

DS #:

5298

APN:

125.15-607.009

PROJECT:

Griffith Residence

SUBMITTAL:

1st

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM		DATE: August 17, 2020
TO: Land Development Services Department of Building & Safety		FROM: Jennifer Shinn, P.E.  Flood Control, Engr. Associate Department of Public Works
SUBJECT:	Drainage Study for: Griffith Residence	
Cross Streets:	NWC of Farm Road and Balsam Street	
File Number:	F:\Depot\DSMemos\DS5298A.doc	
Parcel Number:	125-15-607-009	
Zoning Action:		
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES	NO X
COPIES TO:		JPL Engineering
		Mark E. & Naoma Griffith
		Bart Anderson, P.E., DevCo
		CCPW

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	7/21/2020 (Paid 7/30/2020)	8/17/2020	Approved	\$400.00	3933666: \$400
			TOTAL FEES (LDDRS):	\$400.00	----

REMARKS:

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

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

1. **City of Las Vegas Flood Control** staff has reviewed the Technical Drainage Study, including the 2 of addenda for the subject development "**Griffith Residence**" within the jurisdiction of **Clark County**. **City of Las Vegas** concurs with the acceptance of the drainage study by **Clark County**. The review of this project was limited to issues of flood control significance to the **City of Las Vegas**.

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.

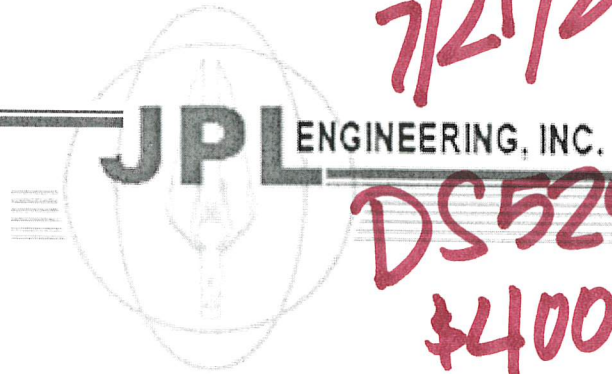
NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the *Nevada Division of Environmental Protection* a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained 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

jks

T/R/S: T19S/R60E/15

AREA G15



7/21/20

DS5298
\$400.00
GIS

**SUPPLEMENT EMAIL
TECHNICAL DRAINAGE STUDY**

FOR

GRIFFITH RESIDENCE

(APN: 125-15-607-009)

PW20-13554

@

FARM ROAD AND BALSAM STREET

JPL Job No. 19024

Prepared for:

MARK E. & NOAMA GRIFFITH

6900 Farm Road

Las Vegas, NV 89131

Prepared by:

JPL Engineering, Inc.

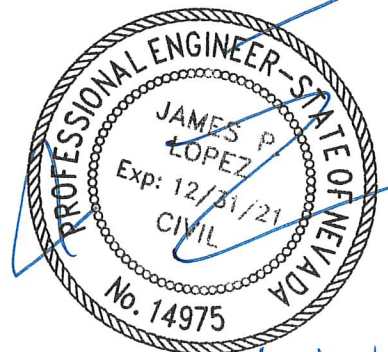
6725 South Eastern Ave., Ste. 5

Las Vegas, Nevada 89119

Phone: 702-898-6269

Fax: 877-557-8292

June, 2020



7/20/20

From: Rhonda Miller [mailto:Rhonda.Miller@westwoodps.com]
Sent: Tuesday, June 30, 2020 10:01 AM
To: Ernie Corn
Cc: Josh Johnson; james@jplengineeringinc.com
Subject: RE: PW20-13554 (Griffith Estates)

Hi Ernie,

I spoke to the owner and he is agreeable to adding the 5-foot drainage easement along the northerly property line. We will add this to the parcel map that is in process now. Let me know if you'd like an updated copy of the map showing the easement.

Thank you!

Rhonda Miller
Assistant Project Manager
rhonda.miller@westwoodps.com

direct (702) 284-5377
main (702) 284-5300
cell (702) 574-7432

Westwood
5740 S. Arville Street, Suite 216
Las Vegas, NV 89118

westwoodps.com
(888) 937-5150

From: Ernie Corn <Ernie.Corn@ClarkCountyNV.gov>
Sent: Thursday, June 11, 2020 7:19 AM
To: Rhonda Miller <Rhonda.Miller@westwoodps.com>; Josh Johnson <Josh.Johnson@westwoodps.com>; james@jplengineeringinc.com
Subject: FW: PW20-13554 (Griffith Estates)

Just wanted to follow up and see if anything was decided yet.

Ernie

From: Ernie Corn
Sent: Monday, June 8, 2020 8:30 AM
To: Rhonda Miller <Rhonda.Miller@westwoodps.com>; Josh Johnson <Josh.Johnson@westwoodps.com>; james@jplengineeringinc.com
Subject: PW20-13554 (Griffith Estates)

Good morning all,

Rhonda I know we emailed back and forth about the drainage easement located in parcel 125-15-607-004 and how it didn't appear to impact the subject site.

However after speaking with Layne we believe it would be best to dedicate a 5 foot private drainage easement to be privately maintained along the north property line.

For the future possibility of adjacent parcels wanting to drain through the subject site.

The 18 inches of free board for the drainage easement will not be required at this time but if in the future adjacent parcels would like to drain through the drainage easement the owner could have them build a 2' CMU wall to meet the freeboard requirements.

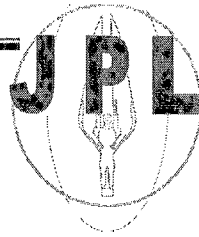
Let me know what you guys think.

No revised plans or calculation would be required, I would simply redline the plans and add a comment to the approval letter.

Thanks.

Ernie

Ernie Corn, P.E.
Associate Engineer
Clark County Department of Public Works
500 S. Grand Central Parkway
Las Vegas, NV 89155



ENGINEERING • ENVIRONMENTAL • SURVEY
DESIGN • BUILD • CONSTRUCTION

Date: July 20, 2020

Job Number: JPL JOB # 19024
GRIFFITH RESIDENCE

To: Department of Public Works
CITY OF LAS VEGAS
Development Review Division

From: James Lopez
JPL Engineering, Inc.
6725 S Eastern Ave., Ste. 5
Las Vegas, NV 89119

Transmitted:

- ☒ Herewith
☐ Via Carrier
☐ Signature

For:

- | | |
|--|---|
| ☐ Approval | ☐ Information |
| ☐ Checking | ☐ Return after Use |
| ☒ Your Use | ☐ As Requested |

The Following:

- (1) 1 copy of TDS
- (2) 1 set of GP
- (3) CD

Comments:

If you have any questions, please call our office at (702) 898-6269.

Received by (print name) : _____ Date: _____

Signature: _____



CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 5/18/11)

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

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

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

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

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

CITY OF LAS VEGAS MINIMUM DRAINAGE STUDY CRITERIA CHECKLIST

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

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

CITY OF LAS VEGAS MINIMUM DRAINAGE STUDY CRITERIA CHECKLIST

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

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

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



Department of Public Works

500 S Grand Central Pky • Box 554000 • Las Vegas NV 89155-4000
(702) 455-6000 • Fax (702) 455-6040

Denis Cederburg, P.E., Director • E-Mail: dlc@ClarkCountyNV.gov

Drainage Study Approval Letter

Date: June 30, 2020
Firm: JPL Engineering Inc.
Engineer: James P. Lopez, P.E.
Address: 6725 South Eastern Avenue, Suite 5, Las Vegas, NV 89119
Phone: (702) 898-6269
Fax:
E-mail: james@jplengineeringinc.com

Subject: Technical Drainage Study for Griffith Estates
Location: NWC of Farm Road and Balsam Street
APN: 125-15-607-009
Sec, Township, Range: S15, T19S, R60E
Flood Zone & Panel: Zone X, 1765F, dated November 16, 2011
Application Number: PW20-13554

Submittals	Date Received	Date Returned	Reviewer	Miscellaneous
Technical	04/20/2020	05/18/2020	EC	
Addendum 1	06/03/2020	06/08/2020	EC	
Supplement	06/30/2020	06/30/2020	EC	Email regarding drainage easement

Concurrence Required: (Must be obtained prior to permit issuance)		Reason Concurrence is Required
	Boulder City	Adjacent to or Impacts Jurisdiction
	City of Mesquite	Adjacent to or Impacts Jurisdiction
	City of Henderson	Adjacent to or Impacts Jurisdiction
X	City of Las Vegas	Adjacent to or Impacts Jurisdiction
	City of North Las Vegas	Adjacent to or Impacts Jurisdiction
	Nevada Department of Transportation	Adjacent to or Impacts NDOT Facility
	Union Pacific Rail Road	Adjacent to or Impacts a UPRR Facility
	US Army Corps of Engineers	Impacts a USACE Facility
	Clark County Regional Flood Control District	Regional Significance, Adjacent to or Impacts CCRFCD MPU Facility or in a SFHA

The referenced **Technical Drainage Study** has been reviewed and is accepted as complying with minimum improvement standards. As set forth in the subject drainage study, the following measures will be taken to mitigate flood hazards.

The site shall be graded with respect to drainage as shown on **“Griffith Residence Water Connection”** grading plan sheet C-1, C-2, C-3, G-1, and G-2 signed and sealed by Joshua L. Johnson, P.E. on May 29, 2020.

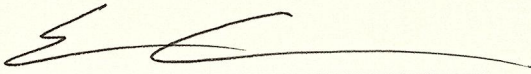
Check appropriate conditions

	Retaining/screen wall combination may be in excess of current Clark County Unified Development Code, Chapter 30.64.050.
	A FEMA Elevation Certificate, completed by a licensed surveyor, must be submitted to and approved by CCPW Development Review Plan Check prior to the issuance of Certificates of Occupancy for those structures.
X	Mylars of the grading plan must be submitted to the CCPW Development Review Plan Check for approval signatures prior to map recordation (residential) or permit issuance (commercial).
	An administrative variance to allow the finished floor elevation(s) to be set below the current Clark County criteria must be approved. The finished floor variance must be submitted to CCPW Development Review front counter after drainage study approval and prior to offsite final review.
X	The grading plan will be reviewed by the Building Office Operations Division to ensure compliance with the ADA access requirements. Revisions to the grading plan may be required if the site accessibility design does not comply with the requirements set forth in the Accessibility Chapter of the Clark County Building Code.
	The plans show work is proposed on another property. Notarized written permission must be obtained prior to plan approval. A grading permit must be obtained from Building Dept prior to grading.
	Right-of-way dedication must be verified.
	Any previously approved drainage easements that are not being used must be vacated.
	<i>Per Regional Flood Control District policies and Procedures manual, Section VIII. D. 13. Uniform Regulations for the Control of Drainage</i> , the Engineer of Record shall provide As-Built plans or record drawings to the District after completion and final inspection of such privately installed flood control facilities that have regional flood control significance.
	Structural calculations are required. The structural calculations, plans, and details must be approved prior to “Offsite” submittal and prior to CCRFCD submittal, if applicable.
X	Plan revisions can be found on the red-lined plans and must be addressed.
X	Prepare drainage easement documents as shown on the grading plans.

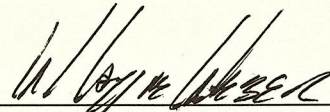
Additional Conditions:

1. The drainage easement along the north property line will be dedicated for the future possibility of adjacent parcels draining through the subject site.
2. Any improvements not depicted on the above mentioned grading plans may require an Update to this Technical Drainage Study.

The County's review is solely based on the information submitted by the Engineer of Record. The County's review is strictly limited to compliance with minimum County Codes and Standards. The Engineer of Record is responsible for researching and addressing situations that may require designs above and beyond the minimum codes for issues of public safety and impacts to upstream, downstream and adjacent properties. The County assumes no liability for information data, designs or conclusions of the Engineer of Record.



Ernie Corn, P.E.
Senior Civil Engineer
Development Review
Ernie.corn@ClarkCountyNV.gov



W. Layne Weber, P.E., CFM
Principal Engineer
Development Review
wlweber@ClarkCountyNV.gov

TECHNICAL DRAINAGE STUDY

FOR

**GRIFFITH RESIDENCE
(APN: 125-15-607-009)**

@

FARM ROAD AND BALSAM STREET

JPL Job No. 19024

Prepared for:

MARK E. & NOAMA GRIFFITH
6900 Farm Road
LAS VEGAS, NV 89131

Prepared by:

JPL Engineering, Inc.
6725 South Eastern Ave., Ste. 5
Las Vegas, Nevada 89119
Phone: 702-898-6269
Fax: 877-557-8292

April, 2020

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Griffith Residence Date: 4/15/20

Location of Development: a) Descriptive (Cross Streets) North/South: Balsam Street
East/West: Farm Road
b) Section: 15 Township: 19 South Range: 60 East
c) APN : 125-15-607-009

Name of Owner: Mark E. & Naoma Griffith

Telephone No.: _____ Fax No.: _____ E-Mail Address: _____
Address: 6900 Farm Road, Las Vegas, NV 89131

Contact Person-Name: James Lopez Telephone No.: (702) 898-62 69

* E-Mail Address: james@jplengineeringinc.com Fax No.: _____

Firm: JPL Engineering, Inc.

Address: 6725 S. Eastern Ave, Ste 5, Las Vegas, NV, 89119

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: 2.01 AC +/- Being Developed/Disturbed: 2.01 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

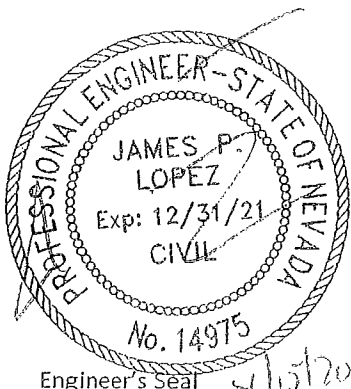
4. Proposed type of development (Residential, Commercial, Etc.): Residential

5. Approximate upstream land area which drains to the subject site: See Plans

6. Has the site drainage been evaluated in the past? ☐ YES ☒ NO If yes, please identify documentation: _____

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: _____

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



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

*New Required Field

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

	Revision	Date
Local Entity File No. _____		

REFERENCE:

STANDARD FORM 1

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Griffith Residence

Map ID:

Firm Name: JPL Engineering, Inc

Engineer: James Lopez

Address: 6725 S. Eastern Ave

City: Las Vegas

State: NV

Zip: 89119

Phone Number: (702) 898-6269

Fax Number:

Property Owner: Mark E. & Naoma Griffith

Address: 6900 Farm Road

City: Las Vegas

State: NV

Zip: 89131

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

☒

☐

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

☒

☐

Design Manual **Standard Form 4**.

☒

☐

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

☐

N/A

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

II. MAPS AND EXHIBITS

Yes No

☒

☐

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

☒

☐

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

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

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

III. DRAINAGE PLAN

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

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

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

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
☐	<u>N/A</u>	For areas in Zone A, AE, AH, and AO, base flood elevations (BFEs) must be shown for each lot; BFEs may be listed on each lot, or in a table. Finish floor elevations must be a minimum of 18 inches above BFE.
☐	<u>N/A</u>	Appropriately elevated "humps" 6 inches above the 100 year water surface elevation at site accesses where the intent is to protect the site from the Q_{100} flows.
☐	<u>N/A</u>	Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.
☐	<u>N/A</u>	Location and detail of best management practice (BMP) for parking lots and low impact development (LID) (if required).

IV. HYDROLOGIC ANALYSIS

Yes	No	
<u>x</u>	☐	Appropriate soil information and Soils Map for existing and future conditions with subbasins and property delineated.
<u>x</u>	☐	Input and output information for existing conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
<u>x</u>	☐	Input and output information for future conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
<u>x</u>	☐	Use of correct precipitation values in and around the McCarran Airport rainfall area.
<u>x</u>	☐	A discussion in the text of the hydrologic analysis justifying subbasin boundaries and cutoffs, supporting assumptions, and calculations.
<u>x</u>	☐	A summary table of stormwater flows showing basin area, Q_{10} and Q_{100} for both individual basins and combined basin flows, where applicable.
<u>x</u>	☐	Copies of supporting technical information referenced from a previously approved study and a statement accepting these results.
<u>x</u>	☐	On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners in accordance with current Nevada Drainage Law.
☐	<u>N/A</u>	Calculation for impervious area for parking lots and LIDs (if required).

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes No

- | | | |
|-------|-----|---|
| _____ | 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. $Q_{100} d \times v \leq 8$. $Q_{10} d \times v \leq 6$ and 12 foot dry lane for rights-of-way ≥ 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan. |
| _____ | 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. |
| _____ | x | Appropriate hydraulic calculations for block wall openings assuming a 50 percent vertical clogging factor. (Assume the lower half of the opening is plugged.) |
| _____ | N/A | Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set finish floor elevations. Hydraulic calculations must include submerged weir, superelevation and tee intersection losses, where appropriate. |
| _____ | x | Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow or depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Buildings adjacent to drainage easements must always be provided with 18 inches of freeboard above the Q_{100} weir height or flow depth, whichever is greater. |
| _____ | N/A | A complete water surface profile analysis (HEC-2, HEC-RAS, etc.) for channel flows and FEMA Zone A flood zones. <ul style="list-style-type: none"> • 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. |
| _____ | N/A | Provide a 50 percent clogging factor in the capacity calculation for drop inlets. |
| _____ | N/A | Hydraulic calculations for culverts and storm drains. D-Load calculations must be provided for storm drain pipes in public rights-of-way, including headwater pool inundation. |
| _____ | x | The mitigation of nuisance water, both during construction and in the fully developed condition, must be addressed. |
| _____ | N/A | Provide BMP type, size and supporting calculations for parking lots and LIDs (if required). |

REFERENCE:

STANDARD FORM 2

TECHNICAL DRAINAGE STUDY

FOR

**GRIFFITH RESIDENCE
(APN: 125-15-607-009)**

@

FARM ROAD AND BALSAM STREET

JPL Job No. 19024

Prepared for:

MARK E. & NOAMA GRIFFITH
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Prepared by:

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April, 2020

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APPENDICES

Appendix A	Hydrologic Parameters
Appendix B	Hydraulic Calculations
Appendix C	HEC-1
Appendix D	Reference Material

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Assessor's Parcel Map

FEMA Flood Insurance Rate Map

2018 Clark County Regional Flood Control District - Master Plan Figure F-11

2018 Clark County Regional Flood Control District - Master Plan Figure W-2B

Existing Condition Drainage Basin Exhibit

Future Developed Condition Drainage Basin Exhibit

1.0 INTRODUCTION

1.1 Scope

This report has been prepared as a *Technical Drainage Study for GRIFFITH (APN: 125-15-607-009)*. The purpose of this report is to provide general hydrologic and hydraulic analysis for the proposed improvements. The criteria set forth in the Clark County Regional Flood Control District's (CCRFCD) Hydrologic Criteria and Drainage Design Manual (HC&DDM) have been used as the technical basis for this study.

This study will evaluate the offsite and onsite runoff impacting the property in existing conditions as well as evaluate and mitigate as necessary the runoff impacting the property and surrounding properties under developed conditions.

1.2 Location

The property is located on Ford Road and Balsam Street, Section 15, Township 19 South, Range 60 East in Clark County, Nevada (see Vicinity Map and Assessor's Parcel Map at the back of the text), Assessor's Parcel Number 125-15-607-009.

1.3 Description of Project

This project is a residential development on 1 lot (125-15-607-009) of approximately 2.01 acres for the development of residential building and the division of the site into two lots. The north most lot will be 1.18 acres and the other lot will be 0.83 acres. The current building will remain and an additional building will be constructed in the south lot. The site is on the corner of Farm Road and Balsam Street with residential building to the north and west.

1.4 Master Planning Information

The site is shown on:

2018 Clark County Regional Flood Control District - Master Plan Figure F-11

2018 Clark County Regional Flood Control District - Master Plan Figure W-2B

Please refer to the figures at the back of text.

1.5 Floodplain Information

The subject site is located within FEMA Zone "X". Zone "X" is determined to be outside the 0.2% annual chance floodplain as shown on F.I.R.M Community-Panel Number 32003C1765F dated November 16, 2011.

1.6 Reference Materials

The references were used to define the existing and developed conditions offsite drainage flow rates and hydraulic analysis.

Reference: "*2018 CCRFCD Las Vegas Valley Master Plan Update HEC-1 Analysis*", ATKINS, prepared for Clark County Regional Flood Control District on December 2018

The HEC-1 model is used to determine the flow at the split point at Tenaya and Farm Road. This point is labeled as DNW161-C with a flow of 73-cfs.

1.7 BMP

The site will not require BMPs since it is classified as residential.

2.0 Storm Water Runoff Analysis

2.1 Hydrologic Parameters

The SCS unit hydrograph method was used to model the runoff from the site. The NRCS soil survey website classifies the onsite as 192 (a combination of A, B, and C type soil) and the offsite as both 192 and 237 (C type soil). The weighted curve number for the onsite existing condition basin is 56.3 using the runoff curve number of an 80,000 ft^2 lot. The curve numbers for the onsite developed conditions basins is calculated to be 60.3 using the runoff curve numbers for 40,000 ft^2 lot. Assuming the offsite during the existing conditions is classified as residential 40,000 ft^2 lots and classified as residential 20,000 ft^2 lots during developed conditions the weighted curve numbers are 65.9 and 67.9 for the offsite to the west (OFFX1/OFFD1), respectively, and 64.9 and 67.0 for the offsite to north (OFFX2/OFFD2), respectively.

Precipitation is based on NOAA Atlas 2 data. The site is located within the McCarran Rainfall Area. The depth durations values were taken from the McCarran rainfall Area data table. The adjusted point rainfall precipitation for the 10-year and 100-year, 6-hour storm event are 1.58'' and 2.77'', respectively, within the McCarran Airport Rainfall Area.

The HEC-1 multi-ratio option (HEC 1990) was used to model the 10-year and 100-year design storms in the HEC-1 input file. The HEC-1 JR card was used to specify the precipitation by which to multiply the 100-year precipitation values (point rainfall). The 10-year and 100-year ratios are 0.57 and 1.00, respectively (see calculation for 10-year ratio included in Appendix A).

A storm distribution number 3 (SDN3) for areas less than 8 square miles was used. Calculations are presented in the appendix.

Time of Concentration and Lag Time Lag times were calculated per the following equations per HCDDM:

For drainage basins with less than one square mile, the time of concentration is calculated as follows:

$$T_c = T_i + T_t$$

Where:

T_c = Time of concentration (minutes)

T_i = Initial, inlet or overland flow time (minutes)

T_t = Travel time in the ditch, gutter, etc. (minutes)

The Lag time for basins less than one square mile is calculated as follows:

$$T_{lag} = 0.6T_c \text{ (hours)}$$

Initial flow time is calculated as follows:

$$T_i = 1.8(1.1 - K)L_o^{1/2}/S^{1/3}$$

Where:

T_i =	Initial overland flow time (minutes)
K =	$0.0132 * CN - 0.39$
CN =	Curve Number
L_o =	Length of overland flow (max. 500 ft)
S =	Average basin slope (percent)

Travel time is calculated as follows:

$$T_t = 500/(60 V_1) + (L_t - 500)/(60 V_2)$$

Where:

T_t =	Travel time in the ditch, gutter, etc. (minutes)
L_t =	Travel Length (feet)
V_1 =	Average velocity of flow for the first 500 feet of travel distance (ft/s)
V_2 =	Average velocity of flow for the remaining travel distance (ft/s)

V_1 and V_2 are calculated as follows:

$$V_1 = C_1 * (S/100)^{1/2}$$

$$V_2 = C_2 * (S/100)^{1/2}$$

Where:

C_1 =	20.2 for developed areas and 14.8 for undeveloped areas
C_2 =	30.6 for developed areas and 29.4 for undeveloped areas
S =	Average slope for the flow path (percent)

In urbanized areas, the time of concentration calculated above should not exceed the time of concentration calculated by the following equation:

$$t_c = (L / 180) + 10$$

Where:

t_c =	Time of concentration at the first design point in an urban watershed (min)
L =	Watershed length (ft)

The smaller of the two calculations for time of concentration will control. Minimum T_c for any watershed is limited to 5 minutes.

