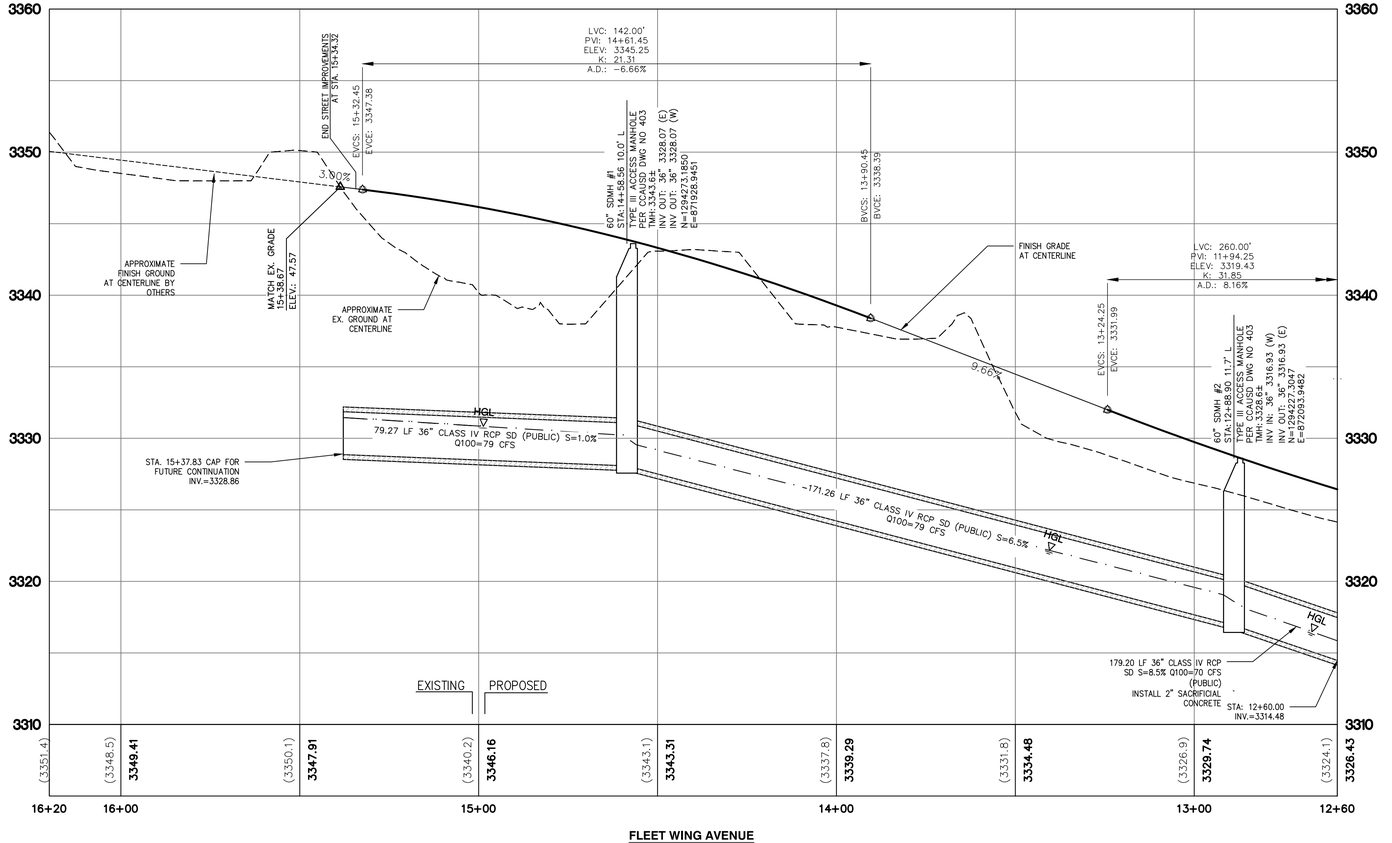
GRADING PLAN 2

DRAWING
GD2
9 OF 17 SHTS

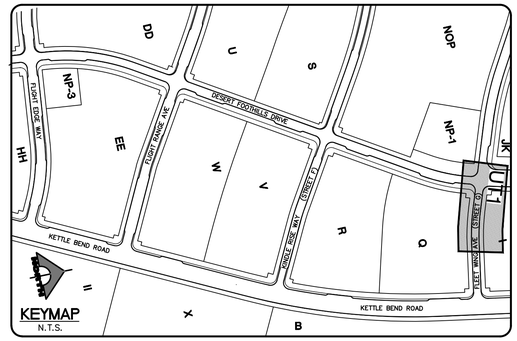


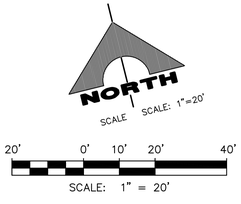
FLEET WING AVENUE
(PUBLIC)

PROFILE SCALES:
HORIZ. = 1"=20'
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FLEET WING AVENUE
(PUBLIC)





PROTECTION CONSTRUCTION NOTES

1. EXISTING PAVEMENT, PROTECT IN PLACE
2. EXISTING CURB/GUTTER, PROTECT IN PLACE
3. EXISTING PULLBOX, ADJUST TO FINISH GRADE
4. EXISTING GATE VALVE, ADJUST TO FINISH GRADE PER UDACS PLT. NO. 39
5. EXISTING WATER VAULT MH, ADJUST TO FINISH GRADE PER DETAIL 5 & 7 DWG. DT2
6. EXISTING SSMH.

ROADWAY CONSTRUCTION NOTES

1. INSTALL A.C. PAVEMENT PER STREET SECTIONS, SEE DWG. DT1
2. INSTALL "L" TYPE CURB & GUTTER, SEE SUMMERLIN STD DWG. S-47
3. CONSTRUCT SIDEWALK RAMP PER USD DWG. NO. 235 (CASE I)

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SOUTHWEST GAS APPROVAL

Lee de Brums	2020lxd66631	03/30/2021
SOUTHWEST GAS CORPORATION	SW UID	DATE

CAUTION:

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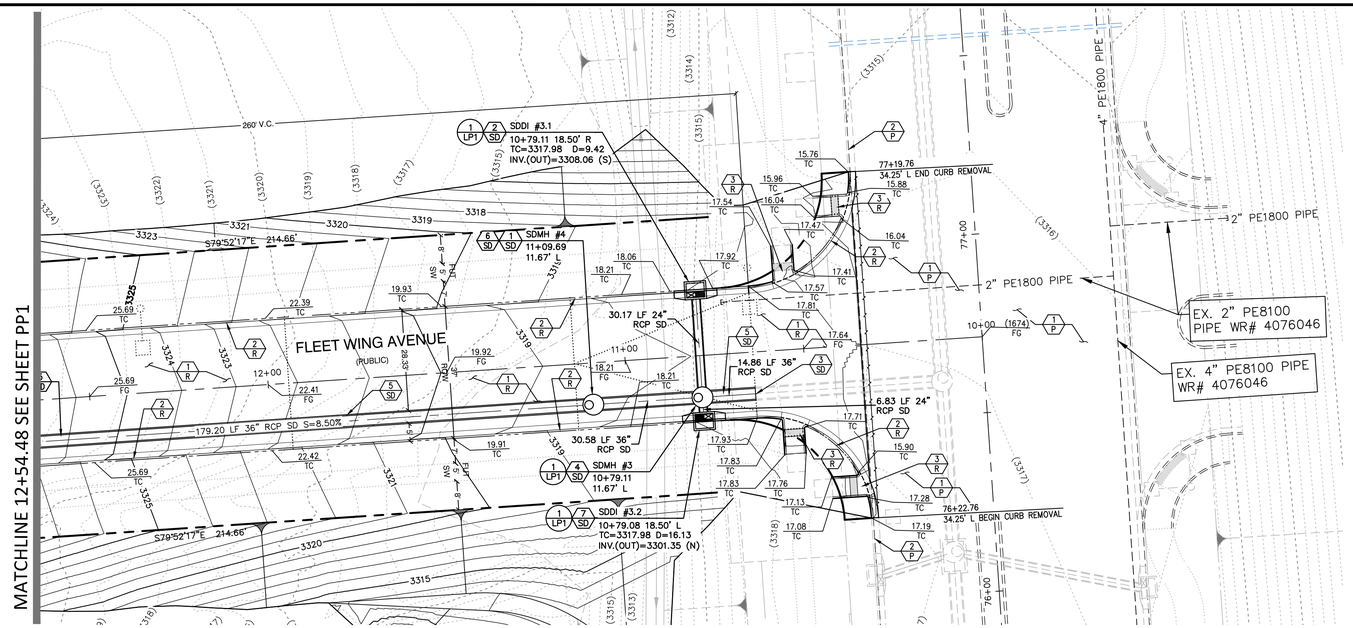
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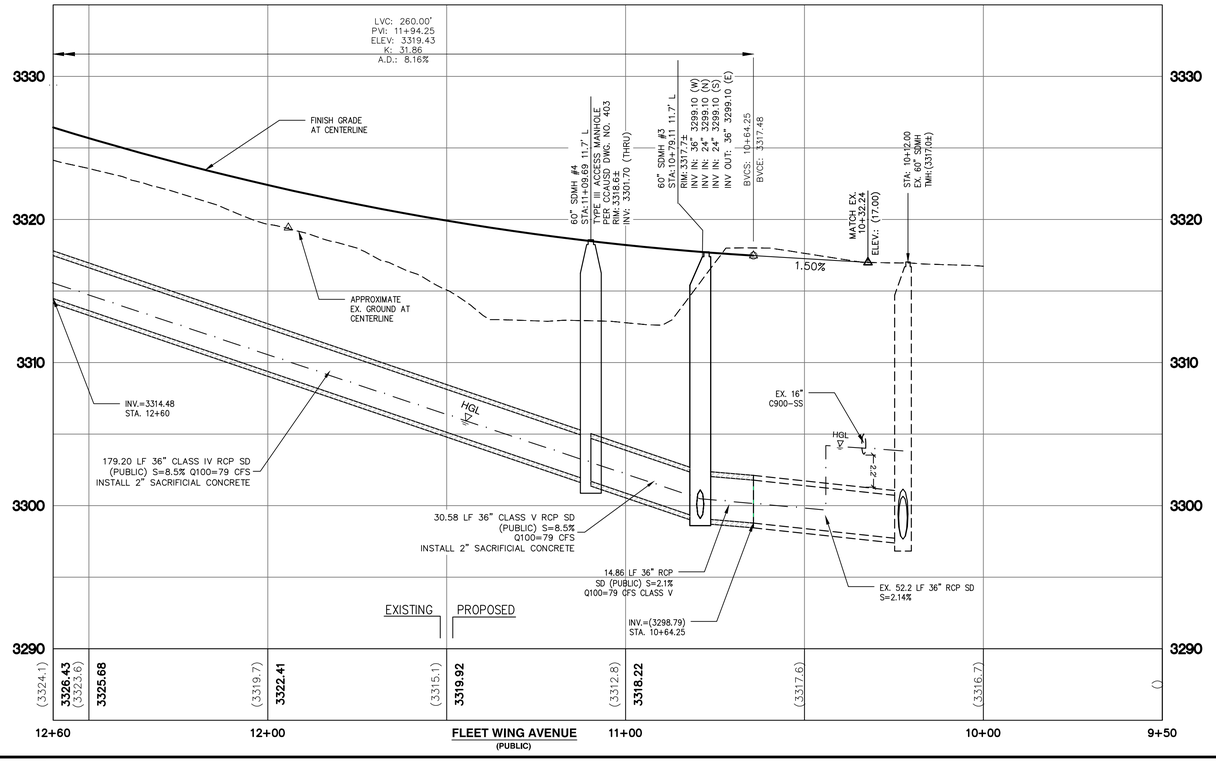
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UTILITY PLAN AND PROFILE 1

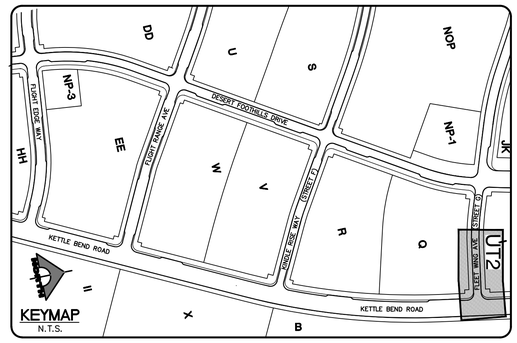
DRAWING
PP1
10 OF 17 SHTS

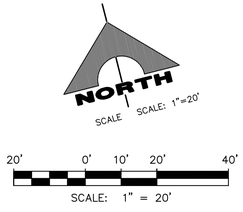


FLEET WING AVENUE
(PUBLIC)

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Lee de Brums	2020lxd66631	03/30/2021
SOUTHWEST GAS CORPORATION	SW UID	DATE

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DANIEL LEE

THE HOWARD HUGHES COMPANY. LLC
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KETTLE BEND TO DESERT FOOTHILLS
UTILITY PLAN AND PROFILE 2

DRAWING
PP2
11 OF 17 SHTS

REFERENCES

Summerlin West V22 Fleet Wing Avenue (from Kettle Bend to Desert Foothills), DS#5247, VTN (2020)

Approval Letters
Excerpts (*Update #1*)
Appendix A - Rainfall Map (*Update #1)*
Appendix A - Figure 6 : Ultimate Condition Basin Map *(Update #1)*
Appendix A - Figure 7 : Local Storm Drain Facilities Map *(Update #1)*
Appendix B - Curve Number Calculations *(Update #1)*
Appendix B - Standard Form 4 *(Update #1)*
Appendix B - Ultimate Condition HEC-1 *(Update #1)*
Appendix C - Hydraulic Calculations - Facility 21A *(Update #1)*
Appendix C - Hydraulic Calculations - Facility 22A *(Update #1)*

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: April 6, 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 V22 – Fleet Wing Avenue** **(from Kettle Bend to Desert Foothills)**			**COPIES TO:** VTN Nevada
Cross Streets:	Desert Foothills Blvd. & Fleet Wing Avenue		Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5247B.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-23-201-001		APPROVAL LETTER
Zoning Action:	N/A		
FEMA Flood Zone	YES	NO **X**	
Proposed Storm Drain	YES **X**	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	2/11/2020	3/4/2020	Not Approved	$400.00	3741272: $400
2nd Submittal	3/17/2020	4/6/2020	See Comments Below	$400.00	3782002: $400
			TOTAL FEES (LDDRS):	**$800.00**	**----**

REMARKS:

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

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

APPROVAL LETTER

3. **Second Request:**

   ***Sheet UT2**:*

   - *Provide a nuisance inlet at the south side of SDMH #3 in Fleet Wing Avenue.*

   Note that there are handicap ramps downstream and adjacent to the location of SDMH #3. No nuisance drainage shall be crossing the handicap ramps as possible. Therefore, this drop inlet is still required. Provide as such in the improvement plans.

4. **Sheet UT2**:

   - In the Profile View, the note for sacrificial concrete in the Box does not match the profile, one says 1" and the other says 2". Review and revise accordingly.

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

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

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

END OF REMARKS
ays

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

DES3*	2.00	9
CP3*	-	77
STG3*	0.72	3
CSTG3*	-	79

*Referenced from V22 Master Study

III. ONSITE & OFFSITE BASIN ANALYSIS

A. EXISTING CONDITION ANALYSIS

Presently, the existing site slopes from east to west and storm flow is conveyed as sheet flow easterly to the 215 Western Beltway Channel. An existing upstream channel along the former Desert Foothills Drive alignment directs flow generated upstream of the project northerly away from the project. It is assumed that Kettle Bend Road and Desert Foothills Drive between Lake Mead Boulevard and Fleet Wing Avenue will be constructed prior to or concurrently with this project.

The Overall and Village 22 Master Studies defined the flow patterns within the Summerlin West Planning Area and verified the permitted discharge flow rates for the project, and therefore a site-specific existing condition hydrologic analysis is not required.

B. INTERIM CONDITION ANALYSIS

(Refer to *Figure 6: Interim Condition Basin Map* in Appendix A.*)*

Interim Condition assumes that the proposed Fleet Wing Avenue improvements and the referenced Kettle Bend Road and Desert Foothills Drive are fully constructed. The areas immediately to the north and south of the project are assumed to be undeveloped.

A riprap trapezoidal channel constructed with Kettle Bend Road lies within the project. The trapezoidal channel serves to divert 461 cfs of flow from the west towards Kindle Rise Way. Therefore, the proposed Fleet Wing Avenue will be constructed over a portion of the existing channel, and riprap is proposed along the roadway embankment to serve as erosion protection as the offsite flow enters the existing channel. The existing channel will continue to divert flow southerly away from the project.

1. OFFSITE DRAINAGE BASIN DESCRIPTION

As discussed previously, flow impacting the project from the west has been referenced from the Kettle Bend Road Study. The referenced 461 cfs will flow adjacent to the project until it enters the existing riprap trapezoidal channel constructed with Kettle Bend Road. Flow generated by the offsite areas to the north and south are conveyed easterly as sheet flow towards Kettle Bend Road. Basin OFF1 has been delineated to determine the flow impacting the southeast

embankment of the proposed roadway. A swale approximately 120-ft in length is proposed southeast of the project to direct the offsite flow from OFF1 towards Kettle Bend Road. Flow in the proposed roadside swales will eventually enter existing an existing swale and storm drain stub constructed with Kettle Bend Road.

2. ONSITE DRAINAGE BASIN DESCRIPTION

The interim condition onsite basin STG3 has been referenced from the Village 22 Master Study and represents the site in its fully developed state. Flow generated by the project in interim condition will be intercepted by drop inlets and will flow easterly to Kettle Bend Road.

C. ULTIMATE CONDITION ANALYSIS

(Refer to *Figure 7: Ultimate Condition Drainage Map)*

Ultimate condition assumes that the proposed improvements and offsite areas are fully developed. Referenced drainage basins correspond to the future Summerlin West parcels and roadways. Hydrologic calculations have been included in Appendix B. Pertinent reference material is included in Appendix D.

1. OFFSITE DRAINAGE BASIN DESCRIPTION

Ultimate condition offsite drainage basins have been referenced from the Village 22 Master Study. Offsite basins and concentration points tributary to the project in ultimate condition are depicted on Figure 7. The total offsite flow entering the project is given by CP3 (77 cfs). The offsite flow will enter the site by storm drain, and no surface flow will enter the project from upstream. The design flow of the onsite storm drain is given by CSTG3 (79 cfs).

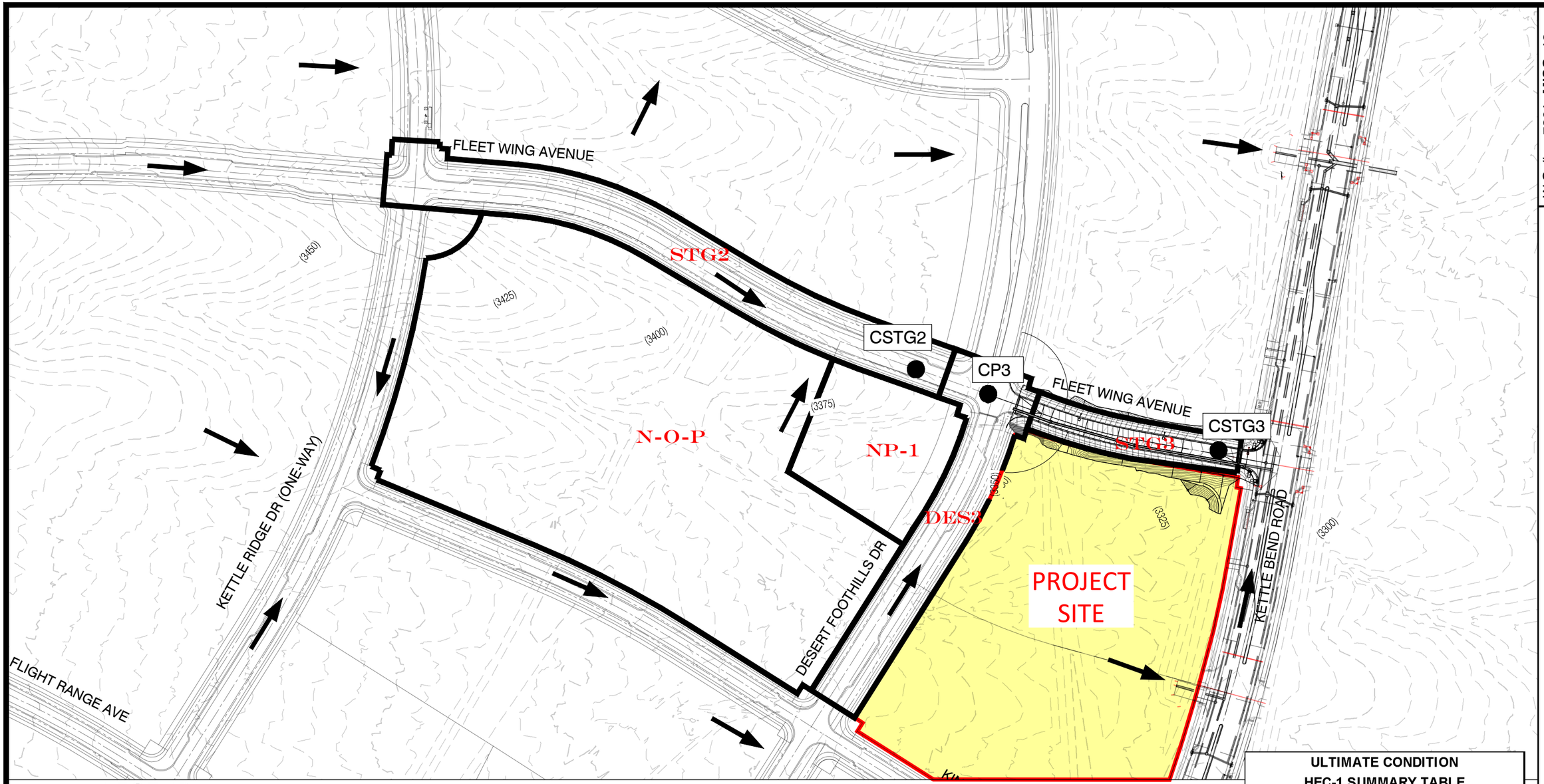
2. ONSITE DRAINAGE BASIN DESCRIPTION

The ultimate condition onsite basin is consistent with the interim condition. Basin STG3 has been referenced from the Village 22 Master Study and represents the project in its fully developed state. Flow generated onsite will be discharged east to Kettle Bend Road.

IV. INTERIM GRADING

(Refer to *Figure 6: Interim Condition Drainage Map)*

A temporary offsite swale is proposed to protect the roadway and to direct flows to storm drain laterals in Kettle Bend Road. The facility names for the offsite swale (OFF1) in the calculations correspond to the tributary basin and facility location. The swale characteristics are summarized in Table 3 below. Velocity in the swale is less than 5 feet per second therefore riprap is not required. Normal depth calculations have been included in Appendix C. Refer to Figure 6 for the locations of the channels.



LEGEND

- BASIN BOUNDARY
- ST7 — BASIN DESIGNATION
- FLOW ARROW

NORTH

GRAPHIC SCALE

200 0 100 200 400

1" = 200'

ULTIMATE CONDITION STREET FLOW ANALYSIS SUMMARY

Street Section	Q100 (cfs)	Slope	Velocity (ft/s)	Depth (ft)	V x D	Tributary Basin
1	3	9.67%	5.23	0.22	1.15	STG3

ULTIMATE CONDITION HEC-1 SUMMARY TABLE

BASIN ID	AREA (ac)	Q100 (CFS)
N-O-P*	14.52	49
NP-1*	1.73	6
STG2*	2.86	13
CSTG2*	-	68
DES3*	2.00	9
CP3*	-	77
STG3*	0.72	3
CSTG3*	-	79

*Referenced from the V22 Master Study

FIGURE 7: ULTIMATE CONDITION BASIN MAP
SUMMERLIN WEST VILLAGE 22
FLEET WING AVE (KETTLE BEND TO DESERT FOOTHILLS)

W.O.#:	7861- MISC- 13
DATE:	01/2020
BY:	JYA
SCALE:	1"= 200'
SHEET	1 OF 1

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NV 89146-5148

H:\7861\Fleet Wing Avenue - Kettle Bend to Desert Foothills\Drainage\A Figures\Figure 7 - Ultimate Condition Map.dwg;jayson; Feb 11, 2020 - 10:16am

STREET CALCULATIONS

Worksheet for 37' ROW

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	9.67	%
Discharge	3.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	0.50
0+00.5	0.50
0+00.5	0.00
0+02.0	0.13
0+02.0	0.17
0+18.5	0.50
0+35.0	0.17
0+35.0	0.13
0+36.5	0.00
0+36.5	0.50
0+37.0	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 0.50)	(0+02.0, 0.13)	0.013
(0+02.0, 0.13)	(0+35.0, 0.13)	0.016
(0+35.0, 0.13)	(0+37.0, 0.50)	0.013

Options

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

Worksheet for 37' ROW

Results

Normal Depth		0.22	ft
Elevation Range	0.00 to 0.50 ft		
Flow Area		0.57	ft²
Wetted Perimeter		8.32	ft
Hydraulic Radius		0.07	ft
Top Width		7.79	ft
Normal Depth		0.22	ft
Critical Depth		0.31	ft
Critical Slope		0.00730	ft/ft
Velocity		5.23	ft/s
Velocity Head		0.43	ft
Specific Energy		0.64	ft
Froude Number		3.40	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.22	ft
Critical Depth	0.31	ft
Channel Slope	9.67	%
Critical Slope	0.00730	ft/ft

Cross Section for 37' ROW

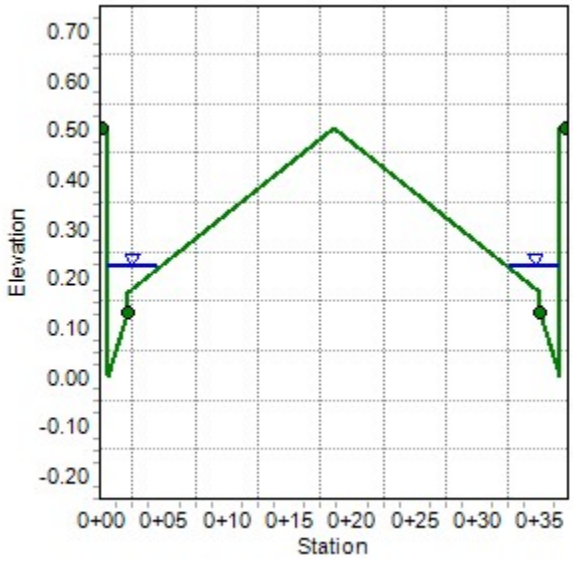
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	9.67	%
Normal Depth	0.22	ft
Discharge	3.00	ft³/s

Cross Section Image



REFERENCES

Update 2 to the Master Conceptual Drainage Study for Summerlin West Village 22, DS#5005, VTN (2020)

Approval Letters
Excerpts (*Update #2*)
Appendix A - Rainfall Map (*Update #1)*
Appendix A - Figure 6 : Ultimate Condition Basin Map *(Update #2)*
Appendix A - Figure 7 : Local Storm Drain Facilities Map *(Update #2)*
Appendix B - Curve Number Calculations *(Update #2)*
Appendix B - Standard Form 4 *(Update #2)*
Appendix B - Ultimate Condition HEC-1 *(Update #2)*
Appendix C - Hydraulic Calculations - Facility 52 *(Update #2)*
Appendix C - Hydraulic Calculations - Facility 55 *(Update #2)*
Appendix C - Hydraulic Calculations - Facility 58 (*Update #2*)

Actus

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

Department of Public Works

500 S Grand Central Pky • Box 554000 • Las Vegas NV 89155-4000
(702) 455-6000 • Fax (702) 455-6040

Denis Cederburg, P.E., Director • E-Mail: dlc@ClarkCountyNV.gov

Drainage Study Concurrence Letter

DS 05005

Date: January 13, 2020
Firm: VTN Nevada
Engineer: Joanna Ayson, P.E.
Address: 2727 South Rainbow Boulevard, Las Vegas, NV 89146
Phone: (702) 873-7550
Fax: (702) 362-2597
E-mail: jayson@vtnnv.com

Subject: Update #2 for Master Conceptual Drainage Study for Summerlin West Village 22
Location: West of I-215 between Lake Mead Boulevard and Summerlin Parkway
APN: 137-14-401-007 & 137-23-201-001
Sec, Township, Range: S14 & 23, T20S, R59E
Flood Zone & Panel: Zone X, 2150E, Dated September 27, 2002
Application Number: PW19-20502UP

Submittals	Date Received	Date Returned	Reviewer	Miscellaneous
Update	12/20/2019	01/10/2020	CR	
Supplement	01/13/2020	01/13/2020	CR	Emailed

The above-referenced project is located within the **City of Las Vegas** adjacent to Clark County unincorporated areas. The drainage study was submitted to the County for concurrence on December 20, 2019. In addition, the County has received the City of Las Vegas acceptance letter dated December 12, 2019 for the Technical Drainage Study (DS5005G-Rev).

The County concurs with the acceptance of this Drainage Study by the City of Las Vegas. Please note that the County's review of this development is limited to drainage issues significant to Clark County unincorporated areas.

BOARD OF COUNTY COMMISSIONERS
MARILYN KIRKPATRICK, Chair • LAWRENCE WEEKLY, Vice Chair
LARRY BROWN • JAMES B. GIBSON • JUSTIN C. JONES • MICHAEL NAFT • TICK SEGERBLOM
YOLANDA T. KING, County Manager

Additional Conditions:

1. This update combines parcels; changes parcel boundaries; shifts street alignments; and removes streets; therefore revising hydrology and storm drain systems accordingly. The previously approved Technical Drainage Studies are: PW18-19645 and PW19-12867.

2. The individual Technical Drainage Studies for the areas adjacent to the County to the west of the project site will need to be submitted for County review to verify acceptance of drainage flows.

3. Beltway channel modifications may be necessary prior to site development.

The County's review is solely based on the information submitted by the Engineer of Record. The County's review is strictly limited to compliance with minimum County Codes and Standards. The Engineer of Record is responsible for researching and addressing situations that may require designs above and beyond the minimum codes for issues of public safety and impacts to upstream, downstream and adjacent properties. The County assumes no liability for information data, designs or conclusions of the Engineer of Record.

Crissy Riland, P.E.
Senior Civil Engineer
Development Review
crissy@ClarkCountyNV.gov

W. Layne Weber, P.E., CFM
Principal Engineer
Development Review
wlweber@ClarkCountyNV.gov

REGIONAL FLOOD CONTROL DISTRICT

DS05005

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

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George Gault
City of Mesquite

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Mayor Carolyn Goodman
City of Las Vegas

Stavros Anthony
City of Las Vegas

Isaac Barron
City of North Las Vegas

Mayor Kleman McManus
City of Boulder City

January 16, 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: **UPDATE #2 FOR SUMMERL WEST VILLAGE 22-MDS (DS5005G-REV) (RFCD No. 19-11423)**

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated November 15, 2019 for above-mentioned project as submitted by VTN NEVADA. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Department of Public Works dated December 12, 2019.

District concurs with acceptance of this Technical Drainage Study by City of Las Vegas Department of Public Works.

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*.

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, information submitted by VTN NEVADA 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:dd

c: Joanna Y. Ayson, P.E., VTN Nevada

P:\Letters and Memos\Local Drainage\Land Development & Drainage\2020\L-19-11423.doc

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

PROVIDING QUALITY PROFESSIONAL SERVICE SINCE 1960

November 5, 2019
W.O. #7861-3A

City of Las Vegas
Land Development Services
333 N. Rancho Drive, 7th Floor
Las Vegas, NV 89106

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

SUBJECT: UPDATE #2 TO THE MASTER CONCEPTUAL DRAINAGE STUDY FOR SUMMERLIN WEST VILLAGE 22

Mr. Sung:

This Update #2 to the approved *Master Conceptual Drainage Study for Summerlin West Village 22* (DS#5005) is being submitted to address revisions to the overall Summerlin West Planning Area land plan. Since the approval of the original study, the *Update #2 to the 2017 Summerlin West Planning Area Flood Control Master Plan Update* (hereinafter referred to as the Overall Master Plan Update study) was submitted to the City of Las Vegas on October 28, 2019. The Overall Master Plan Update study included revisions to the overall Summerlin West hydrology and proposed CCRFCD facilities in the area. This update reanalyzes Village 22 according to the revisions submitted in the Overall Master Plan Update study. In addition, this update reconfigures the conceptual storm drain alignment previously presented. The revisions addressed in this update are summarized below and are discussed in more detail throughout this document:

1. The alignment of Carriage Hill Drive has shifted slightly to the west. The areas of the adjacent parcels B, I, Q, R, V, W, W EE, HH, II have been revised as a result. In addition, the areas of the basins which represent Carriage Hill have been updated as a result.
2. Hive Bluff Lane (Street FF) has been removed. Parcels N, O, and P have been combined into a single parcel N-O-P.
3. Bask Ridge Drive (Street L) between Parcels L and M has been removed. Parcels L and M have been combined into a single parcel L-M as a result.
4. Bask Ridge Drive (Street L) between basins Y and Z, and Flight Edge Way between Parcels AA and Z have been removed. Parcels Y and Z have been combined into single parcel Y-Z and an open space area COS-3 has been added between Y-Z and AA as a result.
5. The boundary of Parcel COS-2 has changed and the corresponding basin boundary has been updated accordingly. The areas of Parcels A, C, and D were impacted as a result.
6. Landscaped areas previously considered portions of street basins within Fleet Wing Avenue (Street G) and Flight Edge Way (Street EE) at the intersections of Kettle Ridge Drive and Desert Foothills Drive are now considered portions of parcel basins. Roadway basin areas have decreased as a result, and the areas have been added to the adjacent parcels.
7. Parcel S and NP-3 have been combined into a single Parcel S.

8. The park NP-1 previously located southeast of the Clowder Pass Way and Desert Foothills Drive intersection has been relocated southwest of the Fleet Wing Ave and Desert Foothills Drive intersection.
9. Offsite parcels have been reconfigured. The boundaries of offsite basins have been updated accordingly, and the naming convention of the offsite basins have been updated to match the parcel designations.
10. The length of storm drain designated as Regional Facility SD-J has reduced to only include the portion of storm drain within Desert Foothills Drive. Storm drain tributary to SD-J has also been reconfigured.

The analysis presented in this update has been completed in accordance with the criteria established in the Clark County Regional Flood Control District (CCRFCD) *Hydrologic Criteria and Drainage Design Manual*, hereinafter referred to as the Manual.

I. HYDROLOGY

As discussed previously, the Overall Master Plan Update study included changes to the land uses and parcel configurations throughout the SWPA and revisions to the proposed CCRFCD MPU facilities. The new parcel areas and land uses have been utilized in this drainage study to revise the curve numbers and hydrologic basins within Village 22. Revised hydrologic calculations and HEC-1 analysis for Village 22 have been included in Appendix B of this report. Updated basin boundaries and flow rates are depicted on *Figure 6: Ultimate Condition Basin Map* in Appendix A.

II. STORM DRAIN ANALYSIS

a. ONSITE LOCAL AND CCRFCD STORM DRAIN FACILITIES

As discussed in the approved study, flows generated by Village 22 are discharged to three CCRFCD Facility Locations: (1) the existing 215 Western Beltway Channel, (2) the proposed storm drain system SD-F, and (3) the storm drain system SD-J. The discharge locations shown in this update are consistent with those in the approved study. The following table compares the flows discharged in this Update #2 versus the approved Update #1. In general the discharge flow rates in this study are less than the approved study. The reduction of discharge flows are due to the removal of streets, the reduction of developed offsite tributary flows, and combining separate parcels into single parcels.

DISCHARGE FLOW COMPARISON TABLE

		New (Update #2)		Old (Update #1)	
Discharge Location	**Description**	**Basin/CP**	**Discharge Q100 (cfs)**	**Basin/CP**	**Discharge Q100 (cfs)**
1A	Existing Lake Mead Blvd SD	CP1	191	CP1	201
1B	Existing Beltway Channel	DUMMY1	1024	DUMMY1	1103
2	CCRFCD Facility SD-F	DUMMY2	708	DUMMY6	859
3	CCRFCD Facility SD-J	DUMMY4	282	DUMMY11	299

The SD-F system was re-evaluated in the Update #2 to the Overall MCDS. The facility map has been updated to reflect the latest Regional Facility sizes shown in the latest Update to the Overall MCDS.

Previously, a portion of the regional system SD-J was located in Flight Range Avenue between Kettle Ridge Drive and Desert Foothills Drive. The Update #2 to the Overall MCDS shortened the total length of SD-J so that only the segment of storm drain within Desert Foothills Drive would be considered a regional facility. This was done to more realistically coincide with where a majority of design flows would be conveyed by the system. This drainage study update for Village 22 provides a specific analysis of the local flows tributary to SD-J. In addition, the local storm drain facilities 77 to 82 previously discharging flows to SD-J at the intersection of Kettle Ridge Drive and Flight Range Ave have been re-routed south in Kettle Ridge Drive to discharge flow into the existing storm drain in Sunset Run Drive. The additional flow to be discharged at Sunset Run Drive was accounted for in the *Technical Drainage Study for Summerlin Parkway Extension,* therefore the storm drain re-routing will not adversely impact downstream facilities.

The following technical drainage studies within Village 22 have been submitted since Update #1 was approved:

1. *Technical Drainage Study for Summerlin West Village 22 Kestrel Creek Avenue (Street I): Desert Foothills Drive to Kettle Ridge Drive (Street J),* DS5171A
2. *Technical Drainage Study for Summerlin West Village 22 Kettle Ridge Drive (Street J) and Scurry Bend Drive (Street N) Street Improvements: Lake Mead Blvd to Fleet Wing Ave,* DS5156
3. *Technical Drainage Study for Summerlin West Village 22 Lake Mead Blvd Street Improvements from Desert Foothills Drive to Kettle Ridge Drive (Street J) – also Lake Mead Blvd Rough Grade from Kettle Ridge Drive to Scurry Bend Drive;* DS5155
4. *Technical Drainage Study for Village 22 Kettle Bend Road;* DS5204

This facilities shown in this update match those presented in the referenced Village 22 technical studies. The updated local and CCRFCD facilities have been depicted on *Figure 7: Local Flood Control Facilities Map*. Normal depth calculations have been included in Appendix C. Pertinent reference material has been included in Appendix D.

I hope this addresses your concerns regarding this project. If there are any questions or any additional information is required, please contact this office.

Respectfully Submitted,

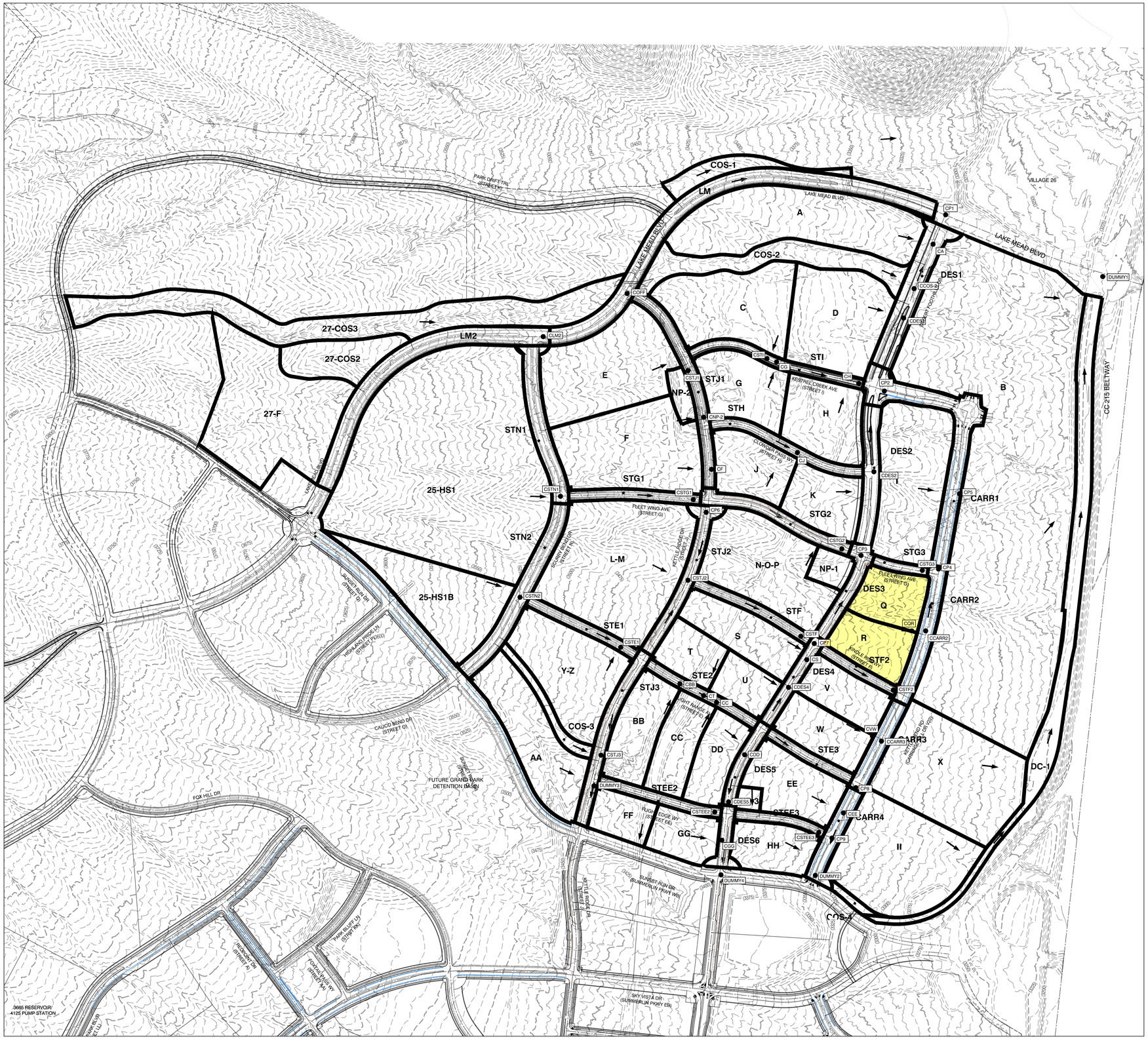
VTN Consulting



Joanna Ayson, P.E.

APPENDIX

APPENDIX A
FIGURES



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
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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.

