DS #: 5360

APN: 137-22-812-001

PROJECT: Summerlin West Village 21- Parcels P, Q, and R

SUBMITTAL: 1st

SCANNED BY/DATE:

CHECKED BY/DATE:

CITY OF LAS VEGAS NEVADA

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: October 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:			**COPIES TO:**
Summerlin West Village 21 - Parcels P, Q, and R				RCI Engineering
Cross Streets:	NWC Desert Foothills Dr. & Kindle Corner Rd			Toll South LV LLC
File Number:	F:\Depot\DSMemos\DS5360A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	137-22-812-001			CCRFCD
Zoning Action:	TMP-78626			
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	9/16/2020	10/6/2020	See Comments Below	$400.00	3991600: $400
			TOTAL FEES (LDDRS):	**$400.00**	----

REMARKS:

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

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

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

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

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

2. Table 1 in the report states that the 100 YR flow for EX1 is 27 cfs, but Figure 5 Existing Condition Map and the HEC-1 provided in Appendix A shows the 100 YR flow as 28 cfs. Address this discrepancy.
3. **Figure 6:** The road on the west side is called *Talon Ridge Street*, however in the grading sheet it is referred to as *Wave Rock Street*. Review and resolve in the next submittal.
4. In **Figure 6**, "CPR2 ULT1=37" should be referred to as CPR3.
5. In locations where the 100-year flow depth tops the curb inundating into the adjacent landscaping area in private lots, install erosion protective materials such as ripraps. Provide a general review of all impacted locations and riprap sizing calculations in the next submittal. Review and revise all pertinent plans, section details and construction notes accordingly.

6. Locations where stormwater flow will surface run between private lots are to be designated a Public Drainage Easement. In the next submittal, provide an overall lot drainage map to identify intra-lot drainage areas which will be required as common lot as well as public drainage easements to be privately maintained by the Homeowners Association.
7. **Sheet G-1:** There is a typo in the FF elevation for Unit #101. FF= 34116.80, however it should say FF=3416.80.
8. **Sheet G-4:** *Banded Hawk Street* entry cross section reference say D-2, however this cross section is detailed in D-1. Resolve accordingly.
9. **Sheet G-6**: It appears that the proposed riprap channel/gutter between two parking spaces leading to the grate inlet cannot contain the 100-year flow of 37 cfs. To a minimum, the two adjacent parking spaces will be inundated in every storm event and that is not permissible. Provide hydraulic calculation in the next submittal to support the minimum width of the flow corridor. One or two parking spaces may need to be removed.
10. **Sheet G-6**: The proposed overflow spillway may cause a local ponding in the vicinity at the corner of *Stone Run Street* and *Sentinal Spire Street* during every storm event. The spillway and/or the grate inlet may need to be lowered to mitigate the ponding situation. Address and resolve in the next submittal.
11. **Sheet G-6**: Provide a storm drain manhole at the connection point of the proposed outlet pipe from the grate inlet to the existing 30"-RCP stub in *Desert Foothill Boulevard*.
12. **Sheet D-1**: **Section Details 5, 7, 8 and 15**: In all these locations, the onsite are below the adjacent street grade, a minimum 2'-high solid grouted stem wall (8"-CMU thickness or equivalent) must be provided at the property line below the guardrail for flood protection.
13. **Sheet D-2**: Same comment as above for **Section Detail 29**.
14. The engineer must provide a table on the grading plans that shows a quantity estimate of all drainage improvements within Public Drainage Easements. All drainage improvements within Public Drainage Easements must be bonded and inspected.
15. Add a note in all pertinent sheets for the construction of all storm drain drop inlets per a newly adopted USDCCA Drawing No. 421 (*Stormwater Quality Management Stamp and Sign Detail*).
16. All drainage easements must be public drainage easements to be privately maintained and common lots to be labeled on the grading plans and to be dedicated as such in the final map.

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

END OF REMARKS
HDR/AYS

T/R/S: T20S/R59E/22
AREA K-27

TECHNICAL DRAINAGE STUDY
FOR
SUMMERLIN VILLAGE 21
PARCELS P, Q AND R

Prepared for:

Toll Brothers Inc.
1140 N. Town Center Drive Suite 250
Las Vegas, NV 89144
Phone: (702) 243-9800
Fax: (702) 243-9610

August 2020

PROJECT 3110.0048

RCI Engineering
500 South Rancho Drive, Suite 17 * Las Vegas, NV 89106
Tel: 702.453.0800 * Fax: 702.453.0801
www.rcinevada.com

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Summerlin Village 21 Parcels P, Q, and R Date: August, 2020

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

East/West: Kindle Corner

b) Section: 22 Township: 20 S Range: 59 E

c) APN : 137-22-812-001

Name of Owner: Toll South LV LLC

Telephone No.: 702-243-9800 Fax No.: 702-243-9610 E-Mail Address:

Address: 1140 N. Town Center Drive Suite 250 Las Vegas, Nevada 89144

Contact Person-Name: Rick J. Read, P.E. **Telephone No.:** 702-453-0800

*** E-Mail Address:** rread@rcinevada.com **Fax No.:** 702-453-0801

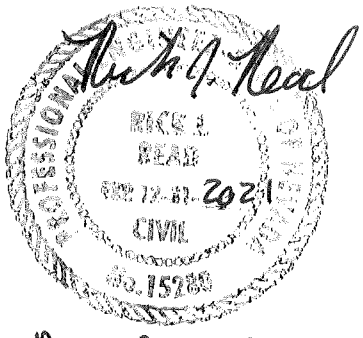
Firm: RCI Engineering

Address: 500 South Rancho Boulevard, Suite 17 Las Vegas, Nevada 89106

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: 9.3 ac +/- Being Developed/Disturbed: 9.3 ac+/-
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.): Attached Family Residential
5. Approximate upstream land area which drains to the subject site: 0 acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: Conceptual Drainage Study for West Planning Area Summerlin Village 21 (DS 4926 H)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: East into a RCP stub from a 10x8 RCB in Desert Foothills Drive
8. Briefly describe your proposed schedule for the subject project: ASAP



Aug 19, 2020

Engineer's Seal

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

***New Required Field**

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

Revision	Date

Local Entity File No.

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

RCI Engineering

August 19, 2020

City of Las Vegas
Flood Control
333 N Rancho Dr.
Las Vegas, NV 89106

RE: Certification Letter for Paper and Digital Plans for the Technical Drainage Study for Summerlin Village 21 Parcels PQR

Mr. Sung,

This letter has been provided as certification that the paper version of the plans match the digital PDF plans on the CD submitted with the drainage study.

Sincerely,

RCI Engineering

Rick J. Read, P.E.

500 S Rancho Drive, Suite 17 - Las Vegas, NV 89106 - Main 702.453.0800
www.RCINEVADA.com

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name:	Village 21 Parcels PQR		Map ID:
Firm Name:	RCI Engineering		Engineer: Rick Read, P.E.
Address:	500 South Rancho Drive, Suite 17		
City:	Las Vegas	State: Nevada	Zip: 89106
Phone Number:	453-0800	Fax Number: 453-0801	

Property Owner: Toll Brothers		
Address: 1140 Town Center Drive Suite 250		
City: Las Vegas	State: Nevada	Zip: 89144
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.

Reference:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

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.
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.
	N/A	Off-site drainage basin maps for existing, interim and future conditions showing the existing topography, basin boundaries, concentration points, and flows in cfs.

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.

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
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.
	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.
X		Cross-sectional detail for channels, including cutoff wall locations.
X		Existing and proposed drainage facilities, appurtenances, and connections (i.e., sidewalk, ditches, swales, storm drain systems, unimproved and improved channels, and culverts, etc.) stating size, material, shape, and slope with plan and profile and HGL calculations.
X		Existing and proposed drainage easements and widths shown with sufficient detail. A cross sectional detail must be provided that shows appropriate lining and reinforcement.
	N/A	Location and detail of existing, proposed, and future block wall openings. Minimum size is16"x48". 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.

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
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.
	N/A	For areas in Zone A, AE, AH, and AO, base flood elevations (BFEs) must be shown for each lot; BFEs may be listed on each lot, or in a table. Finish floor elevations must be a minimum of 18 inches above BFE.
	N/A	Appropriately elevated "humps" 6 inches above the 100-year water surface elevation at site accesses where the intent is to protect the site from the Q_{100} flows.
X		Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.

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 storm water flows showing basin area, Q_{10} and Q_{100} for both individual basins and combined basin flows, where acceptable.
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.

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 ≤ 8. Q_{10} d x v ≤ 6 and 12 foot dry lane for rights-of-way ≥ 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan.
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, which ever is greater.
	N/A	A complete water surface profile analysis (HEC-2, HEC-RAS, etc.) for channel flows and FEMA Zone A flood zones.
	N/A	• 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.

REFERENCE:	STANDARD FORM 2

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II. LOCATION AND DESCRIPTION 1

III. FEDERAL EMERGENCY MANAGEMENT AGENCY
(FEMA) FLOOD HAZARD ANALYSIS 4

IV. CLARK COUNTY REGIONAL FLOOD CONTROL
DISTRICT FACILITIES 4

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VII. ULTIMATE CONDITIONS 10

VIII. PRORATED STORM FLOWS AND HYDRAULICS 12

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5	EXISTING CONDITIONS MAP	9
6	ULTIMATE CONDITIONS MAP	11

I. INTRODUCTION

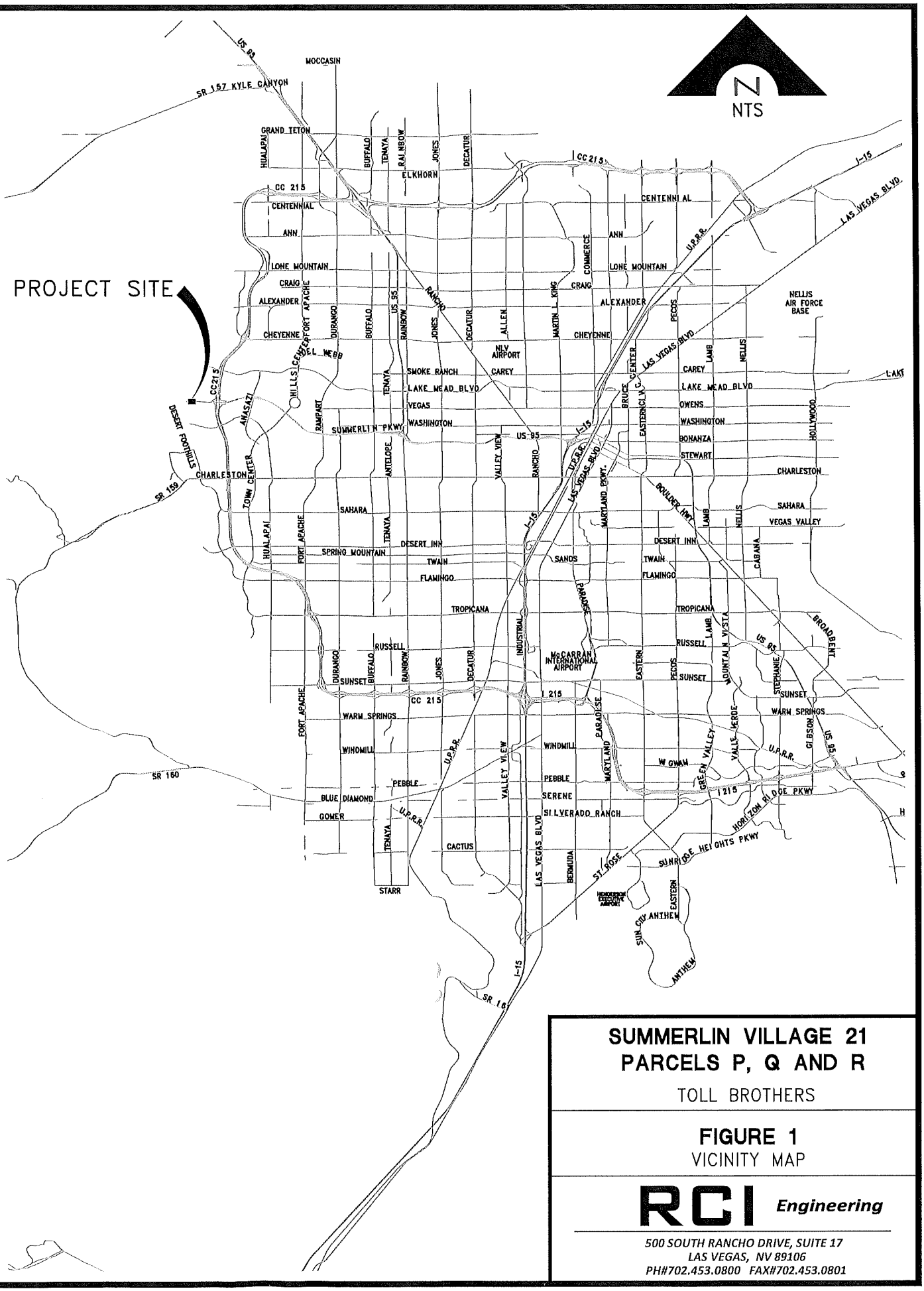
Toll Brothers is proposing to develop a 9.25 acre site (Parcels PQR) as a single family attached townhomes residential project located in Village 21 of Summerlin. The overall Project will consist of 136 single family residences with onsite open space, amenities, landscaping, and perimeter block walls. The purpose of this report is to accompany the civil improvement plans, to provide detailed hydrological and hydraulic analyses for the site, and to determine adequate protection for the Project from offsite and onsite flows. The following tasks were performed in the preparation of this report:

- Identify previous drainage studies for the project site and surrounding areas.
- Identify the FEMA floodplain designation for the project site.
- Identify existing and proposed regional drainage facilities adjacent to the site.
- Estimate runoff generated for the peak onsite 10-year and 100-year return period storms for existing, proposed, and ultimate conditions (offsite flows are referenced).
- Recommend drainage facilities to protect the project from storm runoff.

II. LOCATION AND DESCRIPTION

The Project is located in Section 22, Township 20 South, Range 59 East, M.D.M., in Las Vegas, Nevada. The site is bordered on the east by Desert Foothills Drive, on the south by Kindle Corner Way, on the west by Kettle Ridge Drive and on the north by Red Pass Drive.

It is assumed for this drainage study that the perimeter streets surrounding the Project site will be constructed before or concurrently with this Project. Please see the Vicinity Map and Location Maps on the following pages. The proposed development will consist of residential housing with Type A and Type B drainage. The project will include lots with an average lot size of approximately 2500 square feet. The Project will have a gated entrance from Kindle Corner Way. Interior streets will be private with private surface maintenance. The entrance road will be a 64-foot private roadway (back of curb to back of curb) with a median Island and landscaping on both sides. The interior residential streets will consist of 25-foot and 30-foot wide private roadways with normal crown sections, R type curb and gutter and a 5-foot wide sidewalk on a couple of the streets.



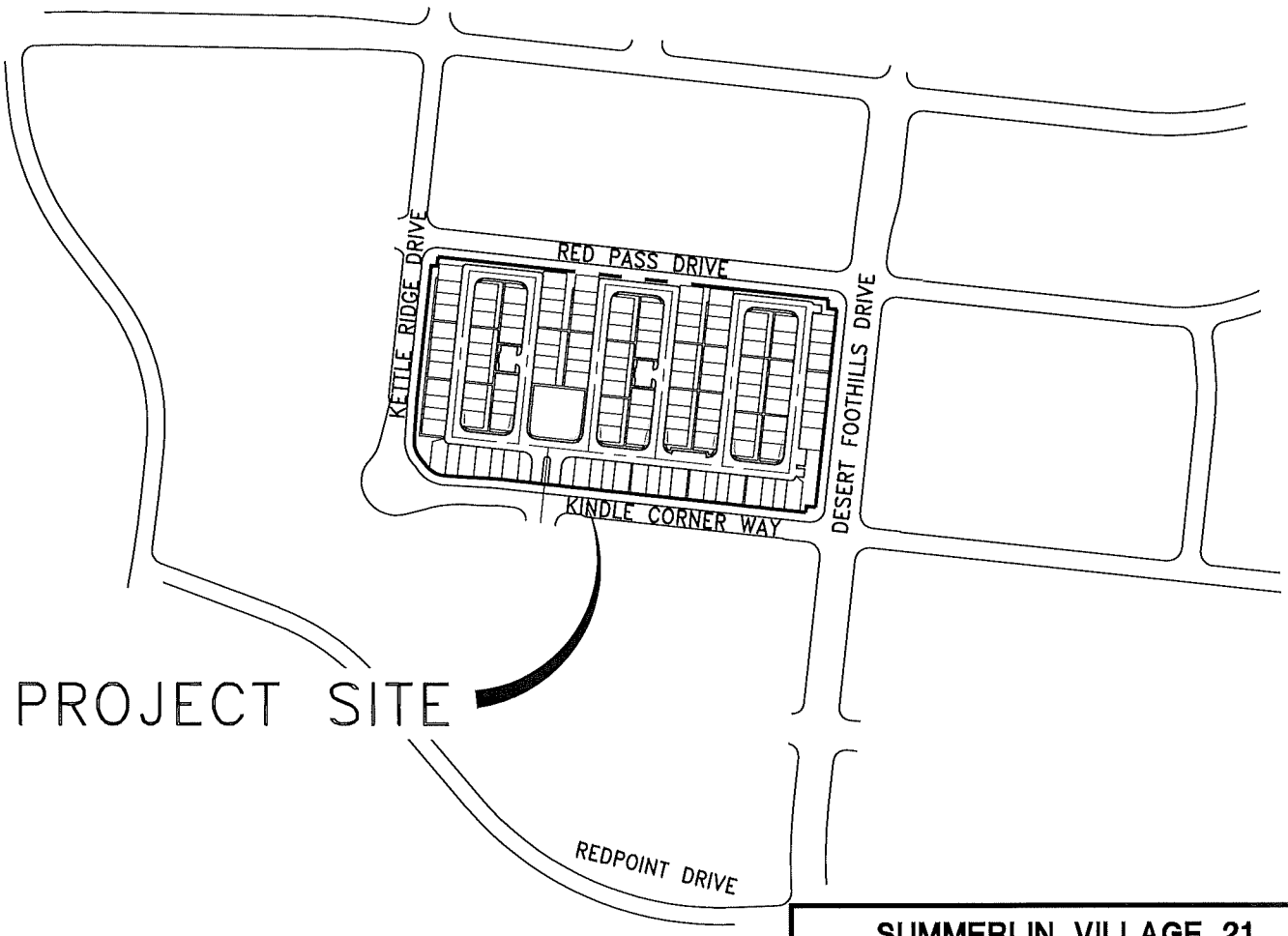
SUMMERLIN VILLAGE 21
PARCELS P, Q AND R

TOLL BROTHERS

FIGURE 1
VICINITY MAP

RCI Engineering
500 SOUTH RANCHO DRIVE, SUITE 17
LAS VEGAS, NV 89106
PH#702.453.0800 FAX#702.453.0801

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SUMMERLIN VILLAGE 21
PARCELS P, Q AND R

TOLL BROTHERS

FIGURE 2
LOCATION MAP

RCI Engineering
500 SOUTH RANCHO DRIVE, SUITE 17
LAS VEGAS, NV 89106
PH#702.453.0800 FAX#702.453.0801

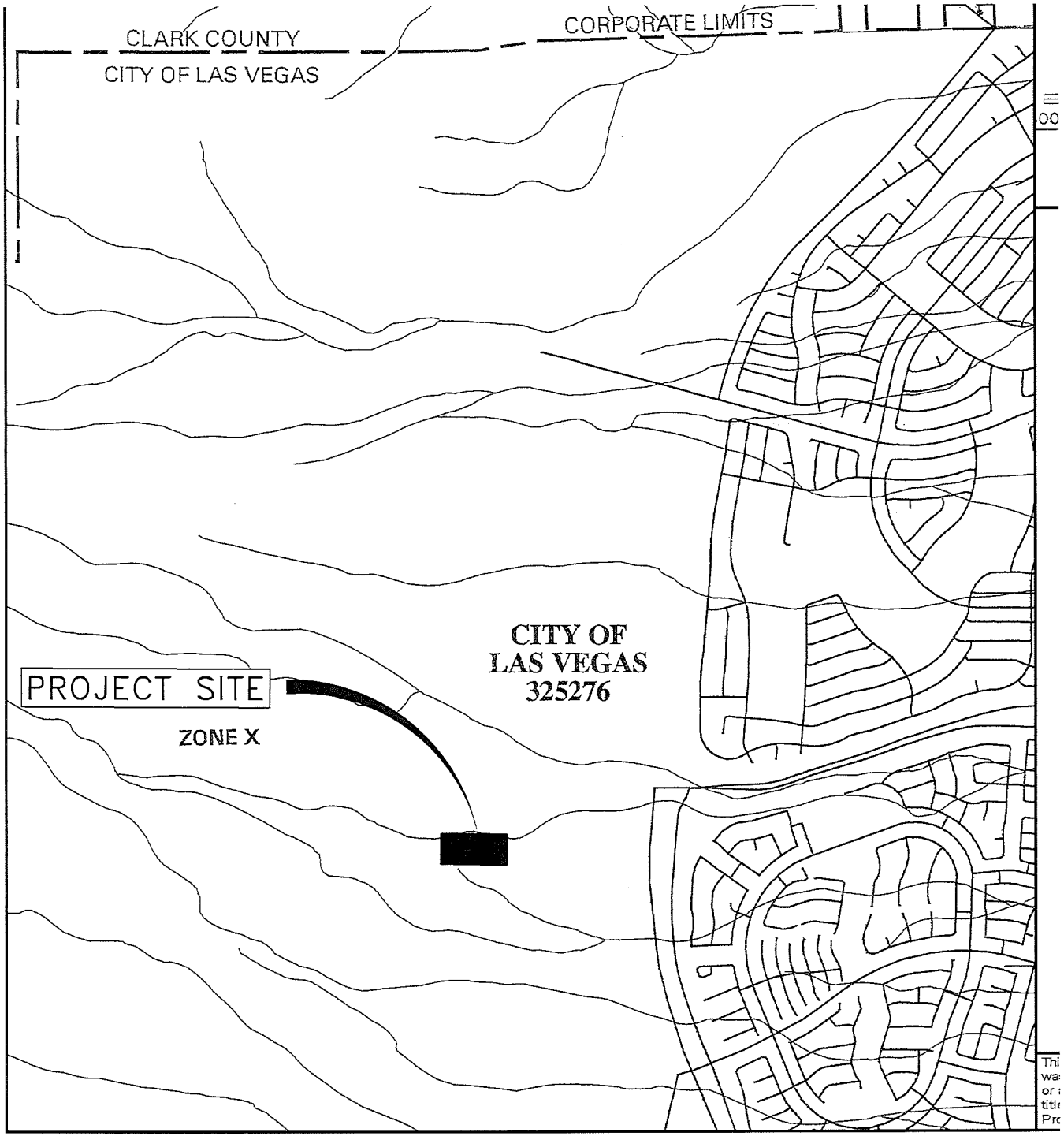
C:\3110_Toll\0048_Summerlin V21-PQR_DRAIN\FIGURES\ORIGINAL\figure2.dwg rread 7/22/20 6:43am

III. FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD HAZARD ANALYSIS

Figure 3 was reproduced from the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) containing Community Panel Number 32003C2150E, dated September 27, 2002. Review of the FIRM shows that the Project is currently located within a Zone X. Zone X areas are defined as areas outside of the 100-year floodplains; areas of 100 year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100 year flood. Therefore, the project is not located within a FEMA-designated Special Flood Hazard Area (SFHA).

IV. CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT FACILITIES

Figure 4 is reproduced from Figure F-22 of the 2018 *Clark County Regional Flood Control District (CCRFCD) Master Plan Update* (Reference 1, hereinafter referred to as the 2018 MPU). This figure depicts the project site in relation to existing and proposed CCRFCD facilities. As shown on the figure, the site is adjacent to CCRFCD Facility APDF 0026. Therefore, this drainage study will be submitted to CCRFCD for concurrence upon receipt of a conditional letter of approval from the City of Las Vegas.



N

PANEL 2150 E

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY,
NEVADA AND
INCORPORATED AREAS

PANEL 2150 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LAS VEGAS, CITY OF	325276	2150	E
CLARK COUNTY, UNINCORPORATED AREAS	320003	2150	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
32003C2150 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

MAP SCALE 1" = 2000'

1000 0 2000 4000 FEET

SUMMERLIN VILLAGE 21
PARCELS P, Q AND R
TOLL BROTHERS INC.

FIGURE 3
F.I.R.M. MAP

RCI Engineering
500 SOUTH RANCHO DRIVE, LAS VEGAS, NV 89106
PH#702.453.0800 FAX#702.453.0801

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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

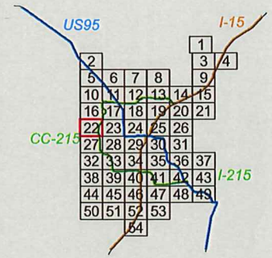
FIGURE 4

N

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

Scale: 1 inch = 2,000 feet

AerialSource:Esri World Imagery 2017



ATKINS
Member of the SNC-Lavalin Group

Louis Berger

V. HYDROLOGY

The methodology presented in this study is in compliance with the *CCRFCD Hydrologic Criteria and Drainage Design Manual* (Reference 2, hereinafter referred to as the Manual).

Model Description - The watersheds were modeled using the SCS Unit Hydrograph method within the U.S. Army Corps of Engineers *HEC-1 Flood Hydrograph Package* (Reference 3).

Precipitation - The project site lies outside of the McCarran Rainfall Area as delineated in the Design Manual on Figures 503 and 506. The 10-year and 100-year point precipitation values for the project will be 1.86 inches and 3.40 inches during a 6-hour storm event, respectively. This equates to a 0.55 ratio between the 10-year and 100-year storm events. (See Appendix A)

Since the drainage area for the project will be less than 8 square miles, an SDN 3 design storm distribution per Table 503 of the Manual was selected for use in the HEC-1 computer model.

Curve Numbers (CN) –The soils information for this Project was also referenced from the NRCS Website. The site is comprised of soil type 152 (Cave).

The soils map from the NRCS Website has been included in Appendix A that delineates soil type 152 as HSG "D".

For the given soils, CN values were determined from the appropriate columns of Table 602 of the Manual. For the ultimate conditions, the developed site was modeled with a CN value of 95 for commercial was used for the onsite residential basin. A CN value of 88 for desert shrub was used for the existing condition onsite drainage basin.

Drainage Areas and Flow Patterns - The subbasins and flow patterns used in the hydrologic modeling for proposed conditions used electronic files of the grading plans for the Project and for the surrounding improvements constructed by Summerlin.

Lag Time - The lag time (TLAG) is described as the time between the center of mass of rainfall and the time of peak discharge from a basin. Lag time can be related to time of concentration (Tc) by the following relationship: TLAG = 0.6(Tc). The time of concentration (Tc) is defined as the time required for runoff to flow from the most remote part of the basin area to the outlet of the basin or a design point under consideration. The procedure for calculating Tc is outlined in Section 602 of the Manual. Lag time calculations for the drainage subbasins has been included in Appendix A on Standard Form 4.

VI. EXISTING CONDITIONS

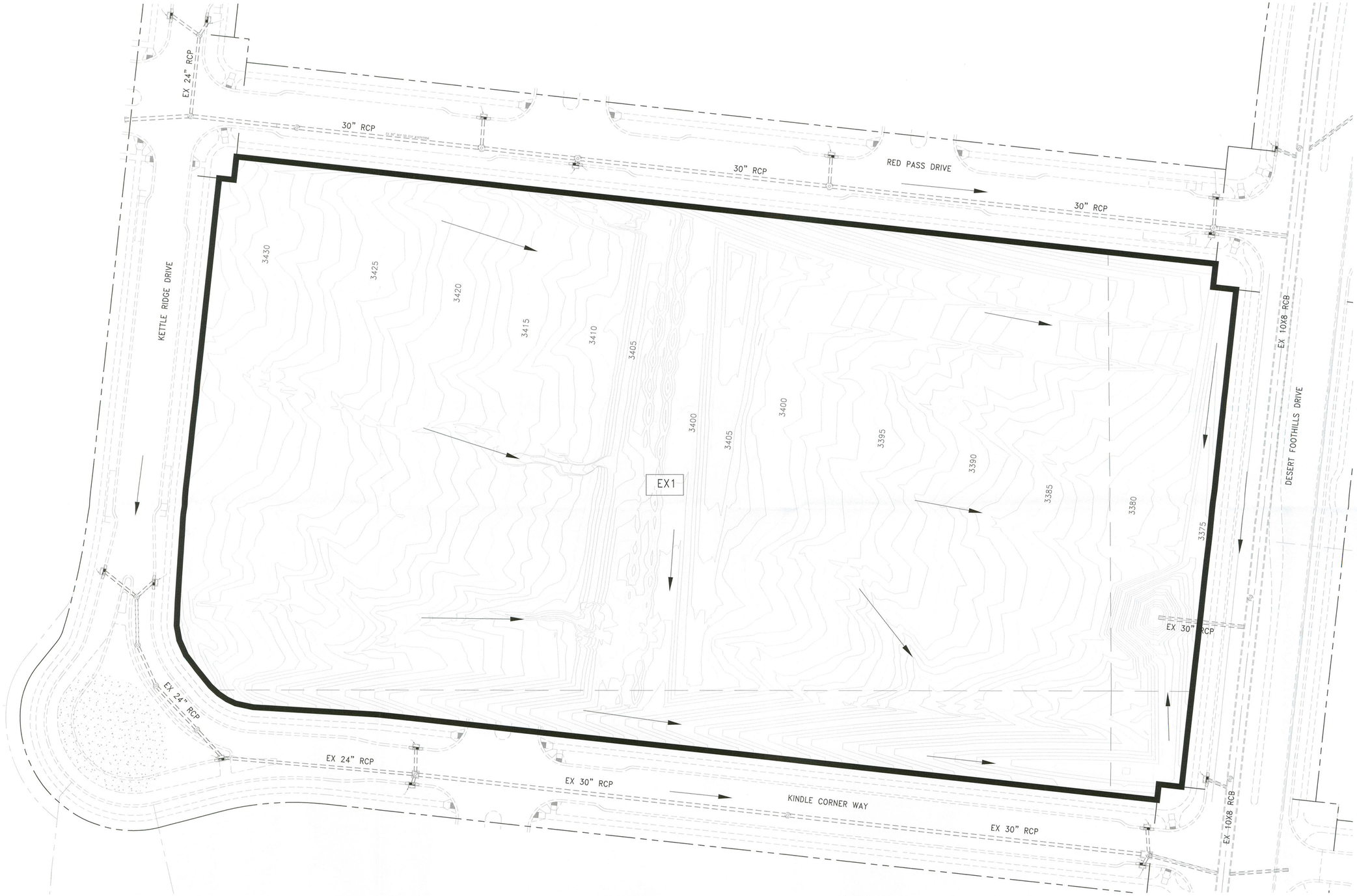
Existing conditions only for the site itself has been analyzed, since the surrounding area has been referenced from approved studies. Figure 5 depicts the existing condition subbasins for the Project site. The existing condition HEC-1 model has been included in Appendix A. Table 1 summarizes the existing condition 100-year and 10-year flow rates for the site.

TABLE 1
EXISTING CONDITIONS
HEC-1 MODEL SUMMARY

*SUBBASIN OR CP	BASIN AREA (AC)	100 YR (cfs)	10 YR (cfs)
EX1	9.25	27	12

*See Figure 5

Under existing conditions all of the surrounding roads have been constructed. Desert Foothills Drive on the east was constructed as a part of the *Technical Drainage Study for Summerlin West Village 21 Desert Foothills Drive (Redpoint to Summerlin Parkway),* by VTN Nevada (Reference 4, hereinafter referred to as the Desert Foothills Study). The Desert Foothills Study was approved on June 25, 2019. Kindle Corner and Kettle Ridge Drive on the south and west were designed as a part of the *Technical Drainage Study for Summerlin West Village 21 Kindle Corner Ave. & Kettle Ridge Drive (Sky Vista to Desert Foothills)* by VTN Nevada (Reference 5, hereinafter referred to as the Kindle Kettle Study). The Kindle Kettle Study was approved on June 25, 2019 and CCRFCD approved that study on June 6, 2019.



N

20' 0' 20' 40'

SCALE: 1" = 40'

LEGEND

FLOW DIRECTION

EXIST SUBBASIN BOUNDARY

EX1 EXIST DRAINAGE SUBBASIN

EXISTING STORM DRAIN

EXISTING CONDITIONS HEC-1 MODEL SUMMARY

SUBBASIN OR CP	BASIN AREA (AC)	100 YR (cfs)	10 YR (cfs)
EX1	9.25	28	12

SUMMERLIN VILLAGE 21
PARCELS P, Q AND R
TOLL BROTHERS

FIGURE 5
EXISTING CONDITIONS MAP

RCI Engineering
500 South Rancho Drive,suite 17 Las Vegas, NV 89106
PH#702.453.0800 FAX#702.453.0801

O:\3110_Tol\1048_Summerlin V21-PQR_DRAIN\FIGURES\ORIGINAL\figure5.dwg rreed 8/19/20 4:21pm

Red Pass Drive on the north was designed as a part of the *Technical Drainage Study for Summerlin West Village 21 Red Pass Drive (Desert Foothills Kettle Ridge Drive)* by VTN Nevada (Reference 6, hereinafter referred to as the Red Pass Study). The Red Pass Study was approved on October 28, 2019. The roadways that border the Project have either been constructed or will be completed prior to or concurrently with this Project. Therefore, it is assumed that the site is protected from offsite storm flows from the surrounding area by the adjacent street improvements. Please see the pertinent excerpts from the referenced approved studies in Appendix C.

VII. ULTIMATE CONDITIONS

Figure 6 depicts the ultimate condition subbasin and flow patterns for the Project. The ultimate condition HEC-1 model has been included in Appendix A. Table 2 summarizes the ultimate condition 100-year and 10-year flow rates for the project site. The site will drain to the east and to the south and all of the 100-year storm runoff from the site will be intercepted by a drop inlet and conveyed to Desert Foothills Drive via storm drain constructed with this Project.

TABLE 2
ULTIMATE CONDITIONS
HEC-1 MODEL SUMMARY

SUBBASIN OR CP*	BASIN AREA (AC)	100 YR (cfs)	10 YR (cfs)
ULT1	9.25	37	19

*See Figure 6

Subbasin ULT1 will generate 37 cfs during a 100-year storm event and 19 cfs during a 10-year storm event. The runoff produced by Subbasin ULT1 will be conveyed through the site as surface flow to a proposed area inlet at the east end of the Project. Storm flows Produced by the site will be conveyed to an existing 10-foot wide by 8 foot tall RCB in Desert Foothills Drive via a 30-inch storm drain. Prorated storm flows from this study were calculated to model the ultimate conditions onsite discharges. The prorated storm flows and the detailed hydraulics for the Project will be addressed in the Prorated Storm Flows and Hydraulics Section of this report.



N

20' 0' 20' 40'

SCALE: 1" = 40'

LEGEND

- STREET SLOPE DIRECTION
- ULTIMATE SUBBASIN BOUNDARY
- ULT1 — ULTIMATE DRAINAGE SUBBASIN
- (A) — CROSS SECTION LOCATION
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- PRORATED BASIN BOUNDARY
- PR1, XX AC — PRORATED DRAINAGE BASIN
- CPR2 — PRORATED COMBINATION POINT

100-YEAR HYDRAULIC SECTIONS

Location	Slope (%)	Q_{100} (cfs)	D_{100} (ft)	V_{100} (ft/sec)	$D*V_{100}$
Section 1	8.25	12	0.33	6.39	2.1
Section 2	2.00	6	0.33	3.20	1.1
Section 3	7.77	18	0.36	7.04	2.5
Section 4	7.52	24	0.39	7.22	2.8
Section 5	2.64	30	0.47	5.31	2.5
Section 6	2.00	7	0.33	3.48	1.1
Section 7	4.63	6	0.29	4.46	1.3

ULTIMATE CONDITIONS HEC-1 MODEL SUMMARY

SUBBASIN OR CP	BASIN AREA (AC)	100 YR (cfs)	10 YR (cfs)
ON1	9.25	37	19

100-YR PRORATED STORM FLOWS

PR1=2.9 ACRES X 4.0 CFS/ACRE=12 CFS
PR2=3.0 ACRES X 4.0 CFS/ACRE=12 CFS
PR3=1.5 ACRES X 4.0 CFS/ACRE=6 CFS
PR4=1.9 ACRES X 4.0 CFS/ACRE=7 CFS

CPR1 PR1+PR2=24 CFS
CPR2 CPR1+PR3=30 CFS
CPR2 ULT1=37 CFS

SUMMERLIN VILLAGE 21
PARCELS P, Q AND R
TOLL BROTHERS

FIGURE 6
ULTIMATE CONDITIONS MAP

RCI Engineering
500 South Rancho Drive,suite 17 Las Vegas, NV 89106
PH#702.453.0800 FAX#702.453.0801

O:\3110_Toll\004B_Summerlin V21-PQR_DRAIN\FIGURES\ORIGINAL\Figure6.dwg rreed 8/19/20 4:08am

VIII. PRORATED STORM FLOWS AND HYDRAULICS

Prorated storm flows from this study were calculated to model the ultimate conditions onsite discharges to design points. Calculations are based on the overall 100-year storm flow from Subbasin ULT1 and then divided by the acreage to determine how much runoff per acre will be produced. The acreage of each Prorated Basin is then multiplied by the cfs/acre which equals the cfs per Prorated Basin. The site will generate a 100-year storm flow of 4 cfs per acre (37 CFS/9.25 acres). The Prorated Basins and prorated 100-year storm flows have been shown on Figure 6.

The 100-year storm flows from prorated Basins PR1 and PR2 will combine at CPR1 for a 100-year storm flow of 24 cfs. The 100-year flow at CPR2 is the combined flows from PR3 plus CPR1 for a total 100-year storm flow of 30 cfs. Prorated Basin PR4 will produce 7 cfs during a 100-year storm event. CPR3 is the combined 100-year storm flow of 37 cfs that will be produced by the site. Please refer to Figure 6.

One 6-foot by 6-foot Jensen Precast area drain is proposed for the Project. That inlet will intercept the 100-year storm flows of 37 cfs produced by the site at a ponding depth of 0.8 feet. The 100-year storm flows intercepted by the area drain will be conveyed to the existing 10 ft. by 8 ft. RCB in Desert Foothills Drive (CCRFCD Facility APDF 0026). The starting HGL for the onsite storm drain system will be 3353.3 and was referenced from the Desert Foothills Study from Sheet UT14 enclosed in Appendix C. A Standard Form 6 model was prepared for the onsite storm drain and as shown in the model, the 100-year HGL will remain a minimum of 1 foot below finish grade per Manual Criteria. The Standard Form 6 model and area drain calculation have been included in Appendix B.

The onsite storm drain conveys the 100-year storm flows from the site to the existing 10 ft. by 8 ft. RCB in Desert Foothills Drive. There is an existing 30-inch stub to the site that was designed for a 100-year storm flow of 31 cfs in the interim condition from the Desert Foothills Study (Please refer to Appendix C). The ultimate condition runoff from the site will be 37 cfs during a 100-year storm event. That is an increase in flows from the design of 16 percent from the site. There is a 100-year design flow in the existing 10-foot by 8-foot RCB in Desert Foothills of 1053 cfs and an increase of 6 cfs to that system is only an increase of 0.6 percent and will not have a negative impact to that existing facility.

The interior residential streets will consist of a 30-foot wide private roadways from back of curb to back of curb. The streets will be constructed with a normal crown section and R type curb and gutter. There are small section of roadways on the north that will be constructed 25 feet wide from back of curb to back of curb with a 5-foot wide sidewalk on one side of street. The entrance street is 64 feet wide with landscape and sidewalks on both sides. Please refer to Figure 6 for the Cross Section locations and a hydraulic summary of the storm flows in the onsite streets

There will be an average 100-year storm flow of 6 cfs draining as surface flow in the north south running streets. A normal depth calculation was conducted at the downstream end of those streets that have a "T" intersection. Cross Section 2 was modelled at several location to insure that the storm flows in the streets would not jump the curb and flood the lots on the south side of the intersections. As shown in those cross section calculations, the velocity head for those flows is equal to 0.16 feet. That depth was added to the depth of flow at Cross Sections 1, 3, and 4 to calculate the potential depth of flow at those intersections. As shown the worst case the potential depth (energy grade line) is 0.55 feet deep at Section 4 and in all cases the finish floor elevation of the lots at the intersections are higher than that depth. Please refer to the normal depth calculation locations and the 100-year Hydraulic Summary Table on Figure 6. In all cases the DXV Product for the site is less than 6 and no 10-year storm flow calculations are warranted.

In all cases the 100-year depth of flow is below the top of "R" curb for the north south roads. Storm Run Street has erosive velocities and the 100-year storm flows west of Cross Section 4 will drain below top of curb. Once the 100-year storm flows from Grey Saker Street drain into Storm Run Street the 100-year storm flows will overtop the curb and drain with erosive velocities. Six inch decorative rock to a depth of 1 foot is proposed in the front yards of Lots 9 through 16 on the south to prevent the front yards from eroding. There is sidewalk on the north side of the road to keep erosion from occurring

There will be a worst case depth of 100-year storm flow of 0.25 feet (below TC) adjacent to the site in Red Pass Drive. The finish floor elevations for lots adjacent to Red Pass Drive range from being about 5 feet below the TC elevation to 2.5 feet above the TC elevation. The perimeter wall will be solid grouted to protect those homes that are below TC elevation in Red Pass Drive against offsite storm flow. Please refer to Figure 8 in

Appendix C.

There will be a worst case depth of 100-year storm flow of 0.37 feet (below TC) adjacent to the site in Kindle Corner Avenue and Kettle Ridge Drive. All finish floor elevations along Kettle Ridge Drive are below the TC elevation in the adjacent street. The perimeter wall will be solid grouted to protect those homes that are below TC elevation in Kettle Ridge Drive against offsite storm flow. All finish floor elevations along Kindle Corner Ave. are above the TC elevation in the adjacent street. Therefore, those homes are protected from offsite storm flows.