Channel flow calculations of velocities for estimating travel time for surface flow were used to develop a Time of Concentration. Slopes are based on average slopes across the entire drainage basin. Calculations for the channel flow velocities are included in Appendix C. Initial flow time is calculated by the following equation:

$$T_i = 1.8(1.1K)L_o^{1/2}/S^{1/3}$$

Standard Form 4 for existing and developed conditions is presented in Appendix C.

2.2 Existing Condition

Offsite Drainage Condition Historic offsite drainage patterns in the area of the subject site are typically drained from west to east and north to south.

The development directly to the west is residential and is separated from the site by an existing wall. The runoff from this parcel, 125-15-607-005, drains from north to south and drains into Farm Road. The offsite basin to the west of the site is used to calculate the total runoff in Farm Road. The offsite, OFFX1, is bound by Tenaya to the west and Farm Road to the south. The runoff is calculated to be 1/7-cfs (Q10/Q100). The calculated runoff is combined with the referenced flow from the The runoff west of Tenaya is referenced from the "2018 CCRFCD Master Plan Update", referred to as "DNW161-C", with a value of 44/73-cfs (Q10/Q100). The reference basin is in fully developed condition with all RFCFCD facilities in place. The two runoff values are combined as the total flow from the offsite to the west of the site.

The developments to the north of the site are residential and are separated from the site by an existing wall. The runoff from this parcel does not enter the site. The runoff from the parcels to the north of the site extending to Tenaya Way drain are used as a drainage basin that drains onto Balsam Street. The offsite basin is referred to as OFFX2. The total runoff from OFFX2 is determined to be <1/4-cfs (Q10/Q100).

See below Existing Conditions Drainage Exhibit.

Onsite Drainage Condition Historic onsite drainage patterns in the area of the subject site are typically drained from west to east.

The onsite area consists of one drainage basin ONX1. The basin is surrounded by residential buildings to the north and west. The onsite runoff drains south onto Farm Road where The runoff from OFFX1 and the referenced runoff referred to as DNW161-C combine with the runoff from ONX1 at the concentration point CP1 which is to the south of the site. The runoff at CP1 is 46/81-cfs (Q10/Q100). The

runoff from OFFX2 collects at the concentration point CP2 to the east of the site. The runoff at CP2 is 1/4-cfs (Q10/Q100).

The runoff values for the reference, the offsite, and the onsite can be seen below.

Drainage Basin	Area (Acres)	Q₁₀ (cfs)	Q₁₀₀ (cfs)
*DNW161-C	-	44	73
OFFX1	15.3	1	7
OFFX2	11.1	<1	4
ONX1	2.01	<1	<1
**CP1	-	46	81
***CP2	-	<1	4

***Referenced from 2018 CCRFCD Master Plan Update (HEC-1)**

****CP1 = *DNW161-C + OFFX1 + ONX1**

*****CP2 = OFFX2**

2.3 Developed Conditions

Offsite Drainage Condition The offsite conditions are now considered as developed. OFFX1 is now referred to as OFFD1. OFFX2 is now referred to as OFFD2.

See below Existing Conditions Drainage Exhibit.

Onsite Drainage Condition The onsite is now developed. The parcel is now divided into two lots with residential building on both. The north most lot is 1.18 acres. The south most lot is 0.83 acres. The onsite basin is divided into two basins, the north basin, OND1, and the south basin, OND2. The lot drains from east to west onto Balsam Road. The location of concentration points for both Farm Road and Balsam Street remain the same. The flow rate at CP1 is 45/82-cfs (Q10/Q100). The flow rate of CP2 is 3/8-cfs (Q10/Q100).

The runoff values for the reference, the offsite, and the onsite can be seen below.

Drainage Basin	Area (Acres)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
*DNW161-C	-	44	73
OFFD1	15.3	1	9
OFFD2	11.1	1	6
OND1	1.18	<1	<1
OND2	0.83	<1	<1
**CP1	-	45	82
***CP2	-	3	8

*Referenced from 2018 CCRFCD Master Plan Update (HEC-1)

**CP1 = *DNW161-C + OFFD1

***CP2 = OFFD2+OND1+OND2

3.0 DRAINAGE FACILITIES

3.2 Street Flow Calculations

Farm Road and Balsam Street flow depth is calculated. The full street section is considered for both street sections. The cross sections for developed future conditions are included below.

Street Section	ROW (ft)	Q ₁₀ cfs	D ₁₀ ft	Q ₁₀₀ cfs	D ₁₀₀ ft	V ₁₀₀ fps	DxV	10-yr Dry Lane?
Farm Road	80	45	0.48	82	0.60	2.80	1.68	No
Balsam Street	60	3	0.27	8	0.41	1.93	0.79	N/A

The finished floor elevations for both lots are greater than 2x the gutter flow of Farm Road and Balsam Street. Farm Road dictates a minimum elevation of 2366.2' and Balsam Street dictates a minimum elevation of 2367.82' and the elevation of both building is greater with a value of 2368.5' for both.

4.0 CONCLUSIONS

4.1 Compliance with regulations

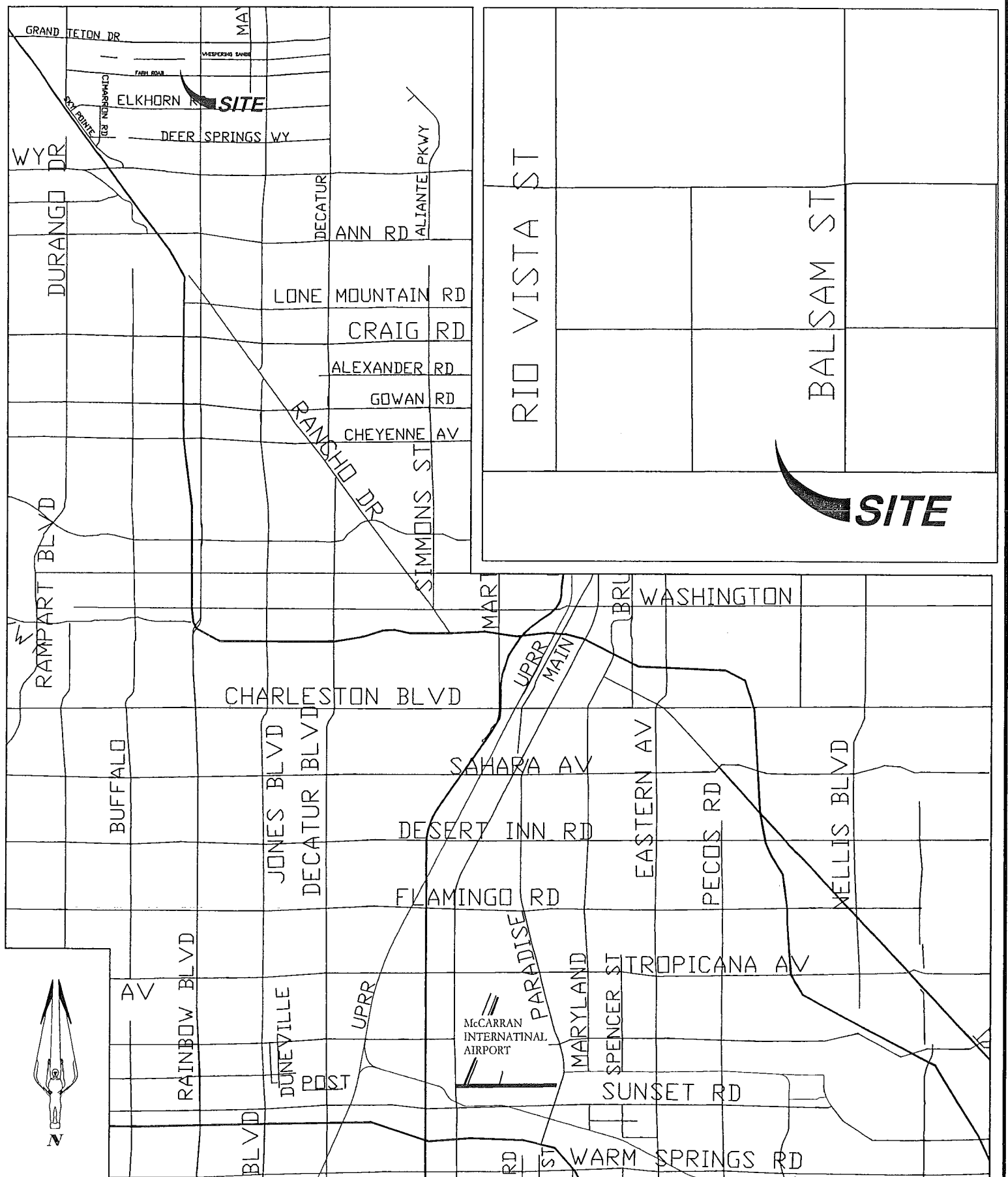
Development of the subject property will not have an adverse impact to downstream properties. The site development complies with all applicable FEMA Zone regulations.

The development of this site is in compliance with the CCRFCD Flood Control Master Plan Update, and the drainage design criteria set forth in the Hydrologic Criteria & Drainage Design Manual.

The FF elevation is higher than 2x the gutter flow in Farm Road and Balsam Street.

5.0 REFERENCES

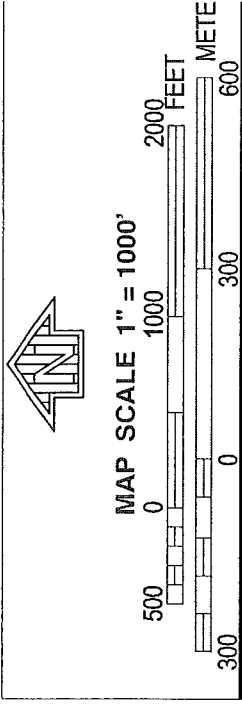
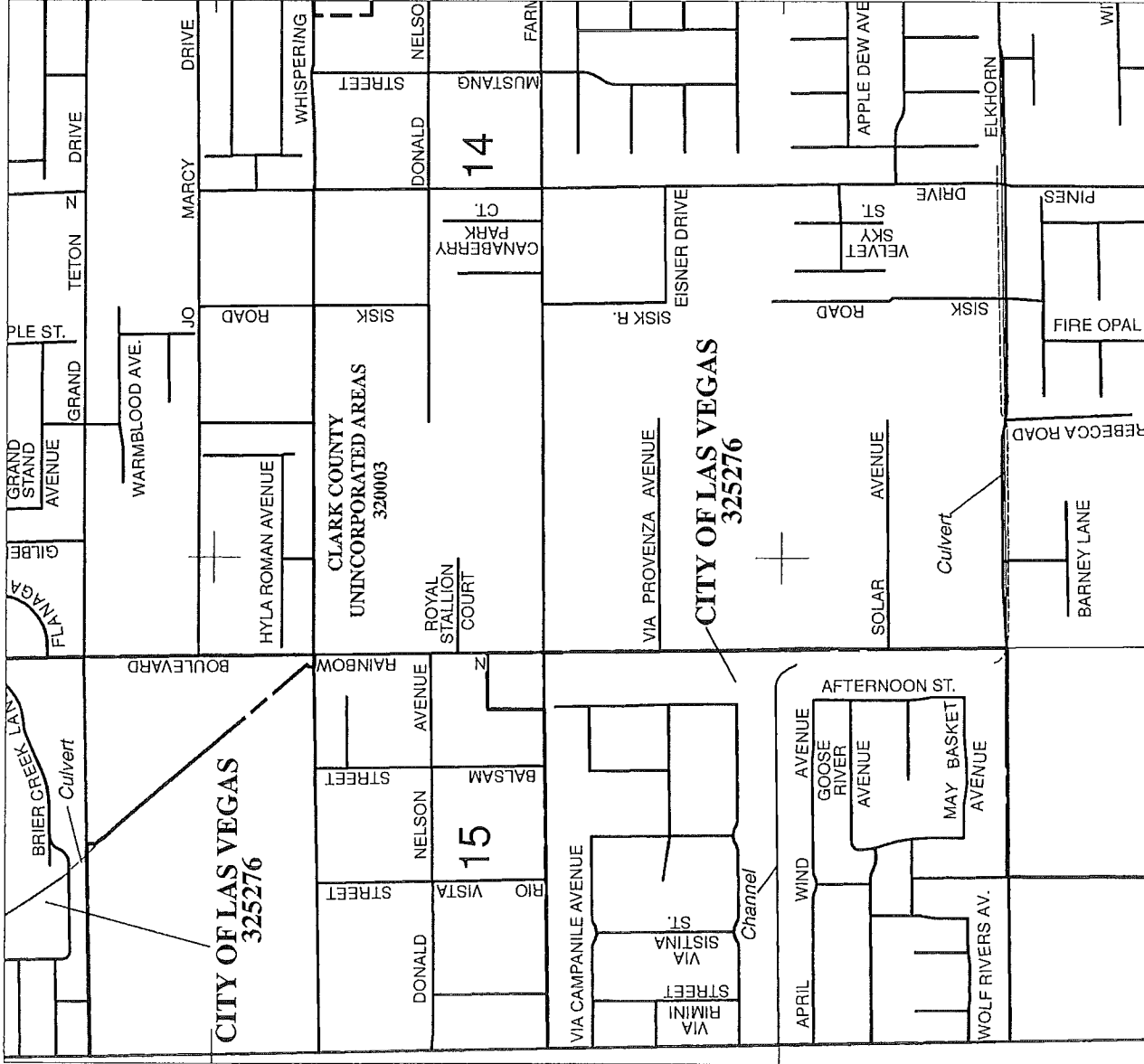
1. Clark County Regional Flood Control District Hydrologic Criteria and Drainage Design Manual, October 1996, WRC Engineering, Inc.
2. Federal Emergency Management Agency Flood Insurance Rate Map Clark County, Nevada and Incorporated Areas Map Number 32003C2569F, effective November 16, 2011.
3. Web Soil Service Natural Resource Conservation Service United States Department of Agriculture, Soil Conservation Service.
4. FlowMaster Version 6, Haestad Methods, Inc. 1994-1995.
5. HEC-1 Flood Hydrograph Package Version 4.0. U.S. Army Corps of Engineers, Hydrologic Engineering Center, September 1991.
6. *2018 CCRFCD Master Plan Update*, December 2018, ATKINS.



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 6725 Eastern Ave Suite 5
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 P. 702-898-6269
 F. 877-557-8292

GRIFFITH
RESIDENCE
LAS VEGAS

VICINITY-MAP
 NOT TO SCALE



FIRM		PANEL 1765F	
FLOOD INSURANCE RATE MAP			
CLARK COUNTY,			
NEVADA			
AND INCORPORATED AREAS			
PANEL 1765 OF 4090			
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)			
CONTAINS:			
COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY	320003	1765	F
LAS VEGAS CITY OF	325276	1765	F
NORTH LAS VEGAS, CITY OF	320007	1765	F
Notice to User: The Map Number shown below should be used on all applications for insurance coverage. The above should be used on insurance applications for the subject community.			
		MAP NUMBER 32003C1765F MAP REVISED NOVEMBER 16, 2011	
Federal Emergency Management Agency			

GRIFFITH RESIDENCE

FEMA FLOOD EXHIBIT

JPL ENGINEERING INC.

6725 S. EASTERN AVE., STE. 105, LAS VEGAS, NV 89119
PHONE (702) 898-6269 # FAX (877) 557-8292

NOTES

This map is for assessment use only and does NOT represent a survey.
No liability is assumed for the accuracy of the data delineated herein.
Information on roads and other non-assessed parcels may be obtained from the Road Document Listing in the Assessor's Office.
This map is compiled from official records, including surveys and deeds, but only contains the information required for assessment. See the recorded documents for more detailed legal information.

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

MAP LEGEND

Parcel Boundary

Sub Boundary

PM/LD Boundary

Road Easement

Match / Leader Line

Historic Lot Line

Historic Sub Boundary

Historic PM/LD Boundary

Section Line

Condominium Unit

Air Space PCL

Right of Way PCL

Sub-Surface PCL

ASSESSOR'S PARCELS - CLARK COUNTY, NV.

Briana Johnson - Assessor

001 ROAD PARCEL NUMBER

001 PARCEL NUMBER

1.00 ACREAGE

202 PARCEL SUB/SEQ NUMBER

PB 24-45 PLAT RECORDING NUMBER

5 BLOCK NUMBER

5 LOT NUMBER

GL5 GOV. LOT NUMBER

T19S R60E

15

S 2 NE 4

125-15-6

099 100 101

126 125 124

137 138 139

6 5 4 3 2 1

7 8 9 10 11 12

18 17 16 15 14 13

19 20 21 22 23 24

30 29 28 27 26 25

31 32 33 34 35 36

8 4 8 4

5 1 5 1

6 2 6 2

7 3 7 3

8 4 8 4

5 1 5 1

CLARK COUNTY

NEVADA

Scale: 1" = 200'

Rev: 1/8/2019

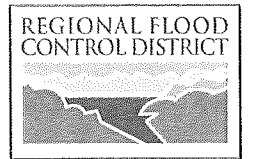
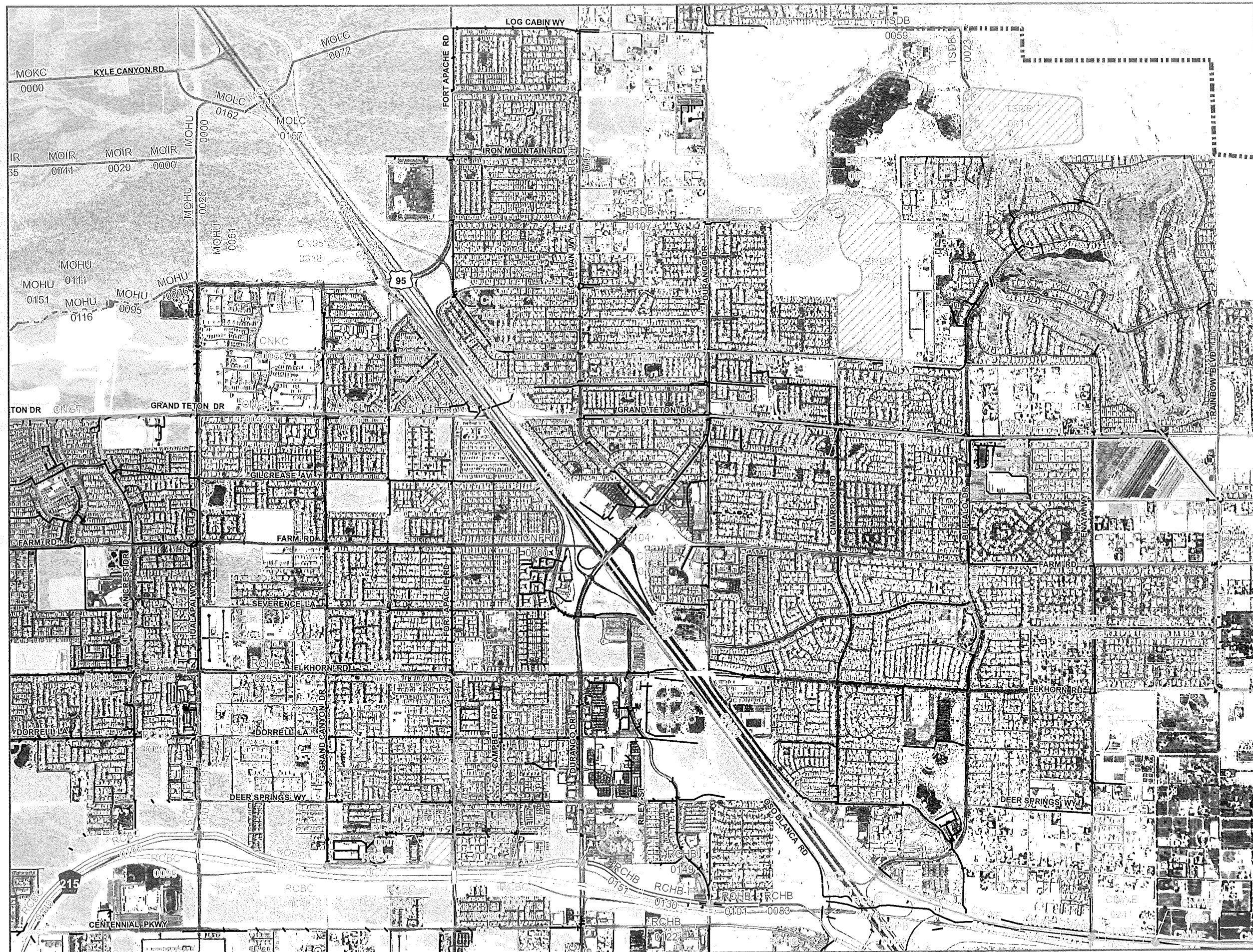
This is a detailed assessor's map of parcels in Clark County, NV. The map shows a grid of land parcels, each identified by a unique parcel number (e.g., 001, 002, 003, etc.) and a lot number (e.g., 1, 2, 3, etc.). The parcels are bounded by lines representing property boundaries, and some are labeled with 'PM' (Plat Map) or 'LD' (Lot Division) numbers. The map includes several roads: WHISPERING SANDS DRIVE, DONALD NELSON DR, FARM RD, VICTORY GALLUP ST, PLEASANT TAP AVE, TENAYA WAY, DESPERADO ST, RIO VISTA ST, BALSAM ST, and RAINBOW BLVD. The map also shows various other features such as easements, sub-boundaries, and section lines. The map is oriented with North at the top, as indicated by the north arrow in the top left corner. The map is scaled at 1 inch = 200 feet. The map is dated 1/8/2019 and is the property of Clark County, Nevada.