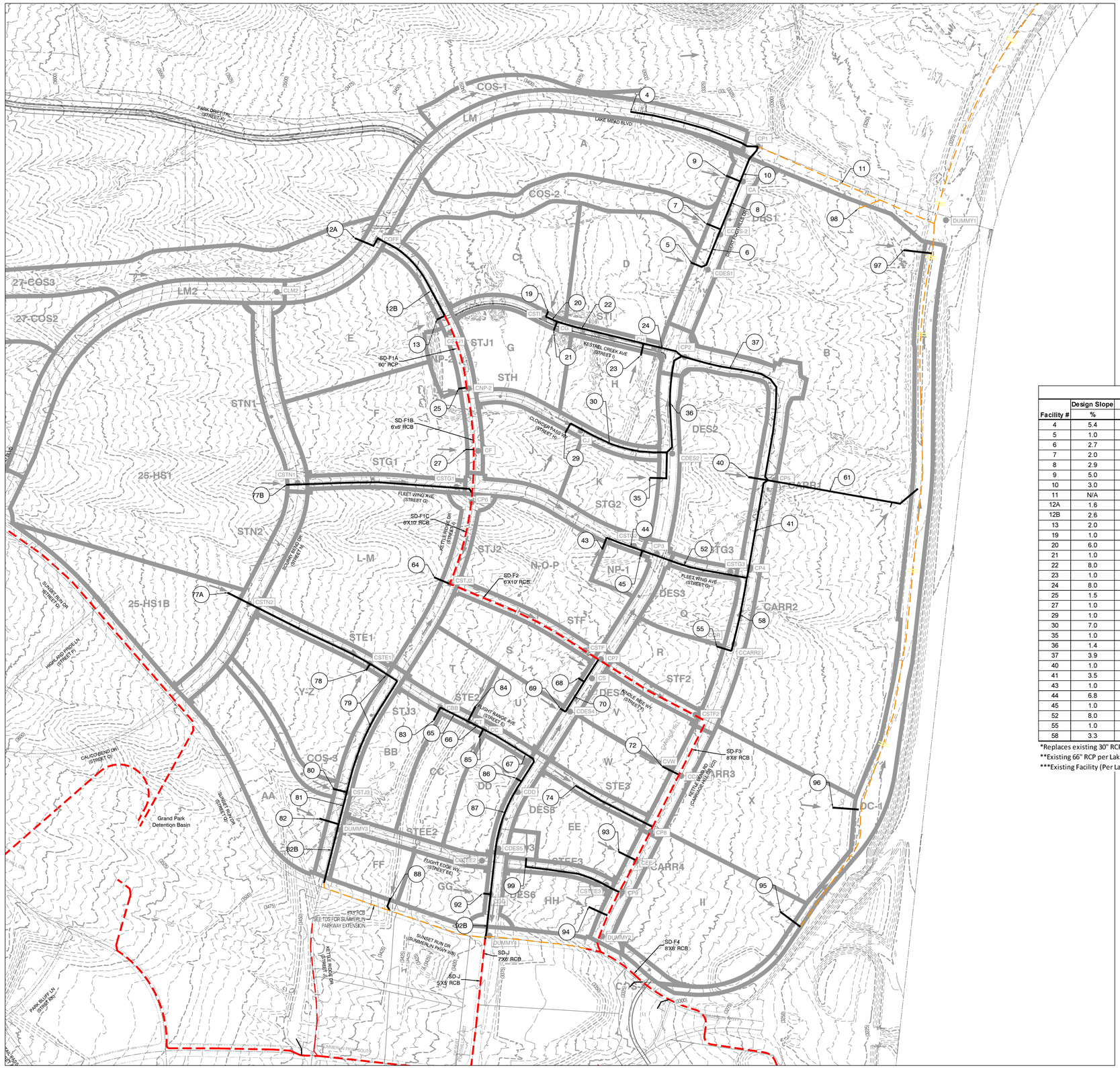
PROJECT NO: 7861

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

APPENDIX B
HYDROLOGIC CALCULATIONS

CURVE NUMBERS FOR SOILS - W.O. #7861

Soil # 152 Cave gravelly fine sandy loam, 0 to 4 percent slopes							
Soil	Percent	Group	Apartment/Condo$_1$	Townhouses$_2$	Open Space$_3$	Urban Districts$_4$	Impervious$_5$
Cave	100%	D	93	92	89	95	98
Total	**100%**		**93**	**92**	**89**	**95**	**98**

Soil # 155 Cave gravelly fine sandy loam, 4 to 15 percent slopes							
Soil	Percent	Group	Apartment/Condo$_1$	Townhouses$_2$	Open Space$_3$	Urban Districts$_4$	Impervious$_5$
Cave	100%	D	93	92	89	95	98
Total	**100%**		**93**	**92**	**89**	**95**	**98**

Soil # 156 Vace - Wechech association							
Soil	Percent	Group	Apartment/Condo$_1$	Townhouses$_2$	Open Space$_3$	Urban Districts$_4$	Impervious$_5$
Vace and Similar	45%	D	93	92	89	95	98
Wechech and Similar	25%	D	93	92	89	95	98
Wechech, steep, and similar	15%	D	93	92	89	95	98
Weiser	8%	B	88	87	79	92	98
Irongold	4%	D	93	92	89	95	98
Commski	2%	B	88	87	79	92	98
Threelakes	1%	A	81	80	68	89	98
Total	**100%**		**93**	**92**	**88**	**95**	**98**

Soil # 502 Canutio-Cave gravelly fine sandy loams, 2 to 8 percent slopes							
Soil	Percent	Group	Apartment/Condo$_1$	Townhouses$_2$	Open Space$_3$	Urban Districts$_4$	Impervious$_5$
Canutio	55%	A	81	80	68	89	98
Cave	40%	D	93	92	89	95	98
Arizo	5%	D	93	92	89	95	98
Total	**100%**		**87**	**86**	**78**	**92**	**98**

1-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602A
* Residential (Apartments / Condos)
2-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602A
* Residential (Townhouses)
3-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602 page 1 of 4
* Open spaces in poor condition (grass cover < 50%)
4-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602 page 1 of 4
* Urban Districts (Commercial / Business & Residential with average lot size <6000 sqft)
5-Referenced Clark County's Hydrologic Criteria and Drainage Design Manual Table 602 page 1 of 4
*Impervious (Paved Streets)

Curve Number calculations for ONSITE Basins

Basin	Type	Soil Percentage	Apartment/Condo$_1$	Townhouses$_2$	Open Space$_3$	Urban Districts$_4$	Impervious$_5$	CN Value
A	155	100%				100%		95.0
B	152	7%	40%			60%		93.5
	155	76%	40%			60%		
	502	17%	40%			60%		
C	155	100%				100%		95.0
D	155	100%				100%		95.0
E	155	100%				100%		95.0
F	155	100%				100%		95.0
G	155	100%				100%		95.0
H	155	100%				100%		95.0
I	152	12%		100%				92.0
	155	88%		100%				
J	152	2%		100%				92.0
	155	98%		100%				
K	152	36%		100%				92.0
	155	64%		100%				
L-M	155	81%		100%				94.4
	502	19%		100%				
N-O-P	152	2%		95%		5%		90.3
	155	98%		95%		5%		
Q	155	100%		95%		5%		92.2
R	155	66%		95%		5%		93.2
	502	34%		95%		5%		
S	155	27%		95%		5%		87.9
	502	73%		95%		5%		
T	502	100%		95%		5%		86.3
U	502	100%		95%		5%		86.3
V	155	0%	40%			60%		90.0
	502	100%	40%			60%		
W	502	100%	40%			60%		90.0
X	502	100%	40%			60%		90.0
Y-Z	156	7%		100%				92.2
	502	93%		100%				
AA	156	77%	100%					88.4
	502	23%	100%					
BB	156	26%	40%			60%		91.1
	502	74%	40%			60%		
CC	156	16%	40%			60%		90.7
	502	84%	40%			60%		
DD	156	13%	40%			60%		90.5
	502	87%	40%			60%		
EE	156	5%	40%			60%		90.2
	502	95%	40%			60%		
FF	156	100%	40%			60%		94.2

GG	156	100%	40%			60%		**94.2**
HH	156	100%	40%			60%		**94.2**
II	156	75%	40%			60%		**93.2**
	502	25%	40%			60%		
COS-1	155	16%			100%			**79.8**
	502	84%			100%			
COS-2	155	100%			100%			**89.0**
COS-3	156	52%			100%			**83.2**
	502	48%			100%			
COS-4	156	100%			100%			**88.0**
NP-1	155	100%			100%			**89.0**
NP-2	155	100%			100%			**89.0**
NP-3	156	25%			100%			**80.5**
	502	75%			100%			
DC-1	152	14%					100%	**98.0**
	155	46%					100%	
	156	9%					100%	
	502	31%					100%	
LM	155	95%					100%	**98.0**
	502	5%					100%	
LM2	155	88%					100%	**98.0**
	502	12%					100%	
DES1	155	100%					100%	**98.0**
DES2	152	23%					100%	**98.0**
	155	77%					100%	
DES3	155	100%					100%	**98.0**
DES4	155	18%					100%	**98.0**
	502	82%					100%	
DES5	156	7%					100%	**98.0**
	502	94%					100%	
DES6	156	100%					100%	**98.0**
CARR1	152	4%					100%	**98.0**
	155	96%					100%	
CARR2	155	55%					100%	**98.0**
	502	45%					100%	
CARR3	502	100%					100%	**98.0**
CARR4	156	67%					100%	**98.0**
	502	33%					100%	
STE1	502	100%					100%	**98.0**
STE2	502	100%					100%	**98.0**
STE3	502	100%					100%	**98.0**
STF	155	100%					100%	**98.0**
STF2	155	16%					100%	**98.0**
	502	84%					100%	
STG1	155	100%					100%	**98.0**
STG2	152	42%					100%	**98.0**
	155	58%					100%	

STG3	155	100%					100%	**98.0**
STH	155	100%					100%	**98.0**
STI	155	100%					100%	**98.0**
STJ1	155	100%					100%	**98.0**
STJ2	155	70%					100%	**98.0**
	502	30%					100%	
STJ3	156	50%					100%	**98.0**
	502	50%					100%	
STN1	155	502%					100%	**98.0**
STN2	155	44%					100%	**98.0**
	502	56%					100%	
STEE2	156	100%					100%	**98.0**
STEE3	156	100%					100%	**98.0**
25-HS1	155	94%				100%		**94.8**
	502	6%				100%		
25-HS1B	155	7%				100%		**92.2**
	502	93%				100%		
27-COS2	155	100%			100%			**89.0**
27-COS3	155	100%			100%			**89.0**
27-F	155	74%				100%		**94.2**
	502	26%				100%		

TRAVEL TIME CALCULATIONS

DEVELOPMENT: Summerlin West Village 22

W.O. # 7861 **CALCULATED BY:** AH

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

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

Non-Urban		Urban	
C1=14.8	C2=29.4	C1=20.2	C2=30.6

					First 500 feet		Remaining Travel Distance	
Basin	**Length** (ft)	**High Elev** (ft)	**Low Elev** (ft)	**Slope** (ft/ft)	**C1**	**V1** (fps)	**C2**	**V2** (fps)
DEVELOPED CONDITION ONSITE								
A	1651	3448	3310	0.084	20.2	5.8	30.6	8.8
B	1355	3336	3230	0.078	20.2	5.6	30.6	8.6
C	538	3454	3371	0.154	20.2	7.9	30.6	12.0
D	541	3368	3327	0.076	20.2	5.6	30.6	8.4
E	849	3526	3447	0.093	20.2	6.2	30.6	9.3
F	941	3514	3422	0.098	20.2	6.3	30.6	9.6
G	419	3435	3408	0.064	20.2	5.1	30.6	7.8
H	494	3408	3336	0.146	20.2	7.7	30.6	11.7
I	1044	3347	3299	0.046	20.2	4.3	30.6	6.6
J	403	3433	3371	0.154	20.2	7.9	30.6	12.0
K	326	3389	3346	0.132	20.2	7.3	30.6	11.1
L-M	1375	3514	3448	0.048	20.2	4.4	30.6	6.7
N-O-P	1164	3429	3375	0.046	20.2	4.4	30.6	6.6
Q	640	3353	3315	0.059	20.2	4.9	30.6	7.5
R	622	3364	3319	0.072	20.2	5.4	30.6	8.2
S	1000	3432	3375	0.057	20.2	4.8	30.6	7.3
T	284	3451	3403	0.169	20.2	8.3	30.6	12.6
U	276	3421	3384	0.134	20.2	7.4	30.6	11.2
V	680	3370	3329	0.060	20.2	5.0	30.6	7.5
W	700	3381	3333	0.069	20.2	5.3	30.6	8.0
X	1072	3338	3254	0.078	20.2	5.7	30.6	8.6
Y-Z	900	3530	3475	0.061	20.2	5.0	30.6	7.6
AA	1050	3535	3475	0.057	20.2	4.8	30.6	7.3
BB	703	3468	3428	0.057	20.2	4.8	30.6	7.3
CC	652	3431	3408	0.035	20.2	3.8	30.6	5.7
DD	621	3421	3391	0.048	20.2	4.4	30.6	6.7
EE	555	3393	3341	0.094	20.2	6.2	30.6	9.4
FF	269	3469	3416	0.197	20.2	9.0	30.6	13.6
GG	392	3426	3392	0.087	20.2	5.9	30.6	9.0
HH	505	3387	3343	0.087	20.2	6.0	30.6	9.0
II	962	3337	3268	0.072	20.2	5.4	30.6	8.2
COS-1	1373	3450	3350	0.073	14.8	4.0	29.4	7.9
COS-2	1676	3452	3417	0.021	14.8	2.1	29.4	4.2
COS-3	1035	3530	3465	0.063	14.8	3.7	29.4	7.4
COS-4	362	3326	3308	0.050	14.8	3.3	29.4	6.6
NP-1	98	3359	3343	0.163	20.2	8.2	30.6	12.4
NP-2	95	3460	3420	0.421	20.2	13.1	30.6	19.9
NP-3	123	3391	3376	0.122	20.2	7.1	30.6	10.7
DC-1	3630	3252	3219	0.009	20.2	1.9	30.6	2.9

TRAVEL TIME CALCULATIONS

DEVELOPMENT: Summerlin West Village 22

W.O. # 7861 **CALCULATED BY:** AH

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

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

Non-Urban		Urban	
C1=14.8	C2=29.4	C1=20.2	C2=30.6

					First 500 feet		Remaining Travel Distance	
Basin	**Length** (ft)	**High Elev** (ft)	**Low Elev** (ft)	**Slope** (ft/ft)	**C1**	**V1** (fps)	**C2**	**V2** (fps)
LM	3472	3515	3305	0.060	20.2	5.0	30.6	7.5
LM2	2360	3654	3510	0.061	20.2	5.0	30.6	7.6
DES1	1148	3344	3303	0.036	20.2	3.8	30.6	5.8
DES2	1035	3354	3336	0.017	20.2	2.7	30.6	4.0
DES3	552	3369	3337	0.058	20.2	4.9	30.6	7.4
DES4	652	3385	3366	0.029	20.2	3.4	30.6	5.2
DES5	696	3393	3380	0.019	20.2	2.8	30.6	4.2
DES6	318	3400	3391	0.028	20.2	3.4	30.6	5.1
CARR1	1400	3343	3301	0.030	20.2	3.5	30.6	5.3
CARR2	920	3320	3302	0.020	20.2	2.8	30.6	4.3
CARR3	720	3335	3332	0.004	20.2	1.3	30.6	2.0
CARR4	735	3350	3337	0.018	20.2	2.7	30.6	4.1
STE1	870	3519	3461	0.067	20.2	5.2	30.6	7.9
STE2	867	3455	3384	0.082	20.2	5.8	30.6	8.8
STE3	505	3384	3341	0.085	20.2	5.9	30.6	8.9
STF	887	3436	3370	0.074	20.2	5.5	30.6	8.3
STF2	620	3362	3325	0.060	20.2	4.9	30.6	7.5
STG1	890	3513	3421	0.103	20.2	6.5	30.6	9.8
STG2	1025	3424	3348	0.074	20.2	5.5	30.6	8.3
STG3	405	3341	3309	0.079	20.2	5.7	30.6	8.6
STH	1102	3421	3343	0.071	20.2	5.4	30.6	8.1
STI	1262	3442	3345	0.077	20.2	5.6	30.6	8.5
STJ1	1498	3457	3415	0.028	20.2	3.4	30.6	5.1
STJ2	1025	3440	3413	0.026	20.2	3.3	30.6	5.0
STJ3	926	3473	3453	0.022	20.2	3.0	30.6	4.5
STN1	1450	3519	3508	0.008	20.2	1.8	30.6	2.7
STN2	1175	3546	3514	0.027	20.2	3.3	30.6	5.0
STEE2	791	3470	3393	0.097	20.2	6.3	30.6	9.5
STEE3	575	3386	3342	0.077	20.2	5.6	30.6	8.5
25-HS1	1685	3636	3520	0.069	20.2	5.3	30.6	8.0
25-HS1B	1355	3632	3531	0.075	20.2	5.5	30.6	8.4
27-COS2	990	3670	3597	0.074	14.8	4.0	29.4	8.0
27-COS3	4130	3791	3461	0.080	14.8	4.2	29.4	8.3
27-F	1215	3711	3624	0.072	20.2	5.4	30.6	8.2

STANDARD FORM 4

DEVELOPMENT: Summerlin West Village 22

W.O. # 7861 **CALCULATED BY:** AH

V1 applies to the first 500 feet of travel distance V2 applies to the remaining travel distance	
Existing:	**Developed**

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

$V1 = 1.48 * S^{1/2}$ $V2 = 2.94 * S^{1/2}$

$V1 = 2.02 * S^{1/2}$ $V2 = 3.06 * S^{1/2}$

$$k = 0.0132 C_n - 0.39$$

SUB-BASIN DATA					INITIAL/OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK (URBANIZED BASINS)		FINAL Tc	LAG TIME	REMARKS
DESIG. (1)	Cn	K (2)	AREA Ac. (3)	AREA Mi^2	LENGTH Ft (4)	SLOPE % (5)	Ti Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	V1 fps (9a)	V2 fps (9b)	Tt Min. (10)	TOTAL LENGTH (11)	Tc Min. (12)	Min.	TLAG Hr.	
DEVELOPED CONDITION ONSITE																	
A	95.0	0.864	17.39	0.0272	100	1.0	4.25	1651	8.4	5.8	8.8	3.60	1751	19.73	7.84	0.078	
B	93.5	0.844	80.77	0.1262	100	1.0	4.61	1355	7.8	5.6	8.6	3.14	1455	18.08	7.75	0.077	
C	95.0	0.864	12.05	0.0188	100	1.0	4.25	538	15.4	7.9	12.0	1.10	638	13.54	5.35	0.054	
D	95.0	0.864	11.96	0.0187	100	1.0	4.25	541	7.6	5.6	8.4	1.58	641	13.56	5.83	0.058	
E	95.0	0.864	13.91	0.0217	100	1.0	4.25	849	9.3	6.2	9.3	1.98	949	15.27	6.22	0.062	
F	95.0	0.864	14.22	0.0222	100	1.0	4.25	941	9.8	6.3	9.6	2.09	1041	15.78	6.34	0.063	
G	95.0	0.864	7.05	0.0110	100	1.0	4.25	419	6.4	5.1	7.8	1.36	519	12.88	5.61	0.056	
H	95.0	0.864	7.64	0.0119	100	1.0	4.25	494	14.6	7.7	11.7	1.07	594	13.30	5.32	0.053	
I	92.0	0.824	13.44	0.0210	100	1.0	4.96	1044	4.6	4.3	6.6	3.31	1144	16.36	8.27	0.083	
J	92.0	0.824	5.93	0.0093	100	1.0	4.96	403	15.4	7.9	12.0	0.85	503	12.79	5.81	0.058	
K	92.0	0.824	5.28	0.0083	100	1.0	4.96	326	13.2	7.3	11.1	0.74	426	12.37	5.70	0.057	
L-M	94.4	0.856	21.14	0.0330	100	1.0	4.38	1375	4.8	4.4	6.7	4.06	1475	18.19	8.44	0.084	
N-O-P	90.3	0.801	14.52	0.0227	100	1.0	5.38	1164	4.6	4.4	6.6	3.59	1264	17.02	8.97	0.090	
Q	92.2	0.826	4.58	0.0072	100	1.0	4.93	640	5.9	4.9	7.5	2.01	740	14.11	6.93	0.069	
R	93.2	0.840	4.97	0.0078	100	1.0	4.68	622	7.2	5.4	8.2	1.78	722	14.01	6.46	0.065	
S	87.9	0.770	3.01	0.0047	100	1.0	5.94	1000	5.7	4.8	7.3	2.87	1100	16.11	8.81	0.088	
T	86.3	0.749	4.02	0.0063	100	1.0	6.32	284	16.9	8.3	12.6	0.57	384	12.13	6.89	0.069	
U	86.3	0.749	3.49	0.0055	100	1.0	6.32	276	13.4	7.4	11.2	0.62	376	12.09	6.94	0.069	
V	90.0	0.798	5.01	0.0078	100	1.0	5.44	680	6.0	5.0	7.5	2.08	780	14.33	7.52	0.075	
W	90.0	0.798	5.28	0.0083	100	1.0	5.44	700	6.9	5.3	8.0	1.99	800	14.44	7.43	0.074	
X	90.0	0.798	17.45	0.0273	100	1.0	5.44	1072	7.8	5.7	8.6	2.59	1172	16.51	8.02	0.080	
Y-Z	92.2	0.827	11.28	0.0176	100	1.0	4.91	900	6.1	5.0	7.6	2.55	1000	15.56	7.46	0.075	
AA	88.4	0.777	10.13	0.0158	100	1.0	5.82	1050	5.7	4.8	7.3	2.98	1150	16.39	8.80	0.088	
BB	91.1	0.812	6.29	0.0098	100	1.0	5.18	703	5.7	4.8	7.3	2.19	803	14.46	7.37	0.074	
CC	90.7	0.807	5.34	0.0083	100	1.0	5.28	652	3.5	3.8	5.7	2.64	752	14.18	7.91	0.079	
DD	90.5	0.805	4.76	0.0074	100	1.0	5.31	621	4.8	4.4	6.7	2.18	721	14.01	7.48	0.075	
EE	90.2	0.801	6.80	0.0106	100	1.0	5.39	555	9.4	6.2	9.4	1.45	655	13.64	6.83	0.068	
FF	94.2	0.853	3.49	0.0055	100	1.0	4.44	269	19.7	9.0	13.6	0.50	369	12.05	4.94	0.049	Use Min TLAG = 0.050 per HCDDM
GG	94.2	0.853	4.98	0.0078	100	1.0	4.44	392	8.7	5.9	9.0	1.10	492	12.73	5.54	0.055	
HH	94.2	0.853	4.85	0.0076	100	1.0	4.44	505	8.7	6.0	9.0	1.41	605	13.36	5.84	0.058	
II	93.2	0.840	16.03	0.0250	100	1.0	4.69	962	7.2	5.4	8.2	2.48	1062	15.90	7.17	0.072	
COS-1	79.8	0.663	2.87	0.0045	100	1.0	7.87	1373	7.3	4.0	7.9	3.92	1473	18.18	11.79	0.118	
COS-2	89.0	0.785	7.51	0.0117	100	1.0	5.67	1676	2.1	2.1	4.2	8.51	1776	19.87	14.18	0.142	
COS-3	83.2	0.708	1.70	0.0027	100	1.0	7.05	1035	6.3	3.7	7.4	3.46	1135	16.31	10.51	0.105	Use Min TLAG = 0.100 per HCDDM
COS-4	88.0	0.772	0.57	0.0009	100	1.0	5.91	362	5.0	3.3	6.6	1.83	462	12.57	7.74	0.077	Use Min TLAG = 0.100 per HCDDM
NP-1	89.0	0.785	1.73	0.0027	100	1.0	5.67	98	16.3	8.2	12.4	0.20	198	11.10	5.87	0.059	
NP-2	89.0	0.785	1.34	0.0021	100	1.0	5.67	95	42.1	13.1	19.9	0.12	195	11.08	5.79	0.058	
NP-3	80.5	0.673	0.70	0.0011	100	1.0	7.69	123	12.2	7.1	10.7	0.29	223	11.24	7.98	0.080	
DC-1	98.0	0.904	12.59	0.0197	100	1.0	3.54	3630	0.9	1.9	2.9	22.21	3730	30.72	25.74	0.257	
LM	98.0	0.904	10.04	0.0157	100	1.0	3.54	3472	6.0	5.0	7.5	8.26	3572	29.84	11.79	0.118	
LM2	98.0	0.904	7.23	0.0113	100	1.0	3.54	2360	6.1	5.0	7.6	5.77	2460	23.67	9.31	0.093	
DES1	98.0	0.904	4.46	0.0070	38	2.0	1.73	1148	3.6	3.8	5.8	4.05	1186	16.59	5.78	0.058	
DES2	98.0	0.904	3.09	0.0048	38	2.0	1.73	1035	1.7	2.7	4.0	5.34	1073	15.96	7.07	0.071	

STANDARD FORM 4

DEVELOPMENT: Summerlin West Village 22

W.O. # 7861 **CALCULATED BY:** AH

V1 applies to the first 500 feet of travel distance V2 applies to the remaining travel distance	
Existing:	**Developed**

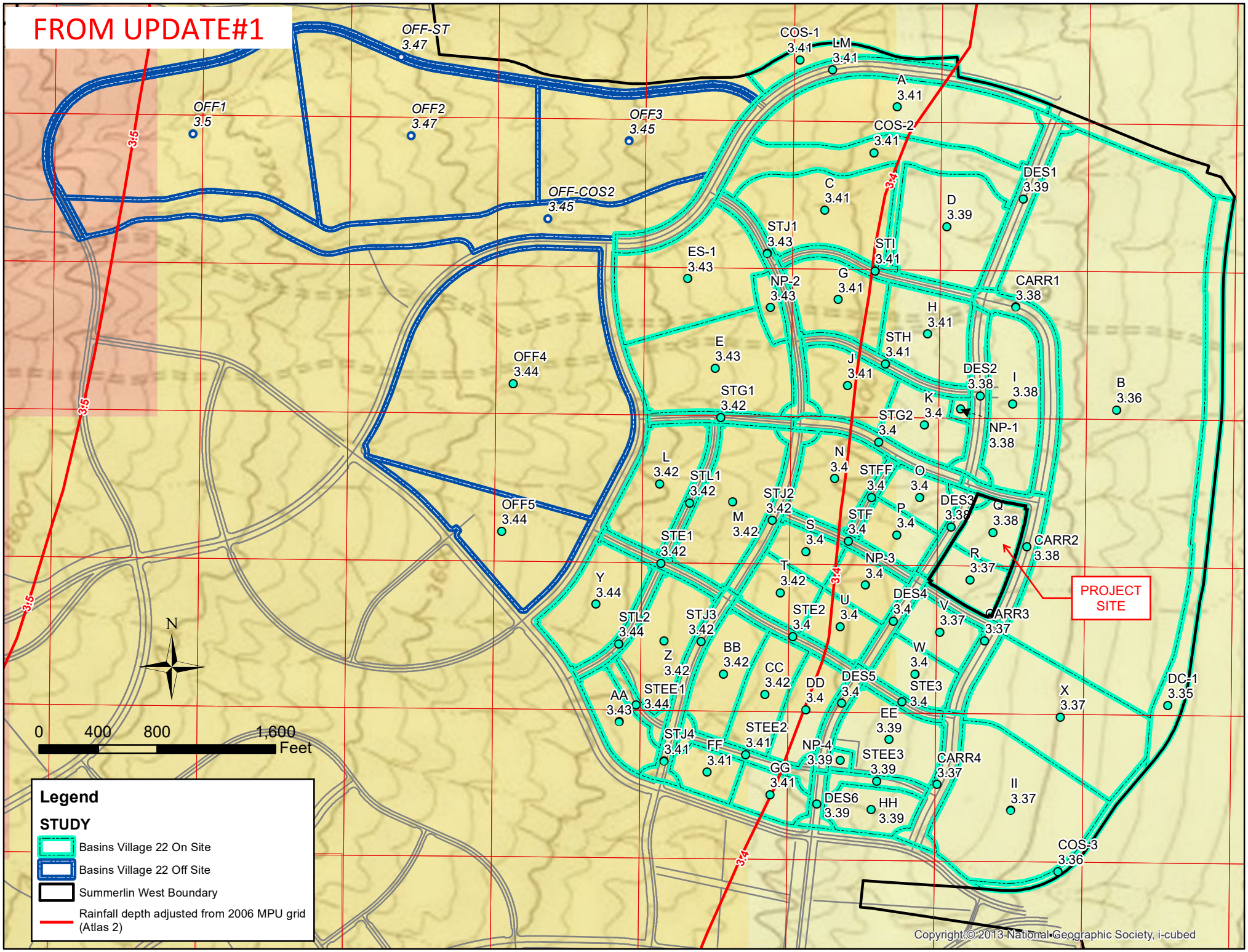
$$T_i = \frac{1.8(1.1-k)L^{1/2}}{S^{1/3}} \qquad T_t = \frac{L}{60V} \qquad T_c = T_i + T_t$$

$V1 = 1.48 * S^{1/2}$ $V2 = 2.94 * S^{1/2}$

$V1 = 2.02 * S^{1/2}$ $V2 = 3.06 * S^{1/2}$

$$k = 0.0132 C_n - 0.39$$

SUB-BASIN DATA					INITIAL/OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK (URBANIZED BASINS)		FINAL Tc	LAG TIME	REMARKS
DESIG. (1)	Cn	K (2)	AREA Ac. (3)	AREA Mi^2	LENGTH Ft (4)	SLOPE % (5)	Ti Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	V1 fps (9a)	V2 fps (9b)	Tt Min. (10)	TOTAL LENGTH (11)	Tc Min. (12)	Min.	TLAG Hr.	
DES3	98.0	0.904	2.00	0.0031	30	2.0	1.54	552	5.8	4.9	7.4	1.83	582	13.23	3.37	0.034	Use Min TLAG = 0.050 per HCDDM
DES4	98.0	0.904	1.77	0.0028	30	2.0	1.54	652	2.9	3.4	5.2	2.90	682	13.79	4.44	0.044	Use Min TLAG = 0.050 per HCDDM
DES5	98.0	0.904	1.57	0.0025	30	2.0	1.54	696	1.9	2.8	4.2	3.80	726	14.03	5.34	0.053	
DES6	98.0	0.904	1.31	0.0020	30	2.0	1.54	318	2.8	3.4	5.1	1.56	348	11.93	3.10	0.031	Use Min TLAG = 0.050 per HCDDM
CARR1	98.0	0.904	6.95	0.0109	42	2.0	1.82	1400	3.0	3.5	5.3	5.21	1442	18.01	7.03	0.070	
CARR2	98.0	0.904	3.58	0.0056	42	2.0	1.82	920	2.0	2.8	4.3	4.58	962	15.34	6.40	0.064	
CARR3	98.0	0.904	2.14	0.0033	42	2.0	1.82	720	0.4	1.3	2.0	8.25	762	14.23	10.07	0.101	
CARR4	98.0	0.904	2.33	0.0036	42	2.0	1.82	735	1.8	2.7	4.1	4.06	777	14.32	5.88	0.059	
STE1	98.0	0.904	1.75	0.0027	21	2.0	1.29	870	6.7	5.2	7.9	2.38	891	14.95	3.66	0.037	Use Min TLAG = 0.050 per HCDDM
STE2	98.0	0.904	1.78	0.0028	21	2.0	1.29	867	8.2	5.8	8.8	2.14	888	14.93	3.43	0.034	Use Min TLAG = 0.050 per HCDDM
STE3	98.0	0.904	1.36	0.0021	21	2.0	1.29	505	8.5	5.9	8.9	1.42	526	12.92	2.71	0.027	Use Min TLAG = 0.050 per HCDDM
STF	98.0	0.904	1.84	0.0029	21	2.0	1.29	887	7.4	5.5	8.3	2.29	908	15.04	3.57	0.036	Use Min TLAG = 0.050 per HCDDM
STF2	98.0	0.904	1.21	0.0019	21	2.0	1.29	620	6.0	4.9	7.5	1.96	641	13.56	3.24	0.032	Use Min TLAG = 0.050 per HCDDM
STG1	98.0	0.904	1.85	0.0029	19	2.0	1.22	890	10.3	6.5	9.8	1.94	909	15.05	3.17	0.032	Use Min TLAG = 0.050 per HCDDM
STG2	98.0	0.904	2.86	0.0045	30	2.0	1.54	1025	7.4	5.5	8.3	2.57	1055	15.86	4.10	0.041	Use Min TLAG = 0.050 per HCDDM
STG3	98.0	0.904	0.72	0.0011	30	2.0	1.54	405	7.9	5.7	8.6	1.19	435	12.42	2.73	0.027	Use Min TLAG = 0.050 per HCDDM
STH	98.0	0.904	2.29	0.0036	21	2.0	1.29	1102	7.1	5.4	8.1	2.78	1123	16.24	4.07	0.041	Use Min TLAG = 0.050 per HCDDM
STI	98.0	0.904	2.42	0.0038	19	2.0	1.22	1262	7.7	5.6	8.5	2.99	1281	17.12	4.21	0.042	Use Min TLAG = 0.050 per HCDDM
STJ1	98.0	0.904	3.52	0.0055	19	2.0	1.22	1498	2.8	3.4	5.1	5.71	1517	18.43	6.93	0.069	
STJ2	98.0	0.904	3.10	0.0048	30	2.0	1.54	1025	2.6	3.3	5.0	4.30	1055	15.86	5.84	0.058	
STJ3	98.0	0.904	3.22	0.0050	30	2.0	1.54	926	2.2	3.0	4.5	4.39	956	15.31	5.92	0.059	
STN1	98.0	0.904	3.61	0.0056	40	2.0	1.77	1450	0.8	1.8	2.7	10.68	1490	18.28	12.45	0.125	
STN2	98.0	0.904	4.33	0.0068	40	2.0	1.77	1175	2.7	3.3	5.0	4.73	1215	16.75	6.50	0.065	
STEE2	98.0	0.904	1.79	0.0028	21	2.0	1.29	791	9.7	6.3	9.5	1.83	812	14.51	3.12	0.031	Use Min TLAG = 0.050 per HCDDM
STEE3	98.0	0.904	1.23	0.0019	21	2.0	1.29	575	7.7	5.6	8.5	1.64	596	13.31	2.92	0.029	Use Min TLAG = 0.050 per HCDDM
25-HS1	94.8	0.862	49.49	0.0773	21	2.0	1.56	1685	6.9	5.3	8.0	4.03	1706	19.48	5.59	0.056	
25-HS1B	92.2	0.827	11.63	0.0182	21	2.0	1.79	1355	7.5	5.5	8.4	3.22	1376	17.64	5.00	0.050	
27-COS2	89.0	0.785	5.25	0.0082	21	2.0	2.06	990	7.4	4.0	8.0	3.10	1011	15.62	5.16	0.052	
27-COS3	89.0	0.785	17.46	0.0273	21	2.0	2.06	4130	8.0	4.2	8.3	9.27	4151	33.06	11.34	0.113	
27-F	94.2	0.854	19.13	0.0299	21	2.0	1.61	1215	7.2	5.4	8.2	3.00	1236	16.87	4.61	0.046	Use Min TLAG = 0.050 per HCDDM
															Tc Min (Urban)= 5 min		
															Tc Min (Non Urb)= 10 min		



H:\7861\Village 22 Master\GIS\Rainfall\mxd\Village22-2006MPU-Precipitation.mxd Date: 11/5/2018

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1****************************************                                    ****************************************
 *                                      *                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998              *                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                    *          609 SECOND STREET           *
 *                                      *                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   23OCT19  TIME  13:10:22  *                                    *           (916) 756-1104             *
 *                                      *                                    *                                      *
 ****************************************                                    ****************************************

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


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

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

1                                                  HEC-1 INPUT                                                  PAGE  1

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

                        *DIAGRAM
 *** FREE ***
               1        ID    ULTIMATE CONDITION HYDROLOGIC MODEL
               2        ID    INPUT FILE DATE = OCTOBER 2019
               3        ID    DESIGN STORM = 100-YEAR 6-HR STORM
               4        ID    STORM DISTRIBUTION = SDN #3
               5        ID    MODELED BY VTN (JYA)
               6        ID
               7        ID    ******************************************************
               8        ID    * UPDATE #2 - SUMMERLIN WEST VILLAGE 22                *
               9        ID    ******************************************************
              10        ID
              11        ID
              12        ID
              13        ID
              14        ID  JR CARD RATIOS REPRESENT DEPTH-AREA REDUCTION FACTORS (DARF'S)
              15        ID
              16        ID  100-YEAR,  6-HOUR STORM,  SDN3
              17        ID
              18        IT       5       0       0     100
              19        IO       5       0       0
              20        IN       5       0       0
              21        JR    PREC    1.00
                        *

              22        KK      LM
              23        BA  0.0157
              24        PB    3.41
              25        PC       0   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
              26        PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
              27        PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
              28        PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
              29        PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
              30        PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
              31        PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
              32        PC   0.998   0.999       1
              33        LS       0    98.0
              34        UD   0.118
                        *

              35        KK       D
              36        BA  0.0187
              37        PB    3.39
              38        LS       0    95.0
              39        UD   0.058
                        *

              40        KK    DES1
              41        BA  0.0070
              42        PB    3.39
              43        LS       0    98.0
              44        UD   0.058
                        *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  45          KK   CDES1
  46          KM   COMBINE D AND DES1
  47          HC       2
              *

  48          KK  RCDES1
  49          KM   ROUTE CDES1 TO CCOS-2
  50          RD     241   0.027   0.013       0    CIRC     2.5
              *

  51          KK   COS-2
  52          BA  0.0117
  53          PB    3.41
  54          LS       0    89.0
  55          UD   0.142
              *

  56          KK  CCOS-2
  57          KM   COMBINE CDES1 AND COS-2
  58          HC       2
              *

  59          KK RCCOS-2
  60          KM   ROUTE CCOS-2 TO CA
  61          RD     325   0.007   0.013       0    CIRC     3.0
              *

  62          KK       A
  63          BA  0.0272
  64          PB    3.41
  65          LS       0    95.0
  66          UD   0.078
              *

  67          KK      CA
  68          KM   COMBINE CCOS-2 AND A
  69          HC       2
              *

  70          KK     RCA
  71          KM   ROUTE CA TO CP1
  72          RD     325   0.050   0.013       0    CIRC     3.5
              *

  73          KK     CP1
  74          KM   COMBINE LM AND CA
  75          HC       2
              *
```



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

  76          KK     STI
  77          KM   KESTREL CREEK AVE
  78          BA  0.0038
  79          PB    3.41
  80          LS       0    98.0
  81          UD   0.050
              *

  82          KK       C
  83          BA  0.0188
  84          PB    3.41
  85          LS       0    95.0
  86          UD   0.054
              *

  87          KK    CSTI
  88          KM   COMBINE C AND STI
  89          HC       2
              *

  90          KK       G
  91          BA  0.0110
  92          PB    3.41
  93          LS       0    95.0
  94          UD   0.056
              *

  95          KK      CG
  96          KM   COMBINE CSTI AND CG
  97          HC       2
              *

  98          KK     RCG
```

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

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

            106          KK      CH
            107          KM   COMBINE CG AND CH
            108          HC       2
                         *
1                                      HEC-1 INPUT                                          PAGE  4

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


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

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

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

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

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

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

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

            139          KK   CDES2
            140          KM   COMBINE DES2, CJ, AND K
            141          HC       3
                         *
1                                      HEC-1 INPUT                                          PAGE  5

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


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

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

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

            151          KK   CARR1
            152          BA  0.0109
            153          PB    3.38
```

```
          154          LS       0    98.0
          155          UD   0.070
                       *

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

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

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

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



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

          177          KK   CSTG2
          178          KM   COMBINE N-O-P, NP-1 AND STG2
          179          HC       3
                       *
          180          KK    DES3
          181          BA  0.0031
          182          PB    3.38
          183          LS       0    98.0
          184          UD   0.050
                       *
          185          KK     CP3
          186          KM   COMBINES CSTG2 & DES3
          187          HC       2
                       *

          188          KK    RCP3
          189          KM   ROUTE CP3 TO CSTG3
          190          RD     513   0.080   0.013       0    CIRC     3.0
                       *
          191          KK    STG3
          192          BA  0.0011
          193          PB    3.38
          194          LS       0    98.0
          195          UD   0.050
                       *
          196          KK   CSTG3
          197          KM   COMBINES CP3 AND STG
          198          HC       2
                       *
          199          KK       Q
          200          BA  0.0072
          201          PB    3.38
          202          LS       0    92.2
          203          UD   0.069
                       *

          204          KK       R
          205          BA  0.0078
          206          PB    3.37
          207          LS       0    93.2
          208          UD   0.065
                       *
          209          KK     CQR
          210          KM   COMBINE R AND Q
          211          HC       2
                       *
```

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

     212         KK   CARR2
     213         BA  0.0056
     214         PB    3.37
     215         LS       0    98.0
     216         UD   0.064
                 *

     217         KK  CCARR2
     218         KM   COMBINE CQR AND CARR2
     219         HC       2
                 *

     220         KK RCCARR2
     221         KM   ROUTE CCARR2 TO CP4
     222         RD     414   0.033   0.013       0    CIRC     2.5
                 *

     223         KK     CP4
     224         KM   COMBINE CP3 AND CCARR2
     225         HC       2
                 *

     226         KK    RCP4
     227         KM   ROUTE CP4 TO CP5
     228         RD     582   0.010   0.013       0    CIRC     3.5
                 *

     229         KK     CP5
     230         KM   COMBINE CARR1, I, CP2 AND CP4
     231         HC       4
                 *

     232         KK      II
     233         BA  0.0250
     234         PB    3.37
     235         LS       0    93.2
     236         UD   0.072
                 *

     237         KK       X
     238         BA  0.0273
     239         PB    3.37
     240         LS       0    90.0
     241         UD   0.080
                 *

     242         KK       B
     243         BA  0.1262
     244         PB    3.36
     245         LS       0    93.5
     246         UD   0.077
                 *
1                                      HEC-1 INPUT                                      PAGE  8

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

     247         KK    DC-1
     248         BA  0.0197
     249         PB    3.35
     250         LS       0      98
     251         UD   0.257
                 *

     252         KK   COS-4
     253         BA  0.0009
     254         PB    3.35
     255         LS       0    88.0
     256         UD   0.077
                 *

     257         KK DUMMY1A
     258         KM   REGIONAL FACILITY - BELTWAY CHANNEL NORTH
     259         KM   COMBINE II, X, B, DC1, AND COS-4
     260         HC       5
                 *

     261         KK   COS-1
     262         BA  0.0045
     263         PB    3.41
     264         LS       0    79.8
     265         UD   0.118
                 *

     266         KK  DUMMY1
     267         KM   REGIONAL FACILITY - BELTWAY CHANNEL NORTH
     268         KM   COMBINE CP1, CP5, DUMMY1A, AND COS-1
     269         HC       4
```

```
                *

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

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

 280            KK     LM2
 281            BA  0.0113
 282            PB    3.41
 283            LS       0    98.0
 284            UD   0.093
                *
1                                       HEC-1 INPUT                                             PAGE  9

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


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

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

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

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

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

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

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

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

 317            KK    NP-2
 318            BA  0.0021
 319            PB    3.43
 320            LS       0    89.0
 321            UD   0.058
                *
1                                       HEC-1 INPUT                                             PAGE 10

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


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

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

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

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

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

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

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

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

 353          KK  RCSTN1
 354          KM   ROUTE CSTN1 TO CSTG1
 355          RD    1010   0.090   0.013       0    CIRC     4.5
              *
1                                        HEC-1 INPUT                                        PAGE 11

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

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

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

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

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

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

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

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

```
          383          KK  RCSTJ2
          384          KM   ROUTE CSTJ2 TO CSTF
          385          RD    1000   0.069   0.015       0    DEEP       6       0
                       *

          386          KK     STF
          387          BA  0.0029
          388          PB    3.40
          389          LS       0    98.0
          390          UD   0.050
                       *
1                                        HEC-1 INPUT                                        PAGE 12

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


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

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

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

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

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

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

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

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

          421          KK    STF2
          422          BA  0.0019
          423          PB    3.37
          424          LS       0    98.0
          425          UD   0.050
                       *
1                                        HEC-1 INPUT                                        PAGE 13

