DS #: 5265

APN: 139.22.803.002

PROJECT: Red Realty - Cultivation Facility

SUBMITTAL: 1st

SCANNED BY/DATE:

CHECKED BY/DATE:

CITY OF LAS VEGAS NEVADA

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: April 27, 2020
TO: **Land Development Services** Department of Building & Safety				**FROM:** Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **RED REALTY – CULTIVATION FACILITY** **(Project in CNLV for CLV Concurrence)**			**COPIES TO:** Baughman & Turner
Cross Streets:	NEC of Owens Avenue & "A" Street			Knit Designing Community
File Number:	F:\Depot\DSMemos\DS5265A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	139-22-803-002			CNLV
Zoning Action:	N/A			
FEMA Flood Zone	YES	NO	X	
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal & Addendum #1	3/30/2020	4/27/2020	Approved	$400.00	$400
			TOTAL FEES (LDDRS):	**$400.00**	----

REMARKS: CNLV reference # 29-2020. Study submitted for CLV Concurrence. Site located in the City of North Las Vegas at the Northeast Corner of Owens Avenue and "A" Street.

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.

City of Las Vegas Flood Control staff has reviewed the Technical Drainage Study, including the *Addendum #1* for the subject development "***Red Realty – Cultivation Facility***" within the jurisdiction of ***City of North Las Vegas***. ***City of Las Vegas*** concurs with the acceptance of the drainage study by the ***City of North Las Vegas Department of Public Works***. The review of this project was limited to issues of flood control significance to the ***City of Las Vegas***.

1. **For clarity, Label the City Limits along Owens Avenue between the City of North Las Vegas and the City of Las Vegas on the Grading Plans.**

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

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

END OF REMARKS
Ays/pbj

T/R/S: T20S/R61E/22
AREA M-22

TECHNICAL DRAINAGE STUDY FOR
RED REALTY-CULTIVATION FACILITY
SECTION 22, TOWNSHIP 20, SOUTH, RANGE 61 EAST
CITY OF NORTH LAS VEGAS, NEVADA

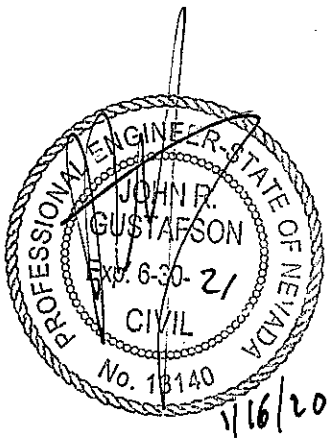
January 16, 2020

PREPARED FOR:

KNIT DESIGNING COMMUNITY
7250 PEAK DRIVE, SUITE 216
LAS VEGAS, NV 89128

PREPARED BY:

BAUGHMAN & TURNER, INC.
1210 HINSON STREET
LAS VEGAS, NEVADA 89102
(702) 870-8771



HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Red Realty-Cultivation Facility Date: January 16, 2020

Location of Development: a) Descriptive (Cross Streets) North/South: I-15
East/West: Owens

b) Section: 22 Township: 20 S Range: 61 E

c) APN: 139-22-803-002 and -001

Name of Owner: Knit Designing Community

Telephone No.: 702.341.2291 Fax No.: E-Mail Address: Michelled@knitstudios.com

Address 7250 Peak Drive, Suite 216 Las Vegas, NV 89128

Contact Person-Name: Sunshine Woods **Telephone No.:** 702-870-8771

***E-Mail Address:** SunshineW@baughman-turner.com **Fax No.:** 702-878-2695

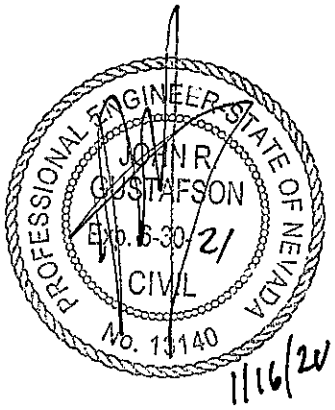
Firm: Baughman & Turner, Inc.

Address: 1210 Hinson Street Las Vegas, NV 89102

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: 2.53 acres Being Developed/Disturbed: 2.53 acres
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ Yes** ☒ No
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☐ Yes** ☒ No
4. Proposed type of development (Residential, Commercial, Etc.): commercial
5. Approximate upstream land area which drains to the subject site: 13 acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: CNLV #52294
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: East to the UPRR railroad tracks and south to Owens Ave
8. Briefly describe your proposed schedule for the subject project: ASAP



Engineer's Seal

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

***New Required Field**

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

Revision	Date

Local Entity File No.

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

March 11, 2020

City of Las Vegas Flood Control
Attn.: Mr. Albert Sung, PE
2200 N. Rancho Drive
Las Vegas, Nevada 89103

Re: Technical Drainage Study for Red Realty - Cultivation Facility

Dear Mr. Sung,

This letter certifies that all items provided on the Technical Drainage Study for Red Realty – Cultivation Facility electronic submittal matches 100% the paper version bound into the study.

Respectfully submitted,

John Gustafson. PE
Baughman & Turner, Inc.



January 15, 2020
22-20-61

City of North Las Vegas Public Works
Development and Flood Control Division
Attn.: Mr. Dan Le, PE
2250 Las Vegas Boulevard North
North Las Vegas, Nevada 89030

Re: Technical Drainage Study for Red Realty-Cultivation Facility

Dear Mr. Le,

Transmitted herewith for your approval are two (2) copies of the hydrology study for Red Realty-Cultivation Facility, a 2.53-acre site. The property lies at the northeast corner of I-15 and Owens Avenue. The proposed development is a marijuana cultivation site including two buildings.

If there are any questions concerning this study, please contact this office.

Sincerely,
Baughman & Turner, Inc.

Sunshine M Woods
Staff Engineer

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I. INTRODUCTION

This study analyzes the development of a medical marijuana cultivation establishment and associated onsite facilities where a gravel parking lot and building currently exist. Analysis presented herein was established after first consulting with the Clark County Regional Control District's (CCRFCD) 2018 Master Plan Update, FEMA regulations and policies, and the CCRFCD's Hydrologic Criteria and Drainage Design Manual (referred to hereafter as the HCDDM).

II. GENERAL DESCRIPTION

A. Location

The proposed 2.53-acre site is in a portion of the South Half (S ½) of the Southeast Quarter (SE¼) of Section 22, Township 20 South, Range 61 East, M.D.B.&M., Clark County, Nevada. The property lies at the northeast corner of I-15 and Owens Ave (see Figure 1, Vicinity Map). The site is more specifically described as Assessor's Parcel Numbers 139-22-803-002 and -001 (see Figure 2, Assessor's Parcel Map).

B. Property Description

The property is about 2.53 acres of developed property. The site has been used for years as a vehicular impound yard. The storage yard is a combination of dirt and gravel which has been hard packed over the years. There is an existing office building and a secondary building along the west property line. The property is surrounded by a corrugated metal fence with barbed wire on three sides and a chain link fence on the west property line. Owens Avenue borders the south property line, the UPRR railroad tracks border the east property line and I-15 borders the west property line (See Figure 3, Aerial View and 4, General Aerial View). In the existing condition, the property slopes from the southwest to the northeast at about 3.3%.

C. Master Planning Information

The Clark County Regional Flood Control District's (CCRFCD) 2018 Master Plan Update, a comprehensive plan to facilitate construction of regionally significant flood control structures to alleviate flooding in the Las Vegas Valley, has no existing or proposed facilities adjacent to the site.

A review of the 2018 CCRFCD's Master Plan Update, Figure F-25, (see Figure 5, Flood Control Facilities), indicates that there are existing regional facilities located in Owens, west of I-15, and on the west side of I-15. LVOW 0000 is an existing 10' x 6' RCB in Owens. This facility collects flows from Owens and discharges them into the facility along the freeway. LV15 0280 and LV15 0255 are concrete lined channels located on the west side of I-15. These regional facilities provide 100-yr flood protection from stormwater runoff from the west and protect the freeway.

The I-15 freeway is the western hydrologic basin boundary. The proposed development is located at the western end of sub-basin E-C, as shown on Master Plan Figure W-5 (see Figure 6, Hydrologic Sub-basins).

D. Floodplain Information

The Flood Insurance Rate Map, Clark County, Nevada, Community Panel No. 32003 C 2160 F (effective date November 16, 2011), published by the Federal Emergency Management Agency (FEMA), indicates that the site is in a Zone X. A Zone X is determined to be an area outside the 0.2% annual chance floodplain (see Figure 7, Flood Insurance Rate Map).

E. Previous Hydrology Studies

The following study was reviewed in the preparation of this study. Reference material from the study is included in Appendix I.

> Technical Drainage Study for MD Development (CNLV No. 52294) approved August 21, 2015 by Baughman & Turner, Inc.

The MD Development Study previously analyzed the project site and was an update to the Susan Cannavo Study. The study establishes hydrologic cutoffs, identified the offsite basins as fully developed in the existing conditions, and analyzed the project site in the existing condition. See Appendix H for relevant report excerpts and figures.

III. HYDROLOGY

A. Existing Offsite Drainage Conditions

The existing offsite drainage conditions impacting the site remain unchanged from the MD Development Study. The two offsite basins OFFA and OWENS are fully developed in the existing conditions (See Figure 8, Existing Offsite Drainage Basin Map). Per the MD Development Study (Susan Cannavo Study):

> *"Basin OWENS is the Owens Street right of way between the west boundary of I-15 and the eastern boundary of the site. Runoff west of I-15 is collected in drop inlets and discharged to the freeway channel. Basin OWENS generates 4 and 6 cfs during the 10 and 100-year storms, respectively. Runoff produced by basin OWENS travels east past the site combining with flow from basin OFFA. The total flow in Owens at the east end of the site is 19 and 35 cfs. At the east side of the site, Owens is below the railroad crossing providing up to a 15 ft buffer from offsite flows. "*

B. Existing Onsite Drainage Conditions

The existing site was analyzed as two basins in the MD Development/Susan Cannavo Study, EXSITE and EXSITES (see Figure 9, Existing Onsite Drainage Basin Map). Per the Susan Cannavo Study:

> *" Basin EXSITES is about 0.27 acres at the southeast corner of the site. The basin will generate <1 cfs and 1 cfs in the 10- and 100-year, 6-hour storm event, respectively. This storm runoff will sheet flow southeast to discharge to the existing UPRR railroad tracks, then south to Owens. Basin EXSITE is the balance of the site, about 1.60 acre. This basin will generate 3 cfs and 6 cfs in the 10- and 100-year, 6-hour storm event, respectively. This storm runoff will sheet flow east to discharge to the existing UPRR railroad tracks."*

Please note that the existing onsite basins were analyzed using a curve number of 94, which is not consistent with that of newly graded SCS Soil Type C. It should be noted that the site has been used as a tow yard and vehicle storage lot for numerous years, and therefore compaction has occurred. Due to this, a curve number of 94 for newly graded soil (Type D Soil) is more appropriate.

The parcel located to the north of the MD Development analysis was added to this study. The basin, EXSITEN is 0.66 acres and will generate 3 cfs in the 10-year storm event and 5 cfs in the 100-year storm. These flows head east and drain towards the UPRR. The runoff from EXSITE and EXSITEN will sheet flow to the railroad tracks, a total of 5 cfs in the 10 year and 11 cfs in the 100 year.

C. Interim Drainage Conditions

There is no interim condition as the offsite basins are fully developed. The developed condition will discuss the development of the site.

D. Developed Onsite Drainage Conditions

The developed site has been analyzed as two (2 basins: DSITEN and DSITES (see Figure 10, Developed Onsite Drainage Basin Map).

Basin DSITEN is about 0.95 acres which is the north portion of the site. The basin will generate 3 cfs and 5 cfs in the 10- and 100-year, 6-hour storm event, respectively. This storm runoff will drain east then discharge to the existing UPRR railroad tracks. Basin DSITES is the balance of the site, about 1.58 acres. This basin will generate 3 cfs and 5 cfs in the 10- and 100-year, 6-hour storm event, respectively. This runoff will drain southeast to the rip-rap swale and then discharge south to Owens where it will combine with the offsite flows at CP1.

E. Compliance with Regulations and Adopted Plans

All design criteria has been established after first consulting with the CCRFCD's 2018 Master Plan Update, FEMA regulations and policies, and the CCRFCD's Hydrologic Criteria and Drainage Design Manual. Clark County will review this study as it relates to development standards.

IV. HYDROLOGIC/HYDRAULIC CRITERIA

A. Soil Classification

Per the MD Development Study (Susan Cannavo Study):

> "The native soils associated with the site and offsite basins have been classified by the United States Department of Agriculture Soils Conservation Service (SCS) in their soil survey of Las Vegas Valley Area as Soil Unit 236, Glencarb, very fine sandy loam, saline, and Soil Unit 380 Skyhaven, very fine sandy loam. Glencarb has a weighted hydrologic soils group of B and Skyhaven has a weighted hydrologic soils group of C. The curve number for the offsite basins was defined as 98 percent impervious."

The existing onsite basins are classified as having Type C Soil; however, in order to be consistent with the existing onsite use, the existing onsite basins were analyzed using a curve number of 94 which is consistent with newly graded and compacted Type D Soil. The developed onsite basin has been analyzed as commercial with Type C soil. All curve numbers were calculated using Table 602 and Table 602A of the HCDDM. The on and off-site associated curve numbers can be found in Appendix B along with the soil information.

B. Precipitation

The project and associated offsite basins are located within the McCarran Airport Rainfall area as shown on Figure 513 of the HCDDM. 10 and 100-year rainfall depths were referenced from Table 505. The HCDDM figures and tables are included in Appendix C.

In accordance with the CCRFCD's Hydrologic Criteria and Drainage Design Manual, the design storm selected was a 6-hour duration storm. Three different 6-hour storm distributions are allowed in the Clark County area, labeled SDN-3, SDN-4, and SDN-5 (see Table 503). For drainage areas less than 8 square miles, an SDN-3 is required. The drainage area associated with this site is less than 8 square miles; therefore, an SDN-3 was used.

C. Time of Concentration and Lag Time

The Criteria Manual's Standard Form 4 was completed to determine the time of concentration for each drainage basin. For all basins, which comprise less than 1 square mile, the time of concentration was calculated as follows:

$$T_c = T_i + T_t$$

Where: T_c = Time of Concentration
T_i = Initial, inlet or overland flow time
T_t = Travel time in the ditch, gutter, etc.

The time of concentration is the sum of the initial flow time, T_i and the travel time, T_t. The minimum T_c recommended for non-urban watersheds is 10 minutes and 5 minutes minimum for urban watersheds.

Initial flow time was calculated as follows:

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

Where: T_i = Initial overland flow time (in minutes)
$K = 0.0132CN - 0.39$ Lo = Length of overland flow (maximum 500 feet)
CN = Curve Number S = Average basin slope (in percent)

The lag time was calculated as follows:

$T_{lag} = 0.6Tc$ (in hours) (See Appendix D for calculations)

D. Summary of Findings

Table 1 and 2 list the 100-year and 10-year, 6-hour storm flows. The HEC-1 printouts can be found in Appendices E and F.

Table 1. Peak Flow Summary

Existing Condition		
Source	**100-Year Flow (cfs)**	**10-Year Flow (cfs)**
OFFA*	30	17
OWENS*	6	4
EXSITES*	1	<1
CP1*	37	21
EXSITE*	6	3
EXSITEN	5	2
CP2	11	5

*=Referenced from MD Development

Table 2. Peak Flow Summary

Developed Condition		
Source	**100-Year Flow (cfs)**	**10-Year Flow (cfs)**
OFFA*	30	17
OWENS*	6	4
DSITES	5	3
CP1	40	22
DSITEN	5	3

*=Referenced from MD Development

Analysis to determine peak flow rates were achieved using the SCS Unit Hydrograph Method. The input parameters discussed in Section IV, A – C were input into HEC-1, a computer results are shown in the Table above. A summary of input parameters and the HEC-1 printouts can be found in Appendices E and F.

Comparisons between the site discharges draining to the UPRR have been made between the existing flow conditions, the approved allowable flow rates from the Susan Cannavo Study, the approved allowable flows from the MD Development Study, and the proposed discharge from this study. The comparison is summarized in Table 3 below.

Table 3. Discharge to UPRR Comparison

Flowrate Conveyance Comparison		
Source	**100-Year Flow (cfs)**	**10-Year Flow (cfs)**
Existing Flow Rate	11	5
Susan Cannavo Approved Flows	6	3
MD Development Approved Flows	4	2
Proposed Flows	**5**	**3**

As demonstrated in Table 3, the proposed development will limit its discharge to reduce the existing 100-year peak flow rate of 5 cfs and to match the 10-year flow of 3 cfs. Therefore, no negative impacts are anticipated to the UPRR property or to downstream properties. There is a 3 cfs increase in the 100-yr and a 1 cfs increase in the 10-yr discharge to Owens. However, there is no impact to the adjacent property owners.

E. Facility Design Calculations

1. Street Capacity

Street capacity analyses were performed to determine the depth of flow in the surrounding streets. Table 4 summarizes the 100-year flow in the street.

Table 4. Street Capacity Summary

Location	Q (cfs)	D (feet)	V (fps)	DxV	Remarks
100-Year Flow – Ultimate Conditions					
HS1) Owens - Upstream*	6	0.28	4.52	1.27	VxD <8 is met; D less than 2 ft
HS2) Owens - Downstream*	40	0.47	6.84	3.21	VxD <8 is met; D less than 2 ft
10-Year Flow – Ultimate Conditions					
HS1) Owens - Upstream*	4	0.26	4.22	1.10	VxD <6 is met; D less than 1; 10-yr dry lane is met
HS2) Owens - Downstream*	22	0.47	5.95	2.38	VxD <6 is met; D less than 1

*=Referenced from MD Development

All the roadways meet the 100-year Clark County criteria for depth and VxD (i.e. VxD less than 8), as well as, the 10-year criteria for depth and VxD (i.e. VxD less than 6). Please note that Owens Avenue at HS2 does not meet 10-year dry lane criteria; however, the depth of flow is less than the curb depth, which meets HCDDM criteria. Additionally, although 100-feet of right-of-way of Owens has been dedicated, the existing overpass bridge at the I-15 and the UPRR bridge (which bound the site to the west and east) only allow for approximately 62 feet of roadway width, curb, gutter, and sidewalk. When HS2 was reanalyzed as a 100-foot right of way road with 10' median, approximately 27-feet of dry lane is provided, which meets dry lane criteria. See Appendix G for all street capacity calculations.

As shown in the hydraulic criteria tables (Tables 1-5), the *HCDDM* hydraulic criteria are met as follows:

- 10-year and 100-year DxV products are less than 6 and 8, with depths of flow less than 1 foot and 2 feet, respectively.
- The interior parking lot will safely convey storm water towards the UPRR right-of-way.

2. Finished Floor Calculations

There are two new buildings being built with this development along with onsite pavement and perimeter blockwalls. Finish Floor Elevation analysis for the buildings were determined according to the specifications outlined in the CCRFCD's *Hydrologic Criteria and Drainage Manual*. The finished floor must be set a minimum of twice the depth of flow, or one (1) foot above the top of curb, measured at the high side of the building, whichever is highest. Table 5 below summarizes the method to determine the proposed finished floor elevation. The two finished floor elevations more than meet the criteria.

Table 5. Minimum Finished Floor Elevation Determination

Owens Ave	Top of Curb	Free-board	FF Based on TC in Street	Flowline Elevation	Depth of Flow	Free-board	Finished Floor Based on Depth of Flow	Proposed Minimum Elevation
Building 1	73.0	1	74.0	72.5	0.3	0.3	73.1	1982.3
Building 2	66.0	1	67.0	65.5	0.5	0.5	66.4	1983.3

3. Best Management Practices

The total parking area for the site will exceed 1 acre in size and shall conform to the Section 1500; Structural Best Management Practices as referenced within the Clark County Regional Flood Control District (CCRFCD) Hydrologic and Drainage Design Manual (HCDDM). The discharge for the newly paved parking area has been designed to allow the stormwater to travel over a rip rap area along the east property line before discharging to the UPRR right-of-way via sheet flow. The table below provides the calculations for the impervious area for parking lots and LIDs.

Table 6. BMP Calculations

PARKING LOT AREA	ACERAGE
Property size (PS)	2.53
Building Area (BA)	0.96
Total Pervious Area (TPA)	0.15
Parking Lot Area (PLA) PLA = PS-BA-TPA	1.42
Min. PLA to be treated Min = PLA x 0.75	1.07

4. Proposed Facilities

The drainage facilities required for this site consist of:

- Positive onsite grading
- Riprap lined swales
- Sidewalk underdrains and curb openings

V. CONCLUSIONS

A. Compliance with Agency Regulations

City of North Las Vegas will review the Hydrology Study as it relates to development standards and overall facility effectiveness. Below is a discussion of the effectiveness of the

proposed drainage scheme. This study complies with the standards as set forth in the CCRFCD's Hydrologic Criteria and Drainage Design Manual.

B. Overall Facility Effectiveness

Development of this site will not adversely affect surrounding property owners, since current drainage patterns have not been significantly changed. The small increase in runoff generated by the developed site will be handled as discussed above and will meet City of North Las Vegas and Clark County Regional Flood Control District standards.

VI. REFERENCES

The following documents were used in the preparation of this hydrology study update:

1) DRAINAGE DESIGN MANUAL, 1999 - Hydrologic Criteria and Drainage Design Manual, Clark County Regional Flood Control District.

2) CCRFCD, 2018 - Flood Control Master Plan Update, Volume 1, Clark County Regional Flood Control District, James M. Montgomery Consulting Engineers, Inc., 2018.

3) NRCS, 2019 - Soil Survey of the Las Vegas Valley Area, Nevada, United States Department of Agriculture Soils, Natural Resources Conservation Service, Washington D.C., June 14, 2019.

4) FEMA, 2011 - Flood Insurance Rate Maps, Clark County, Nevada, U.S. Federal Emergency Management Agency, November 16, 2011.

5) HEC, 1988 - HEC-1 Flood Hydrograph Package, Users Manual, U.S. Army Corps of Engineers, the Hydrologic Engineering Center, Davis, California, 1988.

6) Technical Drainage Study for MD Development (CNLV No. 52294) approved August 21, 2015 by Baughman & Turner, Inc.



VICINITY MAP

FIGURE 1

BAUGHMAN & TURNER, INC.
CIVIL ENGINEERS
LAND PLANNERS
LAND SURVEYORS
1210 HINSON STREET
LAS VEGAS, NEVADA
(702) 870-8771
89102

PREPARED FOR :

RED REALTY-CULTIVATION FACILITY

DATE: 2020
DESIGN: SW
DRAWN: SW
JOB: 22-20-61

NOTES

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

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

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

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

0 100 200 400 600 800

MAP LEGEND

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

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

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

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

BOOK T20S R61E

125	124	123
138	139	140
163	162	161

Scale: 1" = 200'

SEC. 22

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

Rev: 1/8/2019

MAP S 2 SE 4

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

139-22-8

CLARK COUNTY NEVADA

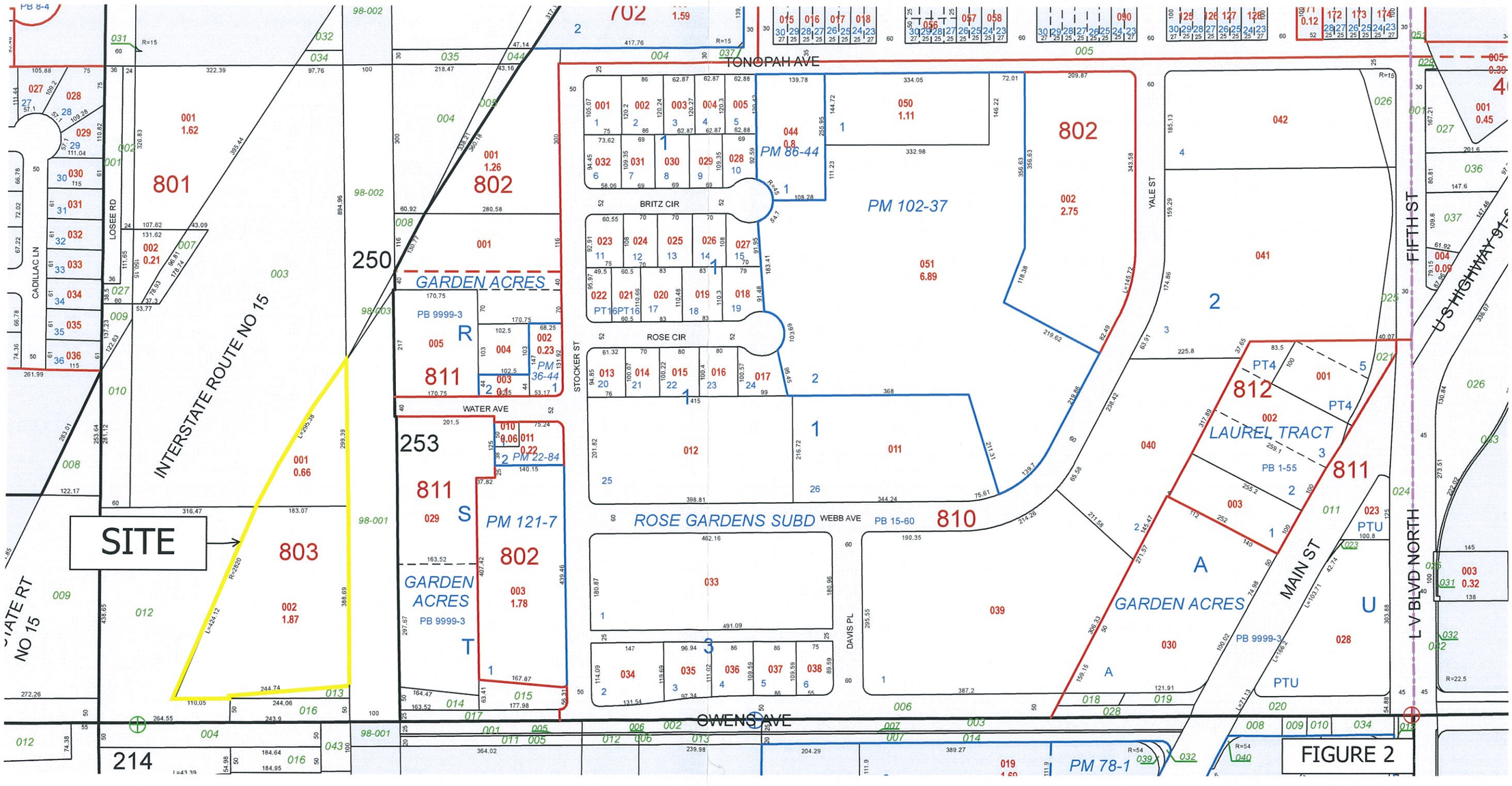
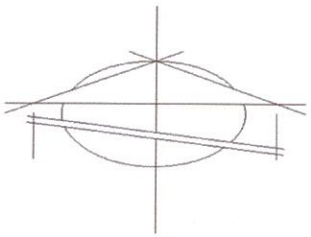
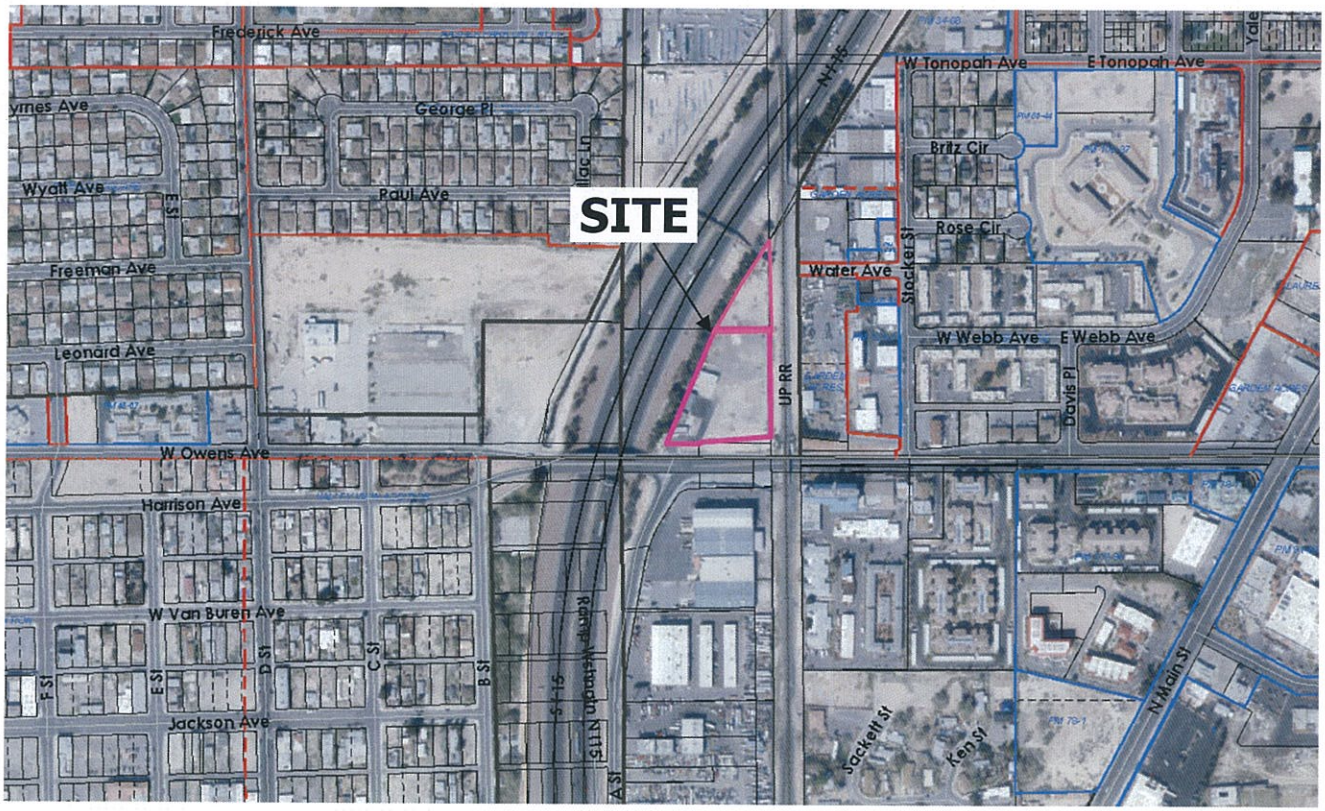


FIGURE 2

TAX DIST 250,253





GENERAL AERIAL VIEW

FIGURE 3

BAUGHMAN & TURNER, INC.
CIVIL ENGINEERS
LAND PLANNERS
LAND SURVEYORS
1210 HINSON STREET
LAS VEGAS, NEVADA
89102
(702) 870-8771

PREPARED FOR :

RED REALTY-CULTIVATION FACILITY

DATE: 2020
DESIGN: SW
DRAWN: SW
JOB: 22-20-61



N.T.S.