TAX DIST 125,200

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%)**
BCHU		BELTWAY CHANNEL - HUALAPAI						
0000	E	12' X 5' RCAP	853	206	DBA3-C	WEST3	0.84	1.11
0017	E	8' X 5' RCAP	1216	218	CBA3-C	WEST3	0.84	1.33
0040	E	66" RCP	60	57	DHW26-C	WEST3	0.51	1.04
0042	E	60" RCP	615	57	DHW26-C	WEST3	0.51	1.42
0054	E	54" RCP	615	57	DHW26-C	WEST3	0.51	1.23
BRDB		BRENT DRAINAGE SYSTEM						
0000	E	36" RCP WITH 16" ORIFICE PLATE	2170	36	BRDB	WEST3	2.37	0.40
0031	E	45,080 CFS PMF SPILLWAY		45080	CBRDB	WEST3	2.37	
0032	E	450 AC-FT SOUTH ENVIRONMENTAL ENHANCEMENT AREA		1685	CBRDB	WEST3	2.37	
0033	E	ENERGY DISSIPATOR	100	1052	CNW147W	WEST3	1.75	
0043	E	20' X 7' RCB	135	1052	CNW147W	WEST3	1.75	0.50
0045	E	CONC CHNL 12W 7D 2:1 SS	983	1052	CNW147W	WEST3	1.75	2.00
0058	E	12' X 6' RCB	1688	951	CNW113-C	WEST3	1.47	1.81
0107	P	8' X 6' RCB	2560	951	CNW113-C	WEST3	1.47	2.40
0157	P	12' X 7' RCB	2580	621	CNW96-C	WEST3	0.84	0.25
CN95		CENTENNIAL PKWY CHANNEL WEST / U.S 95 BRANCH						
0000	E	20' X 7' RCB	3335	2778	CNWBB3-C	WEST3	3.35	2.00
0058	E	20' X 7' RCB	2300	2725	CNW103-C	WEST3	3.04	2.10
0102	E	CONC CHNL 20W 9D 0:1 SS	375	2548	2CHW89-C	WEST3	2.65	1.77
0104	E	2: 12' X 10' RCB	300	2548	2CHW89-C	WEST3	2.65	1.10
0167	E	16' X 8' RCB	3521	2548	2CHW89-C	WEST3	2.65	1.58
0199	E	15' X 9' RCB	407	1467	2CHW72-C	WEST3	1.13	0.41
0218	E	15' X 9' RCB	1227	1467	2CHW72-C	WEST3	1.13	0.82
0257	E	TRANSITION STRUCTURE	59	1467	2CHW72-C	WEST3	1.13	0.77
0259	E	15' X 9' RCB	284	599	CNW74-C	WEST3	0.40	0.77
0313	E	10' X 6' RCB	2680	599	CNW74-C	WEST3	0.40	2.50
0318	E	TRANSITION STRUCTURE	60	599	CNW74-C	WEST3	0.40	1.50
0333	E	5' X 6' RCB	670	259	1NW62-S	WEST3	0.16	1.50
CNFR		CENTENNIAL PKWY CHANNEL WEST / FARM ROAD						
0000	P	8' X 6' RCB	8350	776	CNN89-C	WEST3	1.05	2.00
CNGT		CENTENNIAL PKWY CHANNEL WEST / GRAND TETON BRANCH						
0000	E	10' X 5' RCB	2376	543	CHW71-E	WEST3	0.47	2.58
0020	E	10' X 5' RCB	1570	543	CNW71-E	WEST3	0.47	3.50
0043	E	8' X 6' RCB	2470	543	CNW71-E	WEST3	0.47	3.60
0118	E	5' X 5' RCAP	5472	349	KYLEDET	KYLED8	58.61	3.72
CNKC		CENTENNIAL PKWY CHANNEL WEST / KYLE CANYON BRANCH						
0000	E	12' X 4' RCB	377	954	CNW72-C	WEST3	0.74	4.58
0007	E	10' X 5' RCB	874	954	CHW72-C	WEST3	0.74	3.28
0024	E	8' X 5' RCB	1385	954	CNW72-C	WEST3	0.74	2.40
0050	E	72" RCP	2757	437	1NW45-S	WEST3	0.31	3.60
CNWE		CENTENNIAL PKWY CHANNEL WEST						
0195	E	CONC CHNL 36W 9D 0:1 SS	1130	3771	CNW383-C	WEST3	5.84	0.60
0200	E	CONC CHNL 36W 9D 0:1 SS	1340	3523	CNW2D4-C	WEST3	5.14	1.00
0226	E	2: 18' X 8.5' RCB @ RIO VISTA	100	3523	CNW2D4-C	WEST3	5.14	0.51
0241	E	CONC CHNL 36W 9.5D 0:1 SS	405	3523	CNW2D4-C	WEST3	5.14	0.51
0251	E	CONC CHNL 36W 9D 0:1 SS	575	3234	CNW2D3-C	WEST3	4.64	0.51
0271	E	CONC CHNL 32W 10D 0:1 SS	229	3234	CNW2D3-C	WEST3	4.64	0.51
0274	E	32' X 10' RCB @ TEIUYA	142	3234	CNW2D3-C	WEST3	4.64	0.51
0277	E	CONC CHNL 32W 9D 0:1 SS	579	3234	CNW2D3-C	WEST3	4.64	0.64
0287	E	CONC CHNL 32W 8D 0:1 SS	865	2992	CNW2B2-C	WEST3	3.83	1.59
0301	E	2: 15' X 7' RCB	1738	2992	CNW2B2-C	WEST3	3.83	1.30
0304	E	22' X 7' RCB	3410	2992	CNW2B2-C	WEST3	3.83	1.85
0314	E	22' X 7' RCB	703	2822	CNW6D2-N	WEST3	3.45	1.94
EKBH		ELKHORN SPRINGS AND BUFFALO						
0000	E	60" RCP	1046	255	NW134-C	WEST3	0.46	0.89
EKDB		ELKHORN SPRINGS DETENTION BASIN						
0000	E	GRASS CHNL 15W 5.8D 3.5:1 SS	2575	221	CNW150-C	WEST3	1.41	0.39
0025	E	4' X 3' RCB	160	106	ELKBASIN	WEST3	0.84	0.50
0026	E	46" RCP	1270	106	ELKBASIN	WEST3	0.84	1.23
0049	E	60" RCP	1095	106	ELKBASIN	WEST3	0.84	0.13
0070	E	46 AC-FT ELKHORN SPRINGS DETENTION BASIN		456	CNW133-C	WEST3	0.84	

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%)**
EKHU		ELKHORN AND HUALAPAI						
0003	E	6' X 4' RCAP	980	393	CHW26-C	WEST3	0.51	3.61
0020	E	6' X 5' RCAP	150	393	CHW26-C	WEST3	0.51	3.61
0023	E	8' X 5' RCAP	1200	393	CHW26-C	WEST3	0.51	0.90
G0EC		GOWAN NORTH - EL CAPITAN BRANCH						
0176	P	78" RCP	1320	190	CCPFR-C	GOW3A	0.46	1.15
GONO		GOWAN NORTH SYSTEM						
0511	P	6' X 5' RCB	1320	326	CCPHW-C	GOW3A	0.60	1.14
LVND		LAS VEGAS WASH - MIDDLE						
2507	E	2: 13' X 9' RCB	2831	1808	CHW168-C	CWEST3	4.43	0.36
2525	E	24' X 8' RCB	1140	1598	CNW159-C	CWEST3	3.92	0.40
2550	E	24' X 8' RCB	1445	1312	CD161-C	CWEST3	3.42	0.40
2574	E	24' X 8' RCB	1430	1312	CD161-C	CWEST3	3.42	0.41
2699	E	CONC CHNL 24W 7D 2:1 SS	1577	1268	CNW162-C	CWEST3	3.10	0.51
2632	E	18' X 5' RCB	1443	695	CNW138-C	WEST3	1.16	0.47
2661	E	18' X 5' RCB	3003	695	CHW138-C	WEST3	1.16	0.78
2711	E	10' X 5' RCB	2440	560	CHW139-C	WEST3	0.93	2.00
2737	E	8' X 5' RCB	265	560	CNW139-C	WEST3	0.93	2.25
2763	E	6' X 5' RCB	1565	560	CHW139-C	WEST3	0.93	2.41
2789	E	6' X 5' RCB	910	560	CNW139-C	WEST3	0.93	2.00
MOHU		MOCCASIN-HUALAPAI BRANCH						
0000	P0	13' X 6' RCB	1476	924	2CNW33-C	LOWER3	2.08	1.80
0028	P0	11' X 6' RCB	1654	560	CNW45-N	LOWER3	1.25	0.50
0061	P0	9' X 6' RCB	779	560	CNW45-N	LOWER3	1.25	0.50
0076	P0	60" RCP	1000	263	CNW45-C	LOWER3	1.03	3.00
0095	P0	NATURAL WASH	865	263	CNW45-C	LOWER3	1.03	3.00
0111	P0	6' X 5' RCB @ EGAN CREB DR	164	263	CNW45-C	LOWER3	1.03	6.10
0116	P0	NATURAL WASH	1900	263	CNW45-C	LOWER3	1.03	3.00
0151	P0	54" RCPC @ SHAUMBER	438	72	MOD81	LOWER3	0.86	2.00
MOIR		MOCCASIN - IRON MOUNTAIN BRANCH						
0000	P0	60" RCP	1060	410	CNW33-C	LOWER3	0.83	4.50
0020	P0	54" RCP	1161	71	MOD82	LOWER3	0.56	3.20
0041	P0	42" RCP	1236	71	MOD82	LOWER3	0.56	5.00
0065	P0	60" RCP	1099	71	MOD82	LOWER3	0.56	0.40
MOKC		MOCCASIN AND KYLE CANYON						
0000	P0	9' X 5' RCB	6140	1072	CNW35-C	LOWER3	2.89	3.40
MOLC		MOCCASIN - LOG CABIN BRANCH						
0000	P0	20' X 10' RCB	2206	2265	2CNW84	LOWER3	6.06	0.65
0072	P0	12' X 8' RCB	4493	2265	2CNW84	LOWER3	6.06	2.66
0149	E	13' X 8' RCB	520	1817	CNW62-N	LOWER3	4.88	2.00
0157	P	13' X 8' RCB	288	1817	CNW62-N	LOWER3	4.88	1.40
0162	P0	13' X 6' RCB	435	1817	CNW62-N	LOWER3	4.88	1.80
MSNV		MOUNTAIN SPANVISTA RANCH						
0000	E	6: 12' X 5' RCB @ GRAID TETON	273	639	CNW163-C	CWEST3	1.69	0.40
0005	E	GRASS CHNL 10W 4.5D 10:1 SS	6325	259	CNW155-C	WEST3	4.46	0.40
0125	E	GRASS CHNL 10W 4.5D 10:1 SS	1300	66	CNW147E	WEST3	1.55	0.40
RACO		RACEL STREET COLLECTOR						
0000	E	14' X 7' RCB BAFFLED ENERGY DISSIPATOR	87	424	CNW111S	WEST3	0.55	0.29
0001	E	76" RCP	3245	424	CNW111S	WEST3	0.55	2.46
0064	E	76" RCP	2650	347	DHW111S	WEST3	0.44	2.09
RCBC		RANCHO ROAD SYSTEM - BELTWAY CHANNEL						
0000	E	6' X 5' RCB	1062	173	FADB	WEST3	1.54	1.04
0002	E	54" RCP OUTLET WITH 41" ORIFICE	503	173	FADB	WEST3	1.54	2.38
0003	E	2,341 CFS PMF SPILLWAY		2341	FADBN	WEST3	1.54	
0004	E	76 AC-FT FORT APACHE DETENTION BASIN		658	FADBN	WEST3	1.54	
0007	E	ENERGY DISSIPATOR	100	658	FADBN	WEST3	1.54	
0009	E	12' X 6' RCB @ FORT APACHE DETENTION BASIN	133	658	FADBN	WEST3	1.54	1.79
0012	E	CONC CHNL 12W 6-7D 0:1 SS	1937	658	FADBN	WEST3	1.54	3.15
0048	E	12' X 6' RCB @ GRAND CANYON	140	559	CMWA1	WEST3	1.27	3.15
0051	E	CONC CHNL 12W 6-3D 0:1 SS	2660	559	CMWA1	WEST3	1.27	3.44
0096	E	1: 10' X 6' AND 1: 6' X 6' RCB @ HUALAPAI WAY	190	559	CMWA1	WEST3	1.27	1.93
0100	E	CONC CHNL 12W 5.5D 0:1 SS	2085	475	CDMWA1	WEST3	0.43	2.88

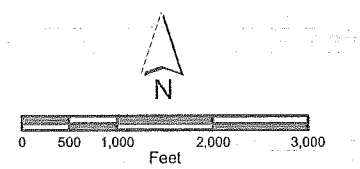
ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
RCBC		RANCHO ROAD SYSTEM - BELTWAY CHANNEL						
0140	E	CONC CHNL 10W 5D 0.1 SS	2155	475	CDMWA1	WEST3	0.43	1.65
RCHB		RANCHO ROAD SYSTEM - BELTWAY						
0053	E	2 12' X 6' RCBC @ SOUTH RAMP CONNECTOR	85	1465	CDW1C1-C	WEST3	3.55	1.40
0054	E	CONC CHNL 21W 8D 0.1 SS	432	1465	CDW1C1-C	WEST3	3.55	1.51
0062	E	TRANSITION STRUCTURE	130	1465	CDW1C1-C	WEST3	3.55	1.51
0065	E	24' X 7' RCB	480	1465	CDW1C1-C	WEST3	3.55	0.30
0074	E	24' X 6' RCB	50	1414	CNWBC6-C	WEST3	3.41	0.30
0075	E	20' X 6' RCBC @ BELTWAY	428	1414	CNWBC6-C	WEST3	3.41	2.81
0083	P	20' X 4' RCB	950	1414	CNWBC6-C	WEST3	3.41	2.49
0101	P	CONC CHNL 20W 5D 0.1 SS	980	1414	CNWBC6-C	WEST3	3.41	2.38
0120	E	20' X 6' RCBC @ GRAIND MONTECITO	120	1414	CNWBC6-C	WEST3	3.41	1.00
0122	P	CONC CHIL 16'-20W 6D 0:1 SS	350	1414	CNWBC6-C	WEST3	3.41	1.84
0130	P	CONC CHNL 16W 5.5D 0.1 SS	1012	1414	CNWBC6-C	WEST3	3.41	2.67
0149	P	CONC CHNL 16W 5-5.5D 0.1 SS	87	1115	CNWBC3	WEST3	2.99	2.27
0151	P	CONC CHIL 16W 5D 0.1 SS	1255	1115	CNWBC3	WEST3	2.99	2.65
0171	E	16' X 6' RCBC @ EL CAPITAN WAY	234	1115	CNWBC3	WEST3	2.99	1.75
0175	E	CONC CHNL 14W 7D 0.1 SS	1220	1115	CNWBC3	WEST3	2.99	2.93
0198	E	CONC CHIL 14W 7D 0.1 SS	225	788	CNWBAC-C	WEST3	1.88	2.93
0227	E	12' X 6' RCB	955	788	CNWBAC-C	WEST3	1.88	1.73
0250	E	12' X 6' RCB	4020	788	CNWBAC-C	WEST3	1.88	1.12
0275	E	7' X 6' RCB	2650	535	CNW66-C	WEST3	1.04	3.30
0295	P	7' X 6' RCB	2860	431	CNW53-C	WEST3	0.80	3.60
TSDB		TULE SPRINGS DRAINAGE SYSTEM						
0000	E	2 10' X 4' RCBC @ ECHO GRANDE	100	25	TULEDB	WEST3	1.37	1.04
0002	E	36" RCP WITH 22" ORIFICE PLATE	320	25	TULEDB	WEST3	1.37	0.33
0010	E	14,013 CFS PMF SPILLWAY		14013	CTULEDB	WEST3	1.37	
0011	E	117 AC-FT NORTH ENVIRONMENTAL ENHANCEMENT AREA		551	CTULEDB	WEST3	1.37	
0012	E	ENERGY DISSIPATOR	260	333	CNW148-C	WEST3	0.59	
0023	P	78" RCP	1320	333	CNW148-C	WEST3	0.59	0.80
0059	P	72" RCP	2640	333	CNW148-C	WEST3	0.59	1.03



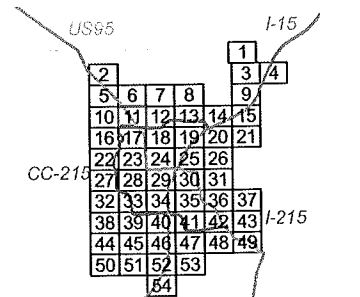
2018
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

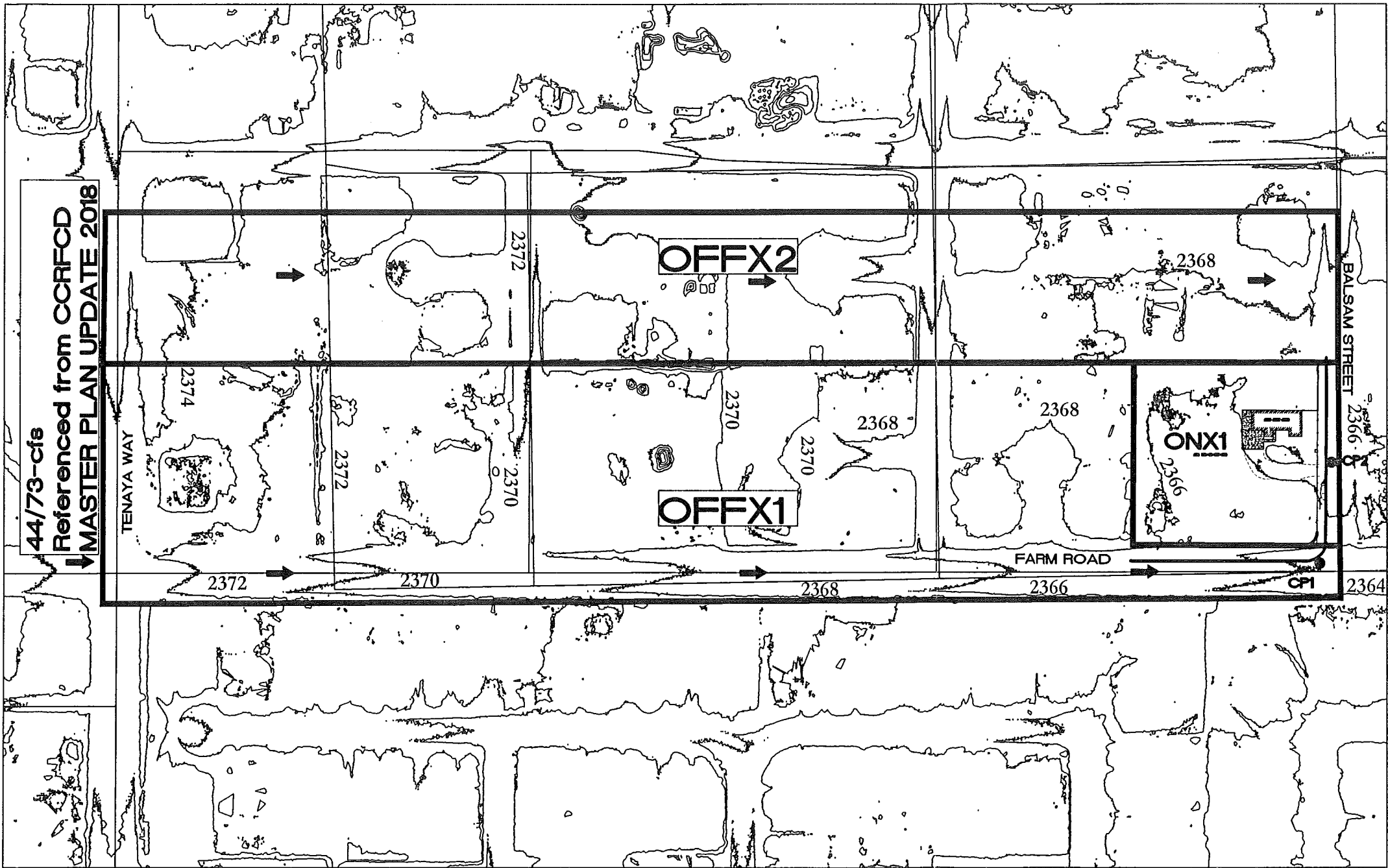
FIGURE F-11
FLOOD CONTROL FACILITIES

- 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 |



AAerialSource:Esri World Imagery 2017

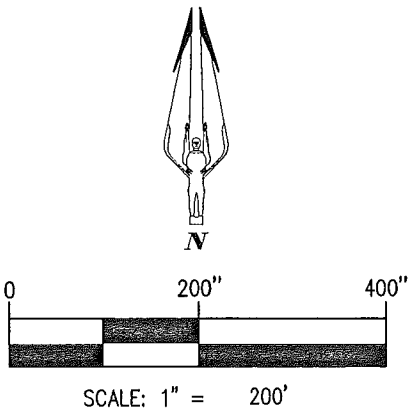




DRAINAGE BASINS

BASIN NAME/ CONCENTRATION POINT	AREA (ARCES)	Q ₁₀ /Q ₁₀₀ (CFS)
*DNW161-C	-	44/73
OFFX1	15.3	1/7
OFFX2	11.1	<1/4
ONX1	2.01	<1/<1
**CP1	-	46/81
***CP2	-	<1/4

• Reference from 2018 CCRFCD
Master Plan Update HEC-1
•• CP1 =•DNW161-C + OFFX1 + ONX1
••• CP2 = OFFX2



LEGEND

- ON1X Basin Name
- Flow Arrow
- Basin Boundary

NOTE:
-SEE GRADING PLAN SHEETS
FOR DETAILED CONTOURS
AND PRECISE GRADING

GRIFFITH ESTATES
OFFSITE AND ONSITE EXISTING CONDITION
DRAINAGE BASIN EXHIBIT

JPL ENGINEERING INC.

6725 S. EASTERN AVE. STE 15, LAS VEGAS, NV 89119
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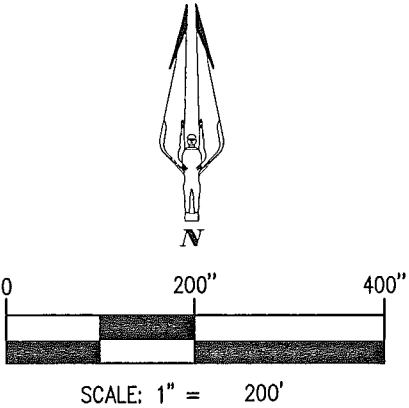
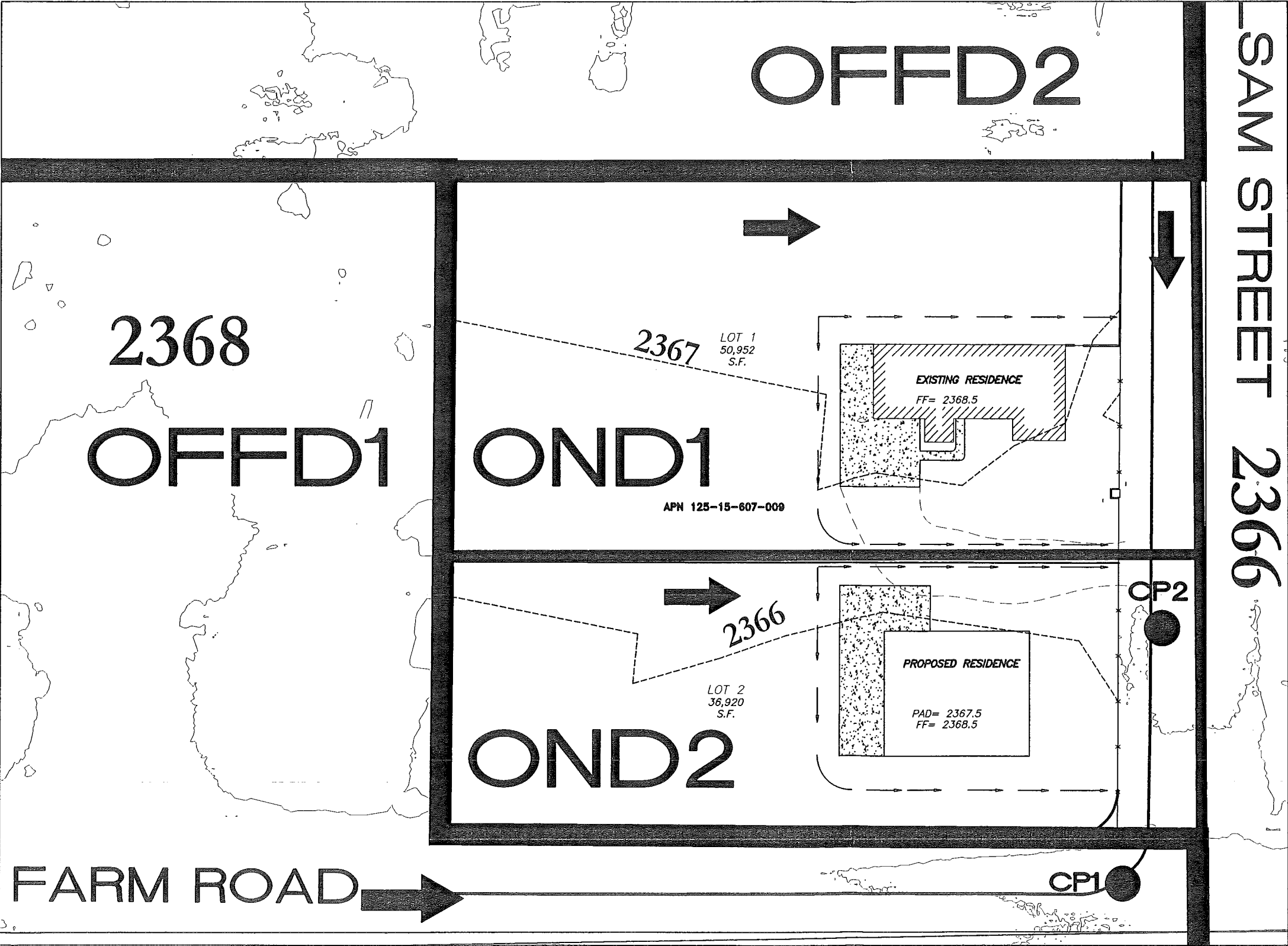
APRIL, 2020

CROSS SECTION NAME	ROW (FT)	Q ₁₀ (CFS)	D ₁₀ (FT)	Q ₁₀₀ (CFS)	D ₁₀₀ (FT)	V ₁₀₀ (CFS)	DxV
Farm Road SEC 1	80	45	0.48	82	0.60	1.68	1.68
Balsam Street SEC 2	60	3	0.27	8	0.41	0.79	0.79

DRAINAGE BASINS

BASIN NAME/ CONCENTRATION POINT	AREA (ARCES)	Q ₁₀ /Q ₁₀₀ (CFS)
*DNW161-C	-	44/73
OFFX1	15.3	1/9
OFFX2	11.1	1/6
OND1	1.18	<1/<1
OND2	0.83	<1/<1
**CP1	-	45/82
***CP2	-	3/8

• Reference from 2018 CCRFCD Master Plan Update HEC-1
•• CP1 = •DNW161-C + OFFD1
••• CP2 = OFFD2 + OND1 +OND2



LEGEND

- ON1X Basin Name
- Flow Arrow
- Basin Boundary

NOTE:
-SEE GRADING PLAN SHEETS FOR DETAILED CONTOURS AND PRECISE GRADING

GRIFFITH RESIDENCE
OFFSITE AND ONSITE EXISTING CONDITION
DRAINAGE BASIN EXHIBIT

JPL ENGINEERING INC.