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


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

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

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

```
 437          KK       W
 438          BA  0.0083
 439          PB    3.40
 440          LS       0    90.0
 441          UD   0.074
              *

 442          KK     CVW
 443          KM   COMBINE W AND V
 444          HC       2
              *

 445          KK   CARR3
 446          BA  0.0033
 447          PB    3.37
 448          LS       0    98.0
 449          UD   0.101
              *

 450          KK  RCARR3
 451          KM   ROUTE CCARR3 TO CP8
 452          RD     360   0.005   0.015       0    DEEP       8       0
              *

 453          KK  CCARR3
 454          KM   COMBINE STF2, CVW AND CARR3
 455          HC       3
              *

 456          KK    STE3
 457          BA  0.0021
 458          PB    3.40
 459          LS       0    98.0
 460          UD   0.050
              *
1                                       HEC-1 INPUT                                        PAGE 14

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

 461          KK     CP8
 462          KM   COMBINE STE3 AND CCARR3
 463          HC       2
              *

 464          KK    RCP8
 465          KM   ROUTE CP8 TO CEE
 466          RD     240   0.005   0.015       0    DEEP       8       0
              *

 467          KK      EE
 468          BA  0.0106
 469          PB    3.39
 470          LS       0    90.2
 471          UD   0.068
              *

 472          KK     CEE
 473          KM   COMBINES CP8 AND EE
 474          HC       2
              *

 475          KK    RCP8
 476          KM   ROUTE CEE TO CP9
 477          RD     220   0.005   0.015       0    DEEP       8       0
              *

 478          KK    NP-3
 479          BA  0.0011
 480          PB    3.39
 481          LS       0    80.5
 482          UD   0.080
              *

 483          KK   STEE3
 484          BA  0.0019
 485          PB    3.39
 486          LS       0    98.0
 487          UD   0.050
              *

 488          KK  CSTEE3
 489          KM   COMBINES NP-3 AND CSTEE3
 490          HC       2
              *

 491          KK     CP9
 492          KM   COMBINES CSTEE3 AND CEE
 493          HC       2
              *
1                                       HEC-1 INPUT                                        PAGE 15
```

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

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

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

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

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

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

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

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

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

 526          KK     Y-Z
 527          BA  0.0176
 528          PB    3.42
 529          LS       0    92.2
 530          UD   0.075
              *
1                                      HEC-1 INPUT                                          PAGE 16

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

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

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

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

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

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

```
 551          UD   0.059
              *

 552          KK   CSTJ3
 553          KM   COMBINE CSTE1, COS-3 AND STJ3
 554          HC       3
              *

 555          KK      AA
 556          BA  0.0158
 557          PB    3.44
 558          LS       0    88.4
 559          UD   0.088
              *

 560          KK  DUMMY3
 561          KM   COMBINE CSTJ3 AND AA
 562          HC       2
              *

 563          KK    STE2
 564          BA  0.0028
 565          PB    3.40
 566          LS       0    98.0
 567          UD   0.050
              *
1                                        HEC-1 INPUT                                        PAGE 17

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


 568          KK      BB
 569          BA  0.0098
 570          PB    3.42
 571          LS       0    91.1
 572          UD   0.074
              *

 573          KK     CBB
 574          HC       2
              *

 575          KK       T
 576          BA  0.0063
 577          PB    3.42
 578          LS       0    86.3
 579          UD   0.069
              *

 580          KK      CT
 581          HC       2
              *

 582          KK      CC
 583          BA  0.0083
 584          PB    3.42
 585          LS       0    90.7
 586          UD   0.079
              *

 587          KK     CCC
 588          HC       2
              *

 589          KK    RCCC
 590          KM   ROUTE CCC TO CDD
 591          RD     570   0.005   0.015       0    CIRC       3
              *

 592          KK      DD
 593          BA  0.0074
 594          PB    3.40
 595          LS       0    90.5
 596          UD   0.075
              *

 597          KK     CDD
 598          HC       2
              *
1                                        HEC-1 INPUT                                        PAGE 18

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


 599          KK    RCDD
 600          KM   ROUTE CCDD TO CDES5
 601          RD     390   0.005   0.015       0    CIRC     3.5
              *

 602          KK    DES5
 603          BA  0.0025
```

```
            604          PB    3.40
            605          LS       0    98.0
            606          UD   0.053
                         *

            607          KK   CDES5
            608          HC       2
                         *

            609          KK  RCDES5
            610          KM   ROUTE CDES5 TO CGG
            611          RD     280   0.005   0.015       0    CIRC     3.5
                         *

            612          KK   STEE2
            613          BA  0.0028
            614          PB    3.41
            615          LS       0    98.0
            616          UD   0.050
                         *

            617          KK  CSTEE2
            618          HC       2
                         *

            619          KK      GG
            620          BA  0.0078
            621          PB    3.41
            622          LS       0    94.2
            623          UD   0.055
                         *

            624          KK     CGG
            625          HC       2
                         *

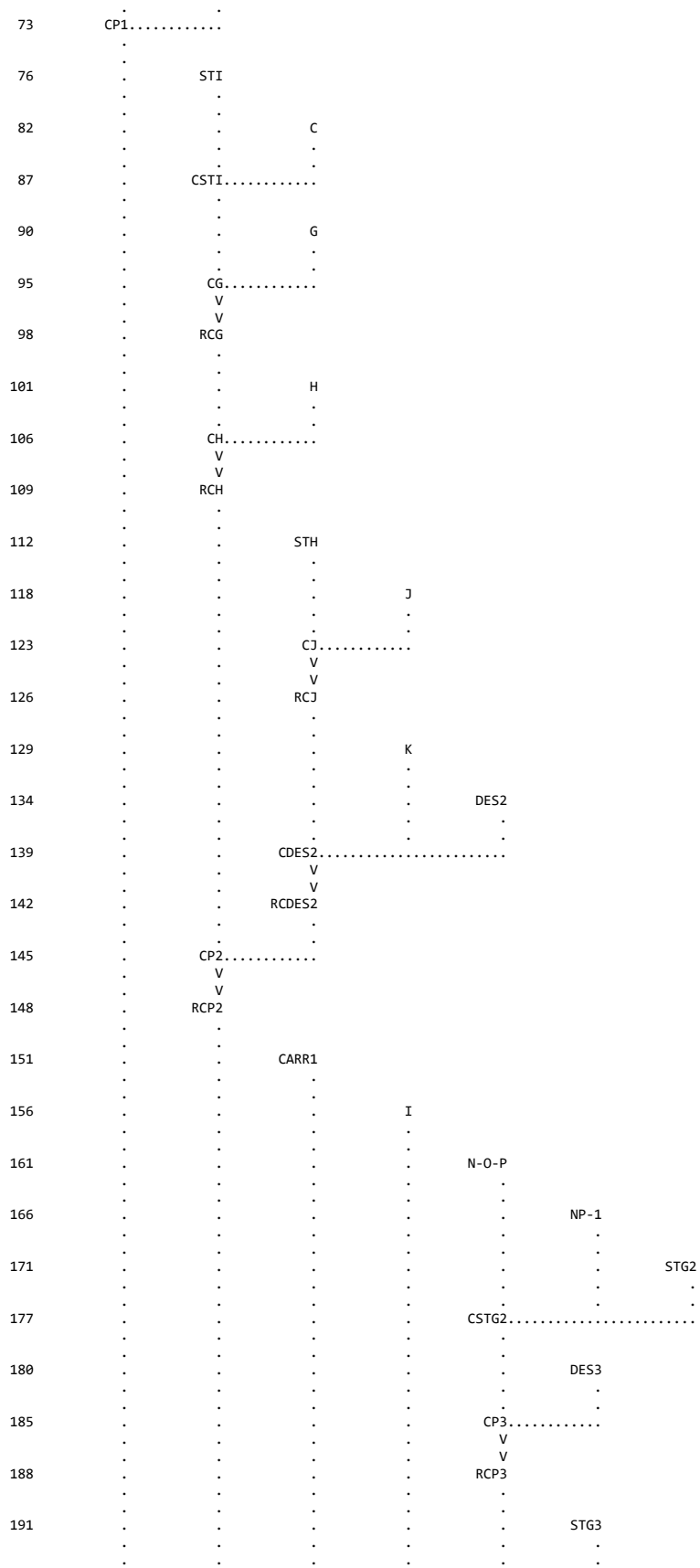
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            627          BA  0.0055
            628          PB    3.41
            629          LS       0    94.2
            630          UD   0.050
                         *
1                                              HEC-1 INPUT                                          PAGE 19

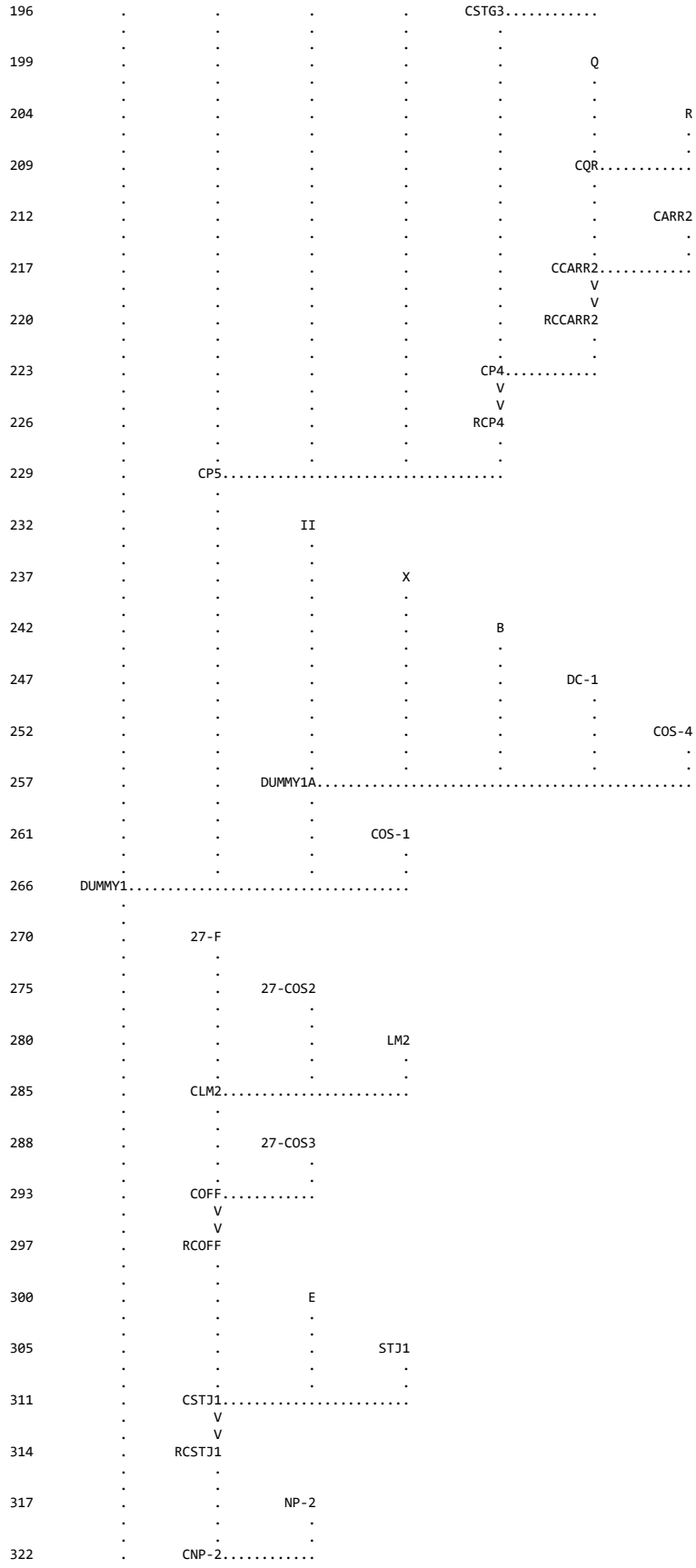
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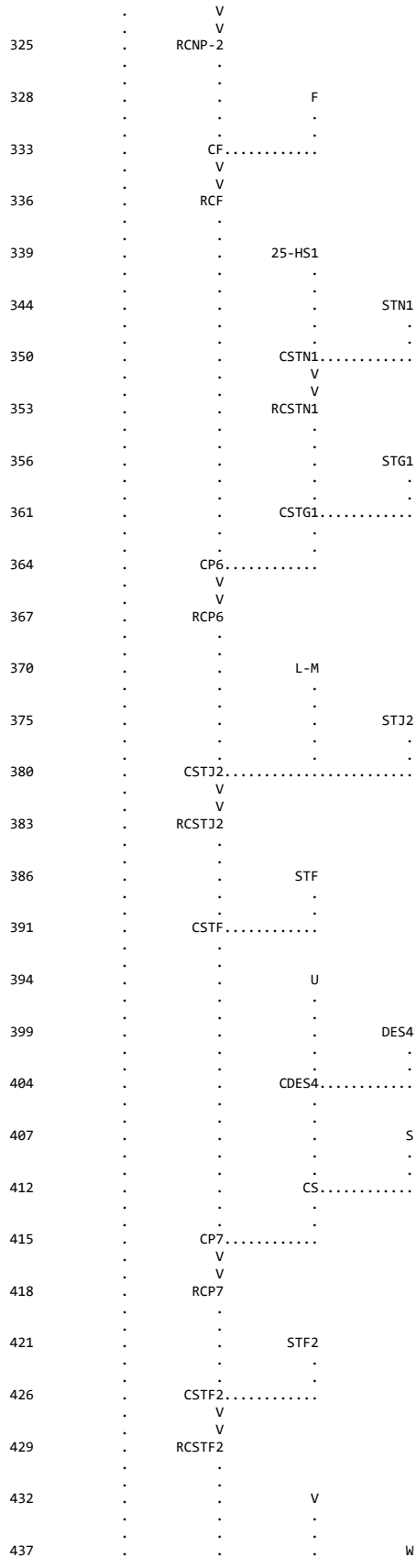

            631          KK  DUMMY4
            632          KM   COMBINE DUMMY3, FF, AND CGG
            633          HC       3
                         *
            634          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

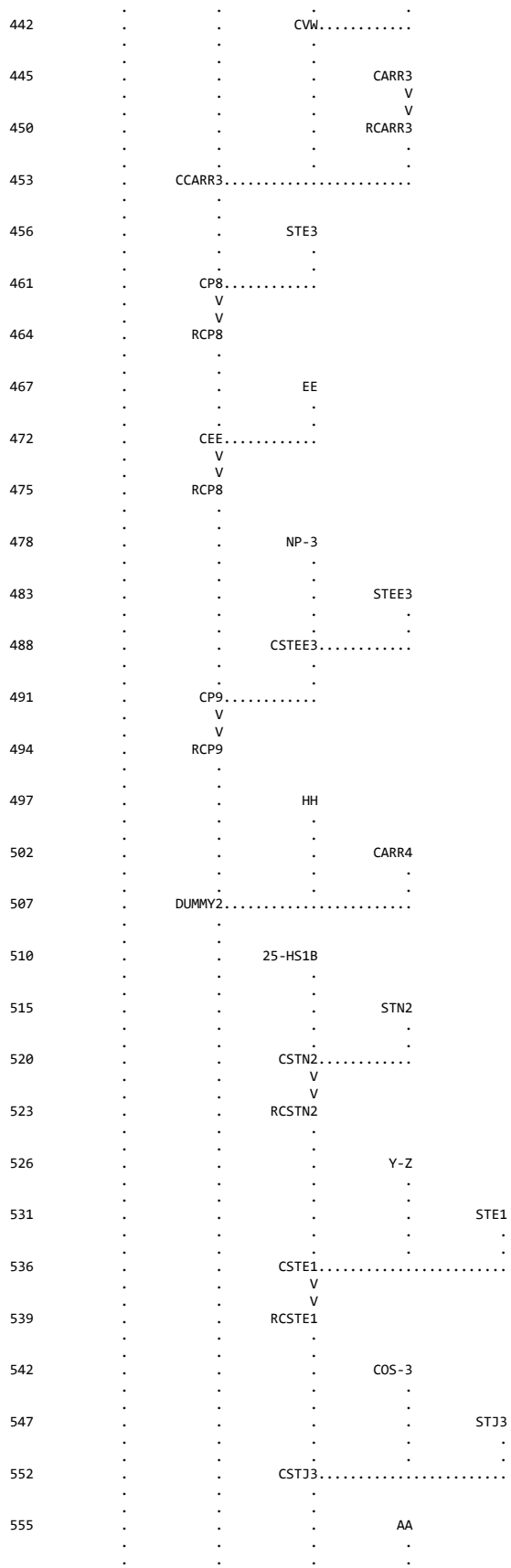
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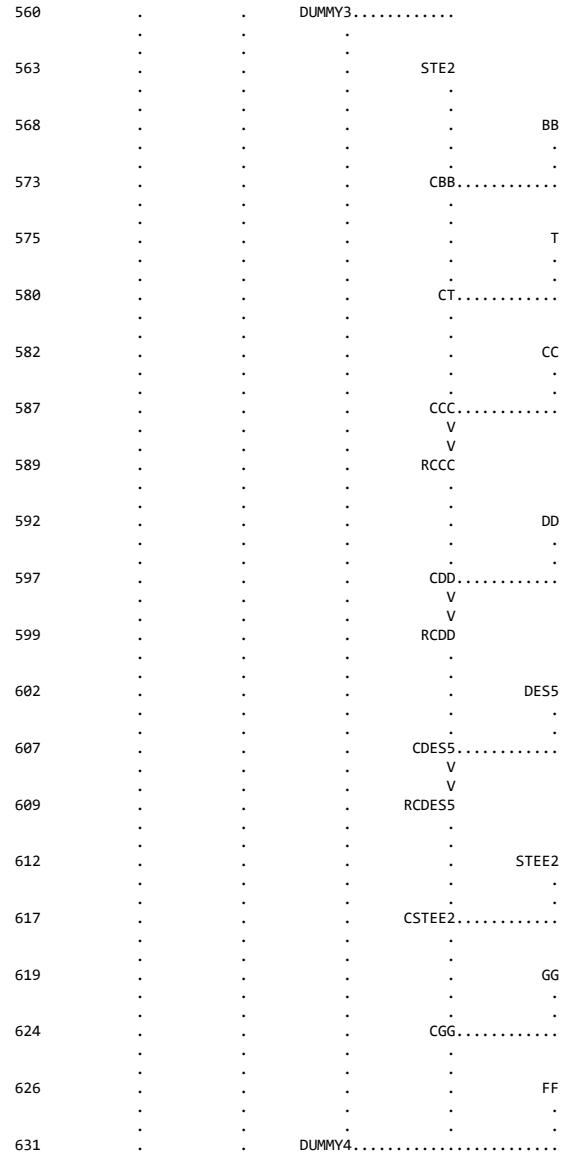
    22          LM
                 .
                 .
    35           .           D
                 .           .
                 .           .
    40           .           .       DES1
                 .           .          .
                 .           .          .
    45           .      CDES1............
                 .           V
                 .           V
    48           .     RCDES1
                 .           .
                 .           .
    51           .           .      COS-2
                 .           .          .
                 .           .          .
    56           .     CCOS-2............
                 .           V
                 .           V
    59           .    RCCOS-2
                 .           .
                 .           .
    62           .           .          A
                 .           .          .
                 .           .          .
    67           .          CA............
                 .           V
                 .           V
    70           .         RCA
                 .           .
```


73
CP1
76
STI
82
C
87
CSTI
90
G
95
CG
98
RCG
101
H
106
CH
109
RCH
112
STH
118
J
123
CJ
126
RCJ
129
K
134
DES2
139
CDES2
142
RCDES2
145
CP2
148
RCP2
151
CARR1
156
I
161
N-O-P
166
NP-1
171
STG2
177
CSTG2
180
DES3
185
CP3
188
RCP3
191
STG3


CSTG3
Q
R
CQR
CARR2
CCARR2
V
V
RCCARR2
CP4
V
V
RCP4
CP5
II
X
B
DC-1
COS-4
DUMMY1A
COS-1
DUMMY1
27-F
27-COS2
LM2
CLM2
27-COS3
COFF
V
V
RCOFF
E
STJ1
CSTJ1
V
V
RCSTJ1
NP-2
CNP-2


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


CVW
CARR3
RCARR3
CCARR3
STE3
CP8
RCP8
EE
CEE
RCP8
NP-3
STEE3
CSTEE3
CP9
RCP9
HH
CARR4
DUMMY2
25-HS1B
STN2
CSTN2
RCSTN2
Y-Z
STE1
CSTE1
RCSTE1
COS-3
STJ3
CSTJ3
AA



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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

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

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

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

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

100-YEAR, 6-HOUR STORM, SDN3

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

      IT          HYDROGRAPH TIME DATA
                        NMIN           5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1    0  STARTING DATE
                       ITIME         0000  STARTING TIME
                          NQ          100  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      1    0  ENDING DATE
                      NDTIME         0815  ENDING TIME
                       ICENT           19  CENTURY MARK

                    COMPUTATION INTERVAL     .08 HOURS
                         TOTAL TIME BASE    8.25 HOURS

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

      JP          MULTI-PLAN OPTION
                       NPLAN           1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                     1.00
1

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


                                                                      RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION     AREA    PLAN                        RATIO 1
                                                                     1.00

 HYDROGRAPH AT
+                     LM       .02     1   FLOW                    36.
                                            TIME                   3.50

 HYDROGRAPH AT
+                      D       .02     1   FLOW                    50.
                                            TIME                   3.50

 HYDROGRAPH AT
+                   DES1       .01     1   FLOW                    20.
                                            TIME                   3.50

  2 COMBINED AT
+                  CDES1       .03     1   FLOW                    70.
                                            TIME                   3.50

 ROUTED TO
+                 RCDES1       .03     1   FLOW                    69.
                                            TIME                   3.50

 HYDROGRAPH AT
+                  COS-2       .01     1   FLOW                    22.
                                            TIME                   3.58

  2 COMBINED AT
+                 CCOS-2       .04     1   FLOW                    89.
                                            TIME                   3.50

 ROUTED TO
+                RCCOS-2       .04     1   FLOW                    87.
                                            TIME                   3.50

 HYDROGRAPH AT
+                      A       .03     1   FLOW                    68.
                                            TIME                   3.50

  2 COMBINED AT
+                     CA       .06     1   FLOW                   156.
                                            TIME                   3.50

 ROUTED TO
+                    RCA       .06     1   FLOW                   155.
                                            TIME                   3.50
```

```
  2 COMBINED AT
+                    CP1       .08     1   FLOW         191.
                                           TIME        3.50

 HYDROGRAPH AT
+                    STI       .00     1   FLOW          11.
                                           TIME        3.50

 HYDROGRAPH AT
+                      C       .02     1   FLOW          51.
                                           TIME        3.50

  2 COMBINED AT
+                   CSTI       .02     1   FLOW          62.
                                           TIME        3.50

 HYDROGRAPH AT
+                      G       .01     1   FLOW          30.
                                           TIME        3.50

  2 COMBINED AT
+                     CG       .03     1   FLOW          92.
                                           TIME        3.50

 ROUTED TO
+                    RCG       .03     1   FLOW          91.
                                           TIME        3.50

 HYDROGRAPH AT
+                      H       .01     1   FLOW          33.
                                           TIME        3.50

  2 COMBINED AT
+                     CH       .05     1   FLOW         124.
                                           TIME        3.50

 ROUTED TO
+                    RCH       .05     1   FLOW         123.
                                           TIME        3.50

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

 HYDROGRAPH AT
+                      J       .01     1   FLOW          24.
                                           TIME        3.50

  2 COMBINED AT
+                     CJ       .01     1   FLOW          34.
                                           TIME        3.50

 ROUTED TO
+                    RCJ       .01     1   FLOW          33.
                                           TIME        3.50

 HYDROGRAPH AT
+                      K       .01     1   FLOW          22.
                                           TIME        3.50

 HYDROGRAPH AT
+                   DES2       .00     1   FLOW          13.
                                           TIME        3.50

  3 COMBINED AT
+                  CDES2       .03     1   FLOW          68.
                                           TIME        3.50

 ROUTED TO
+                 RCDES2       .03     1   FLOW          66.
                                           TIME        3.50

  2 COMBINED AT
+                    CP2       .07     1   FLOW         189.
                                           TIME        3.50

 ROUTED TO
+                   RCP2       .07     1   FLOW         184.
                                           TIME        3.50

 HYDROGRAPH AT
+                  CARR1       .01     1   FLOW          29.
                                           TIME        3.50

 HYDROGRAPH AT
+                      I       .02     1   FLOW          38.
                                           TIME        3.50

 HYDROGRAPH AT
+                  N-O-P       .02     1   FLOW          49.
                                           TIME        3.50
```

```
 HYDROGRAPH AT
+                   NP-1       .00     1   FLOW          6.
                                           TIME         3.50

 HYDROGRAPH AT
+                   STG2       .00     1   FLOW         13.
                                           TIME         3.50

  3 COMBINED AT
+                  CSTG2       .03     1   FLOW         68.
                                           TIME         3.50

 HYDROGRAPH AT
+                   DES3       .00     1   FLOW          9.
                                           TIME         3.50

  2 COMBINED AT
+                    CP3       .03     1   FLOW         77.
                                           TIME         3.50

 ROUTED TO
+                   RCP3       .03     1   FLOW         76.
                                           TIME         3.50

 HYDROGRAPH AT
+                   STG3       .00     1   FLOW          3.
                                           TIME         3.50

  2 COMBINED AT
+                  CSTG3       .03     1   FLOW         79.
                                           TIME         3.50

 HYDROGRAPH AT
+                      Q       .01     1   FLOW         17.
                                           TIME         3.50

 HYDROGRAPH AT
+                      R       .01     1   FLOW         20.
                                           TIME         3.50

  2 COMBINED AT
+                    CQR       .01     1   FLOW         37.
                                           TIME         3.50

 HYDROGRAPH AT
+                  CARR2       .01     1   FLOW         15.
                                           TIME         3.50

  2 COMBINED AT
+                 CCARR2       .02     1   FLOW         52.
                                           TIME         3.50

 ROUTED TO
+                RCCARR2       .02     1   FLOW         51.
                                           TIME         3.50

  2 COMBINED AT
+                    CP4       .05     1   FLOW        131.
                                           TIME         3.50

 ROUTED TO
+                   RCP4       .05     1   FLOW        127.
                                           TIME         3.50

  4 COMBINED AT
+                    CP5       .15     1   FLOW        379.
                                           TIME         3.50

 HYDROGRAPH AT
+                     II       .03     1   FLOW         61.
                                           TIME         3.50

 HYDROGRAPH AT
+                      X       .03     1   FLOW         60.
                                           TIME         3.50

 HYDROGRAPH AT
+                      B       .13     1   FLOW        304.
                                           TIME         3.50

 HYDROGRAPH AT
+                   DC-1       .02     1   FLOW         36.
                                           TIME         3.67

 HYDROGRAPH AT
+                  COS-4       .00     1   FLOW          2.
                                           TIME         3.50

  5 COMBINED AT
+                DUMMY1A       .20     1   FLOW        454.
```

```
                                        TIME         3.50

 HYDROGRAPH AT
+                  COS-1       .00     1   FLOW          6.
                                        TIME         3.58

  4 COMBINED AT
+                 DUMMY1       .44     1   FLOW       1030.
                                        TIME         3.50

 HYDROGRAPH AT
+                    27-F       .03     1   FLOW         83.
                                        TIME         3.50

 HYDROGRAPH AT
+                 27-COS2       .01     1   FLOW         20.
                                        TIME         3.50

 HYDROGRAPH AT
+                    LM2       .01     1   FLOW         28.
                                        TIME         3.50

  3 COMBINED AT
+                    CLM2      .05     1   FLOW        132.
                                        TIME         3.50

 HYDROGRAPH AT
+                 27-COS3       .03     1   FLOW         53.
                                        TIME         3.50

  2 COMBINED AT
+                    COFF      .08     1   FLOW        185.
                                        TIME         3.50

 ROUTED TO
+                   RCOFF       .08     1   FLOW        182.
                                        TIME         3.50

 HYDROGRAPH AT
+                       E       .02     1   FLOW         58.
                                        TIME         3.50

 HYDROGRAPH AT
+                    STJ1       .01     1   FLOW         15.
                                        TIME         3.50

  3 COMBINED AT
+                   CSTJ1       .10     1   FLOW        255.
                                        TIME         3.50

 ROUTED TO
+                  RCSTJ1       .10     1   FLOW        250.
                                        TIME         3.50

 HYDROGRAPH AT
+                    NP-2       .00     1   FLOW          5.
                                        TIME         3.50

  2 COMBINED AT
+                   CNP-2       .11     1   FLOW        255.
                                        TIME         3.50

 ROUTED TO
+                  RCNP-2       .11     1   FLOW        250.
                                        TIME         3.50

 HYDROGRAPH AT
+                       F       .02     1   FLOW         59.
                                        TIME         3.50

  2 COMBINED AT
+                      CF       .13     1   FLOW        309.
                                        TIME         3.50

 ROUTED TO
+                     RCF       .13     1   FLOW        303.
                                        TIME         3.50

 HYDROGRAPH AT
+                  25-HS1       .08     1   FLOW        211.
                                        TIME         3.50

 HYDROGRAPH AT
+                    STN1       .01     1   FLOW         13.
                                        TIME         3.58

  2 COMBINED AT
+                   CSTN1       .08     1   FLOW        224.
                                        TIME         3.50

 ROUTED TO
```

```
+                RCSTN1       .08     1   FLOW         220.
                                             TIME         3.50

 HYDROGRAPH AT
+                 STG1       .00     1   FLOW           8.
                                             TIME         3.50

  2 COMBINED AT
+                 CSTG1       .09     1   FLOW         229.
                                             TIME         3.50

  2 COMBINED AT
+                  CP6       .21     1   FLOW         532.
                                             TIME         3.50

 ROUTED TO
+                 RCP6       .21     1   FLOW         518.
                                             TIME         3.50

 HYDROGRAPH AT
+                  L-M       .03     1   FLOW          81.
                                             TIME         3.50

 HYDROGRAPH AT
+                 STJ2       .00     1   FLOW          13.
                                             TIME         3.50

  3 COMBINED AT
+                 CSTJ2       .25     1   FLOW         612.
                                             TIME         3.50

 ROUTED TO
+                RCSTJ2       .25     1   FLOW         602.
                                             TIME         3.50

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

  2 COMBINED AT
+                  CSTF       .25     1   FLOW         610.
                                             TIME         3.50

 HYDROGRAPH AT
+                    U       .01     1   FLOW          11.
                                             TIME         3.50

 HYDROGRAPH AT
+                  DES4       .00     1   FLOW           8.
                                             TIME         3.50

  2 COMBINED AT
+                 CDES4       .01     1   FLOW          19.
                                             TIME         3.50

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

  2 COMBINED AT
+                   CS       .01     1   FLOW          29.
                                             TIME         3.50

  2 COMBINED AT
+                  CP7       .27     1   FLOW         639.
                                             TIME         3.50

 ROUTED TO
+                 RCP7       .27     1   FLOW         632.
                                             TIME         3.50

 HYDROGRAPH AT
+                 STF2       .00     1   FLOW           5.
                                             TIME         3.50

  2 COMBINED AT
+                 CSTF2       .27     1   FLOW         637.
                                             TIME         3.50

 ROUTED TO
+                RCSTF2       .27     1   FLOW         623.
                                             TIME         3.50

 HYDROGRAPH AT
+                    V       .01     1   FLOW          17.
                                             TIME         3.50

 HYDROGRAPH AT
+                    W       .01     1   FLOW          19.
                                             TIME         3.50
```

```
  2 COMBINED AT
+                    CVW       .02     1   FLOW          36.
                                           TIME         3.50

 HYDROGRAPH AT
+                   CARR3       .00     1   FLOW           8.
                                           TIME         3.50

 ROUTED TO
+                  RCARR3       .00     1   FLOW           8.
                                           TIME         3.50

  3 COMBINED AT
+                  CCARR3       .29     1   FLOW         667.
                                           TIME         3.50

 HYDROGRAPH AT
+                    STE3       .00     1   FLOW           6.
                                           TIME         3.50

  2 COMBINED AT
+                     CP8       .29     1   FLOW         673.
                                           TIME         3.50

 ROUTED TO
+                    RCP8       .29     1   FLOW         664.
                                           TIME         3.50

 HYDROGRAPH AT
+                      EE       .01     1   FLOW          25.
                                           TIME         3.50

  2 COMBINED AT
+                     CEE       .30     1   FLOW         689.
                                           TIME         3.50

 ROUTED TO
+                    RCP8       .30     1   FLOW         680.
                                           TIME         3.50

 HYDROGRAPH AT
+                    NP-3       .00     1   FLOW           2.
                                           TIME         3.50

 HYDROGRAPH AT
+                   STEE3       .00     1   FLOW           5.
                                           TIME         3.50

  2 COMBINED AT
+                  CSTEE3       .00     1   FLOW           7.
                                           TIME         3.50

  2 COMBINED AT
+                     CP9       .30     1   FLOW         688.
                                           TIME         3.50

 ROUTED TO
+                    RCP9       .30     1   FLOW         678.
                                           TIME         3.50

 HYDROGRAPH AT
+                      HH       .01     1   FLOW          20.
                                           TIME         3.50

 HYDROGRAPH AT
+                   CARR4       .00     1   FLOW          10.
                                           TIME         3.50

  3 COMBINED AT
+                  DUMMY2       .32     1   FLOW         708.
                                           TIME         3.50

 HYDROGRAPH AT
+                25-HS1B       .02     1   FLOW          48.
                                           TIME         3.50

 HYDROGRAPH AT
+                    STN2       .01     1   FLOW          19.
                                           TIME         3.50

  2 COMBINED AT
+                   CSTN2       .03     1   FLOW          67.
                                           TIME         3.50

 ROUTED TO
+                  RCSTN2       .03     1   FLOW          65.
                                           TIME         3.50

 HYDROGRAPH AT
+                     Y-Z       .02     1   FLOW          42.
                                           TIME         3.50
```

```
 HYDROGRAPH AT
+                   STE1       .00     1   FLOW          8.
                                           TIME         3.50

  3 COMBINED AT
+                  CSTE1       .05     1   FLOW        115.
                                           TIME         3.50

 ROUTED TO
+                 RCSTE1       .05     1   FLOW        107.
                                           TIME         3.50

 HYDROGRAPH AT
+                   COS-3      .00     1   FLOW          4.
                                           TIME         3.50

 HYDROGRAPH AT
+                   STJ3       .00     1   FLOW         14.
                                           TIME         3.50

  3 COMBINED AT
+                  CSTJ3       .05     1   FLOW        126.
                                           TIME         3.50

 HYDROGRAPH AT
+                     AA       .02     1   FLOW         33.
                                           TIME         3.50

  2 COMBINED AT
+                 DUMMY3       .07     1   FLOW        159.
                                           TIME         3.50

 HYDROGRAPH AT
+                   STE2       .00     1   FLOW          8.
                                           TIME         3.50

 HYDROGRAPH AT
+                     BB       .01     1   FLOW         23.
                                           TIME         3.50

  2 COMBINED AT
+                    CBB       .01     1   FLOW         31.
                                           TIME         3.50

 HYDROGRAPH AT
+                      T       .01     1   FLOW         13.
                                           TIME         3.50

  2 COMBINED AT
+                     CT       .02     1   FLOW         44.
                                           TIME         3.50

 HYDROGRAPH AT
+                     CC       .01     1   FLOW         19.
                                           TIME         3.50

  2 COMBINED AT
+                    CCC       .03     1   FLOW         63.
                                           TIME         3.50

 ROUTED TO
+                   RCCC       .03     1   FLOW         60.
                                           TIME         3.50

 HYDROGRAPH AT
+                     DD       .01     1   FLOW         17.
                                           TIME         3.50

  2 COMBINED AT
+                    CDD       .03     1   FLOW         77.
                                           TIME         3.50

 ROUTED TO
+                   RCDD       .03     1   FLOW         74.
                                           TIME         3.50

 HYDROGRAPH AT
+                   DES5       .00     1   FLOW          7.
                                           TIME         3.50

  2 COMBINED AT
+                  CDES5       .04     1   FLOW         81.
                                           TIME         3.50

 ROUTED TO
+                 RCDES5       .04     1   FLOW         80.
                                           TIME         3.50