There will be a worst case depth of 100-year storm flow of 0.38 feet adjacent to the site in Desert Foothills Drive. All lots along Desert Foothills Drive have finish floor elevations that are about 2 feet above the adjacent TC elevation and are protected from the offsite storm flows. Please see pertinent excerpts from the Desert Foothills Study in Appendix C.

At the west side of the entrance to the site from Kindle Corner there is an existing 5 foot long Modified Type "C" drop inlet that has been designed to intercept the entire 100-year storm flow of 2.5 cfs in the north half of the street. There is a small hump in entrance road from Kindle Corner Way, but there is no flow that will drain onto the site since that inlet intercepts the entire 100-year storm flows. Please see the calculations and figures from the Kindle Kettle Study in Appendix C.

The drainage easement at the east side of the site will serve as the emergency overflow path for the Project. Assuming the 6-foot by 6-foot Jensen Precast inlet is 100-percent clogged the 100-year using the 100-year storm flow of 37 will drain east into Desert Foothills Drive as surface flow. The property line at Desert Foothills Drive is an open fence and the overflow will drain east into the street as sheet flow.

Per City of Las Vegas criteria in the Design Manual, the onsite finish floor elevations shall be set at a vertical distance of 6-inches above highest top of curb elevation or twice the depth of flow in the gutter flow line. The finish floor elevations are set at twice the 100-year depth of flow elevation at the high side top of curb elevation. The garage finish floor elevations have been set at twice the 100-year storm depth of flow elevation at the high side of the driveway.

Based on the calculated street flow characteristics, the Design Manual criteria for depth (D) and velocity times depth (V*D) to be less than 8 during the 100-year storm event will be met. Since in all cases the DxV was less than 6 during the 100-year storm event, 10-year cross section calculations were not warranted.

IX. CONCLUSIONS AND RECOMMENDATIONS

1. Methodology used in this report is in compliance with the Clark County Regional Flood Control District (CCRFCD) criteria.

2. The proposed project lies within a FEMA Zone X. Therefore, the project is not currently located in a FEMA-designated Special Flood Hazard Area.

3. The proposed development does not alter existing peak flows or the character of flows downstream of the development.

4. Homes to be constructed within this project will have adequate freeboard to be protected from flows conveyed in the adjacent streets.

5. Summerlin will construct the adjacent street improvements prior to or concurrently with this project.

X. REFERENCES

1. Clark County Regional Flood Control District, *Clark County Regional Flood Control District - The 2018 Las Vegas Valley Master Plan Update*

2. Clark County Regional Flood Control District, *Hydrologic Criteria and Drainage Design Manual*, updated August 1999.

3. U.S. Army Corps of Engineers, *HEC-1 Flood Hydrograph Package,* June 1998.

4. VTN Nevada, *Technical Drainage Study for Summerlin West Village 21 Desert Foothills Drive (Redpoint to Summerlin Parkway),* June 2019.

5. VTN Nevada, *Technical Drainage Study for Summerlin West Village 21 Kindle Corner Ave. & Kettle Ridge Drive (Sky Vista to Desert Foothills)*, June 2019.

6. VTN Nevada, *Technical Drainage Study for Summerlin West Village 21 Red Pass Drive (Desert Foothills Kettle Ridge Drive),* October, 2019.

APPENDIX A – HYDROLOGIC CALCS

Summerlin TDS Approval Letter

Tentative Map TMP-78626

Precipitation References

Soils Map

Soils Properties

Curve Number References

Existing Conditions

- Curve Number Calculations
- Standard Form 4
- HEC-1 Model

Ultimate Conditions

- Curve Number Calculations
- Standard Form 4
- HEC-1 Model

Howard Hughes.

Russ Mauger
Toll Brothers, Inc.
1140 N. Town Center Drive, Suite 250
Las Vegas, NV 89144

September 9, 2020

Re: SDRC Review | TDS | Approved | Parcel PQR | Summerlin Village 21 (Redpoint) Toll

Dear Russ –

The Summerlin Design Review Committee (SDRC) has reviewed the above referenced submittal, dated August 2020, prepared by RCI Engineering. The submittal is *approved*.

Please let us know if you have any questions or concerns.

Sincerely,

Sharon D. Thompson
Design Review Coordinator, Summerlin

The Howard Hughes Corporation
10845 Griffith Peak Drive, Suite 160
Las Vegas, NV 89135

LAS VEGAS CITY COUNCIL

CAROLYN G. GOODMAN
Mayor

MICHELE FIORE
Mayor Pro Tem

STAVROS S. ANTHONY
CEDRIC CREAR
BRIAN KNUDSEN
VICTORIA SEAMAN
OLIVIA DÍAZ

SCOTT D. ADAMS
City Manager

DEPARTMENT OF PLANNING

ROBERT SUMMERFIELD
DIRECTOR

DEVELOPMENT SERVICES CENTER

333 N. RANCHO DRIVE
3RD FLOOR
LAS VEGAS, NV 89106
702.229.6301 | VOICE
702.474.7463 | FAX
711 | TTY

cityoflasvegas
lasvegasnevada.gov

June 10, 2020

Ms. Betty Shervoski
Howard Hughes Company, LLC
10845 W. Griffith Peak Drive, 1st Floor
Las Vegas, Nevada 89135

RE: TMP-78626 [PRJ-78375] - TENTATIVE MAP
PLANNING COMMISSION MEETING OF JUNE 9, 2020

Dear Applicant:

The Planning Commission at a regular meeting held on June 9, 2020 voted to ***APPROVE*** a request for a Tentative Map FOR A 136-UNIT SINGLE FAMILY ATTACHED RESIDENTIAL SUBDIVISION on a 9.25 acre portion of 105.09 acres at the northeast corner of Kindle Corner Way and Kettle Ridge Drive (Lot 1 of Book 161, Page 34 of Plats), P-C (Planned Community) Zone [SFSD (Single Family Special Lot Development) Summerlin Special Land Use Designation], Ward 2 (Seaman) [PRJ-78375].

This approval is subject to the following conditions:

Planning

1. Approval of the Tentative Map shall be for no more than four (4) years. If a Final Map is not recorded on all or a portion of the area embraced by the Tentative Map within four (4) years of the approval of the Tentative Map, this action is void.

2. Street names must be provided in accordance with the City's Street Naming Regulations.

3. A fully operational fire protection system, including fire apparatus roads, fire hydrants and water supply, shall be installed and shall be functioning prior to construction of any combustible structures.

4. In conjunction with creation, declaration and recordation of the subject common-interest community, and prior to recordation of the Covenants, Codes and Restrictions ("CC&R"), or conveyance of any unit within the community, the Developer is required to record a Declaration of Private Maintenance Requirements ("DPMR") as a covenant on all associated properties, and on behalf of all current and future property owners. The DPMR is to include a listing of all privately

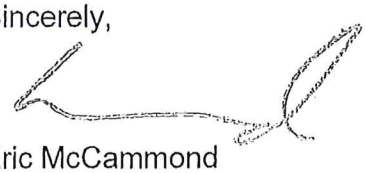
11. A Drainage Plan and Technical Drainage Study must be submitted to and approved by the Department of Public Works prior to the issuance of any building, grading permits or the recordation of a Final Map, whichever may occur first. Provide and improve all drainageways recommended in the approved drainage plan/study. The developer of this site shall be responsible to construct such neighborhood or local drainage facility improvements as are recommended by the City of Las Vegas Neighborhood Drainage Studies and approved Drainage Plan/Study concurrent with development of this site.

12. The approval of all Public Works related improvements shown on this Tentative Map is in concept only. Specific design and construction details relating to size, type and/or alignment of improvements, including but not limited to street, sewer and drainage improvements, shall be resolved prior to approval of the construction plans by the City. No deviations from adopted City Standards shall be allowed unless specific written approval for such is received from the City Engineer prior to the recordation of a Final Map or the approval of subdivision-related construction plans, whichever may occur first. Approval of this Tentative Map does not constitute approval of any deviations. If such approval cannot be obtained, a revised Tentative Map must be submitted showing elimination of such deviations. Roadway locations and parcel entries are schematic and final studies and engineering improvements designs. Geometric design of Parcel entry points must be approved through the development review of each parcel.

13. Site development to comply with all applicable conditions of approval for Tentative Map TMP-73332 and all other applicable site-related actions.

This action by the Planning Commission on **June 9, 2020** is final unless a written appeal is filed with the City Clerk within seven days of the date of the Planning Commission's decision as allowed by code or there is a review action filed by the City Council within the same time period. For additional information on appeals or review requests submitted please access https://www.lasvegasnevada.gov/Business/Permits-Licenses/Building-Permits/Permit-Application-Status, or contact the Department of Planning and Development at 702.229.6301 after ***June 16, 2020***. No building permits or business licenses related to these items shall be issued prior to the expiration of the required seven day waiting period, or until any filed appeal is resolved pursuant to LVMC Title 19.18.

Sincerely,



Eric McCammond
Sr. Management Analyst
Case Planning Division

EM:nl

cc:

Ms. Kelly Winner
Toll Brothers
1140 Town Center Drive, Ste. 250
Las Vegas, Nevada 89144

Ms. Amber Dolce
RCI Engineering
500 S. Rancho Drive, Ste. 17
Las Vegas, Nevada 89106

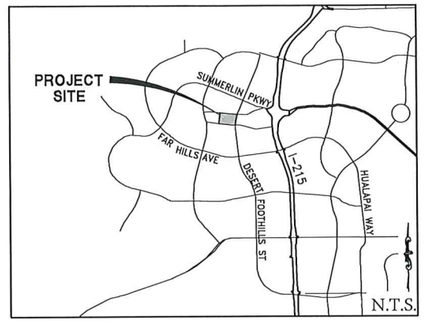
TENTATIVE MAP FOR
SUMMERLIN VILLAGE 21 PARCELS P, Q AND R
BY

Toll Brothers
America's Luxury Home Builder

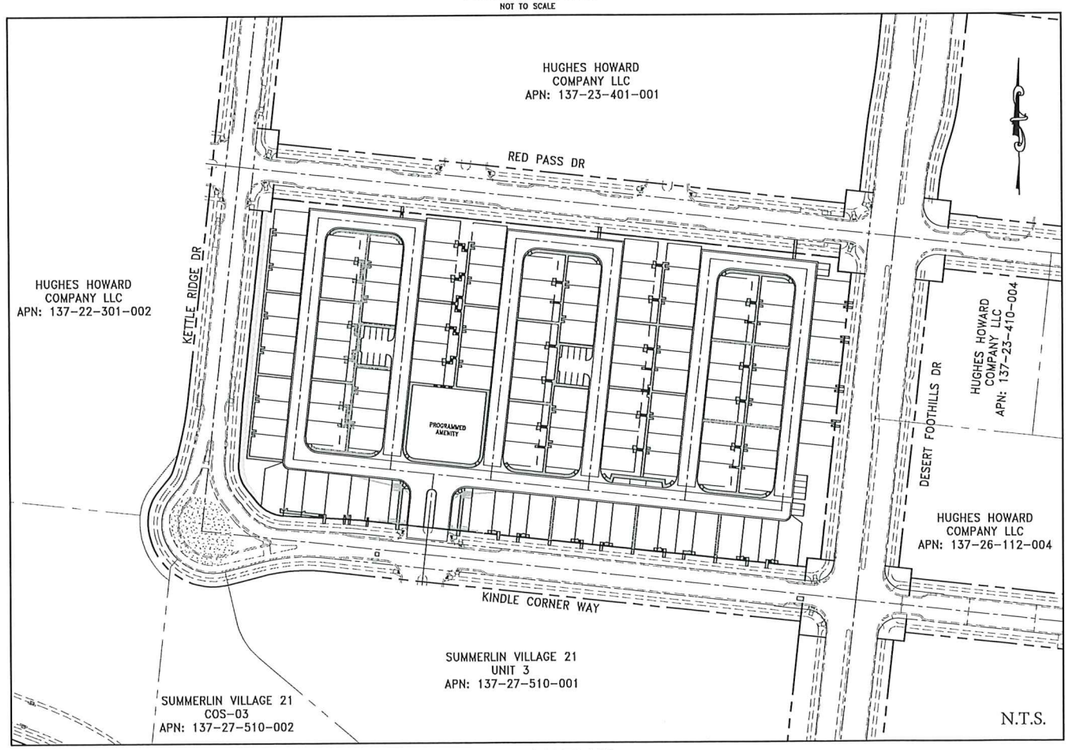
A SINGLE FAMILY RESIDENTIAL SUBDIVISION

9.25 +/- ACRES

PORTION OF APN 137-234-100-001



VICINITY MAP
NOT TO SCALE



SITE PLAN
NOT TO SCALE

GENERAL NOTES

1. ALL IMPROVEMENTS SHALL CONFORM TO THE UNIFORM STANDARDS AND SPECIFICATIONS OF CLARK COUNTY, NEVADA.
2. UTILITY SERVICES PROVIDED AS FOLLOWS:
   - WATER..... LAS VEGAS VALLEY WATER DISTRICT
   - ELECTRIC..... NV ENERGY
   - GAS..... SOUTHWEST GAS CORPORATION
   - SEWER..... CITY OF LAS VEGAS
   - SOLID WASTE DISPOSAL..... REPUBLIC SERVICES
   - TELEPHONE..... CENTURYLINK
3. UTILITY EASEMENTS TO BE DEDICATED TO RESPECTIVE AGENCIES.
4. SEWER CONTRIBUTION = 0.119 M.G.D. AVG. (PEAK)
5. BUILDING SETBACKS TO COMPLY WITH CLARK COUNTY DEVELOPMENT CODE OR APPROVED WAIVERS.
6. STORM WATER TO SURFACE DRAIN ON STREETS.
7. THIS DEVELOPMENT IS SHOWN IN ITS ENTIRETY ON THIS TENTATIVE MAP.
8. THIS DEVELOPMENT LIES WITHIN A ZONE "X" AS DESIGNATED BY FEMA FIRM MAP# 32003C2150E DATED 09/27/2002
9. ALL INTERIOR SEWER AND WATER MAINS ARE 8" UNLESS OTHERWISE SHOWN.
10. ALL INTERIOR STREETS ARE PRIVATE.
11. ALL CURB RADIUS = 20' AT INTERSECTIONS UNLESS OTHERWISE SHOWN.
12. THIS SUBDIVISION WILL HAVE CC&R'S & TO MAINTAIN LANDSCAPING IN PERPETUITY BY THE HOME OWNER'S ASSOCIATION.
13. THERE ARE NO OBSERVABLE FAULTS OR FISSURES ON OR NEAR THIS SITE.
14. SEEPS, SPRINGS, OR OTHER INDICATIONS OR HIGH GROUND WATER LEVELS HAVE NOT BEEN LOCATED WITHIN 20 FEET OF THE EXISTING GROUND SURFACE.
15. THE LOT SQUARE FOOTAGE LISTED ON THIS MAP REPRESENTS NET SQUARE FOOTAGE. NET SQUARE FOOTAGE IS EQUAL TO GROSS SQUARE FOOTAGE.

BENCHMARK

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

CITY OF LAS VEGAS BENCHMARK: D368 (REVISED 2008)
NAVD88 ELEVATION: 989.574 METERS (3,2466.63 FEET)

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

BASIS OF BEARINGS

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 BEARING 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.

LEGEND

RIGHT-OF-WAY	
CENTERLINE	
EASEMENT	
PROPOSED PUBLIC SEWER LINE	
PROPOSED PUBLIC WATERLINE	EX. X" SWR
EXISTING PUBLIC SEWER LINE	EX. X" WTR
EXISTING PUBLIC WATERLINE	
PROPOSED SIDEWALK	
PROPOSED FIRE HYDRANT	
EXISTING STREET LIGHT	
INDEX CONTOUR	2035
INTERMEDIATE CONTOUR	
LOT NUMBER	1
RATE OF GRADE	2.00%
RIGHT OF WAY	R/W
SIDEWALK	SW
SQUARE FEET	S.F.
COMMON ELEMENT	C.E.
POINT OF CONNECTION	POC

DISCLAIMER NOTE:

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND OR OVERHEAD 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. CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES OR DISCREPANCIES.

OWNER

HOWARD HUGHES COMPANY, LLC
10801 W. CHARLESTON BLVD, 3RD FLOOR
LAS VEGAS, NEVADA 89135

APPLICANT

Toll Brothers
America's Luxury Home Builder
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NEVADA 89144
PH#702.243.9800 FAX#702.243.9610

DESIGN ENGINEER:

RCI ENGINEERING
500 SOUTH RANCHO DRIVE, SUITE 17, LAS VEGAS, NV 89106
MAIN: 702.453.0800 FAX: 702.453.0801

LAND USE INFORMATION:

TOTAL ACREAGE	= 9.25 ACRES (NET)
TOTAL LOTS	= 136 LOTS
GROSS DENSITY	= 14.7 LOTS/ACRE
COMMON ELEMENT AREA	= 76,743 S.F.

SUMMERLIN SPECIAL LAND USE DESIGNATION (SFSD)
REAR LOADED ATTACHED UNITS WITH ATTACHED GARAGES PER SUMMERLIN DEVELOPMENT STANDARDS EXHIBIT 2.11

REQUIRED PARKING (GUEST @ UNITS)	=23 SPACES
PROVIDED PARKING	=27 SPACES

SHEET INDEX

SHT No.	DWG ID	DRAWING DESCRIPTION
1	TM1	COVER SHEET
2	TM2	OVERALL SITE MAP
3	TM3	TENTATIVE MAP WEST AREA
4	TM4	TENTATIVE MAP EAST AREA
5	D-1	DETAILS AND SECTIONS

DATE: May 11, 2020
HORIZ. SCALE: N/A
VERT. SCALE: N/A
DRAWN BY: SRC
DESIGNED BY: DSP
CHECKED BY: CLT
APPROVED BY: CLT
PROJECT # 3110.0048

RCI ENGINEERING
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MAIN: 702.453.0800 FAX: 702.453.0801

Toll Brothers
America's Luxury Home Builder
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NEVADA 89144
PH#702.243.9800 FAX#702.243.9610

TENTATIVE MAP
SUMMERLIN VILLAGE 21 PARCEL P, Q & R
COVER SHEET
CITY OF LAS VEGAS NEVADA

PROFESSIONAL ENGINEER - STATE OF NEVADA
CHRISTOPHER L. THOMPSON
Exp. 6/30/2020
CIVIL
No. 14134

DRAWING
TM-1
SHT 1 OF 5

LAND USE INFORMATION:

TOTAL ACREAGE	= 9.25 ACRES (NET)
TOTAL LOTS	= 136 LOTS
GROSS DENSITY	= 14.7 LOTS/ACRE
COMMON ELEMENT AREA	= 76,743 S.F.
REQUIRED PARKING (GUEST 1 UNITS)	=23 SPACES
PROVIDED PARKING	=27 SPACES

HUGHES HOWARD
COMPANY LLC
APN: 137-23-401-001

HUGHES HOWARD
COMPANY LLC
APN: 137-23-401-001

HUGHES HOWARD
COMPANY LLC
APN: 137-22-301-002

RED PASS DR

KETTLE RIDGE DR

SHAW TOWER ST

TALON RIDGE ST

FORTIS CREEK ST

AGATE BRIDGE ST

TERCEL POINT ST

SPOTTED FALCON ST

GREY SAKER ST

FLINDERS CHASE ST

SENTINAL SPIRE ST

DESERT FOOTHILLS DR

PROGRAMMED AMENITY

STONE RUN ST

BANDED HAWK ST

KINDLE CORNER WAY

HUGHES HOWARD
COMPANY LLC
APN: 137-23-410-004

HUGHES HOWARD
COMPANY LLC
APN: 137-26-112-004

SUMMERLIN VILLAGE 21
UNIT 3
APN: 137-27-510-001

SUMMERLIN VILLAGE 21
UNIT 3
APN: 137-27-510-002

HUGHES HOWARD
COMPANY LLC
APN: 137-26-112-004

LEGEND

RIGHT-OF-WAY	
CENTERLINE	
EASEMENT	
PROPOSED PUBLIC SEWER LINE	
PROPOSED PUBLIC WATERLINE	
EXISTING PUBLIC SEWER LINE	FX. X" SWR
EXISTING PUBLIC WATERLINE	FX. X" WTR
PROPOSED SIDEWALK	
PROPOSED FIRE HYDRANT	
EXISTING STREET LIGHT	
INDEX CONTOUR	2035
INTERMEDIATE CONTOUR	
LOT NUMBER	1
RATE OF GRADE	2.00%
RIGHT OF WAY	R/W
SIDEWALK	SW
SQUARE FEET	S.F.
COMMON ELEMENT	C.E.
POINT OF CONNECTION	POC

60' 30' 0' 60' 120'
SCALE: 1" = 60'

DATE: May 11, 2020
HORIZ. SCALE: 1"=60'
VERT. SCALE: N/A
DRAWN BY: SBC
DESIGNED BY: DSP
CHECKED BY: CLT
APPROVED BY: CLT
PROJECT #: 3110.0048

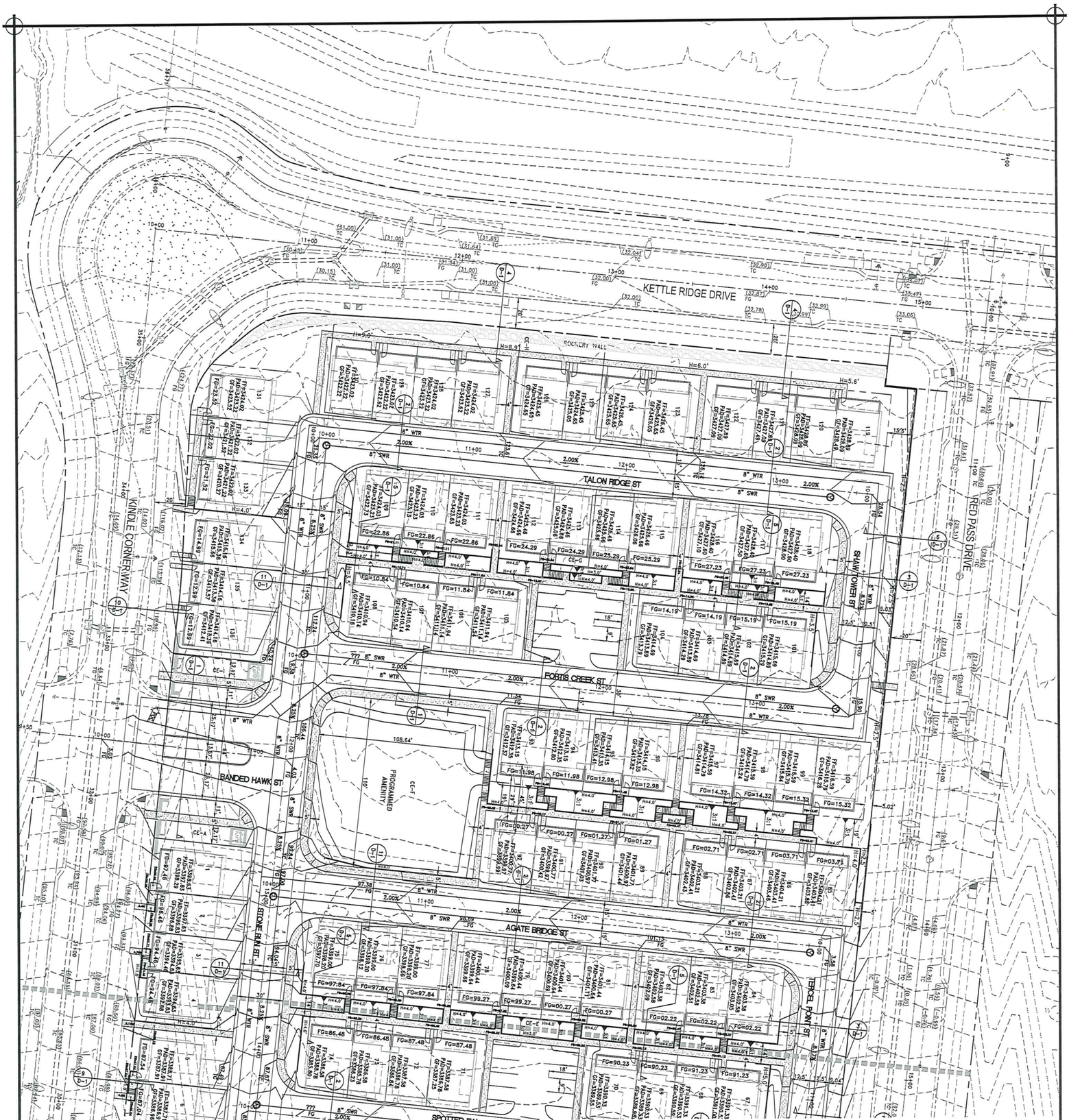
RCI ENGINEERING
500 SOUTH RANCHO DRIVE, SUITE 17, LAS VEGAS, NV 89106
MAIN: 702.453.0800 FAX: 702.453.0801

Toll Brothers
America's Luxury Home Builder
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NEVADA 89144
PH:(702.453.6800 FAX:(702.243.8610

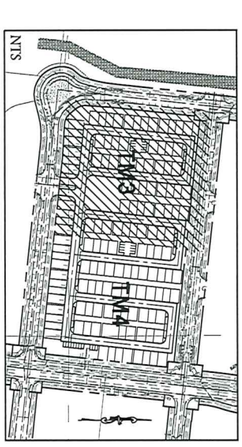
TENTATIVE MAP
SUMMERLIN VILLAGE 21 PARCEL P, Q & R
OVERALL SITE PLAN
CITY OF LAS VEGAS NEVADA

PROFESSIONAL ENGINEER - STATE OF NEVADA
CHRISTOPHER L. THOMPSON
Exp. 6/30/2020
CIVIL
No. 14134

DRAWING
TM-2
SHT 2 OF 5



MATCH LINE SEE SHEET TM-4



SCALE: 1" = 30'

30' 15' 0' 30' 60'

DRAWING TM-3
SHT 8 OF 5

PROFESSIONAL ENGINEER — CHRISTOPHER L. THOMPSON — No. 14134 — CIVIL — 6/29/2020 — STATE OF NEVADA

TENTATIVE MAP
SUMMERLIN VILLAGE 21 PARCEL P, Q & R

TENTATIVE MAP

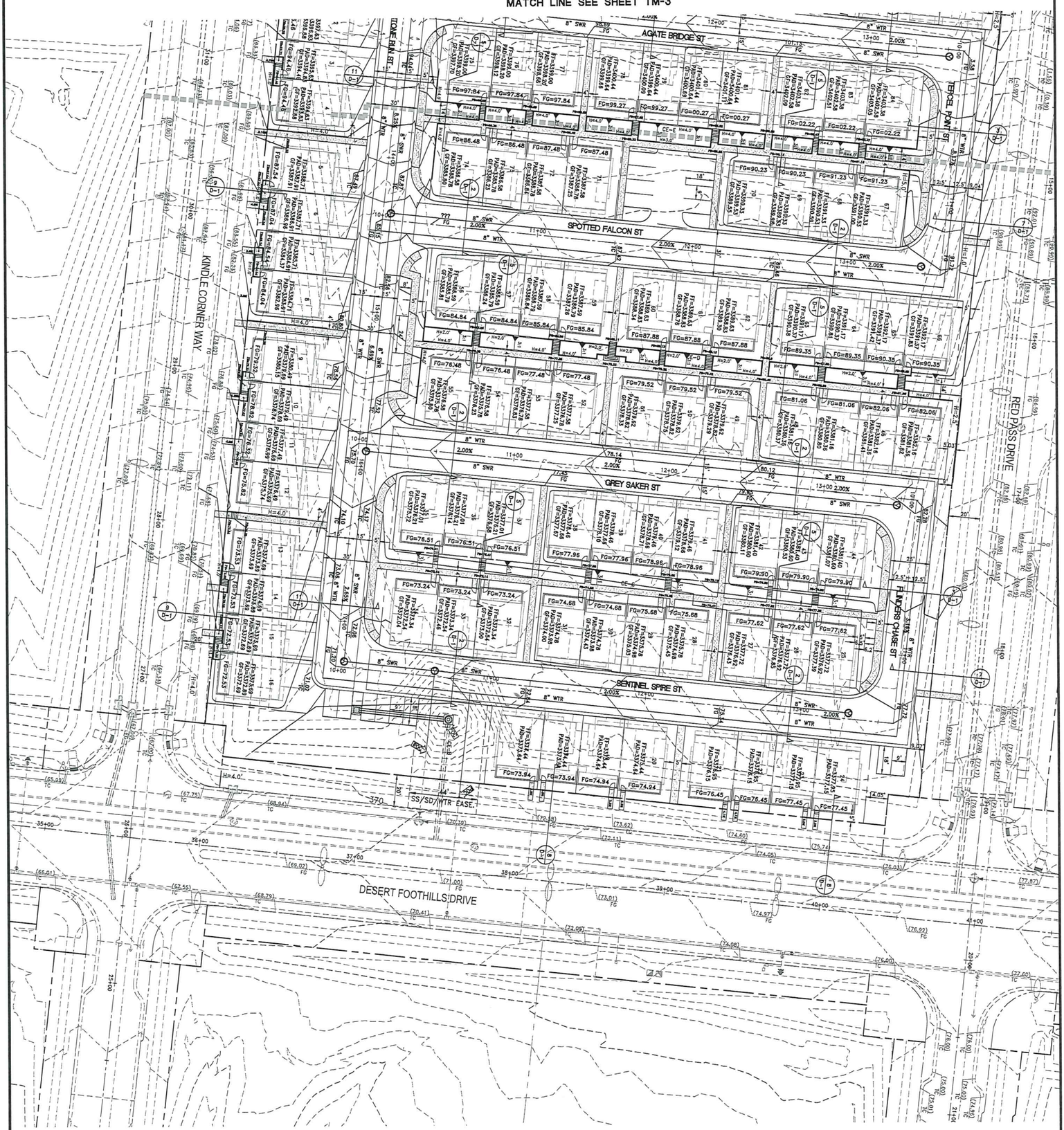
CITY OF LAS VEGAS NEVADA

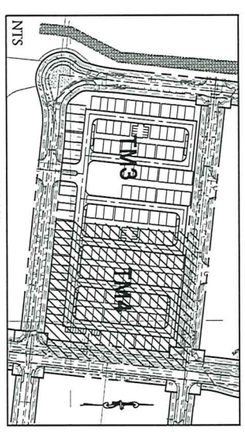
Toll Brothers
America's Luxury Home Builder
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NEVADA 89144
PH#702.243.9800 FAX#702.243.9610

RCI ENGINEERING
500 SOUTH RANCHO DRIVE, SUITE 17, LAS VEGAS, NV 89106
MAIN: 702.453.0800 FAX: 702.453.0801

DATE: May 11, 2020
HORIZ. SCALE: 1"=30'
VERT. SCALE: N/A
DRAWN BY: SRC
DESIGNED BY: DSP
CHECKED BY: CLT
APPROVED BY: CLT
PROJECT #: 3110.0048

MATCH LINE SEE SHEET TM-3





SCALE 1" = 30'
30' 15' 0' 30' 60'

TENTATIVE MAP
SUMMERLIN VILLAGE 21 PARCEL P, Q & R

TENTATIVE MAP

CITY OF LAS VEGAS NEVADA

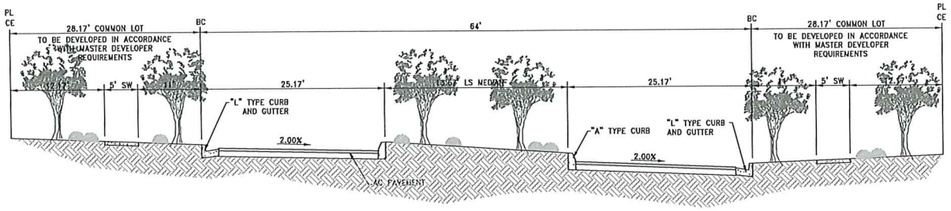
DRAWING TM-4
SHT 4 OF 5

PROFESSIONAL ENGINEER STATE OF NEVADA CHRISTOPHER J. THOMPSON No. 14154 CIVIL 6/29/2020

Toll Brothers
America's Luxury Home Builder
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NEVADA 89144
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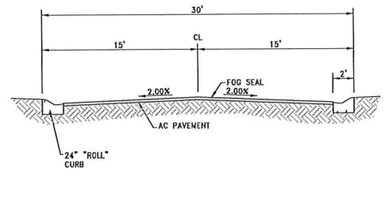
RCI ENGINEERING
500 SOUTH RANCHO DRIVE, SUITE 17, LAS VEGAS, NV 89106
MAIN: 702.453.0800 FAX: 702.453.0801

DATE: May 11, 2020
HORIZ. SCALE: 1"=30'
VERT. SCALE: N/A
DRAWN BY: SRC
DESIGNED BY: DSP
CHECKED BY: CLT
APPROVED BY: CLT
PROJECT #: 3110.0048

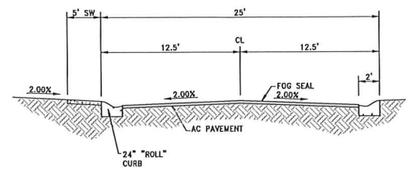


1 COMMUNITY ENTRY ROAD
PUBLIC — SCALE: NTS

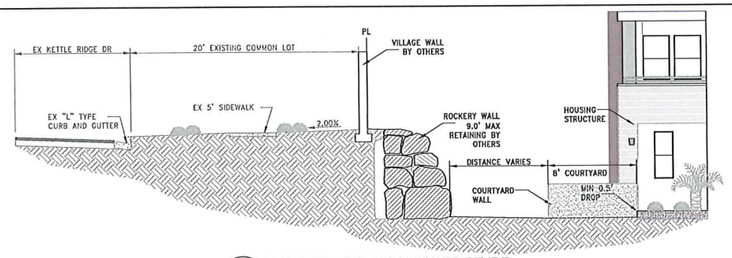
ON SITE COMMON LOTS TO BE MAINTAINED BY THE SUB-ASSOCIATION



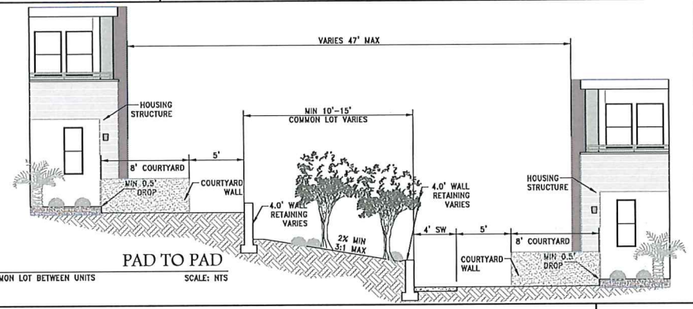
2 ONSITE PUBLIC 30' STREET
SCALE: NTS



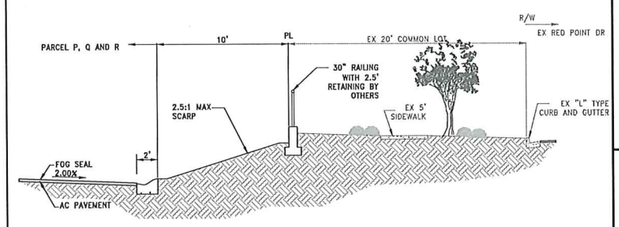
3 ONSITE PUBLIC 25' STREET
SCALE: NTS



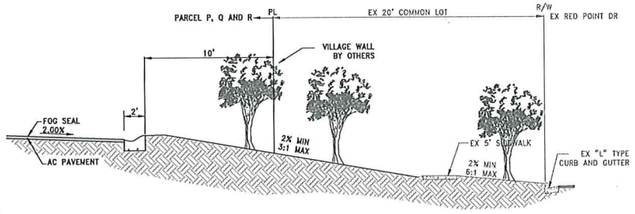
4 LOT BELOW KETTLE RIDGE DR
WITH ROCKERY WALL — SCALE: NTS



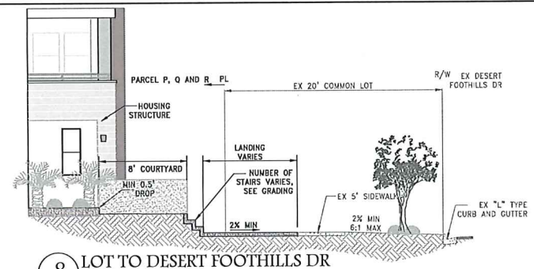
5 PAD TO PAD
COMMON LOT BETWEEN UNITS — SCALE: NTS



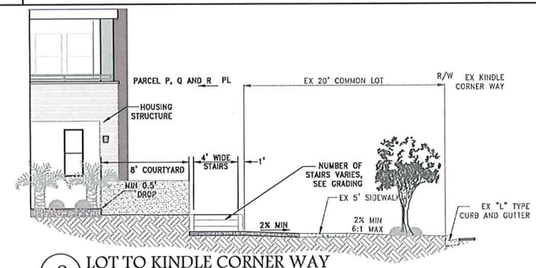
6 STREET BELOW RED PASS DR
SCALE: NTS



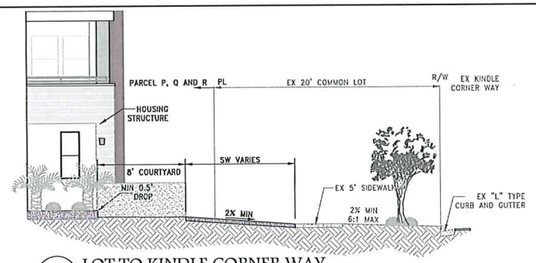
7 STREET ABOVE RED PASS DR
SCALE: NTS



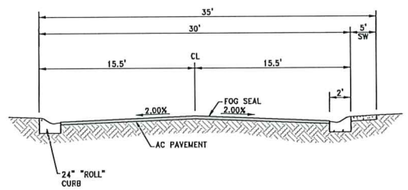
8 LOT TO DESERT FOOTHILLS DR
SCALE: NTS



9 LOT TO KINDLE CORNER WAY
SCALE: NTS



10 LOT TO KINDLE CORNER WAY
SCALE: NTS



11 ONSITE PRIVATE 30' STREET
PRIVATE – SIDEWALK ONE SIDE — SCALE: NTS

DATE: May 11, 2020
HORZ. SCALE: N/A
VERT. SCALE: N/A
DRAWN BY: SBC
DESIGNED BY: DSP
CHECKED BY: CLT
APPROVED BY: CLT
PROJECT # 3110.0046

RCI ENGINEERING
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TENTATIVE MAP
SUMMERLIN VILLAGE 21 PARCEL P, Q & R
DETAILS AND SECTIONS
CITY OF LAS VEGAS — NEVADA

PROFESSIONAL ENGINEER – STATE OF NEVADA
CHRISTOPHER L. THOMPSON
Exp. 6/30/2020
CIVIL
No. 14134

DRAWING
D-1
SHT 5 OF 5

WEST TO EAST SECTION

SOUTH TO NORTH SECTION

KEY MAP

DATE: May 11, 2020
HORIZ. SCALE: 1"=30'
VERT. SCALE: N/A
DRAWN BY: SRC
DESIGNED BY: DSP
CHECKED BY: CLT
APPROVED BY: CLT
PROJECT #: 3110.0045

RCI ENGINEERING
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PH:(702.243.5800 FAX:(702.243.5810