AERIAL VIEW

FIGURE 4

BAUGHMAN & TURNER, INC.
CIVIL ENGINEERS LAND PLANNERS
LAND SURVEYORS
1210 HINSON STREET LAS VEGAS, NEVADA
(702) 870-8771 89102

PREPARED FOR :

RED REALTY-CULTIVATION FACILITY

DATE: 2020
DESIGN: SW
DRAWN: SW
JOB: 22-20-61

REGIONAL FLOOD CONTROL DISTRICT

2018
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F-25
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

N

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

Scale: 1 inch = 2,000 feet

AerialSource:Esri World Imagery 2017

ATKINS
Member of the SNC-Lavalin Group

FIGURE 5A

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
CABZ		CEDAR AVENUE - BONANZA						
0C10	E	66" RCP	1450					0.33
LCCH		LAS VEGAS CREEK CHANNEL						
0C12	E	2: 12' X 6' RCB	2035	5000	CLC20-C	MEADOW34	9.60	0.82
LV15		FREMONT CHANNEL						
0C00	E	CONC CHNL 23W 10D 1.5:1 SS (REPLACE W/ LV150001)	1759	5012	2CLV1E-3	CWEST4	11.19	0.12
0C01	PO	CONC CHNL 55W 11D 0:1 SS (REPLACES LV150006)	1759	5012	2CLV1E-3	CWEST4	11.19	0.12
0C05	E	CONC CHNL 23W 10D 1.5: SS	866	1434'	2CLV1D-3'	CWEST4	10.29	0.13
0C50	E	2: 8'X 10' RCB	1534	1434'	2CLV1D-3'	CLVME4	10.29	0.73
0C51	E	"2"X 10' RCB	2524	3273'	2CLV1D-3'	CLVME4	10.29	0.20
0C76	E	CONC CHNL 23W 10D 1.5:1 SS (REPLACE W/ LV150079)	1698	4676	2CLV1D-5	CWEST4	10.29	0.14
0C79	PO	CONC CHNL 57W 11D 0:1 SS (REPLACES LV150078)	1698	4676	2CLV1D-5	CWEST4	10.29	0.14
0C00	E	CONC CHNL 15-20'W 10'D 1.5:1 SS (REPLACE W/ LV150113)	1578	4563	CLV1D-4	CWEST4	9.45	0.11
0C10	PO	CONC CHNL 45W 11.5'D 0:1 SS (REPLACES LV150130)	1578	4563	CLV1D-4	CWEST4	9.45	0.11
0C39	E	CONC CHNL 15W 10'D 1.5:1 SS (REPLACE W/ LV150 40)	3565	4563	CLV1D-4	CWEST4	9.45	0.13
0C40	PO	CONC CHNL 45W 11'D 0:1 SS (REPLACES LV150 39)	3565	4563	CLV1D-4	CWEST4	9.45	0.13
0C00	E	CONC CHNL 43W 12'D 0:1 SS	326	4561	CW1C2	NAV4SC	8.62	0.45
0C08	E	CONFLUENCE STRUCTURE 64'-48'W 10-13'D 0:1 SS	258	4561	CW1C2	NAV4SC	8.62	0.42
0C10	E	2: 12' X 9' RCB	725	5665	CCVG24	NAV3SC	7.14	0.25
0C23	E	CONFLUENCE STRUCTURE 40'W 9'D 0:1 SS	165	5665	CCVG24	NAV3SC	7.14	0.25
0C30	E	"2"X 4.5' RCBC @ LAKE MEAD	177	1265	DRAILRD	NAV3	5.20	1.19
0C31	E	CONC CHNL 9W 8'D 0:1 SS	900	1265	DRAILRD	NAV3	5.20	2.53
0C48	E	8' X 5' RCBC @ UPRR	350	1265	DRAILRD	NAV3	5.20	1.34
0C55	E	CONC CHNL 8W 8'D 0:1 SS	1330	1265	DRAILRD	NAV3	5.20	2.00
0C80	E	CONC CHNL 21 W 8'D 0:1 SS	650	2530	CCVG10	NAV3	5.20	2.00
0C84	E	"4" X 6' RCB	1790	1444	CVG10-C	NAV3	4.61	0.50
0C16	E	"11' X 6' RCB	3010	1152	CWA20-C	NAV3	4.62	0.50
0C72	E	9' X 5' RCB	1970	1152	CWA20-C	NAV3	4.62	0.69
LMBR		LAS VEGAS - BROOK						
0C00	E	96" CMPC @ UPRR	167	546"	CLV1D-5'	7WEST3	0.60	0.35
0C01	E	8' X 4' RCB @ UPRR	167	530"	CLV1D-5'	7WEST3	0.60	0.93
0C02	E	CONC CHNL 27W 9'D 0:1 SS	125	376	CLV1D-5	7WEST3	0.60	1.57
0C05	E	CONC CHNL 19W 4.5'D 2:1 SS	367	376	CLV1D-5	7WEST3	0.60	2.43
0C11	E	2: 9' X 3' RCBC @ LOSEE	125	376	CLV1D-5	7WEST3	0.60	0.71
0C13	E	CONC CHNL 12W 4.5'D 2:1 SS	765	376	CLV1D-5	7WEST3	0.60	1.53
0C14	E	"2"X 4' RCBC @ N. 5TH ST	100	376	CLV1D-5	7WEST3	0.60	2.50
LVBZ		LAS VEGAS WASH - BONANZA						
0C00	P	2: 12' X 7' RCB	1750	1753	CBN15-C	SW3	2.15	0.43
0C25	P	2: 12' X 7' RCB	2730	1753	CBN15-C	SW3	2.15	0.43
0C64	P	2: 12' X 7' RCB	2530	1603	CBN12-C	SW3	1.87	0.43
0114	P	2: 12' X 6' RCB	2749	1211	CBN10-C	SW3	1.54	0.43
0166	E	54" RCP (REPLACE W/ LVBZ0167)	500	1108	CBN09	SW3	1.20	0.45
0167	PO	"6" X 5' RCB (REPLACES LVBZ0 66)	500	1108	CBN09	SW3	1.20	0.43
0167	E	48" RCP (REPLACE W/ LVBZ0168)	1235	1108	CBN09	SW3	1.20	0.71
0168	PO	6' X 3' RCB (REPLACES LVBZ0167)	1235	1108	CBN09	SW3	1.20	0.71
0210	E	42" RCP (REPLACE W/ LVBZ0211)	704	1004	CBN08	SW3	1.05	1.37
0211	PO	6' X 5' RCB (REPLACES LVBZ02 8)	704	1004	CBN08	SW3	1.05	1.37
0223	E	36" RCP (REPLACE W/ LVBZ0224)	2275	356	CBN03	SW3	0.64	0.72
0224	PO	6' X 5' RCB (REPLACES LVBZ0223)	2275	356	CBN03	SW3	0.64	0.72
LVCC		LAS VEGAS WASH CARTIER CHANNEL						
0C00	P	CONC CHNL 12W 5.5'D 0:1 SS	1900	399	CLW1A-3	CCWEST3	1.00	0.40
0C26	P	"6" X 5' RCB	9750	417	A-C	7WEST3	0.40	0.32
LVCL		LAS VEGAS WASH - COLTON						
0C00	E	CONC CHNL 9W 12'D 0:1 SS	100	1071	CLV1E-3	7WEST3	0.60	0.53
0C02	E	"60" RCP	167	1071	CLV1E-3	7WEST3	0.60	0.52
0C05	E	9' X 3' RCB	1320	1071	CLV1E-3	7WEST3	0.60	0.94
0C30	E	7' X 5' RCB	2148	1071	CLV1E-3	7WEST3	0.60	2.22
LVCS		LAS VEGAS WASH - COMMERCE STREET						
0C00	E	"2" X 5' RCB	250	1550	CVG24	NAV3	5.78	1.04
0C04	E	"6" X 6' RCB	510	1550	CVG24	NAV3	5.78	4.84
0C15	E	"6" X 6' RCB	1700	1550	CVG24	NAV3	5.78	0.37
0C50	E	CONC CHNL 10W 8'D 0:1 SS	200	5265	DCCVG10	NAV3	5.00	2.27

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
LVKC		LAS VEGAS WASH - KING CHARLES CHANNEL						
0C00	E	CONC CHNL 35W 10'D 0:1 SS	552	5518	CLV55B-7	CWEST5	14.74	0.40
0C09	E	CONC CHNL 21.6'W 10'D 1.5:1 SS	3280	5518	CLV55B-7	CWEST5	14.74	0.40
LVLA		LAS VEGAS WASH - LAVB						
0C00	F	2: 13' X 9' RCB	2250	2461	CLVW83	WEST3	3.30	0.30
0041	F	13' X 11' RCB	2800	2320	COA32	WEST3	3.07	0.58
0090	F	13' X 10' RCB	2700	2047	CLW64-3	WEST3	2.65	0.44
0141	F	13' X 10' RCB	2650	1893	CLW64-2	WEST3	2.12	0.38
0191	F	12' X 9' RCB	2700	1452	CLW64-1	WEST3	1.61	0.56
LVLE		LAKE MEAD DRAIN TO LAS VEGAS WASH						
0C00	F	12' X 8' RCB	2600	660	CLV1B-2	WEST3	0.78	0.40
0047	F	12' X 4' RCB	2400	458	LV1E-1	WEST2	0.49	0.50
LVLM		LAS VEGAS WASH - LAKE MEAD						
0C00	E	43"X 68" HERCP (REPLACE W/ LVLM0001)	647	1159	CLM23-C	NW3SC	1.36	4.60
0C01	P9	12' X 4' RCB (REPLACES LVLM0000)	647	1159	CLM23-C	NW3SC	1.36	4.60
0C16	E	34" RCP (REPLACE W/ LVLM0017)	565	1159	CLM23-C	NW3SC	1.36	4.38
0C17	P9	12' X 4' RCB (REPLACES LVLM0016)	565	1159	CLM23-C	NW3SC	1.36	4.38
0033	E	60" RCP (REPLACE W/ LVLM0034)	1186	1159	CLM23-C	NW3SC	1.36	1.62
0034	P9	12' X 5' RCB (REPLACES LVLM0033)	1186	1159	CLM23-C	NW3SC	1.36	1.62
0059	E	72" RCP (REPLACE W/ LVLM0060)	5962	1159	CLM23-C	NW3SC	1.36	0.66
0060	P9	12' X 7' RCB (REPLACES LVLM0059)	5962	1159	CLM23-C	NW3SC	1.36	0.66
LVLV		LAS VEGAS BLVD DRAIN						
0C00	F	2: 10' X 6' RCB	2600	823	CLW97B-4	WEST3	1.03	0.10
LVVD		LAS VEGAS WASH - MIDDLE						
1178	E	EARTH CHNL 30'W 18'-20'D 2:1 SS (REPLACE W/ LVMD1178)	1500	13206	CLVW84-C	CLVWASH5	169.77	0.57
1179	F	CONC CHNL 93'W 9.3'D 2:1 SS (REPLACES LVMD1179)	1500	13206	CLVW84-C	CLVWASH5	169.77	0.57
1208	E	SANK-STAB. CHNL 65'W 7.5'D 2:1 SS (REPLACE W/ LVMD1208)	1420	13206	CLVW84-C	CLVWASH5	169.77	0.32
1209	F	CONC CHNL 93'W 11'D 2:1 SS (REPLACES LVMD1208)	1420	13206	CLVW84-C	CLVWASH5	169.77	0.32
1230	E	4 SPAN BRIDGE 162'W 12'D @ WASHINGTON	105	13172	CCLVW03	CLVWASH5	169.50	0.73
1232	E	SANK-STAB. CHNL 48'W 8'D 2:1 SS (REPLACE W/ LVMD1233)	1900	13172	CCLVW03	CLVWASH5	169.50	0.73
1233	F	CONC CHNL 93'W 8'D 0:1 SS (REPLACES LVMD1232)	1900	13172	CCLVW03	CLVWASH5	169.50	0.73
1271	E	4 SPAN BRIDGE 94'W 10'-12'D 2:1 SS @ LAKE	120	12412	CCLVW01-C	CLVWASH5	166.21	0.38
1272	E	EARTH CHNL 86'W 10'D 2:1 SS (REPLACE W/ LVVD1273)	2400	12412	CCLVW01-C	CLVWASH5	166.21	0.38
1273	F	CONC CHNL 93'W 9'D 2:1 SS (REPLACES LVMD1272)	2400	12412	CCLVW01-C	CLVWASH5	166.21	0.38
1320	E	GABION CHNL 100'W 10'D 2:1 SS (REPLACE W/ LVMD1321)	1950	9070	CCK-C1	CLVWASH5	103.98	0.38
1321	F	CONC CHNL 93'W 8.5'D 2:1 SS (REPLACES LVMD1320)	1950	9070	CCK-C1	CLVWASH5	103.98	0.38
1354	E	5 SPAN BRIDGE 110'W 7.6'D 2:1 SS @ OWENS	120	7810	2CLV1B-2	CLVWASH5	169.05	0.58
1355	E	GABION CHNL 100'W 10'D 2:1 SS	3122	7810	2CLV1B-2	CLVWASH5	169.05	0.58
1390	E	ENERGY DISSIPATOR	137	7892	CLW64-4	CLVWASH5	168.27	0.10
1400	E	CONC CHNL 93' W 12'D 2:1	173	7892	CLW64-4	CLVWASH5	168.27	0.00
1421	E	2 SPAN BRIDGE 34'W 8'D @ LAKE MEAD	200	8906	CLW64-4	CCWEST5	80.53	0.60
1424	E	CONC CHNL 73'W 8.5'D 2:1 SS	1615	8906	CLW64-4	CCWEST5	80.53	0.34
1444	E	CONC CHNL 34'W 8'D 0:1 SS	1450	8906	CLW64-4	CCWEST5	80.53	0.34
1462	E	1 SPAN BRIDGE 34'W 7'D @ CAREY	72	8906	CLW64-4	CCWEST5	80.53	1.00
1484	E	CONC CHNL 34'W 8'-9'D 0:1 SS	1880	8906	CLW64-4	CCWEST5	80.53	0.37
1522	E	CONC CHNL 93'W 10'D 0:1 SS	376	8966	2CLW A-3	CCWEST5	80.16	0.53
1529	E	CONC CHNL 93'W 9.5'D 0:1 SS	260	8966	2CLW A-3	CCWEST5	80.16	0.53
1534	E	1 SPAN BRIDGE 72.5'W 7.5'D @ LAS VEGAS BLVD	120	8742	CLW1A-4	CCWEST5	78.13	0.88
1536	E	CONC CHNL 72'W 8'D 0:1 SS	455	8742	CLW1A-4	CCWEST5	78.13	0.49
1543	E	CONFLUENCE STRUCTURE	353	8742	CLW1A-4	CCWEST5	78.13	1.44
1550	E	CONC CHNL 93'W 7.5'-9'D 0:1 SS	2150	8260	CHYPKOT	CCWEST5	77.19	0.45
1594	E	1 SPAN BRIDGE 99'W 8'D @ CHEYENNE	124	8260	CHYPKOT	CCWEST5	77.19	0.71
1595	E	CONC CHNL 93'W 7'D 0:1 SS	580	8260	CHYPKOT	CCWEST5	77.19	0.40
1600	E	TRANSITION STRUCTURE	144	8260	CHYPKOT	CCWEST5	77.19	0.40
1609	E	60' X 7.25' RCB WITH 2' CENTER PIER	221	8260	CHYPKOT	CCWEST5	77.19	0.40
1614	E	CONC CHNL 93'W 9'-11'D 0:1 SS	703	13796	CHYP-01N	CCWEST5	77.19	0.15
1626	E	TRANSITION STRUCTURE	227	13796	CHYP-01N	CCWEST5	77.19	2.46
1643	E	64,000 CFS PVF SPILLWAY (REPLACE W/ LVMD1644)		64000	CHYP-01N	CCWEST5	77.19	
1644	F	MODIFY 64,000 CFS PMF SPILLWAY, RAISE BY 1' (REPL LVMD1643)		64000	CHYP-01N	CCWEST5	77.19	
1645	E	456 AC-FT CHEYENNE PEAKING BASIN		13796	CHYP-01N	CCWEST5	77.19	
1646	F	UPGRADE TO 530 AC-FT CHEYENNE PEAKING BASIN		13796	CHYP-01N	CCWEST5	77.19	
1647	E	CONC CHNL 123'D 10'W 0:1 SS	600	13796	CHYP-01N	CCWEST5	77.19	0.40

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
LVMD		LAS VEGAS WASH - MIDDLE						
1648	E	3 SPAN BRIDGE 96'W 8'-10'D 2:1 SS @ CTAC CENTER	120	13795	CHYP-01N	CCWEST5	77.19	0.70
1653	E	CONC CHNL 80W 10'D 2:1 SS	700	13715	SC90B-7	CCWEST5	76.87	0.70
1654	E	3 SPAN BRIDGE 75'W 10'D 2:1 SS @ I-15	120	13715	SC90B-7	CCWEST5	76.87	0.70
1655	E	TRANSITION STRUCTURE	200	8157	CLW98B-5	WEST5	48.36	0.36
1669	E	FREE SPAN BRIDGE 55W 10'D @ UPRR	40	8157	CLW98B-5	WEST5	48.36	0.36
1670	E	CONC CHNL 82W 10'D 0:1 SS	370	8157	CLW98B-5	WEST5	48.36	1.60
1677	E	CONC CHNL 80W 10'D 2:1 SS	119	8157	CLW98B-5	WEST5	48.36	0.37
1679	E	4 SPAN BRIDGE 180W 12'D 2:1 SS @ LOSEE	120	8157	CLW98B-5	WEST5	48.36	0.37
LVNC		LAS VEGAS WASH - N CHANNEL						
0C01	E	16' X 7' RCB	150	1059	CLW100	CWEST5	14.59	0.33
0C04	E	CONC CHNL 18W 8.5'D 0:1 SS	200	1059	CLW100	CWEST5	14.59	0.33
0C07	E	DROP STRUCTURE 18'W 2.8'D 2:1 SS	200	1059	CLW100	CWEST5	14.59	0.70
0C08	E	CONC CHNL 18W 10'D 2:1 SS	1250	1059	CLW100	CWEST5	14.59	0.70
0C37	E	2: 14' X 7' 6" CMAP @ CHEYENNE	120	1059	CLW100	CWEST5	14.59	0.70
0C38	E	CONC CHNL 32W 8.5'D 2:1 SS	363	1059	CLW100	CWEST5	14.59	0.30
0C43	E	CONC CHNL 12W 6'-8'D 2:1 SS	1530	1059	CLW100	CWEST5	14.59	0.50
0C79	E	TRANSITION CONC CHNL	350	1059	CLW100	CWEST5	14.59	1.00
0C90	E	2: 12' X 6' RCB	120	1059	CLW100	CWEST5	14.59	0.70
0C91	E	14' X 6' RCAP	1324	1059	CLW100	CWEST5	14.59	0.62
LVOE		OWENS AVENUE - EAST						
0C00	P	15' X 12' RCB	4700	3618	CK-C1	SW5	24.06	0.47
0C85	P	14' X 12' RCB	2540	2908	CC	SW5	23.74	0.62
0134	P	12' X 11' RCB	5300	2833	CE-C	SW5	23.51	1.00
0236	P	12' X 9' RCB	5000	2643	CH-C1	SW5	22.90	1.50
0231	P	12' X 12' RCB	1940	2576	3LVOE	SW5	22.61	0.60
0245	P	12' X 12' RCB	990	2576	3LVOE	SW5	22.61	0.60
LV3W		OWENS AVENUE SYSTEM						
0C00	E	16' X 6' RCB	145	1219	CLM16B-C	NW3	2.43	0.75
0C03	E	96" RCP	7500	1219	CLM16B-C	NW3	2.43	0.70
LVSR		LAS VEGAS WASH - SMOKE RANCH						
0C00	E	CONC CHNL 22W 8'D 0:1 SS	79	1086	CS1-C	NW3SC	1.42	2.32
0C01	E	FREE SPAN BRIDGE 22W 10'D	50	1086	CS1-C	NW3SC	1.42	2.32
0C02	E	CONC CHNL 22W 8'D 0:1 SS	468	1086	CS1-C	NW3SC	1.42	2.32
0C09	E	72" RCP (REPLACE W/ LVSR0013)	702	1086	CS1-C	NW3SC	1.42	2.32
0C10	P	10' X 5' RCB (REPLACES LVSR0009)	702	1086	CS1-C	NW3SC	1.42	2.32
0C20	E	60" RCP (REPLACE W/ LVSR0021)	1320	1086	CS1-C	NW3SC	1.42	3.03
0C21	P	10' X 5' RCB (REPLACES LVSR0020)	1320	1086	CS1-C	NW3SC	1.42	3.03
0C45	E	54" RCP (REPLACE W/ LVSR0043)	1180	1086	CS1-C	NW3SC	1.42	2.41
0C46	P	10' X 5' RCB (REPLACES LVSR0045)	1180	1086	CS1-C	NW3SC	1.42	2.41
0C70	E	66" RCP (REPLACE W/ LVSR0071)	4119	1086	CS1-C	NW3SC	1.42	0.73
0C71	P	10' X 8' RCB (REPLACES LVSR0070)	4119	1086	CS1-C	NW3SC	1.42	0.73
LVWH		WASHINGTON AVENUE CHANNEL						
0C86	E	2: 12' X 8' RCB	1210	3625	CLVW01-C	SW3SC	16.58	0.35
0087	E	2: 12' X 8' RCB	1560	3625	CLVW01-C	SW3SC	16.58	0.33
0136	E	2: 12' X 8' RCB	2063	3728	CQ-C	SW3SC	16.35	0.33
0155	E	3: 10' X 8' RCB	3630	3618	CP-C	SW3SC	16.09	0.68
0234	E	2: 12' X 8' RCB	600	2502	CN-C	SW3SC	15.78	0.71
0240	E	2: 12' X 8' RCB	3240	2502	CN-C	SW3SC	15.78	1.50
0205	E	12' X 8' RCB	2950	1952"	CV1-C'	SW3SC	14.95	2.60
0261	E	12' X 8' RCB	548	1952"	CV1-C'	SW3SC	14.95	0.50
0271	E	12' X 8' RCB	590	1952"	CV1-C'	SW3SC	14.95	2.62
0282	E	CONC CHNL 50W 10'D 0:1 SS	260	3124	CV1-C	SW3SC	14.95	0.80
0287	E	12' X 8' RCB	125	1952"	CV1-C'	SW3SC	14.95	7.43
0289	E	12' X 8' RCB	2110	1952"	CV1-C'	SW3SC	14.95	0.90
0428	E	16' X 8' RCB	150	1952"	CV1-C'	SW3SC	14.95	1.06
0429	E	SPLITTER STRUCTURE (2: 12' X 8' RCB)	190	2870	DCLC21	SW5	22.61	1.50
0431	E	2: 14.33' X 10' RCB	665	2870	DCLC21	SW5	22.61	0.15
0446	E	JUNCTION STRUCTURE	69	2870	DCLC21	SW5	22.61	0.15
0447	E	2: 14.33' X 10' RCB	1955	5193	CCAL93	SW5	22.05	0.15
RWSL		RANGE WASH - SLOAN						
0694	E	CONC CHNL 10W 8'D 1.5:1 SS	1500	1686	C47C4	RW3SC	2.40	0.55

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
RWSL		RANGE WASH - SLOAN						
0F27	E	3: 16' X 8' RCBC	100	1592	C2CTE3	RW3SC	2.25	0.58
0F28	E	CONC CHNL 12W 8.5'D 1.5:1 SS	1345	1592	C2CTE3	RW3SC	2.25	0.59
WAGC		WASHINGTON AVENUE CHANNEL - GRAND CENTRAL						
0C0C	E	2: 12' X 4' RCB	700	505	LC21	SW3	3.56	0.20
0C14	E	1: 12' X 4' RCB AND 1: 11' X 4' RCB	2443	505	LC21	SW3	3.56	0.23
WAPR		WASHINGTON AVENUE CHANNEL PARALLEL						
0C0C	E	12' X 8' RCB	2100	1952"	CV1-C'	SW3SC	14.95	2.20
0C07	E	12' X 8' RCB	590	1952"	CV1-C'	SW3SC	14.95	3.60
0C51	E	12' X 8' RCB	1200	1952"	CV1-C'	SW3SC	14.95	0.80
0C74	E	12' X 8' RCB	550	1952"	CV1-C'	SW3SC	14.95	1.60
0C85	E	14' X 8' RCB	395	1952"	CV1-C'	SW3SC	14.95	0.55
0C87	E	14' X 8' RCB	1935	1952"	CV1-C'	SW3SC	14.95	1.24
0C92	E	2: 9' X 8' RCB	347	1952"	CV1-C'	SW3SC	14.95	1.87

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

REGIONAL FLOOD CONTROL DISTRICT

2018 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

FACILITY INVENTORY FIGURE F-25

LEGEND

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

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

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

Construction Features

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

ATKINS
Member of the SNC-Lavalin Group

FIGURE 5B

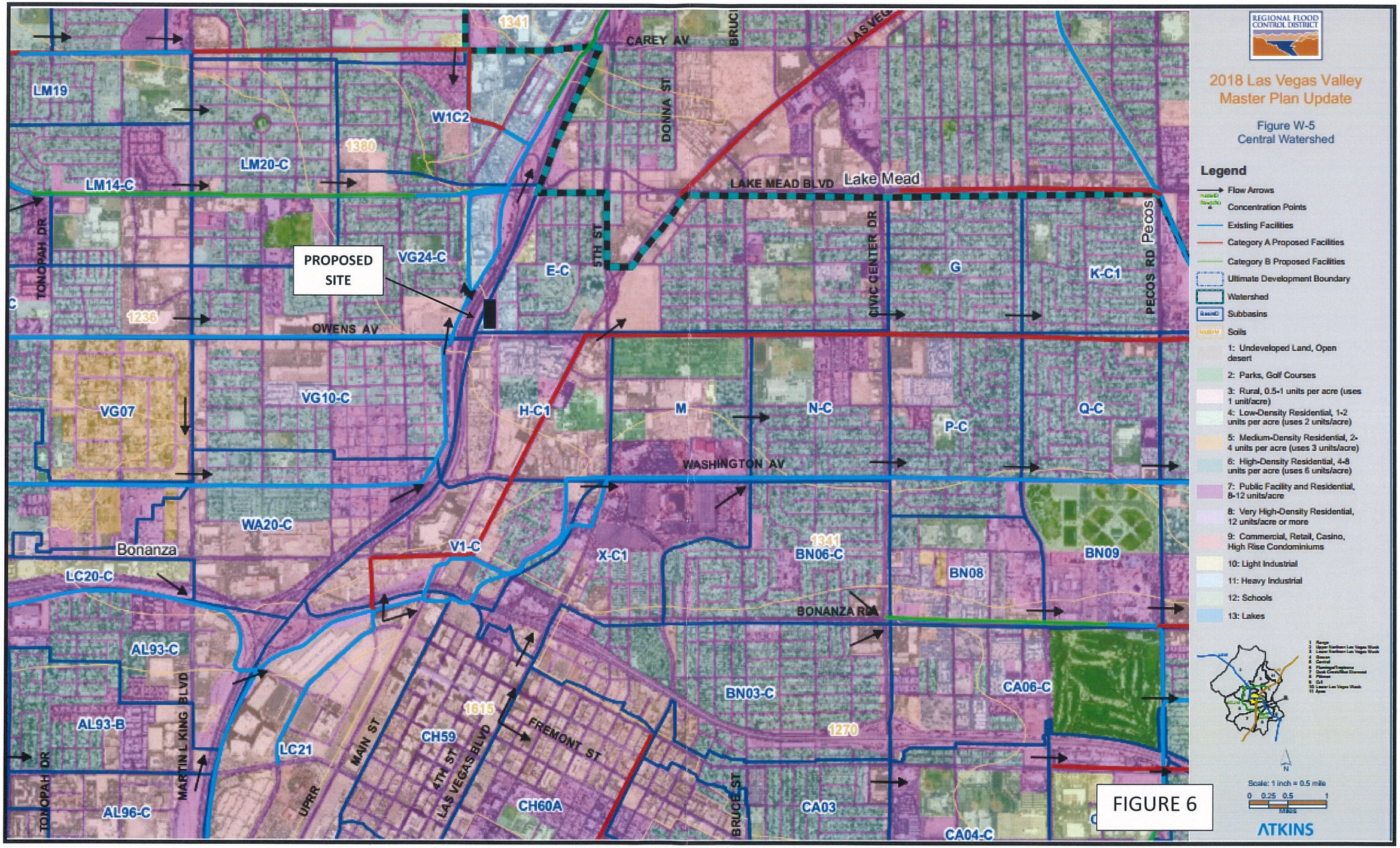

REGIONAL FLOOD CONTROL DISTRICT
2018 Las Vegas Valley Master Plan Update
Figure W-5
Central Watershed
Legend
Flow Arrows
Concentration Points
Existing Facilities
Category A Proposed Facilities
Category B Proposed Facilities
Ultimate Development Boundary
Watershed
Subbasins
Soils
1: Undeveloped Land, Open desert
2: Parks, Golf Courses
3: Rural, 0.5-1 units per acre (uses 1 unit/acre)
4: Low-Density Residential, 1-2 units per acre (uses 2 units/acre)
5: Medium-Density Residential, 2-4 units per acre (uses 3 units/acre)
6: High-Density Residential, 4-8 units per acre (uses 6 units/acre)
7: Public Facility and Residential, 8-12 units/acre
8: Very High-Density Residential, 12 units/acre or more
9: Commercial, Retail, Casino, High Rise Condominiums
10: Light Industrial
11: Heavy Industrial
12: Schools
13: Lakes
PROPOSED SITE
CAREY AV
LAKE MEAD BLVD
Lake Mead
OWENS AV
WASHINGTON AV
Bonanza
BONANZA RD
FREMONT ST
MAIN ST
4TH ST
LAS VEGAS BLVD
MARTIN L KING BLVD
TONOPAH DR
DONNA ST
5TH ST
CIVIC CENTER DR
PECOS RD
BRUCE ST
UPRR
LM19
LM20-C
LM14-C
W1C2
VG24-C
E-C
K-C1
G
VG07
VG10-C
H-C1
M
N-C
P-C
Q-C
WA20-C
V1-C
X-C1
BN06-C
BN08
BN09
LC20-C
AL93-C
AL93-B
AL96-C
LC21
CH59
CH60A
BN03-C
CA06-C
CA03
CA04-C
1341
1380
1236
1615
1270
Scale: 1 inch = 0.5 mile
0 0.25 0.5 1
Miles
ATKINS