 HYDROGRAPH AT
+                  STEE2       .00     1   FLOW          8.
```

APPENDIX C
HYDRAULIC CALCULATIONS

Worksheet for 52

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	8.0	%
Diameter	36.0	in
Discharge	79.00	ft³/s

Results

Normal Depth	16.25	in
Flow Area	3.10	ft²
Wetted Perimeter	4.42	ft
Hydraulic Radius	8.41	in
Top Width	2.99	ft
Critical Depth	2.76	ft
Percent Full	45.1	%
Critical Slope	0.01218	ft/ft
Velocity	25.51	ft/s
Velocity Head	10.11	ft
Specific Energy	11.46	ft
Froude Number	4.41	
Maximum Discharge	202.92	ft³/s
Discharge Full	188.64	ft³/s
Slope Full	0.01403	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	in
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	in
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	45.14	%
Downstream Velocity	Infinity	ft/s

Worksheet for 52

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	16.25	in
Critical Depth	2.76	ft
Channel Slope	8.0	%
Critical Slope	0.01218	ft/ft

Cross Section for 52

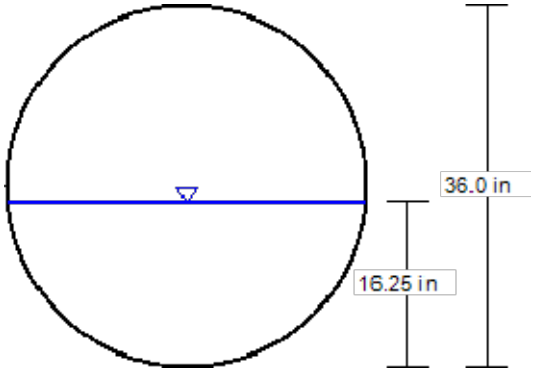
Project Description

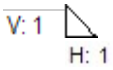
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	8.0	%
Normal Depth	16.25	in
Diameter	36.0	in
Discharge	79.00	ft³/s

Cross Section Image





Worksheet for 55

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	1.0	%
Diameter	30.0	in
Discharge	37.00	ft³/s

Results

Normal Depth	22.29	in
Flow Area	3.91	ft²
Wetted Perimeter	5.20	ft
Hydraulic Radius	9.03	in
Top Width	2.18	ft
Critical Depth	2.06	ft
Percent Full	74.3	%
Critical Slope	0.00806	ft/ft
Velocity	9.46	ft/s
Velocity Head	1.39	ft
Specific Energy	3.25	ft
Froude Number	1.25	
Maximum Discharge	44.12	ft³/s
Discharge Full	41.01	ft³/s
Slope Full	0.00814	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	in
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	in
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	74.31	%
Downstream Velocity	Infinity	ft/s

Worksheet for 55

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	22.29	in
Critical Depth	2.06	ft
Channel Slope	1.0	%
Critical Slope	0.00806	ft/ft

Cross Section for 55

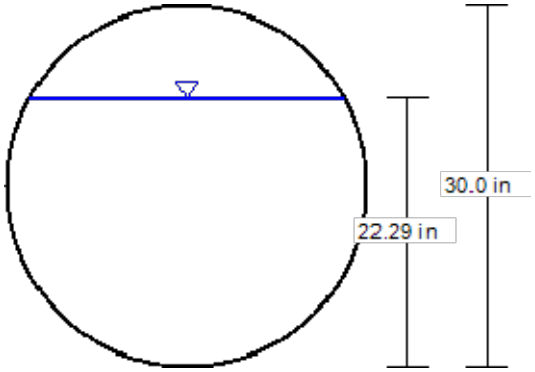
Project Description

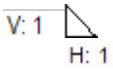
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	1.0	%
Normal Depth	22.29	in
Diameter	30.0	in
Discharge	37.00	ft³/s

Cross Section Image





Worksheet for 58

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	3.3	%
Diameter	30.0	in
Discharge	52.00	ft³/s

Results

Normal Depth	18.46	in
Flow Area	3.17	ft²
Wetted Perimeter	4.51	ft
Hydraulic Radius	8.43	in
Top Width	2.43	ft
Critical Depth	2.32	ft
Percent Full	61.5	%
Critical Slope	0.01391	ft/ft
Velocity	16.41	ft/s
Velocity Head	4.18	ft
Specific Energy	5.72	ft
Froude Number	2.53	
Maximum Discharge	80.15	ft³/s
Discharge Full	74.51	ft³/s
Slope Full	0.01607	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	in
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	in
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	61.53	%
Downstream Velocity	Infinity	ft/s

Worksheet for 58

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	18.46	in
Critical Depth	2.32	ft
Channel Slope	3.3	%
Critical Slope	0.01391	ft/ft

Cross Section for 58

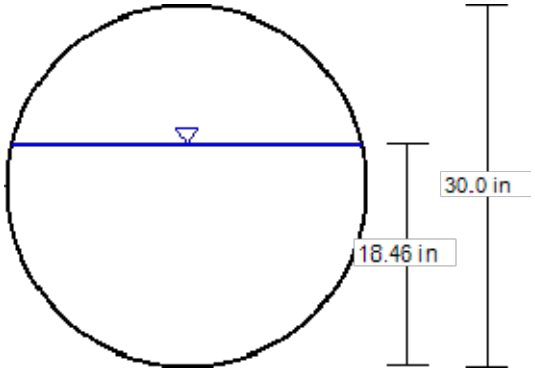
Project Description

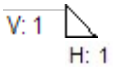
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	3.3	%
Normal Depth	18.46	in
Diameter	30.0	in
Discharge	52.00	ft³/s

Cross Section Image





GRADING PLANS AND DETAILS



LARK HILL

SUMMERLIN VILLAGE 22
PARCEL QR
PREPARED FOR:
TAYLOR MORRISON
APN: 137-23-212-001
CITY OF LAS VEGAS, NEVADA
9.55 ACRES / 105 UNITS

UTILITY CONTACTS

POWER

NV ENERGY
ATTN: NEW DEVELOPMENT
7155 LINDELL ROAD
LAS VEGAS, NEVADA 89118

WATER

LAS VEGAS VALLEY WATER DISTRICT
ATTN: ENGINEERING SERVICES
1001 S VALLEY VIEW BLVD
LAS VEGAS, NV 89107
T: 702-870-2011

SEWER

CITY OF LAS VEGAS PUBLIC WORKS
ATTN: ENGINEERING PLANNING
333 N. RANCHO DRIVE 7TH FLOOR
LAS VEGAS, NEVADA 89106
PHONE: 702-229-6541

GAS

SOUTHWEST GAS CORPORATION
ATTN: ENGINEERING SERVICES
6355 SHATZ STREET
NORTH LAS VEGAS, NV 89115

TELEPHONE

CENTRAL TELEPHONE D/B/A CENTURY LINK
6700 VIA AUSTI PARKWAY
LAS VEGAS, NEVADA 89119

DISPOSAL

REPUBLIC SERVICES, INC.
770 E. SAHARA AVE. - P.O. BOX 98508
LAS VEGAS, NEVADA 89193-8508

CABLE

COX COMMUNICATIONS LAS VEGAS, INC.
1700 VEGAS DRIVE
LAS VEGAS, NEVADA 89106

MOU PER ORDINANCE 6630 § 26

1. MINIMUM STREET WIDTHS WITHIN GATED PRIVATE COMMUNITY INTERIOR STREETS:
   - 41' WIDTH WITH 5' SIDEWALK ON ONE SIDE, MINIMUM 33' WIDTH FLOW LINE TO FLOW LINE OF CURB. PARKING ALLOWED BOTH SIDES OF STREET.
   - 36' WIDTH WITH 5' SIDEWALK ONE SIDE, MINIMUM 28' WIDTH FLOW LINE TO FLOW LINE OF CURB. PARKING ALLOWED ONE SIDE OF STREET.
2. REDUCED FIRE FLOW REQUIRED FOR COMMUNITIES ENTIRELY PROTECTED BY FIRE SPRINKLERS FROM 1,500 GPM TO 1,000 GPM FOR RESIDENCES LESS THAN 3,000 SQ. FT.
3. SIDEWALK REQUIRED ON ONE SIDE OF INTERIOR PRIVATE GATED STREETS IN COMPLIANCE WITH ONE OF THE ABOVE STREET SECTIONS.

PROJECT TEAM

DEVELOPER

TAYLOR MORRISON
1980 FESTIVAL PLAZA DRIVE, SUITE 500
LAS VEGAS, NV 89134
PH: 702-263-8200

CIVIL ENGINEER

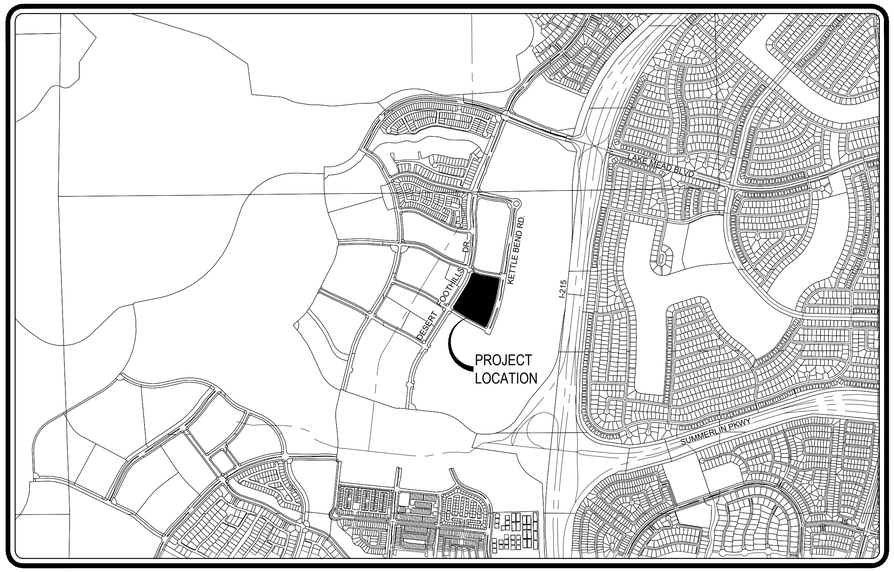
ACTUS
ATTN: DARRYL LATTIMORE, P.E.
3283 E. WARM SPRINGS RD., SUITE 300
LAS VEGAS, NV 89120
PH: 702-586-9296
E-MAIL: DARRYL.LATTIMORE@ACTUS-NV.COM

OWNER

HOWARD HUGHES COMPANY LLC
10801 W CHARLESTON BLVD
SUITE 300
LAS VEGAS, NV 89135
702-791-4000

PROJECT DATA

NUMBER OF LOTS:	105 RESIDENTIAL LOTS
NUMBER OF COMMON ELEMENTS:	3 COMMON ELEMENTS
GROSS AREA (TOTAL)	13.09 ±
DENSITY:	11.0 ± D.U.A.
EXISTING ZONING:	PLANNED COMMUNITY (PC)
OPEN SPACE REQUIRED (OVERALL)	194,175 S.F (1,628 S.F / UNIT)
OPEN SPACE REQUIRED (USABLE)	136,000 SF (70% OF OS REQUIRED)
TOTAL PARKING PROVIDED:	LARK HILL 105 GARAGE STALLS (TWO PER LOT) AND 30 OFF STREET SPACES TOTAL PARKING PROVIDED:240



VICINITY MAP
SCALE: NTS

BASIS OF BEARINGS

SOUTH 89°51'25" EAST, BEING THE BEARING OF NORTH LINE OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 59 EAST, M.D.M., CITY LAS VEGAS, CLARK COUNTY, NEVADA AS PER MAP RECORDED IN FILE 123, PAGE 36 OF PARCEL MAPS, IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDERS.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #5LV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3229.29' (NAVD88)
METERS = 984.29 M (NAVD88)

CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

FLOOD ZONE DESCRIPTION

THIS SITE IS LOCATED IN SHADED ZONE "X", AREAS OF 0.2% ANNUAL CHANCE FLOOD, PER THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL 32003C2150E CLARK COUNTY, NEVADA DATED NOVEMBER 16, 2011.

FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

DEDICATION NOTE

ALL EASEMENTS, RIGHT-OF-WAY, AND OTHER DEDICATIONS WITHIN THIS PLAN SET ARE GRANTED PER FMP# ___-_____ UNLESS OTHERWISE NOTED

FIRE SPRINKLER NOTE

FIRE SPRINKLER SYSTEM SHALL BE PLUMBED TO THE MASTER TOILET.
NO EXCEPTIONS ALLOWED

DISCLAIMER NOTE

THE UNDERGROUND UTILITIES AS SHOWN HEREON HAVE BEEN LOCATED FROM OBSERVED FIELD SURVEY EVIDENCE AND EXISTING DRAWINGS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING; PLANS PROVIDED BY THE CLIENT, UTILITY COMPANIES, AND MUNICIPAL AGENCIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

LEGAL DESCRIPTION

A PORTION OF THE SOUTH HALF (S 1/2) OF THE NORTHWEST QUARTER (NW 1/4) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 59 EAST, M.D.M., CLARK COUNTY, NEVADA, COMMONLY KNOWN AS ASSESSORS PARCEL NUMBER 137-23-212-001, THE PARCEL SHOWN AS LOT "QR" ON PLAT MAP AS RECORDED IN BOOK 160 PAGE 66 OF PLAT MAPS RECORDED WITH CLARK COUNTY RECORDERS OFFICE ON DECEMBER 18, 1997.

CONTINGENCY NOTE

THIS PROJECT PLAN APPROVAL CONTINGENT ON LVVWD #136893 & #13778 PLAN APPROVAL / BEING OPERATIONAL.

REV #	REVISION DESCRIPTION	SHEET(S)	APPD BY	DATE APPD

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
C1	COVER SHEET
C2	GENERAL NOTES
C3	GRADING PLAN 1
C4	GRADING PLAN 2
C5	GRADING PLAN 3
C6	GRADING PLAN 4
C7	GRADING PLAN 5
C8	GRADING PLAN 6
C9	GRADING PLAN 7
C10	GRADING PLAN 8
C11	GRADING PLAN 9
C12	GRADING PLAN 10
C13	GRADING PLAN 11
C14	GRADING PLAN 12
C15	SECTIONS & DETAILS SHEET 1
C16	SECTIONS & DETAILS SHEET 2
C17	SECTIONS & DETAILS SHEET 3
C18	PLAN & PROFILE - LARK HILL & SDDI #1 LATERAL
C19	PLAN & PROFILE - SONG LARK STA 4+50 - 7+50
C20	PLAN & PROFILE - SONG LARK STA 6+50 - 9+50
C21	PLAN & PROFILE - SDDI #3 LATERAL
C22	PLAN & PROFILE - LSDI #3 & #4 LATERAL

APPROVALS

CITY ENGINEER - CITY OF LAS VEGAS — DATE

DEPARTMENT OF PLANNING — DATE

LAS VEGAS FIRE & RESCUE — DATE

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

NV ENERGY — DATE
NV ENERGY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDED 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 PUBLIC UTILITY COMMISSION'S RULES AND REGULATIONS

TORI DICKEY — 2020TED26120 — 01/05/2021
SOUTHWEST GAS CORPORATION — UID# — DATE

CENTRAL TELEPHONE DBA CENTURY LINK — DATE
"THE AFFIXED CENTURY LINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION 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."

COX COMMUNICATIONS LAS VEGAS, INC — DATE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____

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

SHEETS:

CLV# ___-_____

Actus
3283 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9296
Engineering - Surveying - Consulting - Planning

BY	DESCRIPTION	DATE
A		

COVER SHEET
LARK HILL
TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

PROFESSIONAL ENGINEER — STATE OF NEVADA — DARRYL C. LATTIMORE — EXP: 12/31/23 — CIVIL — No. 17516
8/12/2022

DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201

SHEET GROUP: COVER
SHEET NUMBER: C1
SHEET 1 OF 22

Plot Stamp: 8/12/2022 11:38:17 AM - John Austin Jr
File: P:\TMH012201 - Lark Hill (Village 22 - Parcels QR)\Civil_CD\TMH012201_CD-COVR.dwg, Tab: C1 COVER SHEET

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 PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE'S WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND 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 SOUTHWEST GEOTECHNICAL- PROJECT #197203, DATED FEBRUARY 11, 2020) APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS. DRIVEWAY APRONS, FLOWLINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER. WALL NOTES:
16. ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.
17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC, THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.
21. SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE CITY AND APPROVED PRIOR TO ACCEPTANCE OF FACILITY VIDEO INSPECTION. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES AND TRANSITION STRUCTURES, STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXIT THE PUBLIC RIGHT-OF-WAY, SEWER AND STORM DRAIN MAIN ALIGNMENT, INCLUDING DEFLECTION POINTS. THE LOCATION SHALL BE DESCRIBED BY COORDINATES WHICH SHALL BE BASED ON THE OFFICIAL HORIZONTAL AND VERTICAL CONTROL NETWORKS OF THE CITY OF LAS VEGAS. FINAL LOCATION MAPS MUST BE SEALED AND CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINTIES OF ± 0.09 METERS (± 0.3 FEET) HORIZONTALLY AND VERTICALLY. A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S).
22. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST EDITION.
23. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

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.

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.

DISCLAIMER NOTE

THE UNDERGROUND UTILITIES AS SHOWN HEREON HAVE BEEN LOCATED FROM OBSERVED FIELD SURVEY EVIDENCE AND EXISTING DRAWINGS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING; PLANS PROVIDED BY THE CLIENT, UTILITY COMPANIES, AND MUNICIPAL AGENCIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.



CITY OF LAS VEGAS TRAFFIC NOTES

1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.
2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.
3. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
4. WHEN A DESIGNATED "SAFE 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 BE FABRICATED WITH DIAMOND GRADE VIP CLASS 6 REFLECTIVE SHEETING OR APPROVED EQUAL. ALL NEW TRAFFIC SIGNS, EXCEPT STREETNAME AND SCHOOL SPEED LIMIT SIGNS, SHALL HAVE 3M SERIES 1150 OR APPROVED EQUIVALENT ANTI-GRAFFITI PROTECTIVE OVERLAY FILM; SCHOOL ZONE SIGNS SHALL HAVE 3M SERIES 1150 ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. 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 STOPS SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.
10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK AREA. THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR IMSA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT OF WAY.
11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING REGIONAL TRANSPORTATION COMMISION 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 OTHERWISE 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.

CITY OF LAS VEGAS STREETLIGHT NOTES

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION (USS), AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" (USD), LATEST REVISION.
2. 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. LUMINAIRES SHALL BE MARKED TO INDICATE INSTALLATION ORIENTATION, AND SHALL HAVE EXTERNAL LABELS PER ANSI C136 THAT INDICATE WATTAGE AND ARE CLEARLY VISIBLE FROM STREET LEVEL.
4. 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.
5. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION IN ACCORDANCE WITH SECTION 623 G.03.01 OF THE USS.
6. 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.
7. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN COMPLIANCE WITH USD NO. 320A WHEN POLE IS INSTALLED BEHIND SIDEWALK, AND SHALL AT NO TIME COMPLETELY ENCLOSE THE STREET LIGHTING POLE.
8. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TRAFFIC ENGINEERING DIVISION PRIOR TO ANY PRE-FINAL INSPECTION. THE AS-BUILT DRAWING NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.
9. SERVICE POINTS SHALL BE COORDINATED WITH NV ENERGY, AND WHEREVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT.SERVICE POINTS SHALL BE SHOWN ON THE PLANS.THE CONTRACTOR SHALL FURNISH COMPLETE CONDUIT, WIRE, ETC. FROM SERVICE TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON THE PLANS.
10. NEW STREET LIGHT SERVICES SHALL BE 200 AMP PAD MOUNT AND SHALL PROVIDE CAPACITY FOR 20 OR 24 AVAILABLE CIRCUITS.
11. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREETLIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS MUST BE RESOLVED BETWEEN THE DEVELOPER AND THE UTILITIES INVOLVED BEFORE STREETLIGHT BASES ARE INSTALLED. AT NO EXPENSE TO THE CITY OF LAS VEGAS.
12. THE CONTRACTOR SHALL FURNISH COMPLETE CONDUIT, WIRE, ETC. FROM SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON THE PLANS.

LAS VEGAS VALLEY WATER DISTRICT NOTES

LVVWD PROJECT No.: N/A

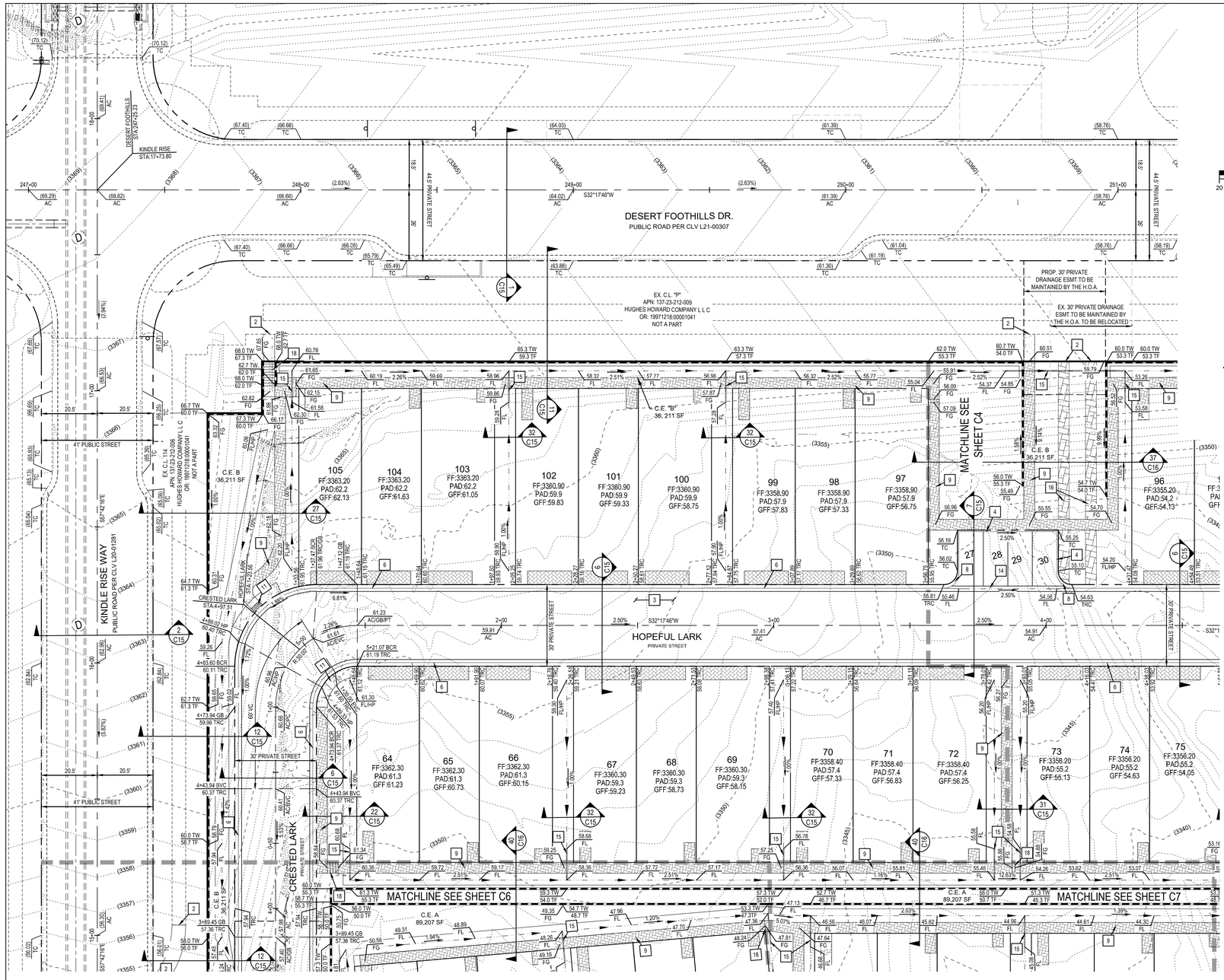
1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVVWD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVWD COMMUNICATION SUPPORT CENTER (258-7171) TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. FOR FUTURE INSPECTIONS, NOTICE MUST BE GIVEN BY 2:00 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED LVVWD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.
2. ALL WORK SHALL CONFORM TO LVVWD STANDARD PLATES, DRAWINGS, AND SPECIFICATIONS, AND TO THE 2010 EDITION OF THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS (UDACS). THE LATEST EDITION OF UDACS SHALL SUPERSEDE ANY CONFLICTS CONTAINED IN THE APPROVED DRAWINGS AND/OR SPECIFICATIONS.
3. ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2 ABOVE, SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT DRAFT OR EDITION OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.
4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.
5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.
6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.
8. ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSINGS SHALL CONFORM TO SECTION 2.22 OF THE 2010 EDITION OF THE UDACS.
9. ALL WATER FACILITIES AND APPURTENANCES SHALL BE DISINFECTED, PRESSURE TESTED, AND HAVE AN ACCEPTABLE PASSING HEALTH WATER SAMPLE OBTAINED, PRIOR TO OPERATION AND USE.
10. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802. TWO (2) WORKING DAYS PRIOR TO METER PICKUP.
11. ANY INTERRUPTION OF SERVICE MUST BE PERFORMED IN ACCORDANCE WITH UDACS SECTION 3.14.01, AND APPROVED BY THE LVVWD INSPECTION DIVISION PRIOR TO SHUTDOWN. PROPER WRITTEN NOTIFICATION MUST BE GIVEN TO ALL AFFECTED CUSTOMERS.
12. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE AS LISTED ON THE LVVWD APPROVED PRODUCT'S LIST FOR NEW FACILITIES, LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS BY SUBMITTING SHOP DRAWINGS.
13. TELEPHONE "CALL BEFORE YOU DIG" AT "811" OR 1-800-227-2600.
14. THE INSTALLATION OF LVVWD MUNICIPAL WATER FACILITIES WITHIN ALL STREETS IS ASSUMED TO BE IN COMPLIANCE WITH THE UNIFORM STANDARDS, INCLUDING THE PLACEMENT OF ASPHALT PAVING STREET SURFACES. ANY REPAIR WORK DONE BY THE LVVWD TO THE MUNICIPAL WATER FACILITIES WILL INCLUDE THE PLACEMENT OF AN APPROPRIATELY SIZED ASPHALT REPAIR PATCH ON THE STREET SURFACE.

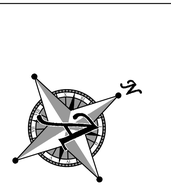
ANY DECORATIVE PAVING SURFACE WITHIN THE STREET IS THE RESPONSIBILITY OF THE OWNER'S ASSOCIATION, OR THE INDIVIDUAL PROPERTY OWNERS IF NO OWNER'S ASSOCIATION IS IN EXISTENCE, OR THE AGENCY HAVING JURISDICTION. DECORATIVE SURFACE MATERIALS PLACED WITHIN THE TEN FOOT EASEMENT ABUTTING A PUBLIC OR PRIVATE STREET, IF DISTURBED BY THE LVVWD DURING THE REPAIR OR OPERATION OF ITS FACILITIES, WILL BE REPLACED BY LVVWD WITH AN APPROPRIATELY SIZED PLAIN FINISH CONCRETE PATCH. THE LVVWD WILL NOT RESTORE, AND WILL NOT BE RESPONSIBLE FOR THE RESTORATION OF, ANY DECORATIVE PAVING SURFACE WITHIN THE STREET. THE LVVWD WILL NOT ATTEMPT TO MATCH COLOR OR FINISH OF ANY ADJACENT MATERIALS.

15. NO LEAD COMPLIANCE NOTE:
TO COMPLY WITH THE FEDERAL SAFE DRINKING WATER ACT, ALL WATER WORKS BRASS PRODUCTS PROPOSED TO BE RELOCATED, OR INSTALLED AS NEW MUST BE INSTALLED WITH THE LEAD FREE APPROVED PRODUCT. THE OLD LEADED PRODUCT MAY NOT BE REUSED.

SOUTHWEST GAS GENERAL NOTES

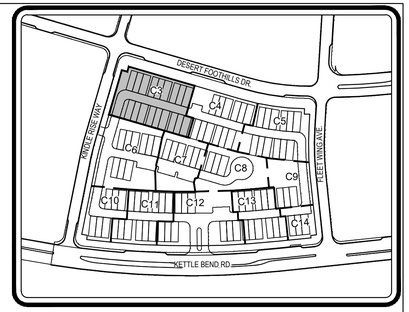
1. IN THE EVENT OF NATURAL GAS EMERGENCIES CALL 911 AND 1-877-860-6020
2. MINIMUM HORIZONTAL AND VERTICAL CLEARANCES BETWEEN NATURAL GAS FACILITIES AND ANY UNDERGROUND UTILITIES AND/OR STRUCTURES, INCLUDING BUT NOT LIMITED TO WATER, SEWER, STORM DRAIN, COMMUNICATIONS, AND ELECTRIC SHALL BE AT LEAST 12-INCHES OR GREATER AS DICTATED BY LOCAL CODES AND STANDARDS.
   a) ANY DEVIATION FROM SPECIFIED MINIMUM CLEARANCES MUST BE APPROVED BY ALL AFFECTED UTILITIES AND/OR MUNICIPALITIES
3. FOR VALVE ADJUSTMENT CONTACT 702-528-7881 14 DAYS PRIO





SCALE: 1"= 20'

20 10 0 20



KEY MAP
SCALE: N.T.S.

GRADING CONSTRUCTION NOTES

1. PROTECT IN PLACE
2. MATCH EXISTING ASPHALT, CURB, SIDEWALK, GUTTER, OR VALLEY GUTTER. SAWCUT CLEAN EDGE FOR CONNECTION.
3. CONSTRUCT 2" AC PAVEMENT OVER 4" TYPE II AGGREGATE BASE COMPATED PER SOILS REPORT
4. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
5. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
6. CONSTRUCT 30" MODIFIED ROLL CURB PER CCAUSD #217.1
7. CONSTRUCT 5' TRANSITION "L" TYPE CURB TO 30" MODIFIED ROLL CURB PER DETAIL "BB", SHEET C17
8. CONSTRUCT ROLL CURB TO "A" TRANSITION
9. CONSTRUCT 4' WIDE SIDEWALK WITH DECORATIVE PAVERS OVER 5" THICK TYPE II AGGREGATE BASE PER CCAUSD #206.S3
10. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD #234
11. CONSTRUCT SIDEWALK RAMP PER CCAUSD #235 CASE III. "A" & "B" = 8' UNLESS OTHERWISE NOTED.
12. CONSTRUCT SIDEWALK DRAIN PER CCAUSD #236
13. CONSTRUCT 8' CROSS GUTTER PER CCAUSD #228
14. CONSTRUCT 2' VALLEY GUTTER PER DETAIL AA, SHEET C17
15. CONSTRUCT 6" PVC SIDEWALK UNDER DRAIN PER DETAIL "CC", SHEET C17
16. CONSTRUCT WHEEL PATH USING DECORATIVE PAVERS (H20 LOADING)
17. CONSTRUCT 2.5' VALLEY GUTTER PER DETAIL "GG", SHEET C17
18. CONSTRUCT STEPS AND HANDRAILS TO BE BUILT BY OTHERS PER DETAIL "KK", SHEET C17
19. INSTALL 24" X 24" YARD INLET PER DETAIL "JJ", SHEET C17
20. CONSTRUCT 15' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
21. CONSTRUCT 20' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
22. CONSTRUCT 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
23. CONSTRUCT 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
24. CONSTRUCT 48" TYPE II STORM DRAIN MANHOLE PER CCAUSD #401 & 405
25. CONSTRUCT 7.5' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
26. CONSTRUCT SPILL CURB TO PROVIDE POSITIVE FLOW FROM FLOW LINE TO LIP OF GUTTER PER DETAIL "DD", SHEET C17
27. CONSTRUCT SPILL CURB TO "L" TYPE CURB TRANSITION
28. CONSTRUCT 30" MODIFIED ROLL CURB TO SPILL CURB TRANSITION
29. CONSTRUCT CURB OPENING FOR POSITIVE DRAINAGE
30. CONSTRUCT GATES PER CCAUSD #425.S1 & SUMMERLIN WEST RESIDENTIAL DESIGN GUIDELINES

LEGEND

PROPOSED	EXISTING	DESCRIPTION
		PUBLIC R/W LINE
		PRIVATE R/W LINE
		BOUNDARY LINE
		EASEMENT LINE
		MATCH LINE
		PHASE LINE
		CENTERLINE
		EDGE OF ASPHALT
		CURB & GUTTER
		RETAINING WALL - DECORATIVE UNLESS OTHERWISE NOTED
		DECORATIVE CMU SCREEN WALL UNLESS OTHERWISE NOTED
		SAWCUT LINE
		FLOWLINE
		GRADE BREAK
2500	(2500)	MAJOR CONTOUR - 5'
2503	(2503)	MINOR CONTOUR - 1'
		SCARP
		CONCRETE SURFACE
		PROPOSED ASPHALT PAVEMENT
		REMOVE AND REPLACE ASPHALT
		RIP-RAP
		DEMO/REMOVE ASPHALT
98.76 XX 1.00%	(98.76) XX (1.00%)	ELEVATION GRADE TAG / GRADE SLOPE TAG
1 C5		SECTION MARKER - DETAIL NUMBER ABOVE SHEET NUMBER
		SIGHT VISIBILITY ZONE

COMMON ABBREVIATIONS

FF	- FINISHED FLOOR	RC	- TOP OF "RIBBON" CURB
TC	- TOP OF CURB	AC	- TOP OF PAVEMENT
FL	- FLOWLINE GRADE	EP	- EDGE OF PAVEMENT
PDE	- PRIVATE DRAINAGE EASEMENT	TW	- TOP OF RETAINING WALL
TF	- TOP OF WALL FOOTER	PRIV.	- PRIVATE
ST.	- STREET	TYP.	- TYPICAL
ESMT	- EASEMENT	R/W	- RIGHT-OF-WAY
BSW	- BACK OF SIDEWALK	EAE	- EMERGENCY ACCESS EASEMENT

STORM DRAIN CONNECTION NOTE

WHEN CONNECTING TO EXISTING RCP, CONTRACTOR SHALL REMOVE THE EXISTING RCP TO THE NEAREST BELL CONNECTION, CONNECT NEW RCP TO EXISTING RCP AND MATCH EXISTING PIPE SLOPE.

LINE & CURVE DATA NOTE

PLEASE REFER TO TRAFFIC SHEETS FOR LINE AND CURVE DATA.

BASIS OF BEARINGS

SOUTH 89°51'25" EAST, BEING THE BEARING OF NORTH LINE OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 59 EAST, M.D.M., CITY LAS VEGAS, CLARK COUNTY, NEVADA AS PER MAP RECORDED IN FILE 123, PAGE 36 OF PARCEL MAPS, IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDERS.

DISCLAIMER NOTE

THE UNDERGROUND UTILITIES AS SHOWN HEREON HAVE BEEN LOCATED FROM OBSERVED FIELD SURVEY EVIDENCE AND EXISTING DRAWINGS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING; PLANS PROVIDED BY THE CLIENT, UTILITY COMPANIES, AND MUNICIPAL AGENCIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.



COMMON LOT NOTE

ALL COMMON LOTS ARE TO BE PUBLIC DRAINAGE, PEDESTRIAN ACCESS, UTILITY, SEWER, AND PRIVATE LANDSCAPE EASEMENTS OVER THEIR ENTIRETY TO BE PRIVATELY MAINTAINED BY THE HOA PER THE APPROVED FINAL MAP FOR THE PROJECT.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3229.29' (NAVD88)
METERS = 984.29 M (NAVD88)

CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

GRADING NOTES

1. ACTUS SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES IN THE PLANS OR CONDITIONS IN THE FILED.
2. FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS, THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
3. WALL DETAILS ARE FOR REFERENCE ONLY AND DO NOT CONSTITUTE A STRUCTURAL DESIGN.
4. CONSTRUCTION OF BLOCK WALLS REQUIRE A SEPARATE BUILDING PERMIT AND APPROVAL BY THE BUILDING DEPARTMENT.

SIGHT VISIBILITY NOTE

NO WALLS, FENCES SHRUBS, UTILITY APPURTENANCES OR ANY OTHER OBJECT, OTHER THAT TRAFFIC CONTROL DEVICES, FIRE HYDRANTS, TREES, AND STREET LIGHT POLES, MAY BE CONSTRUCTED OR INSTALLED WITHIN THE SIGHT VISIBILITY ZONE UNLESS SAID OBJECT IS MAINTAINED AT LESS THAN 24 INCHES IN HEIGHT, MEASURED FROM TOP OF CURB, OR WHERE NO CURB EXISTS, A HEIGHT OF 27 INCHES MEASURED FROM THE TOP OF ADJACENT ASPHALT, GRAVEL OR PAVEMENT STREET SURFACE. THIS RESTRICTION EXTENDS ALONG THE SIGHT VISIBILITY LINE THROUGH LANDSCAPED MEDIANS.