SUMMERLIN VILLAGE 21 PARCEL P, Q & R

SITE CROSS SECTIONS

CITY OF LAS VEGAS NEVADA

PROFESSIONAL ENGINEER - STATE OF NEVADA
CHRISTOPHER L. THOMPSON
Exp. 6/30/2020
CIVIL
No. 14134

DRAWING
XC-1
SHT 1 OF 1

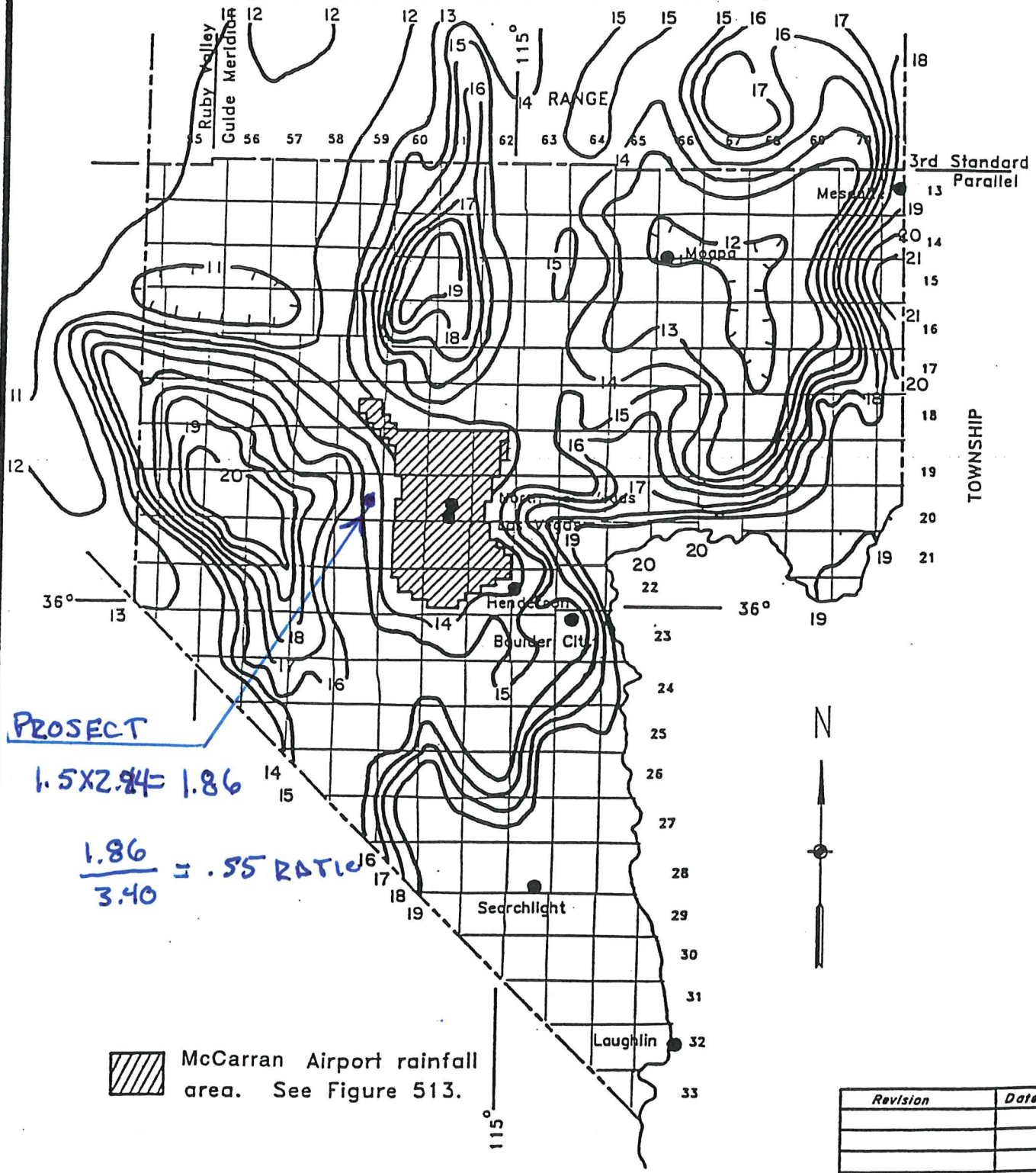
PRECIPITATION ADJUSTMENT RATIOS

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

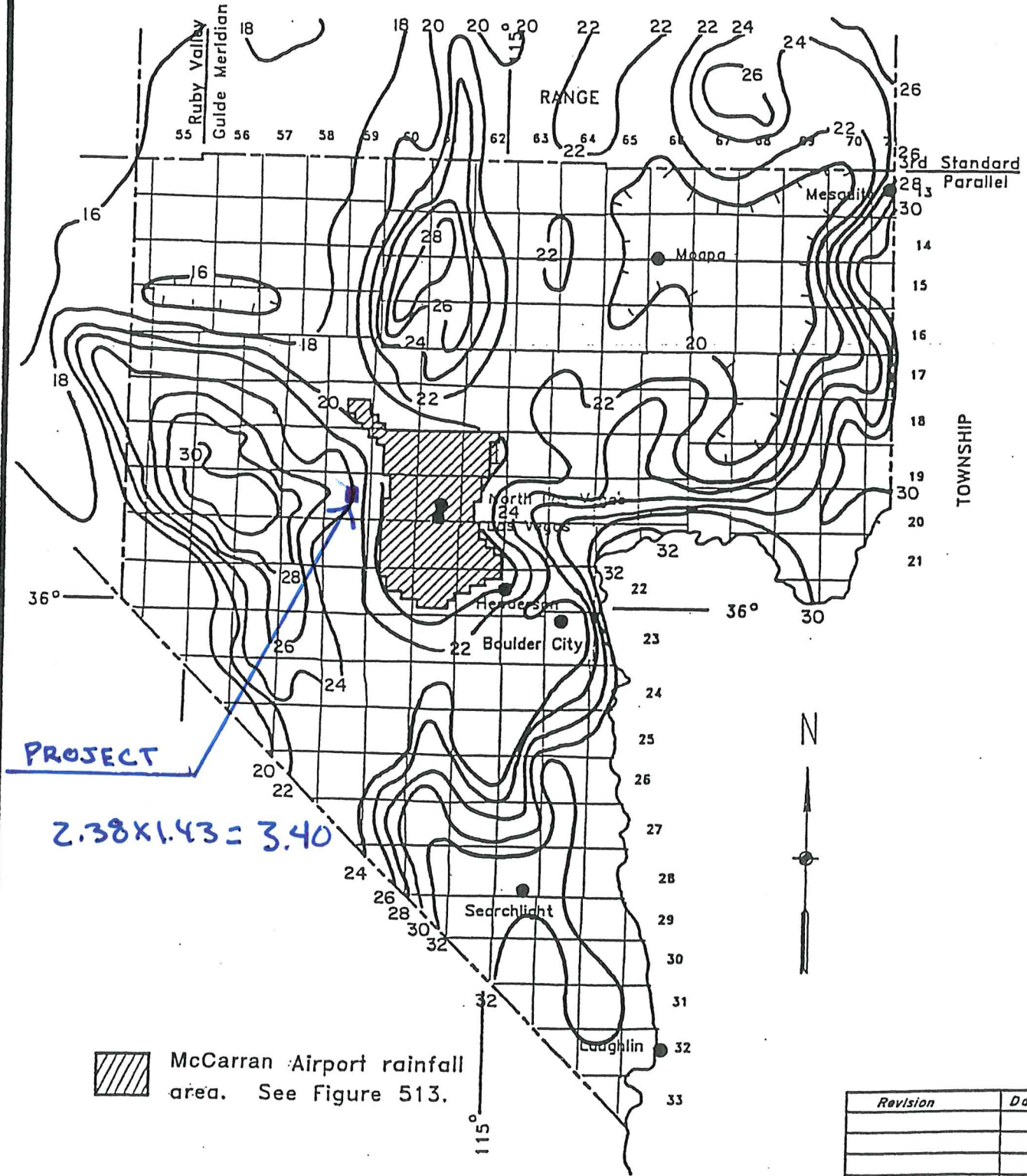
WRC ENGINEERING

REFERENCE:
NOAA ATLAS 2, VOLUME VII NEVADA, 1973

FIGURE 503

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

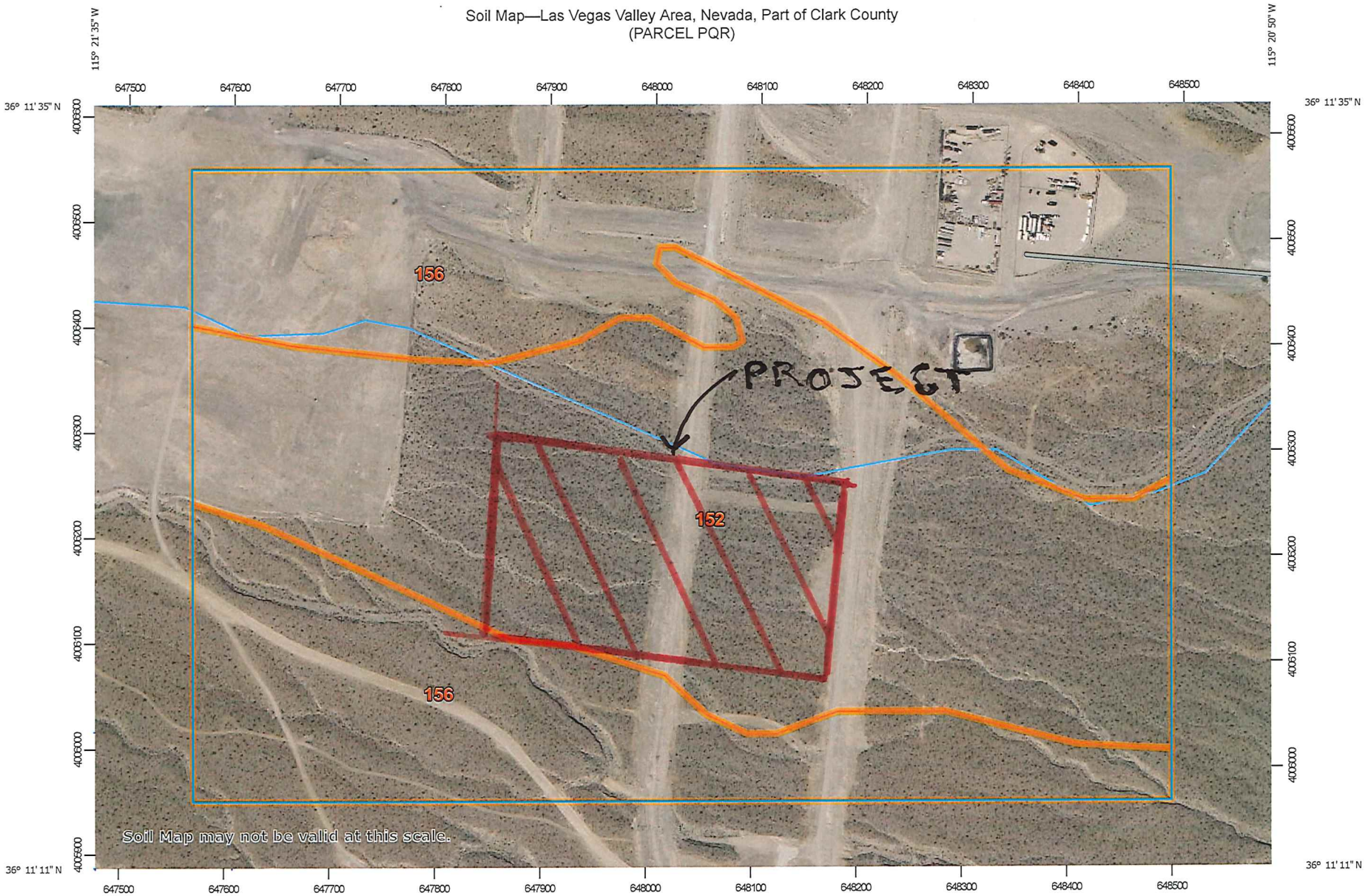
RAINFALL DEPTH-DURATION-FREQUENCY
100-YEAR, 6-HOUR
(DEPTHS IN TENTHS OF INCHES)



Revision	Date

WRC ENGINEERING	REFERENCE: NOAA ATLAS 2, VOLUME VII NEVADA, 1973	FIGURE 506

Soil Map—Las Vegas Valley Area, Nevada, Part of Clark County
(PARCEL PQR)



Map Scale: 1:5,110 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties–Las Vegas Valley Area, Nevada, Part of Clark County														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
152—Cave gravelly fine sandy loam, 0 to 4 percent slopes														
Cave	100	D	0-12	Gravelly fine sandy loam	SC-SM, SM	A-2, A-4	0- 0- 0	0- 3- 5	70-80-90	60-68-75	40-53-65	25-33-40	15-20 -25	NP-3 -5
			12-36	Indurated	—	—	—	—	—	—	—	—	—	—
			36-60	Gravelly loamy sand, very gravelly sandy loam	GM, GP-GM, SM, SP-SM	A-1, A-2	0- 0- 0	0- 3- 5	35-55-75	30-45-60	20-28-35	10-20-30	0-8 -15	NP

RUNOFF CURVE NUMBERS - RESIDENTIAL DISTRICTS

Average Lot Size or Usage[1]	Percent Impervious[2]	Curve Number for Hydrologic Soil Groups			
		A	B	C	D
Apartments/Condos	72	81	88	91	93
Townhouses/6,000 sq ft lots or less[3]	69	80	87	90	92
7,000 sq ft lots	63	76	84	89	91
8,000 sq ft lots	58	73	82	88	90
10,000 sq ft lots	38	61	75	83	87
14,000 sq ft lots	30	57	72	81	86
20,000 sq ft lots	25	54	70	80	85
40,000 sq ft lots	20	51	68	79	84
80,000 sq ft lots	12	46	65	77	82

1 Lot size should represent the size of the average lot and not the gross acreage divided by the number of lots.
2 Actual percent impervious value should be compared to selected land use type.
3 In cases where average residential lots are smaller than 6,000 sq ft, commercial/business/industrial land use should be used.

Revision	Date

REFERENCE:

TABLE 602A

RUNOFF CURVE NUMBERS
(URBAN AREAS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					

See Table 602A

Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system. Impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using Figure 603.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using Figure 603 based on the impervious area percentage (CN #98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using Figure 603 based on the degree of development impervious area percentage) and the CN's for the newly graded pervious areas.

Revision	Date

CN CALCULATIONS - EXISTING CONDITIONS

Basin	% SOIL TYPE	HYDRO	CN- DESERT SHRUB POOR CONDITION %		WEIGHTED CN
EX1		A		63	0.0
		B		77	0.0
		C		85	0.0
	100	D	100	88	88.0
					88.0

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

TIME OF CONCENTRATION

RCI
ENGINEERING

SUMMERLIN VILLAGE 21 PARCELS PQR
EXISTING CONDITIONS

BY: rjr
DATE: 8/17/20

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc	Tc Check	Tlag	REMARKS
DESIG:	DEV./EX. (D or E)	CN	K	AREA Ac	AREA Mi^2	INITIAL LENGTH Feet	SLOPE %	Ti Min	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY FPS	V2 VELOCITY FPS	Tt Min	Min	Min	Tlag= 0.6Tc/60 Hours	
(1)			(2)	(3)		(4)	(5)	(6)	(7)	(8)	(9a)	(9b)	(10)	(13)	(14)		
ON1	E	88.0	0.7716	9.25	0.0145	370	8.4	5.6	1005	4.2	3.0	6.0	4.2	9.8	N/A	0.098	

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

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

Existing V1 = 14.8*(S/100)^1/2
Existing V2 = 29.4*(S/100)^1/2
Minimum Tc (EX) = 10 Min per Section 602

Developed V1 = 20.2*(S/100)^1/2
Developed V2 = 30.6*(S/100)^1/2
Minimum Tc (DEV) = 5 Min per Section 602.1

REFERENCE :

STANDARD FORM 4

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN   1998               *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   17AUG20  TIME  04:58:26   *
*                                       *
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```

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

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

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

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

1 HEC-1 INPUT PAGE 1

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

                        *DIAGRAM
            1           ID     SUMMERLIN VILLAGE 21 PARCELS PQR
            2           ID     EXISTING CONDITIONS MODEL
            3           ID     DESIGN STORM = 100-YEAR 6-HOUR STORM
            4           ID     STORM DISTRIBUTION = SDN3
            5           ID
            6           ID     AREA (SQUARE MILES)   DARF
            7           ID     10-YR STORM FLOW       0.55
            8           ID
            9           IT       5       0       0     300
           10           IO       5       0       0
           11           IN       5       0       0
           12           JR    PREC    1.00    0.55
                        *
            13          KK     EX1
            14          KM     EXISTING CONDITIONS MODEL
            15          BA   .0145
            16          PB     3.4
            17          PC   0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
            18          PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
            19          PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
            20          PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
            21          PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
            22          PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
            23          PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
            24          PC   0.998   0.999   1.000
            25          LS       0      88
            26          UD    .098
                        *
                        *
            27          ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

    13         EX1

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
```


```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN   1998               *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   17AUG20  TIME  04:58:26   *
*                                       *
*****************************************
```

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


SUMMERLIN VILLAGE 21 PARCELS PQR
EXISTING CONDITIONS MODEL
DESIGN STORM = 100-YEAR 6-HOUR STORM
STORM DISTRIBUTION = SDN3

AREA (SQUARE MILES) DARF
10-YR STORM FLOW 0.60

10 IO OUTPUT CONTROL VARIABLES

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

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

                  COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE   24.92 HOURS

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

      JP          MULTI-PLAN OPTION
                     NPLAN           1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                   RATIOS OF PRECIPITATION
                  1.00       .55
1

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


                                                          RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION      AREA     PLAN              RATIO 1  RATIO 2
                                                           1.00      .55

 HYDROGRAPH AT
+                    EX1       .01      1   FLOW           28.      12.
                                            TIME          3.50     3.50


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

CN CALCULATIONS - ULTIMATE CONDITIONS

Basin	% SOIL TYPE	HYDRO	CN-COMMERCIAL %	CN-COMMERCIAL	WEIGHTED CN
ULT1		A		89	0.0
		B		92	0.0
		C		94	0.0
	100	D	100	95	95.0
					95.0

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

TIME OF CONCENTRATION

RCI
ENGINEERING

SUMMERLIN VILLAGE 21 PARCELS PQR
ULTIMATE CONDITIONS

BY: rjr
DATE: 8/19/20

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc	Tc Check	Tlag	REMARKS
DESIG:	DEV./EX. (D or E)	CN	K	AREA Ac	AREA Mi^2	INITIAL LENGTH Feet	SLOPE %	Ti Min	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY FPS	V2 VELOCITY FPS	Tt Min	Min	Min	Tlag= 0.6Tc/60 Hours	
(1)			(2)	(3)		(4)	(5)	(6)	(7)	(8)	(9a)	(9b)	(10)	(13)	(14)		
ULT1	D	95.0	0.8640	9.25	0.0145	62	1.0	3.3	1254	4.5	4.3	6.5	3.9	7.2	17.3	0.072	

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

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

Existing V1 = 14.8*(S/100)^1/2
Existing V2 = 29.4*(S/100)^1/2
Minimum Tc (EX) = 10 Min per Section 602

Developed V1 = 20.2*(S/100)^1/2
Developed V2 = 30.6*(S/100)^1/2
Minimum Tc (DEV) = 5 Min per Section 602.1

REFERENCE :

STANDARD FORM 4

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               JUN  1998               *
*             VERSION 4.1               *
*                                       *
*  RUN DATE   11AUG20  TIME  01:54:00   *
*                                       *
*****************************************
```

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

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

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

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

1 HEC-1 INPUT PAGE 1

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

                        *DIAGRAM
            1           ID     SUMMERLIN VILLAGE 21 PARCELS PQR
            2           ID     ULTIMATE CONDITIONS MODEL
            3           ID     DESIGN STORM = 100-YEAR 6-HOUR STORM
            4           ID     STORM DISTRIBUTION = SDN3
            5           ID
            6           ID     AREA (SQUARE MILES)   DARF
            7           ID     10-YR STORM FLOW       0.55
            8           ID
            9           IT       5       0       0     300
           10           IO       5       0       0
           11           IN       5       0       0
           12           JR    PREC    1.00    0.55
                        *
           13           KK    ULT1
           14           KM    ULTIMATE CONDITIONS SUBBASIN
           15           BA   .0145
           16           PB     3.4
           17           PC   0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
           18           PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
           19           PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
           20           PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
           21           PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
           22           PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
           23           PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
           24           PC   0.998   0.999   1.000
           25           LS       0      95
           26           UD    .072
                        *
                        *
           27           ZZ
```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

    13        ULT1
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               JUN  1998               *
*             VERSION 4.1               *
*                                       *
*  RUN DATE   11AUG20  TIME  01:54:00   *
*                                       *
*****************************************
```

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

SUMMERLIN VILLAGE 21 PARCELS PQR
ULTIMATE CONDITIONS MODEL
DESIGN STORM = 100-YEAR 6-HOUR STORM
STORM DISTRIBUTION = SDN3

AREA (SQUARE MILES) DARF
10-YR STORM FLOW   0.60

10 IO OUTPUT CONTROL VARIABLES

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

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

                  COMPUTATION INTERVAL      .08 HOURS
                       TOTAL TIME BASE   24.92 HOURS

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

      JP          MULTI-PLAN OPTION
                       NPLAN          1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                    1.00       .55
1

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


                                                                  RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION      AREA     PLAN                 RATIO 1  RATIO 2
                                                              1.00       .55

 HYDROGRAPH AT
+                  ULT1        .01      1    FLOW            37.       19.
                                             TIME           3.50      3.50


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

APPENDIX B – HYDRAULIC CALCS

100-Year Ultimate Flow Rate Hydraulic Cross Sections

6-Foot by 6-Foot Area Drain Calculation

Standard Form 6 (SF6) Spreadsheet and Summary Sheet

SF6 Reference

D-Load Calculations

Worksheet for SECT 1 100-YEAR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	8.25 %
Discharge	12 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+00.00	1.00
1+00.00	0.38
1+00.33	0.35
1+00.66	0.25
1+01.00	0.00
1+02.00	0.13
1+02.00	0.17
1+15.00	0.43
1+28.00	0.17
1+28.00	0.13
1+29.00	0.00
1+29.02	0.08
1+29.34	0.25
1+29.63	0.35
1+30.00	0.38
1+30.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.00, 1.00)	(1+02.00, 0.17)	0.013
(1+02.00, 0.17)	(1+28.00, 0.17)	0.016
(1+28.00, 0.17)	(1+30.00, 1.00)	0.013

Options	
Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Normal Depth	0.33 ft
Elevation Range	0.00 to 1.00 ft

Worksheet for SECT 1 100-YEAR

Results	
Flow Area	1.9 ft²
Wetted Perimeter	19.03 ft
Hydraulic Radius	0.10 ft
Top Width	18.72 ft
Normal Depth	0.33 ft
Critical Depth	0.45 ft
Critical Slope	0.55 %
Velocity	6.39 ft/s
Velocity Head	0.64 ft
Specific Energy	0.96 ft
Froude Number	3.561
Flow Type	Supercritical

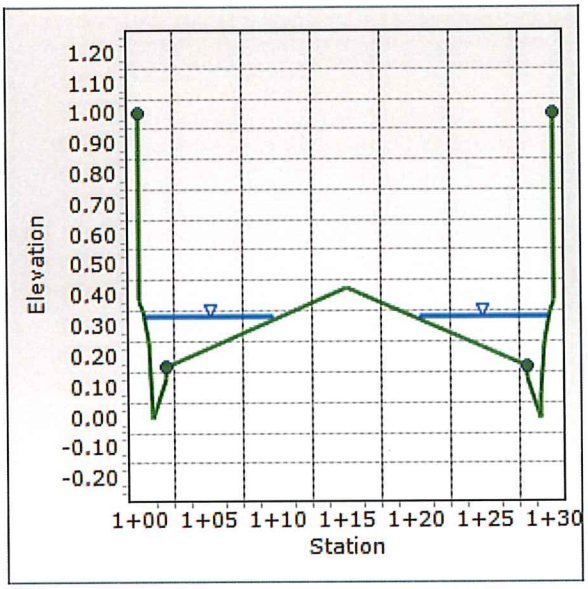
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0.00

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	0.33 ft
Critical Depth	0.45 ft
Channel Slope	8.25 %
Critical Slope	0.55 %

Cross Section for SECT 1 100-YEAR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	8.25 %
Normal Depth	0.33 ft
Discharge	12 cfs



$D = .33$

$\frac{V^2}{2g} = .16$ from Section 2

Total Depth = .49

$+ \frac{V^2}{2g}$

Worksheet for SECT 2 100-YEAR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.00 %
Discharge	6 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+00.00	1.00
1+00.00	0.38
1+00.33	0.35
1+00.66	0.25
1+01.00	0.00
1+02.00	0.13
1+02.00	0.17
1+15.00	0.43
1+28.00	0.17
1+28.00	0.13
1+29.00	0.00
1+29.02	0.08
1+29.34	0.25
1+29.63	0.35
1+30.00	0.38
1+30.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.00, 1.00)	(1+02.00, 0.17)	0.013
(1+02.00, 0.17)	(1+28.00, 0.17)	0.016
(1+28.00, 0.17)	(1+30.00, 1.00)	0.013

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.33 ft
Elevation Range	0.00 to 1.00 ft

Worksheet for SECT 2 100-YEAR

Results	
Flow Area	1.9 ft²
Wetted Perimeter	19.01 ft
Hydraulic Radius	0.10 ft
Top Width	18.70 ft
Normal Depth	0.33 ft
Critical Depth	0.38 ft
Critical Slope	0.61 %
Velocity	3.20 ft/s
Velocity Head	0.16 ft
Specific Energy	0.49 ft
Froude Number	1.785
Flow Type	Supercritical

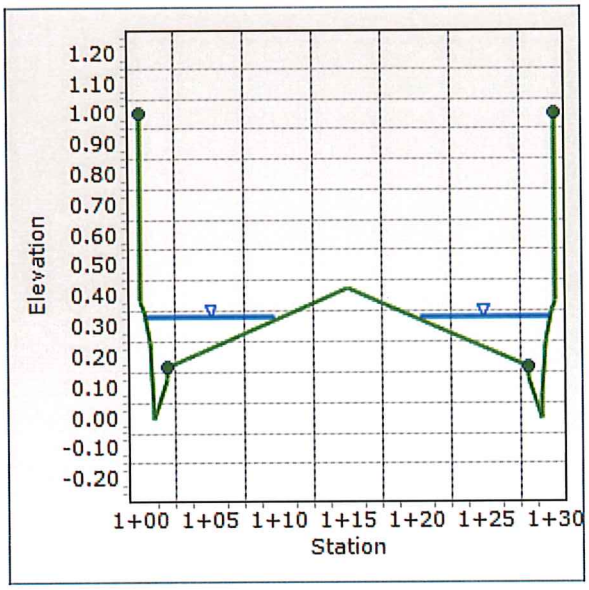
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0.00

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	0.33 ft
Critical Depth	0.38 ft
Channel Slope	2.00 %
Critical Slope	0.61 %

Cross Section for SECT 2 100-YEAR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.00 %
Normal Depth	0.33 ft
Discharge	6 cfs



EGL = 0.49

Velocity Head = .16 feet

Bentley Systems, Inc. Haestad Methods Solution Center
27 Siemon Company Drive Suite 200 W
Watertown, CT 06795 USA +1-203-755-1666

Worksheet for SECT 3 100-YEAR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	7.77 %
Discharge	18 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+00.00	1.00
1+00.00	0.38
1+00.33	0.35
1+00.66	0.25
1+01.00	0.00
1+02.00	0.13
1+02.00	0.17
1+15.00	0.43
1+28.00	0.17
1+28.00	0.13
1+29.00	0.00
1+29.02	0.08
1+29.34	0.25
1+29.63	0.35
1+30.00	0.38
1+30.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.00, 1.00)	(1+02.00, 0.17)	0.013
(1+02.00, 0.17)	(1+28.00, 0.17)	0.016
(1+28.00, 0.17)	(1+30.00, 1.00)	0.013

Options	
Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Normal Depth	0.36 ft
Elevation Range	0.00 to 1.00 ft

Worksheet for SECT 3 100-YEAR

Results	
Flow Area	2.6 ft²
Wetted Perimeter	22.76 ft
Hydraulic Radius	0.11 ft
Top Width	22.44 ft
Normal Depth	0.36 ft
Critical Depth	0.51 ft
Critical Slope	0.46 %
Velocity	7.04 ft/s
Velocity Head	0.77 ft
Specific Energy	1.13 ft
Froude Number	3.676
Flow Type	Supercritical

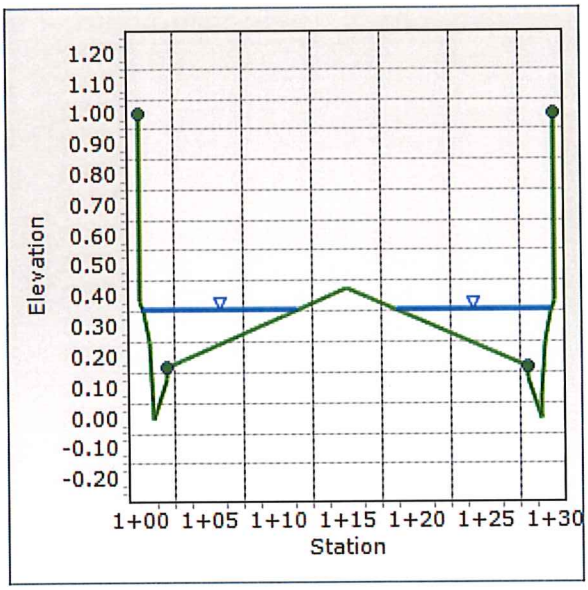
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0.00

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	0.36 ft
Critical Depth	0.51 ft
Channel Slope	7.77 %
Critical Slope	0.46 %

Cross Section for SECT 3 100-YEAR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	7.77 %
Normal Depth	0.36 ft
Discharge	18 cfs



$D = 0.36$

$\frac{V^3}{2g} = .14$ From Section 2

0.52

Bentley Systems, Inc. Haestad Methods Solution Center
27 Siemon Company Drive Suite 200 W
Watertown, CT 06795 USA +1-203-755-1666

Worksheet for SECT 4 100-YEAR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	7.52 %
Discharge	24 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+00.00	1.00
1+00.00	0.38
1+00.33	0.35
1+00.66	0.25
1+01.00	0.00
1+02.00	0.13
1+02.00	0.17
1+15.00	0.43
1+28.00	0.17
1+28.00	0.13
1+29.00	0.00
1+29.02	0.08
1+29.34	0.25
1+29.63	0.35
1+30.00	0.38
1+30.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.00, 1.00)	(1+02.00, 0.17)	0.013
(1+02.00, 0.17)	(1+28.00, 0.17)	0.016
(1+28.00, 0.17)	(1+30.00, 1.00)	0.013

Options	
Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Normal Depth	0.39 ft
Elevation Range	0.00 to 1.00 ft

Worksheet for SECT 4 100-YEAR

Results	
Flow Area	3.3 ft²
Wetted Perimeter	26.40 ft
Hydraulic Radius	0.13 ft
Top Width	26.04 ft
Normal Depth	0.39 ft
Critical Depth	0.55 ft
Critical Slope	0.47 %
Velocity	7.22 ft/s
Velocity Head	0.81 ft
Specific Energy	1.20 ft
Froude Number	3.561
Flow Type	Supercritical

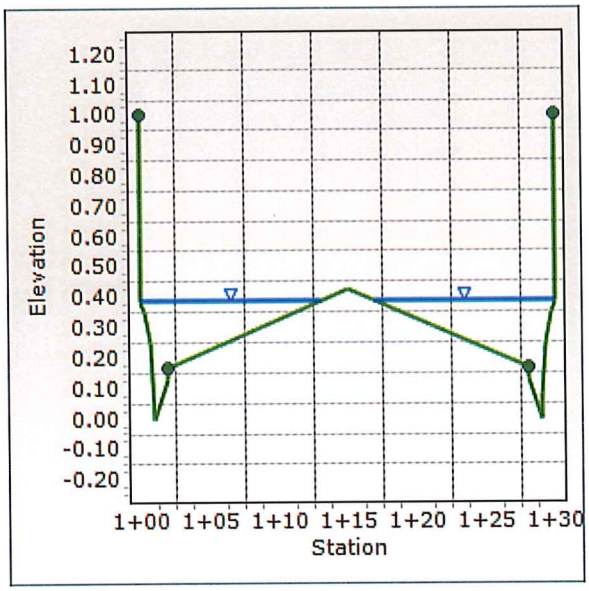
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0.00

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	0.39 ft
Critical Depth	0.55 ft
Channel Slope	7.52 %
Critical Slope	0.47 %

Cross Section for SECT 4 100-YEAR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	7.52 %
Normal Depth	0.39 ft
Discharge	24 cfs



$D = .39$

$\frac{V^2}{2g} = .16$ From Section 2

0.55

Bentley Systems, Inc. Haestad Methods Solution Center
27 Siemon Company Drive Suite 200 W
Watertown, CT 06795 USA +1-203-755-1666

Worksheet for SECT 5 100-YEAR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.64 %
Discharge	30 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+00.00	1.00
1+00.00	0.38
1+00.33	0.35
1+00.66	0.25
1+01.00	0.00
1+02.00	0.13
1+02.00	0.17
1+15.00	0.43
1+28.00	0.17
1+28.00	0.13
1+29.00	0.00
1+29.02	0.08
1+29.34	0.25
1+29.63	0.35
1+30.00	0.38
1+30.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.00, 1.00)	(1+02.00, 0.17)	0.013
(1+02.00, 0.17)	(1+28.00, 0.17)	0.016
(1+28.00, 0.17)	(1+30.00, 1.00)	0.013

Options	
Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Normal Depth	0.47 ft
Elevation Range	0.00 to 1.00 ft

Worksheet for SECT 5 100-YEAR

Results	
Flow Area	5.6 ft²
Wetted Perimeter	30.51 ft
Hydraulic Radius	0.18 ft
Top Width	30.00 ft
Normal Depth	0.47 ft
Critical Depth	0.60 ft
Critical Slope	0.48 %
Velocity	5.31 ft/s
Velocity Head	0.44 ft
Specific Energy	0.91 ft
Froude Number	2.160
Flow Type	Supercritical

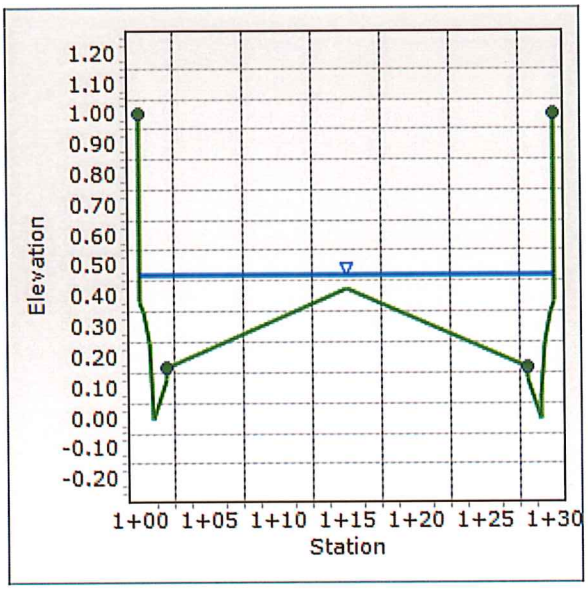
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0.00

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	0.47 ft
Critical Depth	0.60 ft
Channel Slope	2.64 %
Critical Slope	0.48 %

Cross Section for SECT 5 100-YEAR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.64 %
Normal Depth	0.47 ft
Discharge	30 cfs



Worksheet for SECT 6 100-YEAR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.00 %
Discharge	7 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+00.00	1.00
1+00.00	0.38
1+00.33	0.35
1+00.66	0.25
1+01.00	0.00
1+02.00	0.13
1+02.00	0.17
1+15.00	0.43
1+28.00	0.17
1+28.00	0.13
1+29.00	0.00
1+29.02	0.08
1+29.34	0.25
1+29.63	0.35
1+30.00	0.38
1+30.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.00, 1.00)	(1+02.00, 0.17)	0.013
(1+02.00, 0.17)	(1+28.00, 0.17)	0.016
(1+28.00, 0.17)	(1+30.00, 1.00)	0.013

Options	
Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Normal Depth	0.33 ft
Elevation Range	0.00 to 1.00 ft

Worksheet for SECT 6 100-YEAR

Results	
Flow Area	2.0 ft²
Wetted Perimeter	19.79 ft
Hydraulic Radius	0.10 ft
Top Width	19.47 ft
Normal Depth	0.33 ft
Critical Depth	0.39 ft
Critical Slope	0.51 %
Velocity	3.48 ft/s
Velocity Head	0.19 ft
Specific Energy	0.52 ft
Froude Number	1.909
Flow Type	Supercritical

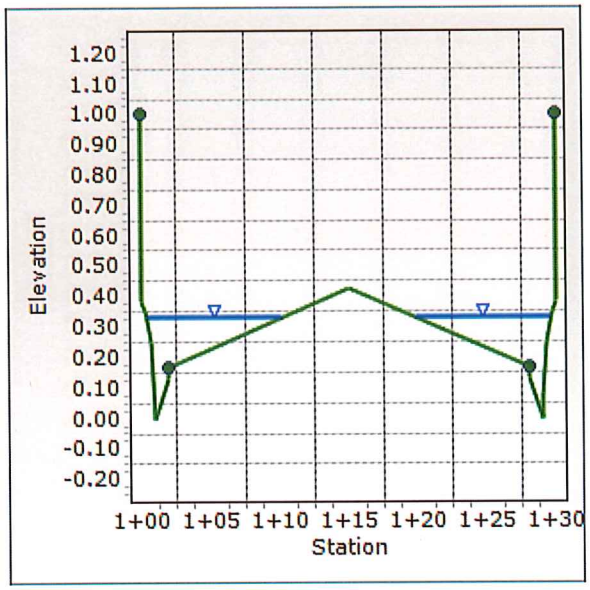
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0.00

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	0.33 ft
Critical Depth	0.39 ft
Channel Slope	2.00 %
Critical Slope	0.51 %

Cross Section for SECT 6 100-YEAR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.00 %
Normal Depth	0.33 ft
Discharge	7 cfs



Worksheet for SECT 7 100-YEAR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	4.63 %
Discharge	6 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+00.00	1.00
1+00.00	0.38
1+00.33	0.35
1+00.66	0.25
1+01.00	0.00
1+02.00	0.13
1+02.00	0.17
1+15.00	0.43
1+28.00	0.17
1+28.00	0.13
1+29.00	0.00
1+29.02	0.08
1+29.34	0.25
1+29.63	0.35
1+30.00	0.38
1+30.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.00, 1.00)	(1+02.00, 0.17)	0.013
(1+02.00, 0.17)	(1+28.00, 0.17)	0.016
(1+28.00, 0.17)	(1+30.00, 1.00)	0.013

Options	
Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Normal Depth	0.29 ft
Elevation Range	0.00 to 1.00 ft

Worksheet for SECT 7 100-YEAR

Results	
Flow Area	1.3 ft²
Wetted Perimeter	15.71 ft
Hydraulic Radius	0.09 ft
Top Width	15.41 ft
Normal Depth	0.29 ft
Critical Depth	0.38 ft
Critical Slope	0.58 %
Velocity	4.46 ft/s
Velocity Head	0.31 ft
Specific Energy	0.60 ft
Froude Number	2.664
Flow Type	Supercritical

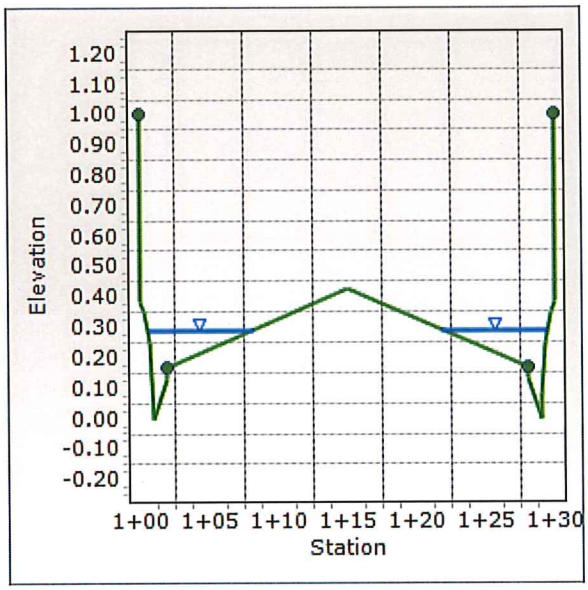
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0.00

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	0.38 ft
Channel Slope	4.63 %
Critical Slope	0.58 %

Cross Section for SECT 7 100-YEAR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	4.63 %
Normal Depth	0.29 ft
Discharge	6 cfs



PARCEL PQR
SUMMERLIN VILLAGE 21

Q =	37.0 cfs	
$A = (W)(D)$	36.00 ft^2	
W=	72.0 in	6.0 ft
D=	72.0 in	6.0 ft

$A' = A(1-0.33)(0.50)$

0.33 = 33% Reduction for steel

0.50 = 50% Clogging Factor

A'= 12.06 ft^2

$L = 2W + 2D$ 24.0 ft

* $L' = W + 2D$

**Assume flow from 3 sides*

L' = 18.0 ft

WEIR		***ORIFICE***	
$Q=CL'H^{1.5}$		$Q=CA'(2gH)^{0.5}$	
C =	3	C =	0.65
H =	0.78	H =	0.35 ft

CONTROL = **WEIR**

PONDING DEPTH = 0.8 ft

Storm Drain Hydraulics Calculations

SUMMERLIN VILLAGE 21 PARCELS PQR

DATE: 08/18/20

Storm Drain Manning's n (typ=0.013)= 0.013 | Inlet Structure Type or K_i= D | Headwall:Square Edge (cut concrete and CMP)

CONDUIT DATA										FLOW DATA									ENERGY LOSS DATA																								EGL & HGL				COMMENTS	
																			PIPE	TRANSITION																												
STATION			PIPE	BOX		IRREG		#	INVERT ELEV	L	S	A	Φ	Q	V	V2/2g	Sf	Ave.	Frict	Frict	Manhole			Junction			Contraction/ Inlet			Expansion/Outlet			Bend					Misc			CONDUIT		TRANSITION		FULL/	
FROM	TO	T/R	D	SPAN	RISE	AREA	HYD RAD		D/S	U/S									S_f	H_f	H_f	Θ	K_{mh}	H_{mh}	Θ	K_j	H_j	Inlet/	K_i	H_c	Θ	K_o	H_o	R_{bend}	Θ	K_b	H_b	H_m	Total	U/S	U/S	U/S	U/S	PART	CRTL
(ft)	(ft)		(in)	(ft)	(ft)	(ft^2)	(ft)		(ft)	(ft)	(ft)	(%)	(ft^2)		(cfs)	(ft/s)	(ft)	(ft/ft)	(ft/ft)	(ft)	(ft)	(deg)		(ft)	(deg)		(ft)	Cont		(ft)	(deg)		(ft)	(ft)	(deg)			(ft)	(ft)	EGL	HGL	EGL	HGL	FLOW	
	100.00		30							54.21																																59.18	58.30		
																													Outlet K_o=		1.0														
100.00	156.13	R	30					1	54.21	57.82	56.1	6.42%	4.91	0.0049	37.0	7.54	0.88	0.0081	0.0081	0.46																					0.00	61.20	60.32			PART	D/S
156.13	161.13	T	30					1	57.82	58.02	5.0	4.10%	4.91	0.0049	37.0	7.54	0.88	0.0081	0.0081		0.04	90	1.33	1.17																	1.21			62.41	61.53	FULL	U/S
161.13	214.19	R	30					1	58.02	58.90	53.1	1.66%	4.91	0.0049	37.0	7.54	0.88	0.0081	0.0081	0.43																					0.00	62.84	61.96			FULL	U/S
214.19	214.19	T	30					1	58.90	58.90	0.0		4.91	0.0049	37.0	7.54	0.88	0.0081	0.0081		0.00									Ki=	0.4	0.35								0.35			63.19	63.19	FULL	U/S

Summary of Results

					(Optional)			HGL with respect	Pressure Gasket
STATION	INVERT	SOFFIT	EGL	HGL	GRADE	LOCATION	DESCRIPTION	to FG	Required?
100.00	54.21	56.71	59.18	58.30	70.90	OUTLET	FG	OK	NO
156.13	57.82	60.32	61.20	60.32	70.60	MH1	TMH	OK	NO
161.13	58.02	60.52	62.41	61.53	70.60	MH1	TMH	OK	NO
214.19	58.90	61.40	62.84	61.96	69.55	INLET	GRATE	OK	NO
214.19	58.90	61.40	63.19	63.19	69.55	INLET	GRATE	OK	NO

Storm Drain Inlet type					
Pipe Entrance	Code	Ke	Box, Reinforced Concrete Entrance	Code	Ke
Headwall			**Headwall parallel to Embankment (no wingwalls)**		
Grooved Edge	A	0.20	Square edge on 3 edges	O	0.50
Rounded Edge (0.15D radius)	B	0.15	Rounded on 3 edges to radius of 1/12 barrel	P	0.20
Rounded Edge (0.25D radius)	C	0.10	**Wingwalls at 30 to 75 deg to barrel**		
Square Edge (cut concrete and CMP)	D	0.40	Square edged at crown	Q	0.40
Headwall and 45 deg Wingwall			Crown edge rounded to radius of 1/12 barrel	R	0.20
Grooved Edge	E	0.20	**Wingwalls at 10 to 30 deg to barrel**		
Square Edge	F	0.35	Square edged at crown	S	0.50
Headwall with Parallel Wingwalls Spaced 1.25D apart			**Wingwalls parallel (extension of sides)**		
Grooved Edge	G	0.30	Square edged at crown	T	0.70
Square Edge	H	0.40			
Beveled Edge	I	0.25			
Projecting Entrance					
Grooved Edge (RCP)	J	0.25			
Square Edge (RCP)	K	0.50			
Sharp Edge, thin wall (CMP)	L	0.90			
Sloping Entrance					
Mitered to conform to slope	M	0.70			
Flared-end Section	N	0.50			

LOSS COEFFICIENTS			
CONTRACTIONS		EXPANSIONS	
A2/A1	Kc	q	Ke
0.1	0.36	5	0.15
0.2	0.34	10	0.18
0.3	0.31	20	0.40
0.4	0.27	30	0.65
0.5	0.22	40	0.95
0.6	0.16	50	1.10
0.7	0.11	60	1.16
0.8	0.05	70	1.14
0.9	0.01	80	1.12
1.0	0.00	90	1.08
BENDS		MANHOLES	
q	Kb	q	Km
(D<Radius)		10	0.05
30	0.14	20	0.11
45	0.18	30	0.22
60	0.20	40	0.32
90	0.25	50	0.46
(D = Radius)		60	0.63
30	0.25	70	0.85
45	0.35	80	1.06
60	0.43	90	1.33
90	0.50		

JUNCTIONS	
q	Kj
15	0.85
30	0.65
45	0.50
60	0.35
90	0.25

Equations Used:	Manual Reference:
Pipe Form Losses HL=K*(V2/2g)	Eq 803 pg 811
Expansion Losses HL=Ke*(V22/2g)*((A2/A1)-1)2	Eq 804 pg 811
Contraction Losses HL=Kc*(V22/2g)	Eq 805 pg 811
Bend Losses HL=Kb*(V22/2g)	Eq 806 pg 812
Junction Losses HL=(V22/2g)-Kj(V12/2g)	Eq 807 pg 812
Manhole Losses HL=Km*(V22/2g)	Eq 808 pg 812
Inlet Losses HL=Ki*(V22/2g)*((A2/A1)-1)2	Eq 809 pg 813
Outlet Losses HL=Ko*(V22/2g)	Eq 810 pg 813

F=2g*(n2)/2.21 = 29.14 n2

Sf=F*Hv/R1.33

DEFINITIONS			
A	Area		
D	Pipe Diameter		
D/S	Downstream		
F	29.14n2		
Hb	Bend Loss		
Hc	Contraction Loss		
He	Expansion Loss		
Hf	Friction Loss		
Hj	Junction Loss		
Hl	Head Loss		
Hm	Misc Losses		
Hmh	Manhole Loss		
K	Loss Coef		
Kb	Bend Loss Coef		
Kc	Contraction Loss Coef		
Ke	Expansion Loss Coef		
Kj	Junction Loss Coef		
Kmh	Manhole Loss Coef		
L	Length		
q	Angle in degrees		
Q	Flow Rate		
R	Hydraulic Radius		
Rbend	Bend Radius		
S	Slope		
Sf	Friction Slope		
T/R	Transition/Reach		
U/S	Upstream		
V	Velocity		
V2/2g	Velocity Head		

DATE

CLIENT JOB NO. CALC. BY

DESCRIPTION CHECKED BY

DLOADS

Use

Bedding Factor Other 1.9

Wall thickness B

Soil Density 140

Live Load HS series 20

Soil Type 0.165 Sand & Gravel.