FIGURE 6

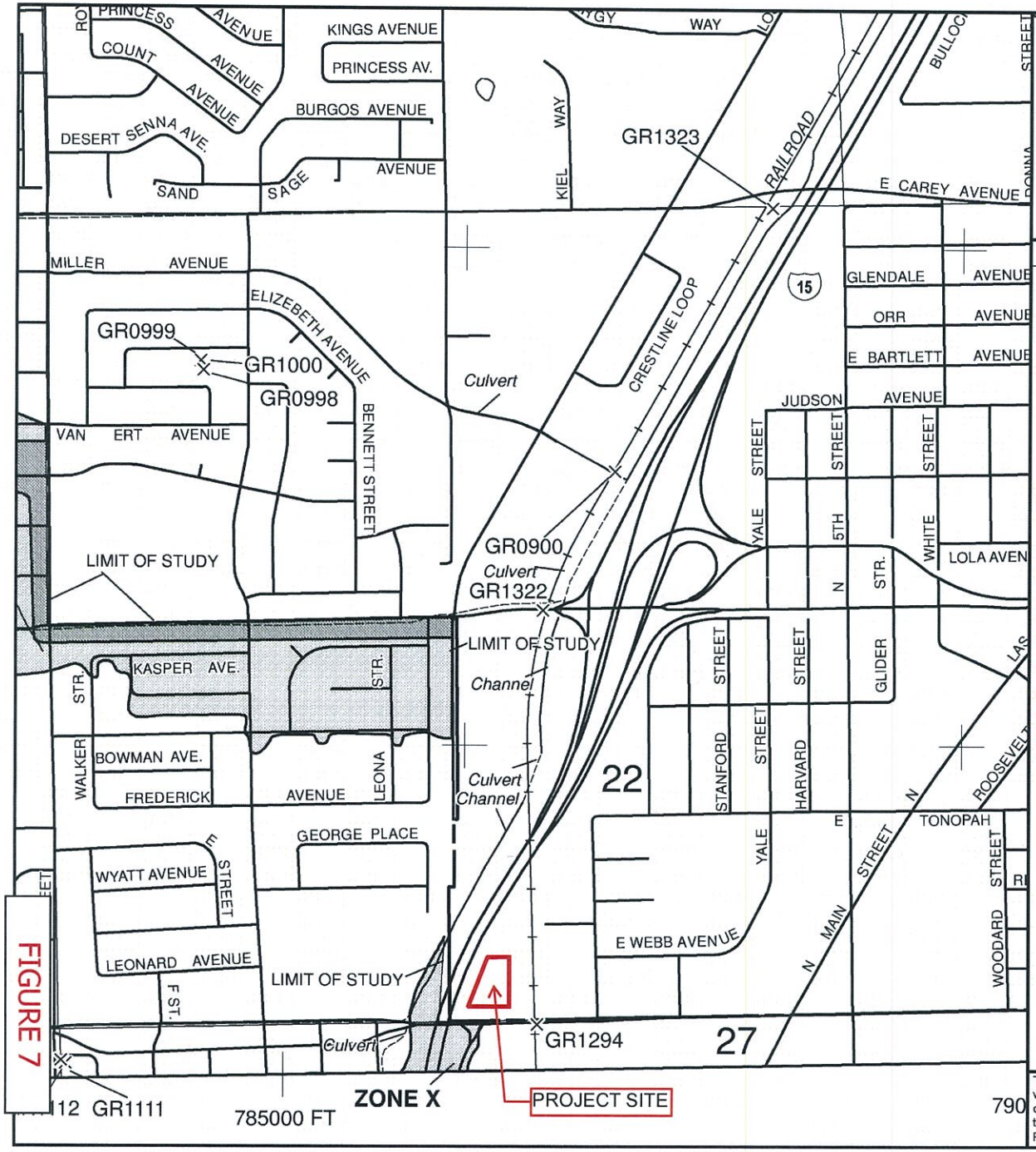


FIGURE 7

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

*REFERENCED

PANEL 2160F

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA

AND INCORPORATED AREAS

PANEL 2160 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY	320003	2160	F
LAS VEGAS, CITY OF	325276	2160	F
NORTH LAS VEGAS, CITY OF	320007	2160	F

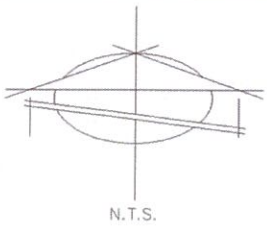
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
32003C2160F

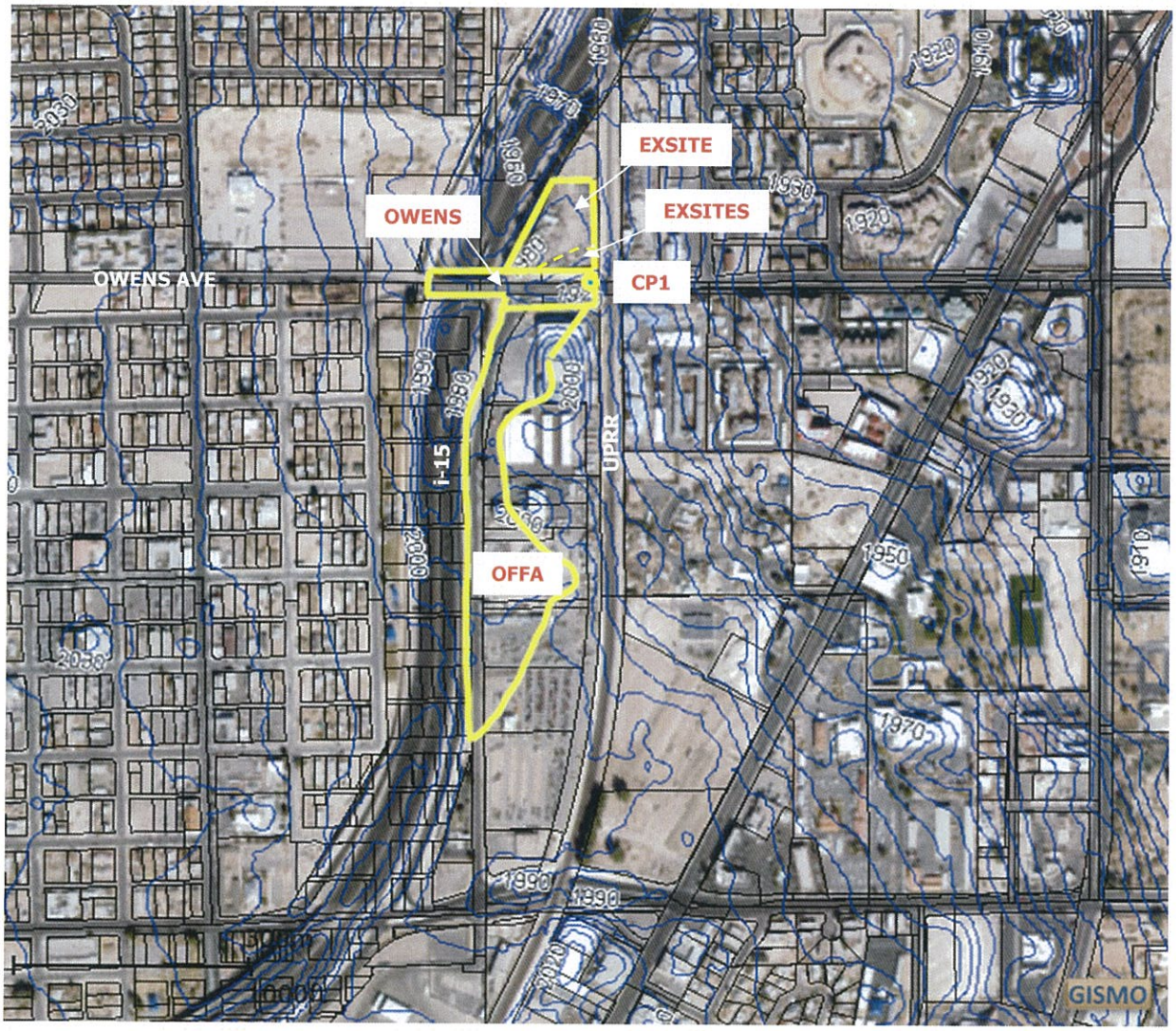
MAP REVISED
NOVEMBER 16, 2011

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



Existing Condition *		
Source	100-Year Flow (cfs)	10-Year Flow (cfs)
OFFA	30	17
OWENS	6	4
EXSITES	1	<1
CP1	37	21
EXSITE	6	3



OFFISTE DRAINAGE BASIN MAP*

(*Referenced from MD Development)

FIGURE 8

BAUGHMAN & TURNER, INC.
CIVIL ENGINEERS LAND PLANNERS
LAND SURVEYORS
1210 HINSON STREET LAS VEGAS, NEVADA
(702) 870-8771 89102

PREPARED FOR :

RED REALTY-CULTIVATION FACILITY

DATE: 2020
DESIGN: SW
DRAWN: SW
JOB: 22-20-61

United States Department of Agriculture

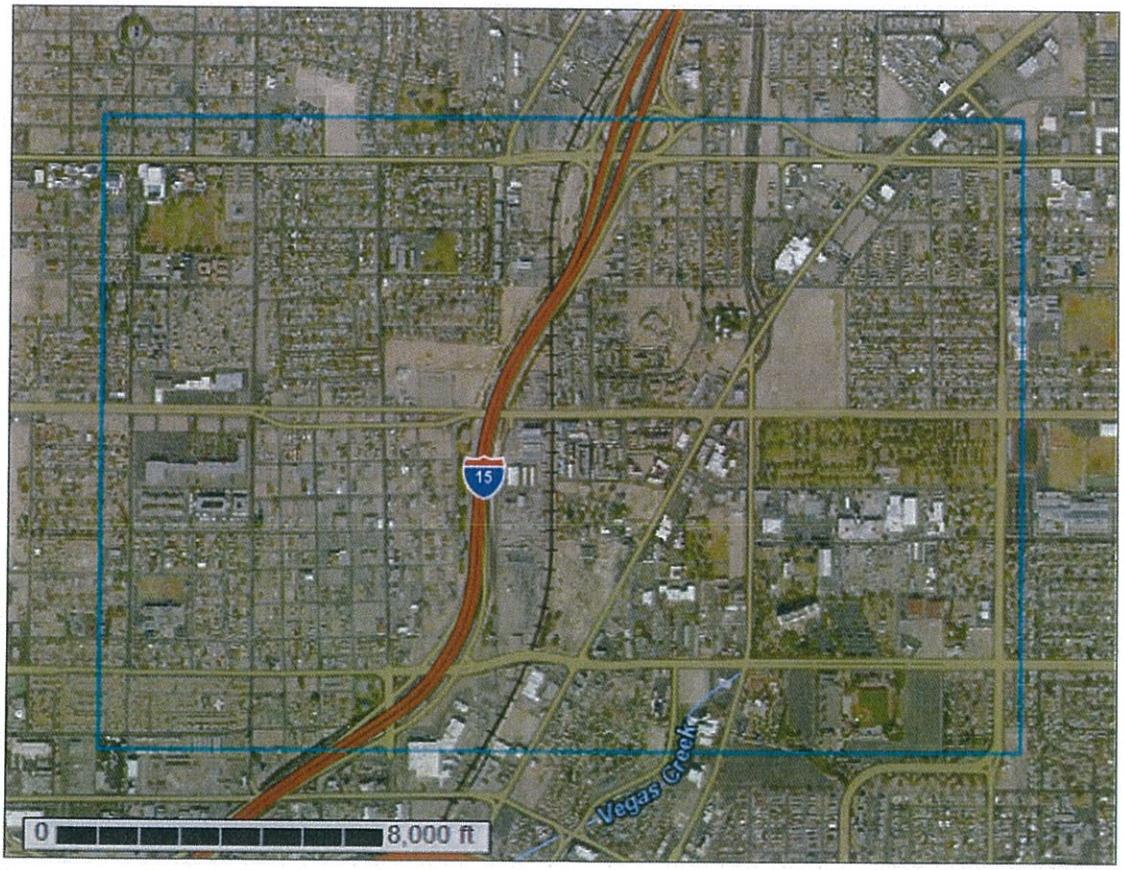
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Las Vegas Valley Area, Nevada, Part of Clark County

Owens/I-15



June 4, 2015

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- 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
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
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 10, Aug 22, 2014

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

Date(s) aerial images were photographed: May 7, 2011—Feb 25, 2014

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

Referenced

Las Vegas Valley Area, Nevada, Part of Clark County (NV788)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
200	Glencarb silt loam	593.8	39.7%
236	Glencarb very fine sandy loam, saline	558.5	37.3%
341	Paradise silt loam	170.2	11.4%
380	Skyhaven very fine sandy loam, 0 to 4 percent slopes	173.9	11.6%
Totals for Area of Interest		1,496.5	100.0%

Map Unit Descriptions

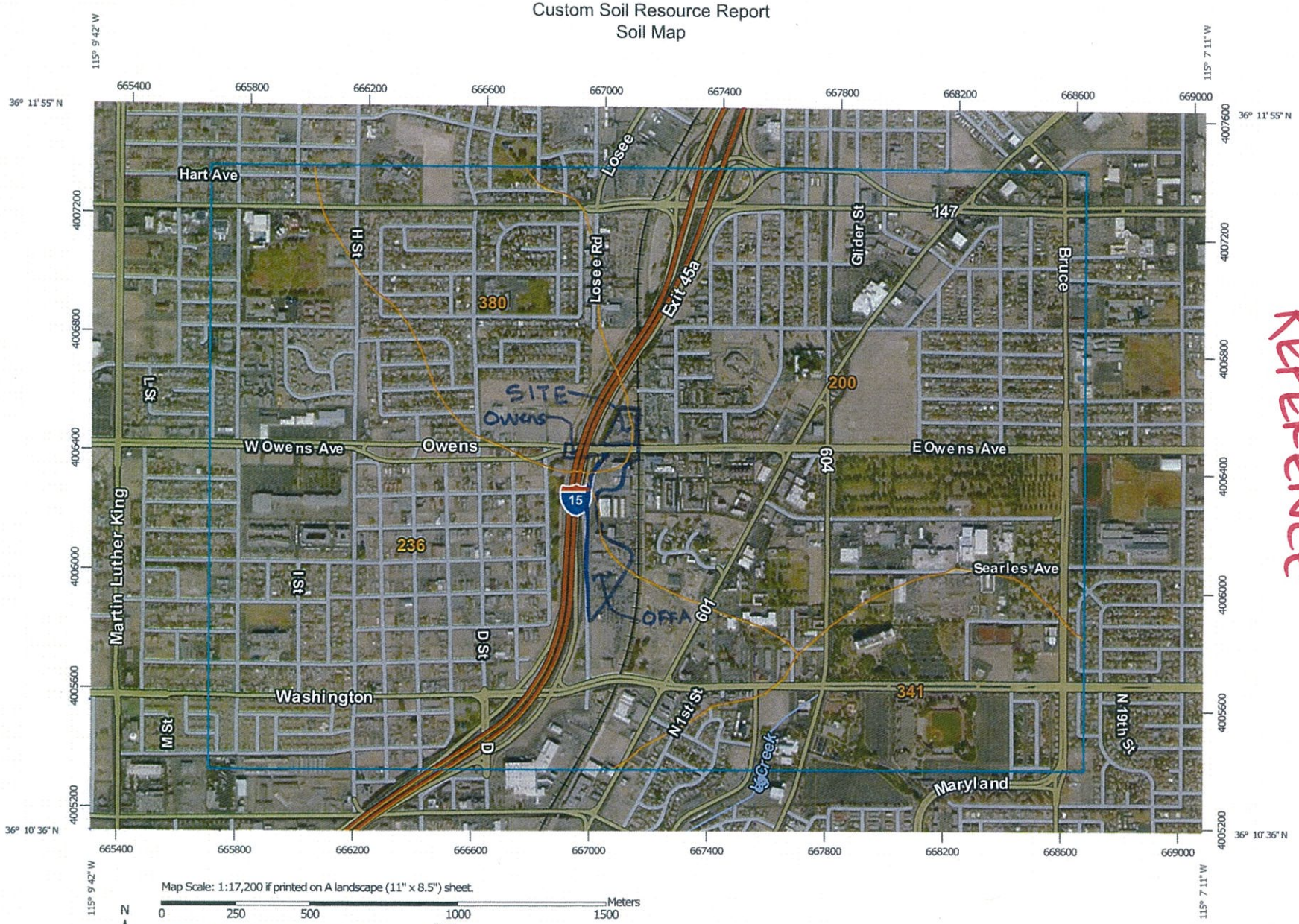
The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that

Custom Soil Resource Report
Soil Map



Map Scale: 1:17,200 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 250 500 1000 1500

Feet: 0 500 1000 2000 3000

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

REFERENCE

Referenced

236—Glencarb very fine sandy loam, saline

Map Unit Setting

National map unit symbol: hrb9
Elevation: 1,500 to 2,400 feet
Mean annual precipitation: 3 to 7 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 240 to 300 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 60 inches: stratified very fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 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 (0.20 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: 60 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 60.0
Available water storage in profile: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: SODIC TERRACE (R030XY040NV)

Referenced

380—Skyhaven very fine sandy loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: hrbz
Elevation: 1,800 to 2,300 feet
Mean annual precipitation: 4 to 6 inches
Mean annual air temperature: 63 to 68 degrees F
Frost-free period: 220 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Skyhaven and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Skyhaven

Setting

Landform: Alluvial flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 1 inches: very fine sandy loam
H2 - 1 to 8 inches: clay loam
H3 - 8 to 37 inches: gravelly silty clay loam
H4 - 37 to 41 inches: indurated

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: 24 to 39 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very high
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: 90 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: 13.0
Available water storage in profile: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Other vegetative classification: SHALLOW LIMESTONE SLOPE 5-8 P.Z. (030XB030NV_2)

Pamela Pitcher

From: Pamela Pitcher [pamp@baughman-turner.com]
Sent: Monday, September 08, 2014 11:44 AM
To: 'johng@baughman-turner.com'
Subject: Susan Cannavo

Hi Dan – In response to your question regarding the CN number for the site, we used a cover type of "newly graded." Although the soil for the site has been determined to be in a hydrologic soils group of C, we felt that with the high level of compaction that has occurred on the site due to the nature of the historic business (vehicle towing and storage) a CN value of 94 was more appropriate.

If you have any further questions, please feel free to call.

Pamela Pitcher
Baughman & Turner, Inc.
1210 Hinson Street
Las Vegas, Nevada 89102
(702)870-8771 fax (702)878-2695
pamp@baughman-turner.com
www.baughman-turner.com

REFERENCE

Reference

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RUNOFF CURVE NUMBERS
(URBAN AREAS[1])

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

See Table 602A

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

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

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

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

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

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

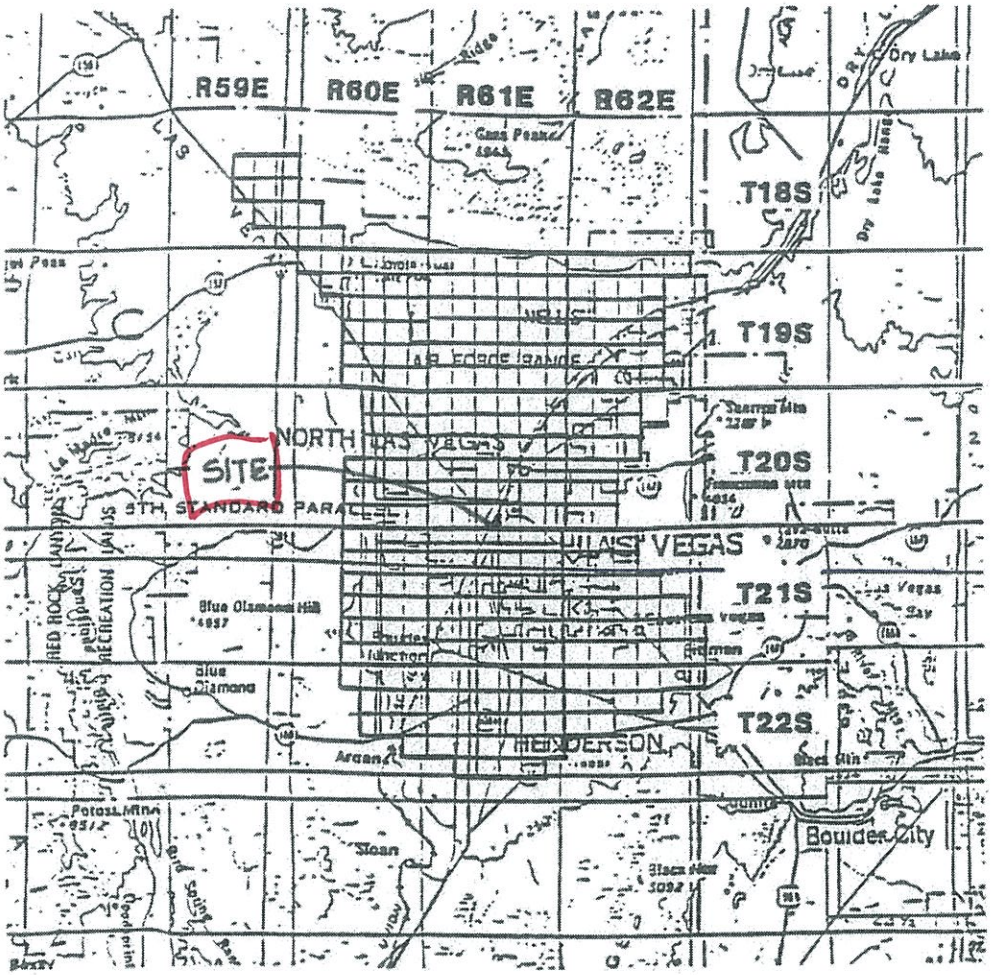
Revision	Date

WRC ENGINEERING

REFERENCE:
SCS TR-55, USDA, June 1986.

TABLE 602
1 of 4

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

Reference

SIX-HOUR STORM DISTRIBUTIONS

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

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

Reference

DEPTH-DURATION-FREQUENCY VALUES FOR McCARRAN AIRPORT RAINFALL AREA

(IN INCHES)

	RECURRENCE INTERVAL					
TIME	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

WRC ENGINEERING	REFERENCE: USACE, Los Angeles District, 1988	TABLE 505

Reference

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

TIME OF CONCENTRATION

*=REFERENCE

BAUGHMAN & TURNER, INC.
CONSULTING ENGINEERS

PROJECT NO. : 23-22-60 **DEVELOPMENT :** MD Development MME (KNIT DESIGNING COMMUNITY)

FILE : Existing & Developed Condition **CALCULATED BY:** pp/sw **DATE :** 01/15/20

Sub-Basin Data					Initial/Overland Time (T_i)			Travel Time (T_t)					T_c	T_c Check (Urbanized Basins)		Final T_c	T_{lag}	Remarks
DESIG	CN	K	AREA (acres)	AREA (mi^2)	LENGTH (ft)	SLOPE (%)	T_i (min)	LENGTH (ft)	SLOPE (%)	V_1 (fps)	V_2 (fps)	T_t (min)	$T_c=T_i+T_t$ (min)	TOTAL (ft)	T_c (min)	T_c (min)	T_{lag} (hrs)	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Existing Condition																		
OFFA*	98	0.904	10.40	0.0163	385	1.00	6.9	1340	1.50	2.47	3.75	7.1	14.0	1725.0	19.6	14.0	0.140	Dev.
OWENS*	98	0.904	1.70	0.0027	43	2.00	1.8	740	4.720	4.39	6.65	2.5	4.3	783.0	14.4	4.3	0.050	Dev.
EXSITE*	94	0.851	1.60	0.0025	120	0.83	5.2	480	2.080	2.91	N/A	2.7	8.0	600.0	13.3	8.0	0.080	Dev.
EXSITES*	94	0.851	0.27	0.0004	80	1.67	3.4	275	2.910	3.45	N/A	1.3	4.7	355.0	12.0	4.7	0.050	Dev.
EXSITEN	94	0.851	0.66	0.0010	80	1.25	3.7	120	2.500	3.19	N/A	0.6	4.4	200.0	11.1	4.4	0.050	Dev.
Developed Condition Onsite																		
DSITEN	94	0.851	0.95	0.0015	60	5.0	2.0	120	2.50	3.19	N/A	0.6	2.7	180.0	11.0	2.7	0.050	Dev
DSITES	94	0.851	1.58	0.0025	100	2.0	3.6	180	2.20	3.00	N/A	1.0	4.6	280.0	11.6	4.6	0.050	Dev

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

$T_c=T_i+T_t$

$K=0.0132(CN)-.39$

$T_{lag}=0.6T_c$

For the travel time (T_t) calculations,
V_1 applies to the first 500 feet of travel distance;
V_2 applies to the remaining travel distance.

Travel Time Velocity Formulas

Existing	Developed
$V_1 = 14.8*(S/100)^{1/2}$	$V_1 = 20.2*(S/100)^{1/2}$
$V_2 = 29.4*(S/100)^{1/2}$	$V_2 = 30.6*(S/100)^{1/2}$

All basins over one square mile are calculated by the equation $T_{lag}=20Kn(L*L_c/S^{0.5})^{0.33}$ and denoted by shaded gray (See Worksheet).

REFERENCE:

STANDARD FORM 4

```
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *               JUN  1998              *
 *            VERSION 4.1               *
 *                                      *
 *  RUN DATE   15JAN20  TIME  12:00:13  *
 *                                      *
 ****************************************
```

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

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

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

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


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

              *DIAGRAM
    1         ID
    2         ID   KNIT DESIGNING COMMUNITY
    3         ID
    4         ID   Existing Condition
    5         ID
    6         ID    File  N:\KNIT\DOCS\HYDROLOGY\HEC1\KNIT 228 OWENS.DAT
    7         ID
    8         ID
    9         IT       5                    300
   10         IO       5
   11         IN       5
   12         JR    PREC    0.57     1.0
              * **********************
              * Existing Conditions  *
              * **********************

   13         KK    OFFA
   14         BA  0.0163
   15         PB    2.77
   16         PC    0.00       2      5.7       7      8.7     10.8     12.4       13       13       13
   17         PC      13      13       13    13.3       14     14.2     14.8     15.8     17.2     18.1
   18         PC      19    19.7     19.7    20.1     20.1     20.4     21.4     22.9     24.1     24.9
   19         PC    25.1    25.6       27    27.8     28.1     28.3     29.5     32.2     35.2     40.9
   20         PC    49.9      59       71    74.4     78.1     81.2     81.9     83.5     85.1     85.6
   21         PC      86    86.8     87.6    88.8       91     92.6     93.7       95       97     97.6
   22         PC    98.2    98.5     98.7    98.9       99     99.3     99.3     99.4     99.5     99.8
   23         PC    99.8    99.9      100
   24         LS              98
   25         UD   0.14

   26         KK  OWENS
   27         BA  0.0027
   28         LS              98
   29         UD   0.050

   30         KK  ESITES
   31         BA  0.0004
   32         LS              94
   33         UD   0.050

   34         KK     CP1
   35         HC       3

   36         KK  EXSITE
   37         BA  0.0025
   38         LS              94
   39         UD   0.080

   40         KK  ESITEN
   41         LS              94
   42         UD   0.050
```



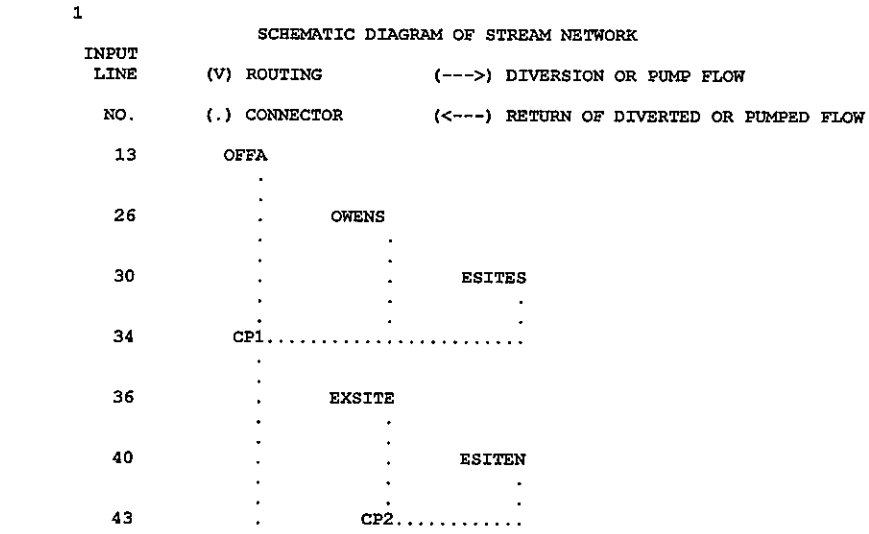
```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   43         KK     CP2
   44         HC       2
```

* = Reference

1

SCHEMATIC DIAGRAM OF STREAM NETWORK



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               JUN  1998               *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   15JAN20  TIME  12:00:13   *
*                                       *
*****************************************
```

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

KNIT DESIGNING COMMUNITY

Existing Condition

File N:\KNIT\DOCS\HYDROLOGY\HEC1\KNIT 228 OWENS.DAT

```
  10 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

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

                   COMPUTATION INTERVAL      .08 HOURS
                        TOTAL TIME BASE    24.92 HOURS

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

     JP          MULTI-PLAN OPTION
                      NPLAN           1  NUMBER OF PLANS

     JR          MULTI-RATIO OPTION
                     RATIOS OF PRECIPITATION
                     .57      1.00
```

1

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

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1	RATIO 2
					.57	1.00
HYDROGRAPH AT						
+	OFFA *	.02	1	FLOW	17.	30.
				TIME	3.58	3.58

HYDROGRAPH AT						
+	OWENS *	.00	1	FLOW	4.	6.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ESITES *	.00	1	FLOW	0.	1.
				TIME	3.50	3.50
3 COMBINED AT						
+	CP1 *	.02	1	FLOW	20.	36.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	EXSITE *	.00	1	FLOW	2.3	5.6
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ESITEN	.00	1	FLOW	3.	5.
				TIME	3.50	3.50
2 COMBINED AT						
+	CP2	.00	1	FLOW	5.6	10.11
				TIME	3.50	3.50

- owens flow → per MD Development Addendum

- to UPRR

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

```
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              JUN  1998               *
 *            VERSION 4.1               *
 *                                      *
 *  RUN DATE   15JAN20  TIME  14:49:57  *
 *                                      *
 ****************************************
```

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

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

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

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


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

                *DIAGRAM
              1 ID
              2 ID   KNIT DESIGNING COMMUNITY
              3 ID
              4 ID   Developed Condition
              5 ID
              6 ID    File  N:\KNIT\DOCS\HYDROLOGY\HEC1\KNIT 228 OWENS.DAT
              7 ID
              8 ID
              9 IT       5                    300
             10 IO       5
             11 IN       5
             12 JR    PREC    0.57     1.0
                * **********************
                * Developed Conditions  *
                * **********************

             13 KK    OFFA *
             14 BA  0.0163
             15 PB    2.77
             16 PC    0.00       2     5.7       7     8.7    10.8    12.4      13      13      13
             17 PC      13      13      13    13.3      14    14.2    14.8    15.8    17.2    18.1
             18 PC      19    19.7    19.7    20.1    20.1    20.4    21.4    22.9    24.1    24.9
             19 PC    25.1    25.6      27    27.8    28.1    28.3    29.5    32.2    35.2    40.9
             20 PC    49.9      59      71    74.4    78.1    81.2    81.9    83.5    85.1    85.6
             21 PC      86    86.8    87.6    88.8      91    92.6    93.7      95      97    97.6
             22 PC    98.2    98.5    98.7    98.9      99    99.3    99.3    99.4    99.5    99.8
             23 PC    99.8    99.9     100
             24 LS              98
             25 UD   0.14