PLEASE REFER TO TRAFFIC SHEETS FOR SIGHT VISIBILITY ZONE DIMENSIONS.

SAWCUT NOTE

FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

ESTIMATED QUANTITIES

NOTE: QUANTITIES SHOWN ARE RAW QUANTITIES AND APPROXIMATE. CONTRACTOR TO DETERMINE HIS OWN QUANTITIES FOR GRADING PURPOSES.
WORK UNDER THIS PLAN CONSTITUTES GRADING IN ACCORDANCE WITH 2018 IBC; ENGINEERING REPORTS AND CERTIFICATIONS IN CONFORMANCE WITH IBC SHALL BE FILED WITH THE COUNTY PRIOR TO COUNTY APPROVAL AT FINAL INSPECTION.

CUT:	3,955 CY
FILL:	111,587 CY
BALANCE:	107,633 (FILL)

NET EXPORTED MATERIAL TO BE DISPOSED OF IN A LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVAL AND ACTIVE GRADING PERMIT.

FLOOD ZONE DESCRIPTION

THIS SITE IS LOCATED IN SHADED ZONE "X", AREAS OF 0.2% ANNUAL CHANCE FLOOD, PER THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL 32003C2150E CLARK COUNTY, NEVADA DATED NOVEMBER 16, 2011.

FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT

BY:	UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER:	4030-2100371
DATED:	3/4/2022

PARKING INFORMATION

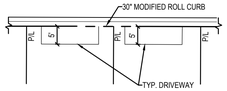
GUEST PARKING PROVIDED:	210 SPACES - (2 SPACES PER GARAGE) 34 PARKING STALLS (2 HANDICAP)
TOTAL PARKING PROVIDED:	244 PARKING SPACES TOTAL

DEDICATION NOTE

ALL EASEMENTS, RIGHT-OF-WAY, AND OTHER DEDICATIONS WITHIN THIS PLAN SET ARE GRANTED PER CLV# ___-_____ UNLESS OTHERWISE NOTED

PRIVATE STREET NOTE

ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS, AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA.



TYPICAL DRIVEWAY DETAIL

NOT TO SCALE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED UPDATED DRAINAGE STUDY CLV# N/A ON FILE WITH THE CITY OF LAS VEGAS.

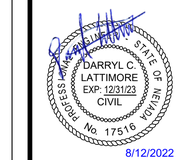
DARRYL LATTIMORE, P.E. #17516 — DATE

CLV# ___-_____

Actus
3283 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9266
Engineering - Surveying - Consulting - Planning

GRADING PLAN 1
LARK HILL
TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

NO.	DATE	DESCRIPTION	BY

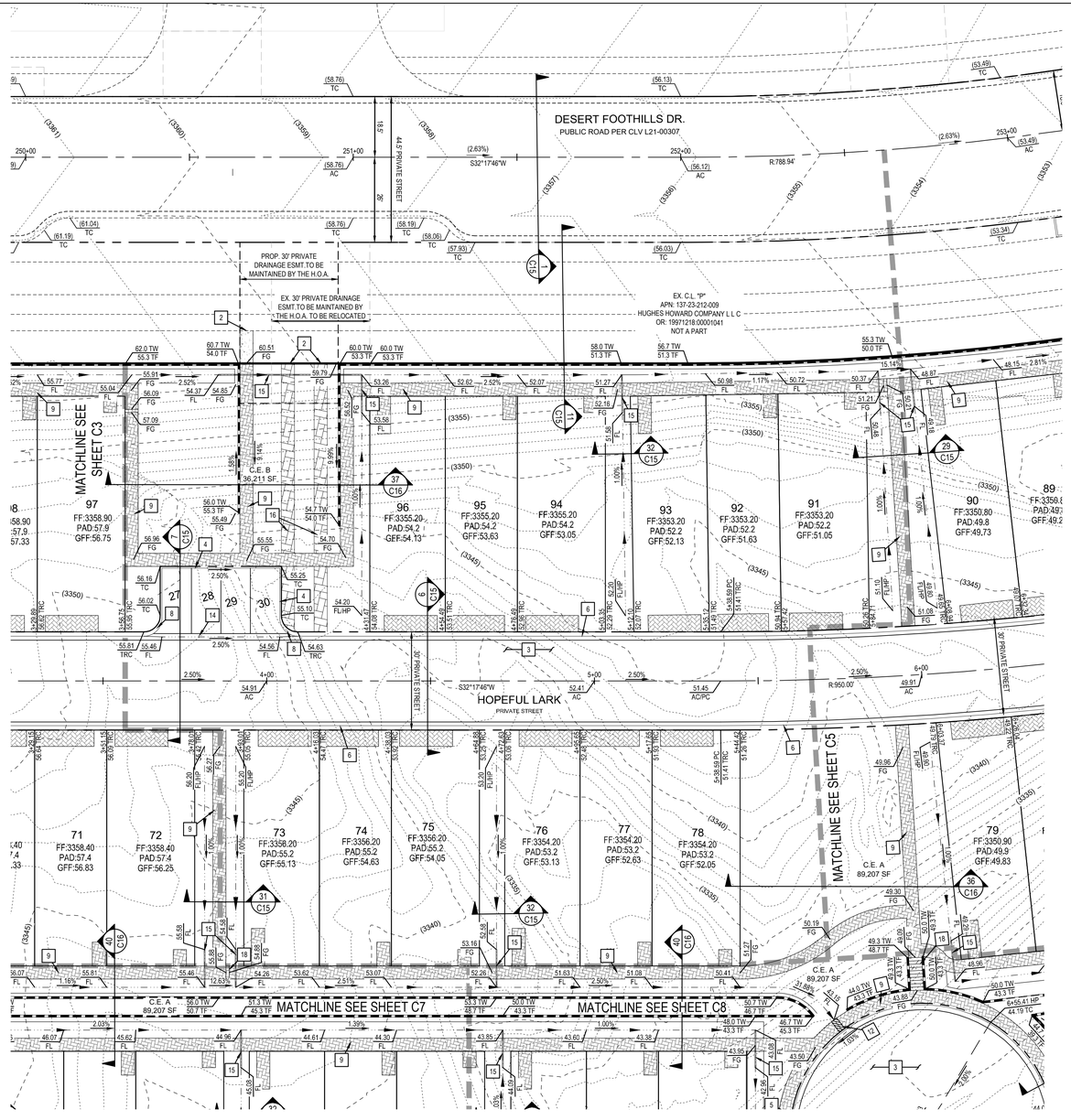


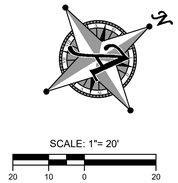
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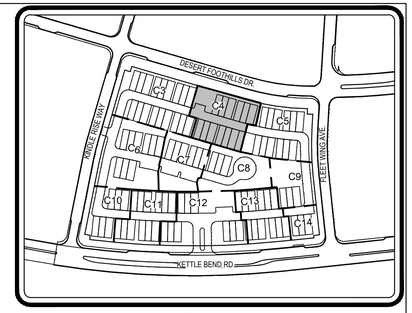
DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201
SHEET GROUP	GRADING
SHEET NUMBER	C3

SHEET 3 OF 22

Plot Stamp: 8/12/2022 11:38:43 AM - John Austin Jr
File: P:\TMH012201 - Lark Hill (Village 22 - Parcel& QR)\Civil_CD\TMH012201_CD-GRAD.dwg, Tab: C3







KEY MAP
SCALE: N.T.S.

GRADING CONSTRUCTION NOTES

1. PROTECT IN PLACE
2. MATCH EXISTING ASPHALT, CURB, SIDEWALK, GUTTER, OR VALLEY GUTTER. SAWCUT CLEAN EDGE FOR CONNECTION.
3. CONSTRUCT 2" AC PAVEMENT OVER 4" TYPE II AGGREGATE BASE COMPATED PER SOILS REPORT
4. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
5. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
6. CONSTRUCT 30" MODIFIED ROLL CURB PER CCAUSD #217.1
7. CONSTRUCT 5' TRANSITION "L" TYPE CURB TO 30" MODIFIED ROLL CURB PER DETAIL "B9", SHEET C17
8. CONSTRUCT ROLL CURB TO "A" TRANSITION
9. CONSTRUCT 4' WIDE SIDEWALK WITH DECORATIVE PAVERS OVER 5" THICK TYPE II AGGREGATE BASE PER CCAUSD #206.S3
10. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD #234
11. CONSTRUCT SIDEWALK RAMP PER CCAUSD #235 CASE III. "A" & "B" = 8' UNLESS OTHERWISE NOTED.
12. CONSTRUCT SIDEWALK DRAIN PER CCAUSD #236
13. CONSTRUCT 8' CROSS GUTTER PER CCAUSD #228
14. CONSTRUCT 2' VALLEY GUTTER PER DETAIL AA, SHEET C17
15. CONSTRUCT 6" PVC SIDEWALK UNDER DRAIN PER DETAIL "CC", SHEET C17
16. CONSTRUCT WHEEL PATH USING DECORATIVE PAVERS (H20 LOADING)
17. CONSTRUCT 2.5' VALLEY GUTTER PER DETAIL "GG", SHEET C17
18. CONSTRUCT STEPS AND HANDRAILS TO BE BUILT BY OTHERS PER DETAIL "KK", SHEET C17
19. INSTALL 24" X 24" YARD INLET PER DETAIL "JJ", SHEET C17
20. CONSTRUCT 15' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
21. CONSTRUCT 20' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
22. CONSTRUCT 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
23. CONSTRUCT 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
24. CONSTRUCT 48" TYPE II STORM DRAIN MANHOLE PER CCAUSD #401 & 405
25. CONSTRUCT 7.5' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
26. CONSTRUCT SPILL CURB TO PROVIDE POSITIVE FLOW FROM FLOW LINE TO LIP OF GUTTER PER DETAIL "DD", SHEET C17
27. CONSTRUCT SPILL CURB TO "L" TYPE CURB TRANSITION
28. CONSTRUCT 30" MODIFIED ROLL CURB TO SPILL CURB TRANSITION
29. CONSTRUCT CURB OPENING FOR POSITIVE DRAINAGE
30. CONSTRUCT GATES PER CCAUSD #425.S1 & SUMMERLIN WEST RESIDENTIAL DESIGN GUIDELINES

LEGEND

PROPOSED	EXISTING	DESCRIPTION
		PUBLIC R/W LINE
		PRIVATE R/W LINE
		BOUNDARY LINE
		EASEMENT LINE
		MATCH LINE
		PHASE LINE
		CENTERLINE
		EDGE OF ASPHALT
		CURB & GUTTER
		RETAINING WALL - DECORATIVE UNLESS OTHERWISE NOTED
		DECORATIVE CMU SCREEN WALL UNLESS OTHERWISE NOTED
		SAWCUT LINE
		FLOWLINE
		GRADE BREAK
2500	(2500)	MAJOR CONTOUR - 5'
2503	(2503)	MINOR CONTOUR - 1'
		SCARP
		CONCRETE SURFACE
		PROPOSED ASPHALT PAVEMENT
		REMOVE AND REPLACE ASPHALT
		RIP-RAP
		DEMO/REMOVE ASPHALT
98.76 XX (1.00%)		ELEVATION GRADE TAG
		GRADE SLOPE TAG
1 C5		SECTION MARKER - DETAIL NUMBER ABOVE SHEET NUMBER
		SIGHT VISIBILITY ZONE

COMMON ABBREVIATIONS

FF	- FINISHED FLOOR	RC	- TOP OF "RIBBON" CURB
TC	- TOP OF CURB	AC	- TOP OF PAVEMENT
FL	- FLOWLINE GRADE	EP	- EDGE OF PAVEMENT
PDE	- PRIVATE DRAINAGE EASEMENT	TW	- TOP OF RETAINING WALL
TF	- TOP OF WALL FOOTER	PRIV.	- PRIVATE
ST.	- STREET	TYP.	- TYPICAL
ESMT	- EASEMENT	R/W	- RIGHT-OF-WAY
BSW	- BACK OF SIDEWALK	EAE	- EMERGENCY ACCESS EASEMENT

STORM DRAIN CONNECTION NOTE

WHEN CONNECTING TO EXISTING RCP, CONTRACTOR SHALL REMOVE THE EXISTING RCP TO THE NEAREST BELL CONNECTION, CONNECT NEW RCP TO EXISTING RCP AND MATCH EXISTING PIPE SLOPE.

LINE & CURVE DATA NOTE

PLEASE REFER TO TRAFFIC SHEETS FOR LINE AND CURVE DATA.

BASIS OF BEARINGS

SOUTH 89°51'26" EAST, BEING THE BEARING OF NORTH LINE OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 59 EAST, M.D.M., CITY LAS VEGAS, CLARK COUNTY, NEVADA AS PER MAP RECORDED IN FILE 123, PAGE 36 OF PARCEL MAPS, IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDERS.

DISCLAIMER NOTE

THE UNDERGROUND UTILITIES AS SHOWN HEREON HAVE BEEN LOCATED FROM OBSERVED FIELD SURVEY EVIDENCE AND EXISTING DRAWINGS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING; PLANS PROVIDED BY THE CLIENT, UTILITY COMPANIES, AND MUNICIPAL AGENCIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.



COMMON LOT NOTE

ALL COMMON LOTS ARE TO BE PUBLIC DRAINAGE, PEDESTRIAN ACCESS, UTILITY, SEWER, AND PRIVATE LANDSCAPE EASEMENTS OVER THEIR ENTIRETY TO BE PRIVATELY MAINTAINED BY THE HOA PER THE APPROVED FINAL MAP FOR THE PROJECT.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3220.29' (NAVD88)
METERS = 984.29 M (NAVD88)

CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

GRADING NOTES

1. ACTUS SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES IN THE PLANS OR CONDITIONS IN THE FILED.
2. FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS, THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
3. WALL DETAILS ARE FOR REFERENCE ONLY AND DO NOT CONSTITUTE A STRUCTURAL DESIGN.
4. CONSTRUCTION OF BLOCK WALLS REQUIRE A SEPARATE BUILDING PERMIT AND APPROVAL BY THE BUILDING DEPARTMENT.

SIGHT VISIBILITY NOTE

NO WALLS, FENCES SHRUBS, UTILITY APPURTENANCES OR ANY OTHER OBJECT, OTHER THAT TRAFFIC CONTROL DEVICES, FIRE HYDRANTS, TREES, AND STREET LIGHT POLES, MAY BE CONSTRUCTED OR INSTALLED WITHIN THE SIGHT VISIBILITY ZONE UNLESS SAID OBJECT IS MAINTAINED AT LESS THAN 24 INCHES IN HEIGHT, MEASURED FROM TOP OF CURB, OR WHERE NO CURB EXISTS, A HEIGHT OF 27 INCHES MEASURED FROM THE TOP OF ADJACENT ASPHALT, GRAVEL OR PAVEMENT STREET SURFACE. THIS RESTRICTION EXTENDS ALONG THE SIGHT VISIBILITY LINE THROUGH LANDSCAPED MEDIANS.

PLEASE REFER TO TRAFFIC SHEETS FOR SIGHT VISIBILITY ZONE DIMENSIONS.

SAWCUT NOTE

FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

ESTIMATED QUANTITIES

NOTE: QUANTITIES SHOWN ARE RAW QUANTITIES AND APPROXIMATE. CONTRACTOR TO DETERMINE HIS OWN QUANTITIES FOR GRADING PURPOSES.
WORK UNDER THIS PLAN CONSTITUTES GRADING IN ACCORDANCE WITH 2018 IBC; ENGINEERING REPORTS AND CERTIFICATIONS IN CONFORMANCE WITH IBC SHALL BE FILED WITH THE COUNTY PRIOR TO COUNTY APPROVAL AT FINAL INSPECTION.

CUT:	3,955 CY
FILL:	111,587 CY
BALANCE:	107,633 (FILL)

NET EXPORTED MATERIAL TO BE DISPOSED OF IN A LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVAL AND ACTIVE GRADING PERMIT.

FLOOD ZONE DESCRIPTION

THIS SITE IS LOCATED IN SHADED ZONE "X", AREAS OF 0.2% ANNUAL CHANCE FLOOD, PER THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL 32003C2150E CLARK COUNTY, NEVADA DATED NOVEMBER 16, 2011.

FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT
BY: UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER: 4030-21003071
DATED: 3/4/2022

PARKING INFORMATION

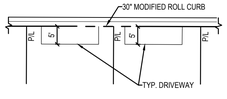
GUEST PARKING PROVIDED:	210 SPACES - (2 SPACES PER GARAGE) 34 PARKING STALLS (2 HANDICAP)
TOTAL PARKING PROVIDED:	244 PARKING SPACES TOTAL

DEDICATION NOTE

ALL EASEMENTS, RIGHT-OF-WAY, AND OTHER DEDICATIONS WITHIN THIS PLAN SET ARE GRANTED PER CLV# ___-_____ UNLESS OTHERWISE NOTED

PRIVATE STREET NOTE

ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS, AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA.



TYPICAL DRIVEWAY DETAIL

NOT TO SCALE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED UPDATED DRAINAGE STUDY CLV# N/A ON FILE WITH THE CITY OF LAS VEGAS.

DARRYL LATTIMORE, P.E. #17516 — DATE

CLV# ___-_____

Actus
3285 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9266
Engineering - Surveying - Consulting - Planning

GRADING PLAN 2
LARK HILL
TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

BY	DESCRIPTION	DATE
A		

DARRYL C. LATTIMORE
EXP: 12/31/23
CIVIL
No. 17516
STATE OF NEVADA
PROFESSIONAL ENGINEER
8/12/2022

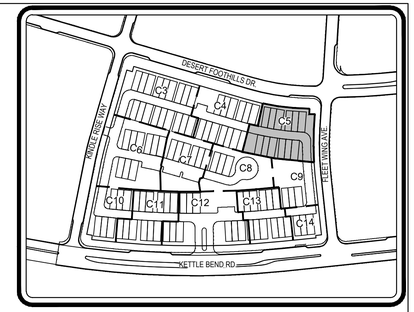
DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201
SHEET GROUP	GRADING
SHEET NUMBER	C4

SHEET 4 OF 22

Plot Stamp: 8/12/2022 11:38:49 AM - John Austin Jr
File: P:\TMH012201 - Lark Hill (Village 22 - Parcels QR)\Civil_CD\TMH012201_CD-GRAD.dwg, Tab: C4







GRADING CONSTRUCTION NOTES

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2. MATCH EXISTING ASPHALT, CURB, SIDEWALK, GUTTER, OR VALLEY GUTTER. SAWCUT CLEAN EDGE FOR CONNECTION.
3. CONSTRUCT 2" AC PAVEMENT OVER 4" TYPE II AGGREGATE BASE COMPATED PER SOILS REPORT
4. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
5. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
6. CONSTRUCT 30" MODIFIED ROLL CURB PER CCAUSD #217.1
7. CONSTRUCT 5' TRANSITION "L" TYPE CURB TO 30" MODIFIED ROLL CURB PER DETAIL "BB", SHEET C17
8. CONSTRUCT ROLL CURB TO "A" TRANSITION
9. CONSTRUCT 4' WIDE SIDEWALK WITH DECORATIVE PAVERS OVER 5" THICK TYPE II AGGREGATE BASE PER CCAUSD #206.S3
10. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD #234
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29. CONSTRUCT CURB OPENING FOR POSITIVE DRAINAGE
30. CONSTRUCT GATES PER CCAUSD #425.S1 & SUMMERLIN WEST RESIDENTIAL DESIGN GUIDELINES

LEGEND

PROPOSED	EXISTING	DESCRIPTION
		PUBLIC R/W LINE
		PRIVATE R/W LINE
		BOUNDARY LINE
		EASEMENT LINE
		MATCH LINE
		PHASE LINE
		CENTERLINE
		EDGE OF ASPHALT
		CURB & GUTTER
		RETAINING WALL - DECORATIVE UNLESS OTHERWISE NOTED
		DECORATIVE CMU SCREEN WALL UNLESS OTHERWISE NOTED
		SAWCUT LINE
		FLOWLINE
		GRADE BREAK
2500	(2500)	MAJOR CONTOUR - 5'
2503	(2503)	MINOR CONTOUR - 1'
		SCARP
		CONCRETE SURFACE
		PROPOSED ASPHALT PAVEMENT
		REMOVE AND REPLACE ASPHALT
		RIP-RAP
		DEMO/REMOVE ASPHALT
98.76 XX 1.00%	(98.76) XX (1.00%)	ELEVATION GRADE TAG
		GRADE SLOPE TAG
1 C5		SECTION MARKER - DETAIL NUMBER ABOVE SHEET NUMBER
		SIGHT VISIBILITY ZONE

COMMON ABBREVIATIONS

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TC	- TOP OF CURB	AC	- TOP OF PAVEMENT
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PDE	- PRIVATE DRAINAGE EASEMENT	TW	- TOP OF RETAINING WALL
TF	- TOP OF WALL FOOTER	PRIV.	- PRIVATE
ST.	- STREET	TYP.	- TYPICAL
ESMT	- EASEMENT	R/W	- RIGHT-OF-WAY
BSW	- BACK OF SIDEWALK	EAE	- EMERGENCY ACCESS EASEMENT

STORM DRAIN CONNECTION NOTE

WHEN CONNECTING TO EXISTING RCP, CONTRACTOR SHALL REMOVE THE EXISTING RCP TO THE NEAREST BELL CONNECTION, CONNECT NEW RCP TO EXISTING RCP AND MATCH EXISTING PIPE SLOPE.

LINE & CURVE DATA NOTE

PLEASE REFER TO TRAFFIC SHEETS FOR LINE AND CURVE DATA.

BASIS OF BEARINGS

SOUTH 89°51'25" EAST, BEING THE BEARING OF NORTH LINE OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 59 EAST, M.D.M., CITY LAS VEGAS, CLARK COUNTY, NEVADA AS PER MAP RECORDED IN FILE 123, PAGE 36 OF PARCEL MAPS, IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDERS.

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COMMON LOT NOTE

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BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3229.29' (NAVD88)
METERS = 984.29 M (NAVD88)

CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

GRADING NOTES

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3. WALL DETAILS ARE FOR REFERENCE ONLY AND DO NOT CONSTITUTE A STRUCTURAL DESIGN.
4. CONSTRUCTION OF BLOCK WALLS REQUIRE A SEPARATE BUILDING PERMIT AND APPROVAL BY THE BUILDING DEPARTMENT.

SIGHT VISIBILITY NOTE

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SAWCUT NOTE

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ESTIMATED QUANTITIES

NOTE: QUANTITIES SHOWN ARE RAW QUANTITIES AND APPROXIMATE. CONTRACTOR TO DETERMINE HIS OWN QUANTITIES FOR GRADING PURPOSES.
WORK UNDER THIS PLAN CONSTITUTES GRADING IN ACCORDANCE WITH 2018 IBC; ENGINEERING REPORTS AND CERTIFICATIONS IN CONFORMANCE WITH IBC SHALL BE FILED WITH THE COUNTY PRIOR TO COUNTY APPROVAL AT FINAL INSPECTION.

CUT: 3,955 CY
FILL: 111,587 CY
BALANCE: 107,633 (FILL)

NET EXPORTED MATERIAL TO BE DISPOSED OF IN A LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVAL AND ACTIVE GRADING PERMIT.

FLOOD ZONE DESCRIPTION

THIS SITE IS LOCATED IN SHADED ZONE "X", AREAS OF 0.2% ANNUAL CHANCE FLOOD, PER THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL 32003C2150E CLARK COUNTY, NEVADA DATED NOVEMBER 16, 2011.

FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT
BY: UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER: 4030-2100371
DATED: 3/4/2022

PARKING INFORMATION

GUEST PARKING PROVIDED: 210 SPACES - (2 SPACES PER GARAGE)
34 PARKING STALLS (2 HANDICAP)

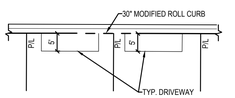
TOTAL PARKING PROVIDED: 244 PARKING SPACES TOTAL

DEDICATION NOTE

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PRIVATE STREET NOTE

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TYPICAL DRIVEWAY DETAIL

NOT TO SCALE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED UPDATED DRAINAGE STUDY CLV# N/A ON FILE WITH THE CITY OF LAS VEGAS.

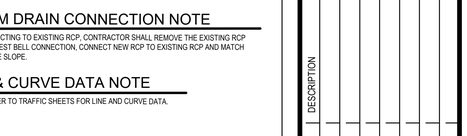
DARRYL LATTIMORE, P.E. #17516 — DATE

CLV# ___-_____

Actus
3283 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
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(702) 586-9266
Engineering - Surveying - Consulting - Planning

GRADING PLAN 3
LARK HILL
TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

BY	DATE	DESCRIPTION

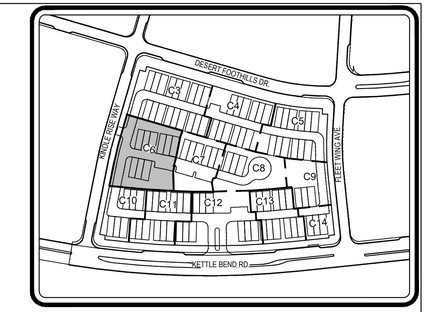


DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201
SHEET GROUP	GRADING
SHEET NUMBER	C5

SHEET 5 OF 22

Plot Stamp: 8/12/2022 11:38:55 AM - John Austin Jr
File: P:\TMH012201 - Lark Hill (Village 22 - Parcel& QR)\Civil_CD\TMH012201_CD-GRAD.dwg, Tab: C5





KEY MAP
SCALE: N/S

SCALE: 1"= 20'
20 10 0 20

GRADING CONSTRUCTION NOTES

1. PROTECT IN PLACE
2. MATCH EXISTING ASPHALT, CURB, SIDEWALK, GUTTER, OR VALLEY GUTTER. SAWCUT CLEAN EDGE FOR CONNECTION.
3. CONSTRUCT 2" AC PAVEMENT OVER 4" TYPE II AGGREGATE BASE COMPATED PER SOILS REPORT
4. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
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19. INSTALL 24" X 24" YARD INLET PER DETAIL "JJ", SHEET C17
20. CONSTRUCT 15' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
21. CONSTRUCT 20' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
22. CONSTRUCT 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
23. CONSTRUCT 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
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30. CONSTRUCT GATES PER CCAUSD #425.S1 & SUMMERLIN WEST RESIDENTIAL DESIGN GUIDELINES

LEGEND

PROPOSED	EXISTING	DESCRIPTION
		PUBLIC R/W LINE
		PRIVATE R/W LINE
		BOUNDARY LINE
		EASEMENT LINE
		MATCH LINE
		PHASE LINE
		CENTERLINE
		EDGE OF ASPHALT
		CURB & GUTTER
		RETAINING WALL - DECORATIVE UNLESS OTHERWISE NOTED
		DECORATIVE CMU SCREEN WALL UNLESS OTHERWISE NOTED
		SAWCUT LINE
		FLOWLINE
		GRADE BREAK
2500	(2500)	MAJOR CONTOUR - 5'
2503	(2503)	MINOR CONTOUR - 1'
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		CONCRETE SURFACE
		PROPOSED ASPHALT PAVEMENT
		REMOVE AND REPLACE ASPHALT
		RIP-RAP
		DEMO/REMOVE ASPHALT
98.76 XX 1.00%	(98.76) XX (1.00%)	ELEVATION GRADE TAG
		GRADE SLOPE TAG
1 C5		SECTION MARKER - DETAIL NUMBER ABOVE SHEET NUMBER
		SIGHT VISIBILITY ZONE

COMMON ABBREVIATIONS

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TC	- TOP OF CURB	AC	- TOP OF PAVEMENT
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PDE	- PRIVATE DRAINAGE EASEMENT	TW	- TOP OF RETAINING WALL
TF	- TOP OF WALL FOOTER	PRIV.	- PRIVATE
ST.	- STREET	TYP.	- TYPICAL
ESMT	- EASEMENT	R/W	- RIGHT-OF-WAY
BSW	- BACK OF SIDEWALK	EAE	- EMERGENCY ACCESS EASEMENT

STORM DRAIN CONNECTION NOTE

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LINE & CURVE DATA NOTE

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COMMON LOT NOTE

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BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3229.29' (NAVD88)
METERS = 984.29 M (NAVD88)

CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

GRADING NOTES

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2. FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS, THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
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4. CONSTRUCTION OF BLOCK WALLS REQUIRE A SEPARATE BUILDING PERMIT AND APPROVAL BY THE BUILDING DEPARTMENT.

SIGHT VISIBILITY NOTE

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SAWCUT NOTE

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ESTIMATED QUANTITIES

NOTE: QUANTITIES SHOWN ARE RAW QUANTITIES AND APPROXIMATE. CONTRACTOR TO DETERMINE HIS OWN QUANTITIES FOR GRADING PURPOSES.
WORK UNDER THIS PLAN CONSTITUTES GRADING IN ACCORDANCE WITH 2018 IBC. ENGINEERING REPORTS AND CERTIFICATIONS IN CONFORMANCE WITH IBC SHALL BE FILED WITH THE COUNTY PRIOR TO COUNTY APPROVAL AT FINAL INSPECTION.

CUT:	3,955 CY
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BALANCE:	107,633 (FILL)

NET EXPORTED MATERIAL TO BE DISPOSED OF IN A LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVAL AND ACTIVE GRADING PERMIT.

FLOOD ZONE DESCRIPTION

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FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT

BY:	UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER:	4030-2100371
DATED:	3/4/2022

PARKING INFORMATION

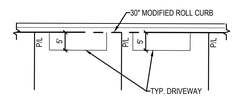
GUEST PARKING PROVIDED:	210 SPACES - (2 SPACES PER GARAGE) 34 PARKING STALLS (2 HANDICAP)
TOTAL PARKING PROVIDED:	244 PARKING SPACES TOTAL

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TYPICAL DRIVEWAY DETAIL

NOT TO SCALE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED UPDATED DRAINAGE STUDY CLV# N/A ON FILE WITH THE CITY OF LAS VEGAS.

DARRYL LATTIMORE, P.E. #17516 — DATE

CLV# ___-_____

Actus
3285 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9266
Engineering - Surveying - Consulting - Planning

GRADING PLAN 4
LARK HILL
TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

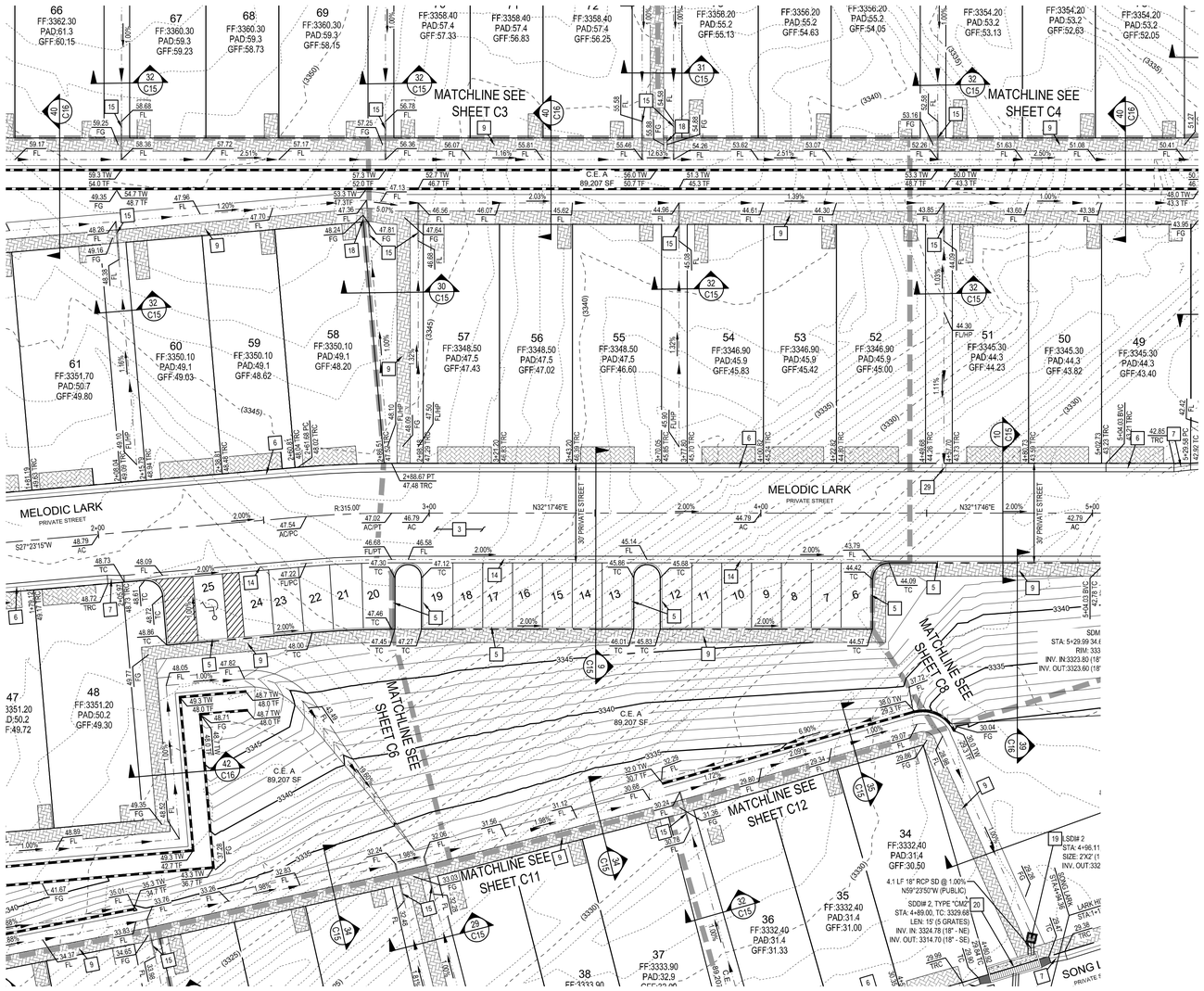
BY	DESCRIPTION	DATE

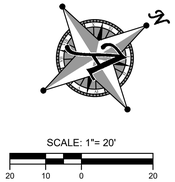
DARRYL C. LATTIMORE EXP: 12/31/23 CIVIL STATE OF NEVADA No. 17516 PROFESSIONAL ENGINEER
8/12/2022

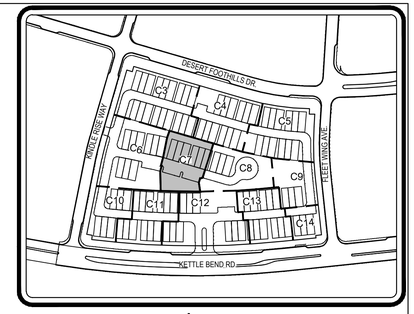
DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201
SHEET GROUP	GRADING
SHEET NUMBER	C6

SHEET 6 OF 22

Plot Stamp: 8/12/2022 11:39:02 AM - John Austin Jr
File: P:\TMH012201 - Lark Hill (Village 22 - Parcels QR)\Civil_CD\TMH012201_CD-GRAD.dwg, Tab: C6







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CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

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FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT
BY: UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER: 4030-2100371
DATED: 3/4/2022

PARKING INFORMATION

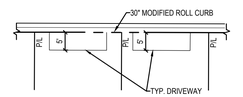
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TYPICAL DRIVEWAY DETAIL

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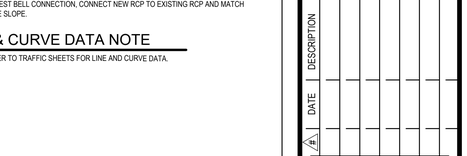
DARRYL LATTIMORE, P.E. #17516 — DATE

CLV# ___-_____

Actus
3285 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9266
Engineering - Surveying - Consulting - Planning

GRADING PLAN 5
LARK HILL
TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

BY	DESCRIPTION	DATE
A		



8/12/2022

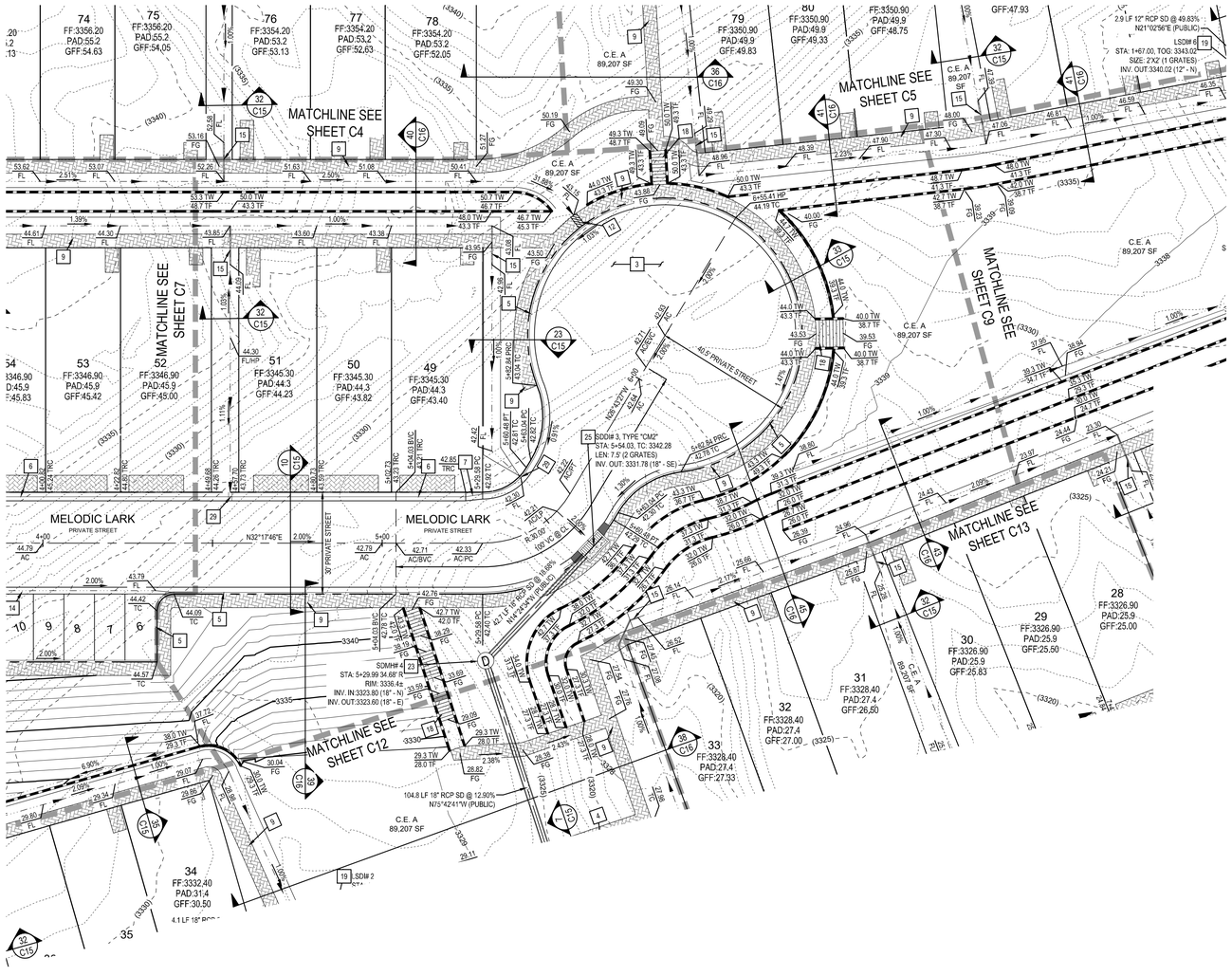
DATE	08/12/2022
DRAWN	CS/RLS
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CHECKED	DCL
PROJECT #	TMH012201

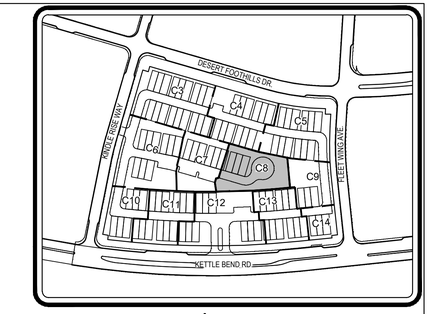
SHEET GROUP
GRADING

SHEET NUMBER
C7

SHEET 7 OF 22

Plot Stamp: 8/12/2022 11:39:09 AM - John Austin Jr
File: P:\TMH012201 - Lark Hill (Village 22 - Parcels QR)\Civil_CD\TMH012201_CD-GRAD.dwg, Tab: C7





KEY MAP
SCALE: N/N

SCALE: 1"= 20'
20 10 0 20

GRADING CONSTRUCTION NOTES

1. PROTECT IN PLACE
2. MATCH EXISTING ASPHALT, CURB, SIDEWALK, GUTTER, OR VALLEY GUTTER. SAWCUT CLEAN EDGE FOR CONNECTION.
3. CONSTRUCT 2" AC PAVEMENT OVER 4" TYPE II AGGREGATE BASE COMPATED PER SOILS REPORT
4. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
5. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
6. CONSTRUCT 30" MODIFIED ROLL CURB PER CCAUSD #217.1
7. CONSTRUCT 5' TRANSITION "L" TYPE CURB TO 30" MODIFIED ROLL CURB PER DETAIL "B5", SHEET C17
8. CONSTRUCT ROLL CURB TO "A" TRANSITION
9. CONSTRUCT 4' WIDE SIDEWALK WITH DECORATIVE PAVERS OVER 5" THICK TYPE II AGGREGATE BASE PER CCAUSD #206.S3
10. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD #234
11. CONSTRUCT SIDEWALK RAMP PER CCAUSD #235 CASE III. "A" & "B" = 8' UNLESS OTHERWISE NOTED.
12. CONSTRUCT SIDEWALK DRAIN PER CCAUSD #236
13. CONSTRUCT 8' CROSS GUTTER PER CCAUSD #228
14. CONSTRUCT 2' VALLEY GUTTER PER DETAIL AA, SHEET C17
15. CONSTRUCT 6" PVC SIDEWALK UNDER DRAIN PER DETAIL "CC", SHEET C17
16. CONSTRUCT WHEEL PATH USING DECORATIVE PAVERS (H20 LOADING)
17. CONSTRUCT 2.5' VALLEY GUTTER PER DETAIL "GG", SHEET C17
18. CONSTRUCT STEPS AND HANDRAILS TO BE BUILT BY OTHERS PER DETAIL "KK", SHEET C17
19. INSTALL 24" X 24" YARD INLET PER DETAIL "JJ", SHEET C17
20. CONSTRUCT 15' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
21. CONSTRUCT 20' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
22. CONSTRUCT 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
23. CONSTRUCT 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
24. CONSTRUCT 48" TYPE II STORM DRAIN MANHOLE PER CCAUSD #401 & 405
25. CONSTRUCT 7.5' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
26. CONSTRUCT SPILL CURB TO PROVIDE POSITIVE FLOW FROM FLOW LINE TO LIP OF GUTTER PER DETAIL "DD", SHEET C17
27. CONSTRUCT SPILL CURB TO "L" TYPE CURB TRANSITION
28. CONSTRUCT 30" MODIFIED ROLL CURB TO SPILL CURB TRANSITION
29. CONSTRUCT CURB OPENING FOR POSITIVE DRAINAGE
30. CONSTRUCT GATES PER CCAUSD #425.S1 & SUMMERLIN WEST RESIDENTIAL DESIGN GUIDELINES

LEGEND

PROPOSED	EXISTING	DESCRIPTION
		PUBLIC R/W LINE
		PRIVATE R/W LINE
		BOUNDARY LINE
		EASEMENT LINE
		MATCH LINE
		PHASE LINE
		CENTERLINE
		EDGE OF ASPHALT
		CURB & GUTTER
		RETAINING WALL - DECORATIVE UNLESS OTHERWISE NOTED
		DECORATIVE CMU SCREEN WALL UNLESS OTHERWISE NOTED
		SAWCUT LINE
		FLOWLINE