SHEET OF

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© april 1979 (revised)

design data 7

american concrete pipe association

CONCRETE PIPE SELECTION: Trench Installations

Trench conduits are usually installed in relatively narrow trenches excavated in undisturbed soil and backfilled to the original ground surface.

When a rigid conduit is installed in a narrow trench and backfilled, the backfill material will tend to settle. This downward movement generates frictional forces along the trench walls, which act upward to help support the weight of the backfill material. The magnitude of the frictional forces depends on the unit weight of the backfill material w, the value of Rankine's lateral pressure ratio K, and the coefficient of sliding friction μ' between the backfill material and the trench walls.

The backfill load on a conduit installed in a trench condition is equal to the weight of the mass of fill material within the trench less the summation of the frictional load transfers, and is expressed by the equation:

$$W_d = C_d \, w \, B_d^2$$

where

W_d = backfill load, pounds per linear foot
C_d = load coefficient for trench condition
w = unit weight of backfill material, pounds per cubic foot
B_d = width of trench at the top of the conduit, feet

Figures 2 through 5, based on the above equation, enable a direct determination of backfill load for a given trench width and depth of cover. As the trench width increases for a given depth of cover and pipe diameter, a point is reached at which an embankment condition develops. The curves showing pipe size indicate the limiting trench width for each pipe diameter beyond which greater trench widths will not affect the load. When this condition occurs, the load on the conduit remains constant. This load should be determined by the intersection of the vertical line representing the depth of cover and the dashed line representing the particular pipe diameter under consideration. For intermediate pipe sizes not shown in *Figures 2 through 5,* interpolation should be used.

The field supporting strength of a concrete pipe line is dependent on the inherent strength of the pipe, the type of foundation on which the pipe is installed and the compaction of the sidefill material adjacent to the pipe. A common method used to determine the inherent strength of a pipe is the three-edge bearing test, in which the pipe is subjected to concentrated loads at the crown and invert. The load that a pipe will support under this condition of loading is called the *three-edge bearing strength* and is expressed in pounds per linear foot.

ASTM Specification C14 covers three strength classes for non-reinforced concrete pipe — Class 1, 2 and 3. These three classes are specified to meet ultimate loads, expressed in terms of minimum strength in three-edge-bearing as listed in *Table I.*

TABLE I: Strength Requirements Non-reinforced Concrete Pipe ASTM C14

Pipe Diameter, Inches	Minimum Three-Edge Bearing Strengths, Pounds per Linear Foot		
	Class 1	Class 2	Class 3
4	1500	2000	2400
6	1500	2000	2400
8	1500	2000	2400
10	1600	2000	2400
12	1800	2250	2600
15	2000	2600	2900
18	2200	3000	3300
21	2400	3300	3850
24	2600	3600	4400
27	2800	3950	4600
30	3000	4300	4750
33	3150	4400	4875
36	3300	4500	5000

Another means of expressing pipe strength is in terms of D-load. The D-load of a pipe is the supporting strength of a pipe loaded under three-edge-bearing test conditions expressed in pounds per linear foot per foot of inside diameter. Thus the bearing strength may be converted to D-load by dividing by the inside diameter in feet.

ASTM Specification C76 specifies five strength classes reinforced concrete pipe. These strength classes are expressed in terms of D-load at 0.01-inch crack and for ultimate load. The D-load to produce the 0.01-inch crack $D_{0.01}$ is the maximum load applied to the concrete pipe before a crack occurs having a width of 0.01-inch measured at close intervals, throughout a length of at least 1-foot. The D-load to produce ultimate load D_u is the maximum three-edge-bearing test load carried by a pipe, expressed as D-load. *Table II* lists 0.01-inch crack and ultimate D-loads for the strength classes covered by ASTM Specification C76.

TABLE II: Strength Requirements Reinforced Concrete Pipe ASTM C76

Strength Class	Minimum D-Load in Three-Edge Bearing Pounds per Linear Foot per Foot of Internal Diameter	
	0.01 Inch Crack-$D_{0.01}$	Ultimate-D_u
I	800	1200
II	1000	1500
III	1350	2000
IV	2000	3000
V	3000	3750

```
SSSSSSSSS   AAAAAAAAA   MMM    MMM   MMM    MMM
SS          AA     AA   MM M M MM   MM M M MM
SSSSSSSSS   AAAAAAAAA   MM  M  MM   MM  M  MM
       SS   AA     AA   MM     MM   MM     MM
SSSSSSSSS   AA     AA   MM     MM   MM     MM
```

P R O G R A M S A M M

AMERICAN CONCRETE PIPE ASSOCIATION
VERSION 2.0 - 1 SEPTEMBER 1990

Program SAMM computes earth loads on concrete pipe in accordance with the methods presented in the Concrete Pipe Design Manual (March 1990) and the Concrete Pipe Handbook (January 1988), published by the American Concrete Pipe Association. The user must select input values suitable to his specific installation. The information presented in the computer output is for review, interpetation, application and approval by a qualified engineer who must assume full responsibility for verifying that said output is appropriate and correct. There are no express or implied warranties. The use of this product does not constitute endorsement by ACPA or any other agents.

DATE: 8/19/2020

DESIGNER: RJR

PROGRAM SAMM
D-LOAD REQUIREMENTS FOR A 30 IN. DIAMETER CIRCULAR PIPE

****

P I P E D A T A

DIAMETER (in.)	30.00
WALL B, THICKNESS (in.)	3.500

I N S T A L L A T I O N C O N D I T I O N S

MINIMUM DEPTH OF FILL (ft.)	1.00
MAXIMUM DEPTH OF FILL (ft.)	20.00
SOIL DENSITY (lb/cu. ft.)	140.0
SPECIFIED BEDDING FACTOR	1.90
INSTALLATION TYPE	TRENCH
TRENCH WIDTH (ft.)	7.10
SOIL LATERAL PRESSURE/FRICTION TERM (KMU')	0.1650
PARAMETERS TO COMPUTE TRANSITION WIDTH	
POSITIVE PROJECTION RATIO	1.00
POSITIVE SETTLEMENT RATIO	0.50
SOIL LATERAL PRESSURE/FRICTION TERM (KMU)	0.1924
SOIL LATERAL PRESSURE COEFICIENT	0.33

A D D I T I O N A L L O A D S

LIVE LOAD	AASHTO HS-20
NO SURCHARGE LOAD	

F A C T O R S O F S A F E T Y

FACTOR OF SAFETY ON 0.01 INCH CRACK D-LOAD (EARTH,LIVE)	1.00; 1.00
FACTOR OF SAFETY ON ULTIMATE LOAD (EARTH,LIVE) IN ACCORDANCE WITH ASTM C 76	
DL.01 LESS THAN 2000 LBS/FT/FT	1.5
DL.01 GREATER THAN 3000 LBS/FT/FT	1.25
DL.01 BETWEEN 2000 AND 3000 LBS/FT/FT	INTERPOLATED

R E S U L T S O F A N A L Y S I S

```
SSSSSSSSS   AAAAAAAAA   MMM   MMM   MMM   MMM
SS          AA     AA   MM M M MM   MM M M MM
SSSSSSSSS   AAAAAAAAA   MM  M  MM   MM  M  MM
      SS    AA     AA   MM     MM   MM     MM
SSSSSSSSS   AA     AA   MM     MM   MM     MM
```

P R O G R A M S A M M

AMERICAN CONCRETE PIPE ASSOCIATION
VERSION 2.0 - 1 SEPTEMBER 1990

Program SAMM computes earth loads on concrete pipe in accordance with the methods presented in the Concrete Pipe Design Manual (March 1990) and the Concrete Pipe Handbook (January 1988), published by the American Concrete Pipe Association. The user must select input values suitable to his specific installation. The information presented in the computer output is for review, interpetation, application and approval by a qualified engineer who must assume full responsibility for verifying that said output is appropriate and correct. There are no express or implied warranties. The use of this product does not constitute endorsement by ACPA or any other agents.

PIPE DEPTH (ft.)	EARTH LOAD ARCHING FACTOR	>TRANS	EARTH LOAD (lb/ft)	LIVE LOAD (lb/ft)	SURCH LOAD (lb/ft)	TOTAL LOAD (lb/ft)	BED FACT	REQUIRED D-LOAD 0.01 in. (lb/ft/ft)	ULT. (lb/ft/ft)
1.0	1.07	Y	460.	2830.	0.	3290.	1.90	693.	1039.
1.5	1.10	Y	712.	2777.	0.	3489.	1.90	734.	1102.
2.0	1.14	Y	981.	2069.	0.	3050.	1.90	642.	963.
2.5	1.17	Y	1266.	1480.	0.	2746.	1.90	578.	867.
3.0	1.21	Y	1571.	1084.	0.	2655.	1.90	559.	838.
3.5	1.25	Y	1895.	896.	0.	2790.	1.90	587.	881.
4.0	1.30	Y	2239.	754.	0.	2993.	1.90	630.	945.
4.5	1.34	Y	2606.	644.	0.	3250.	1.90	684.	1026.
5.0	1.39	Y	2997.	558.	0.	3554.	1.90	748.	1122.
5.5	1.44	Y	3412.	488.	0.	3900.	1.90	821.	1232.
6.0	1.46	Y	3783.	431.	0.	4214.	1.90	887.	1331.
6.5	1.47	Y	4115.	383.	0.	4498.	1.90	947.	1420.
7.0	1.47	Y	4441.	343.	0.	4784.	1.90	1007.	1511.
7.5	1.47	Y	4767.	310.	0.	5077.	1.90	1069.	1603.
8.0	1.47	Y	5093.	281.	0.	5374.	1.90	1131.	1697.
8.5	1.48	Y	5427.	255.	0.	5682.	1.90	1196.	1794.
9.0	1.48	Y	5753.	234.	0.	5986.	1.90	1260.	1890.
9.5	1.48	Y	6079.	215.	0.	6293.	1.90	1325.	1987.
10.0	1.48	Y	6404.	198.	0.	6602.	1.90	1390.	2085.
10.5	1.48	Y	6730.	183.	0.	6913.	1.90	1455.	2183.
11.0	1.49	Y	7056.	170.	0.	7226.	1.90	1521.	2282.
11.5	1.49	Y	7382.	158.	0.	7540.	1.90	1587.	2381.
12.0	1.49	Y	7708.	147.	0.	7855.	1.90	1654.	2480.
12.5	1.49	Y	8034.	138.	0.	8171.	1.90	1720.	2580.
13.0	1.49	Y	8359.	129.	0.	8488.	1.90	1787.	2681.
13.5	1.49	Y	8685.	121.	0.	8806.	1.90	1854.	2781.

14.0	1.49	Y	7324.	94.	0.	7418.	1.90	1952.	2928.
14.5	1.50	Y	7588.	89.	0.	7677.	1.90	2020.	3020.
15.0	1.50	Y	7853.	84.	0.	7937.	1.90	2089.	3087.
15.5	1.50	Y	8117.	79.	0.	8196.	1.90	2157.	3151.
16.0	1.49	Y	8369.	75.	0.	8444.	1.90	2222.	3210.
16.5	1.49	Y	8633.	71.	0.	8704.	1.90	2291.	3269.
17.0	1.50	Y	8897.	68.	0.	8964.	1.90	2359.	3327.
17.5	1.50	Y	9160.	64.	0.	9225.	1.90	2428.	3382.
18.0	1.50	Y	9424.	61.	0.	9485.	1.90	2496.	3435.
18.5	1.50	Y	9688.	58.	0.	9746.	1.90	2565.	3485.
19.0	1.50	Y	9952.	56.	0.	10008.	1.90	2634.	3533.
19.5	1.50	Y	10216.	53.	0.	10269.	1.90	2702.	3579.
20.0	1.50	Y	10480.	51.	0.	10530.	1.90	2771.	3622.

APPENDIX C – REFERENCE MATERIALS

VTN Nevada, *Technical Drainage Study for Summerlin West Village 21 Desert Foothills Drive (Redpoint to Summerlin Parkway),* June 2019.

VTN Nevada, *Technical Drainage Study for Summerlin West Village 21 Kindle Corner Ave. & Kettle Ridge Drive (Sky Vista to Desert Foothills)*, June 2019.

VTN Nevada, *Technical Drainage Study for Summerlin West Village 21 Red Pass Drive (Desert Foothills Kettle Ridge Drive),* October, 2019.

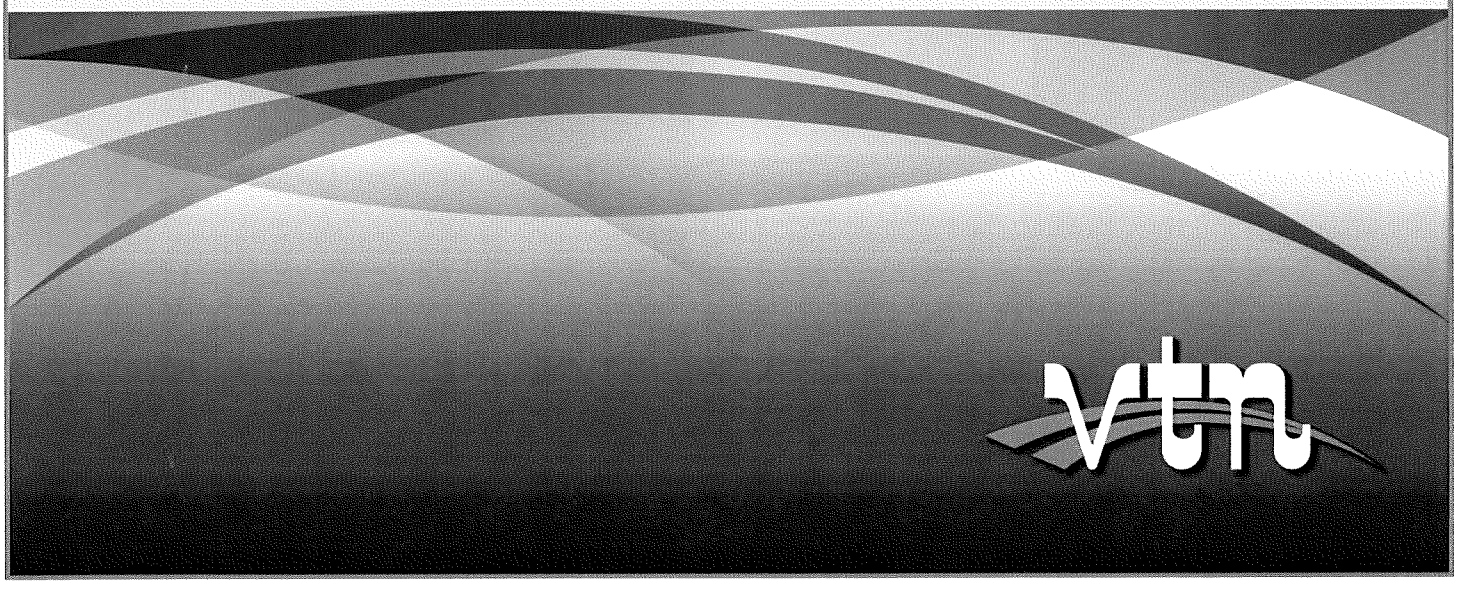
Addendum #3 to the Technical Drainage Study for

Summerlin West Village 21
Desert Foothills Drive
(Redpoint to Summerlin Parkway)

Las Vegas, Nevada

Prepared for:
Howard Hughes Company, LLC

Submitted to:
City of Las Vegas
Public Works



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: June 25, 2019
TO: **Land Development Services** Department of Building & Safety			FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Summerlin West Village 21 - Desert Foothills Drive (Redpoint Drive to Summerlin Parkway)**		**COPIES TO:** VTN Nevada
Cross Streets:	Desert Foothills Dr. from Redpoint Drive to Summerlin Parkway		Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5052E.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-26-101-001		CCRFCD
Zoning Action:	N/A		
FEMA Flood Zone	YES	NO X	
Proposed Storm Drain	YES X	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	10/24/2018	11/8/2018	Not Approved	$400.00	500378: $400
2nd Submittal	2/4/2018	2/21/2018	Conditional Approval	$400.00	502878: $400
3rd Submittal	4/25/2019	5/9/2019	Not Approved	$400.00	3105168: $400
4th Submittal	5/15/2019	6/11/2019	Conditional Approval	$400.00	3133317: $400
CCRFCD	6/20/2019	6/25/2019	Concurrence Recv'd	N/C	N/C
			TOTAL FEES (LDDRS):	**$1,600.00**	**----**

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

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

2. Since the street and the associated storm drain facilities will eventually be accepted by the *City of Las Vegas*, the engineer/developer must coordinate with *City of Las Vegas Streets & Sanitation Department* for their review and approval prior to the final acceptance of the subject improvement plans.