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APRIL, 2020

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DEPTH-DURATION-FREQUENCY VALUES FOR McCARRAN AIRPORT RAINFALL AREA (IN INCHES)

TIME	RECURRENCE INTERVAL					
	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
5 min.	0.15	0.27	0.35	0.46	0.54	0.63
10 min.	0.25	0.44	0.57	0.74	0.89	1.02
15 min.	0.33	0.57	0.74	0.97	1.15	1.32
30 min.	0.44	0.78	1.01	1.31	1.55	1.79
1 hour	0.52	0.89	1.15	1.50	1.78	2.06
2 hour	0.59	1.01	1.30	1.70	2.01	2.30
3 hour	0.64	1.08	1.39	1.82	2.15	2.48
6 hour	0.72	1.22	1.58	2.05	2.41	2.77
24 hour (TR-55)	1.20	1.60	1.80	2.40	2.70	2.96

- NOTE: 1. Refer to Figure 513 for a description and drawing of the area included in the McCarran Airport Rainfall Area.
2. The 24 hour values presented above are for use with TR-55 only.
3. Table 501 adjustments not required.

Revision	Date

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

SIX-HOUR STORM DISTRIBUTIONS

Percent of Total Storm Depth				Percent of Total Storm Depth			
Storm Time (In Minutes)	SDN3	SDN4	SDN5	Storm Time (In Minutes)	SDN3	SDN4	SDN5
0	0.0	0.0	0.0	185	32.2	37.6	43.0
5	2.0	2.0	2.0	190	35.2	41.5	47.7
10	5.7	5.8	5.9	195	40.9	46.2	51.4
15	7.0	7.5	8.0	200	49.9	53.0	56.1
20	8.7	9.9	11.0	205	59.0	61.0	63.0
25	10.8	12.6	14.4	210	71.0	71.0	71.0
30	12.4	13.7	15.0	215	74.4	73.2	72.0
35	13.0	14.5	16.0	220	78.1	75.6	73.1
40	13.0	14.9	16.8	225	81.2	78.2	75.2
45	13.0	15.1	17.1	230	81.9	79.9	77.9
50	13.0	15.5	18.0	235	83.5	81.3	79.0
55	13.0	15.6	18.2	240	85.1	82.3	79.5
60	13.0	15.9	18.7	245	85.6	83.0	80.4
65	13.3	16.2	19.0	250	86.0	83.5	81.0
70	14.0	16.9	19.7	255	86.8	84.4	82.0
75	14.2	17.2	20.2	260	87.6	85.1	82.6
80	14.8	17.9	21.0	265	88.8	86.4	84.0
85	15.8	18.9	22.0	270	91.0	88.5	85.9
90	17.2	20.1	23.0	275	92.6	90.8	88.9
95	18.1	21.1	24.1	280	93.7	92.4	91.0
100	19.0	22.0	25.0	285	95.0	94.4	93.8
105	19.7	22.8	25.9	290	97.0	96.8	96.6
110	19.9	23.2	26.5	295	97.6	97.3	97.0
115	20.0	24.0	28.0	300	98.2	97.8	97.4
120	20.1	24.6	29.0	305	98.5	98.2	97.9
125	20.4	25.2	30.0	310	98.7	98.4	98.1
130	21.4	26.0	30.5	315	98.9	98.6	98.3
135	22.9	26.9	30.9	320	99.0	98.8	98.5
140	24.1	27.6	31.0	325	99.3	99.1	98.9
145	24.9	28.3	31.7	330	99.3	99.2	99.0
150	25.1	28.6	32.1	335	99.4	99.3	99.2
155	25.6	29.2	32.7	340	99.5	99.4	99.3
160	27.0	30.2	33.3	345	99.8	99.7	99.6
165	27.8	31.2	34.6	350	99.8	99.8	99.7
170	28.1	32.1	36.1	355	99.9	99.9	99.9
175	28.3	33.2	38.1	360	100.0	100.0	100.0
180	29.5	35.2	40.8				

- Notes: 1. For drainage areas less than 8 square miles in size, use SDN 3.
 2. For drainage areas greater than or equal to 8 square miles and less than 12 square miles in size, use SDN 4.
 3. For drainage areas greater than or equal to 12 square miles, use SDN 5.
 4. A graphical representation of these values is presented on **Figure 515**.

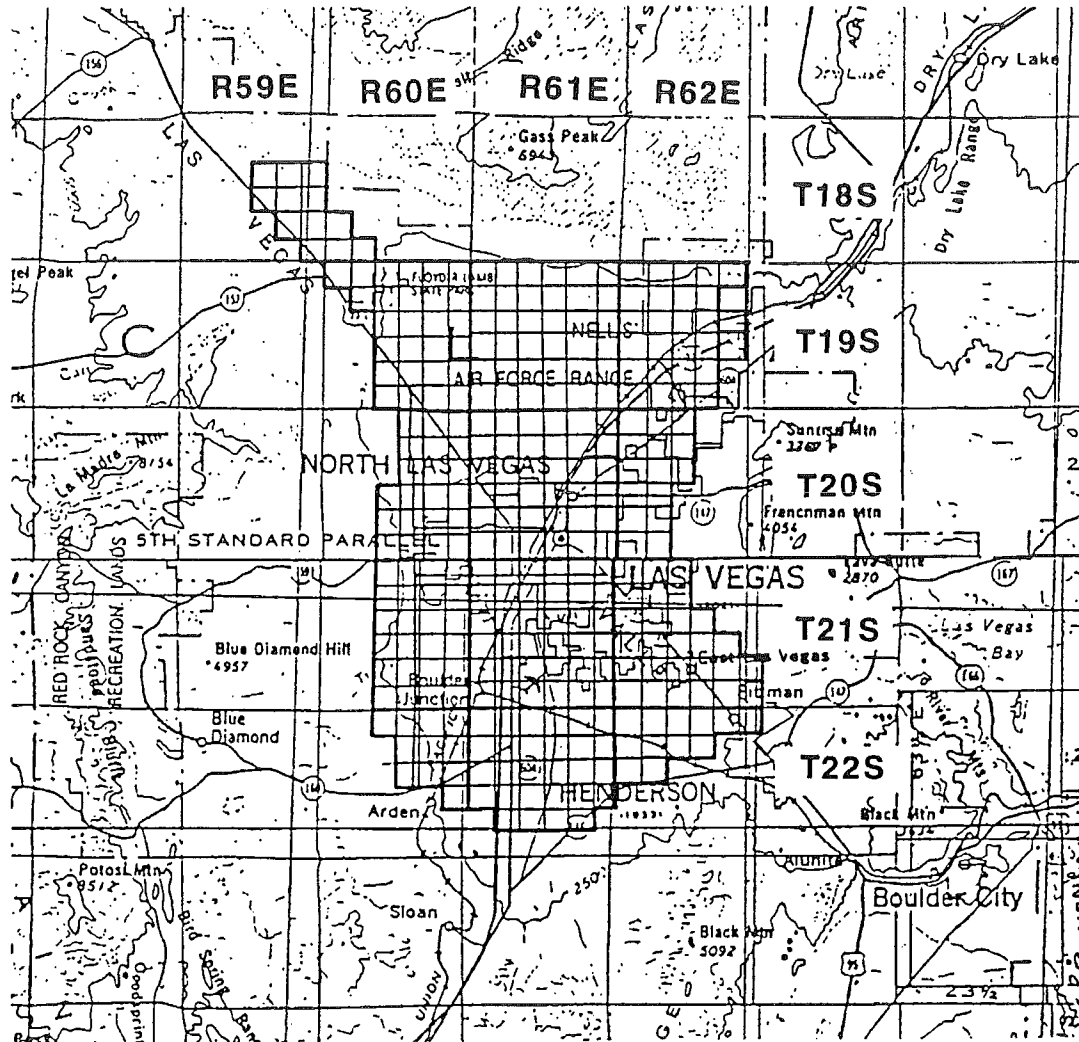
Revision	Date

REFERENCE:

TABLE 503

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

McCARRAN AIRPORT RAINFALL AREA



TOWNSHIP RANGE SECTIONS

18 South	59 East	13-15,22-26,36
18 South	60 East	30-32
19 South	60 East	1-6,8-16,21-28,33-36
19 South	61 East	ALL SECTIONS
19 South	62 East	2-11,14-23,27-34
20 South	60 East	1-3,10-15,21-28,33-36
20 South	61 East	ALL SECTIONS

TOWNSHIP RANGE SECTIONS

20 South	62 East	4-9,16-20,29-32
21 South	60 East	1-4,9-16,21-28,33-36
21 South	61 East	ALL SECTIONS
21 South	62 East	4-9,15-23, 25-36
22 South	60 East	1-4,10-15,24
22 South	61 East	1-24,26-29
22 South	62 East	1-10,17-18

Notes:

1. Refer to Table 505 and Figure 516 Depth-Duration-Frequency values in the McCarran Airport Rainfall Area.
2. Refer to Table 506 and Figure 517 for Time-Intensity-Frequency values on the McCarran Airport Rainfall Area.

Revision	Date

WRC

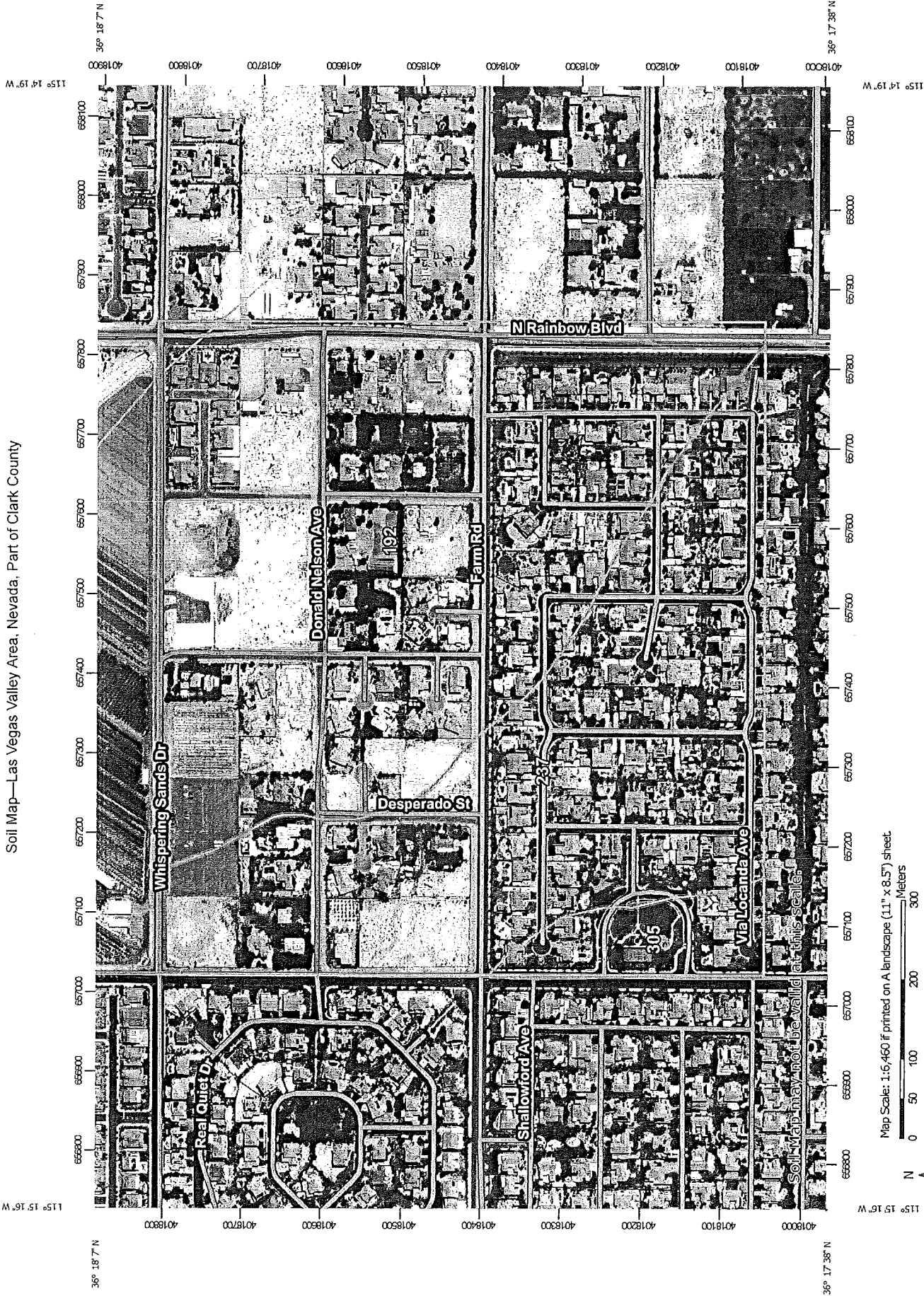
ENGINEERING

REFERENCE:

USACE. Los Angeles District. 1988

FIGURE 513

Soil Map—Las Vegas Valley Area, Nevada, Part of Clark County



MAP LEGEND

Area of Interest (AOI)			Spill Area
Area of Interest (AOI)			Stony Spot
Soils			Very Stony Spot
Soil Map Unit Polygons			Wet Spot
Soil Map Unit Lines			Other
Soil Map Unit Points			Special Line Features
Special Point Features			
Water Features			Streams and Canals
Blowout			
Borrow Pit			
Clay Spot			
Closed Depression			
Gravel Pit			
Gravelly Spot			
Landfill			
Lava Flow			
Marsh or swamp			
Mine or Quarry			
Miscellaneous Water			
Perennial Water			
Rock Outcrop			
Saline Spot			
Sandy Spot			
Severely Eroded Spot			
Sinkhole			
Slide or Slip			
Sodic Spot			
Transportation			Rails
Interstate Highways			
US Routes			
Major Roads			
Local Roads			
Background			Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County

Survey Area Data: Version 14, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 3, 2016—Oct 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
192	Dalian-McCullough complex, 0 to 4 percent slopes	87.7	56.6%
237	Glencarb very fine sandy loam, hardpan substratum	60.5	39.0%
305	Las Vegas-DeStazo complex, 0 to 2 percent slopes	6.8	4.4%
Totals for Area of Interest		155.1	100.0%

Las Vegas Valley Area, Nevada, Part of Clark County

192—Dalian-McCullough complex, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: hrb5
Elevation: 1,800 to 5,700 feet
Mean annual precipitation: 4 to 10 inches
Mean annual air temperature: 57 to 68 degrees F
Frost-free period: 170 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Dalian and similar soils: 55 percent
McCullough and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dalian

Setting

Landform: Fan skirts
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from limestone and dolostone

Typical profile

H1 - 0 to 5 inches: very gravelly fine sandy loam
H2 - 5 to 60 inches: very gravelly fine sandy loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High
(1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 60 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Hydric soil rating: No

Description of McCullough

Setting

Landform: Fan skirts
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 5 inches: very gravelly very fine sandy loam
H2 - 5 to 30 inches: stratified sandy loam to loam
H3 - 30 to 40 inches: stratified coarse sand to loamy fine sand
H4 - 40 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat):
Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Gypsum, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Other vegetative classification: LIMY 3-5" P.Z. (030XB019NV_3)
Hydric soil rating: No

Minor Components

Las Vegas

Percent of map unit: 5 percent
Landform: Basin-floor remnants
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: LIMY 3-5" P.Z. (030XB019NV_3)
Hydric soil rating: No

Tencee

Percent of map unit: 5 percent
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex

Hydric soil rating: No

Data Source Information

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 14, Sep 16, 2019

Las Vegas Valley Area, Nevada, Part of Clark County

237—Glencarb very fine sandy loam, hardpan substratum

Map Unit Setting

National map unit symbol: hrbb

Elevation: 2,100 to 2,500 feet

Mean annual precipitation: 4 to 6 inches

Mean annual air temperature: 64 to 68 degrees F

Frost-free period: 180 to 250 days

Farmland classification: Not prime farmland

Map Unit Composition

Glencarb and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glencarb

Setting

Landform: Alluvial flats

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Mixed alluvium

Typical profile

H1 - 0 to 6 inches: very fine sandy loam

H2 - 6 to 42 inches: stratified very fine sandy loam to silty clay loam

H3 - 42 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: 39 to 60 inches to petrocalcic

Natural drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 60 percent

Gypsum, maximum in profile: 5 percent

Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 30.0

Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): 2s

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C

Map Unit Description: Glencarb very fine sandy loam, hardpan substratum---Las Vegas Valley Area, Nevada, Part of Clark County

Other vegetative classification: LIMY 3-5" P.Z. (030XB019NV_3)
Hydric soil rating: No

Data Source Information

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 14, Sep 16, 2019

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

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	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

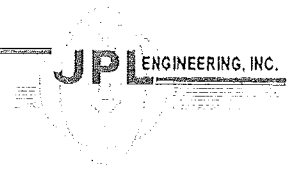
REFERENCE:

TABLE 602A

Curve Number Summary Table for Developed/Existing Conditions

Basin Name	Soil Composition	Soil Type	Percent of each soil Type	Hydrologic Group				Percent of each hydrologic group				Land Use	Percent of each land use	Curve numbers for respective land use				Composite Curve number calculations
				A	B	C	D	A	B	C	D			A	B	C	D	
Basin ONX1	Dalian	192	100	X	X		X	55	35	0	10	Residential Districts (80,000)	100	46	65	77	82	56.3
Basin OND1	Dalian	192	100	X	X		X	55	35	0	10	Residential Districts (40,000)	100	51	68	79	84	60.3
Basin OFFX1	Dalian	192	70	X	X		X	55	35	0	10	Residential Districts (40,000)	70	51	68	79	84	60.3
	Glencarb	237	30				X	0	0	100	0	Residential Districts (40,000)	30	51	68	79	84	79.0
Basin OFFD1	Dalian	192	70	X	X		X	55	35	0	10	Residential Districts (20,000)	70	54	70	80	85	62.7
	Glencarb	237	30				X	0	0	100	0	Residential Districts (20,000)	30	54	70	80	85	80.0
Basin OFFX2	Dalian	192	75	X	X		X	55	35	0	10	Residential Districts (40,000)	75	51	68	79	84	60.3
	Glencarb	237	25				X	0	0	100	0	Residential Districts (40,000)	25	51	68	79	84	79.0
Basin OFFD2	Dalian	192	75	X	X		X	55	35	0	10	Residential Districts (20,000)	75	54	70	80	85	62.7
	Glencarb	237	25				X	0	0	100	0	Residential Districts (20,000)	25	54	70	80	85	80.0

Notes: Refer Table 602 and Table 602A of criteria manual for CN of different hydrologic soil groups



Street FlowMaster Calculations

Balsam Street Q10

Worksheet for Irregular Channel

Project Description	
Worksheet	Balsam Street Q10
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	0.8000 %
Discharge	3.00 cfs

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

Results	
Mannings Coefficient	0.020
Water Surface Elevation	2,366.10 ft
Elevation Range	2,365.83 to 2,366.56
Flow Area	1.5 ft²
Wetted Perimeter	9.86 ft
Top Width	9.75 ft
Actual Depth	0.27 ft
Critical Elevation	2,366.08 ft
Critical Slope	1.1219 %
Velocity	1.94 ft/s
Velocity Head	0.06 ft
Specific Energy	2,366.16 ft
Froude Number	0.86
Flow Type	Subcritical

Calculation Messages:

Water elevation exceeds lowest end station by 0.97791748e-1 ft.

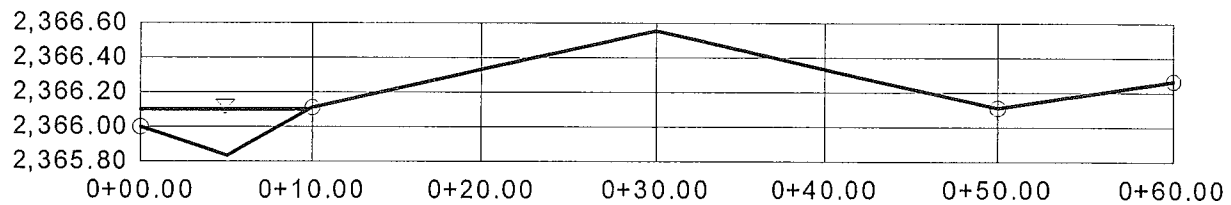
Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+10.00	0.020
0+10.00	0+50.00	0.016
0+50.00	0+60.00	0.020

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.00	2,366.00
0+05.00	2,365.83
0+10.00	2,366.11
0+30.00	2,366.56
0+50.00	2,366.11
0+60.00	2,366.26

Balsam Street Q10 Cross Section Cross Section for Irregular Channel

Project Description	
Worksheet	Balsam Street Q10
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.020
Channel Slope	0.8000 %
Water Surface Elevation	2,366.10 ft
Elevation Range	2,365.83 to 2,366.56
Discharge	3.00 cfs

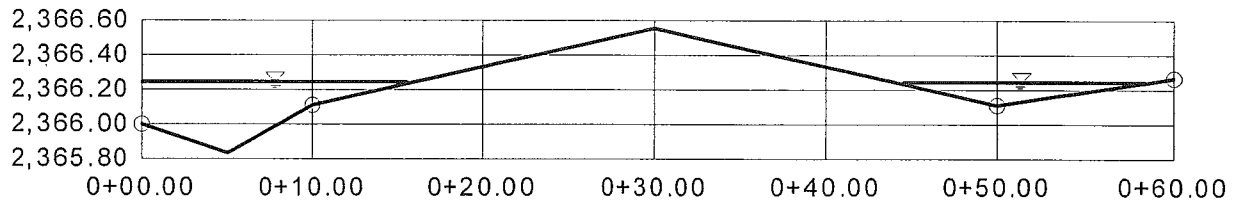


V:10.0
H:1
NTS

Balsam Street Q100 Cross Section Cross Section for Irregular Channel

Project Description	
Worksheet	Balsam Street
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.019
Channel Slope	0.8000 %
Water Surface Elevation	2,366.24 ft
Elevation Range	2,365.83 to 2,366.56
Discharge	8.00 cfs



V:10.0
H:1
NTS

Balsam Street Q100

Worksheet for Irregular Channel

Project Description	
Worksheet	Balsam Street
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	0.8000 %
Discharge	8.00 cfs

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

Results	
Mannings Coefficient	0.019
Water Surface Elevation	2,366.24 ft
Elevation Range	2,365.83 to 2,366.56
Flow Area	4.1 ft ²
Wetted Perimeter	29.69 ft
Top Width	29.44 ft
Actual Depth	0.41 ft
Critical Elevation	2,365.83 ft
Critical Slope	0.0000 %
Velocity	1.93 ft/s
Velocity Head	0.06 ft
Specific Energy	2,366.29 ft
Froude Number	0.91
Flow Type	Subcritical

Calculation Messages:

Water elevation exceeds lowest end station by 0.2366597 ft.
Flow is divided.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+10.00	0.020
0+10.00	0+50.00	0.016
0+50.00	0+60.00	0.020