		GRADE BREAK
2500	(2500)	MAJOR CONTOUR - 5'
2503	(2503)	MINOR CONTOUR - 1'
		SCARP
		CONCRETE SURFACE
		PROPOSED ASPHALT PAVEMENT
		REMOVE AND REPLACE ASPHALT
		RIP-RAP
		DEMO/REMOVE ASPHALT
98.76 XX 1.00%	(98.76) XX (1.00%)	ELEVATION GRADE TAG
		GRADE SLOPE TAG
		SECTION MARKER - DETAIL NUMBER ABOVE SHEET NUMBER
		SIGHT VISIBILITY ZONE

1 C5

COMMON ABBREVIATIONS

FF	- FINISHED FLOOR	RC	- TOP OF "RIBBON" CURB
TC	- TOP OF CURB	AC	- TOP OF PAVEMENT
FL	- FLOWLINE GRADE	EP	- EDGE OF PAVEMENT
PDE	- PRIVATE DRAINAGE EASEMENT	TW	- TOP OF RETAINING WALL
TF	- TOP OF WALL FOOTER	PRIV.	- PRIVATE
ST.	- STREET	TYP.	- TYPICAL
ESMT	- EASEMENT	R/W	- RIGHT-OF-WAY
BSW	- BACK OF SIDEWALK	EAE	- EMERGENCY ACCESS EASEMENT

STORM DRAIN CONNECTION NOTE

WHEN CONNECTING TO EXISTING RCP, CONTRACTOR SHALL REMOVE THE EXISTING RCP TO THE NEAREST BELL CONNECTION, CONNECT NEW RCP TO EXISTING RCP AND MATCH EXISTING PIPE SLOPE.

LINE & CURVE DATA NOTE

PLEASE REFER TO TRAFFIC SHEETS FOR LINE AND CURVE DATA.

BASIS OF BEARINGS

SOUTH 89°51'25" EAST, BEING THE BEARING OF NORTH LINE OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 59 EAST, M.D.M., CITY LAS VEGAS, CLARK COUNTY, NEVADA AS PER MAP RECORDED IN FILE 123, PAGE 36 OF PARCEL MAPS, IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDERS.

DISCLAIMER NOTE

THE UNDERGROUND UTILITIES AS SHOWN HEREON HAVE BEEN LOCATED FROM OBSERVED FIELD SURVEY EVIDENCE AND EXISTING DRAWINGS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING; PLANS PROVIDED BY THE CLIENT, UTILITY COMPANIES, AND MUNICIPAL AGENCIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.



COMMON LOT NOTE

ALL COMMON LOTS ARE TO BE PUBLIC DRAINAGE, PEDESTRIAN ACCESS, UTILITY, SEWER, AND PRIVATE LANDSCAPE EASEMENTS OVER THEIR ENTIRETY TO BE PRIVATELY MAINTAINED BY THE HOA PER THE APPROVED FINAL MAP FOR THE PROJECT.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3229.29' (NAVD88)
METERS = 984.29 M (NAVD88)

CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

GRADING NOTES

1. ACTUS SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES IN THE PLANS OR CONDITIONS IN THE FILED.
2. FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS, THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
3. WALL DETAILS ARE FOR REFERENCE ONLY AND DO NOT CONSTITUTE A STRUCTURAL DESIGN.
4. CONSTRUCTION OF BLOCK WALLS REQUIRE A SEPARATE BUILDING PERMIT AND APPROVAL BY THE BUILDING DEPARTMENT.

SIGHT VISIBILITY NOTE

NO WALLS, FENCES SHRUBS, UTILITY APPURTENANCES OR ANY OTHER OBJECT, OTHER THAT TRAFFIC CONTROL DEVICES, FIRE HYDRANTS, TREES, AND STREET LIGHT POLES, MAY BE CONSTRUCTED OR INSTALLED WITHIN THE SIGHT VISIBILITY ZONE UNLESS SAID OBJECT IS MAINTAINED AT LESS THAN 24 INCHES IN HEIGHT, MEASURED FROM TOP OF CURB, OR WHERE NO CURB EXISTS, A HEIGHT OF 27 INCHES MEASURED FROM THE TOP OF ADJACENT ASPHALT, GRAVEL OR PAVEMENT STREET SURFACE. THIS RESTRICTION EXTENDS ALONG THE SIGHT VISIBILITY LINE THROUGH LANDSCAPED MEDIANS.

PLEASE REFER TO TRAFFIC SHEETS FOR SIGHT VISIBILITY ZONE DIMENSIONS.

SAWCUT NOTE

FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

ESTIMATED QUANTITIES

NOTE: QUANTITIES SHOWN ARE RAW QUANTITIES AND APPROXIMATE. CONTRACTOR TO DETERMINE HIS OWN QUANTITIES FOR GRADING PURPOSES.
WORK UNDER THIS PLAN CONSTITUTES GRADING IN ACCORDANCE WITH 2018 IBC; ENGINEERING REPORTS AND CERTIFICATIONS IN CONFORMANCE WITH IBC SHALL BE FILED WITH THE COUNTY PRIOR TO COUNTY APPROVAL AT FINAL INSPECTION.

CUT:	3,955 CY
FILL:	111,587 CY
BALANCE:	107,633 (FILL)

NET EXPORTED MATERIAL TO BE DISPOSED OF IN A LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVAL AND ACTIVE GRADING PERMIT.

FLOOD ZONE DESCRIPTION

THIS SITE IS LOCATED IN SHADED ZONE "X", AREAS OF 0.2% ANNUAL CHANCE FLOOD, PER THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL 32003C2150E CLARK COUNTY, NEVADA DATED NOVEMBER 16, 2011.

FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT

BY:	UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER:	4030-2100371
DATED:	3/4/2022

PARKING INFORMATION

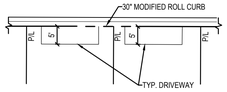
GUEST PARKING PROVIDED:	210 SPACES - (2 SPACES PER GARAGE) 34 PARKING STALLS (2 HANDICAP)
TOTAL PARKING PROVIDED:	244 PARKING SPACES TOTAL

DEDICATION NOTE

ALL EASEMENTS, RIGHT-OF-WAY, AND OTHER DEDICATIONS WITHIN THIS PLAN SET ARE GRANTED PER CLV# ___-_____ UNLESS OTHERWISE NOTED

PRIVATE STREET NOTE

ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS, AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA.



TYPICAL DRIVEWAY DETAIL

NOT TO SCALE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED UPDATED DRAINAGE STUDY CLV# N/A ON FILE WITH THE CITY OF LAS VEGAS.

DARRYL LATTIMORE, P.E. #17516 — DATE

CLV# ___-_____

Actus
3285 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9266
Engineering - Surveying - Consulting - Planning

GRADING PLAN 6
LARK HILL
TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

NO.	DATE	DESCRIPTION	BY
A			

STATE OF NEVADA
DARRYL C. LATTIMORE
EXP: 12/31/23
CIVIL
No. 17516
PROFESSIONAL ENGINEER
8/12/2022

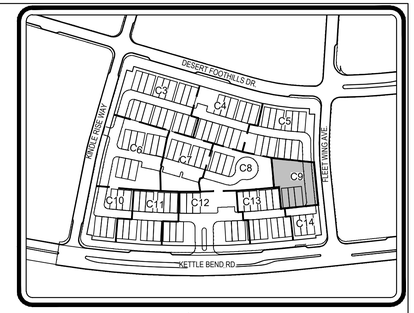
DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201
SHEET GROUP	GRADING
SHEET NUMBER	C8

SHEET 8 OF 22

Plot Stamp: 8/12/2022 11:39:16 AM - John Austin Jr
File: P:\TMH012201 - Lark Hill (Village 22 - Parcels Q\R)\Civil_CD\TMH012201_CD-GRAD.dwg, Tab: C8







GRADING CONSTRUCTION NOTES

1. PROTECT IN PLACE
2. MATCH EXISTING ASPHALT, CURB, SIDEWALK, GUTTER, OR VALLEY GUTTER. SAWCUT CLEAN EDGE FOR CONNECTION.
3. CONSTRUCT 2" AC PAVEMENT OVER 4" TYPE II AGGREGATE BASE COMPATED PER SOILS REPORT
4. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
5. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
6. CONSTRUCT 30" MODIFIED ROLL CURB PER CCAUSD #217.1
7. CONSTRUCT 5' TRANSITION "L" TYPE CURB TO 30" MODIFIED ROLL CURB PER DETAIL "BB", SHEET C17
8. CONSTRUCT ROLL CURB TO "A" TRANSITION
9. CONSTRUCT 4' WIDE SIDEWALK WITH DECORATIVE PAVERS OVER 5" THICK TYPE II AGGREGATE BASE PER CCAUSD #206.53
10. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD #234
11. CONSTRUCT SIDEWALK RAMP PER CCAUSD #235 CASE III. "A" & "B" = 8' UNLESS OTHERWISE NOTED.
12. CONSTRUCT SIDEWALK DRAIN PER CCAUSD #236
13. CONSTRUCT 8' CROSS GUTTER PER CCAUSD #228
14. CONSTRUCT 2' VALLEY GUTTER PER DETAIL AA, SHEET C17
15. CONSTRUCT 6" PVC SIDEWALK UNDER DRAIN PER DETAIL "CC", SHEET C17
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LEGEND

PROPOSED	EXISTING	DESCRIPTION
		PUBLIC R/W LINE
		PRIVATE R/W LINE
		BOUNDARY LINE
		EASEMENT LINE
		MATCH LINE
		PHASE LINE
		CENTERLINE
		EDGE OF ASPHALT
		CURB & GUTTER
		RETAINING WALL - DECORATIVE UNLESS OTHERWISE NOTED
		DECORATIVE CMU SCREEN WALL UNLESS OTHERWISE NOTED
		SAWCUT LINE
		FLOWLINE
		GRADE BREAK
2500	(2500)	MAJOR CONTOUR - 5'
2503	(2503)	MINOR CONTOUR - 1'
		SCARP
		CONCRETE SURFACE
		PROPOSED ASPHALT PAVEMENT
		REMOVE AND REPLACE ASPHALT
		RIP-RAP
		DEMO/REMOVE ASPHALT
		ELEVATION GRADE TAG
		GRADE SLOPE TAG
		SECTION MARKER - DETAIL NUMBER ABOVE SHEET NUMBER
		SIGHT VISIBILITY ZONE

98.76 XX 1.00%

(98.76) XX (1.00%)

1 C-5

COMMON ABBREVIATIONS

FF	- FINISHED FLOOR	RC	- TOP OF "RIBBON" CURB
TC	- TOP OF CURB	AC	- TOP OF PAVEMENT
FL	- FLOWLINE GRADE	EP	- EDGE OF PAVEMENT
PDE	- PRIVATE DRAINAGE EASEMENT	TW	- TOP OF RETAINING WALL
TF	- TOP OF WALL FOOTER	PRIV.	- PRIVATE
ST.	- STREET	TYP.	- TYPICAL
ESMT	- EASEMENT	R/W	- RIGHT-OF-WAY
BSW	- BACK OF SIDEWALK	EAE	- EMERGENCY ACCESS EASEMENT

STORM DRAIN CONNECTION NOTE

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LINE & CURVE DATA NOTE

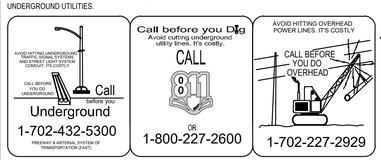
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BASIS OF BEARINGS

SOUTH 89°51'25" EAST, BEING THE BEARING OF NORTH LINE OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 59 EAST, M.D.M., CITY LAS VEGAS, CLARK COUNTY, NEVADA AS PER MAP RECORDED IN FILE 123, PAGE 36 OF PARCEL MAPS, IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDERS.

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BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3229.29' (NAVD88)
METERS = 984.29 M (NAVD88)

CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

GRADING NOTES

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SAWCUT NOTE

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ESTIMATED QUANTITIES

NOTE: QUANTITIES SHOWN ARE RAW QUANTITIES AND APPROXIMATE. CONTRACTOR TO DETERMINE HIS OWN QUANTITIES FOR GRADING PURPOSES.
WORK UNDER THIS PLAN CONSTITUTES GRADING IN ACCORDANCE WITH 2018 IBC; ENGINEERING REPORTS AND CERTIFICATIONS IN CONFORMANCE WITH IBC SHALL BE FILED WITH THE COUNTY PRIOR TO COUNTY APPROVAL AT FINAL INSPECTION.

CUT: 3,955 CY
FILL: 111,587 CY
BALANCE: 107,633 (FILL)

NET EXPORTED MATERIAL TO BE DISPOSED OF IN A LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVAL AND ACTIVE GRADING PERMIT.

FLOOD ZONE DESCRIPTION

THIS SITE IS LOCATED IN SHADED ZONE "X", AREAS OF 0.2% ANNUAL CHANCE FLOOD, PER THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL 32003C2150E CLARK COUNTY, NEVADA DATED NOVEMBER 16, 2011.

FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT
BY: UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER: 4030-2100371
DATED: 3/4/2022

PARKING INFORMATION

GUEST PARKING PROVIDED: 210 SPACES - (2 SPACES PER GARAGE)
34 PARKING STALLS (2 HANDICAP)

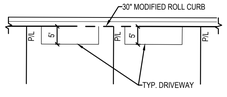
TOTAL PARKING PROVIDED: 244 PARKING SPACES TOTAL

DEDICATION NOTE

ALL EASEMENTS, RIGHT-OF-WAY, AND OTHER DEDICATIONS WITHIN THIS PLAN SET ARE GRANTED PER CLV# ___-_____ UNLESS OTHERWISE NOTED

PRIVATE STREET NOTE

ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS, AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA.



TYPICAL DRIVEWAY DETAIL

NOT TO SCALE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED UPDATED DRAINAGE STUDY CLV# N/A ON FILE WITH THE CITY OF LAS VEGAS.

DARRYL LATTIMORE, P.E. #17516 — DATE

CLV# ___-_____

Actus
3285 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9266
Engineering - Surveying - Consulting - Planning

GRADING PLAN 7
LARK HILL
TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

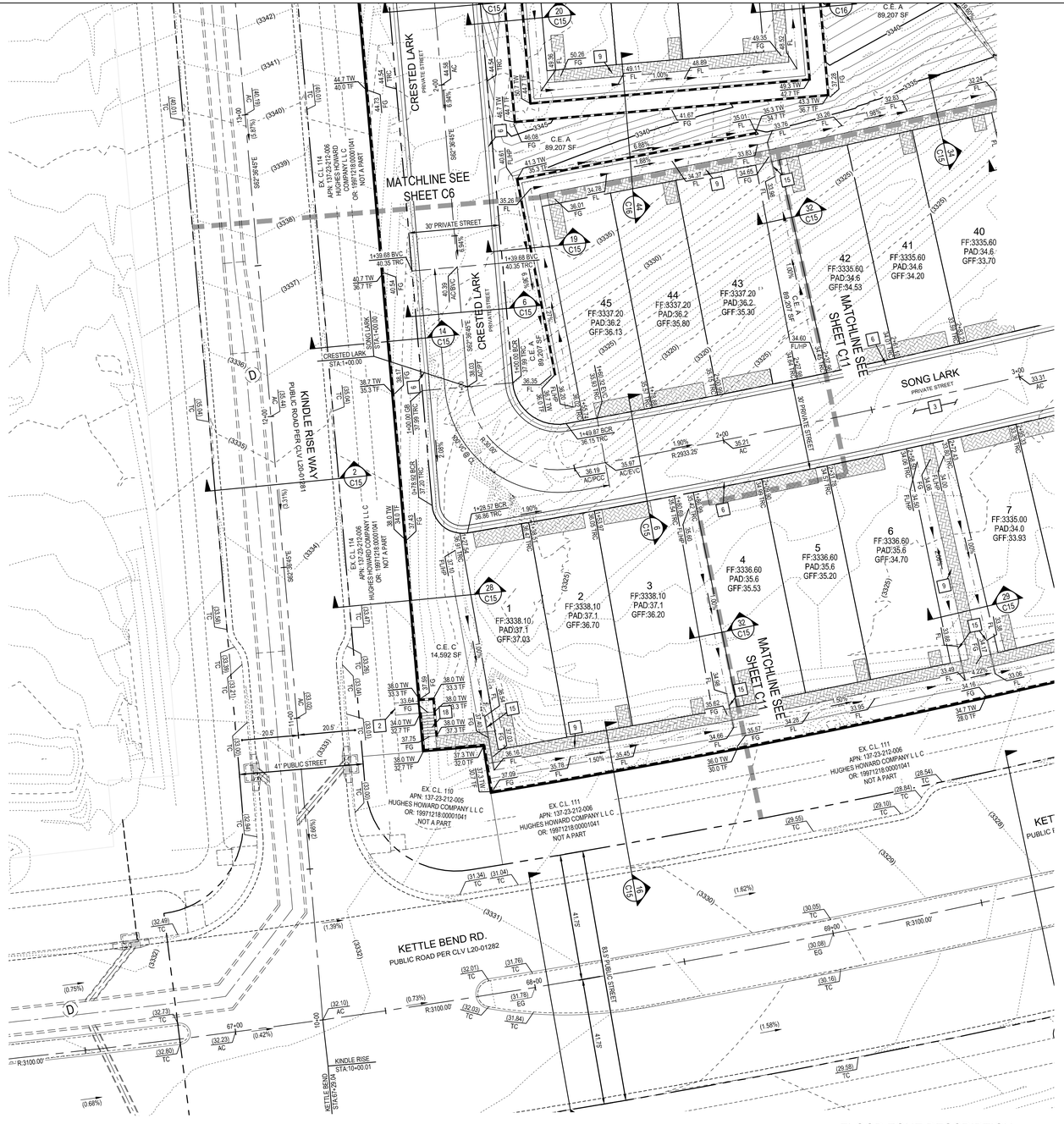
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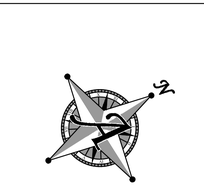
PROFESSIONAL ENGINEER — STATE OF NEVADA
DARRYL C. LATTIMORE
EXP: 12/31/23
CIVIL
No. 17516
8/12/2022

DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201
SHEET GROUP	GRADING
SHEET NUMBER	C9

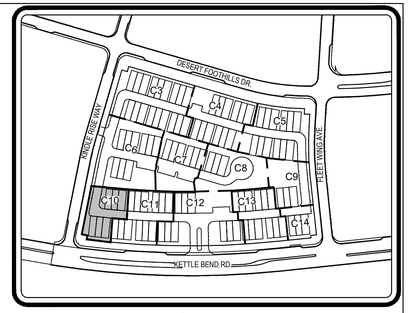
SHEET 9 OF 22

Plot Stamp: 8/12/2022 11:39:22 AM - John Austin Jr
File: P:\TMH012201 - Lark Hill (Village 22 - Parcels OR)\Civil_CD\TMH012201_CD-GRAD.dwg, Tab: C9





SCALE: 1"= 20'
20 10 0 20



KEY MAP
SCALE: NTS

GRADING CONSTRUCTION NOTES

1. PROTECT IN PLACE
2. MATCH EXISTING ASPHALT, CURB, SIDEWALK, GUTTER, OR VALLEY GUTTER. SAWCUT CLEAN EDGE FOR CONNECTION.
3. CONSTRUCT 2" AC PAVEMENT OVER 4" TYPE II AGGREGATE BASE COMPATED PER SOILS REPORT
4. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
5. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
6. CONSTRUCT 30" MODIFIED ROLL CURB PER CCAUSD #217.1
7. CONSTRUCT 5' TRANSITION "L" TYPE CURB TO 30" MODIFIED ROLL CURB PER DETAIL "B8", SHEET C17
8. CONSTRUCT ROLL CURB TO "A" TRANSITION
9. CONSTRUCT 4' WIDE SIDEWALK WITH DECORATIVE PAVERS OVER 5" THICK TYPE II AGGREGATE BASE PER CCAUSD #206.53
10. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD #234
11. CONSTRUCT SIDEWALK RAMP PER CCAUSD #235 CASE III. "A" & "B" = 8' UNLESS OTHERWISE NOTED.
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13. CONSTRUCT 8' CROSS GUTTER PER CCAUSD #228
14. CONSTRUCT 2' VALLEY GUTTER PER DETAIL AA, SHEET C17
15. CONSTRUCT 6" PVC SIDEWALK UNDER DRAIN PER DETAIL "CC", SHEET C17
16. CONSTRUCT WHEEL PATH USING DECORATIVE PAVERS (H20 LOADING)
17. CONSTRUCT 2.5' VALLEY GUTTER PER DETAIL "GG", SHEET C17
18. CONSTRUCT STEPS AND HANDRAILS TO BE BUILT BY OTHERS PER DETAIL "KK", SHEET C17
19. INSTALL 24" X 24" YARD INLET PER DETAIL "JJ", SHEET C17
20. CONSTRUCT 15' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
21. CONSTRUCT 20' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
22. CONSTRUCT 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
23. CONSTRUCT 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
24. CONSTRUCT 48" TYPE II STORM DRAIN MANHOLE PER CCAUSD #401 & 405
25. CONSTRUCT 7.5' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
26. CONSTRUCT SPILL CURB TO PROVIDE POSITIVE FLOW FROM FLOW LINE TO LIP OF GUTTER PER DETAIL "DD", SHEET C17
27. CONSTRUCT SPILL CURB TO "L" TYPE CURB TRANSITION
28. CONSTRUCT 30" MODIFIED ROLL CURB TO SPILL CURB TRANSITION
29. CONSTRUCT CURB OPENING FOR POSITIVE DRAINAGE
30. CONSTRUCT GATES PER CCAUSD #425.S1 & SUMMERLIN WEST RESIDENTIAL DESIGN GUIDELINES

LEGEND

PROPOSED	EXISTING	DESCRIPTION
		PUBLIC R/W LINE
		PRIVATE R/W LINE
		BOUNDARY LINE
		EASEMENT LINE
		MATCH LINE
		PHASE LINE
		CENTERLINE
		EDGE OF ASPHALT
		CURB & GUTTER
		RETAINING WALL - DECORATIVE UNLESS OTHERWISE NOTED
		DECORATIVE CMU SCREEN WALL UNLESS OTHERWISE NOTED
		SAWCUT LINE
		FLOWLINE
		GRADE BREAK
2500	(2500)	MAJOR CONTOUR - 5'
2503	(2503)	MINOR CONTOUR - 1'
		SCARP
		CONCRETE SURFACE
		PROPOSED ASPHALT PAVEMENT
		REMOVE AND REPLACE ASPHALT
		RIP-RAP
		DEMO/REMOVE ASPHALT
		ELEVATION GRADE TAG
		GRADE SLOPE TAG
		SECTION MARKER - DETAIL NUMBER ABOVE SHEET NUMBER
		SIGHT VISIBILITY ZONE

98.76 XX (1.00%) 1.00%
1 C6

COMMON ABBREVIATIONS

FF	- FINISHED FLOOR	RC	- TOP OF "RIBBON" CURB
TC	- TOP OF CURB	AC	- TOP OF PAVEMENT
FL	- FLOWLINE GRADE	EP	- EDGE OF PAVEMENT
PDE	- PRIVATE DRAINAGE EASEMENT	TW	- TOP OF RETAINING WALL
TF	- TOP OF WALL FOOTER	PRIV.	- PRIVATE
ST.	- STREET	TYP.	- TYPICAL
ESMT	- EASEMENT	R/W	- RIGHT-OF-WAY
BSW	- BACK OF SIDEWALK	EAE	- EMERGENCY ACCESS EASEMENT

STORM DRAIN CONNECTION NOTE

WHEN CONNECTING TO EXISTING RCP, CONTRACTOR SHALL REMOVE THE EXISTING RCP TO THE NEAREST BELL CONNECTION, CONNECT NEW RCP TO EXISTING RCP AND MATCH EXISTING PIPE SLOPE.

LINE & CURVE DATA NOTE

PLEASE REFER TO TRAFFIC SHEETS FOR LINE AND CURVE DATA.

BASIS OF BEARINGS

SOUTH 89°51'26" EAST, BEING THE BEARING OF NORTH LINE OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 59 EAST, M.D.M., CITY LAS VEGAS, CLARK COUNTY, NEVADA AS PER MAP RECORDED IN FILE 123, PAGE 36 OF PARCEL MAPS, IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDERS.

DISCLAIMER NOTE

THE UNDERGROUND UTILITIES AS SHOWN HEREON HAVE BEEN LOCATED FROM OBSERVED FIELD SURVEY EVIDENCE AND EXISTING DRAWINGS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING; PLANS PROVIDED BY THE CLIENT, UTILITY COMPANIES, AND MUNICIPAL AGENCIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.



COMMON LOT NOTE

ALL COMMON LOTS ARE TO BE PUBLIC DRAINAGE, PEDESTRIAN ACCESS, UTILITY, SEWER, AND PRIVATE LANDSCAPE EASEMENTS OVER THEIR ENTIRETY TO BE PRIVATELY MAINTAINED BY THE HOA PER THE APPROVED FINAL MAP FOR THE PROJECT.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3220.29' (NAVD88)
METERS = 984.29 M (NAVD88)

CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

GRADING NOTES

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2. FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS, THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
3. WALL DETAILS ARE FOR REFERENCE ONLY AND DO NOT CONSTITUTE A STRUCTURAL DESIGN.
4. CONSTRUCTION OF BLOCK WALLS REQUIRE A SEPARATE BUILDING PERMIT AND APPROVAL BY THE BUILDING DEPARTMENT.

SIGHT VISIBILITY NOTE

NO WALLS, FENCES SHRUBS, UTILITY APPURTENANCES OR ANY OTHER OBJECT, OTHER THAT TRAFFIC CONTROL DEVICES, FIRE HYDRANTS, TREES, AND STREET LIGHT POLES, MAY BE CONSTRUCTED OR INSTALLED WITHIN THE SIGHT VISIBILITY ZONE UNLESS SAID OBJECT IS MAINTAINED AT LESS THAN 24 INCHES IN HEIGHT, MEASURED FROM TOP OF CURB, OR WHERE NO CURB EXISTS, A HEIGHT OF 27 INCHES MEASURED FROM THE TOP OF ADJACENT ASPHALT, GRAVEL OR PAVEMENT STREET SURFACE. THIS RESTRICTION EXTENDS ALONG THE SIGHT VISIBILITY LINE THROUGH LANDSCAPED MEDIANS.

PLEASE REFER TO TRAFFIC SHEETS FOR SIGHT VISIBILITY ZONE DIMENSIONS.

SAWCUT NOTE

FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

ESTIMATED QUANTITIES

NOTE: QUANTITIES SHOWN ARE RAW QUANTITIES AND APPROXIMATE. CONTRACTOR TO DETERMINE HIS OWN QUANTITIES FOR GRADING PURPOSES.
WORK UNDER THIS PLAN CONSTITUTES GRADING IN ACCORDANCE WITH 2018 IBC; ENGINEERING REPORTS AND CERTIFICATIONS IN CONFORMANCE WITH IBC SHALL BE FILED WITH THE COUNTY PRIOR TO COUNTY APPROVAL AT FINAL INSPECTION.

CUT:	3,955 CY
FILL:	111,587 CY
BALANCE:	107,633 (FILL)

NET EXPORTED MATERIAL TO BE DISPOSED OF IN A LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVAL AND ACTIVE GRADING PERMIT.

FLOOD ZONE DESCRIPTION

THIS SITE IS LOCATED IN SHADED ZONE "X", AREAS OF 0.2% ANNUAL CHANCE FLOOD, PER THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL 32003C2150E CLARK COUNTY, NEVADA DATED NOVEMBER 16, 2011.

FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT
BY: UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER: 4030-21003071
DATED: 3/4/2022

PARKING INFORMATION

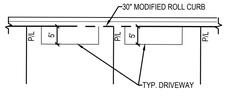
GUEST PARKING PROVIDED:	210 SPACES - (2 SPACES PER GARAGE) 34 PARKING STALLS (2 HANDICAP)
TOTAL PARKING PROVIDED:	244 PARKING SPACES TOTAL

DEDICATION NOTE

ALL EASEMENTS, RIGHT-OF-WAY, AND OTHER DEDICATIONS WITHIN THIS PLAN SET ARE GRANTED PER CLV# ___-_____ UNLESS OTHERWISE NOTED

PRIVATE STREET NOTE

ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS, AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA.



TYPICAL DRIVEWAY DETAIL

NOT TO SCALE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED UPDATED DRAINAGE STUDY CLV# N/A ON FILE WITH THE CITY OF LAS VEGAS.

DARRYL LATTIMORE, P.E. #17516 DATE

CLV# ___-_____

Actus
3285 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9266
Engineering - Surveying - Consulting - Planning

GRADING PLAN 8
LARK HILL
TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

BY	DATE	DESCRIPTION
A		

DARRYL C. LATTIMORE
EXP: 12/31/23
CIVIL
STATE OF NEVADA
No. 17516
PROFESSIONAL ENGINEER
8/12/2022

DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201

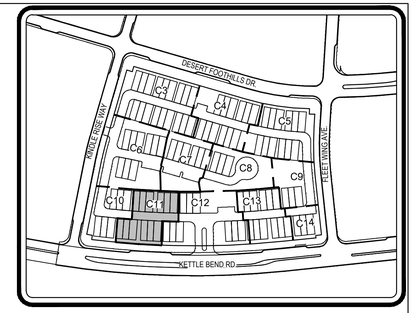
SHEET GROUP
GRADING
SHEET NUMBER
C10
SHEET 10 OF 22

Plot Stamp: 8/12/2022 11:39:28 AM - John Austin Jr
File: P:\TMH012201 - Lark Hill (Village 22 - Parcels QR)\Civil_CD\TMH012201_CD-GRAD.dwg, Tab: C10





SCALE: 1"= 20'
20 10 0 20



KEY MAP
SCALE: N.T.S.

GRADING CONSTRUCTION NOTES

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		SCARP
		CONCRETE SURFACE
		PROPOSED ASPHALT PAVEMENT
		REMOVE AND REPLACE ASPHALT
		RIP-RAP
		DEMO/REMOVE ASPHALT

98.76 XX 1.00% — (98.76) XX (1.00%) — ELEVATION GRADE TAG

GRADE SLOPE TAG

1 C5 — SECTION MARKER - DETAIL NUMBER ABOVE SHEET NUMBER

SIGHT VISIBILITY ZONE

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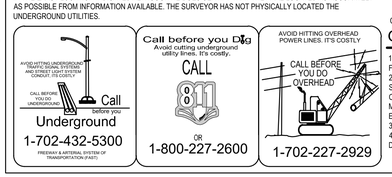
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BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3229.29' (NAVD88)
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CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

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FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT
BY: UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER: 4030-2100371
DATED: 3/4/2022

PARKING INFORMATION

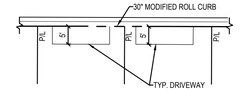
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TYPICAL DRIVEWAY DETAIL

NOT TO SCALE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED UPDATED DRAINAGE STUDY CLV# N/A ON FILE WITH THE CITY OF LAS VEGAS.

DARRYL LATTIMORE, P.E. #17516 — DATE

CLV# ___-_____

Actus
3285 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9266
Engineering - Surveying - Consulting - Planning

GRADING PLAN 9
LARK HILL
TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

BY	DESCRIPTION	DATE

DARRYL C. LATTIMORE
EXP: 12/31/23
CIVIL
No. 17516
STATE OF NEVADA
PROFESSIONAL ENGINEER
8/12/2022

DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201

SHEET GROUP: GRADING
SHEET NUMBER: C11
SHEET 11 OF 22

Plot Stamp: 8/12/2022 11:39:35 AM - John Austin Jr
File: P:\TMH012201 - Lark Hill (Village 22 - Parcels QR)\Civil_CD\TMH012201_CD-GRAD.dwg, Tab: C11



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20. CONSTRUCT 15' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
21. CONSTRUCT 20' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
22. CONSTRUCT 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
23. CONSTRUCT 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
24. CONSTRUCT 48" TYPE II STORM DRAIN MANHOLE PER CCAUSD #401 & 405
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27. CONSTRUCT SPILL CURB TO "L" TYPE CURB TRANSITION
28. CONSTRUCT 30" MODIFIED ROLL CURB TO SPILL CURB TRANSITION
29. CONSTRUCT CURB OPENING FOR POSITIVE DRAINAGE
30. CONSTRUCT GATES PER CCAUSD #425.S1 & SUMMERLIN WEST RESIDENTIAL DESIGN GUIDELINES

LEGEND

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		PRIVATE R/W LINE
		BOUNDARY LINE
		EASEMENT LINE
		MATCH LINE
		PHASE LINE
		CENTERLINE
		EDGE OF ASPHALT
		CURB & GUTTER
		RETAINING WALL - DECORATIVE UNLESS OTHERWISE NOTED
		DECORATIVE CMU SCREEN WALL UNLESS OTHERWISE NOTED
		SAWCUT LINE
		FLOWLINE
		GRADE BREAK
2500	(2500)	MAJOR CONTOUR - 5'
2503	(2503)	MINOR CONTOUR - 1'
		SCARP
		CONCRETE SURFACE
		PROPOSED ASPHALT PAVEMENT
		REMOVE AND REPLACE ASPHALT
		RIP-RAP
		DEMO/REMOVE ASPHALT
98.76 XX	(98.76) XX	ELEVATION GRADE TAG
1.00%	(1.00%)	GRADE SLOPE TAG
1 C5		SECTION MARKER - DETAIL NUMBER ABOVE SHEET NUMBER
		SIGHT VISIBILITY ZONE

COMMON ABBREVIATIONS

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TC	- TOP OF CURB	AC	- TOP OF PAVEMENT
FL	- FLOWLINE GRADE	EP	- EDGE OF PAVEMENT
PDE	- PRIVATE DRAINAGE EASEMENT	TW	- TOP OF RETAINING WALL
TF	- TOP OF WALL FOOTER	PRIV.	- PRIVATE
ST.	- STREET	TYP.	- TYPICAL
ESMT	- EASEMENT	R/W	- RIGHT-OF-WAY
BSW	- BACK OF SIDEWALK	EAE	- EMERGENCY ACCESS EASEMENT

STORM DRAIN CONNECTION NOTE

WHEN CONNECTING TO EXISTING RCP, CONTRACTOR SHALL REMOVE THE EXISTING RCP TO THE NEAREST BELL CONNECTION, CONNECT NEW RCP TO EXISTING RCP AND MATCH EXISTING PIPE SLOPE.

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SOUTH 89°51'25" EAST, BEING THE BEARING OF NORTH LINE OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 59 EAST, M.D.M., CITY LAS VEGAS, CLARK COUNTY, NEVADA AS PER MAP RECORDED IN FILE 123, PAGE 36 OF PARCEL MAPS, IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDERS.

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COMMON LOT NOTE

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BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3229.29' (NAVD88)
METERS = 984.29 M (NAVD88)

CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

GRADING NOTES

1. ACTUS SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES IN THE PLANS OR CONDITIONS IN THE FILED.
2. FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS, THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
3. WALL DETAILS ARE FOR REFERENCE ONLY AND DO NOT CONSTITUTE A STRUCTURAL DESIGN.
4. CONSTRUCTION OF BLOCK WALLS REQUIRE A SEPARATE BUILDING PERMIT AND APPROVAL BY THE BUILDING DEPARTMENT.

SIGHT VISIBILITY NOTE

NO WALLS, FENCES SHRUBS, UTILITY APPURTENANCES OR ANY OTHER OBJECT, OTHER THAT TRAFFIC CONTROL DEVICES, FIRE HYDRANTS, TREES, AND STREET LIGHT POLES, MAY BE CONSTRUCTED OR INSTALLED WITHIN THE SIGHT VISIBILITY ZONE UNLESS SAID OBJECT IS MAINTAINED AT LESS THAN 24 INCHES IN HEIGHT, MEASURED FROM TOP OF CURB, OR WHERE NO CURB EXISTS, A HEIGHT OF 27 INCHES MEASURED FROM THE TOP OF ADJACENT ASPHALT, GRAVEL OR PAVEMENT STREET SURFACE. THIS RESTRICTION EXTENDS ALONG THE SIGHT VISIBILITY LINE THROUGH LANDSCAPED MEDIANS.

PLEASE REFER TO TRAFFIC SHEETS FOR SIGHT VISIBILITY ZONE DIMENSIONS.

SAWCUT NOTE

FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

ESTIMATED QUANTITIES

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WORK UNDER THIS PLAN CONSTITUTES GRADING IN ACCORDANCE WITH 2018 IBC; ENGINEERING REPORTS AND CERTIFICATIONS IN CONFORMANCE WITH IBC SHALL BE FILED WITH THE COUNTY PRIOR TO COUNTY APPROVAL AT FINAL INSPECTION.