             26 KK  OWENS *
             27 BA  0.0027
             28 LS              98
             29 UD   0.050

             30 KK  DSITES
             31 BA  0.0025
             32 LS              94
             33 UD   0.050

             34 KK     CP1
             35 HC       3

             36 KK  DSITEN
             37 LS              94
             38 UD   0.050
             39 ZZ
```

* = referenced

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

   13        OFFA
               .
               .
   26          .       OWENS
```

```
                .          .
    30          .          .      DSITES
                .          .          .
                .          .          .
    34        CP1..........................
                .
                .
    36          .      DSITEN

  (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *               JUN  1998               *
 *            VERSION 4.1                *
 *                                       *
 *  RUN DATE   15JAN20  TIME  14:49:57   *
 *                                       *
 *****************************************

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

                        KNIT DESIGNING COMMUNITY

                        Developed Condition

                         File  N:\KNIT\DOCS\HYDROLOGY\HEC1\KNIT 228 OWENS.DAT


   10 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE

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

                    COMPUTATION INTERVAL      .08 HOURS
                         TOTAL TIME BASE   24.92 HOURS

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

      JP          MULTI-PLAN OPTION
                       NPLAN          1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                      .57      1.00
1

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


                                                                  RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION      AREA    PLAN                 RATIO 1  RATIO 2
                                                              .57      1.00

 HYDROGRAPH AT
+                  OFFA *     .02      1   FLOW             17.      30.
                                            TIME           3.58     3.58

 HYDROGRAPH AT
+                  OWENS *    .00      1   FLOW              4.       6.
                                            TIME           3.50     3.50

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

  3 COMBINED AT
+                    CP1      .02      1   FLOW             22.      40.   - OWENS Are
                                            TIME           3.50     3.50

 HYDROGRAPH AT
+                  DSITEN     .00      1   FLOW              3.       5.   - to UPRR
                                            TIME           3.50     3.50
```

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*          VERSION 4.1                  *
*                                       *
*  RUN DATE   13JUL15  TIME  17:30:45   *
*                                       *
*****************************************
```

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

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

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

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

1 HEC-1 INPUT PAGE 1

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

              *DIAGRAM
    1         ID
    2         ID   MD Development MME
    3         ID            036
    4         ID   Developed Condition
    5         ID
    6         ID    File  u:\pam\HEC-1A\MDDEV                                          ID
    7         ID
    8         IT       5                    300
    9         IO       5
   10         IN       5
   11         JR    PREC    0.57     1.0
              * **********************
              * Developed Conditions *
              * **********************

   12         KK    OFFA
   13         BA   .0163
   14         PB   2.77
   15         PC   0.00       2     5.7       7     8.7    10.8    12.4      13      13      13
   16         PC     13      13      13    13.3      14    14.2    14.8    15.8    17.2    18.1
   17         PC     19    19.7    19.7    20.1    20.1    20.4    21.4    22.9    24.1    24.9
   18         PC   25.1    25.6      27    27.8    28.1    28.3    29.5    32.2    35.2    40.9
   19         PC   49.9      59      71    74.4    78.1    81.2    81.9    83.5    85.1    85.6
   20         PC     86    86.8    87.6    88.8      91    92.6    93.7      95      97    97.6
   21         PC   98.2    98.5    98.7    98.9      99    99.3    99.3    99.4    99.5    99.8
   22         PC   99.8    99.9     100
   23         LS             98
   24         UD   0.140

   25         KK   OWENS
   26         BA  0.0027
   27         LS             98
   28         UD   0.050

   29         KK  DVSTES
   30         BA  0.0012
   31         LS             94
   32         UD   0.0510

   33         KK     CP1
   34         HC       3

   35         KK  DVSITE
   36         BA   .0018
   37         LS             94
   38         UD   0.050
   39         ZZ
```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK

Reference

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

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

   12       OFFA
              .
              .
   25         .       OWENS
```

```
                .          .
    29          .          .      DVSTES
                .          .          .
                .          .          .
    33      , CP1.....................
                .
                .
    35          .      DVSITE

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN  1998               *
*           VERSION 4.1                *
*                                      *
*  RUN DATE   13JUL15  TIME  17:30:45  *
*                                      *
****************************************
```

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

MD Development MME
036
Developed Condition

File u:\pam\HEC-1A\MDDEV ID