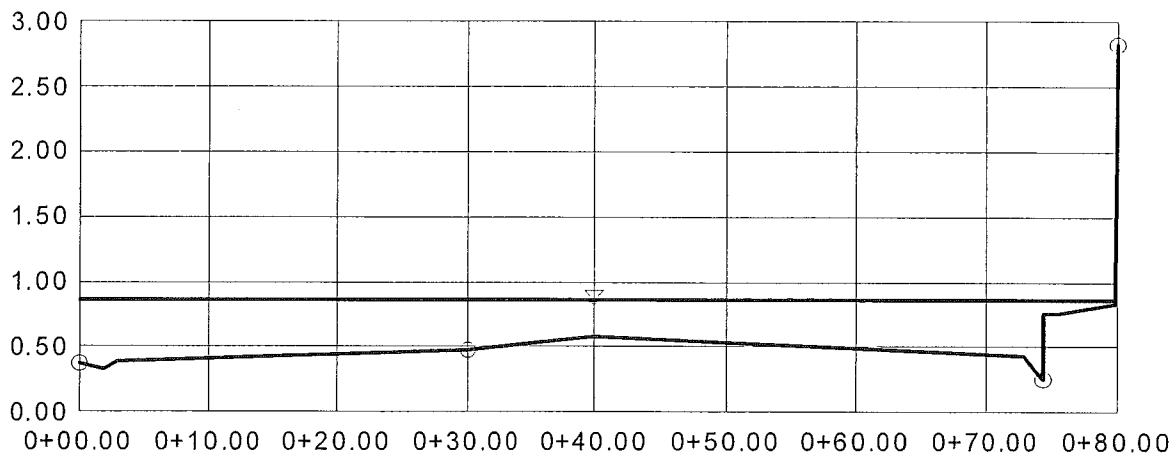
Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.00	2,366.00
0+05.00	2,365.83
0+10.00	2,366.11
0+30.00	2,366.56
0+50.00	2,366.11
0+60.00	2,366.26

Farm Road Q100 Cross Section

Cross Section for Irregular Channel

Project Description	
Worksheet	Farm Road
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.017
Channel Slope	0.4000 %
Water Surface Elevation	0.86 ft
Elevation Range	0.26 to 2.83
Discharge	82.00 cfs



V: 10.0
H: 1
NTS

Farm Road Q100

Worksheet for Irregular Channel

Project Description	
Worksheet	Farm Road
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	0.4000 %
Discharge	82.00 cfs

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

Results	
Mannings Coefficient	0.017
Water Surface Elevation	0.86 ft
Elevation Range	0.26 to 2.83
Flow Area	29.3 ft ²
Wetted Perimeter	80.84 ft
Top Width	79.90 ft
Actual Depth	0.60 ft
Critical Elevation	0.81 ft
Critical Slope	0.6272 %
Velocity	2.80 ft/s
Velocity Head	0.12 ft
Specific Energy	0.98 ft
Froude Number	0.82
Flow Type	Subcritical

Calculation Messages:

Water elevation exceeds lowest end station by 0.49026612 ft.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+30.00	0.020
0+30.00	0+74.40	0.016
0+74.40	0+80.00	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.00	0.37
0+02.00	0.32
0+03.00	0.38
0+30.00	0.48
0+37.00	0.55
0+40.00	0.58
0+73.00	0.43
0+74.40	0.26

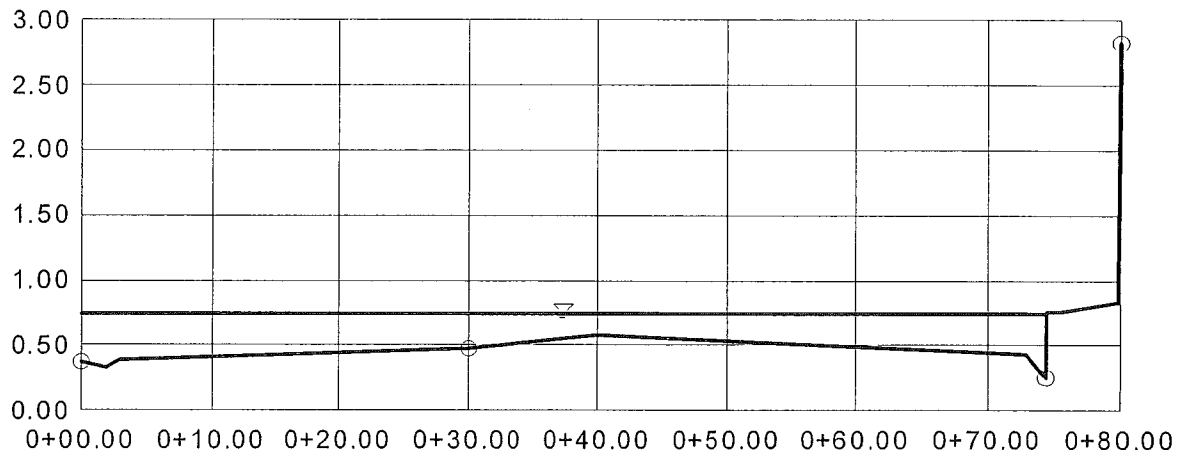
Farm Road Q100
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+74.50	0.76
0+75.50	0.76
0+79.90	0.83
0+80.00	2.83

Farm Road Q10 Cross Section **Cross Section for Irregular Channel**

Project Description	
Worksheet	Farm Road Q10
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.018
Channel Slope	0.4000 %
Water Surface Elevation	0.74 ft
Elevation Range	0.26 to 2.83
Discharge	45.00 cfs



V:10.0
H:1
NTS

Farm Road Q10

Worksheet for Irregular Channel

Project Description	
Worksheet	Farm Road Q10
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	0.4000 %
Discharge	45.00 cfs

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

Results	
Mannings Coefficient	0.018
Water Surface Elevation	0.74 ft
Elevation Range	0.26 to 2.83
Flow Area	20.3 ft ²
Wetted Perimeter	75.28 ft
Top Width	74.50 ft
Actual Depth	0.48 ft
Critical Elevation	0.70 ft
Critical Slope	0.7538 %
Velocity	2.22 ft/s
Velocity Head	0.08 ft
Specific Energy	0.82 ft
Froude Number	0.75
Flow Type	Subcritical

Calculation Messages:
Water elevation exceeds lowest end station by 0.3743037 ft.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+30.00	0.020
0+30.00	0+74.40	0.016
0+74.40	0+80.00	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.00	0.37
0+02.00	0.32
0+03.00	0.38
0+30.00	0.48
0+37.00	0.55
0+40.00	0.58
0+73.00	0.43
0+74.40	0.26

Farm Road Q10
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+74.50	0.76
0+75.50	0.76
0+79.90	0.83
0+80.00	2.83

JPL ENGINEERING INC.
File: STNDFORM4.XLS

GRIFFITH RESIDENCE
Existing and Developed Condition

DATE: 4/15/20

[illegible]
$$\begin{aligned} T_c &= T_i + T_t & T_{lag} &= 0.6 T_c \\ T_i &= 1.8 (1.1 - K) L^{1/2} / S^{1/3} \\ K &= 0.0132 (CN) - 0.39 \\ T_c \text{ Check} &= L/180 + 10 \end{aligned}$$

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 = $14.8 \cdot (S/100)^{1/2}$ Existing V2 = $29.4 \cdot (S/100)^{1/2}$
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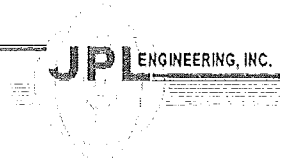
Developed	$V1 = 20.2 \cdot (S/100)^{1/2}$
Developed	$V2 = 30.6 \cdot (S/100)^{1/2}$

REFERENCE : 2002 Las Vegas Valley Flood Control Master Plan Update

STANDARD FORM 4

Minimum Tc for Urban= 5 Min

Minimum Tc for non-Urban=10 Min



HEC-1 (EXISTING AND DEVELOPED)

GEEX

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1*****
*****
*
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
ENGINEERS
* JUN 1998
*
CENTER
* VERSION 4.1
*
STREET
*
95616
* RUN DATE 15APR20 TIME 15:01:26
*
*
*****
*****

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

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X X XXXXXX XXXX X
X X X X X XX
X X X X X X
XXXXXX XXXX XXXX X
X X X X X X
X X X X X
X X XXXXXX XXXX XXX

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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT

STRUCTURE.

THE DEFINITION OF -AMSK- 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

```

1 ID File: GEEX.DAT
2 ID 15 APRIL 2020
3 ID
4 ID GRIFFITH ESTATES
5 ID EXISTING & DEVELOPED CONDITIONS RUN
6 ID
7 ID

```

*** FREE ***

```

8 IT 5 0 0 300
9 IO 5 0 0
10 IN 5 0 0
11 JR PREC 1.00 .57
*
12 KK OFFX1
13 KM OFFSITE EXISTING CONDITION BASIN 1
14 BA 0.0239
15 PB 2.77
16 PC .000 .020 .057 .070 .087 .108 .124 .130 .130 .130
17 PC .130 .130 .130 .133 .140 .142 .148 .158 .172 .181
18 PC .190 .197 .199 .200 .201 .204 .214 .229 .241 .249
19 PC .251 .256 .270 .278 .281 .283 .295 .322 .352 .409
20 PC .499 .590 .710 .744 .781 .812 .819 .835 .851 .856
21 PC .860 .868 .876 .888 .910 .926 .937 .950 .970 .976
22 PC .982 .985 .987 .989 .990 .993 .993 .994 .995 .998
23 PC .998 .999 1.00
24 LS 0 65.9
25 UD 0.241
*

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GEEX

26 KK OFFX2
 27 KM OFFSITE EXISTING CONDITION BASIN 2
 28 BA 0.0173
 29 LS 0 64.9
 30 UD 0.236
 *

31 KK ONX1
 32 KM ONSITE EXISTING CONDITION BASIN 1
 33 BA 0.0031
 34 LS 0 56.3
 35 UD 0.119
 *

36 KK OFFD1
 37 KM OFFSITE DEVELOPED CONDITION BASIN 1
 38 BA 0.0239
 39 LS 0 67.9
 40 UD 0.192
 *

1

HEC-1 INPUT

PAGE 2

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

41 KK OFFD2
 42 KM OFFSITE DEVELOPED CONDITION BASIN 2
 43 BA 0.0173
 44 LS 0 67
 45 UD 0.184
 *

46 KK OND1
 47 KM ONSITE DEVELOPED CONDITION BASIN 1
 48 BA 0.0018
 49 LS 0 60.3
 50 UD 0.117
 *

51 KK OND2
 52 KM ONSITE DEVELOPED CONDITION BASIN 2
 53 BA 0.0013
 54 LS 0 60.3
 55 UD 0.117
 *

56 ZZ

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT
 LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW
 NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW

12 OFFX1
 .
 26 . OFFX2
 .
 31 . ONX1
 .
 36 . OFFD1
 .
 41 . OFFD2
 .
 46 . OND1
 .
 51 . OND2
 .

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

1*****

*

*

*

GEEX

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*
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
ENGINEERS *
* JUN 1998 *
CENTER *
* VERSION 4.1 *
STREET *
*
95616 *
* RUN DATE 15APR20 TIME 15:01:26 *
*
*
*****
*****

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

```

File: GEEX.DAT
15 APRIL 2020

GRIFFITH ESTATES
EXISTING & DEVELOPED CONDITIONS RUN

```

9 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      .57

```

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

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION	
					RATIO 1	RATIO 2
					1.00	.57
HYDROGRAPH AT						
+	OFFX1	.02	1	FLOW TIME	7. 3.75	1. 4.92
HYDROGRAPH AT						
+	OFFX2	.02	1	FLOW TIME	4. 3.75	0. 4.92

					GEEX	
HYDROGRAPH AT						
+	ONX1	.00	1	FLOW	0.	0.
				TIME	3.75	.00
HYDROGRAPH AT						
+	OFFD1	.02	1	FLOW	9.	1.
				TIME	3.67	3.83
HYDROGRAPH AT						
+	OFFD2	.02	1	FLOW	6.	1.
				TIME	3.67	4.92
HYDROGRAPH AT						
+	OND1	.00	1	FLOW	0.	0.
				TIME	3.58	4.92
HYDROGRAPH AT						
+	OND2	.00	1	FLOW	0.	0.
				TIME	3.58	4.92

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

Reference Material

“2018 CCRFCD Master Plan Update” ATKINS, prepared by Clark County Regional Flood Control District, December 2018 (DNW161-C)

CCWEST3

1*****

*
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
ENGINEERS *
* JUN 1998
*
* CENTER *
* VERSION 4.1
*
* STREET *
*
* 95616 *
* RUN DATE 04DEC18 TIME 11:59:45 *
*
*

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

```

X   X  XXXXXX  XXXXX  X
X   X  X      X      XX
X   X  X      X      X
XXXXXX XXXX   X      XXXX X
X   X  X      X      X
X   X  X      X      X
X   X  XXXXXX  XXXXX  XXX

```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.
THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT
STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77
VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

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

*DIAGRAM

*** FREE ***

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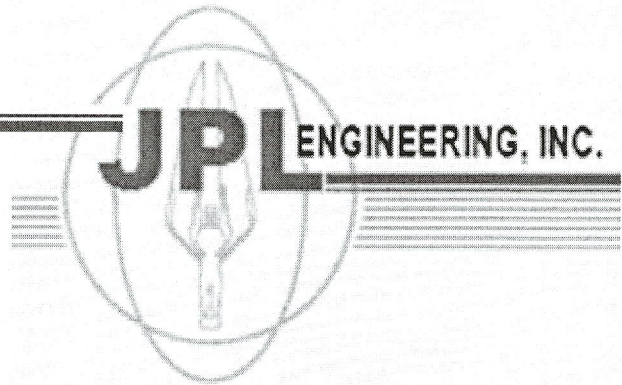
1 ID CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT 2018 MASTER PLAN UPDATE
2 ID UPPER and LOWER NORTHERN LAS VEGAS WASH WATERSHED
3 ID RECOMMENDED DRAINAGE SYSTEM WITH ULTIMATE DEVELOPMENT
4 ID INPUT FILE = CCWEST3.DAT
5 ID INPUT FILE DATE = DEC 2018
6 ID DESIGN STORM = 100-YEAR 6-HOUR STORM
7 ID STORM DISTRIBUTION = SDN3
8 ID MODELED BY ATKINS (EMILY GONSETH, MANOGYA KHANAL)
9 ID CHECKED BY = ATKINS - RAUL VALDEZ, P.E
10 ID STORM CENTERING = REMOVED NORTH LAS VEGAS AND CARY LAKE MEAD DB OUTFLOWS
11 ID DOWNSTREAM OF THE UPPER LAS VEGAS WASH DETENTION BASIN TO THE MOST
12 ID DOWNSTREAM POINT IN THE LOWER NORTHERN LAS VEGAS WASH WATERSHED
13 ID
14 ID REFERENCED HYDROLOGIC MODELS:
15 ID REVISED FINAL DESIGN REPORT FOR THE RANCHO DETENTION BASIN
16 ID PHASE II (VTN 2006)
17 ID SECOND RESPONSE TO COMMENTS OF THE CONCEPTUAL DRAINAGE STUDY
18 ID FOR NORTH LAS VEGAS 2074-ACRE SITE (GC WALLACE 2006)
19 ID BASIN MAPS FOR SUPPLEMENT #2 TO ADDENDUM #2 TO THE MASTER
20 ID DRAINAGE STUDY FOR CLIFF'S EDGE/ PROVIDENCE (VTN 2004)
21 ID MASTER DRAINAGE STUDY FOR KYLE CANYON (GC WALLACE 2006)
22 ID TECHNICAL DRAINAGE STUDY FOR GRAND TETON DRIVE STORM DRAIN
23 ID AND AREA 1 ROADWAY IMPROVEMENTS (GC WALLACE 2006)
24 ID 90% FINAL DESIGN REPORT FOR RANCHO ROAD SYSTEM - EL CAMPO
25 ID GRANDE STORM DRAIN PROJECT (PBS&J 2007)
26 ID MPA FOR RACEL STREET COLLECTOR (LOUIS BERGER JANUARY 2007)
27 ID HYDROLOGIC MODEL FOR FLOYD LAMB NORTH AND SOUTH ENVIRONMENTAL
28 ID ENHANCEMENT AREAS (LOUIS BERGER DECEMBER 7, 2007)

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29	ID	CCWEST3			
30	ID	MASTER DRAINAGE STUDY FOR PARK HIGHLANDS WEST (SHG, 2014)			
31	ID	MASTER DRAINAGE STUDY FOR VILLAS AT TULE SPRINGS (SHG, 2015)			
32	ID	LAS VEGAS BOULEVARD NORTH TONOPAH AVENUE TO CAREY AVENUE (VTN, 2015)			
33	ID	TECHNICAL DRAINAGE STUDY FOR NORTH LAS VEGAS DETENTION BASIN			
34	ID	EVALUATION & DRAINAGE EASEMENT VACATION REQUEST (SHG, 2017)			
35	ID				
36	ID				
37	ID	JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:			
38	ID				
39	ID	AREA (SQUARE MILES)	DARF		
40	ID		SDN3	SDN4	SDN5A SDN5B
41	ID	0 - 0.5	0.99		
42	ID	0.5 - 1	0.975		
43	ID	1 - 2	0.95		
44	ID	2 - 3	0.925		
45	ID	3 - 4	0.915		
46	ID	4 - 5	0.908		
47	ID	5 - 6	0.903		
48	ID	6 - 7	0.895		
49	ID	7 - 8	0.885		
50	ID	8 - 9		0.875	
51	ID	9 - 10		0.865	
52	ID	10 - 11		0.857	
53	ID	11 - 12		0.85	

CCWEST3

ROUTED TO													
+	RCW138-C	1.16	1	FLOW TIME	739. 3.92	717. 3.92	686. 3.92	657. 3.92	644. 3.92	633. 3.92	630. 3.92	620. 3.92	607. 3.92
2 COMBINED AT													
+	2C163-C	6.59	1	FLOW TIME	1456. 4.00	1411. 4.00	1337. 4.00	1256. 4.00	1235. 4.00	1207. 4.00	1188. 4.00	1165. 4.00	1130. 4.00
ROUTED TO													
+	R2C163-C	6.59	1	FLOW TIME	1449. 4.00	1406. 4.00	1331. 4.00	1252. 4.00	1231. 4.00	1203. 4.00	1186. 4.00	1163. 4.00	1129. 4.00
HYDROGRAPH AT													
+	NW162-C	.25	1	FLOW TIME	92. 3.92	88. 3.92	83. 3.92	77. 3.92	75. 3.92	74. 3.92	73. 3.92	71. 3.92	69. 3.92
2 COMBINED AT													
+	CNW162-C	6.84	1	FLOW TIME	1539. 4.00	1493. 4.00	1413. 4.00	1329. 4.00	1305. 4.00	1276. 4.00	1258. 4.00	1233. 4.00	1197. 4.00
ROUTED TO													
+	RCW162-C	6.84	1	FLOW TIME	1531. 4.00	1486. 4.00	1406. 4.00	1324. 4.00	1298. 4.00	1270. 4.00	1254. 4.00	1228. 4.00	1194. 4.00
HYDROGRAPH AT													
+	NW161-C	.33	1	FLOW TIME	143. 4.08	139. 4.08	132. 4.08	125. 4.08	122. 4.08	120. 4.08	119. 4.08	116. 4.08	114. 4.08
DIVERSION TO													
+	DNW150-C	.33	1	FLOW TIME	70. 3.67	70. 3.75	70. 3.75	70. 3.75	70. 3.75	70. 3.75	70. 3.75	70. 3.75	70. 3.75
HYDROGRAPH AT													
+	DNW161-C	.33	1	FLOW TIME	73. 4.08	69. 4.08	62. 4.08	55. 4.08	52. 4.08	50. 4.08	49. 4.08	46. 4.08	44. 4.08
2 COMBINED AT													
+	CD161-C	7.16	1	FLOW TIME	1603. 4.00	1554. 4.00	1466. 4.00	1377. 4.00	1349. 4.00	1319. 4.00	1301. 4.00	1273. 4.00	1236. 4.00
ROUTED TO													
+	RCD161-C	7.16	1	FLOW TIME	1591. 4.00	1543. 4.00	1455. 4.00	1367. 4.00	1339. 4.00	1309. 4.00	1292. 4.00	1263. 4.00	1227. 4.00
HYDROGRAPH AT													
+	NW134-C	.46	1	FLOW TIME	255. 4.08	249. 4.08	238. 4.08	227. 4.08	223. 4.08	220. 4.08	218. 4.08	214. 4.08	210. 4.08
HYDROGRAPH AT													
+	NW133-C	.38	1	FLOW TIME	221. 3.92	215. 3.92	205. 3.92	195. 3.92	191. 3.92	188. 3.92	186. 3.92	183. 3.92	179. 3.92
2 COMBINED AT													
+	CNW133-C	.84	1	FLOW TIME	468. 4.00	456. 4.00	436. 4.00	415. 4.00	407. 4.00	401. 4.00	397. 4.00	391. 4.00	383. 4.00
ROUTED TO													
+	ELKBASIN	.84	1	FLOW TIME	107. 5.58	106. 5.58	103. 5.58	100. 5.58	99. 5.58	98. 5.58	97. 5.58	97. 5.58	95. 5.58
** PEAK STAGES IN FEET **													
1	STAGE				2396.63	2396.41	2396.05	2395.68	2395.53	2395.43	2395.35	2395.23	2395.09
	TIME				5.58	5.58	5.58	5.58	5.58	5.58	5.58	5.58	5.58



**SUPPLEMENT EMAIL
TECHNICAL DRAINAGE STUDY**

FOR

GRIFFITH RESIDENCE

(APN: 125-15-607-009)

PW20-13554

@

FARM ROAD AND BALSAM STREET

JPL Job No. 19024

Prepared for:

MARK E. & NOAMA GRIFFITH

6900 Farm Road

Las Vegas, NV 89131

Prepared by:

JPL Engineering, Inc.

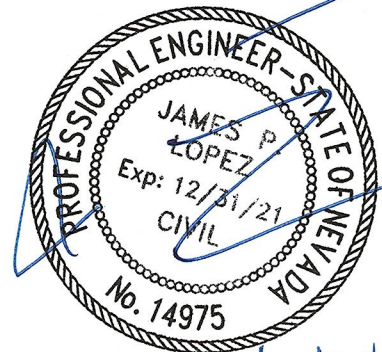
6725 South Eastern Ave., Ste. 5

Las Vegas, Nevada 89119

Phone: 702-898-6269

Fax: 877-557-8292

June, 2020



From: Rhonda Miller [mailto:Rhonda.Miller@westwoodps.com]
Sent: Tuesday, June 30, 2020 10:01 AM
To: Ernie Corn
Cc: Josh Johnson; james@jplengineeringinc.com
Subject: RE: PW20-13554 (Griffith Estates)

Hi Ernie,

I spoke to the owner and he is agreeable to adding the 5-foot drainage easement along the northerly property line. We will add this to the parcel map that is in process now. Let me know if you'd like an updated copy of the map showing the easement.

Thank you!

Rhonda Miller

Assistant Project Manager
rhonda.miller@westwoodps.com

direct (702) 284-5377
main (702) 284-5300
cell (702) 574-7432

Westwood
5740 S. Arville Street, Suite 216
Las Vegas, NV 89118

westwoodps.com
(888) 937-5150

From: Ernie Corn <Ernie.Corn@ClarkCountyNV.gov>
Sent: Thursday, June 11, 2020 7:19 AM
To: Rhonda Miller <Rhonda.Miller@westwoodps.com>; Josh Johnson <Josh.Johnson@westwoodps.com>; james@jplengineeringinc.com
Subject: FW: PW20-13554 (Griffith Estates)

Just wanted to follow up and see if anything was decided yet.

Ernie

From: Ernie Corn
Sent: Monday, June 8, 2020 8:30 AM
To: Rhonda Miller <Rhonda.Miller@westwoodps.com>; Josh Johnson <Josh.Johnson@westwoodps.com>; james@jplengineeringinc.com
Subject: PW20-13554 (Griffith Estates)

Good morning all,

Rhonda I know we emailed back and forth about the drainage easement located in parcel 125-15-607-004 and how it didn't appear to impact the subject site.

However after speaking with Layne we believe it would be best to dedicate a 5 foot private drainage easement to be privately maintained along the north property line.

For the future possibility of adjacent parcels wanting to drain through the subject site.

The 18 inches of free board for the drainage easement will not be required at this time but if in the future adjacent parcels would like to drain through the drainage easement the owner could have them build a 2' CMU wall to meet the freeboard requirements.