CUT:	3,955 CY
FILL:	111,587 CY
BALANCE:	107,633 (FILL)

NET EXPORTED MATERIAL TO BE DISPOSED OF IN A LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVAL AND ACTIVE GRADING PERMIT.

FLOOD ZONE DESCRIPTION

THIS SITE IS LOCATED IN SHADED ZONE "X", AREAS OF 0.2% ANNUAL CHANCE FLOOD, PER THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL 32003C2150E CLARK COUNTY, NEVADA DATED NOVEMBER 16, 2011.

FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT

BY:	UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER:	4030-2100371
DATED:	3/4/2022

PARKING INFORMATION

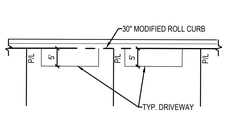
GUEST PARKING PROVIDED:	210 SPACES - (2 SPACES PER GARAGE) 34 PARKING STALLS (2 HANDICAP)
TOTAL PARKING PROVIDED:	244 PARKING SPACES TOTAL

DEDICATION NOTE

ALL EASEMENTS, RIGHT-OF-WAY, AND OTHER DEDICATIONS WITHIN THIS PLAN SET ARE GRANTED PER CLV# ___-_____ UNLESS OTHERWISE NOTED

PRIVATE STREET NOTE

ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS, AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA.



TYPICAL DRIVEWAY DETAIL

NOT TO SCALE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED UPDATED DRAINAGE STUDY CLV# N/A ON FILE WITH THE CITY OF LAS VEGAS.

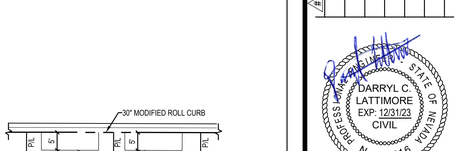
DARRYL LATTIMORE, P.E. #17516 — DATE

CLV# ___-_____

Actus
3285 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9266
Engineering - Surveying - Consulting - Planning

GRADING PLAN 10
LARK HILL
TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

BY	DESCRIPTION	DATE
A		



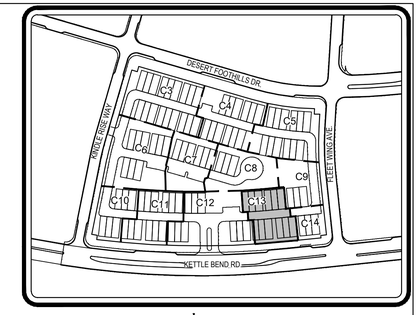
8/12/2022

DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201
SHEET GROUP	GRADING
SHEET NUMBER	C12

SHEET 12 OF 22

Plot Stamp: 8/12/2022 11:39:42 AM - John Austin Jr
File: P:\TMH012201 - Lark Hill (Village 22 - Parcel 6 QR)\Civil_CD\TMH012201_CD-GRAD.dwg, Tab: C12





GRADING CONSTRUCTION NOTES

1. PROTECT IN PLACE
2. MATCH EXISTING ASPHALT, CURB, SIDEWALK, GUTTER, OR VALLEY GUTTER. SAWCUT CLEAN EDGE FOR CONNECTION.
3. CONSTRUCT 2" AC PAVEMENT OVER 4" TYPE II AGGREGATE BASE COMPATED PER SOILS REPORT
4. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
5. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
6. CONSTRUCT 30" MODIFIED ROLL CURB PER CCAUSD #217.1
7. CONSTRUCT 5' TRANSITION "L" TYPE CURB TO 30" MODIFIED ROLL CURB PER DETAIL "B5", SHEET C17
8. CONSTRUCT ROLL CURB TO "A" TRANSITION
9. CONSTRUCT 4' WIDE SIDEWALK WITH DECORATIVE PAVERS OVER 5" THICK TYPE II AGGREGATE BASE PER CCAUSD #206.S3
10. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD #234
11. CONSTRUCT SIDEWALK RAMP PER CCAUSD #235 CASE III. "A" & "B" = 8' UNLESS OTHERWISE NOTED.
12. CONSTRUCT SIDEWALK DRAIN PER CCAUSD #236
13. CONSTRUCT 8' CROSS GUTTER PER CCAUSD #228
14. CONSTRUCT 2' VALLEY GUTTER PER DETAIL AA, SHEET C17
15. CONSTRUCT 6" PVC SIDEWALK UNDER DRAIN PER DETAIL "CC", SHEET C17
16. CONSTRUCT WHEEL PATH USING DECORATIVE PAVERS (H20 LOADING)
17. CONSTRUCT 2.5' VALLEY GUTTER PER DETAIL "GG", SHEET C17
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CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

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FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

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BY: UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER: 4030-2100371
DATED: 3/4/2022

PARKING INFORMATION

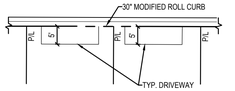
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TYPICAL DRIVEWAY DETAIL

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DARRYL LATTIMORE, P.E. #17516 — DATE

CLV# ___-_____

Actus
3285 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
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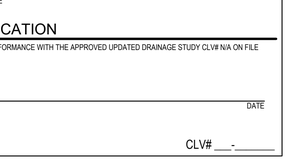
GRADING PLAN 11

LARK HILL

TAYLOR MORRISON

CITY OF LAS VEGAS, NEVADA

NO.	DATE	DESCRIPTION	BY

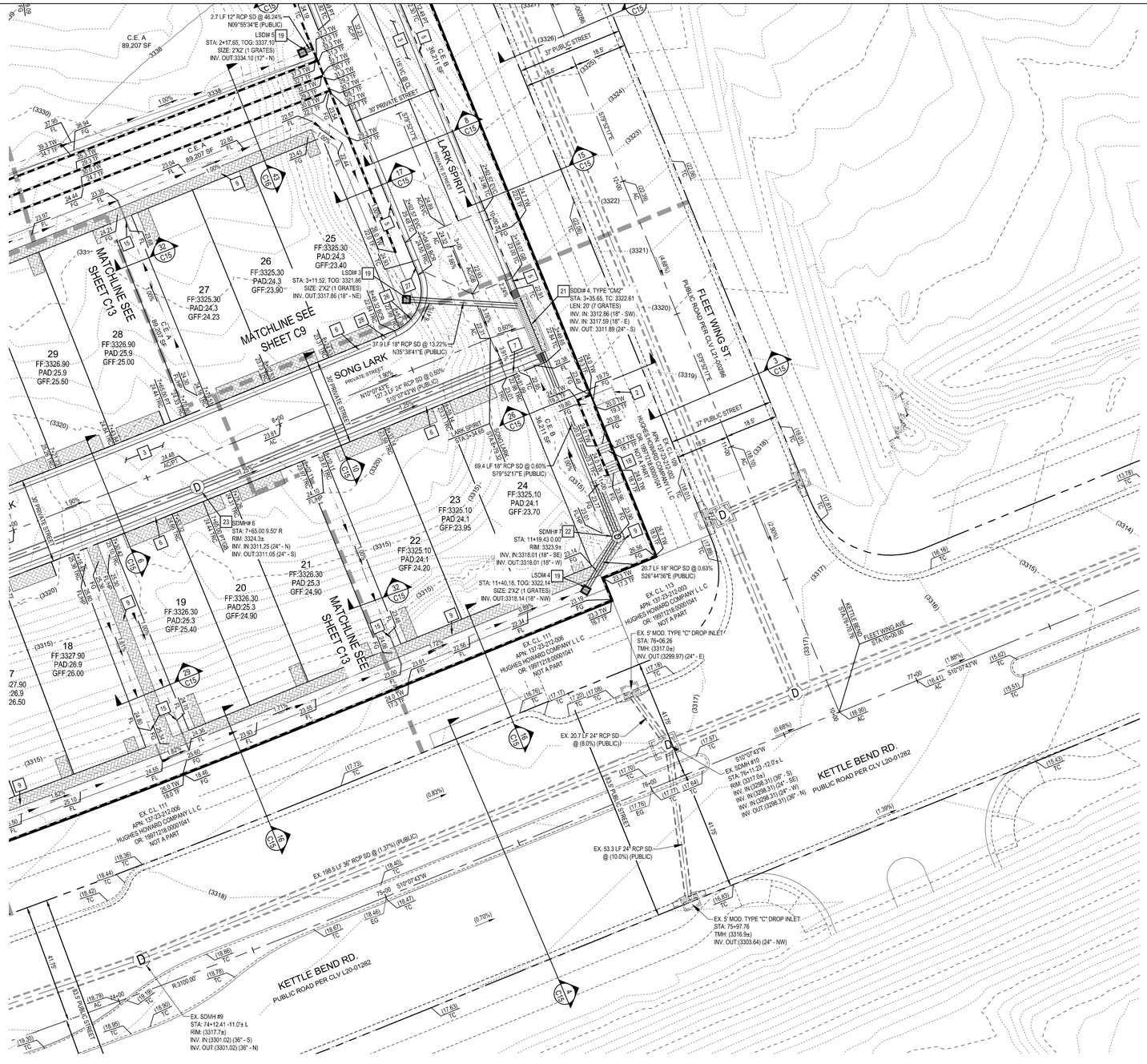


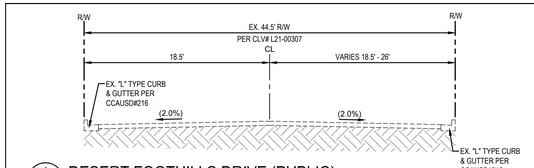
8/12/2022

DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201
SHEET GROUP	GRADING
SHEET NUMBER	C13

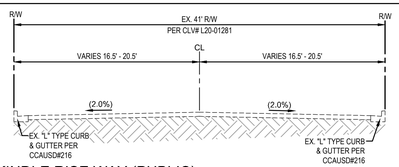
SHEET 13 OF 22

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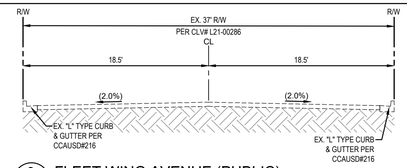

MATCHLINE SEE SHEET C13
MATCHLINE SEE SHEET C9
SONG LARK
PRIVATE STREET
LARK SPIRIT
PRIVATE STREET
FLEET WING ST.
PUBLIC ROAD PER CLV L21-002286
37' PUBLIC STREET
KETTLE BEND RD.
PUBLIC ROAD PER CLV L20-012282
KETTLE BEND STORMDRAIN
FLEET WING AVE STA:10+00.00
C.E. A 89,207 SF
C.E. B 36,211 SF
25 FF:3325.30 PAD:24.3 GFF:23.40
26 FF:3325.30 PAD:24.3 GFF:23.90
27 FF:3325.30 PAD:24.3 GFF:24.23
28 FF:3326.90 PAD:25.9 GFF:25.00
29 FF:3326.90 PAD:25.9 GFF:25.50
18 FF:3327.90 PAD:26.9 GFF:26.00
19 FF:3326.30 PAD:25.3 GFF:25.40
20 FF:3326.30 PAD:25.3 GFF:24.90
21 FF:3326.30 PAD:25.3 GFF:24.90
22 FF:3325.10 PAD:24.1 GFF:24.20
23 FF:3325.10 PAD:24.1 GFF:23.95
24 FF:3325.10 PAD:24.1 GFF:23.70
2.7 LF 12" RCP SD @ 46.24% N09°55'34"E (PUBLIC)
LSDI# 5 STA: 2+17.65, TOG: 3337.10 SIZE: 2'X2' (1 GRATES) INV. OUT:3334.10 (12" - N)
LSDI# 3 STA: 3+11.52, TOG: 3321.86 SIZE: 2'X2' (1 GRATES) INV. OUT:3317.86 (18" - NE)
SDI# 4, TYPE "CM2" STA: 3+35.65, TC: 3322.61 LEN: 20' (7 GRATES) INV. IN: 3312.86 (18" - SW) INV. IN: 3317.59 (18" - E) INV. OUT: 3311.89 (24" - S)
37.9 LF 18" RCP SD @ 13.22% N35°38'41"E (PUBLIC)
N10°07'43"E 24" RCP SD @ 0.50%
310°07'43"W (PUBLIC)
69.4 LF 18" RCP SD @ 0.60% S79°52'17"E (PUBLIC)
SDMH# 7 STA: 11+19.43 0.00' RIM: 3323.9± INV. IN:3318.01 (18" - SE) INV. OUT:3318.01 (18" - W)
LSDI# 4 STA: 11+40.18, TOG: 3322.14 SIZE: 2'X2' (1 GRATES) INV. OUT:3318.14 (18" - NW)
20.7 LF 18" RCP SD @ 0.63% S26°44'36"E (PUBLIC)
EX. 5' MOD. TYPE "C" DROP INLET STA: 76+06.26 TMH: (3317.0±) INV. OUT:(3299.97) (24" - E)
EX. C.L. 111 APN: 137-23-212-006 HUGHES HOWARD COMPANY L L C OR: 19971218:00001041 NOT A PART
EX. C.L. 113 APN: 137-23-212-003 HUGHES HOWARD COMPANY L L C OR: 19971218:00001041 NOT A PART
EX. 20.7 LF 24" RCP SD @ (8.0%) (PUBLIC))
EX. SDMH #10 STA: 76+11.23 - 12.0'± L RIM: (3317.2±) INV. IN:(3298.31) (36" - S) INV. IN:(3298.31) (24" - W) INV. IN:(3298.31) (36" - N) INV. OUT:(3298.31) (36" - N)
EX. 53.3 LF 24" RCP SD @ (10.0%) (PUBLIC)
Ex. 198.5 LF 36" RCP SD @ (1.37%) (PUBLIC)
EX. 5' MOD. TYPE "C" DROP INLET STA: 75+97.76 TMH: (3316.9±) INV. OUT:(3303.64) (24" - NW)
EX. SDMH #9 STA: 74+12.41 -11.0'± L RIM: (3317.7±) INV. IN:(3301.02) (36" - S) INV. OUT:(3301.02) (36" - N)
C1 SR
C2 SR
C3 SR
C4 SR
C5 SR
C6 SR
C7 SR
C8 SR
C9 SR
C10 SR
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C12 SR
C13 SR
C14 SR
C15 SR
C16 SR
C17 SR
C18 SR
C19 SR
C20 SR



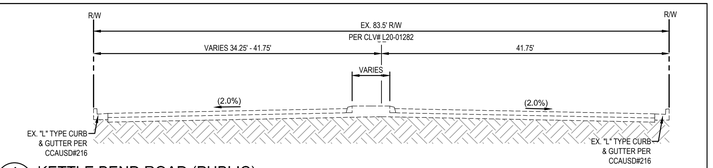
1 DESERT FOOTHILLS DRIVE (PUBLIC)
NOT TO SCALE



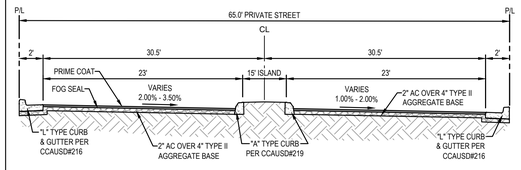
2 KINDLE RISE WAY (PUBLIC)
NOT TO SCALE



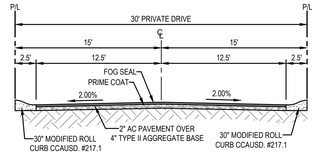
3 FLEET WING AVENUE (PUBLIC)
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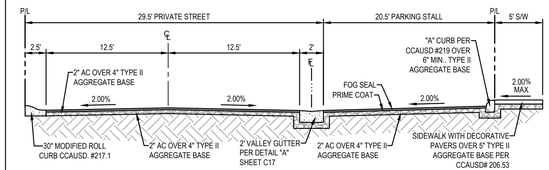
4 KETTLE BEND ROAD (PUBLIC)
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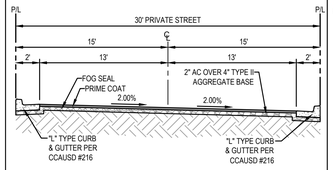
5 65' LARK HILL ENTRY STREET (PRIVATE)
NOT TO SCALE
NO ON-STREET PARKING ALLOWED



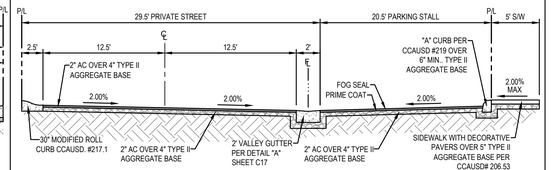
6 30' (PRIVATE) STREET SECTION
NOT TO SCALE
NO ON-STREET PARKING ALLOWED



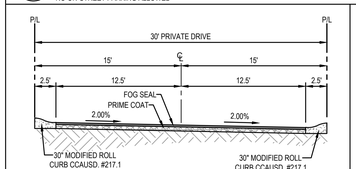
7 30' (PRIVATE) STREET SECTION W/ PARKING STALL
NOT TO SCALE
NO ON-STREET PARKING ALLOWED



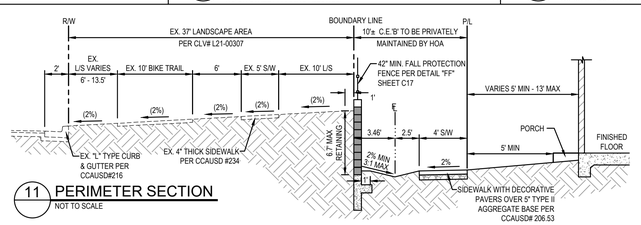
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NO ON-STREET PARKING ALLOWED



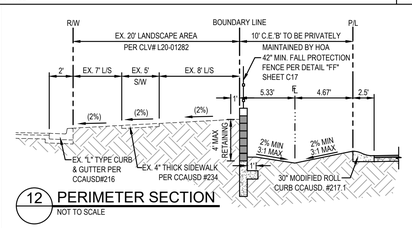
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NOT TO SCALE
NO ON-STREET PARKING ALLOWED



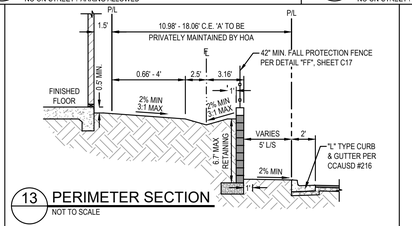
10 30' (PRIVATE) STREET SECTION
NOT TO SCALE
NO ON-STREET PARKING ALLOWED



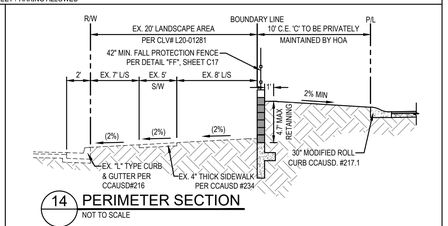
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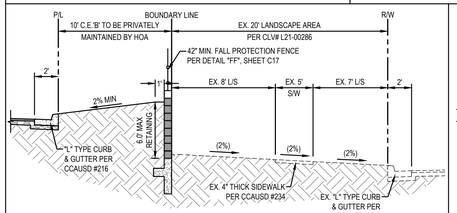
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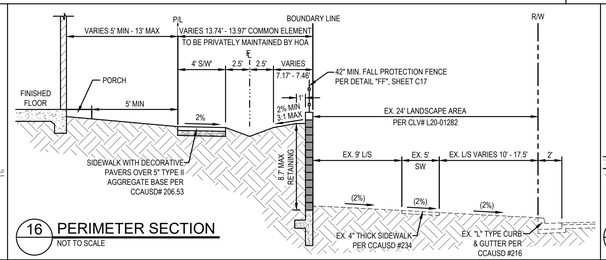
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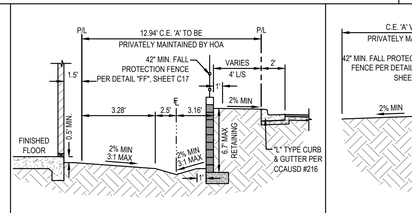
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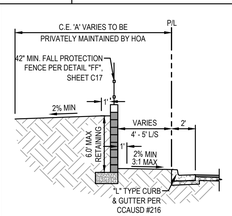
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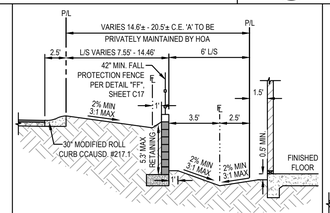
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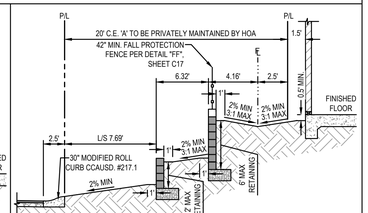
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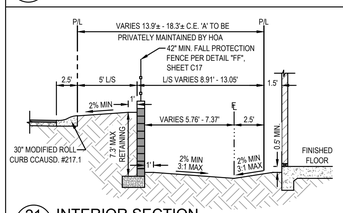
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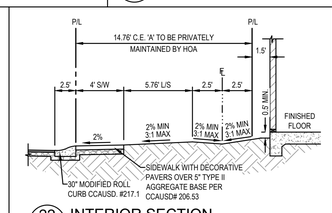
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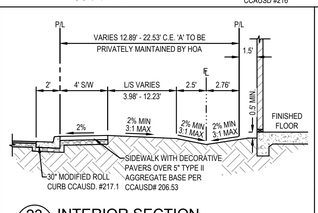
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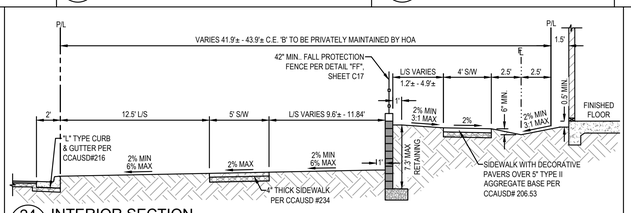
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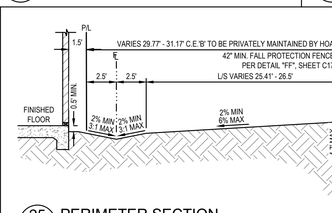
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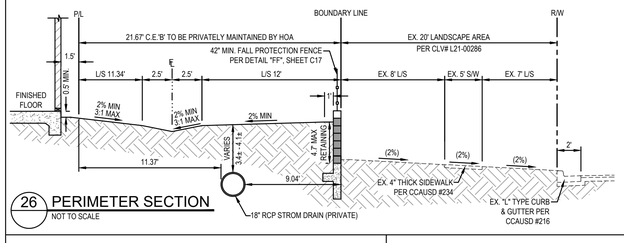
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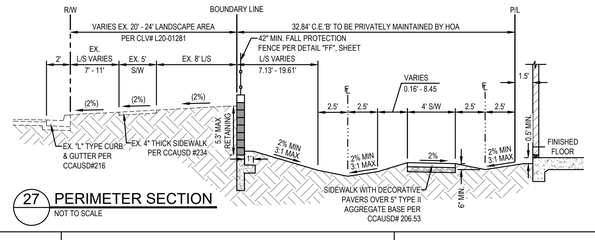
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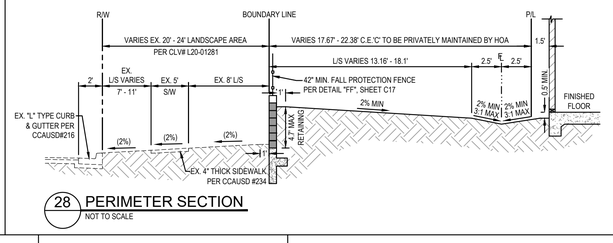
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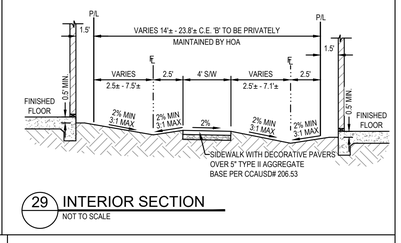
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27 PERIMETER SECTION
NOT TO SCALE



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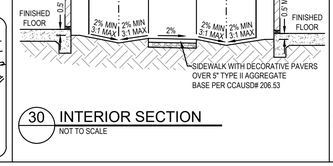


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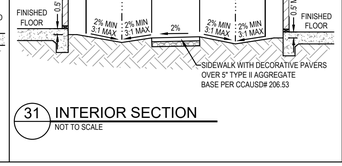
WALL NOTES

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3. ALL RETAINING WALLS SHALL BE WATER-PROOFED.
4. WROUGHT IRON FENCE GATE DETAILS, FOUNDATIONS & PLANS BY OTHERS
5. ALL BLOCK WALLS, WROUGHT IRON FENCING AND GATES MUST MEET ALL SUMMERLIN WEST RESIDENTIAL DESIGN CRITERIA

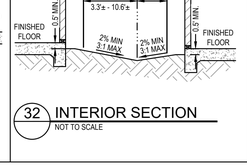




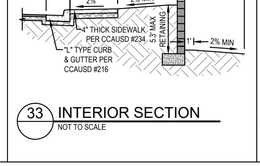
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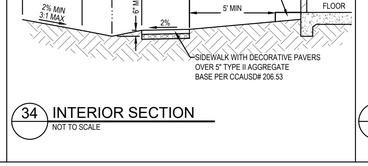
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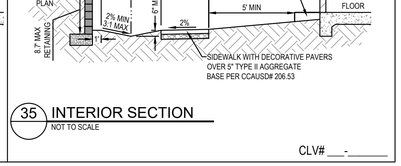
32 INTERIOR SECTION
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33 INTERIOR SECTION
NOT TO SCALE



34 INTERIOR SECTION
NOT TO SCALE



35 INTERIOR SECTION
NOT TO SCALE

CLV# ___-_____

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3285 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
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Engineering - Surveying - Consulting - Planning

SECTIONS & DETAILS SHEET 1
LARK HILL
TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

BY	DATE	DESCRIPTION
A		

PROFESSIONAL ENGINEER — DARRYL C. LATTIMORE — EXP: 12/31/23 — CIVIL — No. 17516 — STATE OF NEVADA

8/12/2022

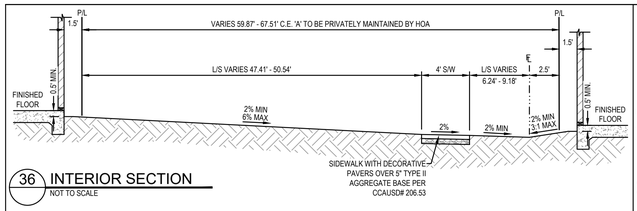
DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201

SHEET GROUP
DETAILS

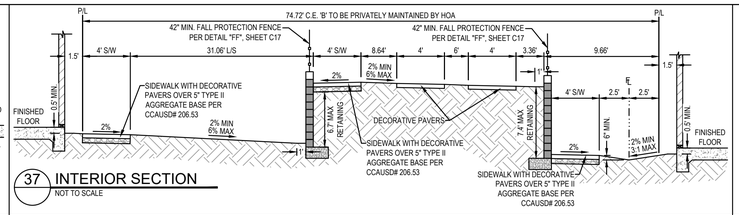
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C15

SHEET 15 OF 22

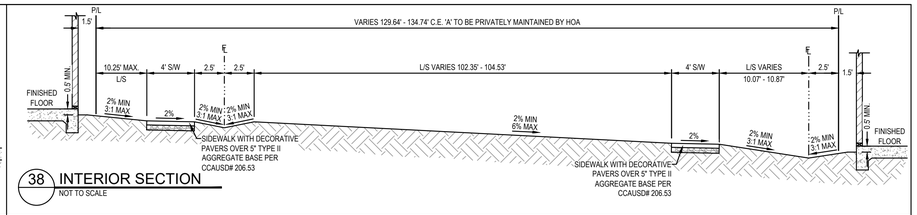
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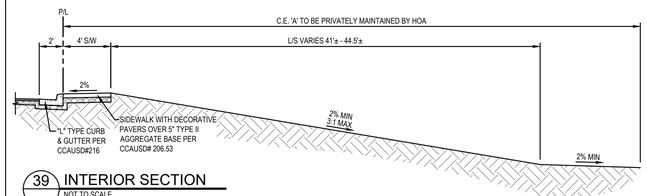
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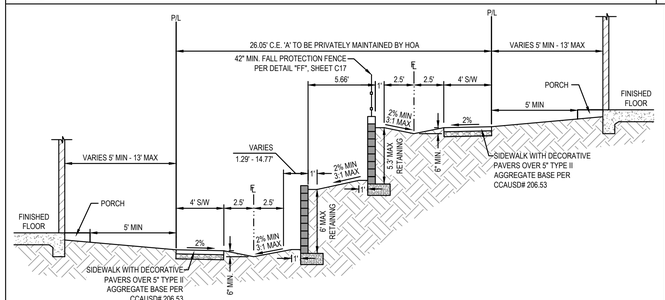
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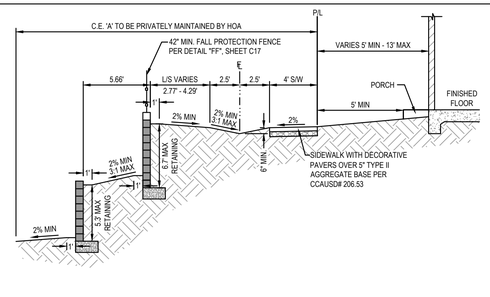
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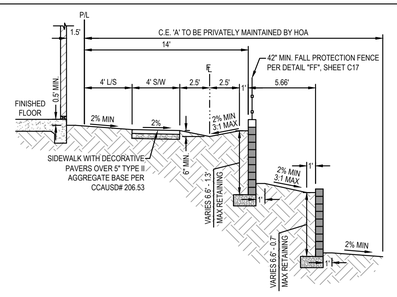
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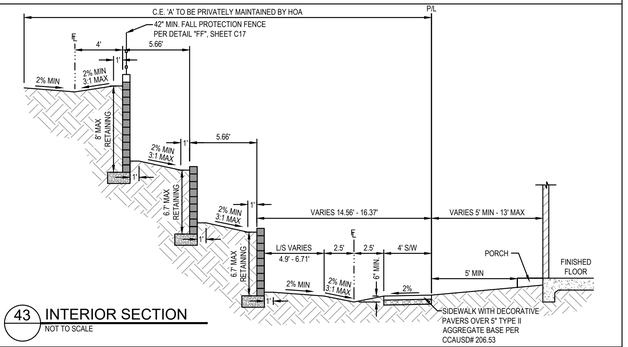
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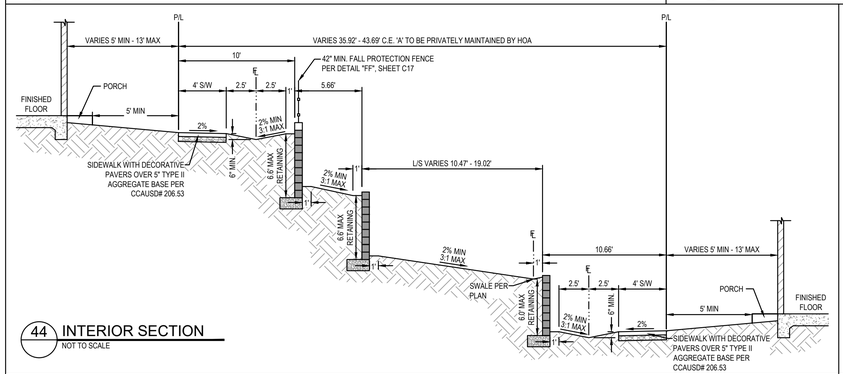
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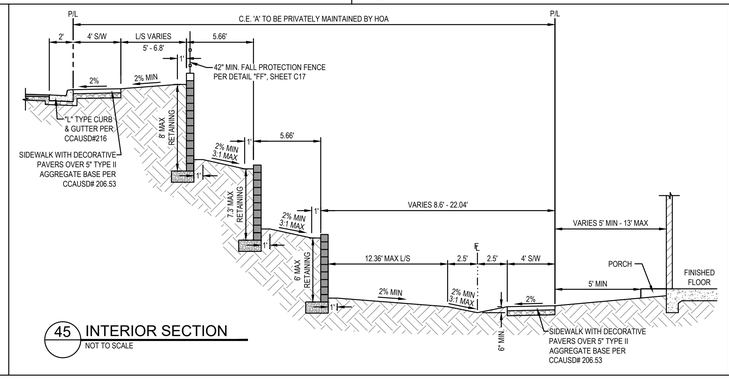
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43 INTERIOR SECTION
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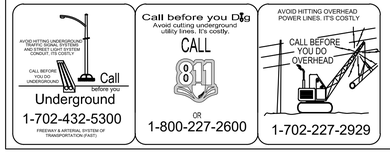
44 INTERIOR SECTION
NOT TO SCALE



45 INTERIOR SECTION
NOT TO SCALE

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2. CONSTRUCTION OF BLOCK WALLS AND FLOOD WALLS REQUIRE A SEPARATE BUILDING PERMIT AND APPROVAL BY THE BUILDING DEPARTMENT.
3. ALL RETAINING WALLS SHALL BE WATER-PROOFED.
4. WROUGHT IRON FENCE GATE DETAILS, FOUNDATIONS & PLANS BY OTHERS
5. ALL BLOCK WALLS, WROUGHT IRON FENCING AND GATES MUST MEET ALL SUMMERLIN WEST RESIDENTIAL DESIGN CRITERIA



CLV# ___-_____

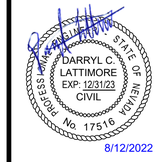
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SECTIONS & DETAILS SHEET 2

LARK HILL

TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

#	DATE	DESCRIPTION	BY
4			



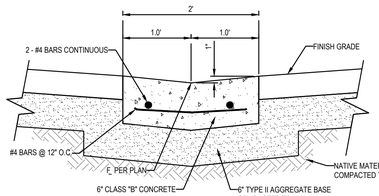
DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201

SHEET GROUP
DETAILS

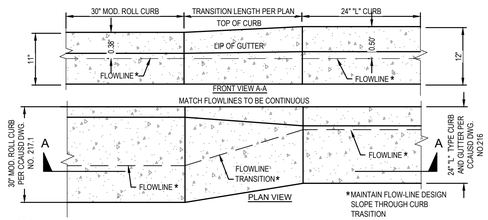
SHEET NUMBER
C16

SHEET 16 OF 22

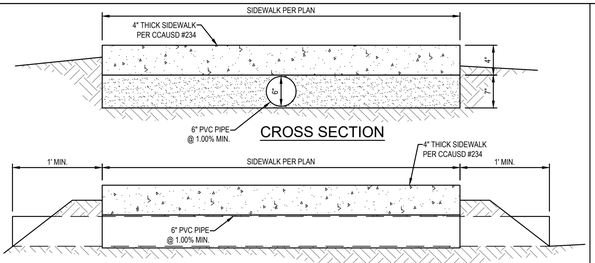
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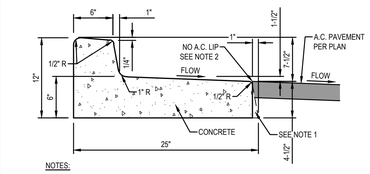
AA 2' VALLEY GUTTER
NOT TO SCALE



BB CURB TRANSITION DETAIL - 'L' CURB TO 30" ROLL CURB
NOT TO SCALE

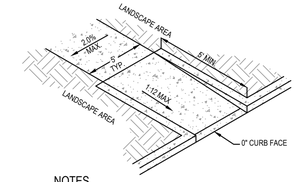


CC 6" PVC SIDEWALK UNDER DRAIN
NOT TO SCALE



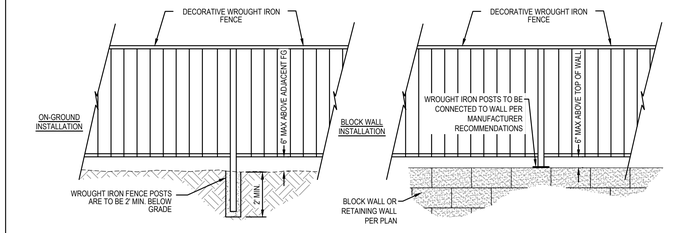
NOTES:
1. 1" BATTER ON GUTTER FACE IS OPTIONAL
2. FINAL EDGE OF ASPHALT IS TO BE THE SAME ELEVATION AS LIP OF GUTTER.
3. WHERE LONGITUDINAL SLOPE IS LESS THAN 0.4%, THE FLOW LINE SHALL BE WATER TESTED.
4. WEAKENED PLAN JOINTS PER CCAUSD #234
5. 1/2" EXPANSION JOINT AT ALL COLD JOINTS, AT BEGINNING AND END OF RETURN AND AT 300' MAX. INTERVALS FOR FORMED CURB. FOR JOINT DETAIL SEE CCAUSD #234

DD SPILL CURB
NOT TO SCALE

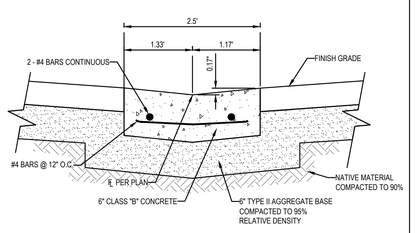


NOTES
1. RAMPS SHALL BE CONSTRUCTED WITH A ROUGH BROOM FINISH TRANSVERSE TO THE SLOPE OF THE RAMP.

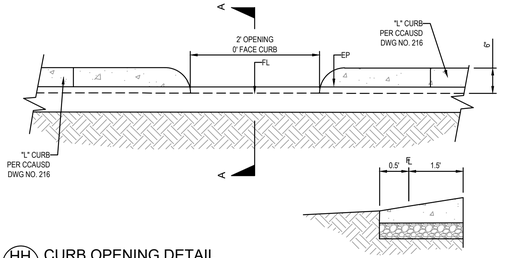
EE SIDEWALK RAMP (ON-SITE ONLY)
NOT TO SCALE



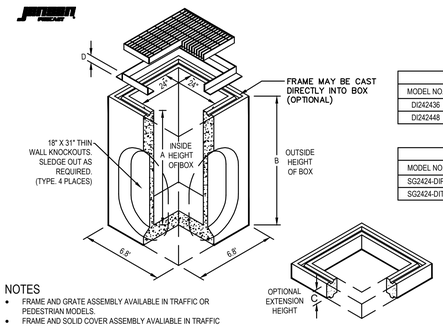
FF WROUGHT IRON FENCE
NOT TO SCALE



GG 2.5' VALLEY GUTTER
NOT TO SCALE



HH CURB OPENING DETAIL
NOT TO SCALE



DROP INLET			
MODEL NO.	A	B	*WEIGHT
DI242436	36"	42"	1900 LBS.
DI242448	48"	54"	2500 LBS.

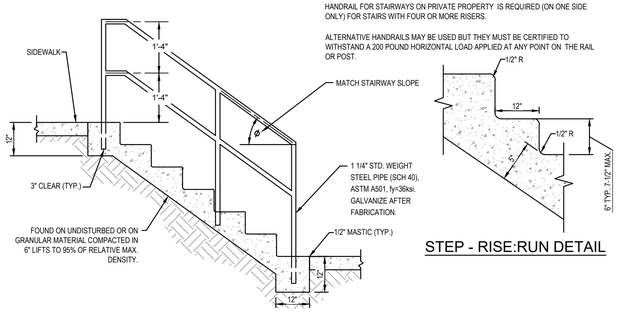
*BOX ONLY

FRAME AND GRATE			
MODEL NO.	RATING	D	WEIGHT
SG2424-DIP	PEDESTRIAN	1 1/2"	41 LBS.
SG2424-DIT	TRAFFIC	3"	120 LBS.

EXTENSION		
MODEL NO.	C	WEIGHT
RS242406	6"	300 LBS.
RS242412	12"	600 LBS.

NOTES
- FRAME AND GRATE ASSEMBLY AVAILABLE IN TRAFFIC OR PEDESTRIAN MODELS.
- FRAME AND SOLID COVER ASSEMBLY AVAILABLE IN TRAFFIC OR PEDESTRIAN MODELS.
- DESIGN FOR H-20-44 BRIDGE LOADING.
- ASSEMBLY TO BE PLACED ON A 6" BASE OF CRUSHER RUN FOR EASE OF INSTALLATION AND EVEN LOAD DISTRIBUTION.
- FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN PRECAST.
- ILLUSTRATION IS TYPICAL ONLY OF GENERAL SERIES CONFIGURATION: FOR SPECIFIC CONFIGURATION, CALL JENSEN PRECAST.

JJ 24" X 24" DRAIN INLET
NOT TO SCALE



HANDRAIL FOR STAIRWAYS ON PRIVATE PROPERTY IS REQUIRED (ON ONE SIDE ONLY) FOR STAIRS WITH FOUR OR MORE RISERS.

ALTERNATIVE HANDRAILS MAY BE USED BUT THEY MUST BE CERTIFIED TO WITHSTAND A 200 POUND HORIZONTAL LOAD APPLIED AT ANY POINT ON THE RAIL OR POST.

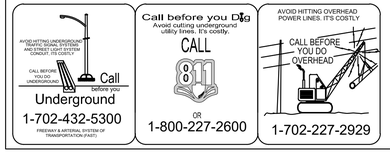
STEP - RISE:RUN DETAIL

NOTE
STAIRS REQUIRE A SEPARATE BUILDING PERMIT AND APPROVAL BY THE BUILDING DEPARTMENT.

KK TYP. STAIRS AND HAND-RAILS
NOT TO SCALE

EASEMENT NOTES

1. ALL EASEMENTS SHOWN AS PROPOSED ARE TO BE GRANTED PER CLV#:___-_____
2. UNLESS OTHERWISE NOTED HEREIN, ALL EASEMENTS ARE PRIVATELY MAINTAINED BY HOA.



CLV# ___-_____

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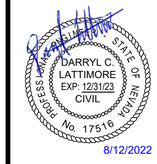
SECTIONS & DETAILS SHEET 3

LARK HILL

TAYLOR MORRISON

CITY OF LAS VEGAS, NEVADA

BY	DATE	DESCRIPTION
A		



8/12/2022

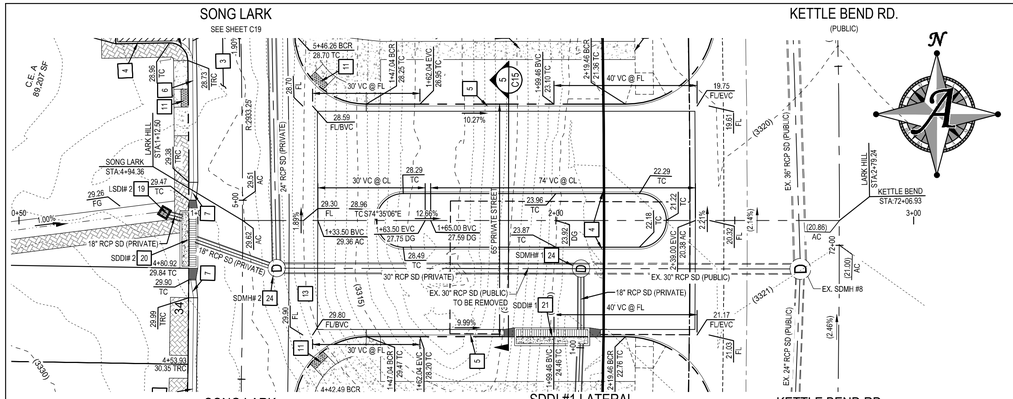
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PROJECT #	TMH012201

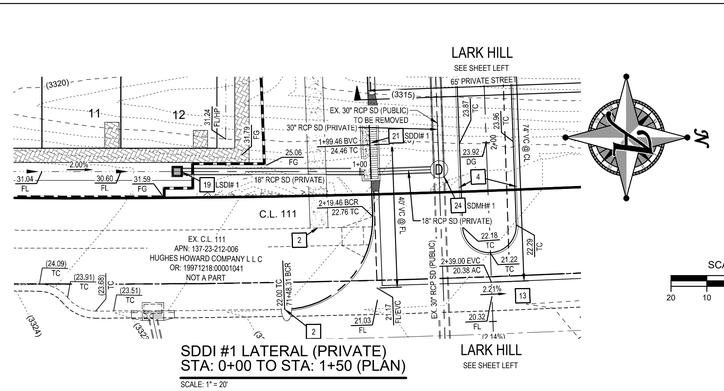
SHEET GROUP
DETAILS

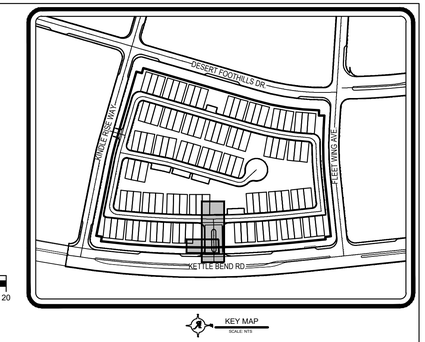
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SHEET 17 OF 22

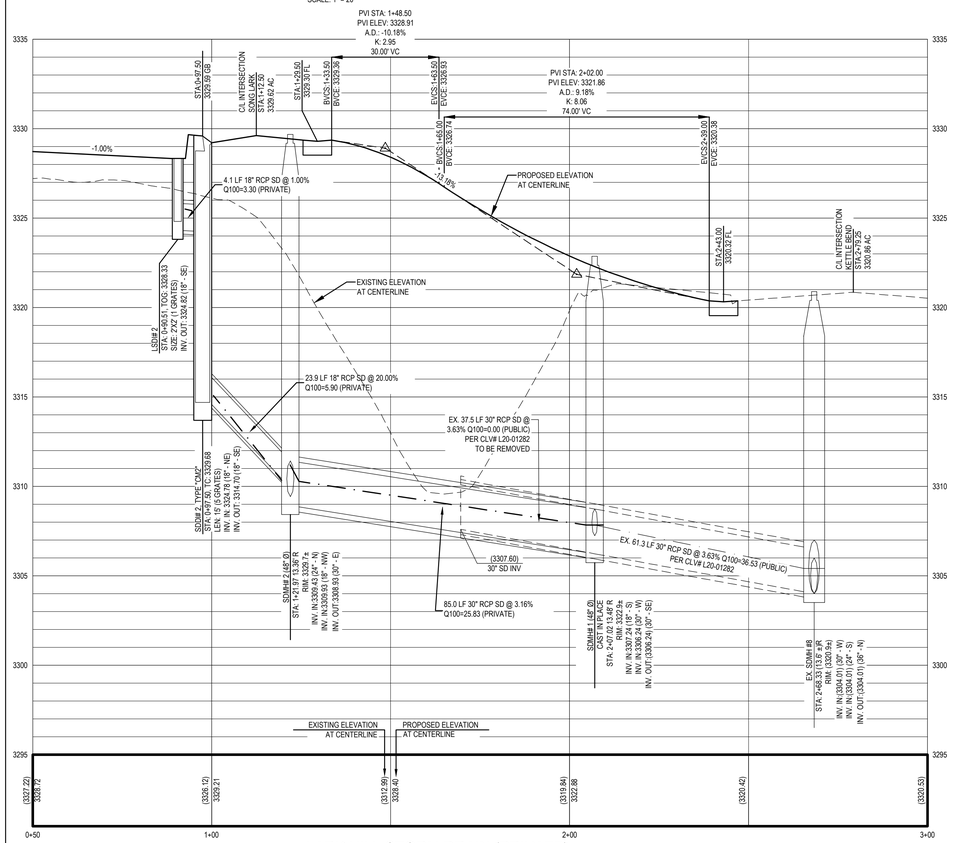
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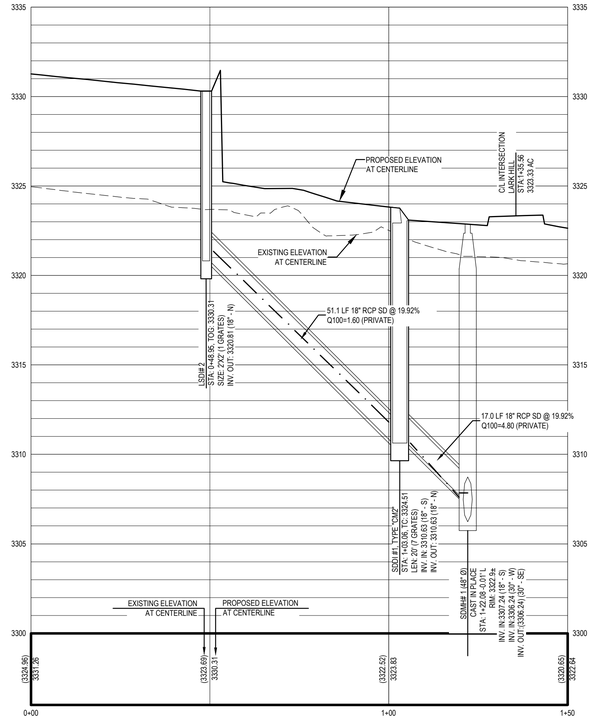




SCALE: 1"= 20'
20 10 0 20



LARK HILL STORM DRAIN (PRIVATE)
STA: 0+50 TO STA: 3+00 (PROFILE)
HORIZONTAL SCALE: 1" = 20' | VERTICAL SCALE: 1" = 4'



SDDI #1 LATERAL (PRIVATE)
STA: 0+00 TO STA: 1+50 (PROFILE)
HORIZONTAL SCALE: 1" = 20' | VERTICAL SCALE: 1" = 4'

GRADING CONSTRUCTION NOTES

1. PROTECT IN PLACE
2. MATCH EXISTING ASPHALT, CURB, SIDEWALK, GUTTER, OR VALLEY GUTTER. SAWCUT CLEAN EDGE FOR CONNECTION.
3. CONSTRUCT 2" AC PAVEMENT OVER 4" TYPE II AGGREGATE BASE COMPATED PER SOILS REPORT
4. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
5. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
6. CONSTRUCT 30" MODIFIED ROLL CURB PER CCAUSD #217.1
7. CONSTRUCT 5' TRANSITION "L" TYPE CURB TO 30" MODIFIED ROLL CURB PER DETAIL "B8", SHEET C17
8. CONSTRUCT ROLL CURB TO "A" TRANSITION
9. CONSTRUCT 4' WIDE SIDEWALK WITH DECORATIVE PAVERS OVER 5" THICK TYPE II AGGREGATE BASE PER CCAUSD #206.S3
10. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD #234
11. CONSTRUCT SIDEWALK RAMP PER CCAUSD #235 CASE III. "A" & "B" = 8' UNLESS OTHERWISE NOTED.
12. CONSTRUCT SIDEWALK DRAIN PER CCAUSD #236
13. CONSTRUCT 8' CROSS GUTTER PER CCAUSD #228
14. CONSTRUCT 2' VALLEY GUTTER PER DETAIL AA, SHEET C17
15. CONSTRUCT 6" PVC SIDEWALK UNDER DRAIN PER DETAIL "CC", SHEET C17
16. CONSTRUCT WHEEL PATH USING DECORATIVE PAVERS (H20 LOADING)
17. CONSTRUCT 2.5' VALLEY GUTTER PER DETAIL "GG", SHEET C17
18. CONSTRUCT STEPS AND HANDRAILS TO BE BUILT BY OTHERS PER DETAIL "KK", SHEET C17
19. INSTALL 24" X 24" YARD INLET PER DETAIL "JJ", SHEET C17
20. CONSTRUCT 15' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
21. CONSTRUCT 20' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
22. CONSTRUCT 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
23. CONSTRUCT 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
24. CONSTRUCT 48" TYPE II STORM DRAIN MANHOLE PER CCAUSD #401 & 405
25. CONSTRUCT 7.5' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
26. CONSTRUCT SPILL CURB TO PROVIDE POSITIVE FLOW FROM FLOW LINE TO LIP OF GUTTER PER DETAIL "DD", SHEET C17
27. CONSTRUCT SPILL CURB TO "L" TYPE CURB TRANSITION
28. CONSTRUCT 30" MODIFIED ROLL CURB TO SPILL CURB TRANSITION
29. CONSTRUCT CURB OPENING FOR POSITIVE DRAINAGE
30. CONSTRUCT GATES PER CCAUSD #425.S1 & SUMMERLIN WEST RESIDENTIAL DESIGN GUIDELINES

LEGEND

PROPOSED	EXISTING	DESCRIPTION
		PUBLIC R/W LINE
		PRIVATE R/W LINE
		BOUNDARY LINE
		EASEMENT LINE
		MATCH LINE
		PHASE LINE
		CENTERLINE
		EDGE OF ASPHALT
		CURB & GUTTER
		RETAINING WALL - DECORATIVE UNLESS OTHERWISE NOTED
		DECORATIVE CMU SCREEN WALL UNLESS OTHERWISE NOTED
		SAWCUT LINE
		FLOWLINE
		GRADE BREAK
2500	(2500)	MAJOR CONTOUR - 5'
2503	(2503)	MINOR CONTOUR - 1'
		SCARP
		CONCRETE SURFACE
		PROPOSED ASPHALT PAVEMENT
		REMOVE AND REPLACE ASPHALT
		RIP-RAP
		DEMO/REMOVE ASPHALT
98.76 XX 1.00%	(98.76) XX (1.00%)	ELEVATION GRADE TAG
		GRADE SLOPE TAG
1 C5		SECTION MARKER - DETAIL NUMBER ABOVE SHEET NUMBER
		SIGHT VISIBILITY ZONE

COMMON ABBREVIATIONS

FF	- FINISHED FLOOR	RC	- TOP OF "RIBBON" CURB
TC	- TOP OF CURB	AC	- TOP OF PAVEMENT
FL	- FLOWLINE GRADE	EP	- EDGE OF PAVEMENT
PDE	- PRIVATE DRAINAGE EASEMENT	TW	- TOP OF RETAINING WALL
TF	- TOP OF WALL FOOTER	PRIV.	- PRIVATE
ST.	- STREET	TYP.	- TYPICAL
ESMT	- EASEMENT	R/W	- RIGHT-OF-WAY
BSW	- BACK OF SIDEWALK	EAE	- EMERGENCY ACCESS EASEMENT

STORM DRAIN CONNECTION NOTE

WHEN CONNECTING TO EXISTING RCP, CONTRACTOR SHALL REMOVE THE EXISTING RCP TO THE NEAREST BELL CONNECTION, CONNECT NEW RCP TO EXISTING RCP AND MATCH EXISTING PIPE SLOPE.

LINE & CURVE DATA NOTE

PLEASE REFER TO TRAFFIC SHEETS FOR LINE AND CURVE DATA.

BASIS OF BEARINGS

SOUTH 89°51'26" EAST, BEING THE BEARING OF NORTH LINE OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 59 EAST, M.D.M., CITY LAS VEGAS, CLARK COUNTY, NEVADA AS PER MAP RECORDED IN FILE 123, PAGE 36 OF PARCEL MAPS, IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDERS.

DISCLAIMER NOTE

THE UNDERGROUND UTILITIES AS SHOWN HEREON HAVE BEEN LOCATED FROM OBSERVED FIELD SURVEY EVIDENCE AND EXISTING DRAWINGS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING; PLANS PROVIDED BY THE CLIENT, UTILITY COMPANIES, AND MUNICIPAL AGENCIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.



COMMON LOT NOTE

ALL COMMON LOTS ARE TO BE PUBLIC DRAINAGE, PEDESTRIAN ACCESS, UTILITY, SEWER, AND PRIVATE LANDSCAPE EASEMENTS OVER THEIR ENTIRETY TO BE PRIVATELY MAINTAINED BY THE HOA PER THE APPROVED FINAL MAP FOR THE PROJECT.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3229.29' (NAVD88)
METERS = 984.29 M (NAVD88)

CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

GRADING NOTES

1. ACTUS SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES IN THE PLANS OR CONDITIONS IN THE FILED.
2. FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS, THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
3. WALL DETAILS ARE FOR REFERENCE ONLY AND DO NOT CONSTITUTE A STRUCTURAL DESIGN.
4. CONSTRUCTION OF BLOCK WALLS REQUIRE A SEPARATE BUILDING PERMIT AND APPROVAL BY THE BUILDING DEPARTMENT.

SIGHT VISIBILITY NOTE

NO WALLS, FENCES SHRUBS, UTILITY APPURTENANCES OR ANY OTHER OBJECT, OTHER THAT TRAFFIC CONTROL DEVICES, FIRE HYDRANTS, TREES, AND STREET LIGHT POLES, MAY BE CONSTRUCTED OR INSTALLED WITHIN THE SIGHT VISIBILITY ZONE UNLESS SAID OBJECT IS MAINTAINED AT LESS THAN 24 INCHES IN HEIGHT, MEASURED FROM TOP OF CURB, OR WHERE NO CURB EXISTS, A HEIGHT OF 27 INCHES MEASURED FROM THE TOP OF ADJACENT ASPHALT, GRAVEL OR PAVEMENT STREET SURFACE. THIS RESTRICTION EXTENDS ALONG THE SIGHT VISIBILITY LINE THROUGH LANDSCAPED MEDIANS.

PLEASE REFER TO TRAFFIC SHEETS FOR SIGHT VISIBILITY ZONE DIMENSIONS.

SAWCUT NOTE

FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

ESTIMATED QUANTITIES

NOTE: QUANTITIES SHOWN ARE RAW QUANTITIES AND APPROXIMATE. CONTRACTOR TO DETERMINE HIS OWN QUANTITIES FOR GRADING PURPOSES.
WORK UNDER THIS PLAN CONSTITUTES GRADING IN ACCORDANCE WITH 2018 IBC; ENGINEERING REPORTS AND CERTIFICATIONS IN CONFORMANCE WITH IBC SHALL BE FILED WITH THE COUNTY PRIOR TO COUNTY APPROVAL AT FINAL INSPECTION.

CUT:	3,955 CY
FILL:	111,587 CY
BALANCE:	107,633 (FILL)

NET EXPORTED MATERIAL TO BE DISPOSED OF IN A LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVAL AND ACTIVE GRADING PERMIT.

FLOOD ZONE DESCRIPTION

THIS SITE IS LOCATED IN SHADED ZONE "X", AREAS OF 0.2% ANNUAL CHANCE FLOOD, PER THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL 32003C2150E CLARK COUNTY, NEVADA DATED NOVEMBER 16, 2011.

FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT
BY: UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER: 4030-21003071
DATED: 3/4/2022

PARKING INFORMATION

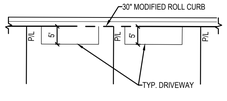
GUEST PARKING PROVIDED:	210 SPACES - (2 SPACES PER GARAGE) 34 PARKING STALLS (2 HANDICAP)
TOTAL PARKING PROVIDED:	244 PARKING SPACES TOTAL

DEDICATION NOTE

ALL EASEMENTS, RIGHT-OF-WAY, AND OTHER DEDICATIONS WITHIN THIS PLAN SET ARE GRANTED PER CLV# ___-_____ UNLESS OTHERWISE NOTED

PRIVATE STREET NOTE

ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS, AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA.



TYPICAL DRIVEWAY DETAIL

NOT TO SCALE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED UPDATED DRAINAGE STUDY CLV# N/A ON FILE WITH THE CITY OF LAS VEGAS.

DARRYL LATTIMORE, P.E. #17516 — DATE

CLV# ___-_____

Actus
3285 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9266
Engineering - Surveying - Consulting - Planning

PLAN & PROFILE - LARK HILL & SDDI #1 LATERAL
LARK HILL
TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

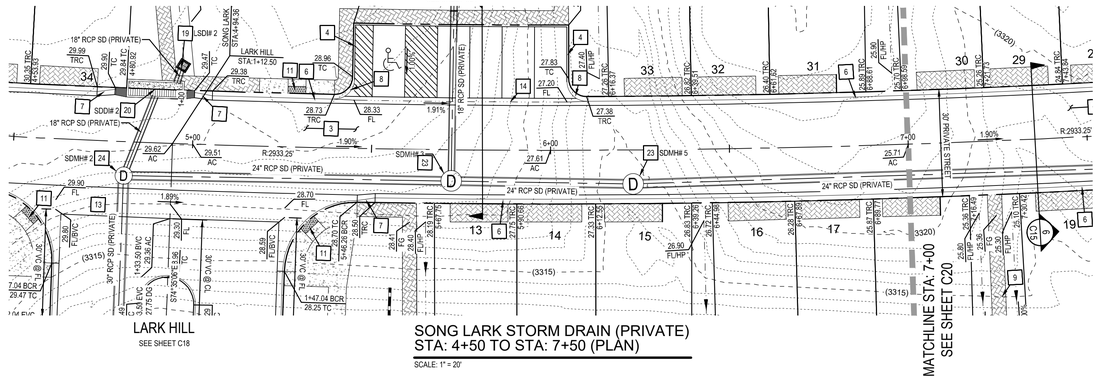
BY	DESCRIPTION	DATE
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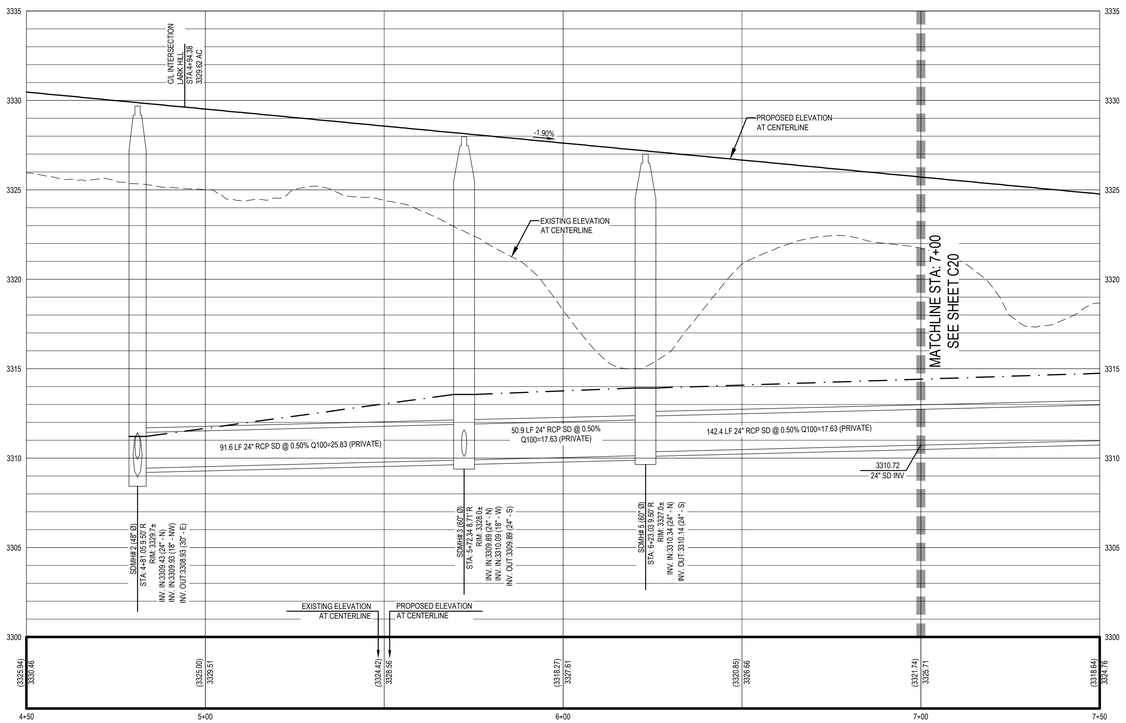
DARRYL C. LATTIMORE — No. 17516 — STATE OF NEVADA — PROFESSIONAL ENGINEER
EXP: 12/31/23
CIVIL
8/12/2022

DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201

SHEET GROUP
PLAN & PROFILES