```
    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
                     .57      1.00
1
```

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

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .57	RATIO 2 1.00
HYDROGRAPH AT						
+	OFFA	.02	1	FLOW	17.	30.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	OWENS	.00	1	FLOW	4.	6.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	DVSTES	.00	1	FLOW	1.	3.
				TIME	3.50	3.50
3 COMBINED AT						
+	CP1	.02	1	FLOW	21.	37.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	DVSITE	.00	1	FLOW	2.	4.
				TIME	3.50	3.50

Reference

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

H S 1

REFERENCE

Owens 10-yr upstream

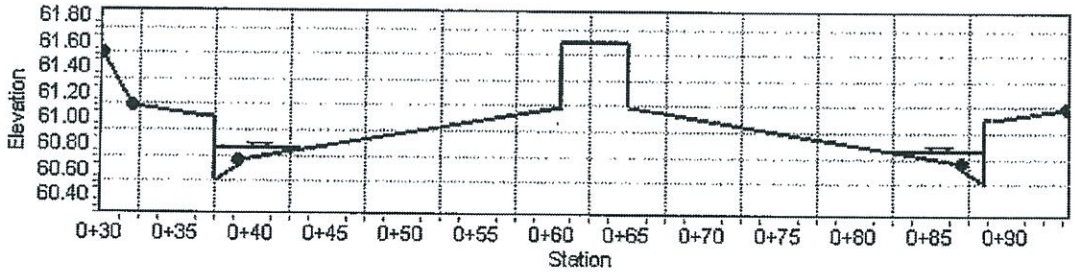
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.06250	ft/ft
Normal Depth	0.26	ft
Discharge	4.00	ft³/s

Cross Section Image



Dry Lane - $\frac{61.10 - 60.76}{0.02}$ = 17.0 ft ✓

HSI

Owens 10-yr upstream

REFERENCE

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.06250	ft/ft
Discharge	4.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+30.00	61.50
0+32.00	61.10
0+37.00	61.00
0+37.50	61.00
0+37.50	60.50
0+39.00	60.63
0+39.00	60.67
0+60.50	61.10
0+60.50	61.60
0+65.00	61.60
0+65.00	61.10
0+87.00	60.67
0+87.00	60.63
0+88.50	60.50
0+88.50	61.00
0+89.00	61.00
0+94.00	61.10

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+30.00, 61.50)	(0+32.00, 61.10)	0.033
(0+32.00, 61.10)	(0+39.00, 60.67)	0.013
(0+39.00, 60.67)	(0+87.00, 60.67)	0.017
(0+87.00, 60.67)	(0+94.00, 61.10)	0.013

Owens 10-yr upstream

Results

Normal Depth		0.26	ft
Elevation Range	60.50 to 61.60 ft		
Flow Area		0.95	ft²
Wetted Perimeter		12.31	ft
Top Width		11.70	ft
Normal Depth		0.26	ft
Critical Depth		0.33	ft
Critical Slope		0.00813	ft/ft
Velocity		4.22	ft/s
Velocity Head		0.28	ft
Specific Energy		0.53	ft
Froude Number		2.62	
Flow Type	Supercritical		

REFERENCE

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.26	ft
Critical Depth	0.33	ft
Channel Slope	0.06250	ft/ft
Critical Slope	0.00813	ft/ft

HS1

Owens 100-yr upstream

REFERENCE

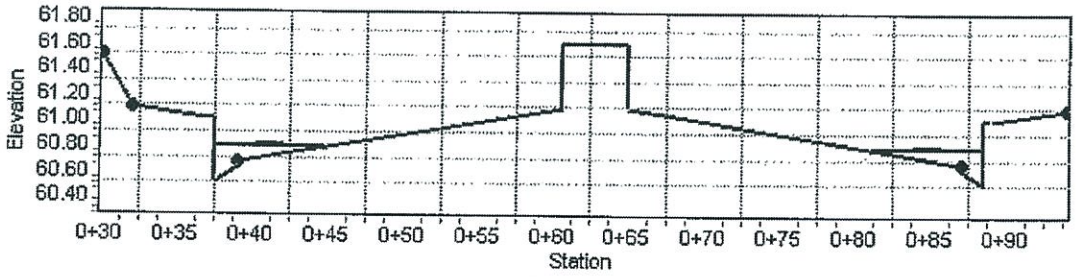
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.06250	ft/ft
Normal Depth	0.28	ft
Discharge	6.00	ft³/s

Cross Section Image



H51

Owens 100-yr upstream

REFERENCE

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.06250	ft/ft
Discharge	6.00	ft^3/s

Section Definitions

Station (ft)	Elevation (ft)
0+30.00	61.50
0+32.00	61.10
0+37.00	61.00
0+37.50	61.00
0+37.50	60.50
0+39.00	60.63
0+39.00	60.67
0+60.50	61.10
0+60.50	61.60
0+65.00	61.60
0+65.00	61.10
0+87.00	60.67
0+87.00	60.63
0+88.50	60.50
0+88.50	61.00
0+89.00	61.00
0+94.00	61.10

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+30.00, 61.50)	(0+32.00, 61.10)	0.033
(0+32.00, 61.10)	(0+39.00, 60.67)	0.013
(0+39.00, 60.67)	(0+87.00, 60.67)	0.017
(0+87.00, 60.67)	(0+94.00, 61.10)	0.013

Owens 100-yr upstream

Results

Normal Depth		0.28	ft
Elevation Range	60.50 to 61.60 ft		
Flow Area		1.33	ft²
Wetted Perimeter		15.29	ft
Top Width		14.63	ft
Normal Depth		0.28	ft
Critical Depth		0.37	ft
Critical Slope		0.00791	ft/ft
Velocity		4.52	ft/s
Velocity Head		0.32	ft
Specific Energy		0.60	ft
Froude Number		2.64	
Flow Type	Supercritical		

REFERENCE

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.28	ft
Critical Depth	0.37	ft
Channel Slope	0.06250	ft/ft
Critical Slope	0.00791	ft/ft

downstream

Cross Section for HS2 OWENS - 10yr

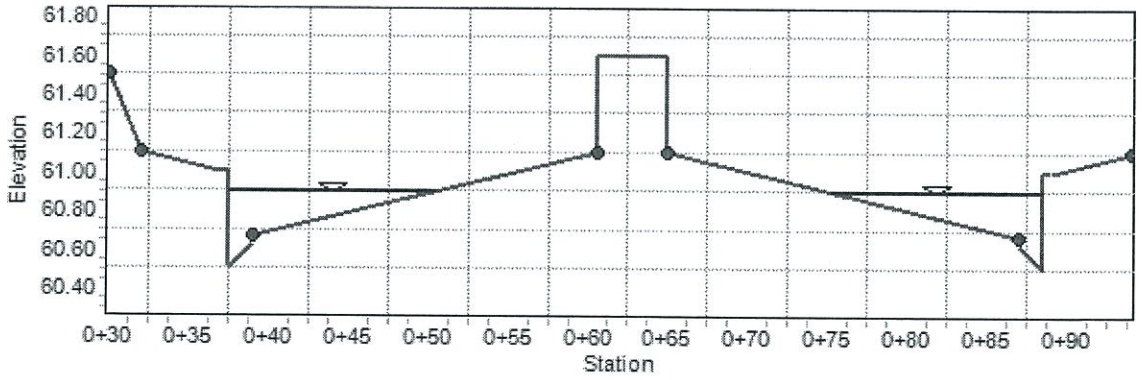
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.06250	ft/ft
Normal Depth	0.40	ft
Discharge	22.00	ft^3/s

Cross Section Image



Worksheet for HS2 OWENS - 10yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.06250	ft/ft
Discharge	22.00	ft^3/s

Section Definitions

Station (ft)	Elevation (ft)
0+30.00	61.50
0+32.00	61.10
0+37.00	61.00
0+37.50	61.00
0+37.50	60.50
0+39.00	60.63
0+39.00	60.67
0+60.50	61.10
0+60.50	61.60
0+65.00	61.60
0+65.00	61.10
0+87.00	60.67
0+87.00	60.63
0+88.50	60.50
0+88.50	61.00
0+89.00	61.00
0+94.00	61.10

Referenced

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+30.00, 61.50)	(0+32.00, 61.10)	0.033
(0+32.00, 61.10)	(0+39.00, 60.67)	0.013
(0+39.00, 60.67)	(0+60.50, 61.10)	0.017
(0+60.50, 61.10)	(0+65.00, 61.10)	0.013

Worksheet for HS2 OWENS - 10yr

Input Data

Start Station	Ending Station	Roughness Coefficient
(0+65.00, 61.10)	(0+87.00, 60.67)	0.017
(0+87.00, 60.67)	(0+94.00, 61.10)	0.013

Options

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

Results

Normal Depth		0.40	ft
Elevation Range	60.50 to 61.60 ft		
Flow Area		3.70	ft²
Wetted Perimeter		27.22	ft
Hydraulic Radius		0.14	ft
Top Width		26.33	ft
Normal Depth		0.40	ft
Critical Depth		0.55	ft
Critical Slope		0.00712	ft/ft
Velocity		5.95	ft/s
Velocity Head		0.55	ft
Specific Energy		0.95	ft
Froude Number		2.80	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.40	ft

Worksheet for HS2 OWENS - 10yr

GVF Output Data

Critical Depth	0.55	ft
Channel Slope	0.06250	ft/ft
Critical Slope	0.00712	ft/ft

Cross Section for HS2 OWENS - 100yr

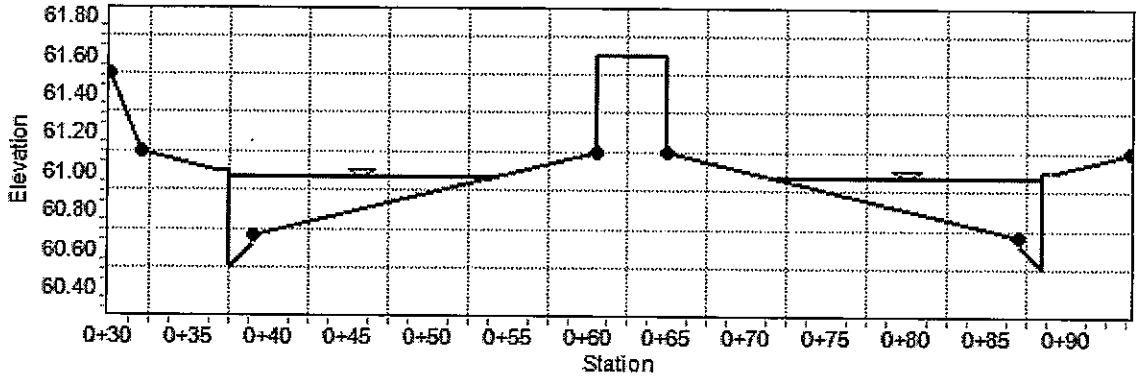
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.06250	ft/ft
Normal Depth	0.47	ft
Discharge	40.00	ft^3/s

Cross Section Image



Worksheet for HS2 OWENS - 100yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.06250	ft/ft
Discharge	40.00	ft^3/s

Section Definitions

Station (ft)	Elevation (ft)
0+30.00	61.50
0+32.00	61.10
0+37.00	61.00
0+37.50	61.00
0+37.50	60.50
0+39.00	60.63
0+39.00	60.67
0+60.50	61.10
0+60.50	61.60
0+65.00	61.60
0+65.00	61.10
0+87.00	60.67
0+87.00	60.63
0+88.50	60.50
0+88.50	61.00
0+89.00	61.00
0+94.00	61.10

referenced

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+30.00, 61.50)	(0+32.00, 61.10)	0.033
(0+32.00, 61.10)	(0+39.00, 60.67)	0.013
(0+39.00, 60.67)	(0+60.50, 61.10)	0.017
(0+60.50, 61.10)	(0+65.00, 61.10)	0.013

Worksheet for HS2 OWENS - 100yr

Input Data

Start Station	Ending Station	Roughness Coefficient
(0+65.00, 61.10)	(0+87.00, 60.67)	0.017
(0+87.00, 60.67)	(0+94.00, 61.10)	0.013

Options

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

Results

Normal Depth		0.47	ft
Elevation Range	60.50 to 61.60 ft		
Flow Area		5.85	ft²
Wetted Perimeter		34.63	ft
Hydraulic Radius		0.17	ft
Top Width		33.59	ft
Normal Depth		0.47	ft
Critical Depth		0.65	ft
Critical Slope		0.00658	ft/ft
Velocity		6.84	ft/s
Velocity Head		0.73	ft
Specific Energy		1.20	ft
Froude Number		2.89	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

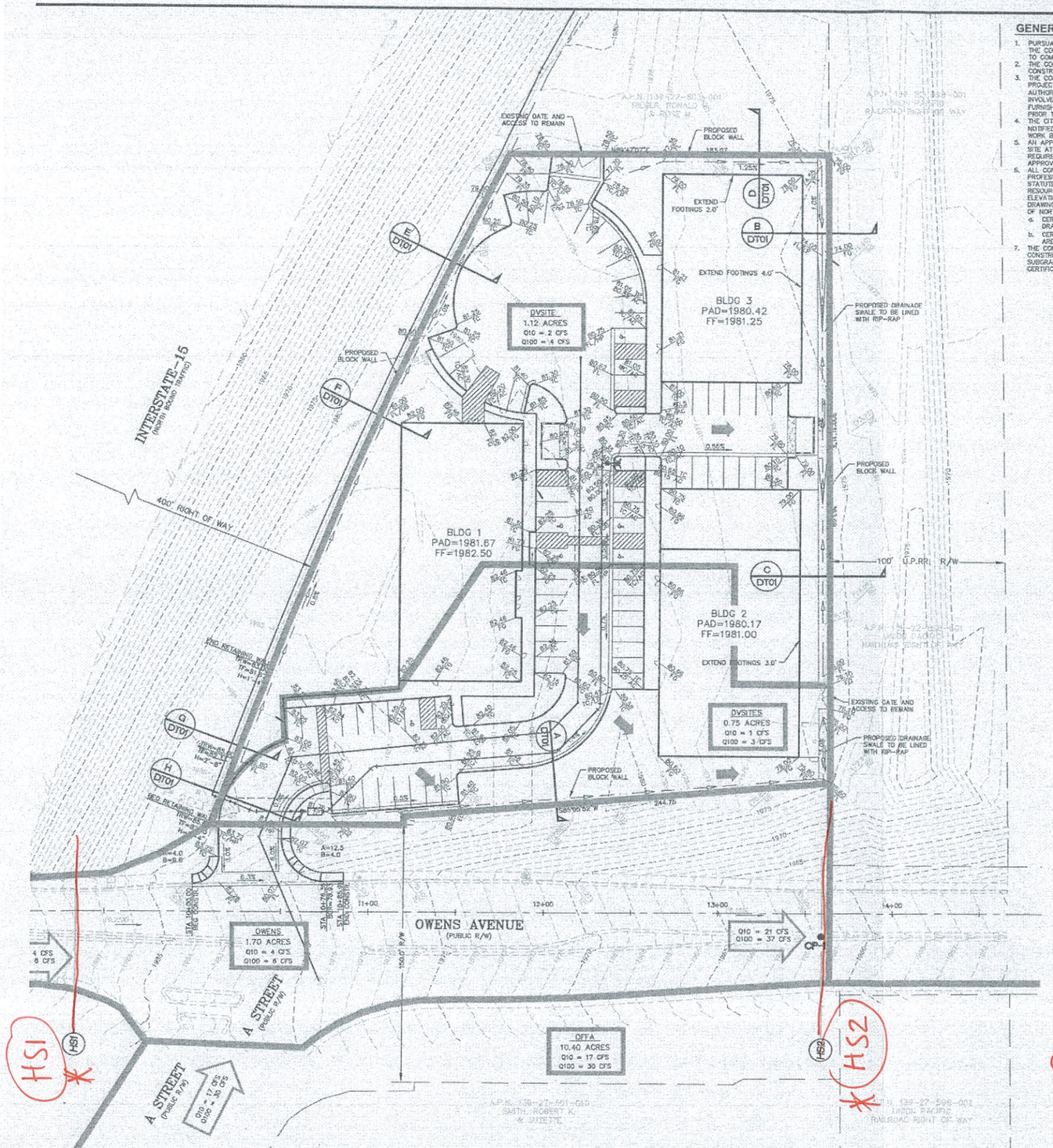
GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.47	ft

Worksheet for HS2 OWENS - 100yr

GVF Output Data

Critical Depth	0.65	ft
Channel Slope	0.06250	ft/ft
Critical Slope	0.00658	ft/ft



NOTE: SEE FIGURE 8 "EXISTING OFFSITE DRAINAGE BASIN MAP" FOR DELINEATION OF OFFSITE BASINS.

GENERAL GRADING AND DRAINAGE NOTES

1. PURSUANT TO CITY OF NORTH LAS VEGAS ORDINANCE NUMBER 1172, THE CONTRACTOR IS REQUIRED TO SECURE A GRADING PERMIT PRIOR TO COMMENCING WORK.
2. THE CONTRACTOR SHALL SECURE A PERMIT FOR ANY OFF-SITE CONSTRUCTION.
3. THE CONTRACTOR'S OPERATIONS SHALL NOT TRESPASS BEYOND THE PROJECT PROPERTY LINES UNLESS A PERMIT OR WRITTEN AUTHORIZATION HAS BEEN OBTAINED FROM THE PROPERTY OWNER(S) INVOLVED. COPIES OF SUCH WRITTEN AUTHORIZATION SHALL BE FURNISHED TO THE CITY OF NORTH LAS VEGAS' REPRESENTATIVE PRIOR TO START OF CONSTRUCTION.
4. THE CITY OF NORTH LAS VEGAS CONSTRUCTION SERVICES SHALL BE NOTIFIED ONE (1) WORKING DAY BEFORE ANY ON-SITE CONSTRUCTION WORK BEGINS.
5. AN APPROVED GRADING AND DRAINAGE PLAN SHALL BE ON THE JOB SITE AT ALL TIMES. DEVIATIONS FROM THE APPROVED PLAN WILL REQUIRE SUBMITTAL OF A FORMAL REVISED PLAN FOR REVIEW AND APPROVAL.
6. ALL CONSTRUCTION SURVEY CONTROL SHALL BE DONE BY A LICENSED PROFESSIONAL LAND SURVEYOR IN ACCORDANCE WITH APPLICABLE STATUTES AND CODES. THE CONTRACTOR SHALL PROVIDE COMPETENT RESOURCES TO ASSURE BUILDING PAD AND BUILDING FLOOR ELEVATIONS CONFORM TO THOSE SHOWN ON THE CONSTRUCTION DRAWINGS. FURTHERMORE, THE CONTRACTOR SHALL PROVIDE THE CITY OF NORTH LAS VEGAS BUILDING DEPARTMENT WITH:
   a. CERTIFICATION OF "BUILDING FLOOR ELEVATIONS" IN CRITICAL DRAINAGE AREAS.
   b. CERTIFICATES OF "BUILDING PAD ELEVATIONS" IN NONCRITICAL AREAS.
7. THE CONTRACTOR SHALL CERTIFY TO THE CITY OF NORTH LAS VEGAS CONSTRUCTION SERVICES DIVISION THAT ALL FILLS, FOUNDATIONS AND SUBGRADES MEET THE MINIMUM COMPACTION REQUIREMENTS. CERTIFICATION SHALL BE MADE PRIOR TO POURING CONCRETE.

BASIS OF BEARING

SOUTH 89°47'07" WEST, BEING THE SOUTH LINE OF SECTION 22, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.&M. AS SHOWN ON MAP AS FILE 5, PAGE 98 ON FILE IN THE COUNTY RECORDERS OFFICE, CLARK COUNTY, NEVADA.

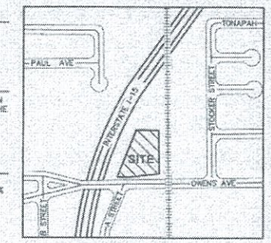
BENCHMARK

7C0122S4 – RIVET AND SQUARE ALUMINUM PLATE IN TOP OF CURB NORTH SIDE OF OWENS AVENUE AT THE EAST FACE OF AND UNDER THE RAILROAD BRIDGE CROSSING OWENS AVENUE.
ELEV: 596.674 METERS = 1957.99 FEET
NAVD 88

FLOOD ZONE DATA

THIS SITE IS LOCATED IN ZONE "X". ZONE "X" HAS BEEN DETERMINED TO BE AN AREA OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.

COMMUNITY PANEL NO. 32003C2160E
EFFECTIVE DATE SEPTEMBER 27, 2002



VICINITY MAP
NO SCALE

GRAPHIC SCALE

(IN FEET)
1 inch = 30 ft.

GENERAL STORMWATER NOTES

1. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATED IN, THE PUBLIC RIGHTS OF WAY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER OR HIS/HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN THE CITY OF NORTH LAS VEGAS AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDANCE MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY. REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION 9.A.8.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS, AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER ANY RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE, OR MODIFY, THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION 9.A.12.
5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

DRAINAGE LEGEND

- PROPERTY LINE
- LOT LINE
- STREET CENTERLINE
- PROPOSED WALL
- EXISTING WALL
- PROPOSED "L" CURB & GUTTER
- EXISTING "L" CURB & GUTTER
- 000.00 EXISTING CONTOUR LINES
- 000.00 PROPOSED CONTOUR LINES
- EXISTING EDGE OF PAVEMENT
- SAWCUT AND REMOVE EXISTING ASPHALT
- 00.00 LOC PROPOSED ELEVATION & LOCATION
- EXISTING ELEVATION & LOCATION
- 0.00% PROPOSED GRADE
- DRAINAGE FLOW
- CL CENTERLINE
- TC TOP OF CURB
- EP EDGE OF PAVEMENT
- FG FINISHED GRADE
- GB GRADE BREAK
- F.F. FINISHED FLOOR
- HP HIGHPOINT
- AC ASPHALTIC CONCRETE
- DRAINAGE BASIN BOUNDARY
- CP1 COMBINATION POINT
- NAME Q_{10} = – cfs Q_{100} = – cfs BASIN NAME & FLOW DATA
- Q_{10} = – CFS Q_{100} = – CFS DIRECTION OF FLOWS
- # STREET CAPACITY SECTION # = LOCATION (SEE DATA TABLE)

STREET CAPACITY SUMMARY

HYDRAULIC SECTION LOCATION	Q (cfs)	SLOPE (ft)	D (ft)	V (fps)	VxD
100-YEAR FLOW – ULTIMATE CONDITIONS					
(HS1) OWENS – UPSTREAM	6	0.28	4.52	1.27	VxD <8 IS MET; D LESS THAN 2 FT.
(HS1) OWENS – UPSTREAM	37	0.46	6.73	3.10	VxD <8 IS MET; D LESS THAN 2 FT.
10-YEAR FLOW – ULTIMATE CONDITIONS					
(HS1) OWENS – UPSTREAM	4	0.28	4.22	1.1	VxD <6 IS MET; D LESS THAN 1; 10-YR DRY LANE IS NOT MET
(HS1) OWENS – UPSTREAM	21	0.40	5.89	2.35	VxD <6 IS MET; D LESS THAN 1; 10-YR DRY LANE IS NOT MET

cross section locations

Referenced

DISCLAIMER NOTE

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

Call before you dig
Call
811
OR CALL
1-800-227-2600

Avoid overhead power line contact
Call before you OVERHEAD
1-702-227-2929
NEVADA POWER CORPORATION AND SIERRA SERVICE DEPARTMENT

PREPARED FOR :
MD DEVELOPMENT
8250 W. CHARLESTON BLVD., STE. 100
LAS VEGAS, NV 89117

DATE	BY	APP'D
JULY 2015	PP	
DESIGN	KJT	
DRAWN	JRG	
CHECK		
SCALE	1"=30'	

BAUGHMAN & TURNER, INC.
CIVIL ENGINEERS LAND SURVEYORS LAND PLANNERS
1210 HINSON STREET LAS VEGAS, NEVADA 89102
PHONE (702) 870-1771 FAX (702) 870-2093

MD DEVELOPMENT MME
DEVELOPED ON-SITE DRAINAGE BASIN MAP
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.& M.
CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA
A.P.N. 139-22-803-002

FIGURE 10
PROJ. NO. M189

Mayor
John J. Lee

Council Members
Anita G. Wood
Pamela A. Goynes-Brown
Isaac E. Barron
Richard Cherchio

CITY OF
NORTH LAS VEGAS

Your Community of Choice

City Manager
Dr. Qiong X. Liu, PE, PTOE

PUBLIC WORKS – DEVELOPMENT AND FLOOD CONTROL
2250 N Las Vegas Blvd., Suite 200 • North Las Vegas, Nevada 89030-6307
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

August 21, 2015 Mailed via: E-mail

Pamela Pitcher
John Gustafson, P.E.

Baughman & Turner, Inc.
1210 Hinson Street
Las Vegas, NV 89102

Re: TDS Update for MD Development MME @ I-15/Owens
CNLV No. 52294

Dear Ms. Pitcher:

CNLV staff has reviewed the above referenced study submitted on July 29, 2015 and supplemental information submitted on August 17, 2015, and found it to meet the minimum accepted standards for the technical drainage study update. This acceptance is contingent upon the following conditions:

1. Concurrence from the City of Las Vegas (CLV) will be required since the project is abutting the jurisdictional boundary.

2. Please coordinate with Duane McNelly, Development and Flood Control Project Leader, when submitting improvement plans for this project. Mr. McNelly can be reached at (702)633-2312.

Please be advised that all land surface area disturbances over 1 acre and/or adjacent to a water way must submit a "Notice of Intent" to discharge to the Nevada Division of Environmental Protection, which certifies that a stormwater pollution prevention plan has been developed and is maintained on site. For more information, including forms and applications, see http://ndep.nv.gov/bwpc/storm01.htm.

Acceptance of this drainage study update does not imply approval of the grading plan associated with this site. A detailed review of the grading plan will be performed by staff during the improvement plan review process.

Any future changes in the proposed design (or design assumptions) as outlined in the approved drainage study update and the attached preliminary grading plans which affect drainage must be addressed in a drainage study amendment and accepted by the CNLV Development and 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, CNLV 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.

CNLV, its officials, or employees assume no liability for information, data, calculations and conclusions presented by the consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review. If you have any questions concerning this matter, please contact me at (702)633-1932.

Sincerely,

Dan Le, P.E., CFM
Senior Engineer
Development and Flood Control Division

RECEIVED OCT 2 3 2015

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: October 19, 2015
TO: **Land Development Services** Department of Building & Safety				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **MD Development MME** **(Project in CNLV for CLV Concurrence)**			**COPIES TO:** Baughman & Turner, Inc.
Cross Streets:	NEC of I-15 and Owens Avenue			MD Development
File Number:	F:\Depot\DSMemos\DS4759A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	139-22-803-002			City of North Las Vegas Public Works Department
Zoning Action:	N/A			
FEMA Flood Zone	YES	NO	X	
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	10/5/2015	10/19/2015	See Comments Below	$400.00	417263: $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.

City of Las Vegas Flood Control staff has reviewed the Technical Drainage Study and Addendum for the subject development "***MD Development MME***" within the jurisdiction of the ***City of North Las Vegas. City of Las Vegas*** concurs with the acceptance of the drainage study by the ***City of North Las Vegas Development and Flood Control Department.*** The review of this project was limited to issues of flood control significance to the ***City of Las Vegas.***

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

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

END OF REMARKS
ays

T/R/S: T20S/R61E/22
AREA M-22

TECHNICAL DRAINAGE STUDY FOR
MD DEVELOPMENT MME
SECTION 22, TOWNSHIP 20, SOUTH, RANGE 61 EAST
CITY OF NORTH LAS VEGAS, NEVADA

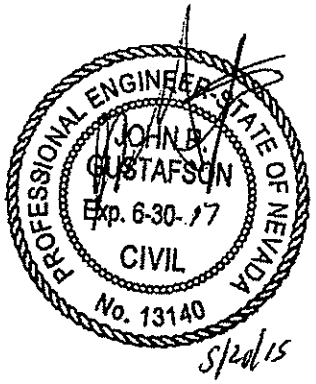
June 8, 2015

PREPARED FOR:

MD DEVELOPMENT
500 NORTH RAINBOW BLVD, SUITE 300
LAS VEGAS, NV 89107

PREPARED BY:

BAUGHMAN & TURNER, INC.
1210 HINSON STREET
LAS VEGAS, NEVADA 89102
TEL: (702) 870-8771/FAX: (702) 878-2695



HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: OWENS & I-15) MD Development MME Date: June 8, 2015

Location of Development: a) Descriptive (Cross Streets) North/South: I-15

East/West: Owens Avenue

b) Section: 22 Township: 20S Range: 61E

c) APN : 139-22-803-002

Name of Owner: MD Development

Telephone No.: Fax No.: E-Mail Address:

Address: 500 North Rainbow Boulevard, Suite 300 Las Vegas NV 89107

Contact Person-Name: Pamela Pitcher **Telephone No.:** 702-870-8771

*** E-Mail Address:** pamp@baughman-turner.com **Fax No.:** 702-878-2695

Firm: Baughman & Turner, Inc

Address: 1210 Hinson Street Las Vegas NV 89102

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: 1.87 acres Being Developed/Disturbed: 1.87 acres
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ **Yes**** ■ **No**
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☐ **Yes**** ■ **No**
4. Proposed type of development (Residential, Commercial, Etc.): Commercial
5. Approximate upstream land area which drains to the subject site: 13 acres
6. Has the site drainage been evaluated in the past? ■ **YES** ☐ **NO** If yes, please identify documentation: Technical Drainage Study for Susan Cannavo (CNLV No. 49053)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: to Owens Avenue
8. Briefly describe your proposed schedule for the subject project: ASAP

PROFESSIONAL ENGINEER STATE OF NEVADA
JOHN R. GUSTAFSON
Exp. 6-30-17
CIVIL
No. 13140

Engineer's Seal 5/20/15

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.

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

I. INTRODUCTION

This study analyzes the development of a medical marijuana cultivation establishment and associated onsite facilities where a gravel parking lot and building currently exist. Analysis presented herein was established after first consulting with the Clark County Regional Control District's (CCRFCD) 2013 Master Plan Update, FEMA regulations and policies, and the CCRFCD's Hydrologic Criteria and Drainage Design Manual (referred to hereafter as the HCDDM).

II. GENERAL DESCRIPTION

A. Location

The proposed 1.87-acre site is located in a portion of the South Half (S ½) of the Southeast Quarter (SE¼) of Section 22, Township 20 South, Range 61 East, M.D.B.&M., Clark County, Nevada. The property lies at the northeast corner of I-15 and Owens Ave (see Figure 1, Vicinity Map). The site is more specifically described as Assessor's Parcel Number 139-22-803-002 (see Figure 2, Assessor's Parcel Map).

B. Property Description

The property is about 1.87 acres of developed property. The site has been used for years as a vehicular impound yard. The storage yard is a combination of dirt and gravel which has been hard-packed over the years. There is an existing office building and a secondary building along the west property line. The property is surrounded by a corrugated metal fence with barbed wire on three sides and a chain link fence on the west property line. Owens Avenue borders the south property line, the UPRR railroad tracks border the east property line and I-15 borders the west property line (See Figure 3, Aerial View and 4, General Aerial View). In the existing condition, the property slopes from the southwest to the northeast at about 3.3%.

C. Master Planning Information

The Clark County Regional Flood Control District's (CCRFCD) 2013 Master Plan Update, a comprehensive plan to facilitate construction of regionally significant flood control structures to alleviate flooding in the Las Vegas Valley, has no existing or proposed facilities adjacent to the site.

A review of the 2013 CCRFCD's Master Plan Update, Figure F-27, (see Figure 5, Flood Control Facilities), indicates that there are existing regional facilities located in Owens, west of I-15, and on the west side of I-15. LVOW 0000 is an existing 10' x 6' RCB in Owens. This facility collects flows from Owens and discharges them into the facility along the freeway. LV15 0280 and LV15 0255 are concrete lined channels located on the west side of I-15. These regional facilities provide 100-yr flood protection from stormwater runoff from the west and protect the freeway.

The I-15 freeway is the western hydrologic basin boundary. The proposed development is located at the western end of sub-basin E-C, as shown on Master Plan Figure H-27 (see

Figure 6, Hydrologic Sub-basins).

D. Floodplain Information

The Flood Insurance Rate Map, Clark County, Nevada, Community Panel No. 32003 C 2160 F (effective date November 16, 2011), published by the Federal Emergency Management Agency (FEMA), indicates that the site is located in a Zone X. A Zone X is determined to be an area outside the 0.2% annual chance floodplain (see Figure 7, Flood Insurance Rate Map).

E. Previous Hydrology Studies

The following study was reviewed in the preparation of this study. Reference material from the study is included in Appendix I.

1) Technical Drainage Study for Susan Cannavo (CNLV No. 49053) approved September 8, 2014, by Baughman & Turner, Inc.

The Susan Cannavo Study previously analyzed the project site. The study establishes hydrologic cutoffs, identified the offsite basins as fully developed in the existing conditions, and analyzed the project site in the existing condition. See Appendix I for relevant report excerpts and figures.

III. HYDROLOGY

A. Existing Offsite Drainage Conditions

The existing offsite drainage conditions impacting the site remain unchanged from the Susan Cannavo Study. The two offsite basins OFFA and OWENS are fully developed in the existing conditions (See Figure 8, Existing Offsite Drainage Basin Map).

Per the Susan Cannavo Study,

> *"Basin OWENS is the Owens Street right of way between the west boundary of I-15 and the eastern boundary of the site. Runoff west of I-15 is collected in drop inlets and discharged to the freeway channel. Basin OWENS generates 4 and 6 cfs during the 10 and 100-year storms, respectively. Runoff produced by basin OWENS travels east past the site combining with flow from basin OFFA. The total flow in Owens at the east end of the site is 19 and 35 cfs. At the east side of the site, Owens is below the railroad crossing providing up to a 15 ft buffer from offsite flows."*

B. Existing Onsite Drainage Conditions

The existing site was analyzed as two basins in the Susan Cannavo Study, EXSITE and EXSITES (see Figure 9, Existing Onsite Drainage Basin Map). Per the Susan Cannavo Study,

> *"Basin EXSITES is about 0.27 acres at the southeast corner of the site. The basin will*

generate <1 cfs and 1 cfs in the 10- and 100-year, 6-hour storm event, respectively. This storm runoff will sheet flow southeast to discharge to the existing UPRR railroad tracks, then south to Owens. Basin EXSITE is the balance of the site, about 1.60 acre. This basin will generate 2 cfs and 5 cfs in the 10- and 100-year, 6-hour storm event, respectively. This storm runoff will sheet flow east to discharge to the existing UPRR railroad tracks."

Please note that the existing onsite basins were analyzed using a curve number of 94, which is not consistent with that of newly graded SCS Soil Type C. It should be noted that the site has been used as a tow yard and vehicle storage lot for numerous years, and therefore compaction has occurred. Due to this, a curve number of 94 for newly graded soil (Type D Soil) is more appropriate.

C. Interim Drainage Conditions

There is no interim condition as the offsite basins are fully developed. The developed condition will discuss the development of the site.

D. Developed Onsite Drainage Conditions

The developed site has been analyzed as two (2 basins: DON1 and DON2 (see Figure 10, Developed Onsite Drainage Basin Map).

Basin DVSTES is about 0.75 acres at the southeast corner of the site. The basin will generate 1 cfs and 3 cfs in the 10- and 100-year, 6-hour storm event, respectively. This storm runoff will drain southeast to the rip-rap swale and then discharge south to Owens. Basin DVSITE is the balance of the site, about 1.12 acres. The site will generate 2 cfs and 4 cfs in the 10- and 100-year, 6-hour storm event, respectively. This storm runoff will drain east to the rip-rap swale then discharge to the existing UPRR railroad tracks via two (2) blockwall openings.

E. Compliance with Regulations and Adopted Plans

All design criteria has been established after first consulting with the CCRFCD's 2013 Master Plan Update, FEMA regulations and policies, and the CCRFCD's Hydrologic Criteria and Drainage Design Manual. Clark County will review this study as it relates to development standards.

IV. HYDROLOGIC/HYDRAULIC CRITERIA

A. Soil Classification

Per the Susan Cannavo Study,

> "The native soils associated with the site and offsite basins have been classified by the United States Department of Agriculture Soils Conservation Service (SCS) in their soil survey of Las Vegas Valley Area as Soil Unit 236, Glencarb, very fine sandy loam, saline, and Soil Unit 380 Skyhaven, very fine sandy loam. Glencarb has a weighted

hydrologic soils group of B and Skyhaven has a weighted hydrologic soils group of C. The curve number for the offsite basins was defined as 98 percent impervious.

The existing onsite basins are classified as having Type C Soil; however in order to be consistent with the existing onsite use, the existing onsite basins were analyzed using a curve number of 94 which is consistent with newly graded and compacted Type D Soil. The developed onsite basin has been analyzed as commercial with Type C soil. All curve numbers were calculated using Table 602 and Table 602A of the HCDDM. The on and off-site associated curve numbers can be found in Appendix B along with the soils information.

B. Precipitation

The project and associated offsite basins are located within the McCarran Airport Rainfall area as shown on Figure 513 of the HCDDM. 10 and 100-year rainfall depths were referenced from Table 505. The aforementioned HCDDM figures and tables are included in Appendix C.

In accordance with the CCRFCD's Hydrologic Criteria and Drainage Design Manual, the design storm selected was a 6-hour duration storm. Three different 6-hour storm distributions are allowed in the Clark County area, labeled SDN-3, SDN-4, and SDN-5 (see Table 503). For drainage areas less than 8 square miles, an SDN-3 is required. The drainage area associated with this site is less than 8 square miles; therefore, an SDN-3 was used.

C. Time of Concentration and Lag Time

The Criteria Manual's Standard Form 4 was completed to determine the time of concentration for each drainage basin. For all basins, which comprise less than 1 square mile, the time of concentration was calculated as follows:

$T_c = T_i + T_t$

Where: T_c = Time of Concentration
T_i = Initial, inlet or overland flow time
T_t = Travel time in the ditch, gutter, etc.

The time of concentration is the sum of the initial flow time, T_i and the travel time, T_t. The minimum T_c recommended for non-urban watersheds is 10 minutes and 5 minutes minimum for urban watersheds.

Initial flow time was calculated as follows:

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

Where: T_i = Initial overland flow time (in minutes)
$K = 0.0132CN - 0.39$ Lo = Length of overland flow (maximum 500 feet)

CN = Curve Number S = Average basin slope (in percent)

The lag time was calculated as follows:

T_{lag} = $0.6T_c$ (in hours) (See Appendix D for calculations)

D. Summary of Findings

Table 1 and 2 list the 100-year and 10-year, 6-hour storm flows. The HEC-1 printouts can be found in Appendices E and F.

Table 1. Peak Flow Summary – Existing Condition

Existing Condition		
Source	100-Year Flow (cfs)	10-Year Flow (cfs)
OFFA	30	17
OWENS	6	4
EXSITES	1	<1
CP1	36	20
EXSITE	5	2

Table 2. Peak Flow Summary – Developed Condition

Developed Condition		
Source	100-Year Flow (cfs)	10-Year Flow (cfs)
OFFA	30	17
OWENS	6	4
DVSTES	3	1
CP1	37	21
DVSITE	4	2

Analysis to determine peak flow rates were achieved using the SCS Unit Hydrograph Method. The input parameters discussed in Section IV, A – C were input into HEC-1, a computer results are shown in the Table above. A summary of input parameters and the HEC-1 printouts can be found in Appendices E and F.

Comparisons between the site discharges draining to the UPRR have been made between the existing flow conditions, the approved allowable flow rates from the Susan Cannavo Study, and the proposed discharge from this study. The comparison is summarized in Table 3 below.

Table 3. Discharge to UPRR Comparison

Flowrate Conveyance Comparison		
Source	100-Year Flow (cfs)	10-Year Flow (cfs)
Existing Flow Rate	5	2
Susan Cannavo Approved Flows	6	3
Proposed Flow	4	2

As demonstrated in Table 3, the proposed development will limit its discharge to reduce the existing 100-year peak flow rate of 5 cfs and to match the 10-year flow of 2 cfs. Therefore, no negative impacts are anticipated to the UPRR property or to downstream properties. There is a 1 cfs increase in the 100-yr and 10-yr discharge to Owens. However, there is no impact to the adjacent property owners.

E. Facility Design Calculations

1. Street Capacity

Street capacity analyses were performed to determine the depth of flow in the surrounding streets. Table 4 summarizes the 100-year flow in the street.