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/26
AREA K-26

WSPG MAINLINE MODEL
100-YEAR ULTIMATE CONDITION

```
T1 Summerlin West Village 21
T2 Desert Foothills Drive (Redpoint to Summerlin Parkway)
T3 MAINLINE - ULTIMATE CONDITION
SO   1000.00 3337.584  3      .015                3347.599
WX   1000.00 3337.584  1
R    1101.69 3339.109  1      .015                                  5.17
R    1733.24 3348.582  1      .015
R    2612.93 3366.704  1      .015                                        10.00
TS   2623.09 3366.913  2      .015
SH   2623.09 3366.913  2      .015
CD   1  3   0   0.00     8.00    10.00  0.00  0.00
CD   2  3   0   0.00     6.00    13.00  0.00  0.00
CD   3  3   0   0.00    10.00    10.00  0.00  0.00
Q          1053.000   .0
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Summerlin West Village 21
Desert Foothills Drive (Redpoint to Summerlin Parkway)
MAINLINE - 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
1000.000	3337.584	10.015	3347.599	1053.00	10.53	1.72	3349.32	.00	7.01	10.00	10.000	10.000	.00	0 .0
WALL EXIT														
1000.000	3337.584	10.016	3347.600	1053.00	13.16	2.69	3350.29	.00	7.01	10.00	8.000	10.000	.00	0 .0
101.690	.0150					.0061	.62	.00	.82	4.78	.015	.00	.00	BOX
1101.690	3339.109	9.239	3348.348	1053.00	13.16	2.69	3351.04	.00	7.01	10.00	8.000	10.000	.00	0 .0
14.662	.0150					.0061	.09	9.24	.82	4.78	.015	.00	.00	BOX
1116.352	3339.329	9.108	3348.437	1053.00	13.16	2.69	3351.13	.00	7.01	10.00	8.000	10.000	.00	0 .0
HYDRAULIC JUMP														
1116.352	3339.329	4.737	3344.066	1053.00	22.23	7.67	3351.74	.00	7.01	10.00	8.000	10.000	.00	0 .0
135.463	.0150					.0155	2.10	4.74	1.80	4.78	.015	.00	.00	BOX
1251.814	3341.361	4.706	3346.067	1053.00	22.38	7.77	3353.84	.00	7.01	10.00	8.000	10.000	.00	0 .0
321.387	.0150					.0167	5.38	4.71	1.82	4.78	.015	.00	.00	BOX
1573.202	3346.181	4.487	3350.668	1053.00	23.47	8.55	3359.22	.00	7.01	10.00	8.000	10.000	.00	0 .0
160.038	.0150					.0190	3.05	4.49	1.95	4.78	.015	.00	.00	BOX
1733.240	3348.583	4.278	3352.861	1053.00	24.61	9.41	3362.27	.00	7.01	10.00	8.000	10.000	.00	0 .0
310.182	.0206					.0198	6.14	4.28	2.10	4.25	.015	.00	.00	BOX
2043.422	3354.972	4.351	3359.324	1053.00	24.20	9.09	3368.42	.00	7.01	10.00	8.000	10.000	.00	0 .0
254.164	.0206					.0182	4.62	4.35	2.04	4.25	.015	.00	.00	BOX

Summerlin West Village 21
Desert Foothills Drive (Redpoint to Summerlin Parkway)
MAINLINE - 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
2297.586	3360.208	4.564	3364.772	1053.00	23.07	8.27	3373.04	.00	7.01	10.00	8.000	10.000	.00	0 .0
114.685	.0206					.0160	1.83	4.56	1.90	4.25	.015	.00	.00	BOX
2412.271	3362.571	4.787	3367.357	1053.00	22.00	7.51	3374.87	.00	7.01	10.00	8.000	10.000	.00	0 .0
68.858	.0206					.0141	.97	4.79	1.77	4.25	.015	.00	.00	BOX
2481.129	3363.989	5.020	3369.010	1053.00	20.98	6.83	3375.84	.00	7.01	10.00	8.000	10.000	.00	0 .0
45.816	.0206					.0124	.57	5.02	1.65	4.25	.015	.00	.00	BOX
2526.945	3364.933	5.265	3370.198	1053.00	20.00	6.21	3376.41	.00	7.01	10.00	8.000	10.000	.00	0 .0
31.786	.0206					.0109	.35	5.27	1.54	4.25	.015	.00	.00	BOX
2558.731	3365.588	5.522	3371.110	1053.00	19.07	5.65	3376.76	.00	7.01	10.00	8.000	10.000	.00	0 .0
22.227	.0206					.0096	.21	5.52	1.43	4.25	.015	.00	.00	BOX
2580.958	3366.046	5.792	3371.837	1053.00	18.18	5.13	3376.97	.00	7.01	10.00	8.000	10.000	.00	0 .0
15.205	.0206					.0085	.13	5.79	1.33	4.25	.015	.00	.00	BOX
2596.163	3366.359	6.074	3372.433	1053.00	17.33	4.67	3377.10	.00	7.01	10.00	8.000	10.000	.00	0 .0
9.758	.0206					.0075	.07	6.07	1.24	4.25	.015	.00	.00	BOX

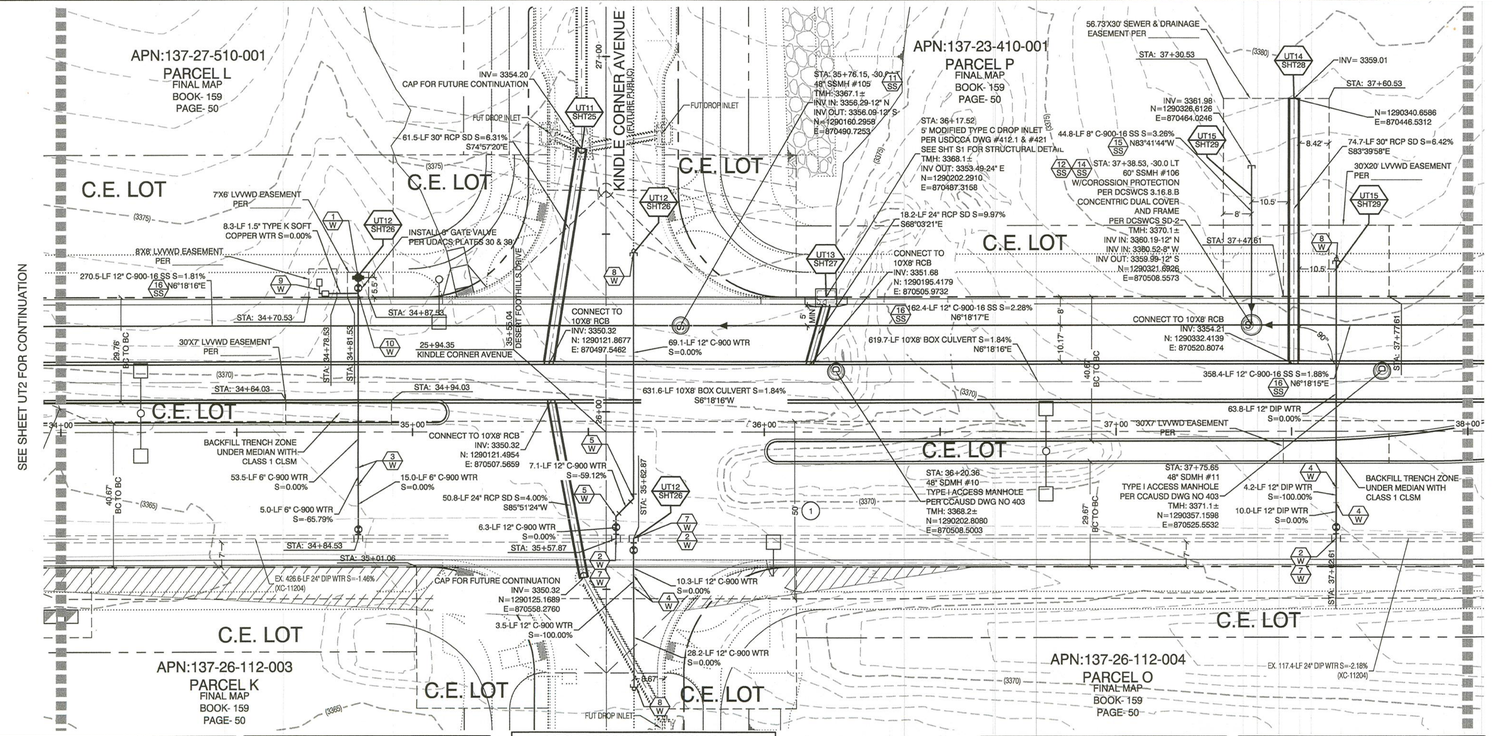
2605.921	3366.560	6.371	3372.931	1053.00	16.53	4.24	3377.17	.00	7.01	10.00	8.000	10.000	.00	0	.0		
5.350	.0206					.0066	.04	6.37	1.15	4.25	.015	.00	.00	BOX			
2611.270	3366.670	6.682	3373.352	1053.00	15.76	3.86	3377.21	.00	7.01	10.00	8.000	10.000	.00	0	.0		
1.660	.0206					.0059	.01	6.68	1.07	4.25	.015	.00	.00	BOX			

Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING Date:10-20-2018 Time:12:26: 9

Summerlin West Village 21
Desert Foothills Drive (Redpoint to Summerlin Parkway)
MAINLINE - 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
2612.930	3366.704	7.009	3373.713	1053.00	15.02	3.50	3377.22	.00	7.01	10.00	8.000	10.000	.00	0	.0		
TRANS STR	.0206					.0071	.07	7.01	1.00		.015	.00	.00	BOX			
2623.090	3366.913	7.653	3374.566	1053.00	13.50	2.83	3377.40	.00	5.89	13.00	6.000	13.000	.00	0	.0		



WATER MAIN JOINT DEFLECTION

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

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

DROP INLET NOTE:

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

GENERAL CONSTRUCTION NOTE:

THE FOLLOWING SUMMERLIN VILLAGE 21 ROADWAY INFRASTRUCTURE PLANS ARE TO BE CONSTRUCTED CONCURRENTLY:
1. DESERT FOOTHILLS (REDPOINT DRIVE TO SKY VISTA)
2. CARRIAGE HILL (REDPOINT DRIVE TO SKY VISTA)
3. KINDLE CORNER (CARRIAGE HILL TO DESERT FOOTHILLS)
4. RED PASS DRIVE (CARRIAGE HILL TO DESERT FOOTHILLS)
5. CLOWDER SPRING (KINDLE CORNER TO RED PASS)

DESERT FOOTHILLS (PUBLIC)

PROFILE SCALES:

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

STORM DRAIN DROP INLET NOTE:

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

WATERLINE TRENCH NOTE:

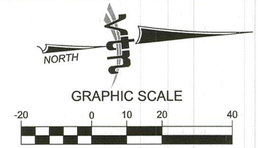
CONSTRUCT WATERLINE TRENCH SECTION AND BACKFILL PER UDACS PLATE NO. 17.

LVVWD NOTE:

ALL JOINTS AND FITTINGS ON DIP TO BE RESTRAINED.

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.



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

SANITATION SEWER NOTES

1. ALL SEWER STATIONING IS BASED ON CENTER OF PIPE LENGTHS FROM MANHOLE TO MANHOLE AND IS NOT RELATIVE IN ANY WAY TO STREET CENTERLINE STATIONING. STREET CENTERLINE STATIONING IS SHOWN ON PLAN FOR ROAD REFERENCE ONLY.
2. ALL MANHOLES ARE 48" SIZED MANHOLES PER DCSWCS SD-1, UNLESS OTHERWISE NOTED ON PLAN.
3. ALL MANHOLES ARE TO BE CONSTRUCTED PER DCSWCS SD-1A AND SD-1B.
4. ALL MANHOLE COVERS AND FRAMES ARE TO BE SINGLE 24" LID.
5. ALL MANHOLE COLLARS ARE TO BE CONSTRUCT PER DCSWCS SD-4.

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401. STA:28+75.21 TO STA:44+96.10

UTILITY CROSSING NOTE:

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

ENGINEER DISCLAIMER NOTE:

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

TYPICAL WATER NOTES

1. MAINTAIN A MINIMUM OF 12-INCHES FOR DRY UTILITIES AND 18-INCHES FOR WET UTILITIES VERTICAL SEPARATION AT ALL POINTS OF UTILITY CROSSINGS.
2. MAINTAIN A MINIMUM OF 3-FEET PARALLEL SEPARATION FROM ADJACENT UTILITIES.
3. ANY EXCAVATION AT THE BACK OF A CURB MUST REMAIN OPEN FOR INSPECTION OF THE COPPER SERVICE LATERALS. ANY COPPER SERVICE LATERAL WHICH IS KINKED, BENT OR OTHERWISE DAMAGED MUST BE REPLACED FROM THE MAIN TO THE ANGLE METER STOP.
   CAUTION MUST BE EXERCISED NEAR ANY EXCAVATION AROUND AN EXISTING FIRE HYDRANT IN ORDER TO AVOID DISTURBING THE THRUST BLOCK AND SURROUNDING SOIL SUPPORTING THE THRUST BLOCK. THIS PREVENTS THE POSSIBILITY OF THE HYDRANT SEPARATING FROM THE LATERAL. PROVIDE A DETAIL OF THE PROPOSED INSTALLATION SHOWING ADEQUATE CLEARANCES TO AVOID DISTURBING EXISTING LVVWD FACILITIES.
4.

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.

WATER LINE MARKER BALLS NOTE

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

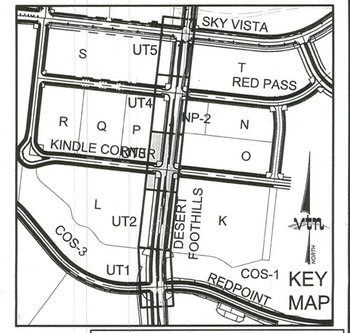
APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:136301 FIRST APPROVED DATE: 10/29/19

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

LVVWD APPROVAL IS VALID FOR ONE (1) YEAR FROM SIGNATURE DATE. IF CONSTRUCTION IS NOT STARTED, PLANS **MUST** BE RESUBMITTED FOR REVIEW AND APPROVAL.



CONSTRUCTION NOTES

WATER

		PUBLIC
W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41) INCLUDING 24" X 6" TAPPING SLEEVE WITH 6" TAPPING VALVE PER UDACS PLATE NO. 34 & SECTION 2.24.01B	3 EA.
W	12" GATE VALVE (PER UDACS PLATE 30 & 39)	9 EA.
W	6" 45° VERTICAL BEND (PER UDACS PLATE 31)	2 EA.
W	12" 45° VERTICAL BEND (PER UDACS PLATE 31)	12 EA.
W	12" 45° BEND (PER UDACS PLATE 31)	6 EA.
W	12" 90° BEND (PER UDACS PLATE 31)	2 EA.
W	24"X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	9 EA.
W	12" CAP & BLOW OFF (PER UDACS PLATE 39)	9 EA.
W	1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" SUMMERLIN COUNCIL METER PER IRRIGATION MASTER PLAN AND UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #8 (PER DETAIL SHEET DT1)	2 EA.
W	6"X1.5" SERVICE SADDLE W/ CORP STOP PER UDACS PLATE 4.	2 EA.
	6" C-900 WATER MAIN PER UDACS 2.06.01 & PLATE 17	109 LF.
	12" C-900 WATER MAIN PER UDACS 2.06.01 & PLATE 17	339 LF.
	12" DIP WATER MAIN PER UDACS 2.06.01 & PLATE 17	208 LF.
WP	WATER POINT OF CONNECTION	

SEWER

		PUBLIC
48 SS	48" STANDARD MANHOLE PER SD-1 & SD-4 W/ SINGLE 24" LID	4 EA.
60 SS	60" STANDARD MANHOLE PER SD-1 & SD-4 W/ SINGLE 24" LID	4 EA.
72 SS	72" STANDARD MANHOLE PER SD-1 & SD-4 W/ SINGLE 24" LID	1 EA.
48	CORROSION PROTECTION	
8	8" C-900-16 SANITARY SEWER MAIN	184 LF.
12	12" C-900-16 SANITARY SEWER MAIN	1,711 LF.
SP	SEWER POINT OF CONNECTION	

WATER CONSTRUCTION NOTES

ALL DIMENSIONS TO UTILITIES ARE TO CENTERLINE OF PIPE UNLESS INDICATED OTHERWISE.

CONTRACTOR SHALL VARIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES AND NOTIFY THE DESIGN ENGINEER IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

ALL EXISTING UTILITY STRUCTURES WITHIN CONSTRUCTION AREA SHALL BE ADJUSTED TO MATCH FINISH GRADE (I.E. WV. BOX, MH, ANNODE BOX, FH, TEL BOX, ETC.)

1. WATER LINE STATIONING IS BASED ON THE CENTERLINE OF STREET RIGHT OF WAY
2. WATER LINE SHALL BE C-900 PVC APPROVED BY THE LAS VEGAS VALLEY WATER DISTRICT.
3. EXISTING ASPHALT SHALL BE REMOVED AND REPLACED PER CITY OF LAS VEGAS SPECIFICATIONS. BACKFILL AND INSTALL PERMANENT PATCH PER CITY STANDARD FOR THIS PLAN.
4. SEE SHEET NT FOR PUBLIC UTILITY NOTES AND GENERAL WATER CONSTRUCTION NOTES.
5. ALL WATER LINE IN STREET RIGHT OF WAY IS PUBLIC WATER SYSTEM AND MUST BE INSPECTED BY THE LAS VEGAS VALLEY WATER DISTRICT.

DEPTH OF COVER NOTE:

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

LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: 9/9/19

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

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.

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

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

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL AND STREET LIGHT SYSTEM CONDUITS
Call 811 before you Underground
1-702-455-7511 CLARK COUNTY TRAFFIC OPERATIONS
OR
1-702-229-6811 LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

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) 873-7590 FAX (702) 362-2597 WEB WWW.LTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY SHEET 3
34+00 TO 38+00

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
REDPOINT TO SKY VISTA

DRAWN BY:	DESIGNED BY:	CHECKED BY:	SCALE:	HORIZ.
BCC 07/23/2018	BCC 07/23/2018	MJM 09/15/2019	1"=20'	VERT. 1"=4'

PROJECT NO: 7851

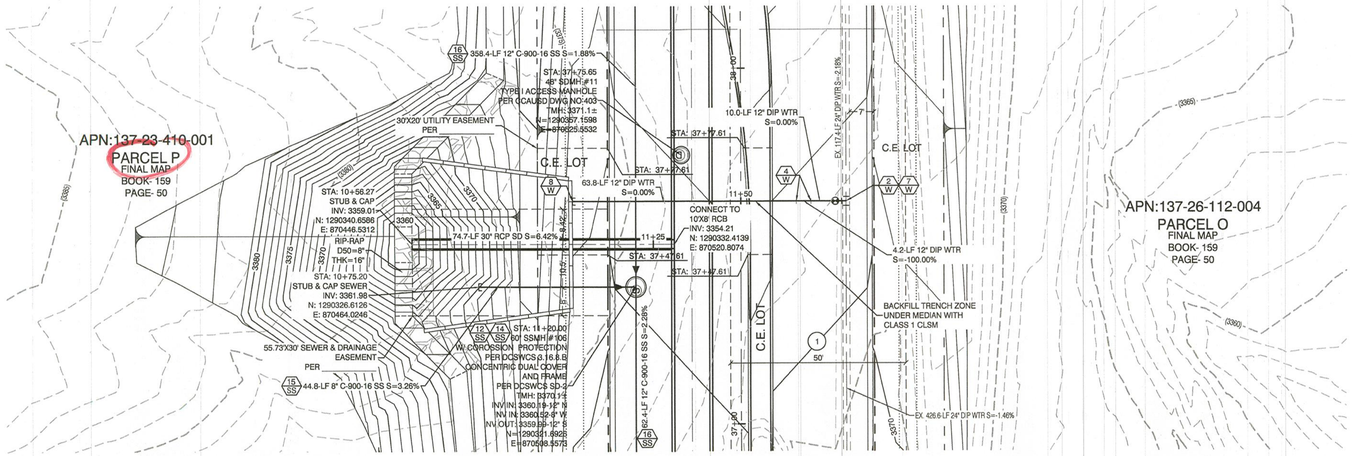
PROJ.#:136301A QS:137-26-NW

WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
PROFESSIONAL ENGINEER STATE OF NEVADA
Old No. 15748
9/16/19

SHEET
UT3
17 OF 40 SHEETS

DRAWING NO.
L19-00350
107V7663

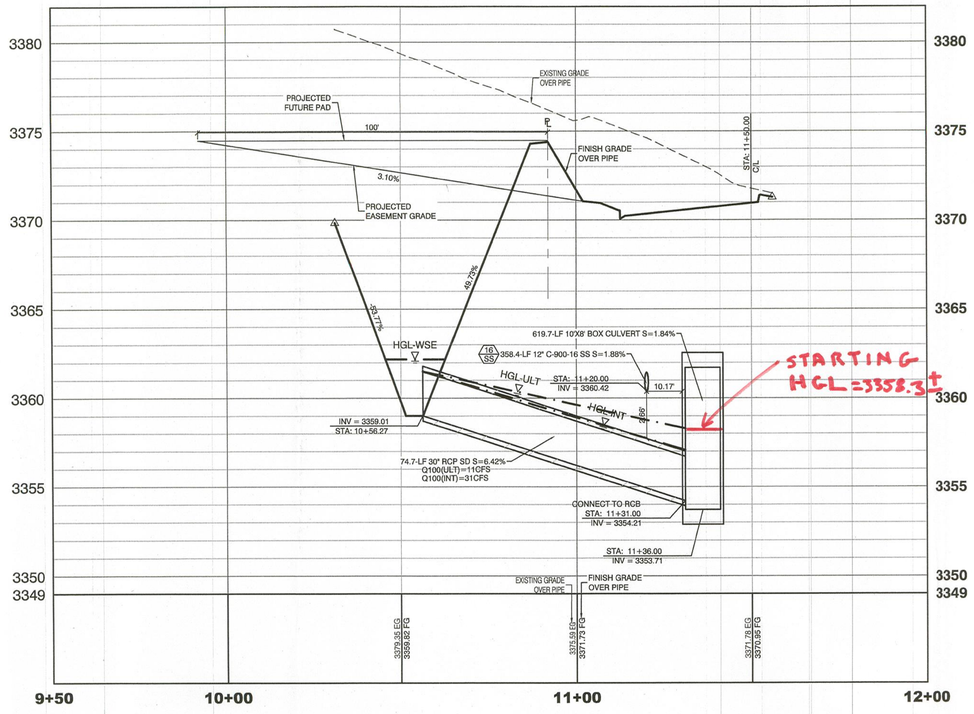
H:\7851\Desert Foothills-Sheet A to Summerlin Pkwy\Sheet Set\7851-UT.dwg,9/16/2019 4:17 PM,jimmyp



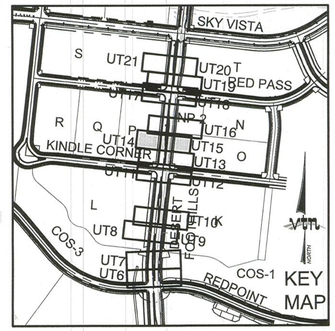
DESERT FOOTHILLS
(PUBLIC)

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

(SEE SHEET UT3 FOR REFERENCE)







CONSTRUCTION NOTES

	WATER	PUBLIC
W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41) INCLUDING 24" X 6" TAPPING SLEEVE WITH 6" TAPPING VALVE PER UDACS PLATE NO. 34 & SECTION 2.24.01B	3 EA.
W	12" GATE VALVE (PER UDACS PLATE 30 & 39)	9 EA.
W	6" 45° VERTICAL BEND (PER UDACS PLATE 31)	2 EA.
W	12" 45° VERTICAL BEND (PER UDACS PLATE 31)	12 EA.
W	12" 45° BEND (PER UDACS PLATE 31)	6 EA.
W	12" 90° BEND (PER UDACS PLATE 31)	2 EA.
W	24"X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	9 EA.
W	12" CAP & BLOW OFF (PER UDACS PLATE 36)	9 EA.
W	1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" SUMMERLIN COUNCIL METER PER IRRIGATION MASTER PLAN AND UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #9 (PER DETAIL SHEET DT1)	2 EA.
W	6"X1.5" SERVICE SADDLE W/ CORP STOP PER UDACS PLATE 4.	2 EA.
	6" C-900 WATER MAIN PER UDACS 2.06.01 & PLATE 17	109 LF.
	12" C-900 WATER MAIN PER UDACS 2.06.01 & PLATE 17	339 LF.
	12" DIP WATER MAIN PER UDACS 2.06.01 & PLATE 17	208 LF.
POC	WATER POINT OF CONNECTION	

	SEWER	PUBLIC
11 SS	48" STANDARD MANHOLE PER SD-1 & SD-4 W/ SINGLE 24" LID	4 EA.
12 SS	60" STANDARD MANHOLE PER SD-1 & SD-4 W/ SINGLE 24" LID	4 EA.
13 SS	72" STANDARD MANHOLE PER SD-1 & SD-4 W/ SINGLE 24" LID	1 EA.
14 SS	CORROSION PROTECTION	
15 SS	8" C-900-16 SANITARY SEWER MAIN	184 LF.
16 SS	12" C-900-16 SANITARY SEWER MAIN	1,711 LF.
POC	SEWER POINT OF CONNECTION	

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.

TYPICAL WATER NOTES

1. MAINTAIN A MINIMUM OF 12-INCHES VERTICAL SEPARATION AT ALL POINTS OF UTILITY CROSSINGS.
2. MAINTAIN A MINIMUM OF 3-FEET PARALLEL SEPARATION FROM ADJACENT UTILITIES.
3. ANY EXCAVATION AT THE BACK OF A CURB MUST REMAIN OPEN FOR INSPECTION OF THE COPPER SERVICE LATERALS. ANY COPPER SERVICE LATERAL WHICH IS KINKED, BENT OR OTHERWISE DAMAGED MUST BE REPLACED FROM THE MAIN TO THE ANGLE METER STOP. CAUTION MUST BE EXERCISED NEAR ANY EXCAVATION AROUND AN EXISTING FIRE HYDRANT IN ORDER TO AVOID DISTURBING THE THRUST BLOCK AND SURROUNDING SOIL SUPPORTING THE THRUST BLOCK. THIS PREVENTS THE POSSIBILITY OF THE HYDRANT SEPARATING FROM THE LATERAL. PROVIDE A DETAIL OF THE PROPOSED INSTALLATION SHOWING ADEQUATE CLEARANCES TO AVOID DISTURBING EXISTING LVVWD FACILITIES.
4.

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.

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.

WATER LINE MARKER BALLS NOTE

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

EASEMENT REFERENCE LEGEND

1	50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401. STA:28+75.21 TO STA:44+96.10

SANITATION SEWER NOTES

1. ALL SEWER STATIONING IS BASED ON CENTER OF PIPE LENGTHS FROM MANHOLE TO MANHOLE AND IS NOT RELATIVE IN ANY WAY TO STREET CENTERLINE STATIONING. STREET CENTERLINE STATIONING IS SHOWN ON PLAN FOR ROAD REFERENCE ONLY.
2. ALL MANHOLES ARE 48" SIZED MANHOLES PER DCSWCS SD-1, UNLESS OTHERWISE NOTED ON PLAN.
3. ALL MANHOLES ARE TO BE CONSTRUCTED PER DCSWCS SD-1A AND SD-1B.
4. ALL MANHOLE COVERS AND FRAMES ARE TO BE CONSTRUCTED PER DCSWCS SD-2.
5. ALL MANHOLE COLLARS ARE TO BE CONSTRUCT PER DCSWCS SD-4.
6 ALL SEWER LATERAL CONNECTIONS TO SEWER MAINS ARET TO BE CONSTRUCTED PER DCSWCS SD-22 UNLESS OTHERWISE NOTED ON PLAN.

WATER CONSTRUCTION NOTES

ALL DIMENSIONS TO UTILITIES ARE TO CENTERLINE OF PIPE UNLESS INDICATED OTHERWISE.

CONTRACTOR SHALL VARIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES AND NOTIFY THE DESIGN ENGINEER IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

ALL EXISTING UTILITY STRUCTURES WITHIN CONSTRUCTION AREA SHALL BE ADJUSTED TO MATCH FINISH GRADE (I.E. WV, BOX, MH, ANNODE BOX, FH, TEL BOX, ETC.)

1. WATER LINE STATIONING IS BASED ON THE CENTERLINE OF STREET RIGHT OF WAY
2. WATER LINE SHALL BE C-900 PVC APPROVED BY THE LAS VEGAS VALLEY WATER DISTRICT.
3. EXISTING ASPHALT SHALL BE REMOVED AND REPLACED PER CITY OF LAS VEGAS SPECIFICATIONS. BACKFILL AND INSTALL PERMANENT PATCH PER CITY STANDARD FOR THIS PLAN.
4 SEE SHEET NT FOR PUBLIC UTILITY NOTES AND GENERAL WATER CONSTRUCTION NOTES.
5. ALL WATER LINE IN STREET RIGHT OF WAY IS PUBLIC WATER SYSTEM AND MUST BE INSPECTED BY THE LAS VEGAS VALLEY WATER DISTRICT.

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

WATER MAIN COVER NOTE:

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

WATERLINE TRENCH NOTE:

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

LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: 9/6/19

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

WATER MAIN JOINT DEFLECTION

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

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

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.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:136301 FIRST APPROVED DATE: 10/29/19

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

LVVWD APPROVAL IS VALID FOR ONE (1) YEAR FROM SIGNATURE DATE. IF CONSTRUCTION IS NOT STARTED, PLANS **MUST** BE RESUBMITTED FOR REVIEW AND APPROVAL.

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

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

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

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) 382-2897 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY LATERAL SHEET 14

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
REDPOINT TO SKY VISTA

PROJ#:136301A QS:137-26-NW

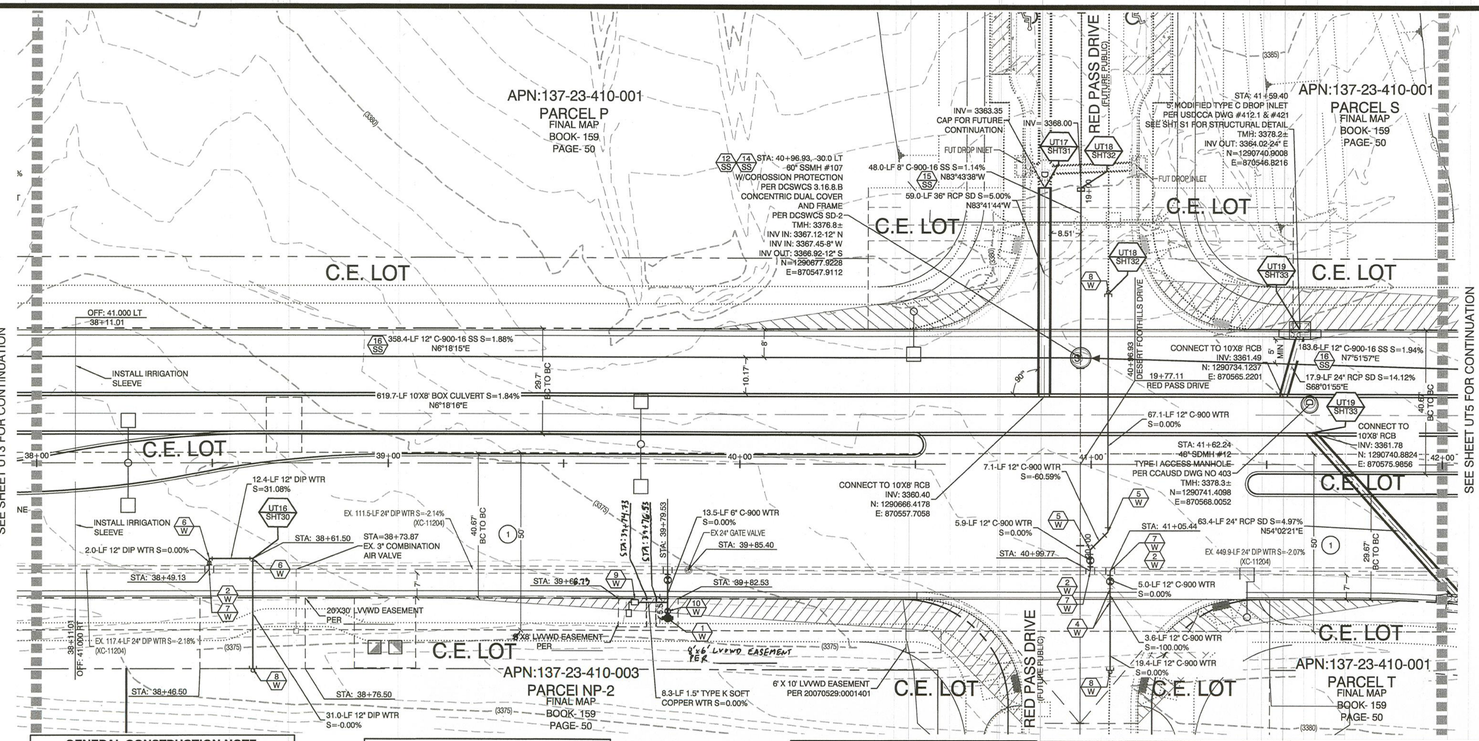
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DESIGNED BY: BCC 08/02/2018
CHECKED BY: WJM 09/15/2019
PROJECT NO: 7951
SCALE: HORIZ. 1"=20' VERT. 1"=4'

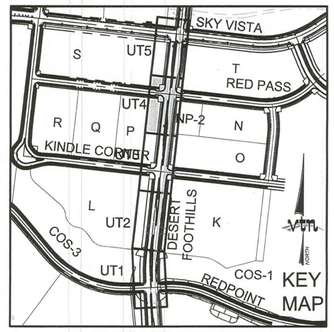
PROFESSIONAL ENGINEER-STATE OF NEVADA
WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
No. 15719
9/16/19

SHEET
UT14
28 OF **40** SHEETS

DRAWING NO.
L19-00350
107V7663

H:\7951\Desert Foothills Street A to Summerlin Pkwy\Sheet Set\7951-UT LAT 2.dwg 9/16/2019 10:03 AM jbmyp





NORTH

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

GENERAL CONSTRUCTION NOTE:

THE FOLLOWING SUMMERLIN VILLAGE 21 ROADWAY INFRASTRUCTURE PLANS ARE TO BE CONSTRUCTED CONCURRENTLY:
1. DESERT FOOTHILLS (REDPOINT DRIVE TO SKY VISTA)
2. CARRIAGE HILL (REDPOINT DRIVE TO SKY VISTA)
3. KINDLE CORNER (CARRIAGE HILL TO DESERT FOOTHILLS)
4. RED PASS DRIVE (CARRIAGE HILL TO DESERT FOOTHILLS)
5. CLOWDER SPRING (KINDLE CORNER TO RED PASS)

WATER MAIN JOINT DEFLECTION

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

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

DESERT FOOTHILLS
(PUBLIC)

PROFILE SCALES:

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

DROP INLET NOTE:

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

STORM DRAIN DROP INLET NOTE:

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

WATERLINE TRENCH NOTE:

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

EASEMENT REFERENCE LEGEND

(1) 50' WIDE LAS VEGAS VALLEY WATER DISTRICT EASEMENT GRANTED PER OR: 20070529:0001401. STA:28+75.21 TO STA:44+96.10

LVVWD NOTE:

ALL JOINTS AND FITTINGS ON DIP TO BE RESTRAINED.

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

SANITATION SEWER NOTES

1. ALL SEWER STATIONING IS BASED ON CENTER OF PIPE LENGTHS FROM MANHOLE TO MANHOLE AND IS NOT RELATIVE IN ANY WAY TO STREET CENTERLINE STATIONING. STREET CENTERLINE STATIONING IS SHOWN ON PLAN FOR ROAD REFERENCE ONLY.
2. ALL MANHOLES ARE 48" SIZED MANHOLES PER DCSWCS SD-1, UNLESS OTHERWISE NOTED ON PLAN.
3. ALL MANHOLES ARE TO BE CONSTRUCTED PER DCSWCS SD-1A AND SD-1B.
4. ALL MANHOLE COVERS AND FRAMES ARE TO BE SINGLE 24" LID.
5. ALL MANHOLE COLLARS ARE TO BE CONSTRUCT PER DCSWCS SD-4.

UTILITY CROSSING NOTE:

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

ENGINEER DISCLAIMER NOTE:

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

TYPICAL WATER NOTES

1. MAINTAIN A MINIMUM OF 12-INCHES FOR DRY UTILITIES AND 18-INCHES FOR WET UTILITIES VERTICAL SEPARATION AT ALL POINTS OF UTILITY CROSSINGS.
2. MAINTAIN A MINIMUM OF 3-FEET PARALLEL SEPARATION FROM ADJACENT UTILITIES.
   ANY EXCAVATION AT THE BACK OF A CURB MUST REMAIN OPEN FOR INSPECTION OF THE COPPER SERVICE
3. LATERALS. ANY COPPER SERVICE LATERAL WHICH IS KINKED, BENT OR OTHERWISE DAMAGED MUST BE REPLACED FROM THE MAIN TO THE ANGLE METER STOP.
   CAUTION MUST BE EXERCISED NEAR ANY EXCAVATION AROUND AN EXISTING FIRE HYDRANT IN ORDER TO AVOID DISTURBING THE THRUST BLOCK AND SURROUNDING SOIL SUPPORTING THE THRUST BLOCK. THIS PREVENTS THE POSSIBILITY OF THE HYDRANT SEPARATING FROM THE LATERAL. PROVIDE A DETAIL OF THE PROPOSED INSTALLATION SHOWING ADEQUATE CLEARANCES TO AVOID DISTURBING EXISTING LVVWD FACILITIES.
4.

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.

WATER LINE MARKER BALLS NOTE

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

WATER PRESSURE ZONE:

WATER SERVICE LOCATED IN THE 3550 PRESSURE ZONE.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT:136301 FIRST APPROVED DATE: 10/29/19

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

LVVWD APPROVAL IS VALID FOR ONE (1) YEAR FROM SIGNATURE DATE. IF CONSTRUCTION IS NOT STARTED, PLANS **MUST** BE RESUBMITTED FOR REVIEW AND APPROVAL.

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

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

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL AND STREET LIGHT SYSTEMS CONDUITS
Call before you Underground
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
OR
1-702-229-6611
LAS VEGAS AREA CONSPICUOUS TRAFFIC SYSTEM

CONSTRUCTION NOTES

	WATER	PUBLIC
W	FIRE HYDRANT ASSEMBLY: (PER UDACS PLATE NO. 30, 39, 40 & 41) INCLUDING 24" X 6" TAPPING SLEEVE WITH 6" TAPPING VALVE PER UDACS PLATE NO. 34 & SECTION 2.24.01B	3 EA.
W	12" GATE VALVE (PER UDACS PLATE 30 & 39)	9 EA.
W	6" 45° VERTICAL BEND (PER UDACS PLATE 31)	2 EA.
W	12" 45° VERTICAL BEND (PER UDACS PLATE 31)	12 EA.
W	12" 45° BEND (PER UDACS PLATE 31)	6 EA.
W	12" 90° BEND (PER UDACS PLATE 31)	2 EA.
W	24"X12" TAPPING SLEEVE W/12" TAPPING VALVE (PER UDACS PLATE 30, 34 & 39 & PER SECTION 2.24.01B)	9 EA.
W	12" CAP & BLOW OFF (PER UDACS PLATE 36)	9 EA.
W	1.5" TYPE K SOFT COPPER WATER LATERAL SERVICE WITH 1.5" SUMMERLIN COUNCIL METER PER IRRIGATION MASTER PLAN AND UDACS PLATE #4 (IRRIGATION) AND 1.5" RPPA PER UDACS PLATE #8 (PER DETAIL SHEET DT1)	2 EA.
W	6"X1.5" SERVICE SADDLE W/ CORP STOP PER UDACS PLATE 4.	2 EA.
	6" C-900 WATER MAIN PER UDACS 2.06.01 & PLATE 17	109 LF.
	12" C-900 WATER MAIN PER UDACS 2.06.01 & PLATE 17	339 LF.
	12" DIP WATER MAIN PER UDACS 2.06.01 & PLATE 17	208 LF.
POC	WATER POINT OF CONNECTION	

	SEWER	PUBLIC
1 SS	48" STANDARD MANHOLE PER SD-1 & SD-4 W/ SINGLE 24" LID	4 EA.
2 SS	60" STANDARD MANHOLE PER SD-1 & SD-4 W/ SINGLE 24" LID	4 EA.
3 SS	72" STANDARD MANHOLE PER SD-1 & SD-4 W/ SINGLE 24" LID	1 EA.
4 SS	CORROSION PROTECTION	
5 SS	8" C-900-16 SANITARY SEWER MAIN	184 LF.
6 SS	12" C-900-16 SANITARY SEWER MAIN	1,711 LF.
POC	SEWER POINT OF CONNECTION	

WATER CONSTRUCTION NOTES

ALL DIMENSIONS TO UTILITIES ARE TO CENTERLINE OF PIPE UNLESS INDICATED OTHERWISE.

CONTRACTOR SHALL VARIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES AND NOTIFY THE DESIGN ENGINEER IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

ALL EXISTING UTILITY STRUCTURES WITHIN CONSTRUCTION AREA SHALL BE ADJUSTED TO MATCH FINISH GRADE (I.E. WV. BOX, MH, ANNODE BOX, FH, TEL BOX, ETC.)

1. WATER LINE STATIONING IS BASED ON THE CENTERLINE OF STREET RIGHT OF WAY
2. WATER LINE SHALL BE C-900 PVC APPROVED BY THE LAS VEGAS VALLEY WATER DISTRICT.