SHEET NUMBER
C18
SHEET 18 OF 22

Plot Stamp: 8/12/2022 11:41:00 AM - John Austin Jr
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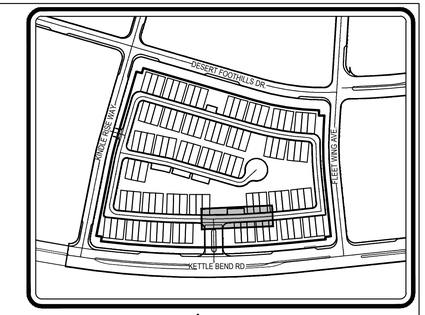




SONG LARK STORM DRAIN (PRIVATE)
STA: 4+50 TO STA: 7+50 (PROFILE)

HORIZONTAL SCALE: 1" = 20' | VERTICAL SCALE: 1" = 4'





GRADING CONSTRUCTION NOTES

1. PROTECT IN PLACE
2. MATCH EXISTING ASPHALT, CURB, SIDEWALK, GUTTER, OR VALLEY GUTTER. SAWCUT CLEAN EDGE FOR CONNECTION.
3. CONSTRUCT 2" AC PAVEMENT OVER 4" TYPE II AGGREGATE BASE COMPATED PER SOILS REPORT
4. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
5. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
6. CONSTRUCT 30" MODIFIED ROLL CURB PER CCAUSD #217.1
7. CONSTRUCT 5' TRANSITION "L" TYPE CURB TO 30" MODIFIED ROLL CURB PER DETAIL "BB", SHEET C17
8. CONSTRUCT ROLL CURB TO "A" TRANSITION
9. CONSTRUCT 4' WIDE SIDEWALK WITH DECORATIVE PAVERS OVER 5" THICK TYPE II AGGREGATE BASE PER CCAUSD #206.S3
10. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD #234
11. CONSTRUCT SIDEWALK RAMP PER CCAUSD #235 CASE III. "A" & "B" = 8' UNLESS OTHERWISE NOTED.
12. CONSTRUCT SIDEWALK DRAIN PER CCAUSD #236
13. CONSTRUCT 8' CROSS GUTTER PER CCAUSD #228
14. CONSTRUCT 2' VALLEY GUTTER PER DETAIL AA, SHEET C17
15. CONSTRUCT 6" PVC SIDEWALK UNDER DRAIN PER DETAIL "CC", SHEET C17
16. CONSTRUCT WHEEL PATH USING DECORATIVE PAVERS (H20 LOADING)
17. CONSTRUCT 2.5' VALLEY GUTTER PER DETAIL "GG", SHEET C17
18. CONSTRUCT STEPS AND HANDRAILS TO BE BUILT BY OTHERS PER DETAIL "KK", SHEET C17
19. INSTALL 24" X 24" YARD INLET PER DETAIL "JJ", SHEET C17
20. CONSTRUCT 15' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
21. CONSTRUCT 20' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
22. CONSTRUCT 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
23. CONSTRUCT 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
24. CONSTRUCT 48" TYPE II STORM DRAIN MANHOLE PER CCAUSD #401 & 405
25. CONSTRUCT 7.5' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
26. CONSTRUCT SPILL CURB TO PROVIDE POSITIVE FLOW FROM FLOW LINE TO LIP OF GUTTER PER DETAIL "DD", SHEET C17
27. CONSTRUCT SPILL CURB TO "L" TYPE CURB TRANSITION
28. CONSTRUCT 30" MODIFIED ROLL CURB TO SPILL CURB TRANSITION
29. CONSTRUCT CURB OPENING FOR POSITIVE DRAINAGE
30. CONSTRUCT GATES PER CCAUSD #425.S1 & SUMMERLIN WEST RESIDENTIAL DESIGN GUIDELINES

LEGEND

PROPOSED	EXISTING	DESCRIPTION
		PUBLIC R/W LINE
		PRIVATE R/W LINE
		BOUNDARY LINE
		EASEMENT LINE
		MATCH LINE
		PHASE LINE
		CENTERLINE
		EDGE OF ASPHALT
		CURB & GUTTER
		RETAINING WALL - DECORATIVE UNLESS OTHERWISE NOTED
		DECORATIVE CMU SCREEN WALL UNLESS OTHERWISE NOTED
		SAWCUT LINE
		FLOWLINE
		GRADE BREAK
2500	(2500)	MAJOR CONTOUR - 5'
2503	(2503)	MINOR CONTOUR - 1'
		SCARP
		CONCRETE SURFACE
		PROPOSED ASPHALT PAVEMENT
		REMOVE AND REPLACE ASPHALT
		RIP-RAP
		DEMO/REMOVE ASPHALT
98.76 XX	(98.76) XX	ELEVATION GRADE TAG
1.00%	(1.00%)	GRADE SLOPE TAG
1 C-5		SECTION MARKER - DETAIL NUMBER ABOVE SHEET NUMBER
		SIGHT VISIBILITY ZONE

COMMON ABBREVIATIONS

FF	- FINISHED FLOOR	RC	- TOP OF "RIBBON" CURB
TC	- TOP OF CURB	AC	- TOP OF PAVEMENT
FL	- FLOWLINE GRADE	EP	- EDGE OF PAVEMENT
PDE	- PRIVATE DRAINAGE EASEMENT	TW	- TOP OF RETAINING WALL
TF	- TOP OF WALL FOOTER	PRIV.	- PRIVATE
ST.	- STREET	TYP.	- TYPICAL
ESMT	- EASEMENT	R/W	- RIGHT-OF-WAY
BSW	- BACK OF SIDEWALK	EAE	- EMERGENCY ACCESS EASEMENT

STORM DRAIN CONNECTION NOTE

WHEN CONNECTING TO EXISTING RCP, CONTRACTOR SHALL REMOVE THE EXISTING RCP TO THE NEAREST BELL CONNECTION, CONNECT NEW RCP TO EXISTING RCP AND MATCH EXISTING PIPE SLOPE.

LINE & CURVE DATA NOTE

PLEASE REFER TO TRAFFIC SHEETS FOR LINE AND CURVE DATA.

BASIS OF BEARINGS

SOUTH 89°51'25" EAST, BEING THE BEARING OF NORTH LINE OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 59 EAST, M.D.M., CITY LAS VEGAS, CLARK COUNTY, NEVADA AS PER MAP RECORDED IN FILE 123, PAGE 36 OF PARCEL MAPS, IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDERS.

DISCLAIMER NOTE

THE UNDERGROUND UTILITIES AS SHOWN HEREON HAVE BEEN LOCATED FROM OBSERVED FIELD SURVEY EVIDENCE AND EXISTING DRAWINGS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING; PLANS PROVIDED BY THE CLIENT, UTILITY COMPANIES, AND MUNICIPAL AGENCIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.



COMMON LOT NOTE

ALL COMMON LOTS ARE TO BE PUBLIC DRAINAGE, PEDESTRIAN ACCESS, UTILITY, SEWER, AND PRIVATE LANDSCAPE EASEMENTS OVER THEIR ENTIRETY TO BE PRIVATELY MAINTAINED BY THE HOA PER THE APPROVED FINAL MAP FOR THE PROJECT.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3229.29' (NAVD88)
METERS = 984.29 M (NAVD88)

CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

GRADING NOTES

1. ACTUS SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES IN THE PLANS OR CONDITIONS IN THE FILED.
2. FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS, THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
3. WALL DETAILS ARE FOR REFERENCE ONLY AND DO NOT CONSTITUTE A STRUCTURAL DESIGN.
4. CONSTRUCTION OF BLOCK WALLS REQUIRE A SEPARATE BUILDING PERMIT AND APPROVAL BY THE BUILDING DEPARTMENT.

SIGHT VISIBILITY NOTE

NO WALLS, FENCES SHRUBS, UTILITY APPURTENANCES OR ANY OTHER OBJECT, OTHER THAT TRAFFIC CONTROL DEVICES, FIRE HYDRANTS, TREES, AND STREET LIGHT POLES, MAY BE CONSTRUCTED OR INSTALLED WITHIN THE SIGHT VISIBILITY ZONE UNLESS SAID OBJECT IS MAINTAINED AT LESS THAN 24 INCHES IN HEIGHT, MEASURED FROM TOP OF CURB, OR WHERE NO CURB EXISTS, A HEIGHT OF 27 INCHES MEASURED FROM THE TOP OF ADJACENT ASPHALT, GRAVEL OR PAVEMENT STREET SURFACE. THIS RESTRICTION EXTENDS ALONG THE SIGHT VISIBILITY LINE THROUGH LANDSCAPED MEDIANS.

PLEASE REFER TO TRAFFIC SHEETS FOR SIGHT VISIBILITY ZONE DIMENSIONS.

SAWCUT NOTE

FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

ESTIMATED QUANTITIES

NOTE: QUANTITIES SHOWN ARE RAW QUANTITIES AND APPROXIMATE. CONTRACTOR TO DETERMINE HIS OWN QUANTITIES FOR GRADING PURPOSES.
WORK UNDER THIS PLAN CONSTITUTES GRADING IN ACCORDANCE WITH 2018 IBC; ENGINEERING REPORTS AND CERTIFICATIONS IN CONFORMANCE WITH IBC SHALL BE FILED WITH THE COUNTY PRIOR TO COUNTY APPROVAL AT FINAL INSPECTION.

CUT:	3,955 CY
FILL:	111,587 CY
BALANCE:	107,633 (FILL)

NET EXPORTED MATERIAL TO BE DISPOSED OF IN A LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVAL AND ACTIVE GRADING PERMIT.

FLOOD ZONE DESCRIPTION

THIS SITE IS LOCATED IN SHADED ZONE "X", AREAS OF 0.2% ANNUAL CHANCE FLOOD, PER THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL 32003C2150E CLARK COUNTY, NEVADA DATED NOVEMBER 16, 2011.

FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT
BY: UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER: 4030-2100371
DATED: 3/4/2022

PARKING INFORMATION

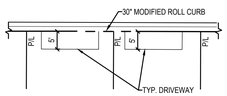
GUEST PARKING PROVIDED:	210 SPACES - (2 SPACES PER GARAGE) 34 PARKING STALLS (2 HANDICAP)
TOTAL PARKING PROVIDED:	244 PARKING SPACES TOTAL

DEDICATION NOTE

ALL EASEMENTS, RIGHT-OF-WAY, AND OTHER DEDICATIONS WITHIN THIS PLAN SET ARE GRANTED PER CLV# ___-_____ UNLESS OTHERWISE NOTED

PRIVATE STREET NOTE

ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS, AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA.



TYPICAL DRIVEWAY DETAIL

NOT TO SCALE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED UPDATED DRAINAGE STUDY CLV# N/A ON FILE WITH THE CITY OF LAS VEGAS.

DARRYL LATTIMORE, P.E. #17516 — DATE

CLV# ___-_____

Actus
3285 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9286
Engineering - Surveying - Consulting - Planning

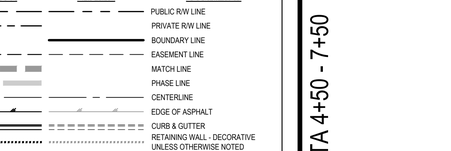
PLAN & PROFILE - SONG LARK STA 4+50 - 7+50

LARK HILL

TAYLOR MORRISON

CITY OF LAS VEGAS, NEVADA

BY	DESCRIPTION	DATE
A		



8/12/2022

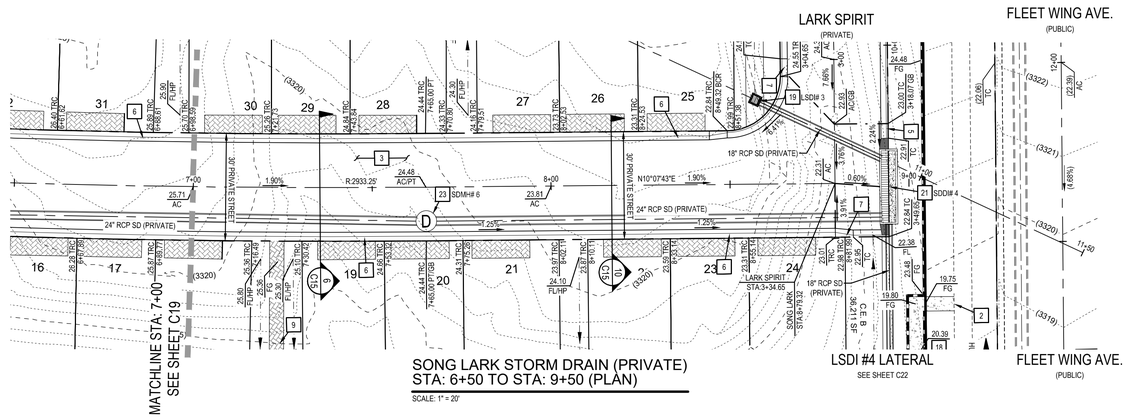
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PROJECT #	TMH012201

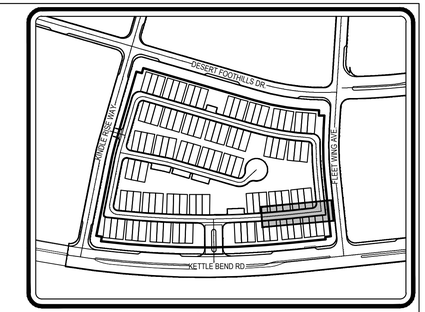
SHEET GROUP
PLAN & PROFILES

SHEET NUMBER
C19

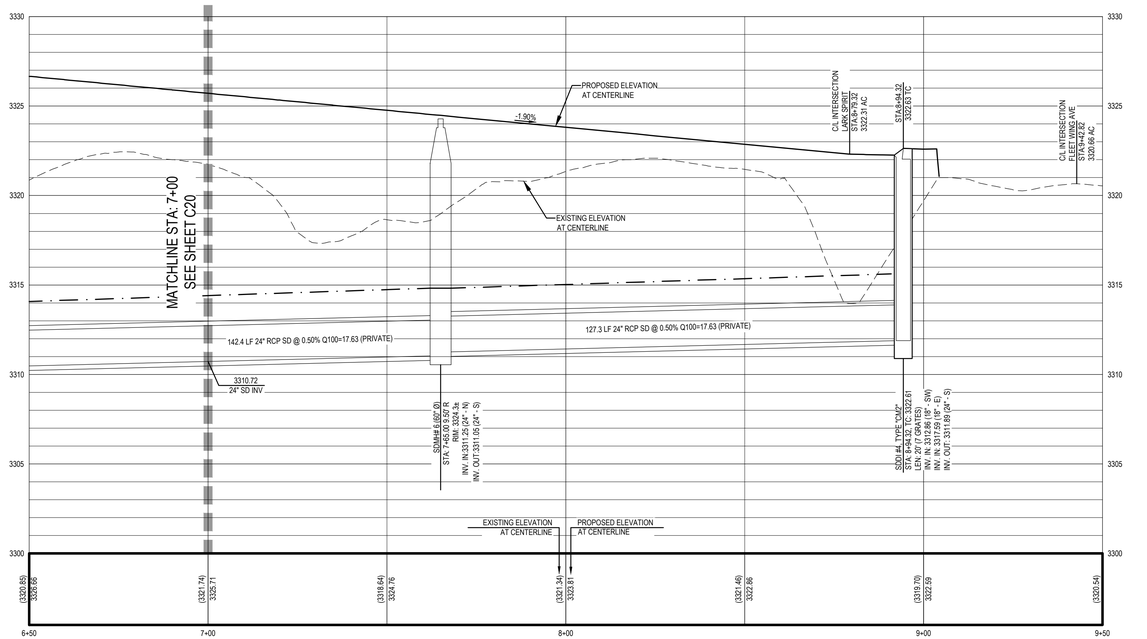
SHEET 19 OF 22

Plot Stamp: 8/12/2022 11:41:12 AM - John Austin Jr
File: P:\TMH012201 - Lark Hill (Village 22 - Parcel 6 QR)\Civil_CD\TMH012201_CD-PROF-STRM.dwg, Tab: C19 - P&P SONG LARK 1





SCALE: 1"= 20'
20 10 0 20



SONG LARK STORM DRAIN (PRIVATE)
STA: 6+50 TO STA: 9+50 (PROFILE)

HORIZONTAL SCALE: 1" = 20' | VERTICAL SCALE: 1" = 4'

GRADING CONSTRUCTION NOTES

1. PROTECT IN PLACE
2. MATCH EXISTING ASPHALT, CURB, SIDEWALK, GUTTER, OR VALLEY GUTTER. SAWCUT CLEAN EDGE FOR CONNECTION.
3. CONSTRUCT 2" AC PAVEMENT OVER 4" TYPE II AGGREGATE BASE COMPATED PER SOILS REPORT
4. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
5. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
6. CONSTRUCT 30" MODIFIED ROLL CURB PER CCAUSD #217.1
7. CONSTRUCT 5' TRANSITION "L" TYPE CURB TO 30" MODIFIED ROLL CURB PER DETAIL "B9", SHEET C17
8. CONSTRUCT ROLL CURB TO "A" TRANSITION
9. CONSTRUCT 4' WIDE SIDEWALK WITH DECORATIVE PAVERS OVER 5" THICK TYPE II AGGREGATE BASE PER CCAUSD #206.S3
10. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD #234
11. CONSTRUCT SIDEWALK RAMP PER CCAUSD #235 CASE III. "A" & "B" = 8' UNLESS OTHERWISE NOTED.
12. CONSTRUCT SIDEWALK DRAIN PER CCAUSD #236
13. CONSTRUCT 8' CROSS GUTTER PER CCAUSD #228
14. CONSTRUCT 2' VALLEY GUTTER PER DETAIL AA, SHEET C17
15. CONSTRUCT 6" PVC SIDEWALK UNDER DRAIN PER DETAIL "CC", SHEET C17
16. CONSTRUCT WHEEL PATH USING DECORATIVE PAVERS (H20 LOADING)
17. CONSTRUCT 2.5' VALLEY GUTTER PER DETAIL "GG", SHEET C17
18. CONSTRUCT STEPS AND HANDRAILS TO BE BUILT BY OTHERS PER DETAIL "KK", SHEET C17
19. INSTALL 24" X 24" YARD INLET PER DETAIL "JJ", SHEET C17
20. CONSTRUCT 15' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
21. CONSTRUCT 20' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
22. CONSTRUCT 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
23. CONSTRUCT 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 & 403
24. CONSTRUCT 48" TYPE II STORM DRAIN MANHOLE PER CCAUSD #401 & 405
25. CONSTRUCT 7.5' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
26. CONSTRUCT SPILL CURB TO PROVIDE POSITIVE FLOW FROM FLOW LINE TO LIP OF GUTTER PER DETAIL "DD", SHEET C17
27. CONSTRUCT SPILL CURB TO "L" TYPE CURB TRANSITION
28. CONSTRUCT 30" MODIFIED ROLL CURB TO SPILL CURB TRANSITION
29. CONSTRUCT CURB OPENING FOR POSITIVE DRAINAGE
30. CONSTRUCT GATES PER CCAUSD #425.S1 & SUMMERLIN WEST RESIDENTIAL DESIGN GUIDELINES

LEGEND

PROPOSED	EXISTING	DESCRIPTION
		PUBLIC R/W LINE
		PRIVATE R/W LINE
		BOUNDARY LINE
		EASEMENT LINE
		MATCH LINE
		PHASE LINE
		CENTERLINE
		EDGE OF ASPHALT
		CURB & GUTTER
		RETAINING WALL - DECORATIVE UNLESS OTHERWISE NOTED
		DECORATIVE CMU SCREEN WALL UNLESS OTHERWISE NOTED
		SAWCUT LINE
		FLOWLINE
		GRADE BREAK
2500	(2500)	MAJOR CONTOUR - 5'
2503	(2503)	MINOR CONTOUR - 1'
		SCARP
		CONCRETE SURFACE
		PROPOSED ASPHALT PAVEMENT
		REMOVE AND REPLACE ASPHALT
		RIP-RAP
		DEMO/REMOVE ASPHALT
XX	(XX)	ELEVATION GRADE TAG
1.00%	(1.00%)	GRADE SLOPE TAG
		SECTION MARKER - DETAIL NUMBER ABOVE SHEET NUMBER
		SIGHT VISIBILITY ZONE

98.76 XX 1.00% — 1 C5 — (98.76) XX (1.00%)

COMMON ABBREVIATIONS

FF	- FINISHED FLOOR	RC	- TOP OF "RIBBON" CURB
TC	- TOP OF CURB	AC	- TOP OF PAVEMENT
FL	- FLOWLINE GRADE	EP	- EDGE OF PAVEMENT
PDE	- PRIVATE DRAINAGE EASEMENT	TW	- TOP OF RETAINING WALL
TF	- TOP OF WALL FOOTER	PRIV.	- PRIVATE
ST.	- STREET	TYP.	- TYPICAL
ESMT	- EASEMENT	R/W	- RIGHT-OF-WAY
BSW	- BACK OF SIDEWALK	EAE	- EMERGENCY ACCESS EASEMENT

STORM DRAIN CONNECTION NOTE

WHEN CONNECTING TO EXISTING RCP, CONTRACTOR SHALL REMOVE THE EXISTING RCP TO THE NEAREST BELL CONNECTION, CONNECT NEW RCP TO EXISTING RCP AND MATCH EXISTING PIPE SLOPE.

LINE & CURVE DATA NOTE

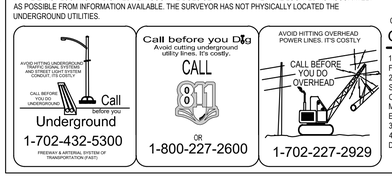
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BASIS OF BEARINGS

SOUTH 89°51'25" EAST, BEING THE BEARING OF NORTH LINE OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 59 EAST, M.D.M., CITY LAS VEGAS, CLARK COUNTY, NEVADA AS PER MAP RECORDED IN FILE 123, PAGE 36 OF PARCEL MAPS, IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDERS.

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BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #5LV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3229.29' (NAVD88)
METERS = 984.29 M (NAVD88)

CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

GRADING NOTES

1. ACTUS SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES IN THE PLANS OR CONDITIONS IN THE FILED.
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SIGHT VISIBILITY NOTE

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SAWCUT NOTE

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ESTIMATED QUANTITIES

NOTE: QUANTITIES SHOWN ARE RAW QUANTITIES AND APPROXIMATE. CONTRACTOR TO DETERMINE HIS OWN QUANTITIES FOR GRADING PURPOSES.
WORK UNDER THIS PLAN CONSTITUTES GRADING IN ACCORDANCE WITH 2018 IBC; ENGINEERING REPORTS AND CERTIFICATIONS IN CONFORMANCE WITH IBC SHALL BE FILED WITH THE COUNTY PRIOR TO COUNTY APPROVAL AT FINAL INSPECTION.

CUT: 3,955 CY
FILL: 111,587 CY
BALANCE: 107,633 (FILL)

NET EXPORTED MATERIAL TO BE DISPOSED OF IN A LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVAL AND ACTIVE GRADING PERMIT.

FLOOD ZONE DESCRIPTION

THIS SITE IS LOCATED IN SHADED ZONE "X", AREAS OF 0.2% ANNUAL CHANCE FLOOD, PER THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL 32003C2150E CLARK COUNTY, NEVADA DATED NOVEMBER 16, 2011.

FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT
BY: UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER: 4030-2100371
DATED: 3/4/2022

PARKING INFORMATION

GUEST PARKING PROVIDED: 210 SPACES - (2 SPACES PER GARAGE)
34 PARKING STALLS (2 HANDICAP)

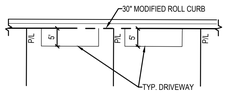
TOTAL PARKING PROVIDED: 244 PARKING SPACES TOTAL

DEDICATION NOTE

ALL EASEMENTS, RIGHT-OF-WAY, AND OTHER DEDICATIONS WITHIN THIS PLAN SET ARE GRANTED PER CLV# ___-_____ UNLESS OTHERWISE NOTED

PRIVATE STREET NOTE

ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS, AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA.



TYPICAL DRIVEWAY DETAIL

NOT TO SCALE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED UPDATED DRAINAGE STUDY CLV# N/A ON FILE WITH THE CITY OF LAS VEGAS.

DARRYL LATTIMORE, P.E. #17516 — DATE

CLV# ___-_____

Actus
3285 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9266
Engineering - Surveying - Consulting - Planning

PLAN & PROFILE - SONG LARK STA 6+50 - 9+50

LARK HILL

TAYLOR MORRISON

CITY OF LAS VEGAS, NEVADA

BY	DESCRIPTION	DATE
A		

DARRYL C. LATTIMORE
EXP: 12/31/23
CIVIL
No. 17516
STATE OF NEVADA
PROFESSIONAL ENGINEER

8/12/2022

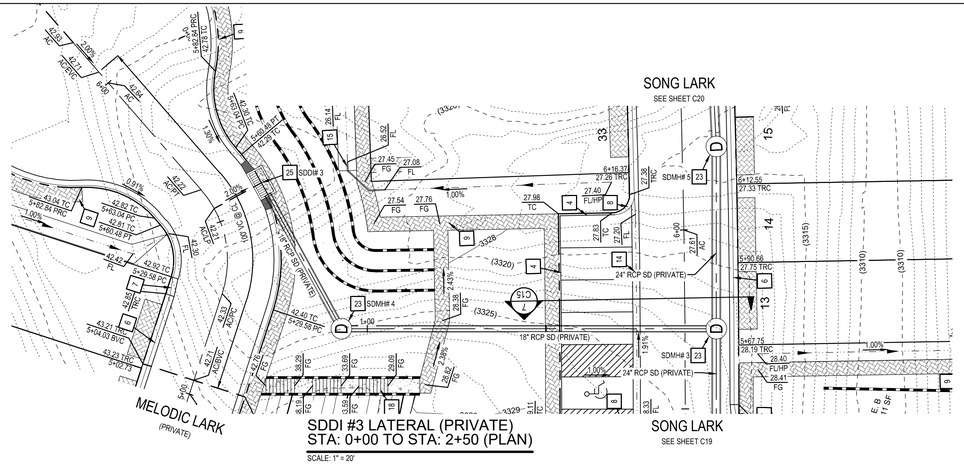
DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201

SHEET GROUP
PLAN & PROFILES

SHEET NUMBER
C20

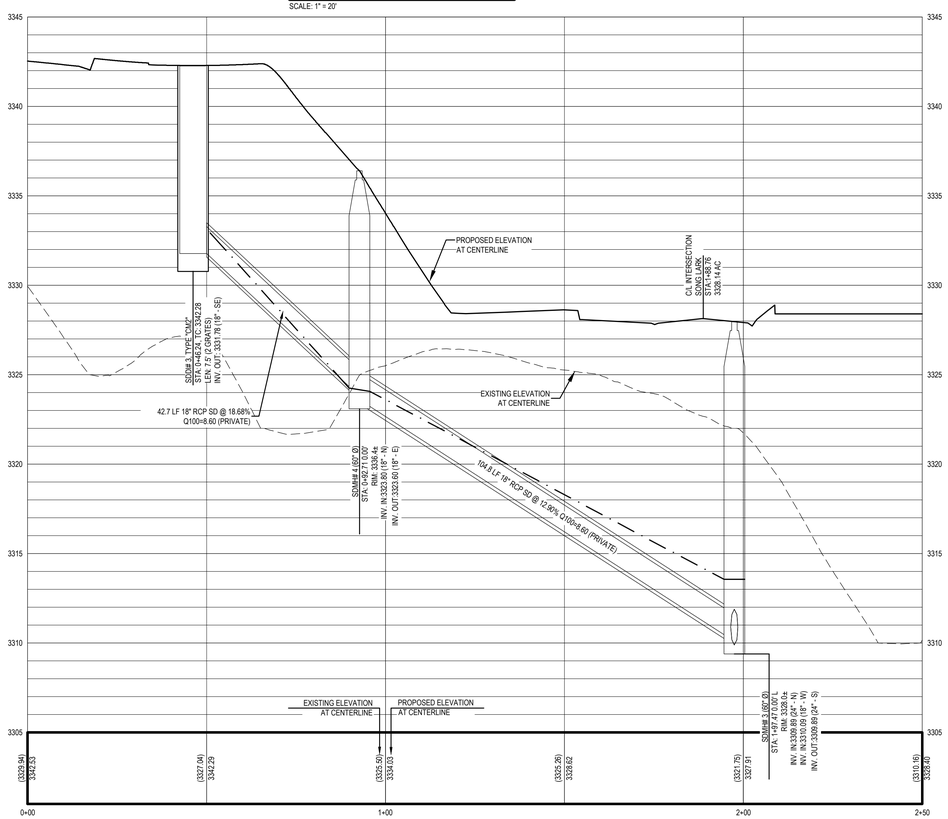
SHEET 20 OF 22

Plot Stamp: 8/12/2022 11:41:24 AM - John Austin Jr
File: P:\TMH012201 - Lark Hill (Village 22 - Parcels Q\R)\Civil_CD\TMH012201_CD-PROF-STRM.dwg, Tab: C20 - P&P SONG LARK 2



SDDI #3 LATERAL (PRIVATE)
STA: 0+00 TO STA: 2+50 (PLAN)

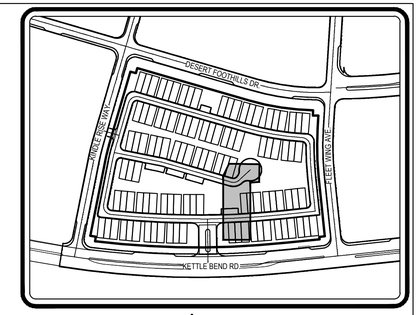
SCALE: 1" = 20'



SDDI #3 LATERAL (PRIVATE)
STA: 0+00 TO STA: 2+50 (PROFILE)

HORIZONTAL SCALE: 1" = 30' | VERTICAL SCALE: 1" = 4'





GRADING CONSTRUCTION NOTES

1. PROTECT IN PLACE
2. MATCH EXISTING ASPHALT, CURB, SIDEWALK, GUTTER, OR VALLEY GUTTER. SAWCUT CLEAN EDGE FOR CONNECTION.
3. CONSTRUCT 2" AC PAVEMENT OVER 4" TYPE II AGGREGATE BASE COMPATED PER SOILS REPORT
4. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
5. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
6. CONSTRUCT 30" MODIFIED ROLL CURB PER CCAUSD #217.1
7. CONSTRUCT 5' TRANSITION "L" TYPE CURB TO 30" MODIFIED ROLL CURB PER DETAIL "BB", SHEET C17
8. CONSTRUCT ROLL CURB TO "A" TRANSITION
9. CONSTRUCT 4' WIDE SIDEWALK WITH DECORATIVE PAVERS OVER 5" THICK TYPE II AGGREGATE BASE PER CCAUSD #206.S3
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12. CONSTRUCT SIDEWALK DRAIN PER CCAUSD #236
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19. INSTALL 24" X 24" YARD INLET PER DETAIL "JJ", SHEET C17
20. CONSTRUCT 15' TYPE CM DROP INLET W/3 GRATE PER CCAUSD #422, DEPTH PER PLAN
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29. CONSTRUCT CURB OPENING FOR POSITIVE DRAINAGE
30. CONSTRUCT GATES PER CCAUSD #425.S1 & SUMMERLIN WEST RESIDENTIAL DESIGN GUIDELINES

LEGEND

PROPOSED	EXISTING	DESCRIPTION
		PUBLIC R/W LINE
		PRIVATE R/W LINE
		BOUNDARY LINE
		EASEMENT LINE
		MATCH LINE
		PHASE LINE
		CENTERLINE
		EDGE OF ASPHALT
		CURB & GUTTER
		RETAINING WALL - DECORATIVE UNLESS OTHERWISE NOTED
		DECORATIVE CMU SCREEN WALL UNLESS OTHERWISE NOTED
		SAWCUT LINE
		FLOWLINE
		GRADE BREAK
2500	(2500)	MAJOR CONTOUR - 5'
2503	(2503)	MINOR CONTOUR - 1'
		SCARP
		CONCRETE SURFACE
		PROPOSED ASPHALT PAVEMENT
		REMOVE AND REPLACE ASPHALT
		RIP-RAP
		DEMO/REMOVE ASPHALT
98.76 XX	(98.76) XX	ELEVATION GRADE TAG
1.00%	(1.00%)	GRADE SLOPE TAG
1 C-5		SECTION MARKER - DETAIL NUMBER ABOVE SHEET NUMBER
		SIGHT VISIBILITY ZONE

COMMON ABBREVIATIONS

FF	- FINISHED FLOOR	RC	- TOP OF "RIBBON" CURB
TC	- TOP OF CURB	AC	- TOP OF PAVEMENT
FL	- FLOWLINE GRADE	EP	- EDGE OF PAVEMENT
PDE	- PRIVATE DRAINAGE EASEMENT	TW	- TOP OF RETAINING WALL
TF	- TOP OF WALL FOOTER	PRIV.	- PRIVATE
ST.	- STREET	TYP.	- TYPICAL
ESMT	- EASEMENT	R/W	- RIGHT-OF-WAY
BSW	- BACK OF SIDEWALK	EAE	- EMERGENCY ACCESS EASEMENT

STORM DRAIN CONNECTION NOTE

WHEN CONNECTING TO EXISTING RCP, CONTRACTOR SHALL REMOVE THE EXISTING RCP TO THE NEAREST BELL CONNECTION, CONNECT NEW RCP TO EXISTING RCP AND MATCH EXISTING PIPE SLOPE.

LINE & CURVE DATA NOTE

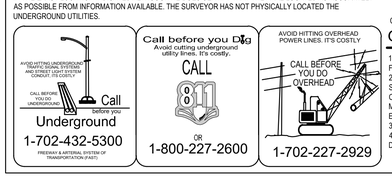
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SOUTH 89°51'25" EAST, BEING THE BEARING OF NORTH LINE OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 59 EAST, M.D.M., CITY LAS VEGAS, CLARK COUNTY, NEVADA AS PER MAP RECORDED IN FILE 123, PAGE 36 OF PARCEL MAPS, IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDERS.

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BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3229.29' (NAVD88)
METERS = 984.29 M (NAVD88)

CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

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SIGHT VISIBILITY NOTE

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PLEASE REFER TO TRAFFIC SHEETS FOR SIGHT VISIBILITY ZONE DIMENSIONS.

SAWCUT NOTE

FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

ESTIMATED QUANTITIES

NOTE: QUANTITIES SHOWN ARE RAW QUANTITIES AND APPROXIMATE. CONTRACTOR TO DETERMINE HIS OWN QUANTITIES FOR GRADING PURPOSES.
WORK UNDER THIS PLAN CONSTITUTES GRADING IN ACCORDANCE WITH 2018 IBC; ENGINEERING REPORTS AND CERTIFICATIONS IN CONFORMANCE WITH IBC SHALL BE FILED WITH THE COUNTY PRIOR TO COUNTY APPROVAL AT FINAL INSPECTION.

CUT: 3,955 CY
FILL: 111,587 CY
BALANCE: 107,633 (FILL)

NET EXPORTED MATERIAL TO BE DISPOSED OF IN A LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVAL AND ACTIVE GRADING PERMIT.

FLOOD ZONE DESCRIPTION

THIS SITE IS LOCATED IN SHADED ZONE "X", AREAS OF 0.2% ANNUAL CHANCE FLOOD, PER THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL 32003C2150E CLARK COUNTY, NEVADA DATED NOVEMBER 16, 2011.

FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT
BY: UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER: 4030-2100371
DATED: 3/4/2022

PARKING INFORMATION

GUEST PARKING PROVIDED: 210 SPACES - (2 SPACES PER GARAGE)
34 PARKING STALLS (2 HANDICAP)

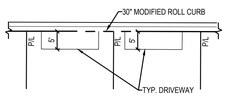
TOTAL PARKING PROVIDED: 244 PARKING SPACES TOTAL

DEDICATION NOTE

ALL EASEMENTS, RIGHT-OF-WAY, AND OTHER DEDICATIONS WITHIN THIS PLAN SET ARE GRANTED PER CLV# ___-_____ UNLESS OTHERWISE NOTED

PRIVATE STREET NOTE

ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS, AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA.



TYPICAL DRIVEWAY DETAIL

NOT TO SCALE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED UPDATED DRAINAGE STUDY CLV# N/A ON FILE WITH THE CITY OF LAS VEGAS.

DARRYL LATTIMORE, P.E. #17516 DATE

CLV# ___-_____

Actus
3285 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9266
Engineering - Surveying - Consulting - Planning

PLAN & PROFILE - SDDI #3 LATERAL

LARK HILL

TAYLOR MORRISON

CITY OF LAS VEGAS, NEVADA

BY	DESCRIPTION	DATE
A		

8/12/2022

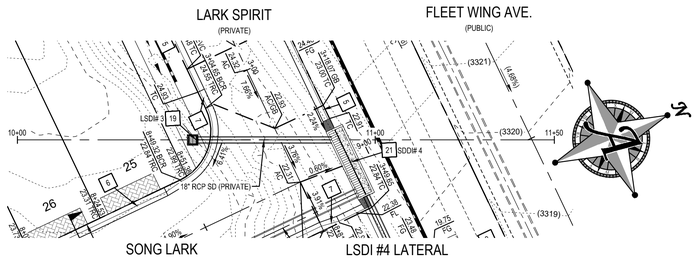
DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201

SHEET GROUP
PLAN & PROFILES

SHEET NUMBER
C21

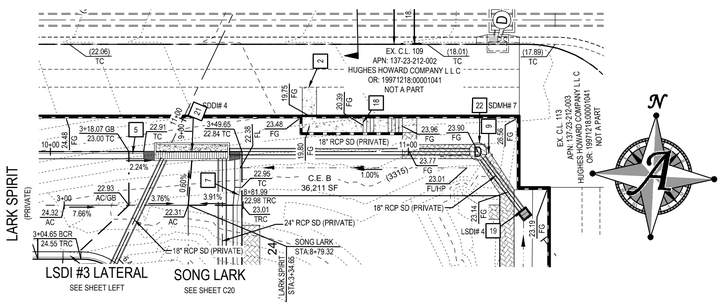
SHEET 21 OF 22

Plot Stamp: 8/12/2022 11:41:34 AM - John Austin Jr
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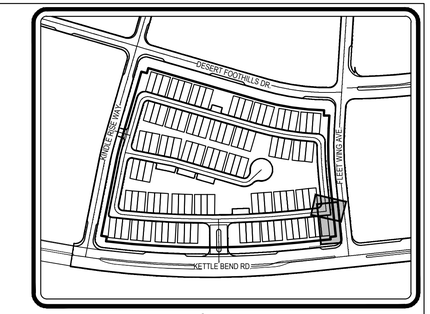
LSDI #3 LATERAL (PRIVATE)
STA: 10+00 TO STA: 11+50 (PLAN)

SCALE: 1" = 20'



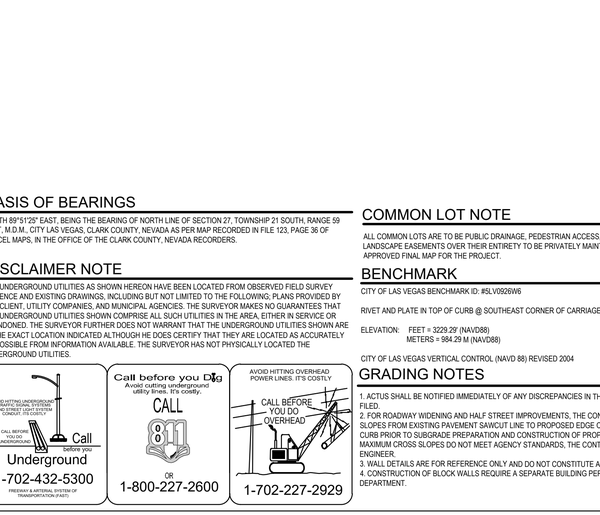
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STA: 10+00 TO STA: 12+00 (PLAN)

SCALE: 1" = 20'



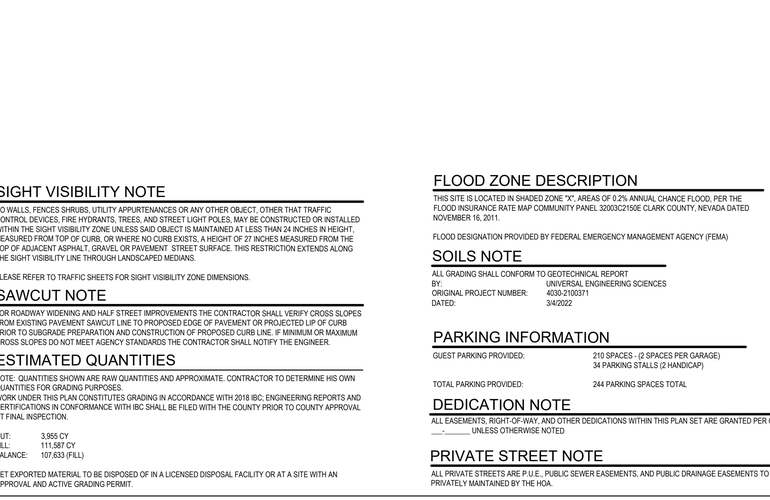
KEY MAP
SCALE: N/S

SCALE: 1"= 20'
20 10 0 20



LSDI #3 LATERAL (PRIVATE)
STA: 10+00 TO STA: 11+50 (PROFILE)

HORIZONTAL SCALE: 1" = 20' | VERTICAL SCALE: 1" = 4'



LSDI #4 LATERAL (PRIVATE)
STA: 10+00 TO STA: 10+00 (PROFILE)

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GRADING CONSTRUCTION NOTES

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		CURB & GUTTER
		RETAINING WALL - DECORATIVE UNLESS OTHERWISE NOTED
		DECORATIVE CMU SCREEN WALL UNLESS OTHERWISE NOTED
		SAWCUT LINE
		FLOWLINE
		GRADE BREAK
2500	(2500)	MAJOR CONTOUR - 5'
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		SCARP
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		PROPOSED ASPHALT PAVEMENT
		REMOVE AND REPLACE ASPHALT
		RIP-RAP
		DEMO/REMOVE ASPHALT
98.76 XX 1.00%	(98.76) XX (1.00%)	ELEVATION GRADE TAG
		GRADE SLOPE TAG
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BSW	- BACK OF SIDEWALK	EAE	- EMERGENCY ACCESS EASEMENT

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BASIS OF BEARINGS

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BENCHMARK

CITY OF LAS VEGAS BENCHMARK ID: #SLV0926W6

RIVET AND PLATE IN TOP OF CURB @ SOUTHEAST CORNER OF CARRIAGE HILL & FAR HILL

ELEVATION: FEET = 3229.29' (NAVD88)
METERS = 984.29 M (NAVD88)

CITY OF LAS VEGAS VERTICAL CONTROL (NAVD 88) REVISED 2004

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THIS SITE IS LOCATED IN SHADED ZONE "X", AREAS OF 0.2% ANNUAL CHANCE FLOOD, PER THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL 32003C2150E CLARK COUNTY, NEVADA DATED NOVEMBER 16, 2011.

FLOOD DESIGNATION PROVIDED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

SOILS NOTE

ALL GRADING SHALL CONFORM TO GEOTECHNICAL REPORT

BY:	UNIVERSAL ENGINEERING SCIENCES
ORIGINAL PROJECT NUMBER:	4030-2100371
DATED:	3/4/2022

PARKING INFORMATION

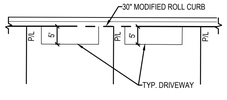
GUEST PARKING PROVIDED:	210 SPACES - (2 SPACES PER GARAGE) 34 PARKING STALLS (2 HANDICAP)
TOTAL PARKING PROVIDED:	244 PARKING SPACES TOTAL

DEDICATION NOTE

ALL EASEMENTS, RIGHT-OF-WAY, AND OTHER DEDICATIONS WITHIN THIS PLAN SET ARE GRANTED PER CLV# ___-_____ UNLESS OTHERWISE NOTED

PRIVATE STREET NOTE

ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS, AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA.



TYPICAL DRIVEWAY DETAIL

NOT TO SCALE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED UPDATED DRAINAGE STUDY CLV# N/A ON FILE WITH THE CITY OF LAS VEGAS.

DARRYL LATTIMORE, P.E. #17516 — DATE

CLV# ___-_____

Actus
3280 E. Warm Springs Rd., Suite 300
Las Vegas, NV 89120
www.Actus-NV.com
(702) 586-9296
Engineering - Surveying - Consulting - Planning

PLAN & PROFILE - LSDI #3 & #4 LATERAL
LARK HILL
TAYLOR MORRISON
CITY OF LAS VEGAS, NEVADA

NO.	DATE	DESCRIPTION	BY

PROFESSIONAL ENGINEER — DARRYL C. LATTIMORE — EXP: 12/31/23 — CIVIL — No. 17516 — STATE OF NEVADA

8/12/2022

DATE	08/12/2022
DRAWN	CS/RLS
DESIGNED	JDA/RLS
CHECKED	DCL
PROJECT #	TMH012201

SHEET GROUP
PLAN & PROFILES

SHEET NUMBER
C22

SHEET 22 OF 22

Plot Stamp: 8/12/2022 11:41:53 AM - John Austin Jr
File: P:\TMH012201 - Lark Hill (Village 22 - Parcels QR)\Civil_CD\TMH012201_CD-PROF-STRM.dwg, Tab: C22 - P&P LSDI #3 & #4