Table 4. Street Capacity Summary

Location	Q (cfs)	D (feet)	V (fps)	D x V	Remarks
100-Year Flow – Ultimate Conditions					
HS1) Owens - Upstream	6	0.28	4.52	1.27	VxD <8 is met; D less than 2 ft.
HS2) Owens Downstream	35	0.46	6.60	3.04	VxD <8 is met; D less than 2 ft.
10-Year Flow – Ultimate Conditions					
HS1) Owens - Upstream	4	0.26	4.22	1.10	VxD <6 is met; D less than 1; 10-yr dry lane is met
HS2) Owens Downstream	20	0.39	5.79	2.26	VxD <6 is met; D less than 1;

All the roadways meet the 100-year Clark County criteria for depth and VxD (i.e. VxD less than 8), as well as, the 10-year criteria for depth and VxD (i.e. VxD less than 6). Please note that Owens Avenue at HS2 does not meet 10-year dry lane criteria; however the depth of flow is less than the curb depth, which meets HCDDM criteria. Additionally, athough 100-feet of right-of-way of Owens has been dedicated, the existing overpass bridge at the I-15 and the UPRR bridge (which bound the site to the west and east) only allow for approximately 62 feet of roadway width, curb, gutter, and sidewalk. When HS2 was reanalyzed as a 100-foot right of way road with 10' median, approximately 27-feet of dry lane is provided, which meets dry lane criteria. See Appendix G for all street capacity calculations.

2. Finished Floor Calculations

There are three (3) new buildings being built with this development along with onsite pavement and perimeter blockwalls. Finish Floor Elevation analysis for the buildings were determined according to the specifications outlined in the CCRFCD's *Hydrologic Criteria and Drainage Manual*. The finished floor must be set a minimum of twice the depth of flow, or one (1) foot above the top of curb, measured at the high side of the building, whichever is highest. Table 5 below summarizes the method to determine the proposed finished floor elevation. The three finished floor elevations more than meet the criteria.

Table 5. Minimum Finished Floor Elevation Determination

	Top of Curb	Free-board	Finished Floor Based on Top of Curb	Flowline Elevation	Depth of Flow	Free-board	Finished Floor Based on Depth of Flow	Proposed Finished Floor Elevation
Building 1	76.10	1.0	77.10	75.60	0.28	0.28	76.16	1982.5
Building 2	67.40	1.0	68.40	75.60	0.46	0.46	76.52	1981.0
Building 3	67.40	1.0	68.40	67.30	0.46	0.46	68.22	1980.25

As shown in the hydraulic criteria tables (Tables 1-5), the *HCDDM* hydraulic criteria are met as follows:

- 10-year and 100-year DxV products are less than 6 and 8, with depths of flow less than 1 foot and 2 feet, respectively.
- The interior parking lot will safely convey storm water towards the UPRR right-of-way.

3. Best Management Practices

The total parking area for the site will exceed 1 acre in size and shall conform to the Section 1500; Structural Best Management Practices as referenced within the Clark County Regional Flood Control District (CCRFCD) Hydrologic and Drainage Design Manual (HCDDM).

The discharge for the newly paved parking area has been designed to allow the stormwater to travel over a rip rap area along the east property line before discharging to the UPRR right-of-way via two (2) blockwall openings to comply with BMP.

4. Proposed Facilities

The drainage facilities required for this site consist of:

- Positive onsite grading;
- Two (2) 16" x 48" blockwall openings along east property line
- 5' rip rap swale along east property line

V. CONCLUSIONS

A. Compliance with Agency Regulations

City of North Las Vegas will review the Hydrology Study as it relates to development standards and overall facility effectiveness. Below is a discussion of the effectiveness of the proposed drainage scheme. This study complies with the standards as set forth in the CCRFCD's Hydrologic Criteria and Drainage Design Manual.

B. Overall Facility Effectiveness

Development of this site will not adversely affect surrounding property owners, since current drainage patterns have not been significantly changed. The small increase in runoff generated by the developed site will be handled as discussed above and will meet City of North Las Vegas and Clark County Regional Flood Control District standards.

VI. REFERENCES

The following documents were used in the preparation of this hydrdogy study update:

1) DRAINAGE DESIGN MANUAL, 1999 - Hydrologic Criteria and Drainage Design Manual, Clark County Regional Flood Control District.

2) CCRFCD, 2013 - Flood Control Master Plan Update, Volume 1, Clark County Regional Flood Control District, James M. Montgomery Consulting Engineers, Inc., September, 2013.

3) SCS, 1985 - Soil Survey of the Las Vegas Valley Area, Nevada, U.S. Department of Agriculture, Soil Conservation Service, Washington D.C., July, 1985.

4) FEMA, 2011 - Flood Insurance Rate Maps, Clark County, Nevada, U.S. Federal Emergency Management Agency, November 16, 2011.

5) HEC, 1988 - HEC-1 Flood Hydrograph Package, Users Manual, U.S. Army Corps of Engineers, the Hydrologic Engineering Center, Davis, California, 1988.

6) Technical Drainage Study for Susan Cannavo (CNLV No. 49053) approved September 8, 2014, by Baughman & Turner, Inc.

TECHNICAL DRAINAGE STUDY ADDENDUM FOR
MD DEVELOPMENT MME
SECTION 22, TOWNSHIP 20, SOUTH, RANGE 61 EAST
CITY OF NORTH LAS VEGAS, NEVADA

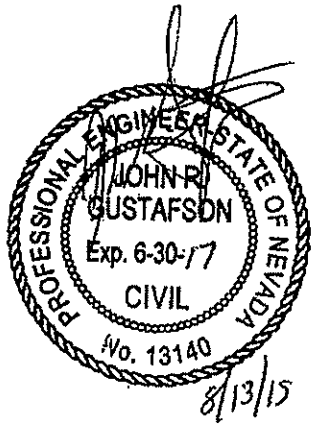
August 12, 2015

PREPARED FOR:

MD DEVELOPMENT
500 NORTH RAINBOW BLVD, SUITE 300
LAS VEGAS, NV 89107

PREPARED BY:

BAUGHMAN & TURNER, INC.
1210 HINSON STREET
LAS VEGAS, NEVADA 89102
TEL: (702) 870-8771/FAX: (702) 878-2695



HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: OWENS & I-15 Date: August 12, 2015

Location of Development: a) Descriptive (Cross Streets) North/South: I-15

East/West: Owens Avenue

b) Section: 22 Township: 20S Range: 61E

c) APN : 139-22-803-002

Name of Owner: MD Development

Telephone No.: Fax No.: E-Mail Address:

Address: 500 North Rainbow Boulevard, Suite 300 Las Vegas NV 89107

Contact Person-Name: Pamela Pitcher Telephone No.: 702-870-8771

* E-Mail Address: pamp@baughman-turner.com Fax No.: 702-878-2695

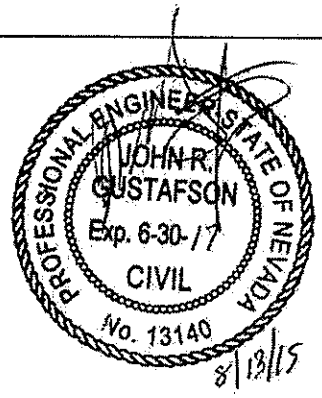
Firm: Baughman & Turner, Inc

Address: 1210 Hinson Street Las Vegas NV 89102

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: 1.87 acres Being Developed/Disturbed: 1.87 acres
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ Yes** ■ No
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☐ Yes** ■ No
4. Proposed type of development (Residential, Commercial, Etc.): Commercial
5. Approximate upstream land area which drains to the subject site: 13 acres
6. Has the site drainage been evaluated in the past? ■ YES ☐ NO If yes, please identify documentation: Technical Drainage Study for Susan Cannavo (CNLV No. 49053)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: to Owens Avenue
8. Briefly describe your proposed schedule for the subject project: ASAP



Engineer's Seal

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

*New Required Field

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

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

Baughman & Turner, Inc.
Consulting Engineers & Land Surveyors
1210 HINSON ST. PHONE (702) 870-8771
LAS VEGAS, NEVADA 89102-1604 FAX (702) 878-2695

August 10, 2015

City of North Las Vegas Public Works
Attn: Mr. Dan Le
2250 Las Vegas Blvd North, #200
North Las Vegas, Nevada 89030

Re: Technical Drainage Study for MD Development MME (I-15/Owens)

Dear Mr. Le,

The following is our response to the comments and conditions of approval placed on the above-referenced project. In an email dated August 3, 2015, the City of North Las Vegas expressed concern about the following items:

Comment No. 1: The first paragraph of Section D. Developed Onsite Drainage Conditions (page 3) of the report refers to Basins DON1 and DON2. However, there is no hydrologic calculations that support these basins. Please review and revise accordingly.

Response: The first paragraph of Section III.D. should read as follows:

D. Developed Onsite Drainage Conditions
The developed site has been analyzed as two (2) basins: DVSITE and DVSITES (see Figure 10, Developed Onsite Drainage Basin Map).

Comment No. 2: The Existing Flow Rate for the 100-Year Flow in Table 3. Discharge to UPRR Comparison (page 5) should be 6 in lieu of 5 since both of the existing onsite basins discharge flow toward the UPRR ROW. Please review and revise accordingly.

Response: Table 3. Discharge to UPRR Comparison has been revised as follows:

Table 3. Discharge to UPRR Comparison

Flowrate Conveyance Comparison		
Source	100-Year Flow (cfs)	10-Year Flow (cfs)
Existing Flow Rate	6	3
Susan Cannavo Approved Flows	6	3
Proposed Flow	4	2

Comment No. 3: The Q10 and Q100 for HS2) Owens Downstream in Table 4. Street Capacity Summary (page 6) should be 21 cfs and 37 cfs in lieu of 20 cfs and 35 cfs, respectively. Please review and revise all related hydraulic calculations accordingly.

Response: The revised hydraulic calculations for HS2) have been provided in Appendix A and Table 4 and Table 5 have been revised accordingly.

Table 4. Street Capacity Summary

Location	Q (cfs)	D (feet)	V (fps)	D x V	Remarks
100-Year Flow – Ultimate Conditions					
HS1) Owens - Upstream	6	0.28	4.52	1.27	VxD <8 is met; D less than 2 ft.
HS2) Owens Downstream	37	0.46	6.73	3.10	VxD <8 is met; D less than 2 ft.
10-Year Flow – Ultimate Conditions					
HS1) Owens - Upstream	4	0.26	4.22	1.10	VxD <6 is met; D less than 1; 10-yr dry lane is met
HS2) Owens Downstream	21	0.40	5.89	2.35	VxD <6 is met; D less than 1;

Comment No. 4: The Proposed Finished Floor Elevation at Building 3 in Table 5. Minimum Finished Floor Elevation Determination (page 7) is shown as 1980.25, but the Grading Plan shows it as 1981.25. Please verify and revise accordingly.

Response: The Proposed Finished Floor elevation for Building 3 in Table 5 has been revised. The depth of flow from Comment 3 above did not change Table 5.

Table 5. Minimum Finished Floor Elevation Determination

	Top of Curb	Free-board	Finished Floor Based on Top of Curb	Flowline Elevation	Depth of Flow	Free-board	Finished Floor Based on Depth of Flow	Proposed Finished Floor Elevation
Building 1	76.10	1.0	77.10	75.60	0.28	0.28	76.16	1982.5
Building 2	67.40	1.0	68.40	75.60	0.46	0.46	76.52	1981.0
Building 3	67.40	1.0	68.40	67.30	0.46	0.46	68.22	1981.25

Comment No. 5: Please revise the call out for the developed condition onsite drainage basin on FIGURE 10 to read "DVSITES" in lieu of "DVSITE". Also, revise the Q10 and Q100 values for HS2) Owens Downstream in the Street Capacity Summary table to reflect 21 cfs and 37 cfs in lieu of 20 cfs and 35 cfs, respectively.

Response: Figure 10 has been revised as noted above.

Comment No. 6: Please address the attached comments on the Grading Plan.

Response: The Grading Plan has been revised to address the comments shown on the redlined plans.

We trust that this letter addresses the comments and conditions raised with the Technical Drainage Study for MD Development MME (I-15/Owens). If you have any further questions, please feel free to contact this office.

Sincerely,
Baughman & Turner, Inc.

Pamela J. Pitcher
Hydrology and Traffic Manager

PJP/aw

cc: MD Development MME – I-15/Owens file

Pamela Pitcher

From:	Dan Le <led@cityofnorthlasvegas.com>
Sent:	Monday, August 3, 2015 9:49 AM
To:	Pamela Pitcher
Cc:	John Gustafson
Subject:	TDS Update for MD Development MME (I-15/Owens)
Attachments:	md dev mme 0000.pdf

Hi Pam,

Per our telephone conversation, below are the minor comments that could be addressed in a supplemental submittal. Please note that these information, including the comments on the grading plans must be addressed before civil submittals.

1. The first paragraph of section **D. Developed Onsite Drainage Conditions (Page 3)** of the report refers to basins DON1 and DON2. However, there is no hydrologic calculations that support these basins. Please review and revise accordingly.

2. The **Existing Flow Rate** for the **100-Year Flow** in **Table 3. Discharge to UPRR Comparison (Page 5)** should be 6 in lieu of 5 since both of the existing onsite basins discharge flow toward the UPRR ROW. Please review and revise accordingly.

3. The Q10 and Q100 for **HS2) Owens Downstream** in **Table 4. Street Capacity Summary (Page 6)** should be 21 cfs and 37 cfs in lieu of 20 cfs and 35 cfs, respectively. Please review and revise all related hydraulic calculations accordingly.

4. The **Proposed Finished Floor Elevation** at **Building 3** in **Table 5. Minimum Finished Floor Elevation Determination (Page 7)** is shown as 1980.25 but the Grading Plan shows it as 1981.25. Please verify and revise accordingly.

5. Please revise the call out for the developed condition onsite drainage basin on **FIGURE 10** to read "DVSITES" in lieu of "DVSITE". Also, revise the Q10 and Q100 values for **HS2) Owens Downstream** in the **Street Capacity Summary** table to reflect 21 cfs and 37 cfs in lieu of 20 cfs and 35 cfs, respectively.

6. Please address the attached comments on the Grading Plan.

Please let me know if you have questions/concerns.

Thanks

DEPARTMENT OF PUBLIC WORKS

CITY OF NORTH LAS VEGAS
Your Community of Choice

Drainage Study Checklist

Background

The City of North Las Vegas strives to provide the development community with adequate information to ensure the successful completion of any project in the City. To aid in the submittal of a complete, thorough drainage study, the following checklist has been compiled to assist the design engineer. This checklist focuses on requirements specific to the City of North Las Vegas. When preparing a drainage study, the engineer will still be required to adhere to all local criterion and guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) *Hydrologic Criteria and Drainage Design Manual* (HCDDM) and the *Uniform Standard Drawings for Public Works' Construction Off-site Improvements* for Clark County Area, Nevada. **In order to have a complete drainage study for submittal to the City, this checklist must be completed, signed, and stamped by the engineer in responsible charge for the completion of the drainage.** Incomplete submittals will not be accepted at the front counter.

Checklist

Provide N/A to an item that is not applicable for the subject site.

I. General Requirement		
Yes	No	
X		Ensure that the new Standard Form 1 and 2 are utilized for all incoming drainage study submittals. The form can be acquired from the CCRFCD's website at http://www.ccrfcd.org/engineering.htm.
X		Ensure that the new 2008 CCRFCD's Master Plan Update (MPU) is utilized for all incoming drainage study submittals. Both the Flood Control Facilities and Facility Inventory Maps must be included with the drainage study.
X		A copy of the approved zoning/planning conditions associated with this site must be included with the initial submittal to verify compliance with conditions.
		If offsite grading is anticipated, a notarized permission letter to construct from the property owner is required prior to the approval of this technical drainage study.
		If the site is proposing to increase or concentrate storm flow and/or nuisance flows onto the adjacent property. A notarized permission letter to accept from the property owner is required prior to the approval of this technical drainage study.
X		The City of North Las Vegas (CNLV) does not allow valley gutters to be constructed across streets with right-of-way widths of 80 feet or greater.
X		Provide map pockets in the back of the drainage study in order to keep the improvement plans with the study.
X		Include a CD-ROM that contains a pdf of the entire study, including improvement plans.
N/A		When submitting flow split analysis for a site, staff suggests using the Pima County flow split calculations. Make sure to provide all supporting documents.

		The project proposes to construct facilities and/or discharge flows within Nevada Department of Transportation (NDOT) right of way. The engineer must contact NDOT for an encroachment permit for the proposed project and it must be received prior to approval of the improvement plans. NOTE: NDOT does not allow for development to increase the 100-year flow rate into their ROW - onsite detention may be required.
N/A		Where right-of-way does not exist, a roadway or drainage easement must be obtained from the adjacent property owner(s) prior to improvement plans approval. Roadway and drainage easement dedication documentation must be processed through the CNLV Real Property Services Division. For more information, please contact Lorena Candelario at 633-2396.
	X	This report serves as a master drainage study for the site. A separate technical drainage study will be required by the City of North Las Vegas upon development of areas shown on the conceptual site plan. Each technical drainage study should provide more detailed design information, including final grading plans with corresponding drainage facility details, hydraulic design calculations, etc.
X		Ensure that the longitudinal slope used to calculate the 100-year flow depth for a given street matches with the slope indicated on the grading plans.
N/A		The City of North Las Vegas (CNLV) is a member of the Community Rating System, which requires Base Flood Elevations (BFE's) to be indicated for any structures located within a Special Flood Hazard Area (SFHA) Zone A, AO, AE, etc.. Please indicate the extent of the effective regulatory SFHA on the grading plan and show the BFE's of the affected lots.
N/A		If a site is adjacent to a future Clark County Regional Flood Control Facility, the developer is required to construct drop inlets at the site's discharge point along the alignment, which will collect 100% of the site's 100-year discharge.
N/A		If the proposed development is required to construct flood control facilities that are depicted on the Clark County Regional Flood Control District's Master Plan Update, structural drawings must be submitted with the drainage study for review and approval by the City of North Las Vegas prior to submitting to CCRFCD for concurrence.
N/A		The City of North Las Vegas North Neighborhood Flood Control Master Plan (NNFCMP) has established centerline intersection grades with corresponding street slopes. Please ensure that the street intersection designs are compatible with the NNFCMP.
N/A		For rectangular shaped culverts, the minimum shall be 6 feet in height and 5 feet in width.
N/A		The City of North Las Vegas requires that all local drainage facilities identified on the North Neighborhood Flood Control Master Plan (NNFCMP) to be constructed by the developer for the full frontage of the site.
N/A		This property is adjacent to Unincorporated Clark County. Please note that a copy of this study and any addenda must be submitted to Clark County Development Services for their review and concurrence.
N/A		This property is adjacent to the City of Las Vegas. Please note that a copy of this study and any addenda must be submitted to City of Las Vegas for their review and concurrence.

N/A		Side lot easement for all residential development will need to meet all the requirements as set forth in the City of North Las Vegas Municipal Code under Title 17.24.210.D.4
N/A		"Arizona" style crossing is not permitted within CNLV right-of-way. Culvert crossings, sized to convey the 100-year flow without any backwater effects, must be designed to convey the flow back to its historical path.
N/A		The minimum pipe diameter to be constructed within public drainage easement or right-of-way shall be 18-inch in reinforced concrete pipe. HDPE pipes are allowed with the caveat that it must be slurry back fill.
N/A		Backwater ponding limits that extend outside of the public right-of-way shall be delineated on the grading plans and a public drainage easement or right-of-way be obtained from the property owner. Roadway and drainage easement dedication documentation must be processed through the CNLV Real Property Services Division. For more information, please contact Lorena Candelario at 633-2396.
N/A		When referencing other drainage studies, all relevant information such as approval letters, drainage basin maps, HEC-1 analyses, details, plans, etc. must be included with the study. The material being referenced should be highlighted in some manner to indicate what is being referenced.
X		Provide a discussion and necessary analyses regarding Best Management Practice per Section 1500 of the Clark County Regional Flood Control District Hydrological Criteria and Drainage Design Manual.

II. Grading Plan Information		
Yes	No	
X		24"X36" copies of Grading Plans including Detail Sheets. Additionally, Plan and Profile sheets must be provided for all public offsite streets and/or storm drain/channel system improvements. The information provided in profile shall include: stationing, length, slope, size, discharge (Q100), material, class of pipe (Class III, IV, V, etc.), hydraulic grade line, inlet locations, finished grade over the pipe and etc.
N/A		On a 100' right-of-way street, the developer is required to build their half of the street, the median island, and one lane on the opposite side of the median. Additionally, the median island will be required to be landscaped.
N/A		Alignment of all existing, proposed, or future Regional Flood Control Facilities adjacent to the site must be shown on the grading plans.
X		Appropriate elevated "humps" 6 inches above the 100-year water surface elevation at all driveways location where the intent is to protect the site from the Q100 flows.
N/A		Erosion protection must be provided at the upstream and downstream terminus of all public roadway improvements.
N/A		Landscape berms used to protect property from flows in the adjacent streets must meet the criterium of being twice the depth of flow above the adjacent flowline up to 18 inches above the adjacent water surface.

N/A		Temporary pavements used to satisfy Clark County PM-10 requirements cannot be used to establish centerline grades for any proposed streets. All proposed street improvements must be designed per the Uniform Standard Drawings for Public Works Construction, Offsite Improvements, Clark County Area, Nevada.
X		Show cross sections along all project boundaries showing the elevational relationship, property line, and any existing or proposed walls.
X		Verify all finished floor elevations of the proposed development meet Section 304.4 of the HCDDM.
X		All onsite drainage swale must maintain a minimum of 1% slope. If < 1% is anticipated, concrete valley gutter is required.
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.), utilities conflict (if any), design hydraulic grade line (HGL) and the 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying the off-site flows.
X		Identify all adjacent parcels with the appropriate assessor parcel number and ownership information.
X		The Engineer must show existing and proposed development at least 100-feet beyond the project site limits. Finished floor elevations of existing buildings, centerline grades, centerline slopes, and top of existing curb elevations must be shown. Reference all adjacent existing improvements with a CNLV Project #. Ensure that it matches with the approved civil plans.
X		Make every effort to provide plan sheets that are clean and clear to review. Be sure to eliminate superimposed text.
X		Due to air quality regulations, all proposed streets must maintain a total of 32' asphalt area. For instance, a 60' half-street improvements will require an additional of 9-foot of overpaving from the centerline.
X		Full intersection designs abutting the proposed development must be provided to ensure that all quadrants of the intersection will drain properly.
X		Provide slopes of driveway fronting all public right-of-ways. Per CNLV Fire Code, the angles of approach and angles of departure must not exceed 6%.
X		For commercial and industrial developments, landscape areas are not allowed to sheet flow over the sidewalk. Provide flow lines with grades and sidewalk under drains for all landscape areas draining to the streets.

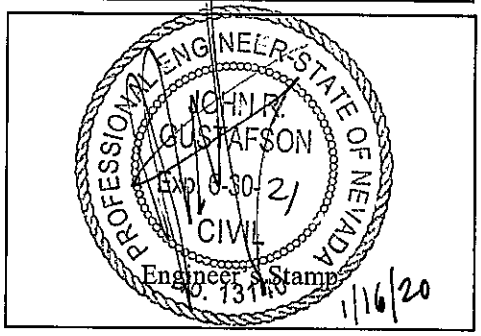
III. Hydrologic and Hydraulic Analyzes		
Yes	No	
X		Verify that the street capacity calculations for "ABC" and "XYZ" streets were completed for the worst case scenario for both water surface elevation and velocity (flattest and steepest slopes). In the interim condition, provide street capacity calculations for the 100-year event. In the ultimate condition, provide street capacity calculations for the 10-year and 100-year events.

X		For 100-year street flows with depths greater than 0.6' and velocities higher than 5 fps, erosion resistant landscaping or pony walls at the back of sidewalk (to the height of the flow in the street) must be provided.
N/A		If a CNLV modified 60' standard street section with offset sidewalk is to be proposed with the development. Ensure that the Flowmaster calculations and improvement drawings are reflected with the correct cross section.
N/A		For 80' and greater streets, if a median island is proposed with the site, ensure that the street capacity calculations are reflected with a median island.
X		For 80' and greater streets, the actual 12' dry lane determination must be shown on the Q10 street capacity calculations. CNLV only requires this criterion to be met in the FUTURE condition. Please note that the dual left turn lane and center median island cannot be used to satisfy the 12' dry lane criterion. Therefore, a minimum of 19' on each half of the street must be achieved for the entire stretch of the site.
		All drainage studies for sites located within the North Neighborhood Flood Control Master Plan (NNFCMP) area must analyze four (4) separate conditions. a. A pure existing condition analysis that quantifies the amount of flow impacting the site in the existing condition. This condition has existing improvements and curve numbers for both onsite and offsite basins. Offsite basins should generally follow contours or existing development drainage patterns. b. An interim condition, where the offsite basins are the same as in the pure existing condition and the onsite basins are developed. The flows in this condition are modeled in the proposed half-streets being constructed with the development and homes/buildings must be at or above the WSE in the street. c. The NNFCMP existing condition flows are analyzed assuming a full street section, the CCRFCD street flow criterion does not need to be met, and the adjacent finished floor elevations must be above the associated WSE. d. The NNFCMP future condition flows are analyzed assuming a full street section, all CCRFCD street flow criteria must be met, and the finished floor elevations must have the required freeboard above the associated WSE.
N/A		For parcels impacted by a FEMA Special Flood Hazard Area, analyses of the floodzone, utilizing the FEMA effective flowrate must be completed for both pre- and post-development cases. The post-development analysis must tie into the effective SFHA in both width and water surface elevation.
N/A		For proposed storm drain connecting into other existing storm drain system, supporting documents must be provided for the beginning HGL used in the hydraulic modeling.
N/A		For the purpose of establishing adequate finished floor elevations for those structures adjacent to the proposed drainage easement, the City requires that submerged weir calculations are submitted. As the sidewalks at the upstream entrance of the drainage easement will effectively act as a broad-crested weir with a submerged tailwater, the water surface elevations at the easement entrances must be calculated as such.

N/A		The engineer must provide inlet control nomograph (see HCDDM) calculations for all proposed drop inlets to ensure that the storm sewer will have the capacity to convey the anticipated 100-year peak flow.
N/A		The CNLV requires that all drop inlet sizing to be performed with the HEC-22 software which can be acquired from the Federal Highway Administration's website at http://www.fhwa.dot.gov/engineering/hydraulics/software.cfm
N/A		Concrete headwalls are required at the inlet and outlet of all culvert installations. Flare end sections are acceptable for culvert less than 30-inch.
N/A		Erosion protection and/or cut off walls may be required at the upstream and downstream of a culvert.
N/A		For the ease of maintainability and constructability, all storm drain pipes must be designed with a soffit to soffit connections.
N/A		Swales that are designed to carry the 100-year flow must maintain a minimum freeboard of six inches above the depth of flow. Provide hydraulic calculations for verification.
N/A		For project sites that are 40 acres or greater, flow values must be labeled at the outlet point of each individual drainage basin and concentration points on all drainage basin maps.
X		The soil's map must include both the off-site and on-site sub-basin delineations for all drainage conditions.

IV. Local Entity Criteria - City of North Las Vegas - HCDDM Section 1603		
Yes	No	
N/A		Within the interior streets of a residential subdivision, the depth times velocity for the major storm event shall be less than or equal to 6.
N/A		When downstream storm sewer facilities are not available, the City of North Las Vegas requires bubbler laterals for the conveyance of storm water under streets with right-of-way widths greater than or equal to 80 feet. The bubbler laterals must consist of a minimum 18-inch diameter reinforced concrete pipe. To accommodate the draining of the bubbler system prior to future downstream extension of the storm sewer system, a minimum 6-inch diameter PVC pipe must be daylighted downstream.