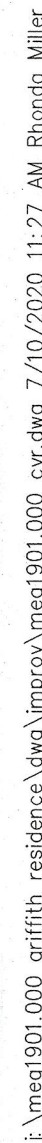
Let me know what you guys think.

No revised plans or calculation would be required, I would simply redline the plans and add a comment to the approval letter.

Thanks.

Ernie

Ernie Corn, P.E.
Associate Engineer
Clark County Department of Public Works
500 S. Grand Central Parkway
Las Vegas, NV 89155



APN: 125-15-607-009



SHEET INDEX

DATE _____

1,500 GPM 20 PS

DATE _____

--	--

100

APPROVED FOR CONSTRUCTION

SHEETS: C-2, C-3, U-1

DATE _____

DATE _____

DATE _____

SLATER HANIFAN GROUP, INC.
5740 S. ARVILLE ST, SUITE 216
LAS VEGAS, NV 89118
PH: (702) 284-5300
FX: (702) 284-5399
CONTACT: JOSH JOHNSON
EMAIL: JOSH.JOHNSON@WESTWOODPS.COM



PW19-20399

FIRE DEPARTMENT NOTES

GENERAL:

- ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE CLARK COUNTY FIRE CODE AS AMENDED, THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS (UDACS) AS ADOPTED BY CLARK COUNTY AND THE CURRENTLY ADOPTED EDITION OF NFPA 24.
- FIRE HYDRANTS AND WATER SUPPLIES FOR FIRE PROTECTION SHALL BE INSTALLED, INSPECTED BY FIRE PREVENTION AND IN SERVICE PRIOR TO AND DURING THE TIME OF CONSTRUCTION IN ACCORDANCE WITH SECTION 3312 OF THE F.C. AS AMENDED. FIRE HYDRANTS SHALL BE WITHIN 300 FEET OF COMBUSTIBLE MATERIALS.
- IF DURING CONSTRUCTION IT BECOMES NECESSARY TO CLOSE ANY CONTROL VALVE OR PLACE A HYDRANT OUT OF SERVICE, APPROVAL SHALL BE OBTAINED FROM THE CDDPP PRIOR TO PLACING THE HYDRANT OUT OF SERVICE.

FIRE HYDRANTS

- FIRE HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MOST CURRENT EDITION OF UDACS, NFPA 24 AND THIS GUIDELINE. FIRE HYDRANTS SHALL BE MAINTAINED IN ACCORDANCE WITH NFPA 25 AND KEPT IN AN OPERATIVE CONDITION WITH THE REQUIRED WATER SUPPLY.
- MANUFACTURER AND MODEL OF FIRE HYDRANTS SHALL CONFORM TO THE APPROVED MATERIALS LIST OF THE LAS VEGAS VALLEY WATER DISTRICT.
- HYDRANTS SHALL BE INSTALLED WITH THEIR PUMPER OUTLET NOZZLE (STEAMER CONNECTION) FACING THE FIRE ACCESS ROAD. A 3-FOOT CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF FIRE HYDRANTS. WHERE HYDRANTS ARE SUBJECT TO IMPACT BY MOTOR VEHICLES, GUARD POSTS (PIPE BOLLARDS) SHALL BE INSTALLED IN ACCORDANCE WITH F.C. SECTION 312.
- HYDRANTS SHALL BE PAINTED SAFETY YELLOW FOR PUBLIC AND SAFETY RED FOR PRIVATE.
- FIRE HYDRANTS SHALL BE LOCATED 4' TO 7' FROM BACK OF CURB (C102.11).
- PAINTING OF CURBS AND/OR ASPHALT AREAS ADJACENT TO HYDRANTS SHALL BE COMPLETED BY THE INSTALLER PRIOR TO FINAL RELEASE INSPECTION. A COAT OF EXTERIOR INDUSTRIAL GRADE SAFETY RED ENAMEL SHALL BE APPLIED FOR A MINIMUM OF 30 FEET, 15 FEET ON EACH SIDE OF THE HYDRANT.
- HYDRANT LOCATIONS SHALL BE MARKED BY MEANS OF A BLUE REFLECTIVE PAVEMENT MARKER INSTALLED IN THE CENTER OF THE FIRE ACCESS DRIVE LANE NEAREST TO THE HYDRANT.

FIRE DEPARTMENT CONNECTIONS

- FIRE DEPARTMENT CONNECTIONS SHALL BE LOCATED WITHIN 100 FEET OF A FIRE HYDRANT AS MEASURED BY AN APPROVED UNOBTSTRUCTED ROUTE.
- FIRE DEPARTMENT CONNECTIONS SHALL BE LOCATED ON THE STREET SIDE OF BUILDINGS, FULLY VISIBLE AND RECOGNIZABLE FROM THE STREET OR NEAREST POINT OF FIRE DEPARTMENT VEHICLE ACCESS (FIRE LANE) OR AS OTHERWISE APPROVED BY THE FIRE CHIEF.
- FIRE DEPARTMENT CONNECTIONS SHALL NOT BE CLOSER THAN 3 FEET TO ANY DOOR OR WINDOW OPENING AND SHALL NOT BE OBSTRUCTED BY TREES, SHRUBS, PARKING SPACES, ETC.
- FIRE DEPARTMENT CONNECTIONS SHALL BE LOCATED NOT LESS THAN 18 INCHES AND NOT MORE THAN 48 INCHES ABOVE THE LEVEL OF THE ADJACENT GRADE OR ACCESS LEVEL.

UNDERGROUND PIPING & VALVES

- UNDERGROUND PIPING SHALL HAVE A MINIMUM WORKING PRESSURE OF 150 PSI. UNDERGROUND PIPING CONNECTED TO A FIRE PUMP OR A FIRE DEPARTMENT CONNECTION (FDC) SHALL HAVE A MINIMUM WORKING PRESSURE OF 200 PSI (CLASS 200).
- FOR PRIVATE FIRE SERVICE MAINS TWO SOURCES OF WATER SUPPLY ARE REQUIRED WHENEVER 4 OR MORE FIRE HYDRANTS AND/OR FIRE SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. WATER SYSTEMS UNDER THE PURVIEW OF THE LAS VEGAS VALLEY WATER DISTRICT SHALL CONFORM TO THE LAS VEGAS VALLEY WATER DISTRICT RULES.
- FOR PRIVATE FIRE SERVICE MAINS SECTIONAL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS AND/OR FIRE SPRINKLER IN BUILDING RISERS (LEAD-INS) CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN. WATER SYSTEMS UNDER THE PURVIEW OF THE LAS VEGAS VALLEY WATER DISTRICT SHALL CONFORM TO THE LAS VEGAS VALLEY WATER DISTRICT RULES.
- ALL PIPING AND VALVES SUPPLYING FIRE SPRINKLER SYSTEMS SHALL BE PROTECTED FROM FREEZING WHEN EXPOSED TO TEMPERATURES LESS THAN 40°F. FREEZE PROTECTION SHALL BE APPROVED, DURABLE AND PERMANENT.
- ALL REQUIRED HYDROSTATIC TESTING AND FLUSHING OF THE PRIVATE FIRE SERVICE MAIN OR UNDERGROUND FIRE SPRINKLER/STANDPIPE WATER SUPPLY PIPING SHALL BE PERFORMED IN THE PRESENCE OF CLARK COUNTY FIRE PREVENTION STAFF. THE PIPING JOINTS SHALL BE UNCOVERED. THE INSTALLING CONTRACTOR SHALL FURNISH A CONTRACTOR'S MATERIAL AND TESTING CERTIFICATE (CMAT) COUNTERSIGNED BY THE PROPERTY OWNER OR REPRESENTATIVE. THE CMAT SHALL BE FILLED OUT COMPLETELY WITH THE INSPECTOR'S INITIALS, WITNESSING EACH TEST. A COPY OF THE UNDERGROUND FLUSH AND HYDROSTATIC TESTING DOCUMENTATION SHALL BE ON-SITE AND SIGNED PRIOR TO THE CONNECTION OF THE UNDERGROUND WATER SUPPLY TO THE FIRE SPRINKLER SYSTEM.

GATES

- SHOP DRAWINGS FOR ALL GATES AND MOTORIZED OPENERS OBSTRUCTING FIRE DEPARTMENT ACCESS ROADS SHALL BE SUBMITTED SEPARATELY FOR REVIEW AND RECEIVE APPROVAL PRIOR TO INSTALLATION. A SEPARATE PERMIT IS REQUIRED FOR EACH GATED ENTRANCE.

FIRE APPARATUS ACCESS ROADS

- SPEED BUMPS AND/OR SPEED HUMPS SHALL NOT BE PERMITTED WITHIN THE REQUIRED WIDTH OF FIRE APPARATUS ACCESS ROADS.
- EXCEPTIONS:
 - SPEED HUMPS ARE ALLOWED ON PRIVATE FIRE APPARATUS ACCESS ROADS SERVING COMMERCIAL AND INDUSTRIAL BUILDINGS WHEN APPROVED BY THE FIRE CODE OFFICIAL.
 - RUMBLE STRIPS ARE ALLOWED ON PRIVATE FIRE APPARATUS ACCESS ROADS SERVING RESIDENTIAL, COMMERCIAL AND INDUSTRIAL BUILDINGS WHEN APPROVED BY THE FIRE CODE OFFICIAL.
- FOR GROUP R, DIVISION 3 STRUCTURES AND FOR STRUCTURES CONSTRUCTED IN ACCORDANCE WITH THE IRC, ROADS SERVING A MAXIMUM OF 6 RESIDENCES AND HAVING A MAXIMUM LENGTH OF 150 FEET, AS MEASURED FROM THE INTERSECTION TO THE BACK OF CURB AT THE END OF THE STUB STREET, MAY FRONT ONTO A STUB STREET WITH A MINIMUM WIDTH OF 25 FEET FROM BACK-OF-CURB TO BACK-OF-CURB, PROVIDED THAT ALL RESIDENCES FRONTING ON THE STUB STREET ARE PROVIDED WITH AN APPROVED AUTOMATIC SPRINKLER SYSTEM AND THAT ON-STREET PARKING ON THE STUB STREET IS PROHIBITED.
- FIRE APPARATUS ACCESS ROADS SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS, WITH A MINIMUM VEHICLE LOAD OF 33,000 POUNDS PER AXLE, AND SHALL BE SURFACED AND PAVED SO AS TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES.

GRADING NOTES

- INDICATED GRADES OTHER THAN T.C., F.G. & GUTTER F.L. ARE ROUGH GRADES.
- THE ROUGH GRADING PLANS SHALL BE ON THE JOB SITE AT ALL TIMES. THE ROUGH GRADING SHALL BE FINISHED IN CONFORMANCE WITH THE LINES AND GRADES SHOWN ON THE PLANS. THE GRADING QUANTITIES ARE BASED ON THE ELEVATION AND DETAILS SHOWN ON THE PLANS. ANY DEVIATIONS FROM THE PLANS WILL RESULT IN QUANTITY CHANGES.
- CARE SHALL BE EXERCISED IN GRADING CORNER LOTS.
- ROUGH PAD ELEVATIONS SHALL BE GRADED TO WITHIN 0.1' OF THE PAD ELEVATIONS SHOWN ON THE PLANS. WHEN GRADING IS COMPLETE PER THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE LOTS CAN BE INSPECTED. AT THAT TIME THE ENGINEER SHALL ALSO DECIDE IF ANY ADDITIONAL DITCHES OR BERMS ARE REQUIRED. THE CONTRACTOR IS REQUESTED NOT TO REMOVE ANY OF HIS ROUGH GRADING EQUIPMENT UNTIL HE RECEIVES GRADING APPROVAL FROM THE ENGINEER.
- SOILS REPORT PREPARED BY GEOTEK, PROJECT NO. 14995-LRV, DATED 9/9/19.
- EARTHWORK QUANTITIES (RAW):
 - CUT = 50 CUBIC YARDS
 - FILL = 50 CUBIC YARDS
 - NET = 0 CUBIC YARDS
 - THE QUANTITIES DO NOT REFLECT LOSSES DUE TO SUBSIDENCE OR SHRINKAGE.
 - THE QUANTITIES DO REFLECT USING NATIVE MATERIAL IN LEO OF TYPE 1 GRAVEL BASE MATERIAL FOR STREET SECTIONS.
 - THE ABOVE DO NOT REFLECT ANY EARTHWORK WHICH MAY BE REQUIRED BY THE ENGINEER TO CONSTRUCT ADDITIONAL PROTECTIVE DITCHES OR BERMS NOT SHOWN ON THESE DRAWINGS.

SOUTHERN NEVADA - SOUTHWEST GAS CORPORATION

GENERAL NOTES

- IN THE EVENT OF NATURAL GAS EMERGENCIES CALL 911 AND 1-877-860-6020
- 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 ELECTRICAL SHALL BE AT LEAST 12-INCHES OR GREATER AS DICTATED BY LOCAL CODES AND STANDARDS.
- FOR VALVE ADJUSTMENT CONTACT 702-668-6107 48 HOURS PRIOR TO CONSTRUCTION.
- IN THE EVENT OF NATURAL GAS CONFLICT WITH PROPOSED UTILITIES AND STRUCTURES CONTACT 702-365-2099

CAUTION: HIGH PRESSURE GAS

CALL SOUTHWEST GAS AT 702-400-1789 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES 48 HOURS PRIOR TO CONSTRUCTION

SOUTHWEST GAS APPROVAL

SOUTHWEST GAS CORPORATION

DATE

CLARK COUNTY TRAFFIC NOTES

- ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION BEFORE ANY ALLOWING PUBLIC TRAFFIC ONTO THE ROAD(S) BEING IMPROVED HEREUNDER. REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.
- 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 GROUND MOUNTED STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING COUNTY STREETS IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
- ALL CONSTRUCTION SIGNING, BARRICADES AND PAVEMENT MARKINGS SHALL CONFORM TO THE NEVADA WORK ZONE TRAFFIC CONTROL HANDBOOK - 1986 AND TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, FOR STREETS AND HIGHWAYS CURRENT EDITION.
- 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 COUNTY TRAFFIC MANAGER.
- THE DEVELOPER SHALL BE RESPONSIBLE TO PROVIDE AND INSTALL ALL PERMANENT SIGNS SHOWN ON THE PLANS. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CLARK COUNTY AREA STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGNPOSTS SHALL BE INSTALLED IN ACCORDANCE WITH CLARK COUNTY AREA STANDARDS. ALL SIGNS SHALL USE CLASS M SHEETING.
- IF A PROPOSED STREET LIGHT STANDARD IS FIELD LOCATED TO WITHIN FIVE (5) FEET OF ANY SIGN SHOWN HEREON TO BE MOUNTED ON A SIGN POST, CHANGE SIGN MOUNTING TO ONE ON THE STREETLIGHT STANDARD.
- PRIOR TO CONSTRUCTION, THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE CURRENT PLANNING DIVISION OF THE DEPARTMENT OF COMPREHENSIVE PLANNING.
- ALL TRAFFIC SIGNAL POLE ASSEMBLIES, STEEL PEDESTAL FOR CABINETS AND STREET LIGHT POLES SHALL BE GALVANIZED PER ASTM A123.
- ALL STREET LIGHTING INSTALLATIONS SHALL CONFORM TO THE UNIFORM STANDARD DRAWINGS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY AREA, NEVADA. LATEST EDITION OF EACH EXCEPT AS NOTED ON THE STREET LIGHTING PLANS AND LED LUMINAIRES. REFER TO CLARK COUNTY PUBLIC WORKS QUALIFIED PRODUCTS LIST "OPL" FOR LED LUMINAIRES. OPL CAN BE FOUND ONLINE AT [HTTP://WWW.CLARKCOUNTYNV.GOV/PUBLIC-WORKS/PAGES/DEFAULT.ASPX](http://www.clarkcountynv.gov/public-works/pages/default.aspx)
- THE FOLLOWING CLARK COUNTY UNDERGROUND FACILITIES MAY BE LOCATED IN YOUR PROJECT AREA: STREET LIGHTING, TRAFFIC SIGNALS, AND FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (F.A.S.T.) INTERCONNECT CABLE. YOU MUST CONTACT CLARK COUNTY TRAFFIC MANAGEMENT DIVISION, OPERATIONS UNIT AT (702)456-6000 FOR LOCATIONS AT LEAST 48 HOURS PRIOR TO WORKING IN THE AREA. CLARK COUNTY IS NOT A MEMBER OF "CALL BEFORE YOU DIG" (UNDERGROUND SERVICE ALERT), AND A CALL TO THAT ORGANIZATION DOES NOT RELIEVE YOU OF LIABILITY FOR CLARK COUNTY FACILITIES.
- F.A.S.T. INTERCONNECT CABLE POLICY IS IN EFFECT. INTERCONNECT CABLE MUST BE MAINTAINED AT ALL TIMES. DEVELOPER/CONTRACTOR SHALL PROVIDE TEMPORARY OVERHEAD INTERCONNECT CABLE WHILE PERMANENT CABLE IS BEING RELOCATED. TEMPORARY AERIAL INSTALLATION MUST BE ACCEPTABLE TO THE COUNTY TRAFFIC MANAGER AND TO F.A.S.T. ANY DAMAGE TO THIS CABLE IS DEEMED IN EMERGENCY BY F.A.S.T., CITY OF LAS VEGAS, CLARK COUNTY AND NDOT AND MUST BE REPAIRED IMMEDIATELY TO F.A.S.T. ACCEPTANCE. \$2,500 PER DAY DAMAGES MAY BE ASSESSED AFTER 24 HOURS HAS ELAPSED FROM TIME OF BREAK OR DAMAGE.
- ALL NEW OR REPLACEMENT TRAFFIC SIGNAL LOOPS SHALL BE INSTALLED USING CABLE-IN-DUCT WRING. SHALL HAVE INDEPENDENT LEAD-IN WIRES FOR EACH LOOP FROM THE CONTROLLER TO THE PULL-BOX, AND EACH LEAD-IN SHALL BE INDIVIDUALLY TAGGED.
- TRAFFIC SIGNAL PEDESTRIAN HEADS SHALL BE THE L.E.D. TYPE.
- ELECTRICAL POWER SERVICE POINT LOCATION(S) FOR STREET LIGHTING AND TRAFFIC SIGNALS MUST BE INDICATED ON THE PLANS. IF CONNECTING TO AN EXISTING CIRCUIT, INDICATE LOCATION OF EXISTING SERVICE POINT FOR EACH CIRCUIT.
- WHEN STREETLIGHTS ARE TO BE CONNECTED TO AN EXISTING CIRCUIT, THE ENGINEER MUST CERTIFY THAT THE EXISTING CIRCUIT IS CAPABLE OF HANDLING THE ADDITIONAL CIRCUIT LOAD.
- CLARK COUNTY RESERVES THE RIGHT TO REJECT STREET LIGHT AND TRAFFIC SIGNAL POLES AND ASSEMBLIES WHICH HAVE A "STRIPED" APPEARANCE.
- TWO WEEKS PRIOR TO BEGINNING OF CONSTRUCTION, MODIFICATION OR RELOCATION OF ANY TRAFFIC SIGNAL SYSTEM, WRITTEN NOTICE SHALL BE SUBMITTED TO THE CLARK COUNTY TRAFFIC MANAGEMENT DIVISION OF THE DATE THAT WORK WILL BEGIN.
- THREE (3) NORMAL WORKING DAYS PRIOR TO TURN-ON OR COMPLETION OF MODIFICATION(S) TO A TRAFFIC SIGNAL SYSTEM, WRITTEN NOTICE SHALL BE SUBMITTED TO THE CLARK COUNTY TRAFFIC MANAGEMENT DIVISION THAT WORK IS BEING COMPLETED AND THE PROPOSED DATE OF COMPLETION.

LAS VEGAS VALLEY WATER DISTRICT (LVVWD) STANDARD NOTES

LVVWD PROJECT # 137060 (REVISED 08/01/2017)

- NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVVWD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVWD COMMUNICATION SUPPORT CENTER (258-7171) TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. FOR FUTURE INSPECTIONS, NOTICE MUST BE GIVEN BY 2:00 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED LVVWD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.
- ALL WORK SHALL CONFORM TO LVVWD STANDARD PLATES, DRAWINGS, AND SPECIFICATIONS, AND TO THE 2010 EDITION OF THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS (UDACS). THE LATEST EDITION OF UDACS SHALL SUPERSEDE ANY CONFLICTS CONTAINED IN THE APPROVED DRAWINGS AND/OR SPECIFICATIONS.
- ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2 ABOVE, SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT DRAFT OR EDITION OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.
- A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.
- ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.
- ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
- ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.
- ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSINGS SHALL CONFORM TO SECTION 2.22 OF THE 2010 EDITION OF THE UDACS.
- ALL WATER FACILITIES AND APPURTENANCES SHALL BE DISINFECTED, PRESSURE TESTED, AND HAVE AN ACCEPTABLE PASSING HEALTH WATER SAMPLE OBTAINED, PRIOR TO OPERATION AND USE.
- THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802, TWO (2) WORKING DAYS PRIOR TO METER PICKUP.
- ANY INTERRUPTION OF SERVICE MUST BE PERFORMED IN ACCORDANCE WITH UDACS SECTION 314.01, AND APPROVED BY THE LVVWD INSPECTION DIVISION PRIOR TO SHUTDOWN. PROPER WRITTEN NOTIFICATION MUST BE GIVEN TO ALL AFFECTED CUSTOMERS.
- ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE AS LISTED ON THE LVVWD APPROVED PRODUCTS LIST FOR NEW FACILITIES, LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS BY SUBMITTING SHOP DRAWINGS.
- TELEPHONE "CALL BEFORE YOU DIG" AT "811" OR 1-800-227-2600.
- THE INSTALLATION OF LVVWD MUNICIPAL WATER FACILITIES WITHIN ALL STREETS IS ASSUMED TO BE IN COMPLIANCE WITH THE UNIFORM STANDARDS, INCLUDING THE PLACEMENT OF ASPHALT PAVING STREET SURFACES. ANY REPAIR WORK DONE BY THE LVVWD TO THE MUNICIPAL WATER FACILITIES WILL INCLUDE THE PLACEMENT OF AN APPROPRIATELY SIZED ASPHALT REPAIR PATCH ON THE STREET SURFACE.

ANY DECORATIVE PAVING SURFACE WITHIN THE STREET IS THE RESPONSIBILITY OF THE OWNER'S ASSOCIATION, OR THE INDIVIDUAL PROPERTY OWNERS IF NO OWNER'S ASSOCIATION IS IN EXISTENCE, OR THE AGENCY HAVING JURISDICTION. DECORATIVE SURFACE MATERIALS PLACED WITHIN THE 48" FOOT CEMENT ASHUTING A PUBLIC OR PRIVATE STREET, IF DISTURBED BY THE LVVWD DURING THE REPAIR OR OPERATION OF ITS FACILITIES, WILL BE REPLACED BY LVVWD WITH AN APPROPRIATELY SIZED PLAIN FINISH CONCRETE PATCH. THE LVVWD WILL NOT RESTORE, AND WILL NOT BE RESPONSIBLE FOR THE RESTORATION OF, ANY DECORATIVE PAVING SURFACE WITHIN THE STREET. THE LVVWD WILL NOT ATTEMPT TO MATCH COLOR OR FINISH OF ANY ADJACENT MATERIALS.

NO LEAD COMPLIANCE NOTE:
TO COMPLY WITH THE FEDERAL SAFE DRINKING WATER ACT, ALL WATER WORKS BRASS PRODUCTS PROPOSED TO BE RELOCATED, OR INSTALLED AS NEW MUST BE INSTALLED WITH THE LEAD FREE APPROVED PRODUCT. THE OLD LEADED PRODUCT MAY NOT BE REUSED.