3. EXISTING ASPHALT SHALL BE REMOVED AND REPLACED PER CITY OF LAS VEGAS SPECIFICATIONS. BACKFILL AND INSTALL PERMANENT PATCH PER CITY STANDARD FOR THIS PLAN.
4. SEE SHEET NT FOR PUBLIC UTILITY NOTES AND GENERAL WATER CONSTRUCTION NOTES.
5. ALL WATER LINE IN STREET RIGHT OF WAY IS PUBLIC WATER SYSTEM AND MUST BE INSPECTED BY THE LAS VEGAS VALLEY WATER DISTRICT.

DEPTH OF COVER NOTE:

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

LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: 9/16/19

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

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.

PROFESSIONAL ENGINEER - STATE OF NEVADA - No. 15745 - WILLIAM J. MEYER - EXP: 12/31/19 - CIVIL
9/16/19

REV	DATE	BY	REVISION

HOWARD HUGES 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) 382-2597 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

UTILITY SHEET 4
38+00 TO 42+00

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
REDPOINT TO SKY VISTA

PROJ.#:136301A QS:137-26-NW

DRAWN BY:	DESIGNED BY:	CHECKED BY:	PROJECT NO:
BCC	BCC	W.AM	7851

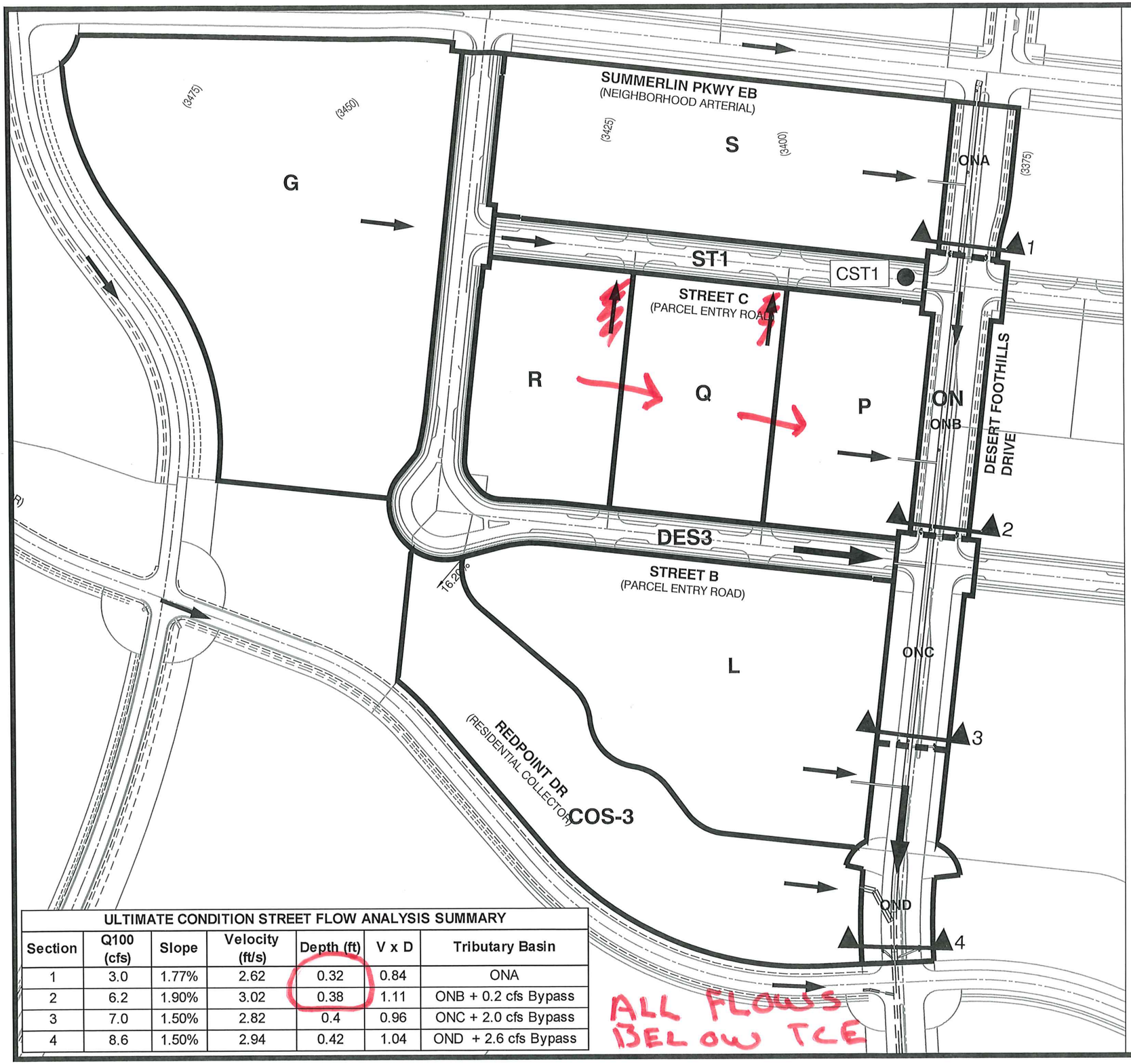
07/23/2018 07/23/2018 08/15/2019

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

SHEET
UT4
18 OF 40 SHEETS

DRAWING NO.
L19-00350
107V7663

H:\7851\Desert Foothills Street A to Summerlin Pkwy\Sheet Set\7851-UT.dwg,9/16/2019 4:17 PM,jimmyp



ULTIMATE CONDITION STREET FLOW ANALYSIS SUMMARY						
Section	Q100 (cfs)	Slope	Velocity (ft/s)	Depth (ft)	V x D	Tributary Basin
1	3.0	1.77%	2.62	0.32	0.84	ONA
2	6.2	1.90%	3.02	0.38	1.11	ONB + 0.2 cfs Bypass
3	7.0	1.50%	2.82	0.4	0.96	ONC + 2.0 cfs Bypass
4	8.6	1.50%	2.94	0.42	1.04	OND + 2.6 cfs Bypass

NORTH

GRAPHIC SCALE

200 0 100 200 400

1" = 200'

LEGEND

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

ULTIMATE CONDITION HEC-1 SUMMARY TABLE		
BASIN ID	AREA (ac)	Q100 (CFS)
S	6.33	25
G	11.43	44
R	3.07	11
Q	3.17	11
ST1	1.58	7
CST1	-	74
P	3.02	11
DES3	3.73	15
L	7.44	30
COS-3	5.9	18
ON	5.18	20

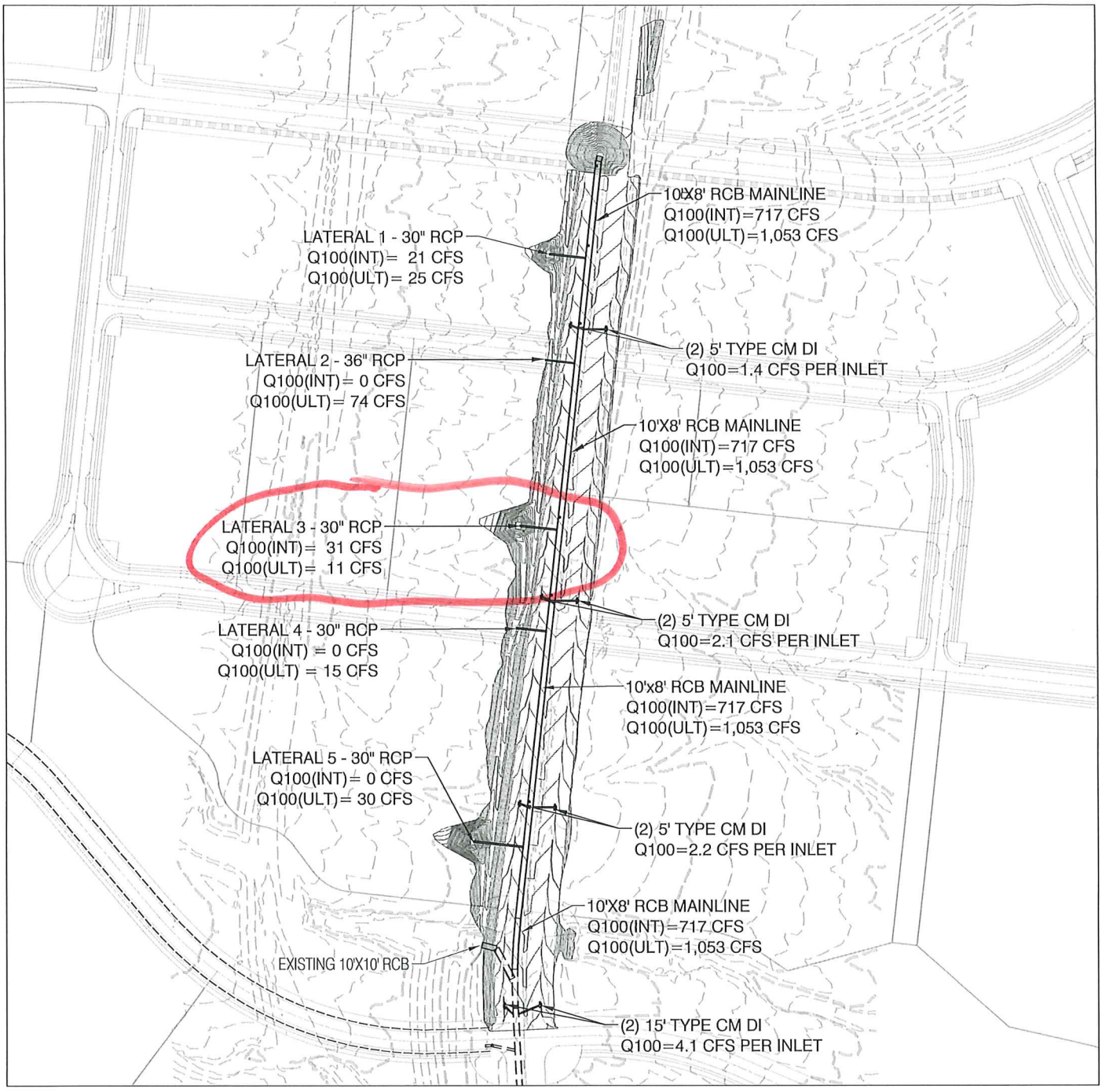
PRORATED SUBBASIN SUMMARY ULTIMATE CONDITION			
BASIN	BASIN AREA		Q100
ON	5.18		20
SUBBASIN	SUB AREA	SUB AREA	Q100
ONA	0.85	16.4%	3
ONB	1.54	29.7%	6
ONC	1.36	26.3%	5
OND	1.43	27.6%	6
TOTAL	5.18	100.0%	20

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

FIGURE 8: ULTIMATE CONDITION BASIN MAP
DESERT FOOTHILLS DRIVE
(REDPOINT DR TO SUMMERLIN PKWY)

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NV 89146-5148

H:\7851\Desert Foothills-Street A to Summerlin Pkwy\Drainage\A Figures\Figure 8 - Ultimate Drainage Map.dwg;jayson; Oct 22, 2018 - 12:57pm





GRAPHIC SCALE

300 0 150 300 600

1" = 300'

H:\7851\Desert Foothills-Street A to Summerlin Pkwy\Drainage\A Figures\Figure 9 - Storm Drain Facilities Map.dwg

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NV 89146-5148

SUMMERLIN WEST VILLAGE 21
DESERT FOOTHILLS DRIVE
(STREET A TO SUMMERLIN PARKWAY)

FIGURE 9:
PROPOSED STORM DRAIN FACILITIES MAP

SCALE	HORZ. 1" = 300'
	VERT. N/A
W.O. NO.	7851-5.6
DRAWN BY:	JYA
DATE:	SEPT 2018
SHEET	1 OF 1

Update #2 to the Technical Drainage Study for

Summerlin West Village 21

Kindle Corner Ave & Kettle Ridge Drive (Sky Vista to Desert Foothills)

Las Vegas, Nevada

W.O. # 7851

Prepared for:

Howard Hughes Company, LLC

Submitted to:

City of Las Vegas
Public Works

vtn

REGIONAL FLOOD CONTROL DISTRICT

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

BOARD OF DIRECTORS

Lawrence L. Brown, III
Chair
Clark County

Mayor Debra March
Vice-Chair
City of Henderson

George Gault
City of Mesquite

James B. Gibson
Clark County

Mayor Carolyn Goodman
City of Las Vegas

Isaac Barron
City of North Las Vegas

Mayor Pro Tem
Dr. Lois Tarkanian
City of Las Vegas

Mayor Rodney Woodbury
City of Boulder City

June 6, 2019

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

DISTRICT CONCURRENCE: **SUMMERLIN WEST V21 - KINDLE CORNER AVE & KETTLE RIDGE DR (DS5111B) (RFCD No. 19-11269)**

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated March 14, 2019, and Addendum No. 1 dated April 17, 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 May 7, 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: Brian Troy Ruiz, P.E., VTN Nevada

P:\Letters and Memos\Local Drainage\Land Development & Drainage\2019\L-19-11269.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

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: June 25, 2019
TO: **Land Development Services** Department of Building & Safety			FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Summerlin West V21 – Kindle Corner Ave & Kettle Ridge Dr (Sky Vista Drive to Desert Foothills Boulevard) – Update #2**		**COPIES TO:** VTN Nevada
Cross Streets:	SWQ Desert Foothill Blvd & Summerlin Pkwy		Howard Hughes Company, LLC
File Number:	F:\Depot\DSMemos\DS5111E.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-26-101-001		CCRFCD
Zoning Action:			
FEMA Flood Zone	YES	NO X	
Proposed Storm Drain	YES X	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	3/14/2019	4/9/2019	Not Approved	$400.00	503995: $400
2nd Submittal	4/17/2019	5/7/2019	Conditional Approval	$400.00	3096217: $400
3rd Submittal	5/23/2019	6/5/2019	Conditional Approval	$100.00	3144682: $100
CCRFCD	6/11/2019	6/21/2019	Concurrence Recv'd	N/C	N/C
4th Submittal	6/18/2019	6/25/2019	See Comments Below	$100.00	3457452: $100
			TOTAL FEES (LDDRS):	**$1,000.00**	----

REMARKS:

4th Submittal: Update #2 to relocate the main line storm drain from directly under the curb to approximately 9' away from the curb

3rd Submittal: Update #1 for Grading Revision to provide a 16'-wide paved waterline access road across an interim channel west of the intersection of Kindel Corner Avenue & Kettle Ridge Drive

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

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

1. The project proposed to construct temporary drainage facilities including drainage berms/swales for the interim protection of the proposed segment of *Kindle Corner Avenue & Kettle Ridge Drive*. Prior to the final plans approval, the developer must complete a ***Maintenance & Liability Agreement*** for the interim drainage improvements and post a minimum maintenance bond of $50,000 or 50-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for constructing the facilities and an exhibit that adequately shows the location and limits of the drainage facilities to *City Flood Control* for approval. Once the drainage study is conditionally approved, the engineer/developer should contact the *City's Land Development Section* (702-229-6371) to begin the agreement process.

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

2. The subject improvement is premised on the fully improved *Desert Foothills Drive* (from *Far Hills Boulevard* to *Summerlin Parkway East Bound*) in order for the proposed storm drain in *Kindle Corner Avenue* to tie to the regional facility in *Desert Foothills Drive*. The subject improvement plans will not be approved prior to the execution of the construction bonds of *Desert Foothills Drive* (*Far Hills* to *Summerlin Parkway*) and the associated facilities.

3. All storm drain inlets that are more than 10'-deep require a special structure detail and structural calculation. Submit structural calculations to *City Building & Safety Department* for review and approval prior to the final acceptance of the improvement 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/26
AREA K-26

Drop Inlet Interception

Project: Street B (Desert Foothills to Summerlin Parkway)
Work Order no.: 7851-MISC-19
Calculated By: RBR
Date: Mar-19

Inlet ID: Section 2B
Drainage Condition: 100-Year Ultimate Condition
Flow Summary: STB-2B
Inlet Description: 5' Type C Modified

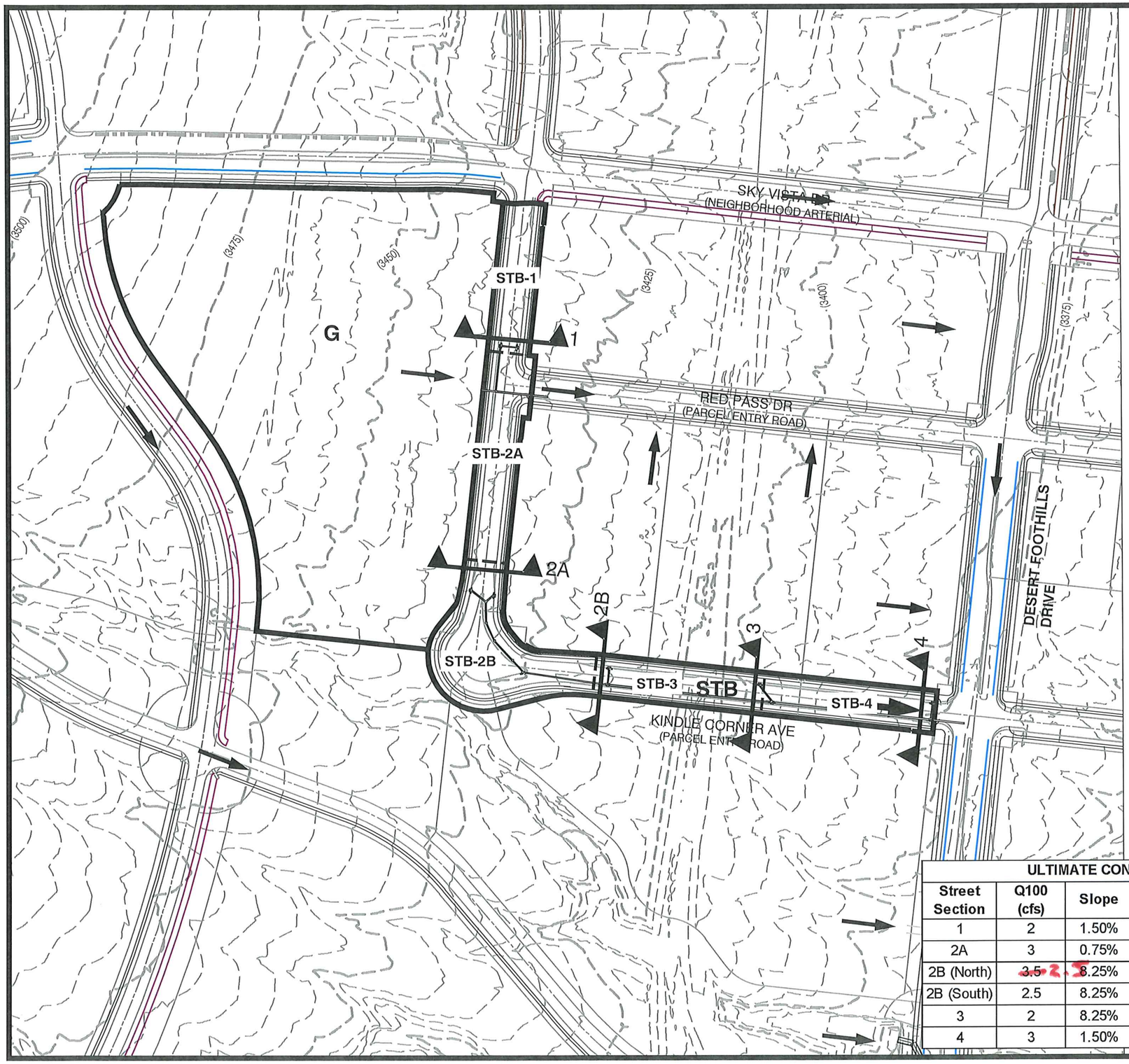
Equations referenced from CCRFCD HCDDM and FHWA HEC-22

Input:	Variable:	Input:
Street Flow (cfs)	Q	2.5
Longitudinal Slope (ft/ft)	S_o	0.0569
Manning's Coefficient	n	0.016
Street Flow Velocity (fps)	V	4.4
Street Flow Depth (ft)	D	0.27
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	1.50
Q_w - Frontal Flow (cfs)	$Q[1-(1-(W/T))^{2.67}]$	1.50
Q_s - Side Flow (cfs)	$Q-Q_w$	1.00
T - Side Flow Spread (ft)	$(D-D_g)/S_x$	5.17
R_s - Side Flow Factor	$1/(1+(0.15*V^{1.8})/(S_x*L_{ge}^{2.3}))$	0.02
Q_{gi} - Intercepted Flow (cfs)	$(R_f*E+R_s*(1-E))*Q$	**2.5**

Output (Curb):	Equation:	Output (Curb):
S_e - Equivalent Cross Slope (ft/ft)	S_x+S_g*E	0.19
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)	**2.5**
Bypass Flow (cfs)	Street Flow - Total Intercepted Flow	**0.0**





GRAPHIC SCALE

200 0 100 200 400

1" = 200'

LEGEND

- BASIN BOUNDARY
- A — BASIN DESIGNATION
- PRORATED SUBBASIN BOUNDARY
- STB-1 — SUBBASIN DESIGNATION
- CROSS SECTION
- CONCENTRATION POINT

ULTIMATE CONDITION HEC-1 SUMMARY TABLE

Basin ID	Area (a.c.)	Q100 (cfs)
G	11.43	44
STB	3.73	15

PRORATED SUBBASIN SUMMARY INTERIM CONDITION

BASIN	BASIN AREA		Q100
STB	3.73		15
SUBBASIN	**SUB AREA**	**SUB AREA**	**Q100**
STB-1	0.53	14.21%	2
STB-2A	0.79	21.18%	3
STB-2B	1.16	31.10%	5
STB-3	0.61	16.35%	2
STB-4	0.64	17.16%	3

ULTIMATE CONDITION STREET FLOW ANALYSIS SUMMARY

Street Section	Q100 (cfs)	Slope	Velocity (ft/s)	Depth (ft)	V x D	Tributary Basin
1	2	1.50%	2.45	0.30	0.74	STB-1
2A	3	0.75%	2.00	0.37	0.74	STB-2A
2B (North)	~~3.5~~ 2.3	8.25%	5.43	0.28	1.52	1/2STB-2B + Bypass at 2A
2B (South)	2.5	8.25%	5.13	0.26	1.33	1/2STB-2B
3	2	8.25%	6.53	0.17	1.11	STB-3
4	3	1.50%	2.32	0.28	0.65	STB-4

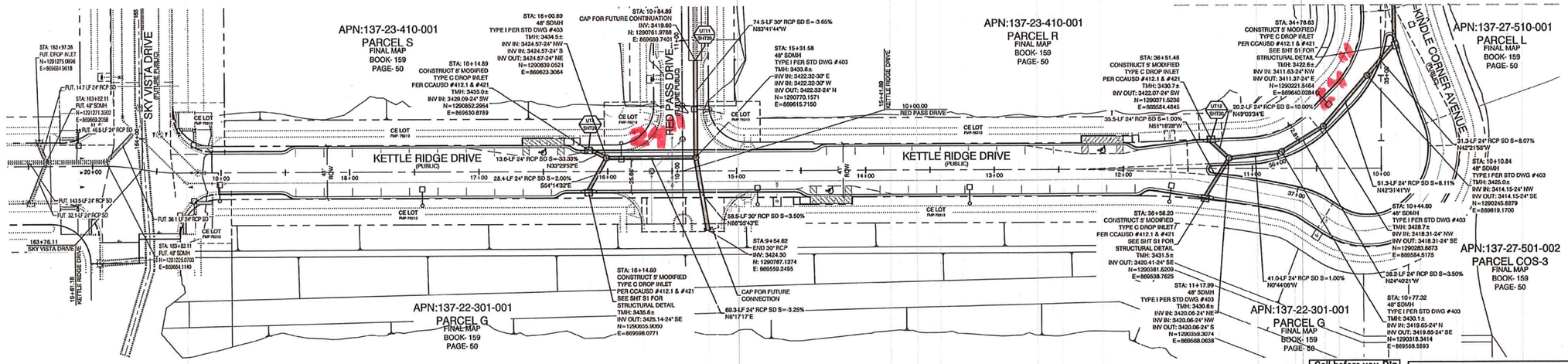
ALL FLOWS BELOW TCE

W.O.#:	7851-MISC-19
DATE:	March 13, 2019
BY:	JYA
SCALE:	1" = 200'
SHEET	1 OF 1

FIGURE 8: ULTIMATE CONDITION BASIN MAP
KINDLE CORNER AVE & KETTLE RIDGE DR (AKA STREET B)
(SKY VISTA DRIVE TO DESERT FOOTHILLS BLVD)

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NV 89146-5148

H:\7851\Street B-Desert Foothills to Summerlin Pkwy\Drainage\2_ADD1\A Figures\Figure 8 - Ultimate Drainage Map.dwg|jayson, Apr 16, 2019 - 10:55am



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

Call before you Underground
1-702-455-7211
CLARK COUNTY TRAFFIC OPERATIONS
1-702-229-6811
LAS VEGAS VALLEY WATER DISTRICT

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

CONSTRUCTION NOTES

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

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

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

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.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT: 136579 FIRST APPROVED DATE: 10/31/19

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

LVVWD APPROVAL IS VALID FOR ONE (1) YEAR FROM SIGNATURE DATE. IF CONSTRUCTION IS NOT STARTED, PLANS MUST BE RESUBMITTED FOR REVIEW AND APPROVAL.

REV	DATE	BY	REVISION

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
1980 FESTIVAL PLAZA DRIVE, SUITE 150
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.VTNINV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

MASTER UTILITY STORM DRAIN

SUMMERLIN WEST VILLAGE 21
KINDLE CORNER AVE & KETTLE RIDGE DRIVE
DESERT FOOTHILLS TO SKY VISTA DRIVE

PROJ#: 13557.9A QS:137-26-NW

DRAWN BY:	DATE:
JDH	09/18/2018
DESIGNED BY:	DATE:
DEH	09/18/2018
CHECKED BY:	DATE:
WJM	09/17/2019
PROJECT NO:	SCALE:
7851	1" = 20' HORIZ. VERT. N/A

WILLIAM J. MEYER
EXP: 12/31/19
CIVIL
STATE OF NEVADA
PROFESSIONAL ENGINEER
9/24/19

SHEET
MUTSD
8 OF 37 SHEETS
DRAWING NO.
L19-01029
107V7773

H:\7851\Sheet\B-Desert Foothills to Summerlin Pkwy\Sheet Set-OPTI\7851-MUTSD.dwg9/18/2019 8:23 AMbrandono

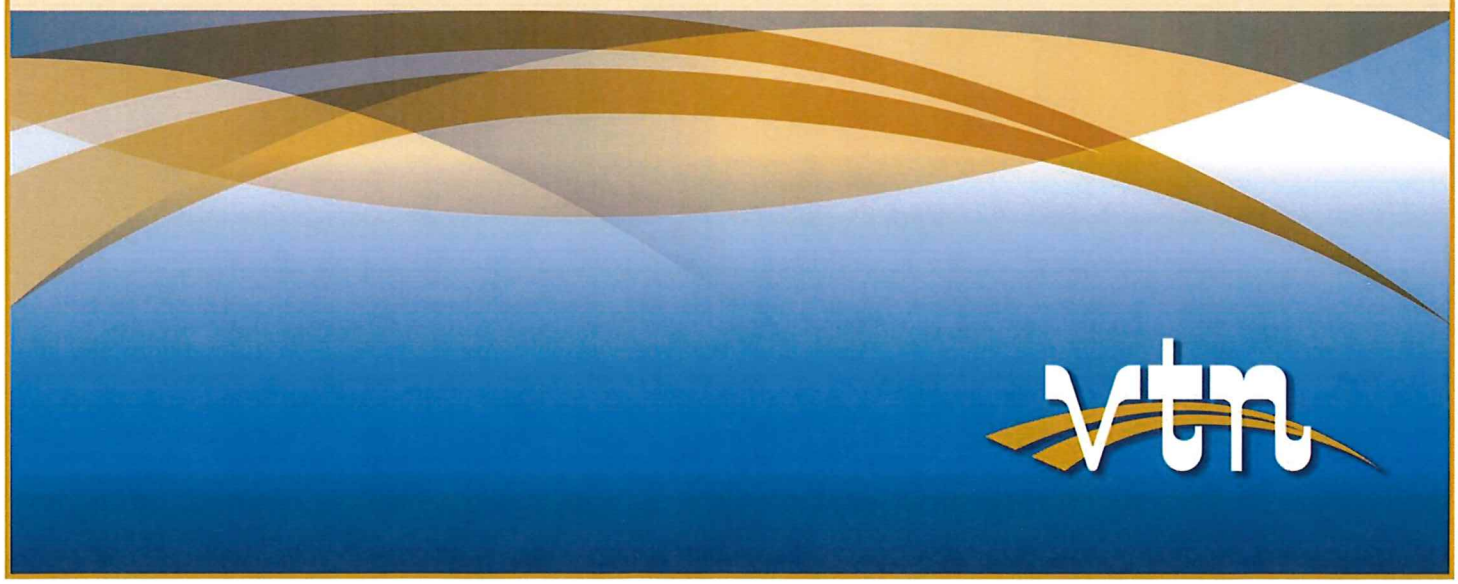
Technical Drainage Study for

Summerlin West Village 21
Red Pass Drive
(Desert Foothills to Kettle Ridge Drive)

Las Vegas, Nevada

Prepared for
Howard Hughes Company, LLC

Submitted to:
City of Las Vegas Public Works



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: October 28, 2019
TO: **Land Development Services** Department of Building & Safety				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Summerlin West Village 21 – Red Pass Drive** **(Desert Foothills Dr. to Kettle Ridge Dr.)**			**COPIES TO:** VTN Nevada, Inc.
Cross Streets:	Red Pass Drive & Desert Foothills Drive			Howard Hughes Company
File Number:	F:\Depot\DSMemos\DS5115C.doc			Bart Anderson, P.E., DevCo
Parcel Number:	137-26-101-001			CCRFCD
Zoning Action:	N/A			
FEMA Flood Zone	YES	NO	**X**	
Proposed Storm Drain	YES	NO	**X**	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	3/21/2019 & 7/1/2019	7/29/2019	Not Approved	$400.00	3057846: $400
2nd Submittal	7/31/2019	8/8/2019	Conditional Approval	$400.00	3508903: $400
CCRFCD & Structural Review	9/4/2019 & 10/28/2019	10/28/2019	Concurrence & Structural Approval 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.
	is conditionally approved subject to Clark County Public Works Department concurrence.

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

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

2. 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*.

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/26
AREA K-26

A series of 5' Type C Modified drop inlets are proposed along the proposed street to collect nuisance flows. Inlet spacing has been limited to a maximum of 600-feet to meet the City of Las Vegas requirement.

VI. STORM DRAIN FACILITES

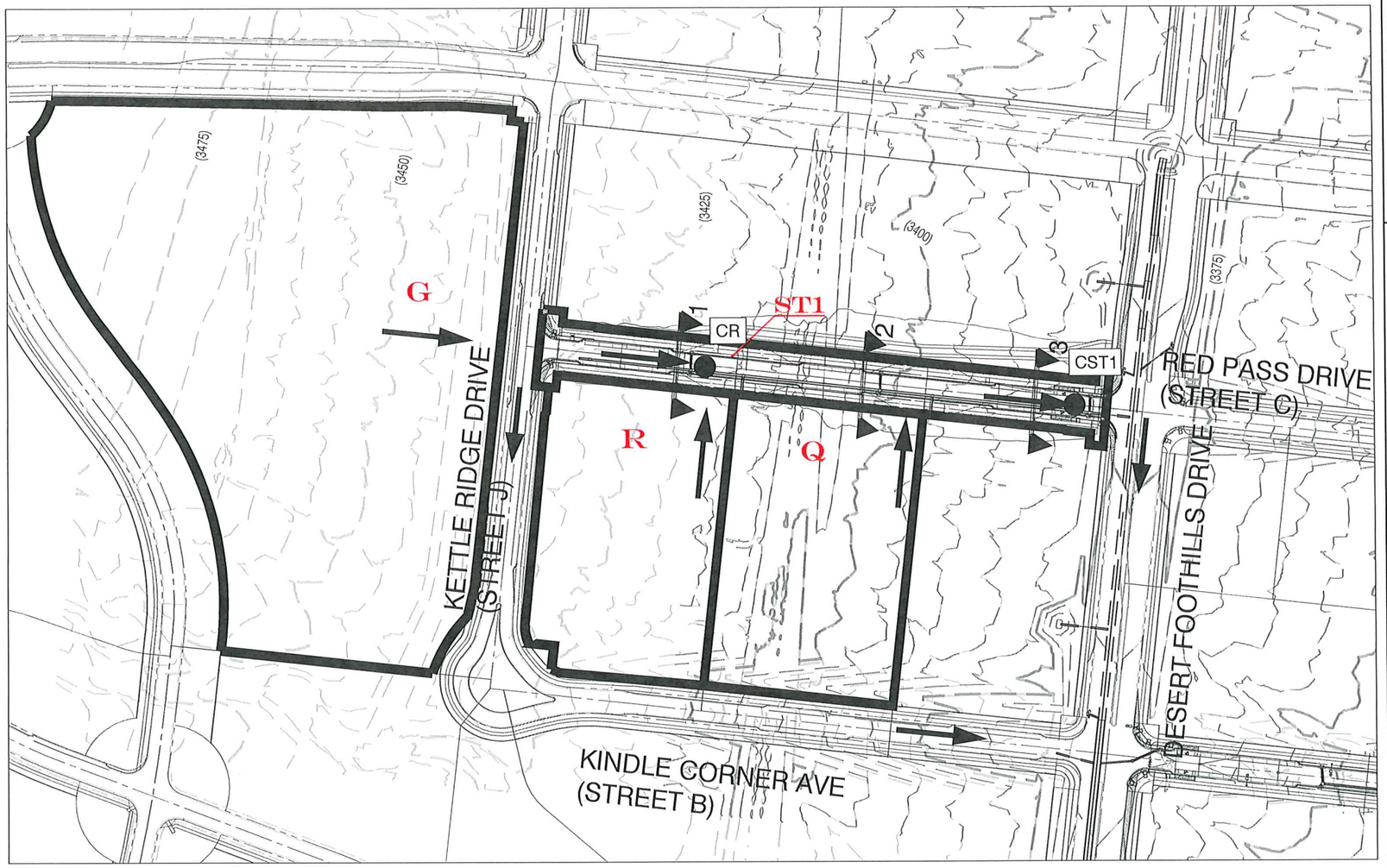
The project will consist of a 36-inch RCP storm drain mainline. The proposed storm drain mainline and laterals are depicted on *Figure 9: Proposed Storm Drain Facilities Map.*

The 36-inch mainline has been modeled in Standard Form 6 for the 100-year ultimate condition storm event. The mainline will convey up to 75 cfs (CST1) and will discharge flow into the existing 36-inch RCP stub in Desert Foothills Drive. Drop inlet laterals are intended to convey nuisance flow only, and therefore have not been modeled. Pertinent reference material has been included in Appendix D.

VII. CONCLUSIONS

This *Technical Drainage Study for Summerlin West Village 21 Red Pass Drive (Desert Foothills Drive to Kettle Ridge Drive)* has been developed in accordance with Criteria established in the Manual. The proposed development does not adversely impact any proposed or existing Clark County Regional Flood Control District Master Plan Update facilities.

The site has been designed to control storm water runoff for the 6-hour, 100-year floods as calculated in this study and the Master Study. There are no adverse effects on upstream or downstream properties due to the proposed drainage system or infrastructure improvements.



NORTH

GRAPHIC SCALE

300 0 150 300 600

1" = 300'

LEGEND

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

ULTIMATE CONDITION HEC-1 SUMMARY TABLE		
BASIN ID	AREA (ac)	Q100 (CFS)
G*	11.44	45
ST1*	1.5	7
R*	3.07	12
CR	-	63
Q*	3.16	12
CST1	-	75

*Referenced from the Master Study

ULTIMATE CONDITION STREET FLOW ANALYSIS SUMMARY						
Street Section	Q100 (cfs)	Slope	Velocity (ft/s)	Depth (ft)	V x D	Tributary Basin
1-3 (Max)	2.33	9.74%	6.65	0.15	1.00	1/3 ST1
1-3 (Min)	2.33	1.50%	2.32	0.25	0.58	1/3 ST1

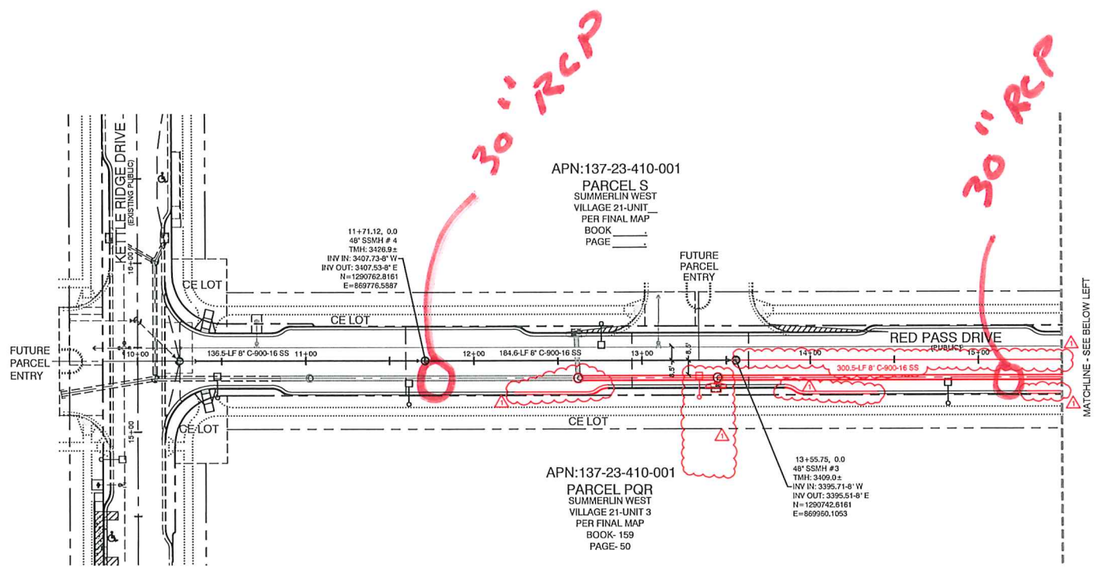
ALL FLOWS ARE BELOW TCE.

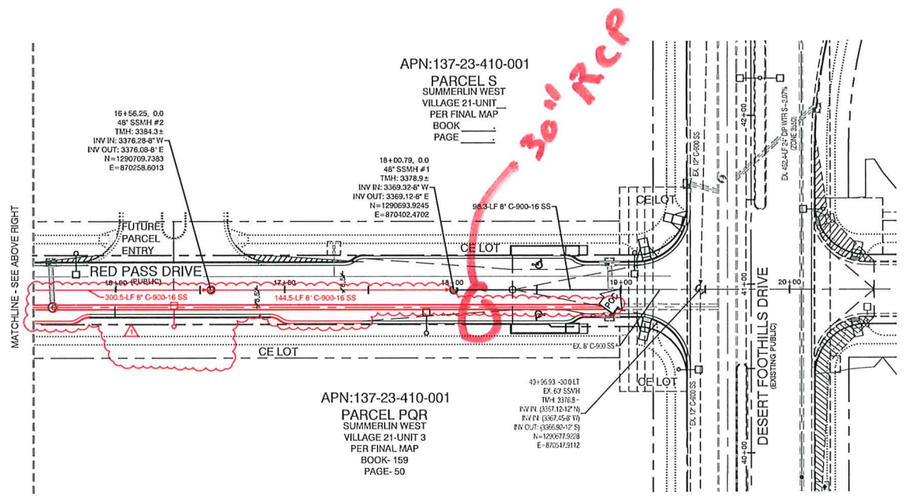
FIGURE 8: ULTIMATE CONDITION BASIN MAP
SUMMERLIN VILLAGE 21 RED PASS DRIVE
DESERT FOOTHILLS TO KINDLE CORNER

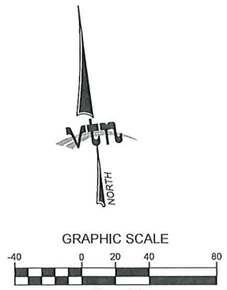
W.O.#:	7851-MISC-21
DATE:	6/26/2019
BY:	RBR
SCALE:	1" = 200'
SHEET	1 OF 1

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NV 89146-5148

H:\7851\Street C-Desert Foothills to Street B\Drainage\02_TDS Revision\A Figures\Figure 8 - Ultimate Basin Map.dwg layout: Jun 26, 2019 - 4:40pm



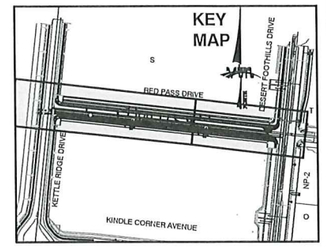




GRAPHIC SCALE

-40 0 20 40 80

1" = 40'



REV	DATE	BY	REVISION
1	10/16/2019	JDH	REMOVE PARCEL ENTRY, ADJUST CLOSE EXTENSIONS, REMOVE (E) SD STUBS, REMOVE (E) SD STUBS, REMOVE (E) SSMH, REMOVE (1) SSMH

CONSTRUCTION NOTES

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

UTILITY CROSSING NOTE:

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

ENGINEER DISCLAIMER NOTE:

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

LAS VEGAS FIRE & RESCUE APPROVAL

BY: _____ DATE: _____

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

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

Call before you Underground
1-702-455-7511
1-702-229-6611

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

APPROVED FOR CONSTRUCTION

_____
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT: 136795 FIRST APPROVED DATE: _____

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

LVVWD APPROVAL IS VALID FOR ONE (1) YEAR FROM SIGNATURE DATE. IF CONSTRUCTION IS NOT STARTED, PLANS MUST BE RESUBMITTED FOR REVIEW AND APPROVAL

HOWARD HUGHES COMPANY, LLC
A DELAWARE LIMITED LIABILITY COMPANY
10845 GRIFFITH PEAK DRIVE, SUITE 150
LAS VEGAS, NEVADA 89135
(702) 791-0500

CITY OF LAS VEGAS

2737 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5146
PH. (702) 873-7555 FAX (702) 362-2987 WEB WWW.VTNNV.COM
CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

MASTER UTILITY SEWER

SUMMERLIN WEST VILLAGE 21
RED PASS DRIVE
DESERT FOOTHILLS TO KETTLE RIDGE DRIVE

DRAWN BY: JDH 11/07/2018
DESIGNED BY: DEH 11/07/2018
CHECKED BY: MSM 10/01/2019
SCALE: HORIZ. N/A VERT. N/A
PROJECT NO: 7651

PROFESSIONAL ENGINEER — STATE OF NEVADA — No. 15745 — WILLIAM J. MEYER — EXP: 11/31/19 — CIVIL

SHEET
MUTSS
7 OF 29 SHEETS

DRAWING NO.
L10-01564
107V7958

H:\7651\Street C-Desert Foothills to Street B\Sheet Set\7651-MUTSS.dwg, 10/21/2019 1:21 PM, bhewett

IMPROVEMENT PLANS FOR

SUMMERLIN VILLAGE 21 PARCELS P Q AND R

A SINGLE FAMILY RESIDENTIAL SUBDIVISION

BY TOLL SOUTH LV, LLC

APN: 137-22-812-001
CITY OF LAS VEGAS, NEVADA
9.25+/- ACRES

LEGAL DESCRIPTION

BEING A SUBDIVISION OF LOT 3 OF PARCEL MAP FILE 125, PAGE 15 LYING WITHIN THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 22, THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 23, THE NORTHWEST QUARTER (NW 1/4) OF SECTION 26 AND THE NORTHEAST QUARTER (NE 1/4) OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

CONTAINING 105.09 ARES, MORE OR LESS AS DETERMINED BY COMPUTER METHODS

BENCHMARK

CITY OF LAS VEGAS BENCHMARK 7LV09 27E4

RIVET AND PLOT IN TOP OF CURB AT SOUTHEAST CORNER OF FAR HILLS AVENUE AND DESERT FOOTHILLS DRIVE.

ELEVATION=1016.62 Meters (NAVD'88 v.2008)
ELEVATION=3335.36 US Survey Feet (NAVD'88 v.2008)

BASIS OF BEARINGS

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 BEARING 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.

SHEET INDEX

SHT No.	DWG ID	DRAWING DESCRIPTION
1	C-1	COVER SHEET
2	N-1	GENERAL NOTES, LEGENDS, AND ABBREVIATIONS
3	G-1	GRADING PLANS (SHEET 1 OF 6)
4	G-2	GRADING PLANS (SHEET 2 OF 6)
5	G-3	GRADING PLANS (SHEET 3 OF 6)
6	G-4	GRADING PLANS (SHEET 4 OF 6)
7	G-5	GRADING PLANS (SHEET 5 OF 6)
8	G-6	GRADING PLANS (SHEET 6 OF 6)
9	D-1	GRADING DETAILS (SHEET 1 OF 3)
10	MU-1	MASTER UTILITY PLAN
11	U-1	UTILITY PLAN (SHEET 1 OF 6)
12	U-2	UTILITY PLAN (SHEET 2 OF 6)
13	U-3	UTILITY PLAN (SHEET 3 OF 6)
14	U-4	UTILITY PLAN (SHEET 4 OF 6)
15	U-5	UTILITY PLAN (SHEET 5 OF 6)
16	U-6	UTILITY PLAN (SHEET 6 OF 6)
17	P-1	PLAN AND PROFILE BANDED HAWK ST AND STONE RUN ST
18	P-2	PLAN AND PROFILE STONE RUN ST STA:14+00.00-17+00.00
19	P-3	PLAN AND PROFILE TALON RIDGE ST STA:10+00.00-14+00.00
20	P-4	PLAN AND PROFILE FORTIS CREEK ST STA:10:00.00-14+00.00
21	P-5	PLAN AND PROFILE AGATE BRIDGE ST STA:10+00.00-14+00.00
22	P-6	PLAN AND PROFILE SPOTTED FALCONS ST 10+00.00-14+00.00
23	P-7	PLAN AND PROFILE GREY SAKER ST STA:10+00.00-14+00.00
24	P-8	PLAN AND PROFILE SENTINAL SPIRE ST STA:10+00.00-14+00.00
25	P-9	PLAN AND PROFILE SHAW TOWER ST, TERCEL POINT ST & FLINDERS CHASE ST
26	S-1	STREETLIGHT, SIGNAGE AND STRIPING PLAN (SHEET 1 OF 6)
27	S-2	STREETLIGHT, SIGNAGE AND STRIPING PLAN (SHEET 2 OF 6)
28	S-3	STREETLIGHT, SIGNAGE AND STRIPING PLAN (SHEET 3 OF 6)
29	S-4	STREETLIGHT, SIGNAGE AND STRIPING PLAN (SHEET 4 OF 6)
30	S-5	STREETLIGHT, SIGNAGE AND STRIPING PLAN (SHEET 5 OF 6)
31	S-6	STREETLIGHT, SIGNAGE AND STRIPING PLAN (SHEET 6 OF 6)

DISCLAIMER NOTE:

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND OR OVERHEAD 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. CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES OR DISCREPANCIES.

Call before you Dig
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call 811 OR 1-800-227-2600

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

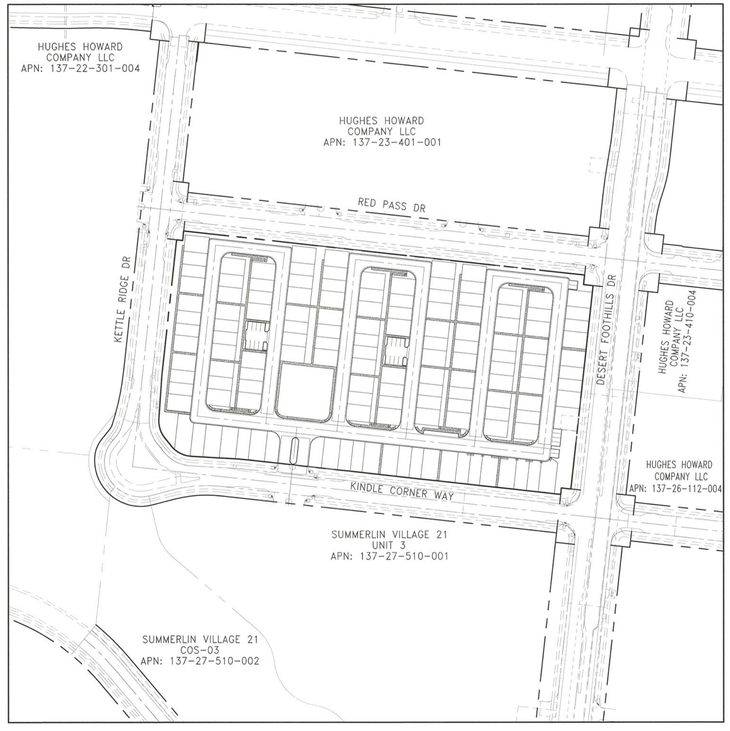
OWNER:
TOLL SOUTH LV, LLC
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NEVADA 89144
PH#702.243.9800
FAX#702.243.9610

DEVELOPER:
Toll Brothers
America's Luxury Home Builder
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NEVADA 89144
PH#702.243.9800 FAX#702.243.9610

DESIGN ENGINEER:
RCI ENGINEERING
500 SOUTH RANCHO DRIVE, SUITE 17, LAS VEGAS, NV 89106
MAIN: 702.453.0800 FAX: 702.453.0801



VICINITY MAP
NOT TO SCALE



SITE PLAN
NOT TO SCALE

APPROVED BY:

CITY OF LAS VEGAS

ALLEN PAVELKA, P.E. #9029 — DATE
CITY ENGINEER

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

CITY OF LAS VEGAS PLANNING DEPARTMENT — DATE
THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING DEPARTMENT.

CENTURYLINK

CENTRAL TELEPHONE COMPANY – dba CENTURYLINK — DATE

THE 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 STATUES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS.

SOUTHWEST GAS CORPORATION

SOUTHWEST GAS CORPORATION — DATE

COX COMMUNICATIONS LAS VEGAS INC.

COX COMMUNICATIONS LAS VEGAS INC. — DATE

NV ENERGY

NV ENERGY COMPANY — DATE

NV ENERGY COMPANY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NV ENERGY 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.

CITY OF LAS VEGAS FIRE DEPARTMENT

CITY OF LAS VEGAS FIRE DEPARTMENT — DATE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. – FIRST APPROVED DATE:
LVVWD APPROVED FIRE FLOW 1,500 GPM AT 20 PSI RESIDUAL
(SHEETS C-1, N-1, D-1, MU-1, U-1 AND P-1)

THE HOWARD HUGHES COMPANY, LLC

KEVIN ORROCK — DATE
VICE PRESIDENT

BY	APP'D	DATE
DESCRIPTION		
REV		

DATE: September 14, 2020
HORIZ. SCALE: NTS
VERT. SCALE: NTS
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.0048

TOLL SOUTH LV, LLC
1140 TOWN CENTER DRIVE SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9610

RCI ENGINEERING
500 SOUTH RANCHO DRIVE, SUITE 17, LAS VEGAS, NV 89106
PH(702.453.0800) FAX(702.453.0801)
www.rcinevada.com

IMPROVEMENT PLANS FOR
SUMMERLIN VILLAGE 21 PARCELS P Q AND R
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
COVER SHEET
CITY OF LAS VEGAS NEVADA

PROFESSIONAL ENGINEER – STATE OF NEVADA
CHRISTOPHER L. THOMPSON
Exp. 6/30/2022
CIVIL
No. 14134
DATE: 9/14/2020

DRAWING
C-1
SHT 1 OF 31
CLV DRAWING NUMBER
CLV PROJECT #

O:\3110_Toll\0048_Summerlin V21-P&R_CIVIL_PFS\500_C01.dwg cthompson 9/14/20 10:36am

CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD 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 GEO TEK RESIDENTIAL, LLC 15002-LVR, 11/12/2019, 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 APPLICABLE 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, ANDSEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC. THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.
21. SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE CITY AND APPROVED PRIOR TO ACCEPTANCE OF FACILITY. VIDEO INSPECTION. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES AND TRANSITION STRUCTURES. STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXIT THE PUBLIC RIGHT-OF-WAY, AND STORM DRAIN MAIN ALIGNMENT, INCLUDING DEFLECTION POINTS. THE LOCATION SHALL BE DESCRIBED BY COORDINATES WHICH SHALL BE BASED ON THE OFFICIAL HORIZONTAL AND VERTICAL CONTROL NETWORKS OF THE CITY OF LAS VEGAS. FINAL LOCATION MAPS MUST BE SEALED AND CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINTIES OF ± 0.09 METERS (± 0.3 FEET) HORIZONTALLY AND VERTICALLY. A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S).
22. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST EDITION.
23. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

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 1160 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 CITIZENS AREA TRANSIT (C.A.T.) IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.
13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.
14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS 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 HYDRANT AND ACCESS GENERAL NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE #6325 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS.
2. ONLY FIRE HYDRANTS THAT ARE ON THE LAS VEGAS VALLEY WATER DISTRICT'S-APPROVED PRODUCTS LISTS ARE ALLOWED TO BE INSTALLED
3. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK. [IFC § 105.7.12]
4. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. [IFC § 3310, § 3312
5. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. [IFC § 507.5.7.3]
6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL. [IFC § 106.3]
7. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. [IFC § 507.2.1, NFPA 24]
8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. [IFC § 507]
9. PRIVATE HYDRANTS SHALL BE PAINTED RED. [IFC § 507.5.7.1]
10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. [IFC § 507]
11. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: [IFC § C102]
    * RESIDENTIAL - 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
    * COMMERCIAL - 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
12. WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. [IFC § C102.8]
13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.
14. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. [IFC § C102.12]
15. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300FT, AS MEASURED BY AN APPROVED ROUTE. [IFC § C102.4]
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. [IFC § C102.7]
17. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200FT. [IFC § C102.6]
18. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN. [IFC § C104]
19. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. [IFC § 503.2.3]
20. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12%. ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FT PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. [IFC § 503.2.7, § 503.2.8]
21. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. [IFC § 503.2.4]
22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13FT 6 INS. [IFC §503.2.1]
23. FIRE DEPARTMENT ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 40 FT FLOW LINE TO FLOW LINE WITH PARALLEL PARKING PERMITTED ON BOTH SIDES. NOT LESS THAN 32 FT WIDE, FLOW-LINE TO FLOW-LINE, WHERE PARKING IS PERMITTED ONLY ON ONE SIDE OF THE FIRE APPARATUS ACCESS ROAD. NOT LESS THAN 24 FT WIDE, FLOW-LINE TO FLOW-LINE, WHERE NO PARKING IS PERMITTED ON EITHER SIDE. FIRE LANES THROUGH PARKING LOTS SHALL BE NOT LESS THAN 24 FT. [IFC § 503.2.1.1]
24. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. THIS DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED. [IFC § 503.1.1
25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT. COMMERCIAL AND INDUSTRIAL DEVELOPMENTS WHERE BUILDINGS EXCEED 2 STORIES OR 30 FEET IN HEIGHT, OR EXCEEDING 62,000 SQUARE FEET IN AREA. [IFC § 503.1.2]
26. ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. [IFC § 503.2.5]
27. ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS OF 100 FT ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM THE ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. [IFC § 503.3]
28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM.SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE IFC § 503.6 AND IFC APPENDIX M.

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 UNTIL THE COMPLETION OF THIS 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.

STORMWATER RUNOFF MANAGEMENT

(REQUIRED FOR ALL SITES GREATER THAN 1 ACRE (43,560 SQ.FT.))

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS OF THE CITY OF LAS VEGAS AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN THE CITY OF LAS VEGAS AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

SOUTHWEST GAS CONSTRUCTION NOTES

SOUTHERN NEVADA - SOUTHWEST GAS CORPORATION 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 PRIOR TO CONSTRUCTION
4. IN THE EVENT OF ANY NATURAL GAS CONFLICT WITH PROPOSED UTILITIES AND STRUCTURES CONTACT 702-365-2099

CAUTION: HIGH PRESSURE GAS!!

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

SOUTHWEST GAS CORPORATION — DATE

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

DISCLAIMER NOTE:

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Call 811
OR
1-800-227-2600

FAST
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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

LEGAL DESCRIPTION

BEING A SUBDIVISION OF LOT 3 OF PARCEL MAP FILE 125, PAGE 15 LYING WITHIN THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 22, THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 23, THE NORTHWEST QUARTER (NW 1/4) OF SECTION 26 AND THE NORTHEAST QUARTER (NE 1/4) OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

CONTAINING 105.09 ARES, MORE OR LESS AS DETERMINED BY COMPUTER METHODS

BENCHMARK

CITY OF LAS VEGAS BENCHMARK 7LV09 27E4

RIVET AND PLOT IN TOP OF CURB AT SOUTHEAST CORNER OF FAR HILLS AVENUE AND DESERT FOOTHILLS DRIVE.

ELEVATION=1016.62 Meters (NAVD'88 v.2008)
ELEVATION=3335.36 US Survey Feet (NAVD'88 v.2008)

BASIS OF BEARINGS

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 BEARING 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.

SURVEY MONUMENT NOTE

OWNER RESPONSIBLE TO PROVIDE SURVEY MONUMENTATION AS REQUIRED BY CITY OF LAS VEGAS AND CLARK COUNTY UNIFORM STANDARD DRAWING NUMBER 243. OWNER IS ALSO RESPONSIBLE TO REPLACE ALL SURVEY MONUMENTATION DAMAGED, DESTROYED, OR OBSCURED DURING CONSTRUCTION.

BUILDING PERMIT NOTE

ALL STRUCTURES SHOWN OR INDICATED ON THIS SUBMITTAL WITHIN THE PROPERTY REQUIRE A BUILDING PERMIT APPLICATION AND SUBMITTAL THIS INCLUDES BUILDINGS, ABOVE GROUND TANKS, SIGNS, RETAINING WALLS, FENCES, TRASH ENCLOSURES, SHADE STRUCTURES, STAIRWAYS, RAMPS, LIGHT POLES, LIGHT BOLLARDS, ETC. THIS DOES NOT INCLUDE ANY FLOOD CONTROL STRUCTURE SUCH AS PIPES, CULVERTS, ARCH CULVERTS, HEADWALLS, ETC. THIS DOES NOT INCLUDE ANY WORK WITHIN A PUBLIC STREET RIGHT-OF-WAY. THIS DOES NOT INCLUDE PRIVATE STREETS. THE REVIEW OF CIVIL IMPROVEMENT AND/OR GRADING PLANS DOES NOT INCLUDE ANY REVIEW OF ANY STRUCTURE THAT REQUIRES A BUILDING PERMIT APPLICATION."

SIGHT VISIBILITY ZONE

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

ENGINEERS NOTES

1. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
2. SEE DETAIL SHEET FOR ON-SITE PAVEMENT SECTIONS. CONTRACTOR TO VERIFY WITH SOILS REPORT.
3. SEE FINAL MAP FOR EXACT PROPERTY LINE DIMENSIONS.
4. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
5. THESE PLANS SHALL NOT, IN PART OR IN WHOLE, BE USED FOR CONSTRUCTION UNTIL APPROVED AND SIGNED BY THE GOVERNING AGENCIES.
6. ALL GRADING SHALL CONFORM TO SOILS REPORT RECOMMENDATIONS.
7. DURING CONSTRUCTION, SURVEYORS AND CONTRACTORS MUST VERIFY THAT ALL STREETS AND LOTS HAVE POSITIVE DRAINAGE. SAME MUST UTILIZE AT LEAST THREE GRADES ON VERTICAL TANGENTS TO VERIFY SLOPES.
8. SOIL REPORT NOTE:
   GRADING SHALL BE IN ACCORDANCE WITH SOILS REPORT PREPARED BY:
   ENGINEER: GEO TEK RESIDENTIAL, LLC
   PROJECT NO. 15002-LVR
   DATED: 11/12/2019
9. CUT/FILL ESTIMATES
   EXISTING TO FINISH GRADE ELEVATIONS
   NET CUT: 89,453 CY
   NET FILL: 138,595 CY
10. SEE DETAIL 31/D-2 FOR TYPICAL LOT DRAINAGE
11. FOR STORMWATER RUNOFF MANAGEMENT NOTES REFER TO SHEET N-1

NOTE

ALL ONSITE STORM DRAINS AND THE ASSOCIATED FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOA

NOTE

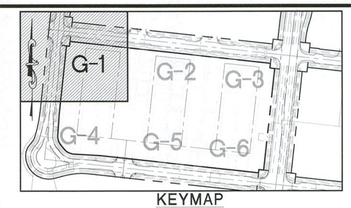
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SEWER EASEMENT NOTE

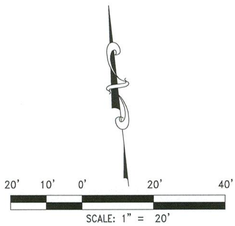
NO STRUCTURES AND NO TREES OR VEGETATION TALLER THAN THREE FEET ALLOWED WITHIN CLV SEWER EASEMENT

FLOOD ZONE NOTE

ACCORDING TO THE FEMA FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY PANEL MAP NUMBERS 32003C2150E DATED SEPTEMBER 27, 2002, THE SITE IS LOCATED IN A ZONE "X". ZONE "X" AREAS ARE DEFINED AS AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD PLAIN.



KEYMAP



SCALE: 1" = 20'

CONSTRUCTION NOTES

1. CONSTRUCT AC PAVEMENT PER DETAILS 1 THRU 4 ON SHEET D-1
2. CONSTRUCT 24" 'L' CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 24" 'R' CURB PER CCAUSD #217.3 S1
4. CONSTRUCT 5' CURB TRANSITION FROM 24" 'L' TYPE CURB AND GUTTER TO 24" 'R' TYPE CURB PER DETAIL 28 SHEET D-2
5. CONSTRUCT 4' SIDEWALK PER CCAUSD #234
6. CONSTRUCT 5' SIDEWALK PER CCAUSD #234 (5" THICK WHEN ADJACENT TO 'R' CURB)
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT 8' MODIFIED ('R' CURB) CROSS GUTTER PER SUMMERLIN IMPROVEMENT STD DWG #S-64
9. CONSTRUCT SIDEWALK RAMPS USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD #235 (CASE 1) SEE PLAN AND PROFILE SHEET CURVE TABLES FOR "A" AND "B" DIMENSIONS
10. 2% MAX GRADING ADJACENT TO FIRE HYDRANT PER PUBLIC FIRE HYDRANT INSTALLATION DETAIL ON UTILITY SHEETS
11. CONSTRUCT PARKING STALL PER DETAIL 29/D-2
12. REMOVE EXISTING RIP RAP
13. CONCRETE APRON AND JENSEN PRECAST DROP INLET SEE DETAIL 13/D-2
14. CONSTRUCT CONCRETE L CURB U CHANNEL PER DETAIL 53/D-3
15. CONSTRUCT DEPRESSED R CURB @ U CHANNEL
16. LEADWALK CROSS DRAIN PER DETAIL 27/D-2
17. 5' WIDE PEDESTRIAN ACCESS TO PERIMETER STREET SIDEWALK
18. ENTRY MONUMENT BY OTHERS
19. INSTALL 6" MINIMUM DECORATIVE ROCK 4' WIDE AND 1' DEEP (FRONT YARD OF LOTS 9-16)
20. CONCRETE COLLAR IS TO BE EITHER COLORED CONCRETE OR STAIN TO MATCH DECORATIVE COBBLE ROCK
21. INSTALL 6" – 12" RIP-RAP DECORATIVE ROCK 24" THICK
22. REMOVE EXISTING "A" TYPE ISLAND CURB

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

CHRISTOPHER L. THOMPSON, PE NO. 14134 DATE

REV	DESCRIPTION	BY	APP'D	DATE

DATE: September 15, 2020
HORIZ. SCALE: NTS
VERT. SCALE: NTS
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JAL
APPROVED BY: JAL
PROJECT #: 3110.0048

TOLL SOUTH LV, LLC
1140 TOWN CENTER DRIVE SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9810

RCI ENGINEERING
500 SOUTH RANCHO DRIVE, SUITE 17, LAS VEGAS, NV 89106
PH(702.453.0800) FAX(702.453.0801)
www.rcinevada.com

IMPROVEMENT PLANS FOR
SUMMERLIN VILLAGE 21 PARCELS P Q AND R
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING PLANS (SHEET 1 OF 6)
CITY OF LAS VEGAS NEVADA

PROFESSIONAL ENGINEER – STATE OF NEVADA
CHRISTOPHER L THOMPSON
Exp. 6/30/2022
CIVIL
No. 14134
DATE: 9/14/2020

DRAWING
G-1
SHT 3 OF 31
CLV DRAWING NUMBER
CLV PROJECT #

O:\3110_Toll\0048_Summerlin V21-PQR_CIVIL_PS\SH03_G01.dwg gisserro 9/15/20 8:33am

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BENCHMARK

CITY OF LAS VEGAS BENCHMARK 7LV09 27E4

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

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   PROJECT NO. 15002-LVR
   DATED: 11/12/2019
9. CUT/FILL ESTIMATES
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10. SEE DETAIL 31/D-2 FOR TYPICAL LOT DRAINAGE
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NOTE

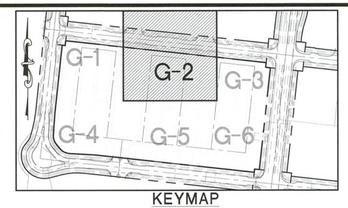
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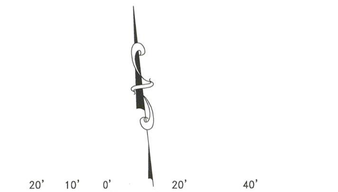
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FLOOD ZONE NOTE

ACCORDING TO THE FEMA FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY PANEL MAP NUMBERS 32003C2150E DATED SEPTEMBER 27, 2002, THE SITE IS LOCATED IN A ZONE "X". ZONE "X" AREAS ARE DEFINED AS AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD PLAIN.



KEYMAP



CONSTRUCTION NOTES

1. CONSTRUCT AC PAVEMENT PER DETAILS 1 THRU 4 ON SHEET D-1
2. CONSTRUCT 24" 'L' CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 24" 'R' CURB PER CCAUSD #217.3 S1
4. CONSTRUCT 5' CURB TRANSITION FROM 24" 'L' TYPE CURB AND GUTTER TO 24" 'R' TYPE CURB PER DETAIL 28 SHEET D-2
5. CONSTRUCT 4' SIDEWALK PER CCAUSD #234
6. CONSTRUCT 5' SIDEWALK PER CCAUSD #234 (5" THICK WHEN ADJACENT TO 'R' CURB)
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
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CHRISTOPHER L. THOMPSON, PE NO. 14134 DATE

REV	DESCRIPTION	BY	APPD	DATE

DATE: September 14, 2020
HORIZ. SCALE: NTS
VERT. SCALE: NTS
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.0048

TOLL SOUTH LV, LLC
1140 TOWN CENTER DRIVE SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9610

RCI ENGINEERING
500 SOUTH RANCHO DRIVE, SUITE 17, LAS VEGAS, NV 89106
PH(702.453.0800) FAX(702.453.0801)
www.rcinevada.com

IMPROVEMENT PLANS FOR
SUMMERLIN VILLAGE 21 PARCELS P Q AND R
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING PLANS (SHEET 2 OF 6)
CITY OF LAS VEGAS NEVADA

PROFESSIONAL ENGINEER
STATE OF NEVADA
CHRISTOPHER L THOMPSON
Exp. 6/30/2022
CIVIL
No. 14134
DATE: 9/14/2020

DRAWING
G-2
SHT 4 OF 31
CLV DRAWING NUMBER
CLV PROJECT #

O:\3110_Toll\0048_Summerlin V21-PDR_CIVIL_PS\S003_G01.dwg cthompson 9/14/20 12:10pm

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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

LEGAL DESCRIPTION

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CONTAINING 105.09 ARES, MORE OR LESS AS DETERMINED BY COMPUTER METHODS

BENCHMARK

CITY OF LAS VEGAS BENCHMARK 7LV09 27E4

RIVET AND PLOT IN TOP OF CURB AT SOUTHEAST CORNER OF FAR HILLS AVENUE AND DESERT FOOTHILLS DRIVE.

ELEVATION=1016.62 Meters (NAVD'88 v.2008)
ELEVATION=3335.36 US Survey Feet (NAVD'88 v.2008)

BASIS OF BEARINGS

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

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ZONE: LAS VEGAS HIGH ELEVATION ZONE

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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)
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OWNER RESPONSIBLE TO PROVIDE SURVEY MONUMENTATION AS REQUIRED BY CITY OF LAS VEGAS AND CLARK COUNTY UNIFORM STANDARD DRAWING NUMBER 243. OWNER IS ALSO RESPONSIBLE TO REPLACE ALL SURVEY MONUMENTATION DAMAGED, DESTROYED, OR OBSCURED DURING CONSTRUCTION.

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ALL STRUCTURES SHOWN OR INDICATED ON THIS SUBMITTAL WITHIN THE PROPERTY REQUIRE A BUILDING PERMIT APPLICATION AND SUBMITTAL THIS INCLUDES BUILDINGS, ABOVE GROUND TANKS, SIGNS, RETAINING WALLS, FENCES, TRASH ENCLOSURES, SHADE STRUCTURES, STAIRWAYS, RAMPS, LIGHT POLES, LIGHT BOLLARDS, ETC. THIS DOES NOT INCLUDE ANY FLOOD CONTROL STRUCTURE SUCH AS PIPES, CULVERTS, ARCH CULVERTS, HEADWALLS, ETC. THIS DOES NOT INCLUDE ANY WORK WITHIN A PUBLIC STREET RIGHT-OF-WAY. THIS DOES NOT INCLUDE PRIVATE STREETS. THE REVIEW OF CIVIL IMPROVEMENT AND/OR GRADING PLANS DOES NOT INCLUDE ANY REVIEW OF ANY STRUCTURE THAT REQUIRES A BUILDING PERMIT APPLICATION."

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ENGINEERS NOTES

1. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
2. SEE DETAIL SHEET FOR ON-SITE PAVEMENT SECTIONS. CONTRACTOR TO VERIFY WITH SOILS REPORT.
3. SEE FINAL MAP FOR EXACT PROPERTY LINE DIMENSIONS.
4. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
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8. SOIL REPORT NOTE:
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   ENGINEER: GEO TEK RESIDENTIAL, LLC
   PROJECT NO. 15002-LVR
   DATED: 11/12/2019
9. CUT/FILL ESTIMATES
   EXISTING TO FINISH GRADE ELEVATIONS
   NET CUT: 89,453 CY
   NET FILL: 138,595 CY
10. SEE DETAIL 31/D-2 FOR TYPICAL LOT DRAINAGE
11. FOR STORMWATER RUNOFF MANAGEMENT NOTES REFER TO SHEET N-1

NOTE

ALL ONSITE STORM DRAINS AND THE ASSOCIATED FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOA

NOTE

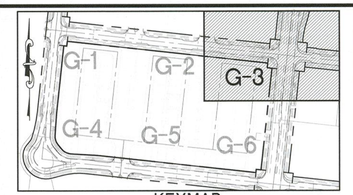
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ACCORDING TO THE FEMA FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY PANEL MAP NUMBERS 32003C2150E DATED SEPTEMBER 27, 2002, THE SITE IS LOCATED IN A ZONE "X". ZONE "X" AREAS ARE DEFINED AS AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD PLAIN.



KEYMAP



20' 10' 0' 20' 40'

SCALE: 1" = 20'

CONSTRUCTION NOTES

1. CONSTRUCT AC PAVEMENT PER DETAILS 1 THRU 4 ON SHEET D-1
2. CONSTRUCT 24" 'L' CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 24" 'R' CURB PER CCAUSD #217.3 S1
4. CONSTRUCT 5' CURB TRANSITION FROM 24" 'L' TYPE CURB AND GUTTER TO 24" 'R' TYPE CURB PER DETAIL 28 SHEET D-2
5. CONSTRUCT 4' SIDEWALK PER CCAUSD #234
6. CONSTRUCT 5' SIDEWALK PER CCAUSD #234 (5" THICK WHEN ADJACENT TO 'R' CURB)
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT 8' MODIFIED ('R' CURB) CROSS GUTTER PER SUMMERLIN IMPROVEMENT STD DWG #S-64
9. CONSTRUCT SIDEWALK RAMPS USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD #235 (CASE I) SEE PLAN AND PROFILE SHEET CURVE TABLES FOR "A" AND "B" DIMENSIONS
10. 2% MAX GRADING ADJACENT TO FIRE HYDRANT PER PUBLIC FIRE HYDRANT INSTALLATION DETAIL ON UTILITY SHEETS
11. CONSTRUCT PARKING STALL PER DETAIL 29/D-2
12. REMOVE EXISTING RIP RAP
13. CONCRETE APRON AND JENSEN PRECAST DROP INLET SEE DETAIL 13/D-2
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16. LEADWALK CROSS DRAIN PER DETAIL 27/D-2
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20. CONCRETE COLLAR IS TO BE EITHER COLORED CONCRETE OR STAIN TO MATCH DECORATIVE COBBLE ROCK
21. INSTALL 6" – 12" RIP-RAP DECORATIVE ROCK 24" THICK
22. REMOVE EXISTING "A" TYPE ISLAND CURB

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

CHRISTOPHER L. THOMPSON, PE NO. 14134 DATE

REV	DESCRIPTION	BY	APPD	DATE

DATE: September 14, 2020
HORZ. SCALE: NTS
VERT. SCALE: NTS
DRAWN BY: CS
DESIGNED BY: SC
CHECKED BY: JAL
APPROVED BY:
PROJECT #: 3110.00448

TOLL SOUTH LV, LLC
1140 TOWN CENTER DRIVE SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-8610

RCI ENGINEERING
500 SOUTH RANCHO DRIVE, SUITE 17, LAS VEGAS, NV 89106
PHONE: 702.243.8001 FAX: 702.243.8001
www.rciengineers.com

IMPROVEMENT PLANS FOR
SUMMERLIN VILLAGE 21 PARCELS P Q AND R
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING PLANS (SHEET 3 OF 6)
CITY OF LAS VEGAS NEVADA

CHRISTOPHER L. THOMPSON Exp. 6/30/2022 CIVIL NO. 14134 STATE OF NEVADA PROFESSIONAL ENGINEER

DATE: 9/14/2020

DRAWING
G-3
SHT 5 OF 31
CLV DRAWING NUMBER
CLV PROJECT #

G:\3110_Toll\0048_Summerlin V21-PQR_CIVIL_PFS\5003_G01.dwg cthompson 9/14/20 12:11pm

DISCLAIMER NOTE:

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND OR OVERHEAD 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. CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES OR DISCREPANCIES.

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Call 811
OR
1-800-227-2600

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

LEGAL DESCRIPTION

BEING A SUBDIVISION OF LOT 3 OF PARCEL MAP FILE 125, PAGE 15 LYING WITHIN THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 22, THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 23, THE NORTHWEST QUARTER (NW 1/4) OF SECTION 26 AND THE NORTHEAST QUARTER (NE 1/4) OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

CONTAINING 105.09 ARES, MORE OR LESS AS DETERMINED BY COMPUTER METHODS

BENCHMARK

CITY OF LAS VEGAS BENCHMARK 7LV09 27E4

RIVET AND PLOT IN TOP OF CURB AT SOUTHEAST CORNER OF FAR HILLS AVENUE AND DESERT FOOTHILLS DRIVE.

ELEVATION=1016.62 Meters (NAVD'88 v.2008)
ELEVATION=3335.36 US Survey Feet (NAVD'88 v.2008)

BASIS OF BEARINGS

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 BEARING 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.
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NOTE

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NOTE

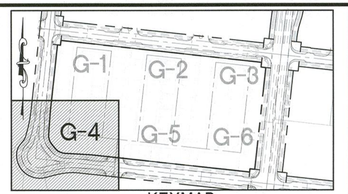
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CHRISTOPHER L. THOMPSON, PE NO. 14134 DATE

REV	DESCRIPTION	BY	APPD	DATE

DATE: September 15, 2020
HORIZ. SCALE: NTS
VERT. SCALE: NTS
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.0048

TOLL SOUTH LV, LLC
1140 TOWN CENTER DRIVE SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9810

RCI ENGINEERING
500 SOUTH RANCHO DRIVE, SUITE 17, LAS VEGAS, NV 89106
PH(702.453.0860 FAX(702.453.0881
www.rciengineering.com

IMPROVEMENT PLANS FOR
SUMMERLIN VILLAGE 21 PARCELS P Q AND R
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING PLANS (SHEET 4 OF 6)
CITY OF LAS VEGAS NEVADA

CHRISTOPHER L. THOMPSON
Exp. 6/30/2022
CIVIL
No. 14134
STATE OF NEVADA
PROFESSIONAL ENGINEER

DATE: 9/14/2020

DRAWING
G-4
SHT 6 OF 31
CLV DRAWING NUMBER
CLV PROJECT #

O:\3110_Fisl\0048_Summerlin V21-PQR_CIVIL_IPS\S003_G01.dwg gtierro 9/15/20 8:32am

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CONTAINING 105.09 ARES, MORE OR LESS AS DETERMINED BY COMPUTER METHODS

BENCHMARK

CITY OF LAS VEGAS BENCHMARK 7LV09 27E4

RIVET AND PLOT IN TOP OF CURB AT SOUTHEAST CORNER OF FAR HILLS AVENUE AND DESERT FOOTHILLS DRIVE.

ELEVATION=1016.62 Meters (NAVD'88 v.2008)
ELEVATION=3335.36 US Survey Feet (NAVD'88 v.2008)

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

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

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EASTING AT CENTRAL MERIDIAN: 300,000 M (984,250.0000 FTUS)
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   PROJECT NO. 15002-LVR
   DATED: 11/12/2019
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NOTE

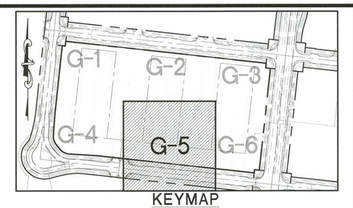
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KEYMAP

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CONSTRUCTION NOTES

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3. CONSTRUCT 24" 'R' CURB PER CCAUSD #217.3 S1
4. CONSTRUCT 5' CURB TRANSITION FROM 24" 'L' TYPE CURB AND GUTTER TO 24" 'R' TYPE CURB PER DETAIL 28 SHEET D-2
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6. CONSTRUCT 5' SIDEWALK PER CCAUSD #234 (5" THICK WHEN ADJACENT TO 'R' CURB)
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT 8' MODIFIED (78' CURB) CROSS GUTTER PER SUMMERLIN IMPROVEMENT STD DWG. #S-64
9. CONSTRUCT SIDEWALK RAMPS USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD #235 (CASE 1) SEE PLAN AND PROFILE SHEET CURVE TABLES FOR "A" AND "B" DIMENSIONS