N/A		The City of North Las Vegas does not permit the construction of permanent structures within a Federal Emergency Management Agency (FEMA) designated Special Flood Hazard Area (SFHA). Under this policy, any developer/builder proposing to place structures within a SFHA must meet the following requirements prior to the issuance of various permits and certificates-of-occupancy: a. Grading and off-site construction permits may be issued by the CNLV Department of Public Works once the improvement plans and drainage study have been approved and a copy of the completed Conditional Letter of Map Revision (CLOMR) application has been submitted to FEMA for processing. b. Building permits can be issued once a favorable CLOMR has been obtained from FEMA. c. Certificates-of-occupancy can be issued once a Letter of Map Revision (LOMR) has been obtained from FEMA.

N/A		The City of North Las Vegas requires that stormwater drop inlet signage be affixed to any installed drop inlets. The plaque must read "Don't pollute - drains to Lake Mead" in English and Spanish. CNLV Quality Control/Offsite inspectors will verify that the signs are properly installed.
X		A minimum longitudinal street slope of 0.4 percent (0.004 ft/ft) shall be used. If the Engineer can demonstrate, to the satisfaction and approval of the City Engineer, severe topographic constraints or other mitigating factors, the design of streets with slopes less than 0.4 percent may be permitted.
N/A		Side lot drainage easements are generally discouraged unless the engineer can demonstrate design constraints that render alternative site layout and drainage facility design options as impossible or impractical.
N/A		All wall openings must be designed to pass the 100-year storm event flows using the assumption that the bottom 50% of the openings are obstructed.
N/A		When a storm drain system is proposed at a sump area, a non-damaging emergency surface flow path must be provided to convey the 100-year flows. Adjacent finished floor elevations must be adequately protected.
N/A		For any ground-mounted air-conditioning pad that encroaches to within three (3) feet of a property line, the engineer must indicate on the plot plans how lot drainage will be accommodated beneath the pad. This can include, but is not limited to, the placement of a 4-inch diameter PVC pipe, with the inlet and outlet inverts of the pipe constructed to correspond with the flow line of the obstructed lot drainage swale.



John R. Gustafson

Engineer in Responsible Charge Name (Printed)

Approved by CNLV Development and Flood Control *Date*

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Red Realty-Cultivation Facility	Map ID:
Firm Name: Baughman & Turner, Inc.	Engineer:
Address: 1210 Hinson Street	
City: Las Vegas	State: NV Zip: 89122
Phone Number: 702-870-8771	Fax Number: 702-878-2695
Property Owner: Knit Designing Community	
Address: 7250 Peak Drive, Suite 216	
City: Las Vegas	State: NV Zip: 89129

Reviewed By:	Date Received:	Date Accepted for Review:

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

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

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

I. GENERAL REQUIREMENT

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

II. MAPS AND EXHIBITS

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

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

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

III. DRAINAGE PLAN

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

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

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

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

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

IV. HYDROLOGIC ANALYSIS

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

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes	No	
____	N/A	Flow split calculations and supporting documentation or reference for the method of flow split calculations used.
X	____	Normal depth street flow calculations and cross section diagrams for all interior and perimeter streets. Provide "d x v" products for the Q_{100} and Q_{10} flows representing the worst case for interior and all perimeter streets. Q_{100} d x v $\leq$ 8. Q_{10} d x v $\leq$ 6 and 12 foot dry lane for rights-of-way $\geq$ 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan.
X	____	A summary table of interior and exterior street capacity calculations showing the street name, Q_{100} flow, slope, depth of flow, velocity and depth times velocity product and streets needing to meet 12 foot dry lane criteria.
____	N/A	Appropriate hydraulic calculations for block wall openings assuming a 50 percent vertical clogging factor. (Assume the lower half of the opening is plugged.)
____	N/A	Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set finish floor elevations. Hydraulic calculations must include submerged weir, superelevation and tee intersection losses, where appropriate.
X	____	Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow or depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Buildings adjacent to drainage easements must always be provided with 18 inches of freeboard above the Q_{100} weir height or flow depth, whichever is greater.
____	N/A	A complete water surface profile analysis (HEC-2, HEC-RAS, etc.) for channel flows and FEMA Zone A flood zones. • Field survey data. • Input and output information. • Plotted cross-sections based on survey with proper encroachments. • A map showing the location of the cross-sections. • Analysis of both sub and super-critical flow segments. • A summary table and a discussion of the results in the text of the report.
____	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.
X	____	Provide BMP type, size and supporting calculations for parking lots and LIDs (if required).

REFERENCE: | **STANDARD FORM 2**

Planning Commission Agenda Item

Date: October 09, 2019

Item No: 7.

TO: Planning Commission

FROM: Marc Jordan, Director Land Development & Community Services
Prepared By: Robert Eastman

SUBJECT: UN-74-19 (71417) 228 WEST OWENS AVENUE (Public Hearing). Applicant: Red Diamond Investors, LLC. Request: A special use permit in an M-2 (General Industrial District) to allow a cultivation facility for marijuana. Location: 228 West Owens Avenue. (APN 139-22-803-002). (For possible action)

RECOMMENDATION: Approval with Conditions

PROJECT DESCRIPTION:

The applicant is requesting consideration of a special use permit to allow a cultivation facility for marijuana. The special use permit is for an expansion to an existing marijuana cultivation facility. The existing special use permit was approved by the City Council on October 14, 2014 and received an extension of time on December 9, 2015. The proposed expansion is for an 110,461 square foot cultivation facility.

BACKGROUND INFORMATION:

Previous Action
On October 14, 2014, the City Council approved a special use permit (UN-88-14) to allow a cultivation facility for medical marijuana.
On December 9, 2015, the Planning Commission approved an extension of time for UN-88-14.

RELATED APPLICATIONS:

Application #	Application Request
UN-75-19	An application for an expansion to an existing use permit to allow the Production of Edible Marijuana Products or Marijuana-Infused Products.

GENERAL INFORMATION:

	Land Use	Zoning	Existing Use
Subject Property	Downtown Business District	M-2, General Industrial District	Existing Marijuana Production and Cultivation facility
North	Downtown Business District	M-2, General Industrial	Undeveloped
South	Light Industrial / Research (City of Las Vegas)	M, Industrial District (City of Las Vegas)	Office/Warehouse
East	Downtown Business District	M-2, General Industrial	Outdoor recycling center.
West	General Commercial (City of Las Vegas)	C-2, General Commercial District (City of Las Vegas)	I-15 and Undeveloped

DEPARTMENT COMMENTS:

Department	Comments
Public Works:	No Comment.
Police:	No Comment.
Fire:	No Comment.

ANALYSIS

The applicant is currently operating the cultivation and production facility with the originally approved 3,579 and 1,902 square foot facilities. The applicant is proposing to develop a three-story building on site. The building will be 60 feet in height and contain both cultivation and production facilities. The total area of the building is 117,642 square feet. The cultivation facility will occupy 110,461 square feet and the production facility will be 3,980 square feet. With administrative offices occupying the remaining 3,201 square feet.

The proposed site plan contains one access drive from Owens Avenue and proposes to create 123 off-street parking spaces, where 121 parking spaces are required. The site will be enclosed with a twelve foot concrete block wall. The applicant has not provided elevations for the wall, however the wall will be required to be decorative.

The applicant has also filed a special use permit for the expansion for the Production of Edible Marijuana Products or Marijuana-Infused Products (UN-75-19). Both applications are on this agenda for Planning Commission consideration.

The proposed building is a concrete tilt-up structure with varying colors to help break the mass of the building. The colors are not proposed, but will be reviewed during the building permit process. Additionally, the building appears to be a single continuous flat plane. Some additional columns, beltlines, or cornice elements may be needed to help break the mass of the building. However, this is relatively minor, and can be addressed during the building permit process.

The landscaping for the site is in compliance with the requirements for an industrial building. The applicant is providing 10 feet of landscaping along Owens Avenue. There is a triangular piece of right-of-way between Owens Avenue and the applicant's parcel. This parcel is a sloped portion that should also be landscaped by the applicant to provide additional buffering for the site.

A cultivation facility for marijuana is permitted within the M-2, General Industrial District with the approval of a special use permit by the Planning Commission. According to Title 17, the following requirements must be demonstrated.

Distance Separation Requirements: The applicant must submit a survey from a Nevada licensed surveyor that demonstrates the proposed establishment meets the separation requirements of 1,000 feet from a school, 300 feet from a community facility, or developed residential, and 1,500 feet from any licensed gaming establishments. The submitted survey indicates that these requirements have been met.

Separate, Stand Alone Building or Facility: According to the site plans, the applicant is proposing to locate the proposed establishment within a separate building. The floor plan for the building shows a cultivation area of approximately 110,000 square feet, and the remaining building allocated to production and office space.

Appropriately Zoned: The subject site has the appropriate zoning of M-2, General Industrial District.

Specific Use of the Facility: The applicant is proposing a cultivation facility for marijuana. Other than a production facility on the third floor and the offices on the first floor neither the letter of intent nor site plan indicates other activities.

A Single Entrance: According to the floor plan, it appears that one main entrance is proposed for the building. Should the State require separate entrances for all uses within the buildings, the floor plan would need to be amended to reflect this requirement. The only other entrances appear to be additional ingress/egress doors for life safety or secured delivery.

No Outside Storage: The site plan does not indicate any outside storage of marijuana proposed as part of this use.

Minimum Square Footage: The proposed cultivation facility will be approximately 110,461 square feet in size. Therefore, the minimum size criteria of 3,500 square feet for a cultivation facility has been met.

In addition to the above requirements, there are several other requirements the applicant would need to comply with that cannot be determined with the submittal of a land use request. Those requirements include, but are not limited to maintaining discreet and professional signage, complying with life safety requirements, and ensuring there is no emission of dust, fumes, vapors, or odors.

Requirements for Approval of a Special Use Permit

In accordance with the Zoning Ordinance, the Planning Commission may, by motion, grant a special use permit if the Planning Commission finds, from the evidence presented, that all of the following facts exist:

1. The proposed use is consistent with the Comprehensive Master Plan and all applicable provisions of this Code and applicable State and Federal regulations;

2. The proposed use is consistent with the purpose and intent of the zoning district in which it is located and any applicable use-specific standards and criteria in Chapter 17.20 of this Code;

3. The proposed use is compatible with adjacent uses in terms of scale, site design, and operating characteristics (such as, but not limited to, hours of operation, traffic generation, lighting, noise, odor, dust, and other external impacts);

4. Any significant adverse impacts anticipated to result from the use will be

mitigated or offset to the maximum extent practicable; and

5. Facilities and services (including sewage and waste disposal, water, gas, electricity, police and fire protection, and roads and transportation, as applicable) will be available to serve the subject property while maintaining adequate levels of service for existing development.

Staff supports the expansion of the existing marijuana cultivation and production facility. The proposed use is allowed in the M-2 zoning classification and the expansion should not create a negative impact on the surrounding neighborhood.

CONDITIONS:

Planning and Zoning:

1. Unless expressly authorized through a variance, waiver or another approved method, this development shall comply with all applicable codes and ordinances.

2. Must permit and construct a building that meets the Industrial Design Guidelines and all applicable Development Standards for the vehicle repair activities.

3. Additional landscaping shall be provided along Owens Avenue on Parcel 139-22-899-013. The landscaping shall include trees every 20 feet on center, with shrubs and groundcover to provide 50% coverage within two years of planting.

Public Works:

4. All known geologic hazards shall be shown on any preliminary development plans and civil improvement plans submitted to the City. Subsequent identification of additional hazards may substantially alter development plans.

5. Approval of a drainage study is required prior to submittal of the civil improvement plans.

6. The size and number of access points and their locations are subject to review and approval by the City of North Las Vegas Traffic Engineer and must meet the standards set forth in *North Las Vegas Municipal Code* section 17.24.040. Conformance may require modifications to the site plan.

7. All driveway geometrics shall be in compliance with the *Uniform Standard Drawings for Public Works' Construction Off-Site Improvements* Drawing Number 222.1 and 222.5.

8. All Nevada Energy easements, appurtenances, lines and poles must be shown and shall be located entirely within the perimeter landscape area of this development. Distribution lines, existing or proposed, shall be placed underground if impacted by the proposed development of the parcel or if the pole impedes upon the proper ADA clearances for sidewalk. Under no circumstances will new down guy wires be permitted.

9. Approval of a traffic study is required prior to submittal of the civil improvement plans. Please contact Traffic Engineering at 633-2676 to request a scope. A queuing analysis may be required.

ATTACHMENTS:
Public Works Memorandum
Fire Safety Memorandum
Letter of Intent
Site Plan
Floor Plan
Elevation
Distance Survey
Clark County Assessor's Map
Location and Zoning Map

Planning Commission Agenda Item

Date: October 09, 2019

Item No: 8.

TO: Planning Commission

FROM: Marc Jordan, Director Land Development & Community Services
Prepared By: Robert Eastman

SUBJECT: UN-75-19 (71422) 228 WEST OWENS AVENUE (Public Hearing). Applicant: Red Diamond Investors, LLC. Request: A special use permit in an M-2 (General Industrial District) to allow the production of edible marijuana products or marijuana-infused products. Location: 228 West Owens Avenue. (APN 139-22-803-002). (For possible action)

RECOMMENDATION: Approval with Conditions

PROJECT DESCRIPTION:

The applicant is requesting consideration of a special use permit to allow the production of edible marijuana products or marijuana infused products. The special use permit is for an expansion to an existing marijuana production facility. The existing special use permit was approved by the City Council on October 14, 2014 and received an extension of time on December 9, 2015.

BACKGROUND INFORMATION:

Previous Action
On October 14, 2014, the City Council approved a special use permit (UN-89-14) to allow the production of edible marijuana products of marijuana infused products.
On December 9, 2015, the Planning Commission approved an extension of time for UN-89-14.

RELATED APPLICATIONS:

Application #	Application Request
UN-74-19	An application for an expansion to an existing use permit to allow a Marijuana Cultivation Facility.

GENERAL INFORMATION:

	Land Use	Zoning	Existing Use
Subject Property	Downtown Business District	M-2, General Industrial District	Existing Marijuana Production and Cultivation facility
North	Downtown Business District	M-2, General Industrial	Undeveloped
South	Light Industrial / Research (City of Las Vegas)	M, Industrial District (City of Las Vegas)	Office/Warehouse
East	Downtown Business District	M-2, General Industrial	Outdoor recycling center.
West	General Commercial (City of Las Vegas)	C-2, General Commercial District (City of Las Vegas)	I-15 and Undeveloped

DEPARTMENT COMMENTS:

Department	Comments
Public Works:	No Comment.
Police:	No Comment.
Fire:	No Comment.

ANALYSIS

The applicant is currently operating the cultivation and production facility with the originally approved 3,579 and 1,902 square foot facilities. The applicant is proposing to develop a three-story building on site. The building will be 60 feet in height and contain both cultivation and production facilities. The total area of the building is 117,642 square feet. The cultivation facility will occupy 110,461 square feet and the production

facility will be 3,980 square feet. With administrative offices occupying the remaining 3,201 square feet.

The proposed site plan contains one access drive from Owens Avenue and proposes to create 123 off-street parking spaces, where 121 parking spaces are required. The site will be enclosed with a twelve foot concrete block wall. The applicant has not provided elevations for the wall, however the wall will be required to be decorative.

The applicant has also filed a special use permit for an expansion of the Marijuana Cultivation Facility (UN-74-19). Both applications are on this agenda for Planning Commission consideration.

The proposed building is a concrete tilt-up structure with varying colors to help break the mass of the building. The colors are not proposed, but will be reviewed during the building permit process. Additionally, the building appears to be a single continuous flat plane. Some additional columns, beltlines, or cornice elements may be needed to help break the mass of the building. However, this is relatively minor, and can be addressed during the building permit process.

The landscaping for the site is in compliance with the requirements for an industrial building. The applicant is providing 10 feet of landscaping along Owens Avenue. There is a triangular piece of right-of-way between Owens Avenue and the applicant's parcel. This parcel is a sloped portion that should also be landscaped by the applicant to provide additional buffering for the site.

The production of edible marijuana products or marijuana infused products is permitted within the M-2, General Industrial District with the approval of a special use permit by the Planning Commission. According to Title 17, the following requirements must be demonstrated.

Distance Separation Requirements: The applicant must submit a survey from a Nevada licensed surveyor that demonstrates the proposed establishment meets the separation requirements of 1,000 feet from a school, 300 feet from a community facility, or developed residential, and 1,500 feet from any licensed gaming establishments. The submitted survey indicates that these requirements have been met.

Separate, Stand Alone Building or Facility: According to the site plans, the applicant is proposing to locate the proposed establishment within a separate building. The floor plan for the building shows a production area of approximately 3,980 square feet, and the remaining building allocated to cultivation and office space.

Appropriately Zoned: The subject site has the appropriate zoning of M-2, General Industrial District.

Specific Use of the Facility: The applicant is proposing the production of edible marijuana products or marijuana-infused products. Other than a cultivation facility throughout the building and the offices on the first floor neither the letter of intent nor site plan indicates other activities.

A Single Entrance: According to the floor plan, it appears that one main entrance is proposed for the building. Should the State require separate entrances for all uses within the buildings, the floor plan would need to be amended to reflect this requirement. The only other entrances appear to be additional ingress/egress doors for life safety or secured delivery.

No Outside Storage: The site plan does not indicate any outside storage of marijuana proposed as part of this use.

Minimum Square Footage: The proposed production facility will be approximately 3,980 square feet in size. According to the ordinance for marijuana establishments, there are no minimum size criteria for production establishments..

In addition to the above requirements, there are several other requirements the applicant would need to comply with that cannot be determined with the submittal of a land use request. Those requirements include, but are not limited to maintaining discreet and professional signage, complying with life safety requirements, and ensuring there is no emission of dust, fumes, vapors, or odors.

Requirements for Approval of a Special Use Permit

In accordance with the Zoning Ordinance, the Planning Commission may, by motion, grant a special use permit if the Planning Commission finds, from the evidence presented, that all of the following facts exist:

1. The proposed use is consistent with the Comprehensive Master Plan and all applicable provisions of this Code and applicable State and Federal regulations;

2. The proposed use is consistent with the purpose and intent of the zoning district in which it is located and any applicable use-specific standards and criteria in Chapter 17.20 of this Code;

3. The proposed use is compatible with adjacent uses in terms of scale, site design,

and operating characteristics (such as, but not limited to, hours of operation, traffic generation, lighting, noise, odor, dust, and other external impacts);

4. Any significant adverse impacts anticipated to result from the use will be mitigated or offset to the maximum extent practicable; and

5. Facilities and services (including sewage and waste disposal, water, gas, electricity, police and fire protection, and roads and transportation, as applicable) will be available to serve the subject property while maintaining adequate levels of service for existing development.

Staff supports the expansion of the existing marijuana cultivation and production facility. The proposed use is allowed in the M-2 zoning classification and the expansion should not create a negative impact on the surrounding neighborhood.

CONDITIONS:

Planning and Zoning:

1. Unless expressly authorized through a variance, waiver or another approved method, this development shall comply with all applicable codes and ordinances.

2. Must permit and construct a building that meets the Industrial Design Guidelines and all applicable Development Standards for the vehicle repair activities.

3. Additional landscaping shall be provided along Owens Avenue on Parcel 139-22-899-013. The landscaping shall include trees every 20 feet on center, with shrubs and groundcover to provide 50% coverage within two years of planting.

Public Works:

4. All known geologic hazards shall be shown on any preliminary development plans and civil improvement plans submitted to the City. Subsequent identification of additional hazards may substantially alter development plans.

5. Approval of a drainage study is required prior to submittal of the civil improvement plans.

6. The size and number of access points and their locations are subject to review and approval by the City of North Las Vegas Traffic Engineer and must meet the

standards set forth in *North Las Vegas Municipal Code* section 17.24.040. Conformance may require modifications to the site plan.

7. All driveway geometrics shall be in compliance with the *Uniform Standard Drawings for Public Works' Construction Off-Site Improvements* Drawing Number 222.1 and 222.5.

8. All Nevada Energy easements, appurtenances, lines and poles must be shown and shall be located entirely within the perimeter landscape area of this development. Distribution lines, existing or proposed, shall be placed underground if impacted by the proposed development of the parcel or if the pole impedes upon the proper ADA clearances for sidewalk. Under no circumstances will new down guy wires be permitted.

9. Approval of a traffic study is required prior to submittal of the civil improvement plans. Please contact Traffic Engineering at 633-2676 to request a scope. A queuing analysis may be required.

ATTACHMENTS:
Public Works Memorandum
Fire Safety Memorandum
Letter of Intent
Site Plan
Floor Plan
Elevation
Distance Survey
Clark County Assessor's Map
Location and Zoning Map

Mayor
John J. Lee

Council Members
Isaac E. Barron
Pamela A. Goynes-Brown
Scott Black
Richard J. Cherchio

CITY OF
NORTH LAS VEGAS
Your Community of Choice

City Manager
Ryann Juden

Department of Public Works
2250 N. Las Vegas Boulevard, Suite 200 • North Las Vegas, Nevada 89030
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

March 11, 2020

Mailed via: E-mail

John R. Gustafson, P.E.
Baughman & Turner, Inc.
1210 Hinson Street
Las Vegas, NV 89102

RE: **Technical Drainage Study for Red Realty – Cultivation Facility**
Addendum No. 1
CNLV #29-2020

Dear Mr. Gustafson:

Staff has reviewed the Technical Drainage Study for Red Realty – Cultivation Facility, dated January 16, 2020 and Addendum No. 1, dated March 2, 2020 and found the hydrological and hydraulic analyses to meet the minimum accepted standards for a technical drainage study. The acceptance of this drainage study is contingent upon the following conditions:

1. Concurrence must be obtained by the City of Las Vegas due to the proposed improvements proximity to the City of Las Vegas Corporate City boundary.

2. Coordination with the City of North Las Vegas (CNLV) and City of Las Vegas (CLV) Utility Departments is necessary to identify specific requirements or limitations for easements necessary to provide unobstructed access to their respective utilities for maintenance purposes. Generally, no walls, signs, parking areas, buildings or other structures may be placed anywhere within any easement or in the vehicle ingress or egress pathway to easements.

Please be advised that all land surface area disturbances over 1 acre and/or adjacent to a water way must submit a "Notice of Intent" to discharge to the Nevada Division of Environmental Protection, which certifies that a stormwater pollution prevention plan has been developed and is maintained on site. For more information including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm.

Acceptance of this study does not imply approval of the grading plan associated with this site. A detailed review of the grading plan will be performed by staff during the improvement plan review process.

Any future changes in the proposed design (or design assumptions) as outlined in the approved drainage study and the attached preliminary grading plans which affect drainage must be addressed in a drainage study update and accepted by the CNLV Development and 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, CNLV 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.

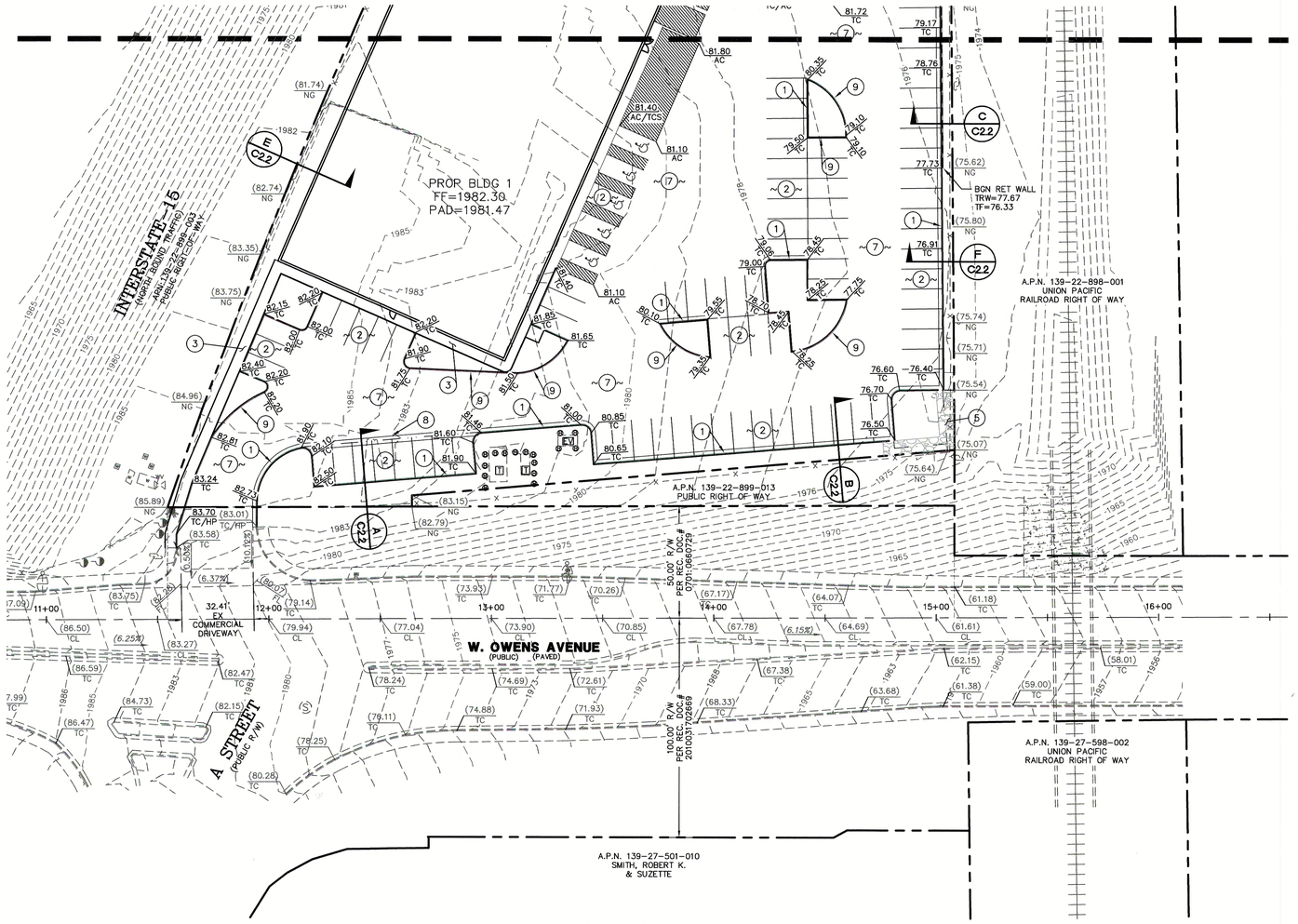
The City of North Las Vegas, its officials, or employees assume no liability for information, data, calculations and conclusions presented by the Engineer. We, therefore, make no warranties, either expressed or implied, in conducting this review. If you have any questions concerning this matter, please contact me at (702) 633-1933.

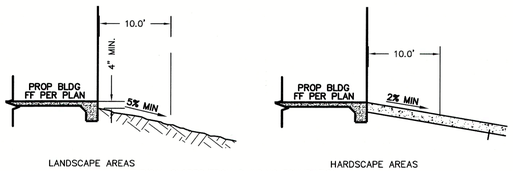
Note that the Clark County Regional Flood Control District (District) has begun efforts to update the *Hydrological Criteria and Drainage Design Manual* (HCDDM) and is requesting participation from the engineering community. The District is collecting comments and suggestions on errors, clarifications, or changes needed to the current Manual and/or content and usability enhancements to be incorporated into the updated Manual. Additional information on procedures and deadline to provide feedback and comments are available online at (http://www.ccrfcd.org/hcddmupdate.html).