GENERAL NOTES

- CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITION BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND OF INGRESS AND EGRESS TO SAID CONSTRUCTION. EXTENT OF TRANSITIONS TO BE DETERMINED BY THE COUNTY ENGINEER.
- EXISTING UTILITIES ARE LOCATED ON PLANS FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. THE CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR THE PROTECTION OF UTILITIES AND THE ENGINEER BEARS NO RESPONSIBILITY FOR UTILITIES NOT SHOWN ON PLANS OR NOT IN THE LOCATION SHOWN ON THE PLANS. (CALL BEFORE YOU DIG 800-227-2600).
- CONSTRUCTION SURVEY: GRADES ARE GIVEN FROM TOP OF STAKES OR NAILS. THE CONTRACTORS ARE CAUTIONED TO OBSERVE THE FOLLOWING RULE IN USING THE GRADE STAKES GIVEN BY THIS OFFICE. THREE CONSECUTIVE POINTS THAT ARE SHOWN TO BE ON THE SAME RATE OF SLOPE MUST BE USED IN COMMON IN ORDER THAT ANY VARIATION OUT OF A PERFECT STRAIGHT GRADE MAY BE DETECTED. IN CASE ANY SUCH DISCREPANCY IS FOUND, THE SAME MUST BE REPORTED OTHERWISE THIS OFFICE WILL NOT BE RESPONSIBLE FOR ANY ERROR IN THE GRADE OF THE FINISH WORK.
- NEITHER THE OWNER NOR ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES OR STRUCTURES NOT SHOWN ON THE DRAWINGS. CONTRACTOR TO VERIFY THE EXACT LOCATION OF UTILITIES PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR'S RESPONSIBILITIES REGARDING UTILITIES SHALL BE AS REQUIRED UNDER SECTION 107.17 OF THE UNIFORM STANDARD SPECIFICATIONS FOR CLARK COUNTY AREA, NEVADA AND AS PROVIDED IN THE SPECIFICATIONS. THE CONTRACTOR SHALL USE EXTREME CARE WORKING OVER OR NEAR ANY EXISTING GAS MAINS.
- THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS, WHICH ARE TO REMAIN IN PLACE FROM DAMAGE. ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR RECONSTRUCTED TO THE SATISFACTION OF THE ENGINEER AT THE EXPENSE OF THE CONTRACTOR.
- FENCES, SIGNS, STRUCTURES, LIGHTS AND OTHER EXISTING IMPROVEMENTS WITHIN STREET R/W SHALL BE REMOVED WHERE SHOWN ON THE CONTRACT DRAWINGS, AND AS REQUIRED BY THE ENGINEER.
- REPLACEMENT, RELOCATION OR RECONSTRUCTION OF ALL EXISTING IMPROVEMENTS INCLUDING FENCES, WALL SIGNS, AND ALL OTHER ITEMS APPLICABLE TO THIS CONTRACT SHALL BE AS REQUIRED BY THE ENGINEER.
- THE CONTRACTOR SHALL BACKFILL AND FINAL GRADE ALL CUT OR FILL SLOPES TO MATCH EXISTING CONDITIONS TO THE SATISFACTION OF THE ENGINEER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERTICAL ADJUSTMENT OF ALL EXISTING SANITARY, WATER AND STORM SEWER MANHOLES TO THE FINAL FINISH GRADES IN ACCORDANCE WITH THE DETAILS SHOWN ON THE CONTRACT DRAWINGS AND IN ACCORDANCE WITH SECTION 609 OF THE "STANDARD SPECIFICATIONS".
- 48 HOURS PRIOR TO START OF CONSTRUCTION THE CONTRACTOR SHALL CONTACT:
NV ENERGY PHONE - (702) 402-8400
CENTURYLINK TELEPHONE COMPANY PHONE - (702) 244-7055
SOUTHWEST GAS CORPORATION PHONE - (702) 278-8451
LAS VEGAS VALLEY WATER DISTRICT PHONE - (702) 870-2011
- PRIVATE STREETS, CURB & GUTTER AND VALLEY GUTTERS REFLECTED ON THESE PLANS ARE TO BE INSPECTED BY A CLARK COUNTY INSPECTOR.
- WHEELCHAIR RAMPS SHALL BE CONSTRUCTED AT ALL STREET INTERSECTIONS PER CLARK COUNTY STANDARD DRAWING 235 EXACT LOCATION OF RAMP TO BE DETERMINED IN FIELD BY A CLARK COUNTY INSPECTOR.
- STANDARD STREET SECTIONS PER CLARK COUNTY STANDARD DRAWINGS UNLESS OTHERWISE NOTED.
- ALL NEW OR REPLACEMENT TRAFFIC SIGNAL LOOPS SHALL BE INSTALLED USING CABLE-IN-DUCT WRING. EACH JOINT SHALL BE CHECKED FOR GRADE PRIOR TO CONSTRUCTION AND WATER TESTED AS SOON AS POSSIBLE AFTER CONSTRUCTION.
- VALLEY GUTTER WITH A GRADE OF FOUR TENTHS OF ONE PERCENT OR LESS SHALL BE CHECKED FOR GRADE PRIOR TO CONSTRUCTION AND WATER TESTED AS SOON AS POSSIBLE AFTER CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSURE PROPER DRAINAGE ACROSS ALL VALLEY GUTTERS.
- ALL BARRICADE AND TEMPORARY TRAFFIC CONTROL DEVICES OR METHODS USED DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE "NEVADA TRAFFIC CONTROL MANUAL, 1986 PUBLISHED BY THE STATE OF NEVADA, DEPARTMENT OF TRANSPORTATION, EXCEPT AS OTHERWISE PROVIDED IN THE CONTRACT DRAWINGS.
- ALL GRADING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION MANUAL AND THE SOILS REPORT AS PREPARED BY GEOTEK WHERE CONFLICTS OCCUR THE MOST RESTRICTIVE SHALL GOVERN.
- THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL OVERHEAD AND UNDERGROUND INTERFERENCES 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 OR UNDERGROUND FACILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COSTS AND LIABILITY IN CONNECTION THEREWITH.
- ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS. ANY ALTERATIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE ENGINEER.
- THE CONTRACTOR SHALL APPLY FOG SEAL ONLY AFTER ALL CORRECTIONS AND ADJUSTMENTS HAVE BEEN MADE.
- THE CONTRACTOR SHALL NOT BACKFILL ANY TRENCHES IN WHICH WATERLINES HAVE BEEN UNCOVERED UNTIL THE WATERLINES HAVE BEEN INSPECTED BY THE LAS VEGAS VALLEY WATER DISTRICT.
- UTILITY COMPANY METER BOXES, MANHOLE UDS, VALVE COVERS, ETC. SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOWLINES, AND VALLEY GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY.
- TYPE V CEMENT SHALL BE USED IN ALL CONCRETE WORK.
- THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ALL MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.550.

CLARK COUNTY PUBLIC WORKS DEVELOPMENT REVIEW

- INSPECTIONS ARE REQUIRED. CALL 24 HOURS IN ADVANCE. 702-455-4610. THE PERMIT, APPROVED PLANS, AND BARRICADE PLANS FOR THIS WORK MUST BE ON THE JOB SITE AT ALL TIMES.
- EXACT LOCATION OF ALL SAW-CUT LINES SHALL BE DETERMINED IN THE FIELD BY A CLARK COUNTY INSPECTOR.
- CURB AND GUTTER WITH A GRADE OF LESS THAN 4/10 OF ONE PERCENT SHALL BE CONSTRUCTED BY FORMING. EACH JOINT SHALL BE CHECKED FOR GRADE PRIOR TO CONSTRUCTION AND WATER TESTED AS SOON AS POSSIBLE AFTER CONSTRUCTION.
- FINAL ASPHALTIC CONCRETE (AC) PAVEMENT SURFACES SHALL BE ONE-HALF (1/2") INCH ABOVE THE LIP OF THE GUTTER (INCLUDING OPEN GRADE).
- ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE UNIFORM STANDARD SPECIFICATIONS AND STANDARD DRAWINGS CLARK COUNTY AREA NEVADA AND CLARK COUNTY SUPPLEMENT TO UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS, LATEST REVISION EXCEPT FOR LUMINAIRES. REFER TO CLARK COUNTY PUBLIC WORKS QUALIFIED PRODUCTS LIST "OPL" FOR LED LUMINAIRES. OPL CAN BE FOUND ONLINE AT [HTTP://WWW.CLARKCOUNTYNV.GOV/PUBLIC-WORKS/PAGES/DEFAULT.ASPX](http://www.clarkcountynv.gov/public-works/pages/default.aspx)
- PRIVATE STREETS, CURB & GUTTER AND VALLEY GUTTERS REFLECTED ON THESE PLANS ARE TO BE INSPECTED BY A CLARK COUNTY INSPECTOR.
- WHEEL CHAIR RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS SHALL BE DETERMINED IN THE FIELD BY A CLARK COUNTY INSPECTOR.
- PROPER SIGNS, BARRIERS, BARRICADES AND LIGHTS SHALL BE PLACED AND MAINTAINED IN ACCORDANCE WITH THE LATEST "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" TRAFFIC, SCHOOL, OR STREET SIGNS OF ANY KIND ARE NOT TO BE MOVED FOR ANY REASON WITHOUT FIRST COORDINATING WITH THE DEPARTMENT OF PUBLIC WORKS OFF-SITE INSPECTOR AT (702)-455-4610.
- THIS PLAN DOES NOT AUTHORIZE CLOSURE OF ANY ROAD OR STREET.
- NO OPEN TRENCH SHALL BE ALLOWED ACROSS ANY STREET OR WITHIN TEN (10') OF ANY TRAVEL-WAY, EXCEPT WHEN WORK IS IN ACTUAL PROGRESS. AREAS COVERED BY ACCEPTABLE STEEL PLATE ARE NOT TO BE CONSTRUCTED AS A TRENCH. NO OPEN TRENCH IS PERMITTED IN EXCESS OF 600 FEET OR LENGTH NECESSARY TO ACCOMMODATE PIPE INSTALLATION IN A SINGLE DAY, WHICH EVER IS GREATER. ALL TRENCH CROSSINGS AND BACKFILL SHALL MEET THE STANDARD SPECIFICATION UNLESS OTHERWISE STATED.
- A TEMPORARY PATCH IS TO BE IN PLACE AT THE END OF EACH WORK DAY WHERE THE BACKFILL IN THE TRENCH HAS BEEN COMPLETED AND PRIOR TO OPENING THE WORK AREA BACK TO TRAFFIC AND IS TO BE MAINTAINED BY THE PERMITTEE. A PERMANENT PATCH IS TO BE IN PLACE WITHIN THIRTY (30) DAYS AFTER THE INSTALLATION OF THE TEMPORARY PATCH.
- COMPACTION TESTS ARE REQUIRED.

STORMWATER MANAGEMENT NOTES

- THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATED IN, THE PUBLIC RIGHTS OF WAY OF CLARK COUNTY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
- ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN CLARK COUNTY BUILDING ADMINISTRATION CODE 24-40 AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDANCE MANUAL.
- TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVRI00000, SECTION III.A.5.
- AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS, AND ALL BMPs WEEKLY, AND WITHIN 24 HOURS AFTER ANY RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVRI00000, SECTION III.A.12.
- 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.

CLARK COUNTY WATER RECLAMATION DISTRICT NOTES

- ALL CONSTRUCTION SHALL CONFORM TO THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS, LATEST EDITION AND THE UNIFORM STANDARDS FOR PUBLIC WORKS OFFSITE IMPROVEMENTS, CLARK COUNTY AREA, LATEST EDITION.
- ANY CONFLICTS BETWEEN THESE DOCUMENTS AND THE STANDARDS REFERENCED IN NOTE 1 MUST BE BROUGHT TO THE ATTENTION OF THE ENGINEER OF RECORD PRIOR TO PERFORMING ANY WORK.
- ALL REVISIONS OF THE APPROVED PLANS MUST BE SUBMITTED TO THE CLARK COUNTY WATER RECLAMATION DISTRICT (DISTRICT) FOR REVIEW AND BE APPROVED PRIOR TO PROCEEDING WITH THE WORK. ALL WORK CONSTRUCTED WITHOUT THE APPROVAL OF THE DISTRICT MUST BE REMOVED AT THE CONTRACTORS EXPENSE.
- ALL SANITARY SEWERS SHALL BE PVC SDR-35 SOLID WALL UNLESS OTHERWISE NOTED.
- ALL SANITARY SEWER MAINS 8-INCHES AND LARGER AND ALL STUBS 8-INCHES AND LARGER ENTIRELY WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE PUBLIC UNLESS OTHERWISE NOTED. ALL ON-SITE SEWER INFRASTRUCTURE SHALL BE PRIVATE UNLESS OTHERWISE NOTED.
- ALL SANITARY SEWER MAINS SHALL BE THE SAME MATERIAL, SIZE, & SLOPE BETWEEN MANHOLES.
- ALL SANITARY SEWER MAINS SHALL BE IN THEIR OWN TRENCHES. THERE WILL BE NO SHARED TRENCHES ALLOWED.
- THE MINIMUM SLOPES FOR ALL PIPES SHALL BE IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION STANDARDS.
- ALL SANITARY SEWER MANHOLES MUST BE LOCATED SUCH THAT THEY ARE ACCESSIBLE IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION STANDARDS.
- A DEBRIS TRAP MUST BE INSTALLED IN THE EXISTING SYSTEM AT THE POINT OF CONNECTION IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION STANDARDS.
- ALL EXISTING MANHOLE CORROSION PROTECTION SYSTEMS MUST BE RESTORED TO THEIR ORIGINAL CONDITION, IF MODIFIED.
- LOCATOR RIBBON AND MARKER BALLS SHALL BE PLACED ABOVE ALL NEW SEWER MAINS AND LATERALS IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION STANDARDS.
- ALL EXISTING GRADE MUST BE RAISED TO WITHIN 18-INCHES OF FINAL GRADE PRIOR TO ANY SEWER TRENCHING.
- PRIVATE SANITARY SEWER NOT REVIEWED OR APPROVED BY COWRD

I CERTIFY THAT THE ONLY DEVIATIONS FROM THE DESIGN AND CONSTRUCTION STANDARDS THAT ARE APPROVED BY THE COWRD ARE LISTED BELOW:

• NONE

JOSH JOHNSON

DATE 7/10/20

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT NO. 137060 FIRST APPROVED DATE:

SLATER HANIFAN GROUP
a Westwood team
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 264-5300 FAX (702) 264-5359

DATE BY APP. DATE

DESCRIPTION

NO

CLARK COUNTY, NV

MARK AND NAOMA GRIFFITH

GRIFFITH RESIDENCE WATER CONNECTION

GENERAL NOTES

DATE: 7/10/20

DRAFTER: CK

DESIGNER: CK

CHECKED: JLU

PROJECT NO. MEG1901.000

C-2

SHEET 2 OF 6

PW19-20399

PROFESSIONAL ENGINEER - STATE OF NEVADA
JOSHUA JOHNSON
Exp. 01/30/2021
CIVIL
No. 15785

7/10/20

FAST
Call before you UnderGround
1-702-432-5300
FREEMAN & ARTERIAL SYSTEM OF TRANSPORTATION (F.A.S.T.)

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

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

I:\Vegas\1901.000 griffith residence\dwg\improvements\1901.000_cw.dwg 7/10/2020 1:50 PM Rhonda Miller

ABBREVIATIONS			
AC	ASPHALTIC CONCRETE OR ACRE	FL	FLOWLINE
AGG	AGGREGATE BASE	FT	FEET OR FOOT
APN	ASSESSORS PARCEL NUMBER	FUT	FUTURE
APPROX OR ~	APPROXIMATE	GRD	GRADE OR GROUND
AVE	AVENUE	GB	GRADE BREAK OR GRADE CHANGE
@	AT	GV	GATE VALVE
BC	BEGIN CURVE OR BACK OF CURB	HDPE	HIGH DENSITY POLYETHYLENE
BOR	BEGINNING OF CURB RETURN	HOA	HOME OWNERS ASSOCIATION
BHW	BOTTOM OF HEADWALL	HORIZ	HORIZONTAL
BLDG	BUILDING	HP	HIGH POINT
BLVD	BOULEVARD	HWL	HIGH WATER LEVEL
BW	BENCHMARK	HDWL OR HW	HEADWALL
BVC	BEGIN VERTICAL CURVE	HYD	HYDRAULIC OR HYDRANT
BWV	BACK WATER VALVE	ID	INSIDE DIAMETER
CC	CLARK COUNTY	IN	INCH
CAUSD	CLARK COUNTY AREA UNIFORM STANDARD DRAWINGS	INT	INTERSECTION
CCPW	CLARK COUNTY PUBLIC WORKS	INV	INVERT ELEVATION
CCFCD	CLARK COUNTY REGIONAL FLOOD DISTRICT	IP	IRON PIPE
CCWRD	CLARK COUNTY WATER RECLAMATION DISTRICT	IRRG	IRRIGATION
CE	COMMON ELEMENT	LF	LINEAR FEET
CL/C/L/C	CENTERLINE	LMC	LANDSCAPE MAINTENANCE CORPORATION
CLR	CLEAR OR CLEARANCE	LP	LOW POINT
CLSM	CONTROLLED LOW STRENGTH MATERIAL	LT OR L	LEFT
CLV	CITY OF LAS VEGAS	LVWD	LAS VEGAS VALLEY WATER DISTRICT
CML&C	CEMENT MORTAR LINED AND COATED	LWL	LOW WATER LEVEL
CMU	CONCRETE MASONRY UNIT	MAX	MAXIMUM
CONV	CITY OF NORTH LAS VEGAS	MECH	MECHANICAL
COH	CITY OF HENDERSON	MH	MANHOLE
CONC	CONCRETE	MIN	MINIMUM
CT	COURT	MISC	MISCELLANEOUS
CT OR CU YD	CUBIC YARD	MUE	MUNICIPAL UTILITY EASEMENT
DCWSC	DESIGN AND CONSTRUCTION FOR WASTEWATER COLLECTION SYSTEMS	NDOT	NEVADA DEPARTMENT OF TRANSPORTATION
DE	DRAINAGE EASEMENT	NTS	NOT TO SCALE
DI	DUCTILE IRON OR DRAIN INLET	NUE	NONEXCLUSIVE UTILITY EASEMENT
DIA, Ø	DIAMETER	NVE	NV ENERGY
DIP	DUCTILE IRON PIPE	OC	ON CENTER
DR	DRIVE	OD	OUTSIDE DIAMETER OR OVERALL DIMENSION
DWG(S)	DRAWING	OFF	OFFSET
DWY	DRIVEWAY	ORG	ORIGINAL
EA	EACH	PAE	PUBLIC OR PEDESTRIAN ACCESS EASEMENT
ECR	END CURB RETURN	PB	PULL BOX
EG	EXISTING GROUND	PC	POINT OF CURVE
ELEV	ELEVATION	PCC	POINT OF COMPOUND CURVE
ESMT	EASEMENT	PDE	PUBLIC DRAINAGE EASEMENT
EP	EDGE OF PAVEMENT	PL OR PL	PROPERTY LINE
ERU	EQUIVALENT RESIDENTIAL UNIT	PQB	POINT OF BEGINNING
EVC	END VERTICAL CURVE	PQC	POINT OF CURVATURE
EX OR EXIST	EXISTING	PCE	POINT OF ENDING
FC	FACE OF CURB	PRC	POINT OF REVERSE CURVATURE
FF	FINISHED FLOOR	PRELUM	PRELIMINARY
FG	FINISHED GRADE	PROP	PROPOSED
FQH	FINISHED GRADE, HIGH SIDE	PRV	PRESSURE REDUCING VALVE
FGL	FINISHED GRADE, LOW SIDE	PUE	PUBLIC UTILITY EASEMENT
FH	FIRE HYDRANT	PT	POINT OF TANGENT OR POINT
		PVC	POLYVINYL CHLORIDE
		PV	POINT OF VERTICAL INTERSECTION
		QTY	QUANTITY
		R	RADIUS
		RCA	REINFORCED CONCRETE ARCH
		RCS	REINFORCED CONCRETE BOX
		RCP	REINFORCED CONCRETE PIPE
		RD	ROAD
		RECD	ROADWAY EASEMENT
		REV	REVISION
		RG	ROUGH GRADE
		RIGHT	RIGHT
		R/W OR R	RIGHT OF WAY
		S	SLOPE
		SCH	SCHEDULE
		SD	STORM DRAIN
		SDDI	STORM DRAIN DROP INLET
		SOMH	STORM DRAIN MANHOLE
		SEC	SECTION
		SF	SQUARE FEET
		SHT	SHEET
		SLTC	STREET LIGHT & TRAFFIC CONTROL ESMT
		SNWA	SOUTHERN NEVADA WATER AUTHORITY
		SPECS	SPECIFICATIONS
		ST	STREET
		SSMH	SANITARY SEWER MANHOLE
		STA	STATION
		STD	STANDARD
		STL	STEEL
		STLT	STREET LIGHT
		SW	SEWAGE
		SWG	SOUTHWEST GAS
		SNR OR SS	SANITARY SEWER
		SY	SQUARE YARD
		TAN	TANGENT
		TC	TOP OF CURB
		TF	TOP OF FLOOR OR TOP OF FOOTING
		TO	TOP OF GRADE
		THRU	THROUGH
		THW	TOP OF HEADWALL
		TP	TOP OF PIPE
		TP	TOP OF WALL
		TRW	TOP OF RETAINING WALL
		TSW	TOP OF SCREEN WALL
		TYP	TYPICAL
		UDACS	UNIFORM DESIGN AND CONSTRUCTION STANDARDS
		UE	UTILITY EASEMENT
		VC	VERTICAL CURVE
		VERT	VERTICAL
		VG	VALLEY GUTTER
		WI	WROUGHT IRON
		WL	WATER LINE
		WPZ	WATER PRESSURE ZONE
		WTR	WATER LINE

SPECIAL NOTE

IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED WHICH 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 CLARK COUNTY DEPT. OF PUBLIC WORKS. TEMPORARY CONSTRUCTION ITEMS INCLUDE: PAVEMENT TRANSITIONS, PROTECTIVE DITCHES AND BERM, ROAD SIGNS AND BARRICADES, ETC.

NOTICE TO CONTRACTOR

-QUANTITIES SHOWN ARE ESTIMATES ONLY AND ARE INTENDED TO ILLUSTRATE SCOPE OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXACT QUANTITIES INVOLVED.

-EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS. CALL BEFORE YOU DIG: (800) 227-2600

LEGEND

EXISTING	PROPOSED	DESCRIPTION
		5' CONTOUR
		1' CONTOUR
		STRIPING
		SEWER MANHOLE
		CURB AND GUTTER
		8" PVC SS
		8" PVC WTR
		SANITARY SEWER PIPE AND FLOW ARROW
		WATER PIPE
		WATER GATE VALVE
		FIRE HYDRANT
		WATER BLOW-OFF
		WATER LATERAL W/ METER
		SANITARY SEWER LATERAL
		STREETLIGHT
		EDGE OF PAVEMENT
		TRAFFIC SIGN
		PAD ELEVATION
		FINISHED FLOOR ELEVATION
		ELEVATION
		RETAINING WALL
		STORM DRAIN W/ MANHOLE

	EXISTING GAS GATE VALVE		PROPOSED SCARP AREA
	EXISTING UNKNOWN MANHOLE		DRIVEWAY
	EXISTING GAS, SIZE PER PLAN		PROPOSED RIP RAP
	EXISTING POWER POLE		SIGHT VISIBILITY ZONE PER STD DWG NO. 201.2
	EXISTING TRAFFIC SIGNAL		HANDICAP RAMP
	EXISTING WALL		
	WATER PIPE FITTING		
	WATER POINT OF CONNECTION		
	SEWER POINT OF CONNECTION		
	DAYLIGHT LINE		
	STREET CENTERLINE		
	RIGHT-OF-WAY		
	MATCHLINE		
	BOUNDARY LINE		
	PHASE LINE		
	PROPERTY LINE		
	FLOWLINE		
	SAWCUT		
	CUT/FILL TRANSITION LINE		
	SIDEWALK		
	EX STRIPING TO BE OBLITERATED		
	GRADE BREAK LINE		
	REFLECTIVE RAISED PAVEMENT MARKERS		
	BACK WATER VALVE		
	WROUGHT IRON FENCE		
	PONY WALL		
	DECORATIVE PERIMETER WALL		
	DECORATIVE PERIMETER RETAINING WALL		
	PROPOSED CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB		
	EXISTING CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB		
	FUTURE CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB		

QUANTITIES

WATER SYSTEM				
1.	FIRE HYDRANT ASSEMBLY W/6" GATE VALVE PER UDACS PLATE NO. 40	EA	-	1
2.	6" PVC WATER PIPE (CLASS 150)	LF	-	3
3.	8" PVC WATER PIPE (CLASS 150)	LF	-	19
4.	8" DIP WATER PIPE (CLASS 53)	LF	-	-
5.	8" GATE VALVE WITH VALVE BOX PER UDACS PLATE NO. 30 & 39	EA	-	2
6.	8" X 6" TEE PER UDACS PLATE NO. 31	EA	-	1
7.	8" X 8" TEE PER UDACS PLATE NO. 31	EA	-	1
8.	24" X 8" TAPPING SLEEVE WITH TAPPING VALVE PER UDACS PLATE NO. 34 & 39 (2,21.01 B)	EA	-	1
9.	8" 11.25 DEGREE BEND PER UDACS PLATE NO. 31	EA	-	-
10.	8" 22.5 DEGREE BEND PER UDACS PLATE NO. 31	EA	-	-
11.	8" 45 DEGREE BEND PER UDACS PLATE NO. 31	EA	-	-
12.	8" X 6" REDUCER PER UDACS PLATE NO. 30	EA	-	1
13.	CAP AND 2" BLOW-OFF ASSEMBLY W/CAP PER UDACS PLATE NO. 36	EA	-	1
14.	1" COPPER SERVICE W/ 3/4" METER PER UDACS PLATE NO. 3	EA	-	1
15.	1" COPPER SERVICE W/ 1" METER PER UDACS PLATE NO. 4	EA	-	-
16.	1" COPPER SERVICE W/ 3/4" METER & 1" RPPA PER UDACS PLATE NO. 4 & 8	EA	-	-

SLATER
HANIFAN
GROUP

5740 S. ARVILLE STREET #216,
LAS VEGAS, NV 89118
PHONE (702) 284-5300
FAX (702) 284-5399

CLARK COUNTY, NV

MARK AND NAOMA GRIFFITH

GRIFFITH RESIDENCE WATER CONNECTION

ABBREVIATIONS, QUANTITIES AND LEGEND

DATE: 7/10/20

DRAFTER: CK

DESIGNER: CK

CHECKED: JLG

PROJECT NO. MEG1901.000

EXP. 06/30/2021

NO. 15789

C-3

SHEET 3 OF 6

PW19-20399

FAST

Call before you Dig

UnderGround

1-702-432-5300

FREELWAY & ARTERIAL SYSTEM OF TRANSPORTATION (F.A.S.T.)

Call before you Dig

811

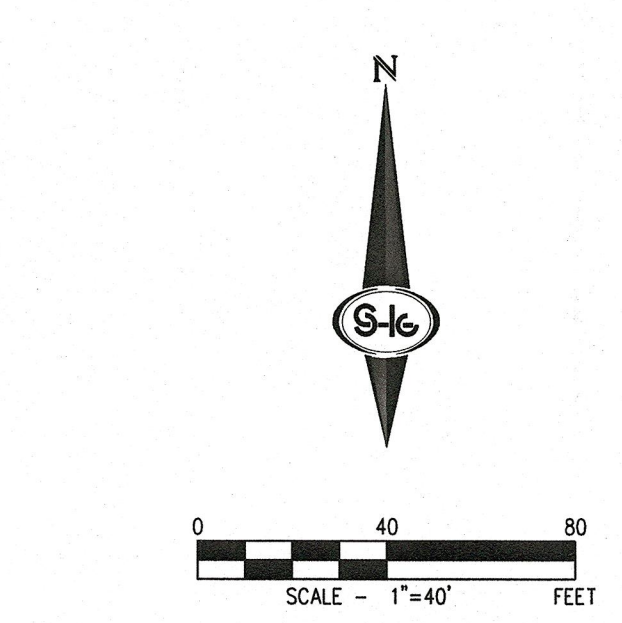
OR

1-800-227-2600

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.

CALL BEFORE YOU DIG OVERHEAD

1-702-227-2929



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

1. REPLACE ALL TRAFFIC CONTROL DEVICES (SIGNS AND/OR PAVEMENT MARKINGS), UNDER CLARK COUNTY'S JURISDICTION, THAT ARE DISTURBED, DESTROYED, MOVED OR MODIFIED BY TRENCHING ACTIVITIES TO CLARK COUNTY'S SATISFACTION. ALL MATERIAL USED SHALL MEET CLARK COUNTY'S SPECIFICATIONS OR WILL BE AN APPROVED EQUIVALENT.

2. IN THE EVENT THAT THE TRAFFIC SIGNAL CONDUITS, LOOP DETECTORS OR ASSOCIATED EQUIPMENT ARE DAMAGED BY CONTRACTOR, THE CONTRACTOR WILL HIRE AN MSA LEVEL II ELECTRICAL CONTRACTOR TO MAKE REPAIRS PER UNIFORM SPECIFICATION NO. 623.01.02
3. ALL SEWER / STORM DRAINS CROSSING WATERWAYS MUST CONFORM TO 12.2.2 OF THE MSA STANDARD SPECIFICATIONS AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.
4. THE CONTRACTOR IS TO VERIFY THE ACTUAL FIELD CONDITIONS OF ALL LOTS AND INSTALL SEWER CHECK VALVES WHERE REQUIRED PER THE LATEST EDITION OF THE UNIFORM SPECIFICATIONS.
5. FITTINGS SHALL NOT FALL UNDER CURBS, CURBERS OR SIDEWALK.
6. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE BUILDING PERMIT APPROVAL BY THE PLANNING AND CONSTRUCTION DEPARTMENT.
7. TREES, SHRUBS, OR DECORATIVE ROCKS, AND ANY BLOCK WALL OR OTHER PERMANENT MATERIALS SHALL BE PLACED TO PROTECT THE ADJACENT EASEMENT(S) TO ALLOW THE DISTINCT DIRECT ACCESS TO THE VAULT(S), BACKFLOW ASSEMBLIES AND PIPING FROM THE ADJACENT BLOCK.

1. MAINTAIN MINIMUM TWENTY-FOUR (24) INCH COVER PER UDACS SECTION 2.08.04. GRADING MUST BE COMPLETED PRIOR TO WATERLINE INSTALLATION.
2. WATER MAIN JOINT DEFLECTION, PER UDACS SECTION 2.07.01 AND 2.07.03.
3. PROTECT IN PLACE AND ADJUST LVWMD EXISTING FACILITIES TO FINISH GRADE PER UDACS. ALL LVWMD FACILITIES SHALL BE ACCESSIBLE AT ALL TIMES.
4. INSTALL PIPELINE MARKER BALLS, PER UDACS PLATE NO. 15
5. ALL ABOVE GROUND OBSTRUCTIONS INCLUDING BUT NOT LIMITED TO, LANDSCAPE BOULDER, FENCES / WALLS, AND SIGNS ARE STRICTLY PROHIBITED WITHIN EASEMENT.
6. NO WATER COMMITMENT IS IMPLIED OR GRANTED TO THIS PAD/BUILDING PARCEL IN ASSOCIATION WITH THE APPROVAL OF THESE PLANS.

MAINTAIN MINIMUM 12" VERTICAL SEPARATION AT ALL POINTS OF CROSSING
MAINTAIN MIN. 3' PARALLEL SEPARATION FROM WATER LINES.
ANY EXCAVATION BACK OF CURB MUST REMAIN OPEN FOR INSPECTION OF
COPPER SERVICE LATERALS. ANY COPPER SERVICE LATERAL KINKED, BENT
OR OTHERWISE DAMAGED MUST BE REPLACED FROM MAIN TO THE ANGLE
METER STOP.

ALL RIGHT OF WAYS & EASEMENTS TO BE DEDICATED BY MSM-19-600094
UNLESS NOTED OTHERWISE.

BENCHMARK NUMBER: 6LV9015E6
RIVET AND PLATE IN TOP OF CURB SOUTH SIDE OF FARM ROAD AT RIO VISTA STREET
ELEVATION = 23664 FEET, 721.281 METERS (NAVD 88 v.2018)
PER THE CITY OF LAS VEGAS VERTICAL CONTROL FOR SURVEY BENCHMARKS.

NORTH 89°53'20" WEST, BEING THE BEARING OF THE SOUTHEAST QUARTER (SE1/4) OF THE NORTHEAST QUARTER (NE1/4) OF SECTION 15, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CLARK COUNTY, NEVADA. AS SHOWN BY THE MAP THEREOF IN FILE 72, PAGE 71 OF PARCEL MAPS IN THE CLARK COUNTY RECORDERS OFFICE, NEVADA.

SOUTHWEST GAS CORPORATION DATE

CALL SOUTHWEST GAS AT
(702) 400-1789 FOR STANDBY
WHEN EXCAVATING OVER OR NEAR
HIGH PRESSURE GAS LINES.



AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.

CALL BEFORE YOU DO OVERHEAD

1-702-227-2929

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

Call
811
OR
1-800-227-2600

- 1 INSTALL 24"x 8" TAPPING SLEEVE WITH TAPPING VALVE PER UDACS PLATE NO. 34 & 39 (UDACS 2.4-01.0)
- 2 INSTALL 6" PVC WATER PIPE PER UDACS PLATE NO. 17
- 3 INSTALL 8" PVC WATER PIPE PER UDACS PLATE NO. 17
- 4 INSTALL GATE VALVE PER UDACS PLATE NO. 30 & 39
- 5 INSTALL 12" PVC WATER PIPE PER UDACS PLATE NO. 17
- 6 INSTALL 5" BEND PER UDACS PLATE NO. 31
- 7 INSTALL 45° BEND PER UDACS PLATE NO. 31
- 8 INSTALL 90° BEND PER UDACS PLATE NO. 31
- 9 INSTALL DEEP FIRE HYDRANT ASSEMBLY W/6" GATE VALVE PER UDACS PLATE NO. 39 & 41
- 10 INSTALL CAP & 2" BLOW-OFF VALVE PER UDACS PLATE NO. 36
- 11 INSTALL 6" x 6" TEE PER UDACS PLATE NO. 31
- 12 INSTALL 8" x 6" TEE PER UDACS PLATE NO. 31
- 13 INSTALL 8" x 6" TEE PER UDACS PLATE NO. 31
- 14 INSTALL 8" CROSS PER UDACS PLATE NO. 31
- 15 INSTALL 8" x 6" REDUCER PER UDACS PLATE NO. 30
- 16 INSTALL 1" COPPER SERVIC & 3/4" METER PER UDACS PL. NO. 3

BY _____

ACCEPTANCE OF THESE PLANS FOR FILING 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 AND/OR SPECIFICATIONS CLARK COUNTY SHALL BE HELD FREE FROM DAMAGES WHICH MAY RESULT FROM THE CONSTRUCTION OF THE IMPROVEMENTS FROM THE ENGINEERING DESIGN DEPICTED HEREIN.

NOTE: POWER POLES AND/OR OTHER EXISTING FACILITIES NOT IN PROPER LOCATION BASED ON PROPOSED IMPROVEMENTS SHOWN HEREON WILL BE RELOCATED AT NO EXPENSE TO CLARK COUNTY

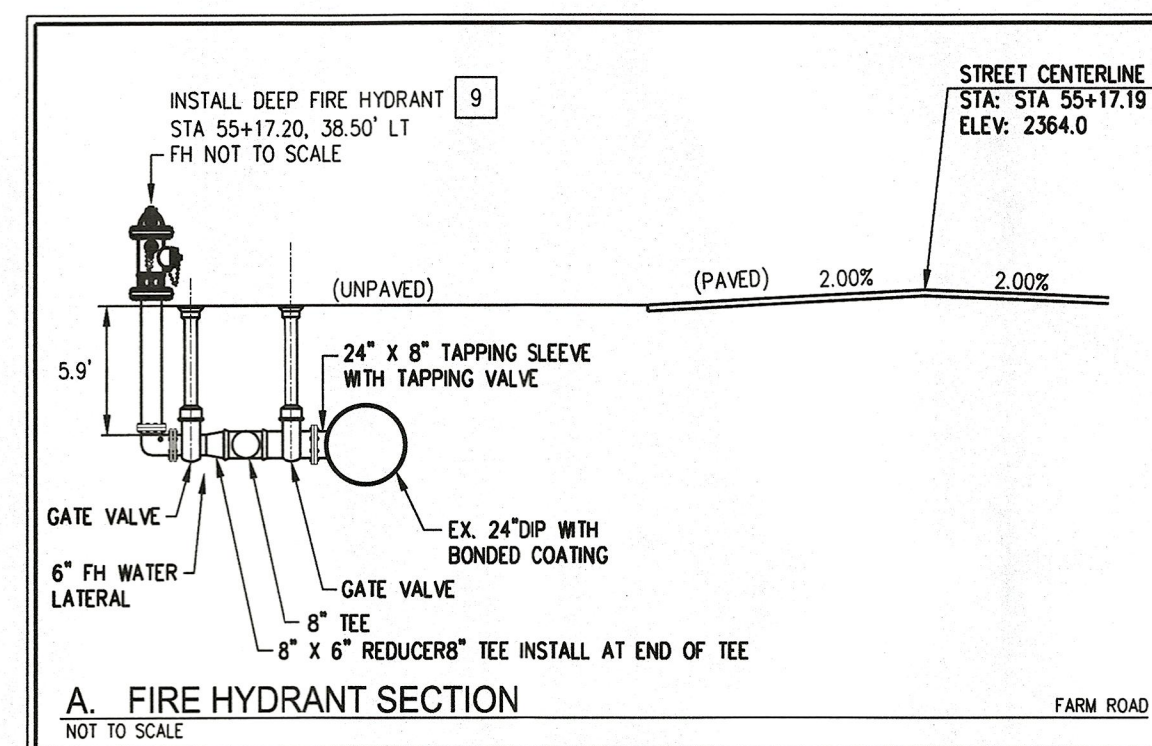
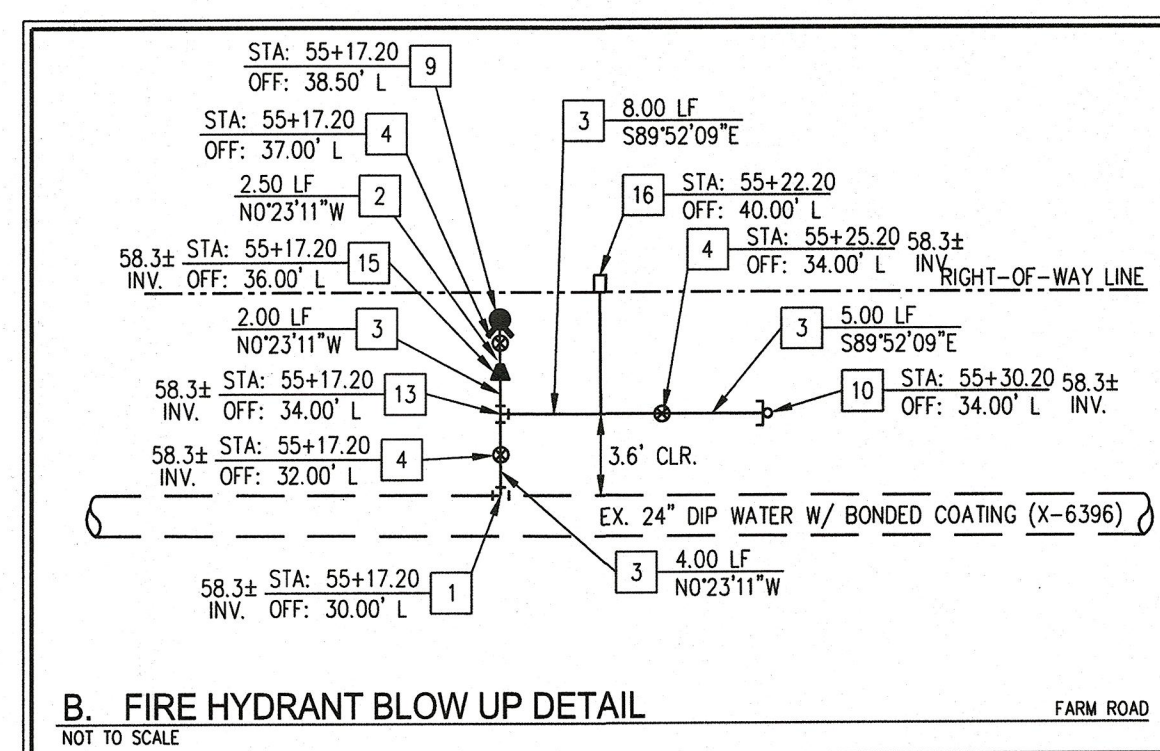
BY: _____ DATE: _____

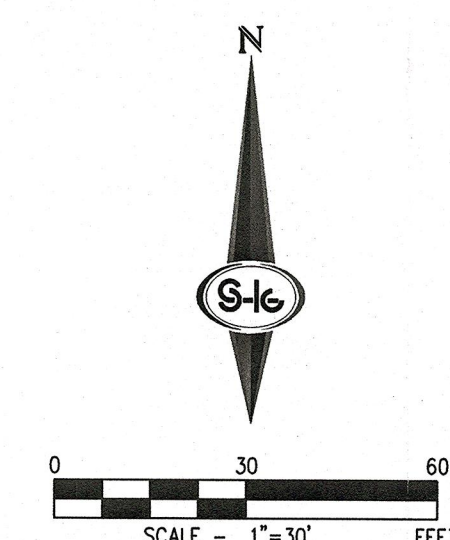
APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF ANY VIOLATION OF, ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS. FIRE FLOW 2,000 GPM AT 20 P.S.I. RESIDUAL.

LAS VEGAS VALLEY WATER DISTRICT PLANNING & ENGINEERING SERVICES
PROJECT NO. 137060 FIRST APPROVED DATE:

NO WALLS, FENCES, SHRUBS, UTILITY APPURTENANCES OR ANY OTHER OBJECT OTHER THAN TRAFFIC CONTROL DEVICES, FIRE HYDRANTS, TREES, AND STREET LIGHT POLES, MAY BE CONSTRUCTED OR INSTALLED WITHIN THE SIGHT VISIBILITY ZONE UNLESS SAID OBJECT IS MAINTAINED AT LESS THAN 24 INCHES IN HEIGHT, MEASURED FROM TOP OF CURB, OR WHERE NO CURB EXISTS, A HEIGHT OF 27 INCHES MEASURED FROM THE TOP OF ADJACENT ASPHALT, GRAVEL OR PAVEMENT STREET SURFACE. THIS RESTRICTION EXTENDS ALONG THE SIGHT VISIBILITY LINE THROUGH LANDSCAPED MEDIANS.

LVVWD WILL NOT SIGN OFF ON THE BUILDING PERMIT WITHOUT VERIFICATION OF THE FIXTURE UNITS TO ENSURE THE 3/4-INCH METER WILL MEET THE DEVELOPMENT NEED BASED ON THE 3RD EDITION OF UDACS - "TABLE A". SHOULD IT BE DETERMINED THAT THE 3/4-INCH IS NOT ADEQUATE, THE METER WILL NEED TO BE INCREASED TO THE APPROPRIATE SIZE. AND THE SERVICE LATERAL MAY NEED TO BE CUT AND CAPPED AT THE MAIN AND A NEW LATERAL THAT MATCHES THE SIZE REQUIRED METER TO BE INSTALLED.





1. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
2. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWPPP.
3. MINIMUM SLOPES SHALL BE MAINTAINED THROUGH SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
4. SEE FINAL MAP FOR EXACT BEARINGS AND DISTANCES.
5. SEE DETAIL SHEET FOR CONSTRUCTION SECTIONS AND DETAILS.
6. ALL EXISTING & PRIVATE DRAINAGE IMPROVEMENTS TO BE BONDED FOR AN INSPECTED.
7. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING UTILITY STRUCTURES AND FACILITIES AND REPORT ALL VARIANCES PRIOR TO CONSTRUCTION. CONTRACTOR TO PROTECT IN PLACE DURING CONSTRUCTION. ENGINEER/OWNER SHALL BE NOTIFIED OF PRIOR DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR REPAIR OF ALL DAMAGE TO EXISTING FACILITIES NOT TO EXISTING OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCING.
8. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE BUILDING PERMIT AND SHALL BE BY THE CITY OF LOS ANGELES.
9. ADDITIONAL CONSTRUCTION SITE DAMAGE 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 PERFORMANCE STANDARDS OF THE CITY OF LOS ANGELES.
10. THE LOS ANGELES VALLEY CONSTRUCTION SITE BMP GUIDANCE MANUAL, ALL WALLS, FENCES, SHRUBS, UTILITY APPOINCEMENTS OR ANY OTHER OBJECTS HIGHER THAN 18 INCHES ABOVE GROUND OR WHERE ANY CURB EXIST, A HEIGHT OF 27 INCHES MEASURED FROM THE TOP OF ADJACENT ASPHALT, GRAVEL OR PAVEMENT SURFACE. THIS RESTRICTION SHALL FOLLOW THE SIGHT VISIBILITY LINE THROUGH LANDSCAPED MEDIANS.
11. FOR ADJACENT MEDIAN, CONTRACTOR SHALL MAINTAIN THE EXISTING SLOPE. CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED UP OF CURB PRIOR TO SUBMITTING EROSION CONTROL PLAN. CONTRACTOR SHALL MAINTAIN MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
12. CONTRACTOR SHALL MAINTAIN EXISTING STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES.

[REQUIRE 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 ON, OR NEAR THE SURFACE OF THE RIGHT-OF-WAY. THIS SHALL BE DONE AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PROPERLY STORED, HANDLED, AND REMOVED FROM THE SITE.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED BY THE OWNER AND HIS OR HER AGENTS DUE TO UNUSUAL SITE CONDITIONS. THE BEST MANAGEMENT PRACTICES DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN CLARK COUNTY CHAPTER 24.40 AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES GUIDANCE.
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 COMPLETED. PERMITS FOR TEMPORARY OR PERMANENT STABILIZATION SHALL REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR000000.
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 AND ALL OTHER AREAS THAT ARE SUSCEPTIBLE TO EROSION, FOR RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS REQUIRED TO REFLECT THE RESULTS OF THE INSPECTIONS. THE CONTRACTOR, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES, REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR000000, SECTION II.A.12.
5. ACCUMULATED SEDIMENT IN BMPs SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED RAIN EVENT. WHEN SUCH REMOVAL IS NOT PRACTICABLE, THE REMOVAL SHALL BE WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

THE PROJECT IS LOCATED WITHIN A FEMA DESIGNATED ZONE 'X' (UNSHADED) DEFINED AS AREA OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN PER FEMA FIRM PANEL 32003C1765F DATED NOVEMBER 16, 2011.

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED
FLOOD STUDY PW20-13654 ON FILE AT CLARK COUNTY FOR THE SUBJECT
PROJECT.

 7/10/20

JOSHUA JOHNSON, PE #15875 DATE

BY _____

ACCEPTANCE OF THESE PLANS FOR FILING 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 AND/OR SPECIFICATIONS CLARK COUNTY SHALL BE HELD FREE FROM DAMAGES WHICH MAY RESULT FROM THE CONSTRUCTION OF THE IMPROVEMENTS FROM THE ENGINEERING DESIGN DETAINED HEREIN.

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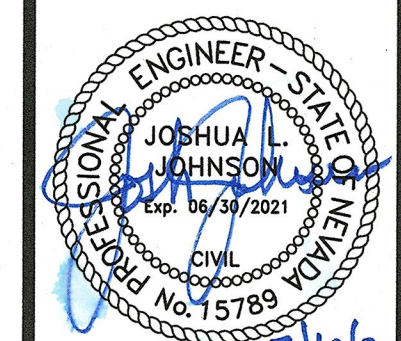
CONTRACTOR SHALL EXERCISE CARE WITH ALL SALVAGED ITEMS AND ASSUME THAT ITEMS WILL BE REUSED BY CLARK COUNTY. CONTRACTOR SHALL CALL FOR AN APPOINTMENT TO DELIVER SALVAGED ITEMS.

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[illegible]

**GRIFFITH RESIDENCE WATER CONNECTION
GRADING PLAN I**

PROJECT NO.
MEG1901-000



G-1
SHEET 5 OF 6

\\meg1901.000\griffith\residence\dwg\improv\meg1901.000_grd.dwg 7/10/2020 2:26 PM Rhonda Miller