10. 2% MAX GRADING ADJACENT TO FIRE HYDRANT PER PUBLIC FIRE HYDRANT INSTALLATION DETAIL ON UTILITY SHEETS
11. CONSTRUCT PARKING STALL PER DETAIL 29/D-2
12. REMOVE EXISTING RIP RAP
13. CONCRETE APRON AND JENSEN PRECAST DROP INLET SEE DETAIL 13/D-2
14. CONSTRUCT CONCRETE L CURB U CHANNEL PER DETAIL 53/D-3
15. CONSTRUCT DEPRESSED R CURB @ U CHANNEL
16. LEADWALK CROSS DRAIN PER DETAIL 27/D-2
17. 5' WIDE PEDESTRIAN ACCESS TO PERIMETER STREET SIDEWALK
18. ENTRY MONUMENT BY OTHERS
19. INSTALL 6" MINIMUM DECORATIVE ROCK 4' WIDE AND 1' DEEP (FRONT YARD OF LOTS 9-16)
20. CONCRETE COLLAR IS TO BE EITHER COLORED CONCRETE OR STAIN TO MATCH DECORATIVE COBBLE ROCK
21. INSTALL 6" – 12" RIP-RAP DECORATIVE ROCK 24" THICK
22. REMOVE EXISTING "A" TYPE ISLAND CURB

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

CHRISTOPHER L. THOMPSON, PE NO. 14134 DATE

APN: 137-27-510-001
REDPOINT VILLAGE SUMMERLIN LP
VILLAGE 21 UNIT 3

APN: 137-27-510-001
REDPOINT VILLAGE SUMMERLIN LP
VILLAGE 21 UNIT 3

REV	DESCRIPTION	BY	APP'D	DATE

DATE: September 14, 2020
HORIZ. SCALE: NTS
VERT. SCALE: NTS
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.0048

TOLL SOUTH LV, LLC
11140 TOWN CENTER DRIVE SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9610

RCI ENGINEERING
500 SOUTH RAINBOW BLVD., SUITE 17, LAS VEGAS, NV 89106
PHONE: (702) 243-1900 FAX: (702) 243-1901
www.rcinevada.com

IMPROVEMENT PLANS FOR
SUMMERLIN VILLAGE 21 PARCELS P Q AND R
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING PLANS (SHEET 5 OF 6)
CITY OF LAS VEGAS NEVADA

PROFESSIONAL ENGINEER – STATE OF NEVADA
CHRISTOPHER L. THOMPSON
Exp. 6/30/2022
CIVIL
No. 14134
DATE: 9/14/2020

DRAWING
G-5
SHT 7 OF 31
CLV DRAWING NUMBER
CLV PROJECT #

D:\3110_Toll\0048_Summerlin V21+PDR_CIVIL_IPS\5003_001.dwg cthompson 9/14/20 12:11pm

DISCLAIMER NOTE:

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND OR OVERHEAD 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. CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES OR DISCREPANCIES.

Call before you Dig
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call 811 OR 1-800-227-2600

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

LEGAL DESCRIPTION

BEING A SUBDIVISION OF LOT 3 OF PARCEL MAP FILE 125, PAGE 15 LYING WITHIN THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 22, THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 23, THE NORTHWEST QUARTER (NW 1/4) OF SECTION 26 AND THE NORTHEAST QUARTER (NE 1/4) OF SECTION 27, TOWNSHIP 21 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

CONTAINING 105.09 ARES, MORE OR LESS AS DETERMINED BY COMPUTER METHODS

BENCHMARK

CITY OF LAS VEGAS BENCHMARK 7LV09 27E4

RIVET AND PLOT IN TOP OF CURB AT SOUTHEAST CORNER OF FAR HILLS AVENUE AND DESERT FOOTHILLS DRIVE.

ELEVATION=1016.62 Meters (NAVD'88 v.2008)
ELEVATION=3335.36 US Survey Feet (NAVD'88 v.2008)

BASIS OF BEARINGS

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 BEARING 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.

SURVEY MONUMENT NOTE

OWNER RESPONSIBLE TO PROVIDE SURVEY MONUMENTATION AS REQUIRED BY CITY OF LAS VEGAS AND CLARK COUNTY UNIFORM STANDARD DRAWING NUMBER 243. OWNER IS ALSO RESPONSIBLE TO REPLACE ALL SURVEY MONUMENTATION DAMAGED, DESTROYED, OR OBSCURED DURING CONSTRUCTION.

BUILDING PERMIT NOTE

ALL STRUCTURES SHOWN OR INDICATED ON THIS SUBMITTAL WITHIN THE PROPERTY REQUIRE A BUILDING PERMIT APPLICATION AND SUBMITTAL THIS INCLUDES BUILDINGS, ABOVE GROUND TANKS, SIGNS, RETAINING WALLS, FENCES, TRASH ENCLOSURES, SHADE STRUCTURES, STAIRWAYS, RAMPS, LIGHT POLES, LIGHT BOLLARDS, ETC. THIS DOES NOT INCLUDE ANY FLOOD CONTROL STRUCTURE SUCH AS PIPES, CULVERTS, ARCH CULVERTS, HEADWALLS, ETC. THIS DOES NOT INCLUDE ANY WORK WITHIN A PUBLIC STREET RIGHT-OF-WAY. THIS DOES NOT INCLUDE PRIVATE STREETS. THE REVIEW OF CIVIL IMPROVEMENT AND/OR GRADING PLANS DOES NOT INCLUDE ANY REVIEW OF ANY STRUCTURE THAT REQUIRES A BUILDING PERMIT APPLICATION."

SIGHT VISIBILITY ZONE

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

ENGINEERS NOTES

1. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
2. SEE DETAIL SHEET FOR ON-SITE PAVEMENT SECTIONS. CONTRACTOR TO VERIFY WITH SOILS REPORT.
3. SEE FINAL MAP FOR EXACT PROPERTY LINE DIMENSIONS.
4. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
5. THESE PLANS SHALL NOT, IN PART OR IN WHOLE, BE USED FOR CONSTRUCTION UNTIL APPROVED AND SIGNED BY THE GOVERNING AGENCIES.
6. ALL GRADING SHALL CONFORM TO SOILS REPORT RECOMMENDATIONS.
7. DURING CONSTRUCTION, SURVEYORS AND CONTRACTORS MUST VERIFY THAT ALL STREETS AND LOTS HAVE POSITIVE DRAINAGE. SAME MUST UTILIZE AT LEAST THREE GRADES ON VERTICAL TANGENTS TO VERIFY SLOPES.
8. SOIL REPORT NOTE:
   GRADING SHALL BE IN ACCORDANCE WITH SOILS REPORT PREPARED BY:
   ENGINEER: GEO TEK RESIDENTIAL, LLC
   PROJECT NO. 15002-LVR
   DATED: 11/12/2019
9. CUT/FILL ESTIMATES
   EXISTING TO FINISH GRADE ELEVATIONS
   NET CUT: 89,453 CY
   NET FILL: 138,595 CY
10. SEE DETAIL 31/D-2 FOR TYPICAL LOT DRAINAGE
11. FOR STORMWATER RUNOFF MANAGEMENT NOTES REFER TO SHEET N-1

NOTE

ALL ONSITE STORM DRAINS AND THE ASSOCIATED FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOA

NOTE

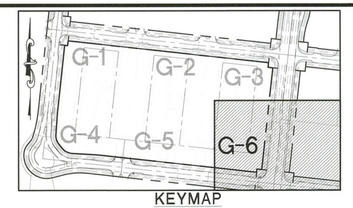
ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY HOA.

SEWER EASEMENT NOTE

NO STRUCTURES AND NO TREES OR VEGETATION TALLER THAN THREE FEET ALLOWED WITHIN CLV SEWER EASEMENT

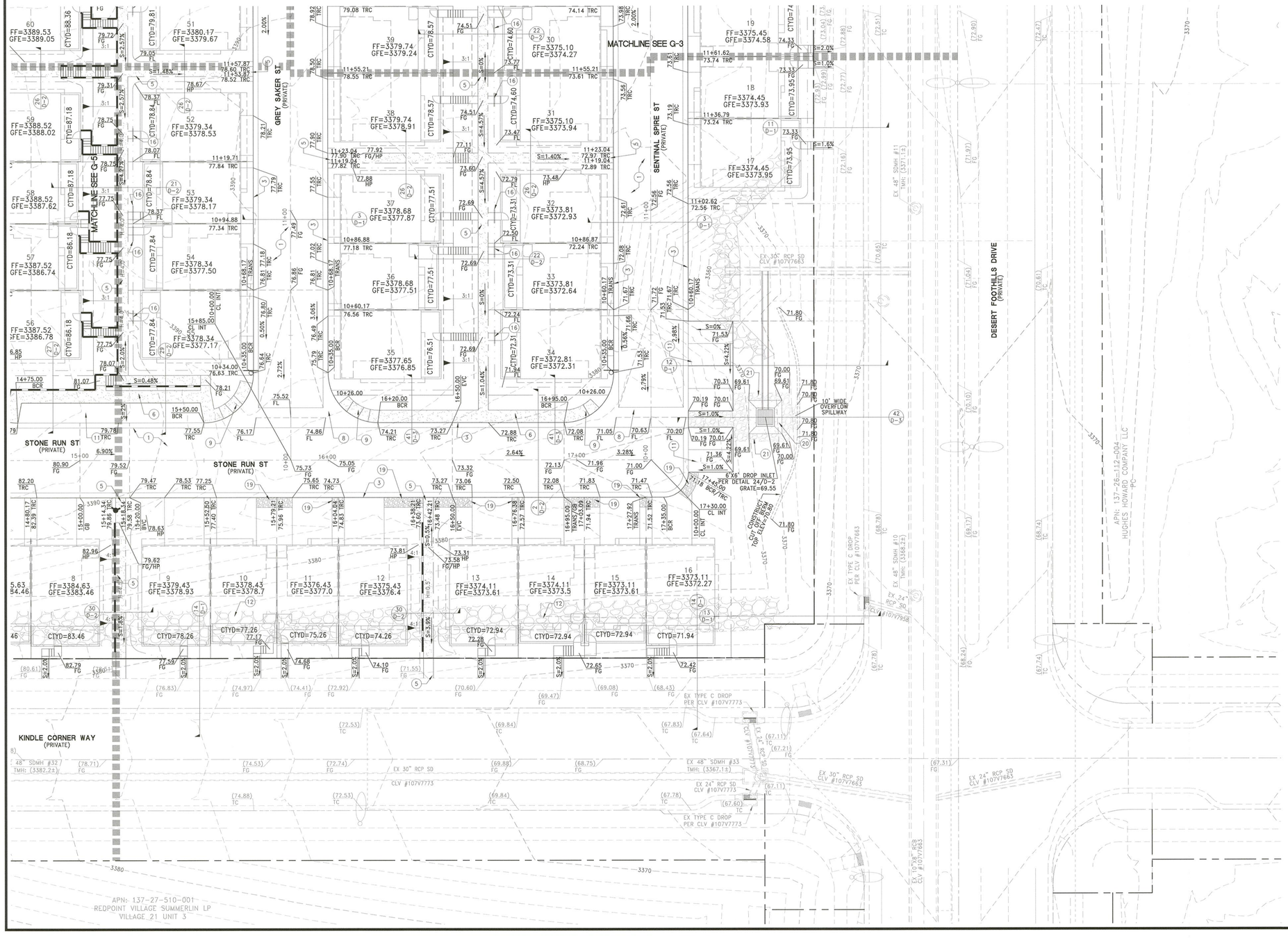
FLOOD ZONE NOTE

ACCORDING TO THE FEMA FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY PANEL MAP NUMBERS 32003C2150E DATED SEPTEMBER 27, 2002, THE SITE IS LOCATED IN A ZONE "X", ZONE "X" AREAS ARE DEFINED AS AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD PLAIN.



KEYMAP

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



CONSTRUCTION NOTES

1. CONSTRUCT AC PAVEMENT PER DETAILS 1 THRU 4 ON SHEET D-1
2. CONSTRUCT 24" 'L' CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 24" 'R' CURB PER CCAUSD #217.3 S1
4. CONSTRUCT 5' CURB TRANSITION FROM 24" 'L' TYPE CURB AND GUTTER TO 24" 'R' TYPE CURB PER DETAIL 28 SHEET D-2
5. CONSTRUCT 4' SIDEWALK PER CCAUSD #234
6. CONSTRUCT 5' SIDEWALK PER CCAUSD #234 (5" THICK WHEN ADJACENT TO 'R' CURB)
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT 8" MODIFIED ('8" CURB) CROSS GUTTER PER SUMMERLIN IMPROVEMENT STD DWG #S-64
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CHRISTOPHER L. THOMPSON, PE NO. 14134 DATE

BY	APP'D	DATE
REV	DESCRIPTION	

DATE: September 14, 2020
HORIZ. SCALE: NTS
VERT. SCALE: NTS
DRAWN BY: SS
DESIGNED BY: SC
CHECKED BY: JBL
APPROVED BY: JBL
PROJECT #: 3110.0048

TOLL SOUTH LV, LLC
1140 TOWN CENTER DRIVE SUITE 250
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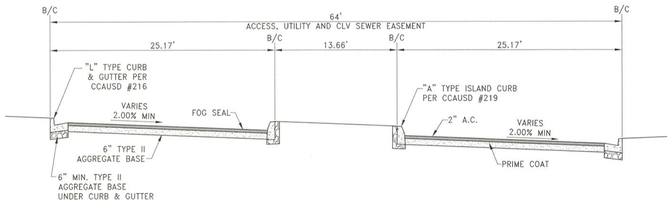
IMPROVEMENT PLANS FOR
SUMMERLIN VILLAGE 21 PARCELS P Q AND R
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING PLANS (SHEET 6 OF 6)
CITY OF LAS VEGAS NEVADA

PROFESSIONAL ENGINEER STATE OF NEVADA
CHRISTOPHER L. THOMPSON
Exp. 6/30/2022
CIVIL
No. 14134

DATE: 9/14/2020

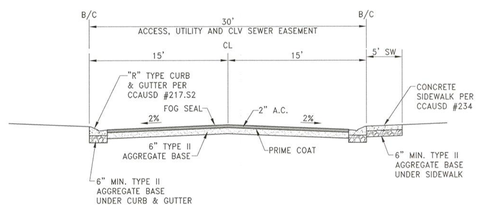
DRAWING
G-6
SHT 8 OF 31
CLV DRAWING NUMBER
CLV PROJECT #

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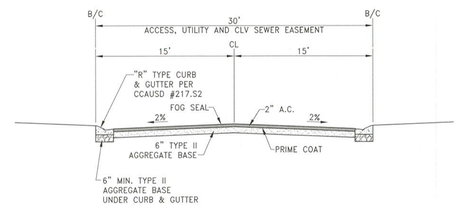
64' PRIVATE ENTRY ROAD

PRIVATE STREET — SCALE: NTS — 1 / D-1



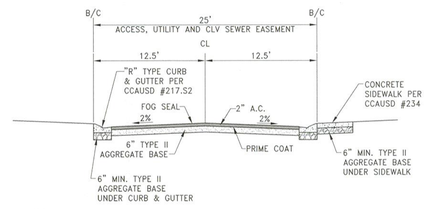
30' PRIVATE STREET SECTION

WITH SIDEWALK — SCALE: NTS — 2 / D-1



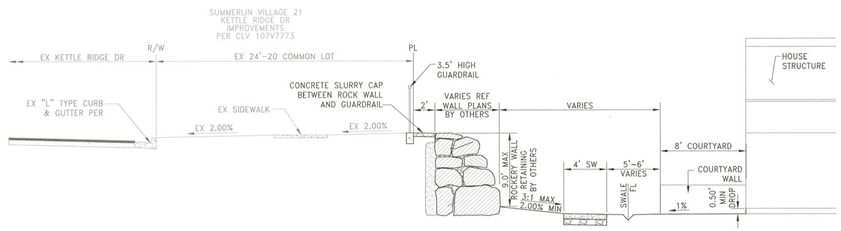
30' PRIVATE STREET SECTION

NO SIDEWALK — SCALE: NTS — 3 / D-1



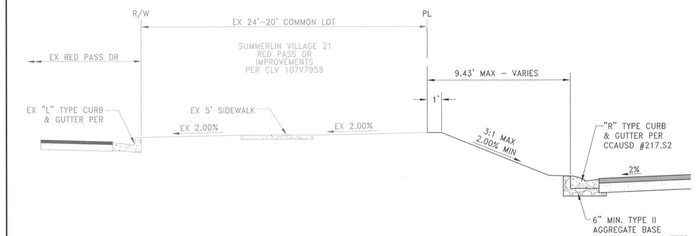
25' PRIVATE STREET SECTION

WITH SIDEWALK — SCALE: NTS — 4 / D-1



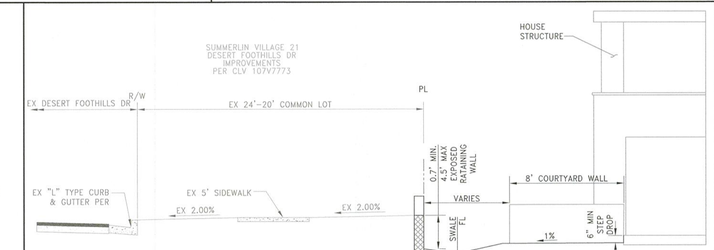
PAD BELOW KETTLE RIDGE DR

WITH ROCKERY WALL — SCALE: NTS — 5 / D-1



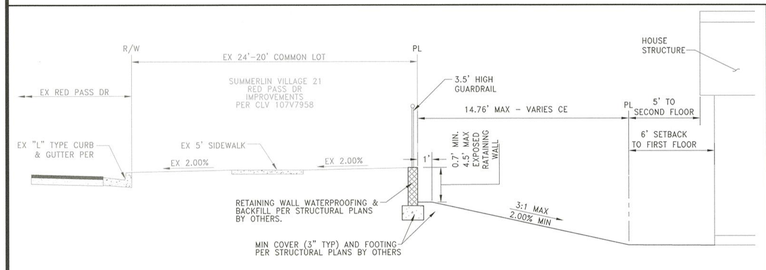
STREET BELOW RED PASS DR

NO RETAINING — SCALE: NTS — 6 / D-1



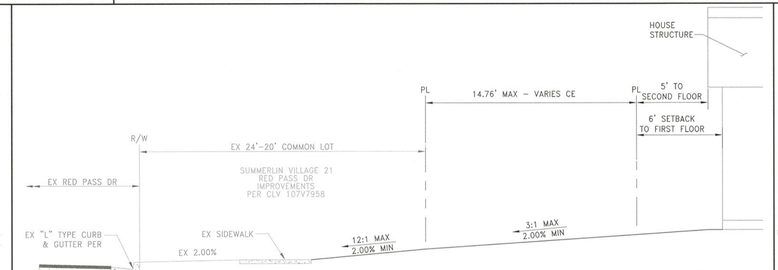
PAD BELOW RED PASS DR

NO RETAINING — SCALE: NTS — 7 / D-1



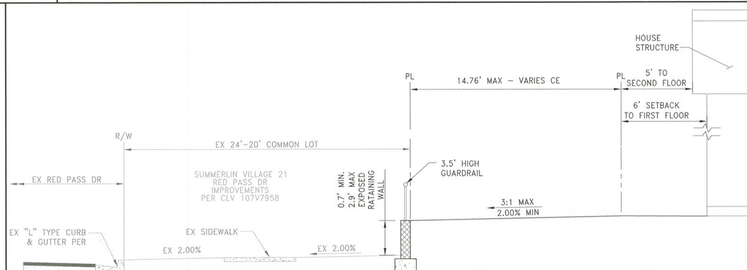
PAD BELOW RED PASS DR

WITH RETAINING WALL — SCALE: NTS — 8 / D-1



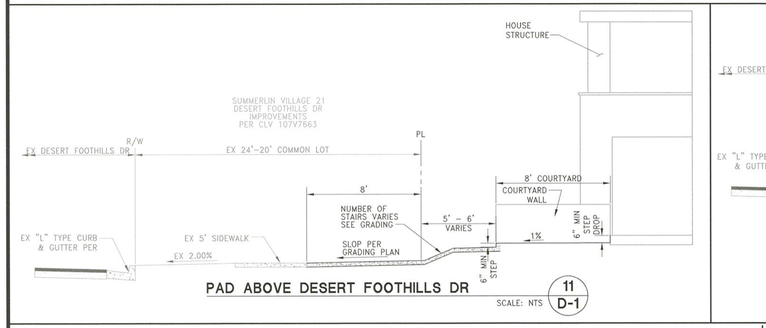
PAD ABOVE RED PASS DR

NO RETAINING — SCALE: NTS — 9 / D-1



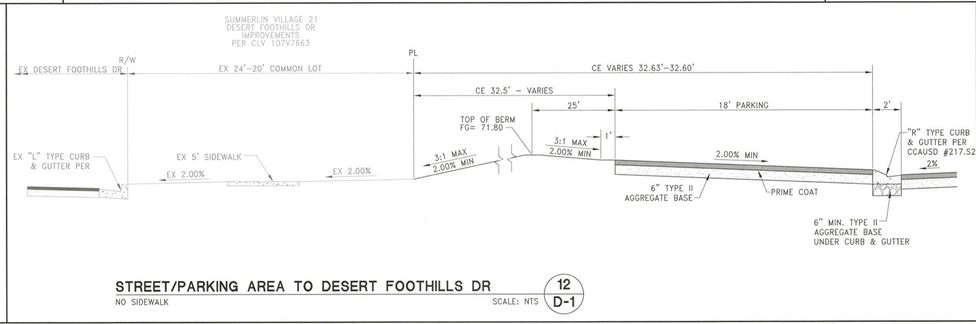
PAD ABOVE RED PASS DR

WITH RETAINING WALL — SCALE: NTS — 10 / D-1



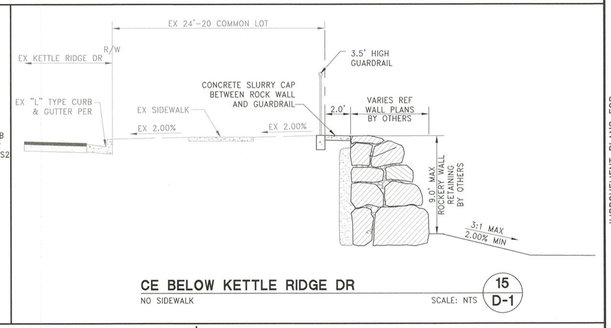
PAD ABOVE DESERT FOOTHILLS DR

SCALE: NTS — 11 / D-1



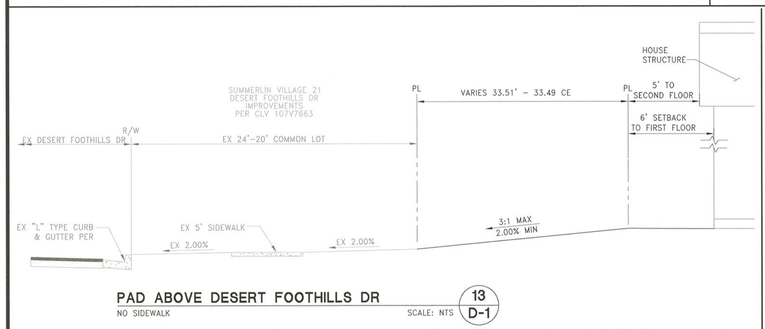
STREET/PARKING AREA TO DESERT FOOTHILLS DR

NO SIDEWALK — SCALE: NTS — 12 / D-1



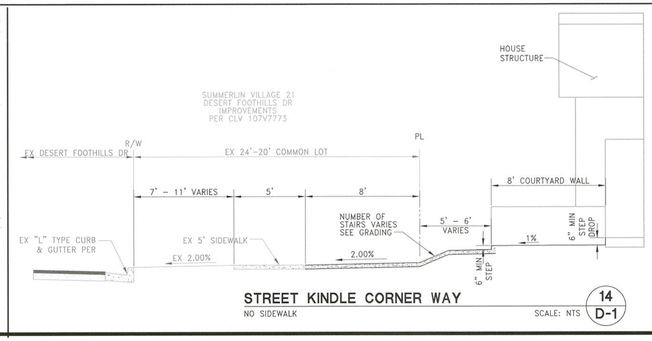
CE BELOW KETTLE RIDGE DR

NO SIDEWALK — SCALE: NTS — 15 / D-1



PAD ABOVE DESERT FOOTHILLS DR

NO SIDEWALK — SCALE: NTS — 13 / D-1



STREET KINDLE CORNER WAY

NO SIDEWALK — SCALE: NTS — 14 / D-1

GEOTECHNICAL NOTE:

A GEOLOGIST OR GEOTECHNICAL ENGINEER SHALL BE ON SITE DURING EXCAVATION AND MASS GRADING OPERATIONS TO EXAMINE THE SOIL CHARACTERISTICS AND GEOLOGICAL CONDITIONS ENCOUNTERED, AND TO PROVIDE PROFESSIONAL ADVICE TO THE OWNER IN THE EVENT THAT UNANTICIPATED SOIL PROBLEMS ARISE AND/OR SUBSURFACE SITE CONDITIONS ARE FOUND TO BE SIGNIFICANTLY DIFFERENT THAN DEFINED BY PRE EXPLORATION AND TESTING.

WALL & SCARP NOTE:

1. CONTRACTOR TO CONSTRUCT ALL SCARP AND MAINTAIN PROPER COVER OVER AND FROM ALL WALL FOOTINGS PER THE SOILS REPORT REFERRED TO ON THE GRADING PLANS, REPORT ANY PROBLEMS IN DOING SO TO THE DEVELOPER AND THE ENGINEER IMMEDIATELY.
2. SCARP LESS THAN 1' VERTICAL NOT SHOWN ON PLANS.
3. ALL WALL ALIGNMENTS SHALL FOLLOW SIGHT VISIBILITY ZONE ALIGNMENT AND REMAIN OUTSIDE OF SIGHT VISIBILITY ZONE.

REV	DESCRIPTION	BY	APP'D	DATE

DATE: September 14, 2020
HORIZ. SCALE: NTS
VERT. SCALE: NTS
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3.1110.0048

TOLL SOUTH LV, LLC
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RCI ENGINEERING
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IMPROVEMENT PLANS FOR
SUMMERLIN VILLAGE 21 PARCELS P Q AND R
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING DETAILS (SHEET 1 OF 3)

NEVADA
CITY OF LAS VEGAS

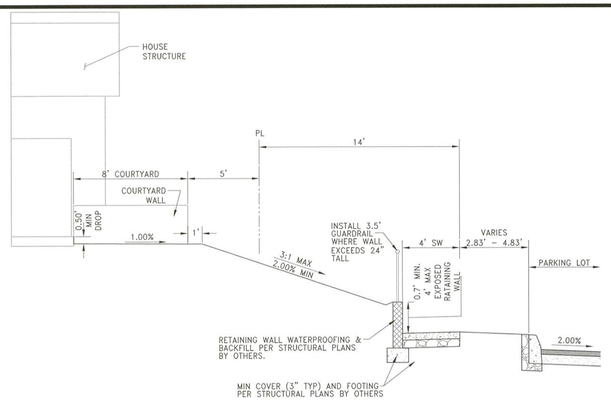
PROFESSIONAL ENGINEER — STATE OF NEVADA
CHRISTOPHER L. THOMPSON
Exp. 6/30/2022
CIVIL
No. 14134

DATE: 9/14/2020

DRAWING
D-1
SHT 9 OF 31
CLV DRAWING NUMBER

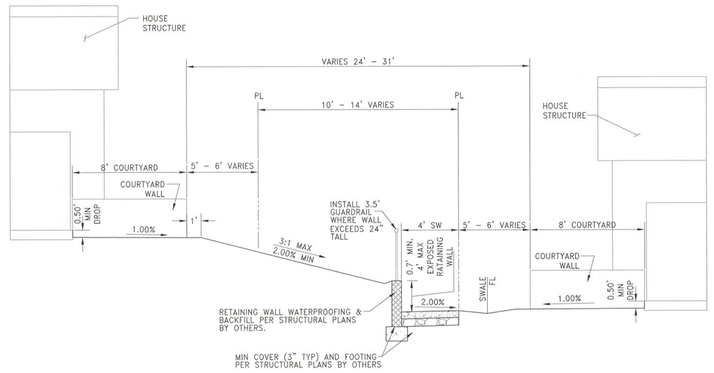
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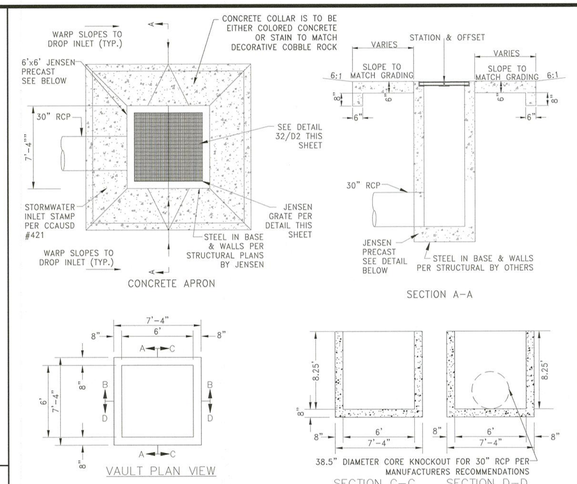
PAD TO PAD

SCALE: NTS 20 D-2



PAD TO PAD
WITH RETAINING

SCALE: NTS 21 D-2



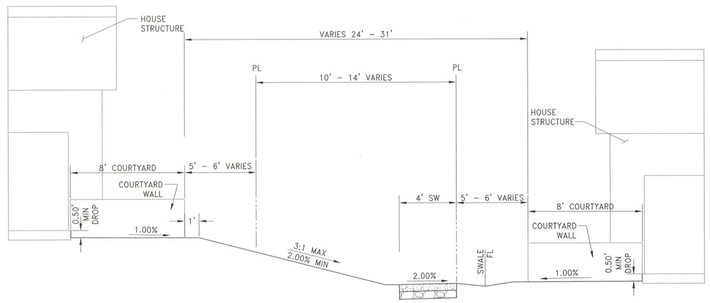
FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN PRECAST.

PROJECT	JENSEN PRECAST 820 STENERI WAY SPARKS, NV 89431 WWW.JENSENPRECAST.COM		
6'-0"x6'-0"x8.25" (NOMINAL INSIDE DIMENSIONS) SHOP DRAWING			
ORIG DATE 08/25/14	REV. DATE	SHEET 1 OF 1	DRAWN RS / FILE NAME S004_D01.DWG

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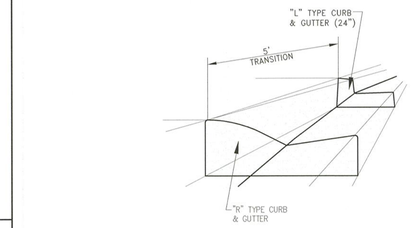
CONCRETE APRON AND JENSEN PRECAST DROP INLET STRUCTURE

SCALE: NTS 24 D-2



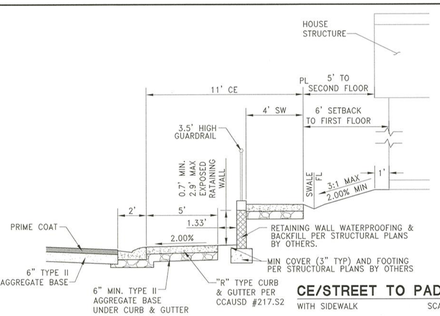
PAD TO PAD
NO RETAINING

SCALE: NTS 22 D-2



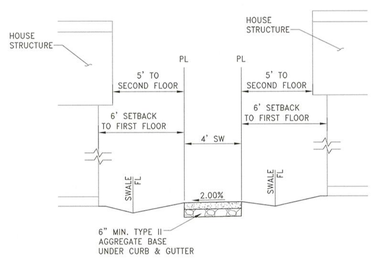
R CURB TO L CURB TRANSITION

SCALE: NTS 28 D-2



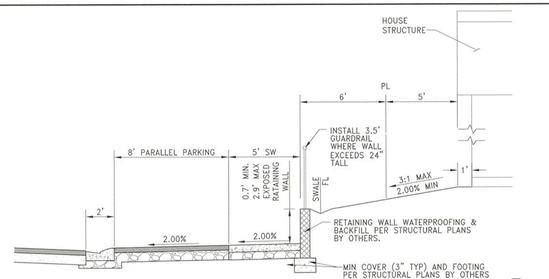
CE/STREET TO PAD
WITH SIDEWALK

SCALE: NTS 25 D-2



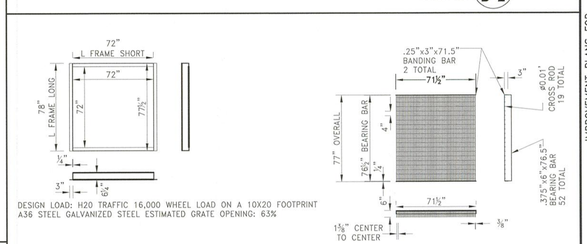
PAD TO PAD
WITH SIDEWALK / NO RETAINING

SCALE: NTS 26 D-2



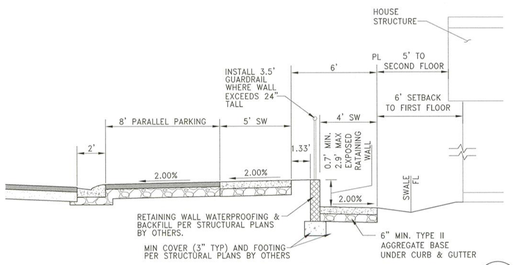
CE/STREET PARKING TO PAD
WITH SIDEWALK/PARKING

SCALE: NTS 27 D-2



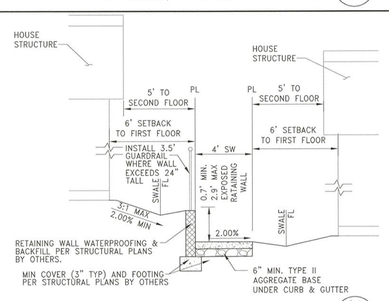
GRATE DETAIL

SCALE: NTS 32 D-2



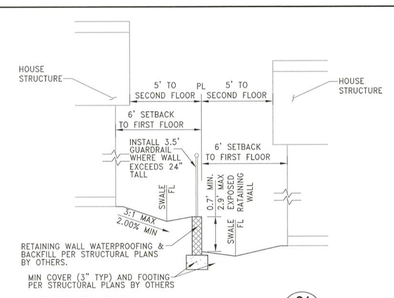
CE/STREET PARKING TO PAD
WITH SIDEWALK/PARKING

SCALE: NTS 29 D-2



PAD TO PAD
WITH SIDEWALK

SCALE: NTS 30 D-2



PAD TO PAD
NO SIDEWALK / WITH RETAINING

SCALE: NTS 31 D-2

GEOTECHNICAL NOTE:

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WALL & SCARP NOTE:

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REV	DESCRIPTION	BY	APPD	DATE

DATE: September 14, 2020
HORIZ. SCALE: NTS
VERT. SCALE: NTS
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.00448

TOLL SOUTH LV, LLC
1140 TOWN CENTER DRIVE SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 | FAX: 702-243-9610

RCI ENGINEERING
509 SOUTH RANCHO DRIVE, SUITE F-17, LAS VEGAS, NV 89106
PH/FX: 702.453.0080 | 702.453.0091
www.rciengineers.com

IMPROVEMENT PLANS FOR
SUMMERLIN VILLAGE 21 PARCELS P Q AND R
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING DETAILS (SHEET 2 OF 3)
CITY OF LAS VEGAS NEVADA

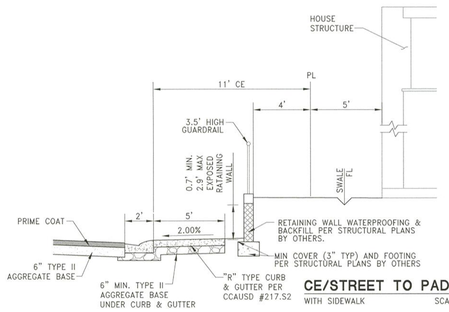
PROFESSIONAL ENGINEER – STATE OF NEVADA
CHRISTOPHER L. THOMPSON
No. 14134
Exp. 6/30/2022
CIVIL

DATE: 9/14/2020

DRAWING
D-2
SHT 10 OF 31

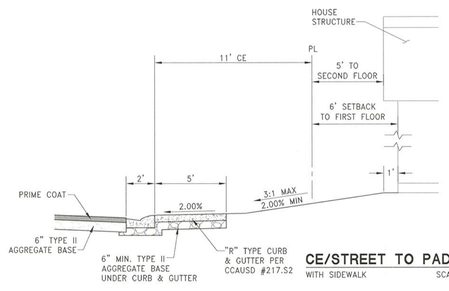
CLV DRAWING NUMBER
CLV PROJECT #

D:\3110_Toll\0048_Summerlin V21-PQR_CIVIL_PS\S004_D01.dwg cthompson 9/14/20 10:37am



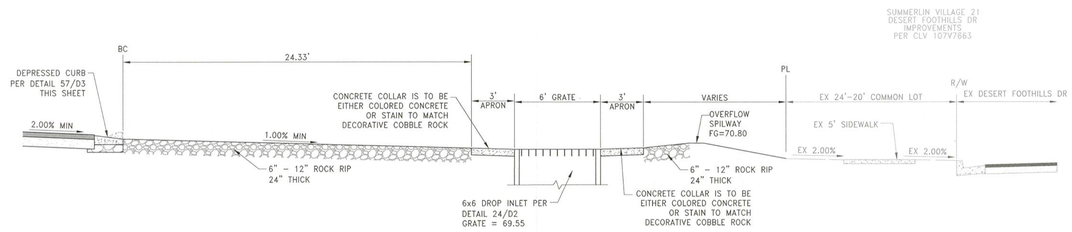
CE/STREET TO PAD
WITH SIDEWALK SCALE: NTS

40 D-3



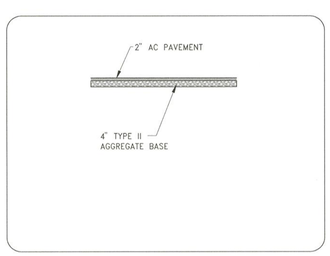
CE/STREET TO PAD
WITH SIDEWALK SCALE: NTS

41 D-3



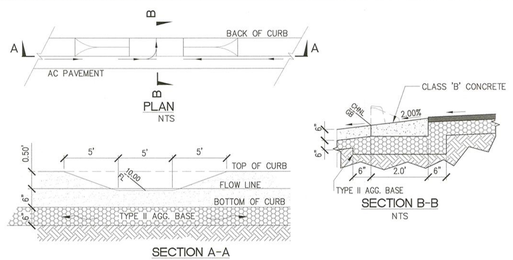
DROP INLET OVER FLOW SPILLWAY
SCALE: NTS

42 D-3

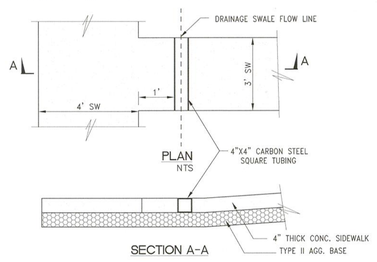


PAVEMENT SECTION
WITH SIDEWALK SCALE: NTS

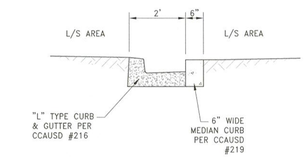
56 D-3



57 D-3 DEPRESSED CURB
SCALE: NTS



58 D-3 LEADWALK CROSS DRAIN DETAIL
SCALE: NTS



CONCRETE "L" CURB U-CHANNEL
SCALE: NTS

55 D-3

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REV	DESCRIPTION	BY	APPD	DATE

DATE: September 14, 2020
HORIZ. SCALE: NTS
VERT. SCALE: NTS
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.0048

TOLL SOUTH LV, LLC
1140 TOWN CENTER DRIVE SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9610

RCI ENGINEERING
500 SOUTH RANCHO DRIVE, SUITE 17, LAS VEGAS, NV 89106
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www.rciengineering.com

IMPROVEMENT PLANS FOR
SUMMERLIN VILLAGE 21 PARCELS P Q AND R
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING DETAILS (SHEET 3 OF 3)
CITY OF LAS VEGAS NEVADA

PROFESSIONAL ENGINEER STATE OF NEVADA
CHRISTOPHER L. THOMPSON
Exp. 6/30/2022
CIVIL
No. 14134
DATE: 9/14/2020

DRAWING
D-3
SHT 11 OF 31
CLV DRAWING NUMBER
CLV PROJECT #

O:\3110_Toll\0048_Summerlin V21-PQR_CIVIL_IPS\S004_D01.dwg cthompson 9/14/20 10:38am

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Call before you Dig
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call 811 OR 1-800-227-2600

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

BASIS OF BEARINGS

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:
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BENCHMARK

CITY OF LAS VEGAS BENCHMARK 7LV09 27E4

RIVET AND PLOT IN TOP OF CURB AT SOUTHEAST CORNER OF FAR HILLS AVENUE AND DESERT FOOTHILLS DRIVE.

ELEVATION=1016.62 Meters (NAVD'88 v.2008)
ELEVATION=3335.36 US Survey Feet (NAVD'88 v.2008)

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.

CONSTRUCTION NOTES

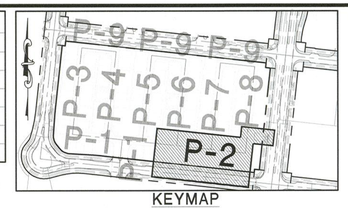
1. CONSTRUCT AC PAVEMENT PER DETAILS 1 THRU 4 ON SHEET D-1
2. CONSTRUCT 24" 'L' CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 24" 'R' CURB PER CCAUSD #217.3 S1
4. CONSTRUCT 5' CURB TRANSITION FROM 24" 'L' TYPE CURB AND GUTTER TO 24" 'R' TYPE CURB PER DETAIL 28 SHEET D-2
5. CONSTRUCT 4' SIDEWALK PER CCAUSD #234
6. CONSTRUCT 5' SIDEWALK PER CCAUSD #234 (5" THICK WHEN ADJACENT TO "R" CURB)
7. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD #219
8. CONSTRUCT 8" MODIFIED ('R' CURB) CROSS GUTTER PER SUMMERLIN IMPROVEMENT STD DWG #S-64
9. CONSTRUCT SIDEWALK RAMPS USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD #235 (CASE I) SEE PLAN AND PROFILE SHEET CURVE TABLES FOR "A" AND "B" DIMENSIONS
10. 2% MAX GRADING ADJACENT TO FIRE HYDRANT PER PUBLIC FIRE HYDRANT INSTALLATION DETAIL ON UTILITY SHEETS
11. CONSTRUCT PARKING STALL PER DETAIL 29/D-2
12. REMOVE EXISTING RIP RAP
13. CONCRETE APRON AND JENSEN PRECAST DROP INLET SEE DETAIL 13/D-2
14. CONSTRUCT CONCRETE L CURB U CHANNEL PER DETAIL 53/D-3
15. CONSTRUCT DEPRESSED R CURB @ U CHANNEL
16. LEADWALK CROSS DRAIN PER DETAIL 27/D-2
17. 5' WIDE PEDESTRIAN ACCESS TO PERIMETER STREET SIDEWALK
18. ENTRY MONUMENT BY OTHERS
19. INSTALL 6" MINIMUM DECORATIVE ROCK 4' WIDE AND 1' DEEP (FRONT YARD OF LOTS 9-16)
20. CONCRETE COLLAR IS TO BE EITHER COLORED CONCRETE OR STAIN TO MATCH DECORATIVE ROCK
21. INSTALL 6" - 12" RIP-RAP (PUBLIC) DECORATIVE ROCK 24" THICK
22. REMOVE EXISTING "A" TYPE ISLAND CURB

SEWER CONSTRUCTION NOTES

21. INSTALL 48" STANDARD MANHOLE WITH WATERTIGHT JOINTS (PER DCSWCS STD. No. SD-1, SD-3, SD-4, SD-5) WITH SINGLE 24" LID
22. INSTALL 4" SEWER LATERAL (PER DCSWCS STD No. SD-17, SD-20 & SD-23)
23. TYPICAL LOCATION FOR SEWER LATERAL AT WATER MAIN CROSSING. ALL SEWER LATERALS MUST MAINTAIN 18" VERTICAL CLEARANCE BELOW WATER MAIN AT CROSSINGS.

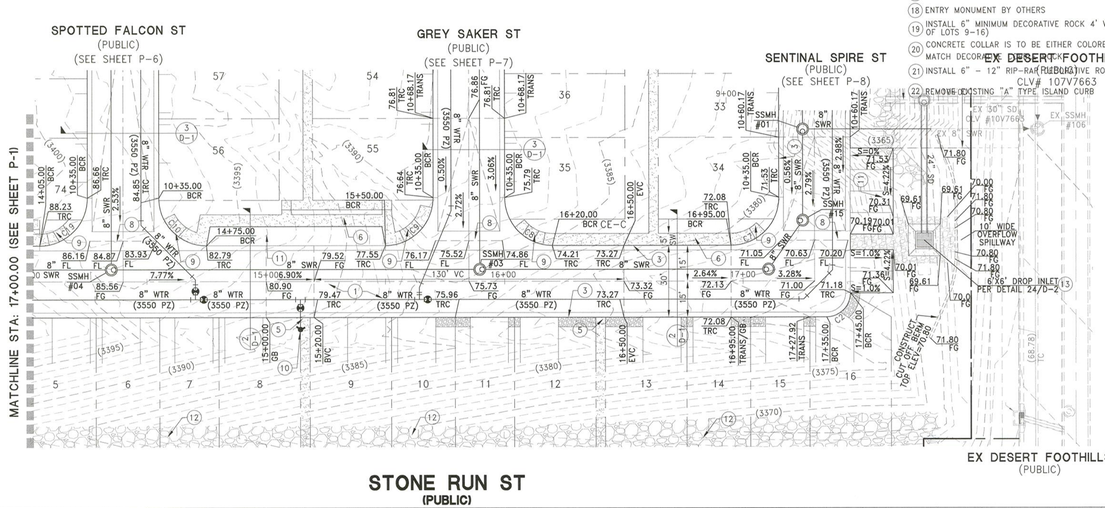
CURVE TABLE

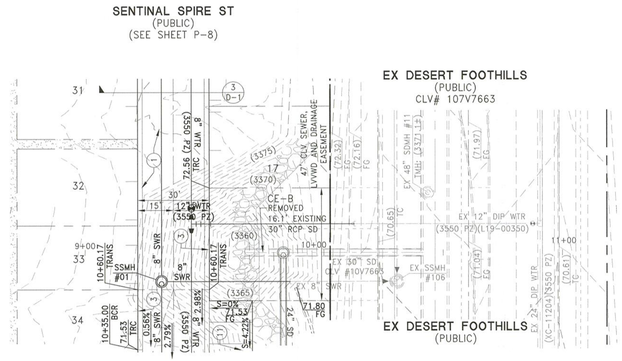
CURVE #	DELTA	RADIUS	LENGTH	TANGENT	"A"	"B"
C2	90°00'00"	10.00'	15.71'	10.00'		
C7	63°15'23"	20.00'	22.08'	12.32'		
C8	63°15'23"	20.00'	22.08'	12.32'		
C9	87°08'03"	20.00'	30.42'	19.02'		
C10	87°08'02"	20.00'	30.42'	19.02'		
C19	63°15'23"	20.00'	22.08'	12.32'		



KEYMAP

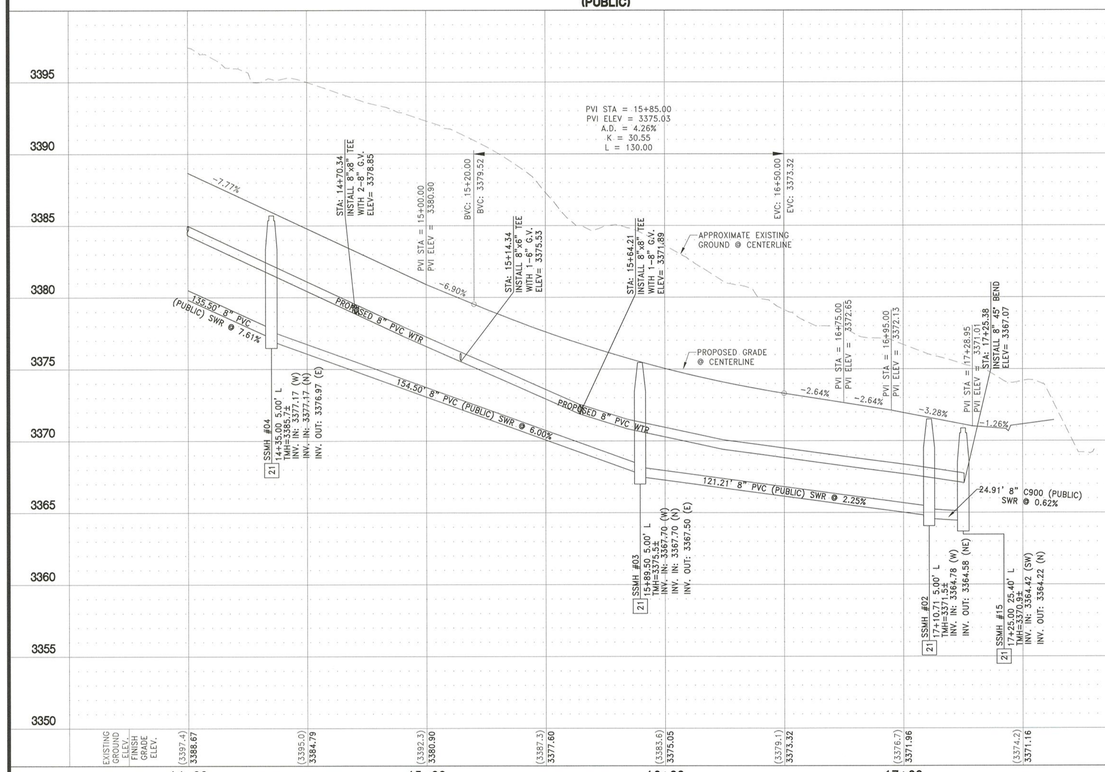
HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: 1" = 5'





APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES
PROJECT NO. – FIRST APPROVED DATE:



EXISTING GROUND ELEV.	3397.4 / 3388.67
FINISH GRADE ELEV.	3395.0 / 3384.79
	3392.3 / 3380.90
	3387.3 / 3377.60
	3383.6 / 3375.05
	3379.1 / 3373.32
	3376.7 / 3371.96
	3374.2 / 3371.16
	3382.8
	3365.5 / 3371.77
	3374.0 / 3371.41
	3370.8
	3370.4

TOLL SOUTH LV, LLC
1140 TOWN CENTER DRIVE SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9810

RCI ENGINEERING
500 SOUTH RANCHO DRIVE, SUITE 17, LAS VEGAS, NV 89106
PH:(702.453.0800 FAX:(702.453.0801
www.rcinevada.com

REV	DESCRIPTION	BY	APPD	DATE

DATE: September 14, 2020
HORIZ. SCALE: NTS
VERT. SCALE: NTS
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.0048

IMPROVEMENT PLANS FOR
SUMMERLIN VILLAGE 21 PARCELS P Q AND R
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
PLAN AND PROFILE
STONE RUN ST STA:14+00.00-17+00.00
CITY OF LAS VEGAS NEVADA

PROFESSIONAL ENGINEER – STATE OF NEVADA
CHRISTOPHER L THOMPSON
Exp. 6/30/2022
CIVIL
No. 14134
DATE: 9/14/2020

DRAWING
P-2
SHT 18 OF 31
CLV DRAWING NUMBER
CLV PROJECT #

O:\3110_Toll\0048_Summerlin V21-P6PR_CIVIL_IP\S\007_P02.dwg chompson 9/14/20 11:11am

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LINEAR UNIT: US SURVEY FOOT (FTUS)

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

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ZONE: LAS VEGAS HIGH ELEVATION ZONE

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EASTING AT CENTRAL MERIDIAN: 300,000 M (984,250.0000 FTUS)
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CITY OF LAS VEGAS BENCHMARK 7LV09 27E4

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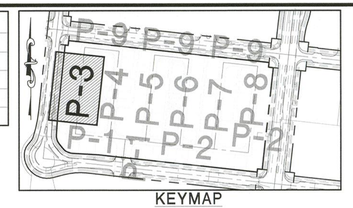
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1. CONSTRUCT AC PAVEMENT PER DETAILS 1 THRU 4 ON SHEET D-1
2. CONSTRUCT 24" 'L' CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 24" 'R' CURB PER CCAUSD #217.3 S1
4. CONSTRUCT 5' CURB TRANSITION FROM 24" 'L' TYPE CURB AND GUTTER TO 24" 'R' TYPE CURB PER DETAIL 28 SHEET D-2
5. CONSTRUCT 4' SIDEWALK PER CCAUSD #234
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8. CONSTRUCT 8' MODIFIED ('R' CURB) CROSS GUTTER PER SUMMERLIN IMPROVEMENT STD DWG #S-64
9. CONSTRUCT SIDEWALK RAMPS USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD #235 (CASE I) SEE PLAN AND PROFILE SHEET CURVE TABLES FOR "A" AND "B" DIMENSIONS
10. 2% MAX GRADING ADJACENT TO FIRE HYDRANT PER PUBLIC FIRE HYDRANT INSTALLATION DETAIL ON UTILITY SHEETS
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21. INSTALL 6" - 12" RIP-RAP DECORATIVE ROCK 24" THICK
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SEWER CONSTRUCTION NOTES

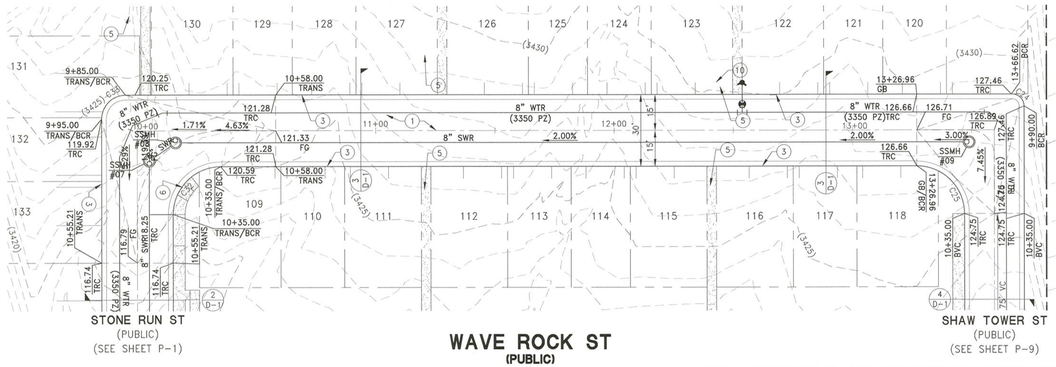
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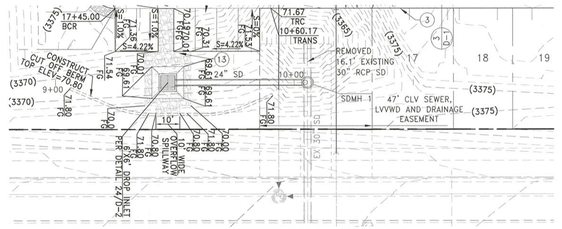
CURVE TABLE						
CURVE #	DELTA	RADIUS	LENGTH	TANGENT	"A"	"B"
C24	90°00'00"	5.00'	7.85'	5.00'		
C25	63°15'23"	20.00'	22.08'	12.32'		
C32	63°15'23"	20.00'	22.08'	12.32'		
C33	86°11'27"	10.00'	15.04'	9.36'		

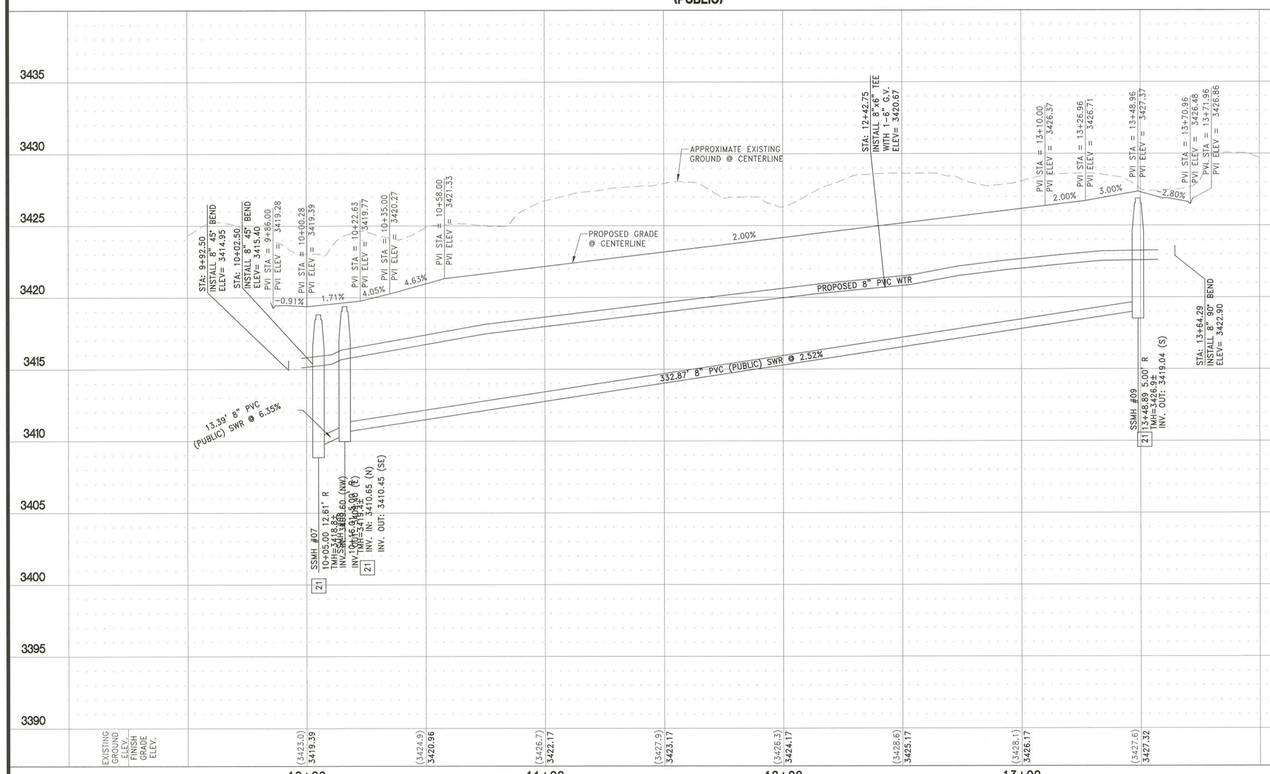


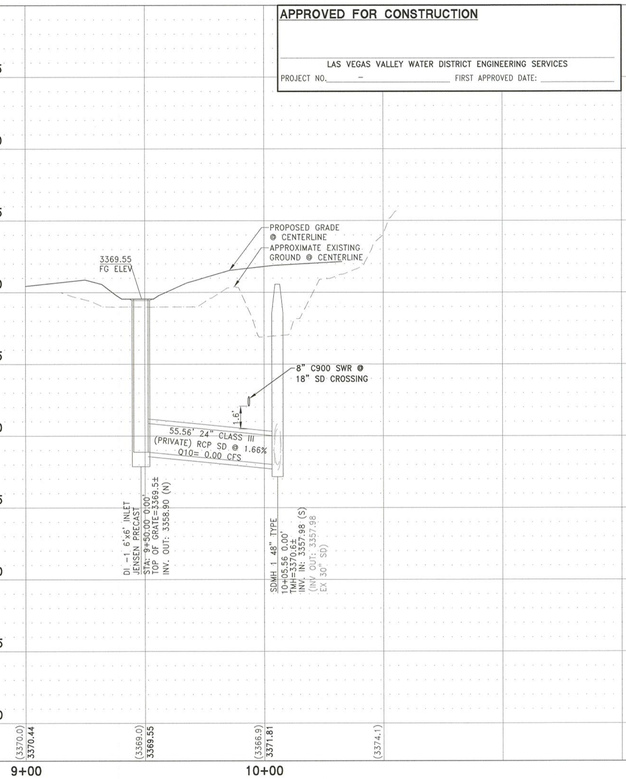
KEYMAP

30' 15' 0' 30' 60'
HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: 1" = 5'









APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES
PROJECT NO. – FIRST APPROVED DATE:

REV	DESCRIPTION	BY	APP'D	DATE

DATE: September 14, 2020
HORIZ. SCALE: NTS
VERT. SCALE: NTS
DRAWN BY: SS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.00A8

TOLL SOUTH LV, LLC
1140 TOWN CENTER DRIVE SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-8900 FAX: 702-243-8610

RCI ENGINEERING
500 SOUTH RANCHO DRIVE, SUITE 17, LAS VEGAS, NV 89106
PHONE 702.243.8080 FAX 702.243.0801
www.rciengineering.com

IMPROVEMENT PLANS FOR
SUMMERLIN VILLAGE 21 PARCELS P Q AND R
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
PLAN AND PROFILE
TALON RIDGE ST STA:10+00.00-14+00.00
CITY OF LAS VEGAS NEVADA

PROFESSIONAL ENGINEER - STATE OF NEVADA
CHRISTOPHER L. THOMPSON
Exp. 6/30/2022
CIVIL
No. 14134
DATE: 9/14/2020

DRAWING
P-3
SHT 19 OF 31
CLV DRAWING NUMBER
CLV PROJECT #

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DISCLAIMER NOTE:

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND OR OVERHEAD 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. CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES OR DISCREPANCIES.

Call before you Dig
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call 811 OR 1-800-227-2600

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

BASIS OF BEARINGS

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 BEARING 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

CITY OF LAS VEGAS BENCHMARK 7LV09 27E4

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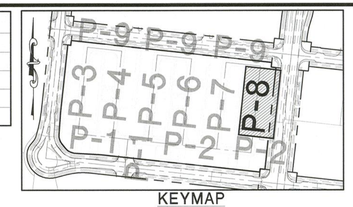
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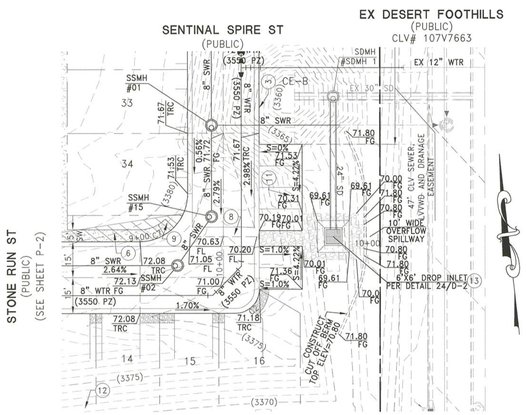
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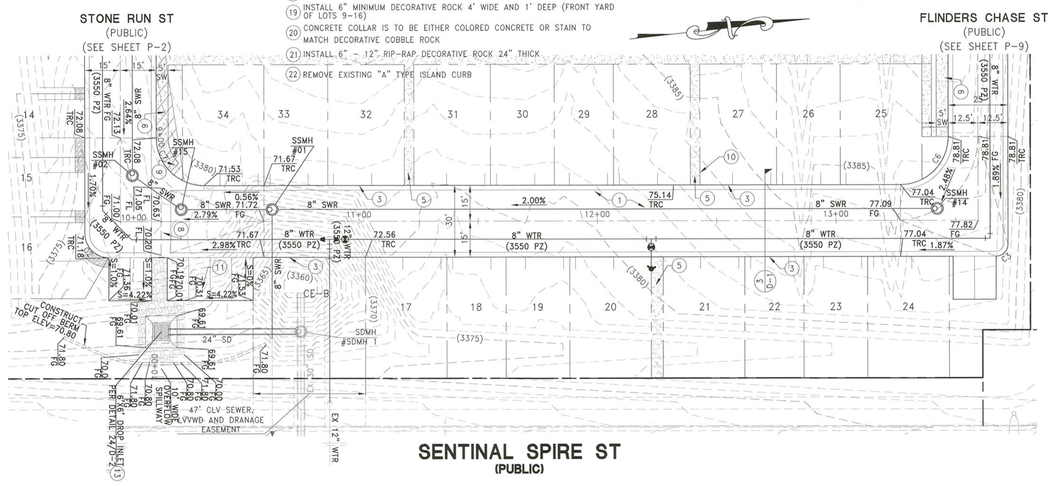
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C7	63°15'23"	20.00'	22.08'	12.32'		

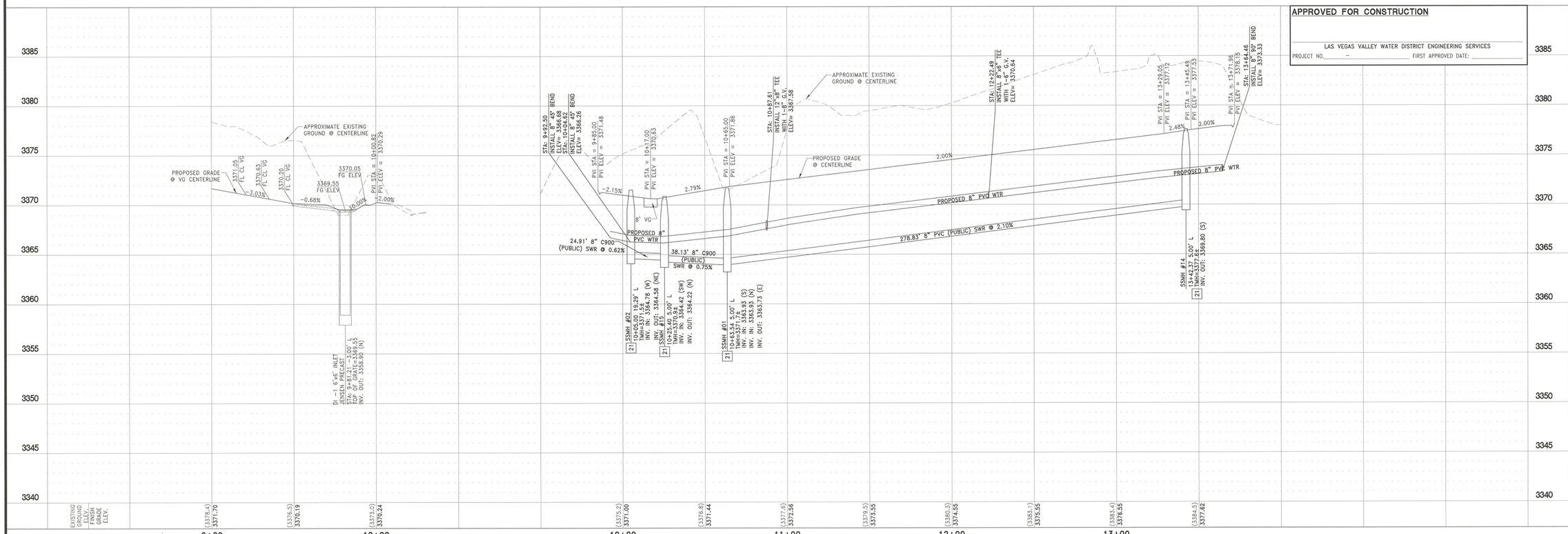


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PROJECT NO._____-_____ FIRST APPROVED DATE: _____

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DRAWN BY: KS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.0048

TOLL SOUTH LV, LLC
1140 TOWN CENTER DRIVE SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9610

RCI ENGINEERING
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PH/702.453.0800 FAX/702.453.0801
www.rcinevada.com

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DRAWING
P-8
SHT 24 OF 31
CLV DRAWING NUMBER
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