Sincerely,

Mark A. Escobedo

Mark Escobedo, P.E., CFM
Engineering Associate
Public Works/Development and Flood Control
City of North Las Vegas
(702) 633-1933





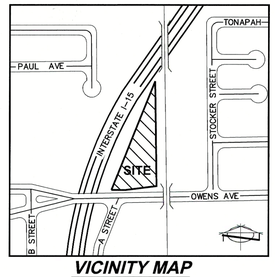
TYPICAL SLOPES FROM BUILDING FOUNDATION

SLOPE REQUIREMENT DETAIL

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.



VICINITY MAP
NO SCALE

LEGEND

- PROPERTY LINE
- STREET CENTERLINE
- LOT LINE
- BUILDING SETBACK LINE
- PROPOSED ROLL CURB
- EXISTING "L" CURB & GUTTER
- EXISTING CONTOUR LINES (XXXX)
- PROPOSED FLOW LINE
- SAW CUT LINE
- PROPOSED EDGE OF PAVEMENT
- EXIST. EDGE OF PAVEMENT
- PROPOSED BLOCK WALL
- PROPOSED SCARP
- EXIST. BLOCK WALL
- SAW CUT AREA
- MATCHLINE
- 00.00 LOC — PROPOSED ELEVATION & LOCATION
- (00.00) LOC — EXISTING ELEVATION & LOCATION
- 0.00% — PROPOSED GRADE
- (#) — CONSTRUCTION NOTE
- PROPOSED HYDRANT
- SIGHT VISIBILITY ZONE*
- ROADWAY EASEMENT

AC	ASPHALTIC CONCRETE
CL	CENTERLINE
TC	TOP OF CURB
EP	EDGE OF PAVEMENT
FG	FINISHED GRADE
TF	TOP OF FOOTING
TRW	TOP OF RETAINING WALL
TFW	TOP OF FLOOD WALL
TSW	TOP OF STEM WALL
BSW	BACK OF SIDEWALK
GB	GRADE BREAK
BVC	BEGIN VERTICAL CURVE
EVC	END VERTICAL CURVE
FF	FINISHED FLOOR
FL	FLOW LINE
HP	HIGH POINT
INV	INVERT
LF	LINEAR FEET
LP	LOW POINT
LS	LANDSCAPE
SWG	SOUTHWEST GAS
P.U.E.	PUBLIC UTILITY EASEMENT
P.D.E.	PRIVATE DRAINAGE EASEMENT
P.S.E.	PRIVATE SEWER EASEMENT
P.L.E.	PRIVATE LANDSCAPE EASEMENT

*NOTE: NOTHING OVER 24" IN HEIGHT ALLOWED IN SIGHT VISIBILITY ZONE EXCEPT TRAFFIC CONTROL DEVICES.

CONSTRUCTION NOTES

#	ITEM	UNIT	QUANTITY PUBLIC	QUANTITY PRIVATE	QUANTITY NDOT
(1)	INSTALL 24" "L" TYPE C & G PER CCAUSD #216.	LF	–	–	–
(2)	CONSTRUCT 2" AC OVER 4" TYPE II AGGREGATE BASE (PARKING STALL)	SY	–	–	–
	TYPE II AGGREGATE BASE	CY	–	–	–
(3)	INSTALL 4" THICK CONCRETE SIDEWALK PER CCAUSD #234.	SF	–	–	–
(4)	INSTALL 2 FT. CURB OPENING PER DETAIL 2 ON SHEET C3.2	EA	–	–	–
(5)	INSTALL RIP RAP D_{50}= 3", BLANKET THICKNESS 6". FOR BMP PER CCRFCD SEC 1503.4.5	SF	–	–	–
(6)	INSTALL TRASH ENCLOSURE SEE ARCHITECTURAL PLANS	EA	–	–	–
(7)	CONSTRUCT 3" AC OVER 6" TYPE II AGGREGATE BASE (DRIVE AISLE)	SY	–	–	–
	TYPE II AGGREGATE BASE	CY	–	–	–
(8)	INSTALL 3' WIDE VALLEY GUTTER PER DETAIL 2 ON SHEET C3.2	LF	–	–	–
(9)	INSTALL "A" TYPE CURB PER CCAUSD #219.	LF	–	–	–

ENGINEERS CERTIFICATE

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS, NEVADA.

JOHN R. GUSTAFSON, P.E. 13140 DATE

APPROVALS

Robert A. McLaughlin, P.E. CFM Date
Manager, Development and Flood Control Division

STORMWATER MANAGEMENT NOTES

1. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATED IN, THE PUBLIC RIGHTS OF WAY OF 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.

2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN CLARK COUNTY TITLE 24.40 AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDANCE MANUAL.

3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.5

4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS, AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER ANY 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 EXCEPTION TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.

5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

GEOTECHNICAL REPORT INFO

SITE SHALL BE GRADED IN ACCORDANCE WITH THE APPROVED GEOTECHNICAL REPORT PREPARED BY:

LAS VEGAS, NV ----
PHONE: -----
DISPATCH: -----
FAX: -----
PROJECT NO. -----
DATED -----
UPDATED ----

AREA OF DISTURBANCE

OFFSITE: 0.00 AC
ONSITE: 0.00 AC

EARTHWORK QUANTITIES

	OFFSITE:	ONSITE
CUT:	0 CY	0 CY
FILL:	0 CY	0 CY
NET:	0 CY	0 CY CUT

DRAINAGE EASEMENT NOTE

NO DEEP ROOTED TRESS OR SHRUBS TO BE PLANTED WITH THE CITY OF NORTH LAS VEGAS DRAINAGE EASEMENT.

BASIS OF BEARING:

SOUTH 89°47'07" WEST, BEING THE SOUTH LINE OF SECTION 22, TOWNSHIP 20 SOUTH RANGE 61 EAST M.D.B.&M. AS SHOWN ON MAP AS FILE 5, PAGE 66 ON FILE IN THE COUNTY RECORDERS OFFICE, CLARK COUNTY, NEVADA.

BENCHMARK

7C0122S4 – RIVET AND SQUARE ALUMINUM PLATE IN TOP OF CURB NORTH SIDE OF OWENS AVENUE AT THE EAST FACE OF AND UNDER THE RAILROAD BRIDGE CROSSING OWENS AVENUE.

ELEV: 596.674 METERS = 1957.59 FEET
NAVD 88

FLOOD ZONE DATA

THIS SITE IS LOCATED IN ZONE "X", ZONE "X" HAS BEEN DETERMINED TO BE AN AREA OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.

COMMUNITY PANEL NO. 32003C2160E
EFFECTIVE DATE SEPTEMBER 27, 2002

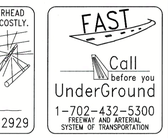
OWNER/DEVELOPER

RED REALTY LLC
7250 PEAK DRIVE, SUITE 216
LAS VEGAS, NV 89128
(702)341-2291
MICHELLED@KNITSTUDIOS.COM

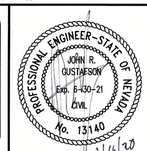
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CNLV PROJECT # ----







DATE	REV NO.	REVISIONS	APPD. INITIALS	DATE APPROVED

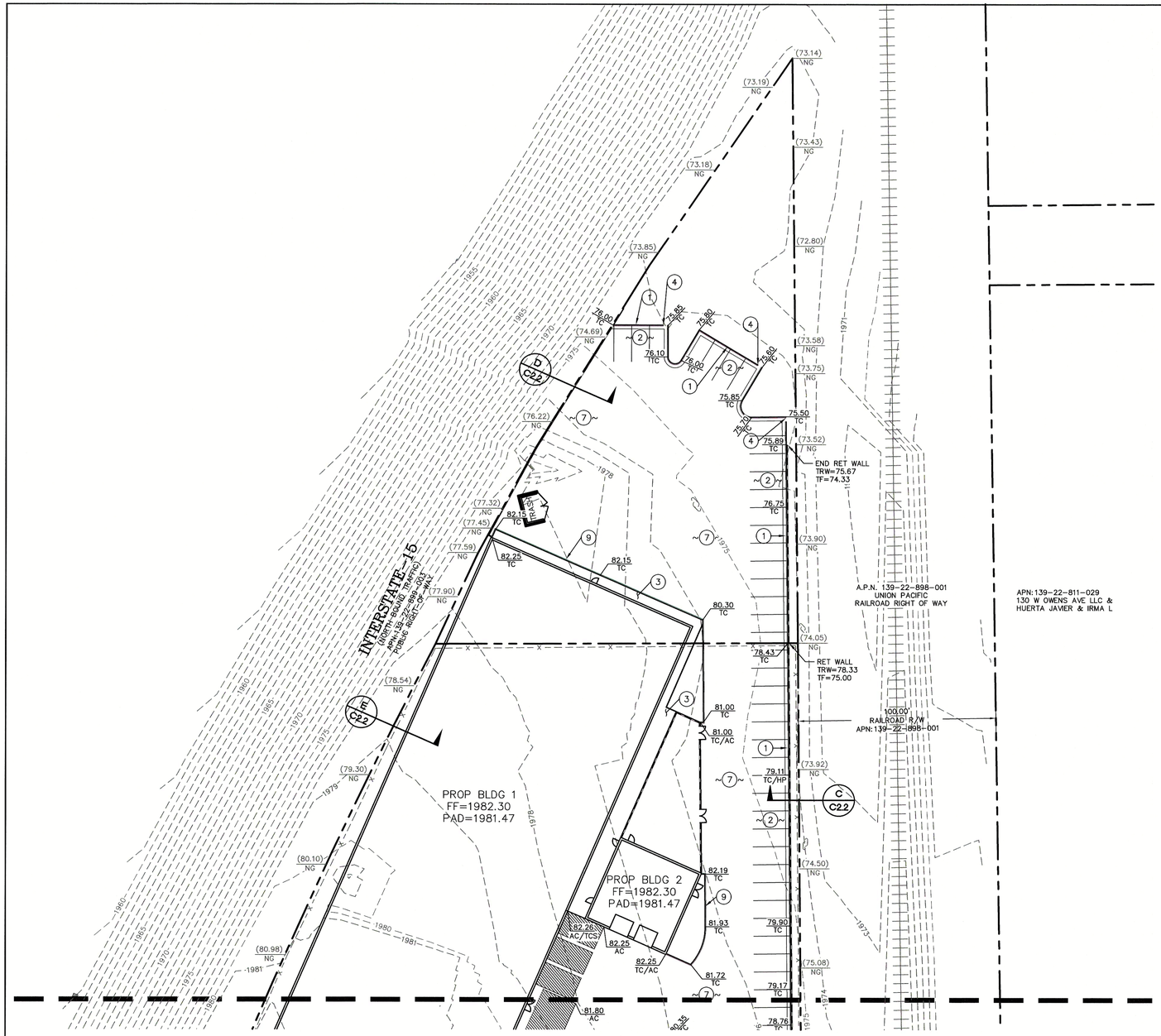
PREPARED FOR :
RED REALTY-CULTIVATION FACILITY
7250 PEAK DRIVE, SUITE 216
LAS VEGAS, NV 89128
(702)341-2291

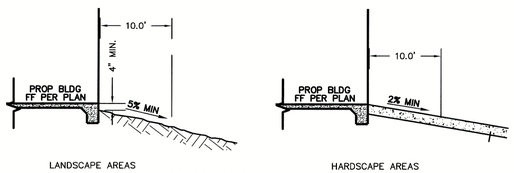
DATE	11/14/2018
DESIGN	JRG
DRAWN	JC
CHECK	JRG
SCALE	

BAUGHMAN & TURNER, INC.
CIVIL ENGINEERS LAND SURVEYORS LAND PLANNERS
1210 HINSON STREET LAS VEGAS, NEVADA 89102
PHONE:(702) 870-8771 FAX:(702) 870-8771

RED REALTY-CULTIVATION FACILITY
GRADING PLAN 1
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.& M.
CITY OF NORTH LAS VEGAS NEVADA
APN 139-22-803-002

SHEET
C2.0
3 OF ----
PROJ. NO.
K095



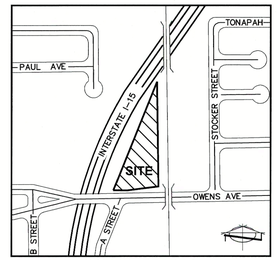


LANDSCAPE AREAS HARDSCAPE AREAS

TYPICAL SLOPES FROM BUILDING FOUNDATION

SLOPE REQUIREMENT DETAIL





VICINITY MAP
NO SCALE

BASIS OF BEARING:

SOUTH 89°47'07" WEST, BEING THE SOUTH LINE OF SECTION 22, TOWNSHIP 20 SOUTH RANGE 61 EAST M.D.B.&M. AS SHOWN ON MAP AS FILE 5, PAGE 66 ON FILE IN THE COUNTY RECORDERS OFFICE, CLARK COUNTY, NEVADA.

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BENCHMARK

7C0122S4 – RIVET AND SQUARE ALUMINUM PLATE IN TOP OF CURB NORTH SIDE OF OWENS AVENUE AT THE EAST FACE OF AND UNDER THE RAILROAD BRIDGE CROSSING OWENS AVENUE.

ELEV: 596.674 METERS = 1957.59 FEET
NAVD 88

CONSTRUCTION NOTES

#	ITEM	UNIT	QUANTITY PUBLIC	PRIVATE	NDOT
1	INSTALL 24" "L" TYPE C & G PER CCAUSD #216.	LF	–	–	–
2	CONSTRUCT 2" AC OVER 4" TYPE II AGGREGATE BASE (PARKING STALL)	SY	–	–	–
	TYPE II AGGREGATE BASE	CY	–	–	–
3	INSTALL 4" THICK CONCRETE SIDEWALK PER CCAUSD #234.	SF	–	–	–
4	INSTALL 2 FT. CURB OPENING PER DETAIL 2 ON SHEET C3.2	EA	–	–	–
5	INSTALL RIP RAP D_{50}= 3", BLANKET THICKNESS 6". FOR BMP PER CCRFCD SEC 1503.4.5	SF	–	–	–
6	INSTALL TRASH ENCLOSURE SEE ARCHITECTURAL PLANS	EA	–	–	–
7	CONSTRUCT 3" AC OVER 6" TYPE II AGGREGATE BASE (DRIVE AISLE)	SY	–	–	–
	TYPE II AGGREGATE BASE	CY	–	–	–
8	INSTALL 3' WIDE VALLEY GUTTER PER DETAIL 2 ON SHEET C3.2	LF	–	–	–
9	INSTALL "A" TYPE CURB PER CCAUSD #219.	LF	–	–	–

LEGEND

- PROPERTY LINE
- STREET CENTERLINE
- LOT LINE
- BUILDING SETBACK LINE
- PROPOSED ROLL CURB
- EXISTING "L" CURB & GUTTER
- XXXX EXISTING CONTOUR LINES
- PROPOSED FLOW LINE
- SAW CUT LINE
- PROPOSED EDGE OF PAVEMENT
- EXIST. EDGE OF PAVEMENT
- PROPOSED BLOCK WALL
- PROPOSED SCARP
- EXIST. BLOCK WALL
- SAW CUT AREA
- MATCHLINE
- 00.00 LOC — PROPOSED ELEVATION & LOCATION
- (00.00) LOC — EXISTING ELEVATION & LOCATION
- 0.00% — PROPOSED GRADE
- (#) — CONSTRUCTION NOTE
- PROPOSED HYDRANT
- SIGHT VISIBILITY ZONE*
- ROADWAY EASEMENT

AC	ASPHALTIC CONCRETE
CL	CENTERLINE
TC	TOP OF CURB
EP	EDGE OF PAVEMENT
FG	FINISHED GRADE
TF	TOP OF FOOTING
TRW	TOP OF RETAINING WALL
TFW	TOP OF FLOOD WALL
TSW	TOP OF STEM WALL
BSW	BACK OF SIDEWALK
GB	GRADE BREAK
BVC	BEGIN VERTICAL CURVE
EVC	END VERTICAL CURVE
FF	FINISHED FLOOR
FL	FLOW LINE
HP	HIGH POINT
INV	INVERT
LF	LINEAR FEET
LP	LOW POINT
LS	LANDSCAPE
SWG	SOUTHWEST GAS
P.U.E.	PUBLIC UTILITY EASEMENT
P.D.E.	PRIVATE DRAINAGE EASEMENT
P.S.E.	PRIVATE SEWER EASEMENT
P.L.E.	PRIVATE LANDSCAPE EASEMENT

*NOTE: NOTHING OVER 24" IN HEIGHT ALLOWED IN SIGHT VISIBILITY ZONE EXCEPT TRAFFIC CONTROL DEVICES.

ENGINEERS CERTIFICATE

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS, NEVADA.

JOHN R. GUSTAFSON, P.E. 13140 DATE

APPROVALS

Robert A. McLaughlin, P.E. CFM Date
Manager, Development and Flood Control Division

DISCLAIMER NOTE

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Call before you Dig — Avoid cutting underground utility lines. It's costly. Call 811 OR 1-800-227-2600

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

PROFESSIONAL ENGINEER-STATE OF NEVADA — JOHN R. GUSTAFSON — Exp. 6-30-21 — CIVIL — No. 13140

11/14/20

DATE CREATED	REV NO.	REVISIONS	APP'D INITIALS	DATE APPROVED

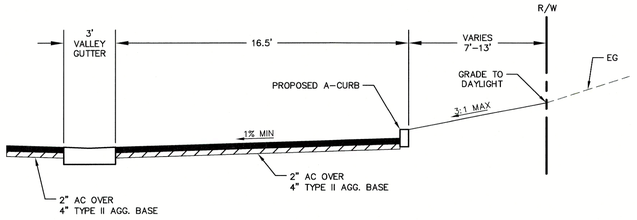
PREPARED FOR :
RED REALTY-CULTIVATION FACILITY
7250 PEAK DRIVE, SUITE 216
LAS VEGAS, NV 89128
(702)341-2291

DATE	11/14/2018		
DESIGN	JRG		
DRAWN	JC		
CHECK	JRG		
SCALE			

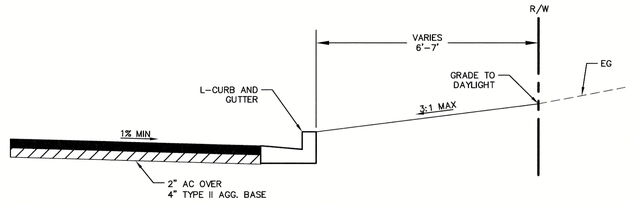
BAUGHMAN & TURNER, INC.
CIVIL ENGINEERS LAND SURVEYORS LAND PLANNERS
1210 HINSON STREET LAS VEGAS, NEVADA 89102
PHONE:(702) 870-8771 FAX:(702) 878-2695

RED REALTY-CULTIVATION FACILITY
GRADING PLAN 2
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.& M.
CITY OF NORTH LAS VEGAS, NEVADA
APN 139-22-803-002

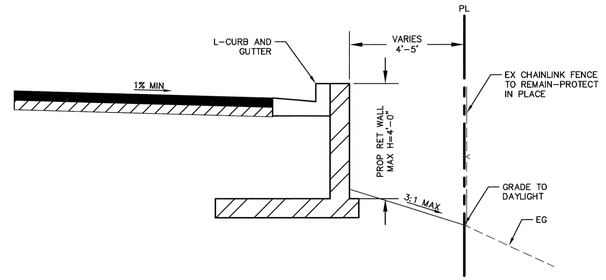
SHEET
C2.1
4 OF ---
PROJ. NO.
K095



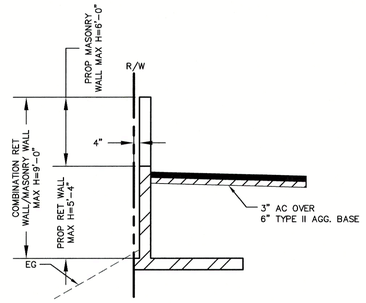
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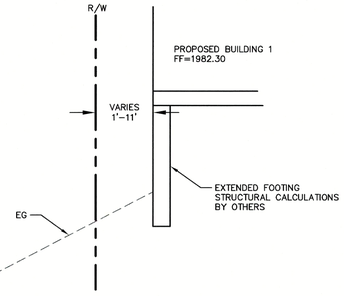
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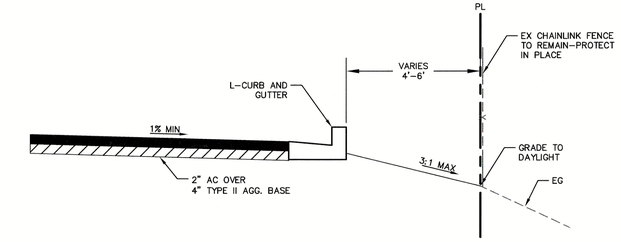
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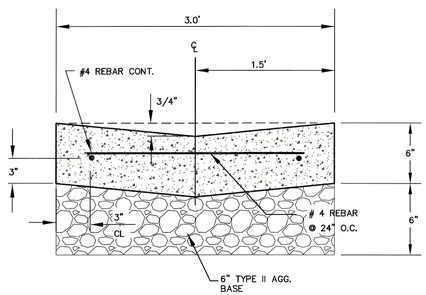
SECTION. N.T.S. **D**



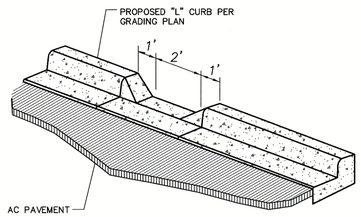
SECTION N.T.S. **E**



SECTION N.T.S. **F**



DETAIL-VALLEY GUTTER N.T.S. **1**



DETAIL-2' CURB OPENING N.T.S. **2**

- N.T.S. **-**

- N.T.S. **-**

- N.T.S. **-**

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PROFESSIONAL ENGINEER-STATE OF NEVADA
JOHN R. GUSTAFSON
EXP. 6-30-21
CIVIL
No. 13140
N.T.S. 11/5/20

		DATE APPROVED
		APP'D INITIALS
	REVISIONS	
		REV NO.
		DATE CREATED

PREPARED FOR :

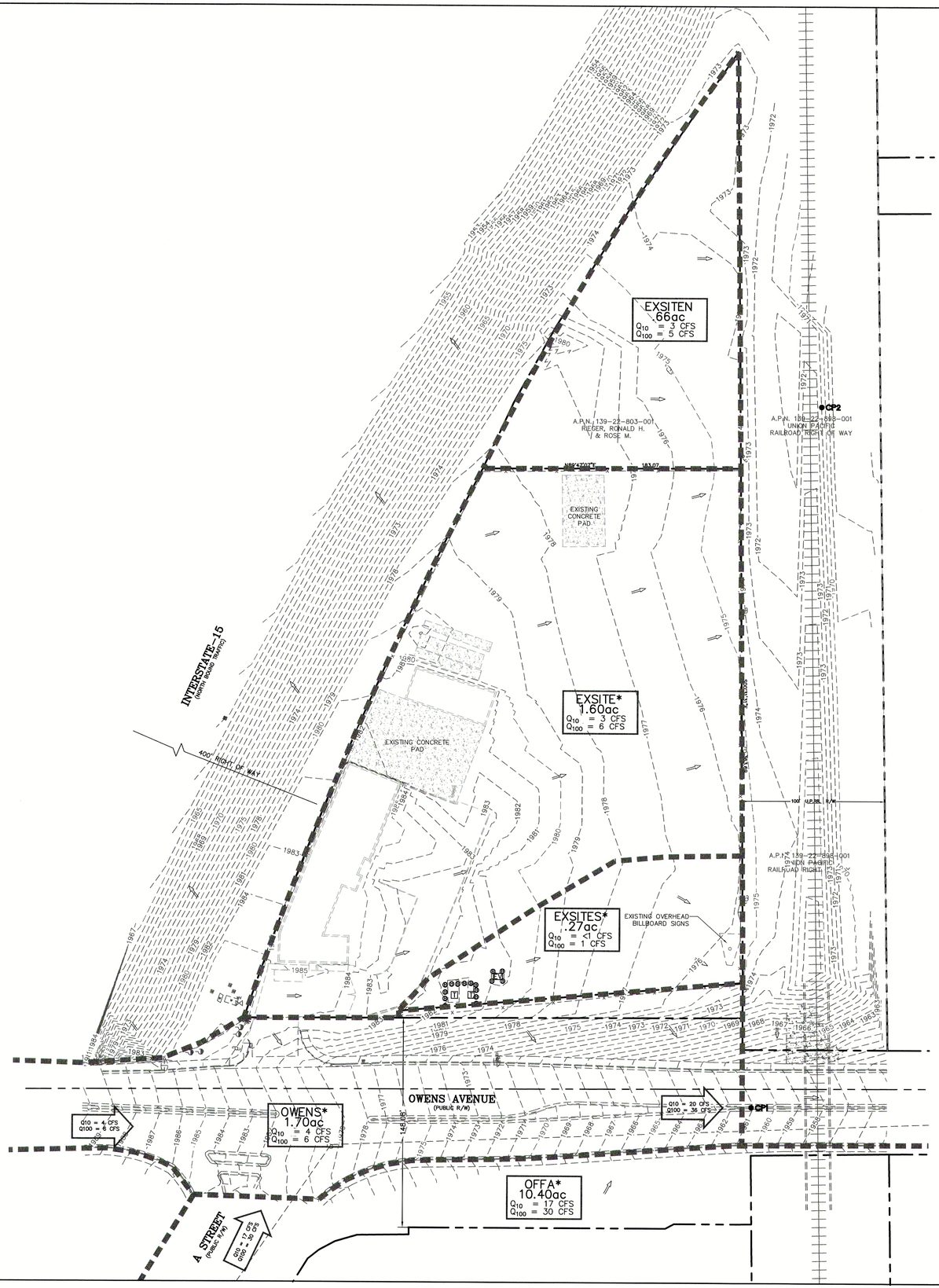
RED REALTY-CULTIVATION FACILITY
7250 PEAK DRIVE, SUITE 216
LAS VEGAS, NV 89128
(702)341-2291

DATE	1/15/2020	
DESIGN	JRG	
DRAWN	JC	
CHECK	JRG	
SCALE		

BAUGHMAN & TURNER, INC.
CIVIL ENGINEERS LAND SURVEYORS LAND PLANNERS
1210 HINSON STREET LAS VEGAS, NEVADA 89102
PHONE:(702) 870-8771 FAX:(702) 878-2695

RED REALTY-CULTIVATION FACILITY
GRADING DETAILS
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.& M.
CITY OF NORTH LAS VEGAS NEVADA
APN 139-22-803-002

SHEET
C2.2
5 OF ----
PROJ. NO.
K095



BASIS OF BEARING

SOUTH 89°47'07" WEST, BEING THE SOUTH LINE OF SECTION 22, TOWNSHIP 20 SOUTH RANGE 61 EAST M.D.B.&M. AS SHOWN ON MAP AS FILE 5, PAGE 66 ON FILE IN THE COUNTY RECORDERS OFFICE, CLARK COUNTY, NEVADA.

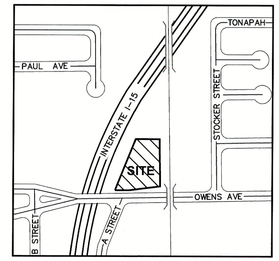
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COMMUNITY PANEL NO. 32003C2160E
EFFECTIVE DATE SEPTEMBER 27, 2002



VICINITY MAP
NO SCALE

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

DRAINAGE LEGEND

- PROPERTY LINE
- LOT LINE
- STREET CENTERLINE
- PROPOSED WALL
- EXISTING WALL
- PROPOSED "L" CURB & GUTTER
- EXISTING "L" CURB & GUTTER
- XXXX EXISTING CONTOUR LINES
- XXXX PROPOSED CONTOUR LINES
- EXISTING EDGE OF PAVEMENT
- SAWCUT AND REMOVE EXISTING ASPHALT
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- 0.00% — PROPOSED GRADE
- EXISTING DRAINAGE FLOW
- CL CENTERLINE
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- FG FINISHED GRADE
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- F.F. FINISHED FLOOR
- HP HIGHPOINT
- AC ASPHALTIC CONCRETE
- DRAINAGE BASIN BOUNDARY
- ●CP1 COMBINATION POINT
- NAME Q_{10} = – cfs Q_{100} = – cfs — BASIN NAME & FLOW DATA
- Q_{10} = – CFS Q_{100} = – CFS — DIRECTION OF FLOWS
- # — STREET CAPACITY SECTION # = LOCATION (SEE DATA TABLE)

Existing Condition		
Source	100-Year Flow (cfs)	10-Year Flow (cfs)
OFFA*	30	17
OWENS*	6	4
EXSITES*	1	<1
CP1*	37	21
EXSITE*	6	3
EXSITEN	5	2
CP2	11	5

*=Referenced from MD Development

* = REFERENCED FROM MD DEVELOPMENT

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REV	DATE CREATED	REVISIONS	APP'D INITIALS	DATE APPROVED

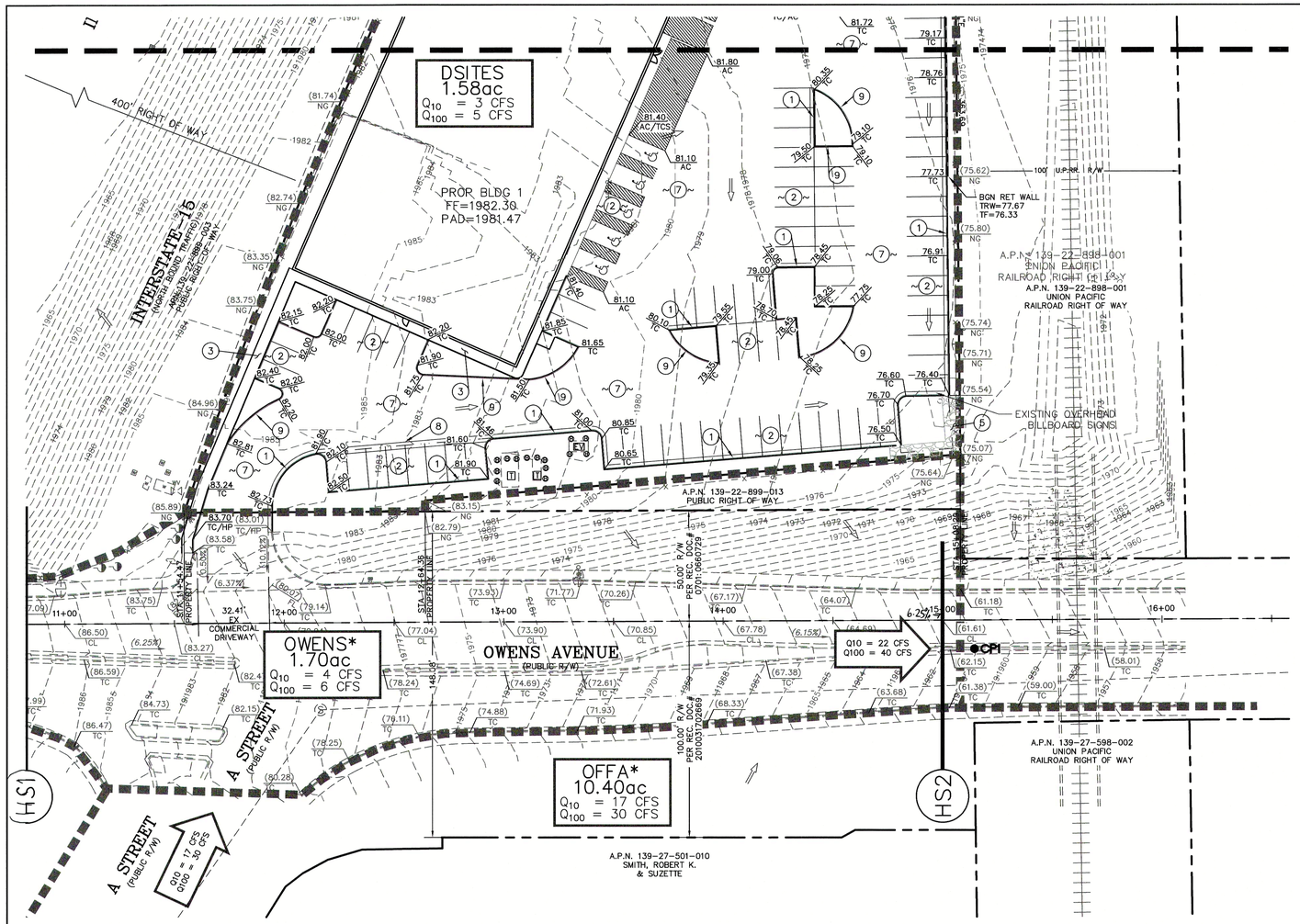
PREPARED FOR :
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7250 PEAK DRIVE, SUITE 216
LAS VEGAS, NV 89128
(702)341-2291

DATE	1/15/2020
DESIGN	PP
DRAWN	JC
CHECK	JRG
SCALE	

BAUGHMAN & TURNER, INC.
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PHONE:(702) 870-8771 FAX:(702) 878-2695 89102

RED REALTY-CULTIVATION FACILITY
EXISTING ON-SITE CONDITIONS MAP
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.& M. NEVADA
CITY OF NORTH LAS VEGAS
APN 139-22-803-002

SHEET
FIG9
PROJ. NO.
K095



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SOUTH 89°47'07" WEST, BEING THE SOUTH LINE OF SECTION 22, TOWNSHIP 20 SOUTH RANGE 61 EAST M.D.B.&M. AS SHOWN ON MAP AS FILE 5, PAGE 66 ON FILE IN THE COUNTY RECORDERS OFFICE, CLARK COUNTY, NEVADA.

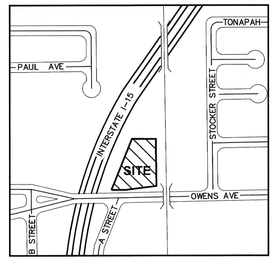
BENCHMARK

7C01225S4 – RIVET AND SQUARE ALUMINUM PLATE IN TOP OF CURB NORTH SIDE OF OWENS AVENUE AT THE EAST FACE OF AND UNDER THE RAILROAD BRIDGE CROSSING OWENS AVENUE.
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COMMUNITY PANEL NO. 32003C2160E
EFFECTIVE DATE SEPTEMBER 27, 2002



VICINITY MAP
NO SCALE

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

DRAINAGE LEGEND

- PROPERTY LINE
- LOT LINE
- STREET CENTERLINE
- PROPOSED WALL
- EXISTING WALL
- PROPOSED "L" CURB & GUTTER
- EXISTING "L" CURB & GUTTER
- XXXX — EXISTING CONTOUR LINES
- XXXX — PROPOSED CONTOUR LINES
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- 00.00 LOC — PROPOSED ELEVATION & LOCATION
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- 0.00% — PROPOSED GRADE
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- CL — CENTERLINE
- TC — TOP OF CURB
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- F.F. — FINISHED FLOOR
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- AC — ASPHALTIC CONCRETE
- DRAINAGE BASIN BOUNDARY
- ●CP1 — COMBINATION POINT
- NAME / Q_{10} = – cfs / Q_{100} = – cfs — BASIN NAME & FLOW DATA
- Q_{10} = – CFS / Q_{100} = – CFS — DIRECTION OF FLOWS
- # — STREET CAPACITY SECTION # = LOCATION (SEE DATA TABLE)

Developed Condition		
Source	100-Year Flow (cfs)	10-Year Flow (cfs)
OFFA*	30	17
OWENS*	6	4
DSITES	5	3
CP1	40	22
DSITEN	5	3

*=Referenced from MD Development

Location	Q (cfs)	D (feet)	V (fps)	DxV	Remarks
100-Year Flow – Ultimate Conditions					
HS1) Owens - Upstream*	6	0.28	4.52	1.27	VxD <8 is met; D less than 2 ft
HS2) Owens - Downstream*	40	0.47	6.84	3.21	VxD <8 is met; D less than 2 ft
10-Year Flow – Ultimate Conditions					
HS1) Owens - Upstream*	4	0.26	4.22	1.10	VxD <6 is met; D less than 1; 10-yr dry lane is met
HS2) Owens - Downstream*	22	0.4	5.95	2.38	VxD <6 is met; D less than 1

*=Referenced from MD Development

* = REFERENCED FROM MD DEVELOPMENT

DISCLAIMER NOTE

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







REV. NO.	DATE CREATED	REVISIONS	APP'D INITIALS	DATE APPROVED

PREPARED FOR :
KNIT DESIGN COMMUNITY
2300 W. SAHARA AVE. SUITE 216
LAS VEGAS, NV 89128
(702)341-2291

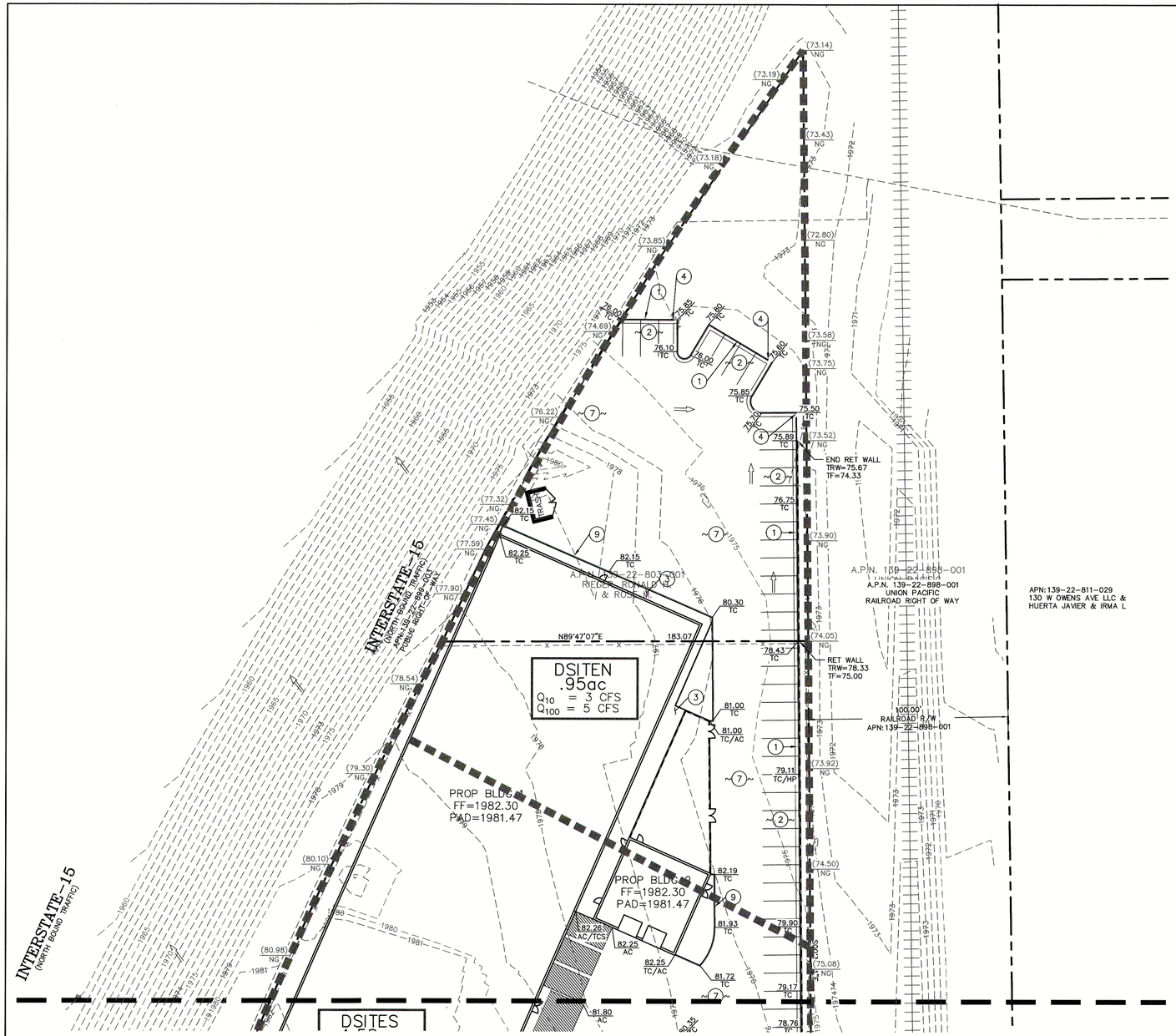
DATE	1/15/2020
DESIGN	SW
DRAWN	JC
CHECK	SW
SCALE	

BAUGHMAN & TURNER, INC.
CIVIL ENGINEERS LAND SURVEYORS LAND PLANNERS
1210 HINSON STREET LAS VEGAS, NEVADA 89102
PHONE:(702) 870-8771 FAX:(702) 878-2695

RED REALTY-CULTIVATION FACILITY
DEVELOPED ON-SITE CONDITIONS MAP
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.& M.
CITY OF NORTH LAS VEGAS NEVADA
APN 139-22-803-002

SHEET
FIG10

PROJ. NO.
K095



BASIS OF BEARING

SOUTH 89°47'07" WEST, BEING THE SOUTH LINE OF SECTION 22, TOWNSHIP 20 SOUTH RANGE 61 EAST M.D.B.&M. AS SHOWN ON MAP AS FILE 5, PAGE 66 ON FILE IN THE COUNTY RECORDERS OFFICE, CLARK COUNTY, NEVADA.

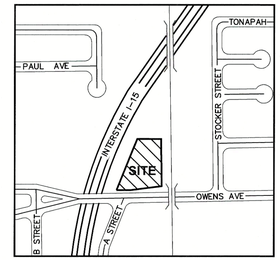
BENCHMARK

7C0122S4 – RIVET AND SQUARE ALUMINUM PLATE IN TOP OF CURB NORTH SIDE OF OWENS AVENUE AT THE EAST FACE OF AND UNDER THE RAILROAD BRIDGE CROSSING OWENS AVENUE.
ELEV: 596.674 METERS = 1957.59 FEET
NAVD 88

FLOOD ZONE DATA

THIS SITE IS LOCATED IN ZONE "X". ZONE "X" HAS BEEN DETERMINED TO BE AN AREA OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.

COMMUNITY PANEL NO. 32003C2160E
EFFECTIVE DATE SEPTEMBER 27, 2002



VICINITY MAP
NO SCALE

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

DRAINAGE LEGEND

- PROPERTY LINE
- LOT LINE
- STREET CENTERLINE
- PROPOSED WALL
- EXISTING WALL
- PROPOSED "L" CURB & GUTTER
- EXISTING "L" CURB & GUTTER
- XXXX — EXISTING CONTOUR LINES
- XXXX — PROPOSED CONTOUR LINES
- EXISTING EDGE OF PAVEMENT
- SAWCUT AND REMOVE EXISTING ASPHALT
- 00.00 LOC — PROPOSED ELEVATION & LOCATION
- (00.00) LOC — EXISTING ELEVATION & LOCATION
- 0.00% — PROPOSED GRADE
- EXISTING DRAINAGE FLOW
- CL CENTERLINE
- TC TOP OF CURB
- EP EDGE OF PAVEMENT
- FG FINISHED GRADE
- GB GRADE BREAK
- F.F. FINISHED FLOOR
- HP HIGHPOINT
- AC ASPHALTIC CONCRETE
- DRAINAGE BASIN BOUNDARY
- ●CP1 — COMBINATION POINT
- NAME Q_{10} = – cfs Q_{100} = – cfs — BASIN NAME & FLOW DATA
- Q_{10} = – CFS Q_{100} = – CFS — DIRECTION OF FLOWS
- # — STREET CAPACITY SECTION # = LOCATION (SEE DATA TABLE)

Developed Condition		
Source	100-Year Flow (cfs)	10-Year Flow (cfs)
OFFA*	30	17
OWENS*	6	4
DSITES	5	3
CP1	40	22
DSITEN	5	3

*=Referenced from MD Development

Location	Q (cfs)	D (feet)	V (fps)	DxV	Remarks
100-Year Flow – Ultimate Conditions					
HS1) Owens - Upstream*	6	0.28	4.52	1.27	VxD <8 is met; D less than 2 ft
HS2) Owens - Downstream*	40	0.47	6.84	3.21	VxD <8 is met; D less than 2 ft
10-Year Flow – Ultimate Conditions					
HS1) Owens - Upstream*	4	0.26	4.22	1.10	VxD <6 is met; D less than 1; 10-yr dry lane is met
HS2) Owens - Downstream*	22	0.4	5.95	2.38	VxD <6 is met; D less than 1

*=Referenced from MD Development

* = REFERENCED FROM MD DEVELOPMENT

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Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call 811 OR 1-800-227-2600

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

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

DATE CREATED	REV NO.	REVISIONS	APP'D INITIALS	DATE APPROVED

PREPARED FOR :
KNIT DESIGNING COMMUNITY
7250 PEAK DRIVE, SUITE 216
LAS VEGAS, NV 89128
(702)344-2287

DATE	1/15/2020			
DESIGN	SW			
DRAWN	JC			
CHECK	SW			
SCALE				

BAUCHMAN & TURNER, INC.
CIVIL ENGINEERS LAND SURVEYORS LAND PLANNERS
1210 HINSON STREET LAS VEGAS, NEVADA 89102
PHONE:(702) 870-8771 FAX:(702) 878-2695

RED REALTY-CULTIVATION FACILITY
DEVELOPED ON-SITE CONDITIONS MAP
SECTION 22 TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.& M.
CITY OF NORTH LAS VEGAS NEVADA
APN 139-22-803-002

SHEET
FIG10
PROJ. NO.
K095

TECHNICAL DRAINAGE STUDY FOR
RED REALTY-CULTIVATION FACILITY
SECTION 22, TOWNSHIP 20, SOUTH, RANGE 61 EAST
CITY OF NORTH LAS VEGAS, NEVADA

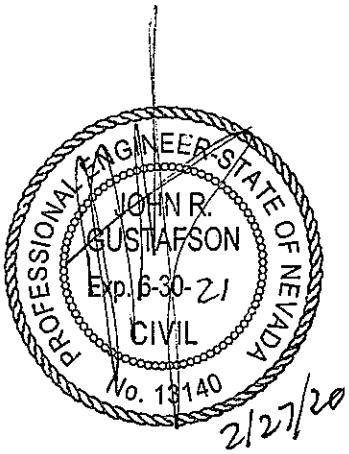
February 24, 2020

PREPARED FOR:

KNIT DESIGNING COMMUNITY
7250 PEAK DRIVE, SUITE 216
LAS VEGAS, NV 89128

PREPARED BY:

BAUGHMAN & TURNER, INC.
1210 HINSON STREET
LAS VEGAS, NEVADA 89102
(702) 870-8771



HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Red Realty-Cultivation Facility Date:

Location of Development: a) Descriptive (Cross Streets) North/South: I-15
East/West: Owens

b) Section: 22 Township: 20 S Range: 61 E

c) APN: 139-22-803-002 and -001

Name of Owner: Knit Designing Community

Telephone No.: 702.341.2291 Fax No.: E-Mail Address: Michelled@knitstudios.com

Address 7250 Peak Drive, Suite 216 Las Vegas, NV 89128

Contact Person-Name: Sunshine Woods **Telephone No.:** 702-870-8771

***E-Mail Address:** SunshineW@baughman-turner.com **Fax No.:** 702-878-2695

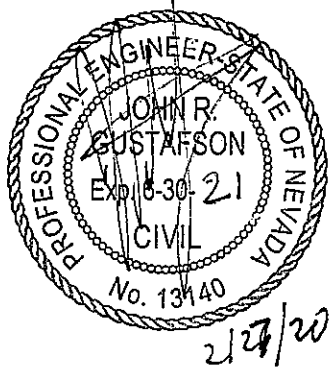
Firm: Baughman & Turner, Inc.

Address: 1210 Hinson Street Las Vegas, NV 89102

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: 2.53 acres Being Developed/Disturbed: 2.53 acres
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ Yes** ☒ No
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☐ Yes** ☒ No
4. Proposed type of development (Residential, Commercial, Etc.): commercial
5. Approximate upstream land area which drains to the subject site: 13 acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: CNLV #52294
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: East to the UPRR railroad tracks and south to Owens Ave
8. Briefly describe your proposed schedule for the subject project: ASAP



Engineer's Seal

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

***New Required Field**

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

Revision	Date

Local Entity File No.

REFERENCE:

STANDARD FORM 1

March 11, 2020

City of Las Vegas Flood Control
Attn.: Mr. Albert Sung, PE
2200 N. Rancho Drive
Las Vegas, Nevada 89103

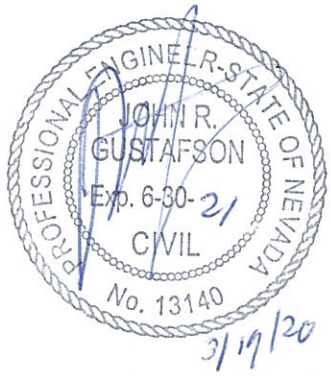
Re: Technical Drainage Study for Red Realty - Cultivation Facility

Dear Mr. Sung,

This letter certifies that all items provided on the Technical Drainage Study for Red Realty – Cultivation Facility electronic submittal matches 100% the paper version bound into the study.

Respectfully submitted,

John Gustafson. PE
Baughman & Turner, Inc.



CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA
STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 5/18/11)

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

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

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

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

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

II. GRADING PLAN INFORMATION		
Yes	No	
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.
X		All existing and "to be constructed" walls with cross-sections showing wall type, (e.g. block wall, retaining wall, flood wall, etc.), with limits clearly defined, adjacent ground elevations. Wall heights must meet current ordinances and in no case exceed 14 feet above the adjacent property.
X		Street slopes for both interior and perimeter streets. Note: The minimum slope for a roadway is 0.4 percent, a minimum 18-inch storm drain must be provided where minimum slopes cannot be met.
X		Back of lot elevations and lot drainage pattern for all lots including common lots.
N/A		Sites with a grade difference two feet above or below existing ground are required to have approval from City of Las Vegas Current Planning. Current Planning approval is required prior to final approval of the drainage study.
X		On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners. (The project must pass flows through the site every 600 feet where the project is blocking flow paths.)
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	
X		Concrete valley gutters are required in parking lots with slopes less than 1 percent. Slopes through cul-de-sac must be at a 1 percent minimum where flow is drained through the cul-de-sac.
X		Ten-foot wide public drainage easements to be privately maintained are allowed for flow less than 20 cfs. The depth of flow entering the easement must be checked using the submerged weir calculation.
N/A		The limits of the flood zones and the base flood elevations (BFE) must be shown on all grading plans for all developments within a Special Flood Hazard Zone A, AO, AE, etc.
X		Minimum finish floor elevation is 6 inches above highest adjacent top of curb. Finish floor calculations must include allowances for super elevations on curves and velocity head for tee intersections.
X		Finished floor elevations for buildings adjacent to public drainage easements must be a minimum of 18 inches above the Q100 weir of submerged weir elevation, whichever is greater.

III. Local Entity Criteria - City of Las Vegas – Manual Section 1600		
Yes	No	
N/A		Lots with "B and C Type Drainage" that drain from one lot to another through a drainage easement shall be required to install an underground nuisance drainage system or a 2-foot valley gutter. 16" x 24" minimum block wall openings are required for both options.
	X	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.

Mayor
John J. Lee

Council Members
Isaac E. Barron
Pamela A. Goynes-Brown
Scott Black
Richard J. Cherchio

CITY OF
NORTH LAS VEGAS
Your Community of Choice

City Manager
Ryann Juden

Department of Public Works
2250 N. Las Vegas Boulevard, Suite 200 • North Las Vegas, Nevada 89030
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

March 11, 2020

Mailed via: E-mail

John R. Gustafson, P.E.
Baughman & Turner, Inc.
1210 Hinson Street
Las Vegas, NV 89102

RE: **Technical Drainage Study for Red Realty – Cultivation Facility**
Addendum No. 1
CNLV #29-2020

Dear Mr. Gustafson:

Staff has reviewed the Technical Drainage Study for Red Realty – Cultivation Facility, dated January 16, 2020 and Addendum No. 1, dated March 2, 2020 and found the hydrological and hydraulic analyses to meet the minimum accepted standards for a technical drainage study. The acceptance of this drainage study is contingent upon the following conditions:

1. Concurrence must be obtained by the City of Las Vegas due to the proposed improvements proximity to the City of Las Vegas Corporate City boundary.

2. Coordination with the City of North Las Vegas (CNLV) and City of Las Vegas (CLV) Utility Departments is necessary to identify specific requirements or limitations for easements necessary to provide unobstructed access to their respective utilities for maintenance purposes. Generally, no walls, signs, parking areas, buildings or other structures may be placed anywhere within any easement or in the vehicle ingress or egress pathway to easements.

Please be advised that all land surface area disturbances over 1 acre and/or adjacent to a water way must submit a "Notice of Intent" to discharge to the Nevada Division of Environmental Protection, which certifies that a stormwater pollution prevention plan has been developed and is maintained on site. For more information including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm.

Acceptance of this study does not imply approval of the grading plan associated with this site. A detailed review of the grading plan will be performed by staff during the improvement plan review process.

Any future changes in the proposed design (or design assumptions) as outlined in the approved drainage study and the attached preliminary grading plans which affect drainage must be addressed in a drainage study update and accepted by the CNLV Development and 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, CNLV 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.

The City of North Las Vegas, its officials, or employees assume no liability for information, data, calculations and conclusions presented by the Engineer. We, therefore, make no warranties, either expressed or implied, in conducting this review. If you have any questions concerning this matter, please contact me at (702) 633-1933.

Note that the Clark County Regional Flood Control District (District) has begun efforts to update the *Hydrological Criteria and Drainage Design Manual* (HCDDM) and is requesting participation from the engineering community. The District is collecting comments and suggestions on errors, clarifications, or changes needed to the current Manual and/or content and usability enhancements to be incorporated into the updated Manual. Additional information on procedures and deadline to provide feedback and comments are available online at (http://www.ccrfcd.org/hcddmupdate.html).

Sincerely,

Mark A. Escobedo

Mark Escobedo, P.E., CFM
Engineering Associate
Public Works/Development and Flood Control
City of North Las Vegas
(702) 633-1933

Baughman & Turner, Inc.
Consulting Engineers & Land Surveyors

1210 Hinson Street
Las Vegas, Nevada 89102-1604

Phone (702) 870-8771
Fax (702) 878-2695

February 27, 2020

City of North Las Vegas Department of Public Works
Attn: Mark Escobedo, P.E., CFM
2250 N. Las Vegas Boulevard, Suite 200
North Las Vegas, Nevada 89030

Re: Technical Drainage Study Update for Red Realty – Cultivation Facility
CNLV #29-2020

Dear Mr. Escobedo,

The following is our response to the comments and conditions of approval placed on the above referenced project. In a letter dated February 5, 2020, The City of North Las Vegas expressed concern about the following items:

Comment No. 1: Please be advised that the CNLV Drainage Study Checklist has been revised as of December 18, 2018. Please use the revised version on future submittals.

Response: Okay.

Comment No. 2: Concurrence must be obtained by the City of Las Vegas due to the proposed improvements proximity to the City of Las Vegas corporate City boundary.

Response: Concurrence will be obtained.

Comment No. 3: The Existing Condition HEC-1 run has been revised to reflect the MD Development Addendum and lists the flow at CP2 discharging into UPRR Right-of-way as 6 cfs in the 10 year and 11 cfs in the 100 year.

Response: Noted. The paragraph should read, "The parcel located to the north of the MD Development analysis was added to this study. The basin, EXSITEN is 0.66 acres and will generate 3 cfs in the 10-year storm event and 5 cfs in the 100-year storm. These flows head east and drain towards the UPRR. The runoff from EXSITE and EXSITEN will sheet flow to the railroad tracks, a total of 6 cfs in the 10 year and 11 cfs in the 100 year."

After adjusting the HEC-1 to include the corrected basin area as requested in comment 8, the flows to the railroad are now 8 cfs in the 100-year storm event and 4 cfs in the 10-year storm event. The runoff from E XSITE and EXSITEN, CP2, will sheet flow to the railroad tracks, a total of 4 cfs in the 10 year and 8 cfs in the 100 year. See table 1 in comment 3b below.

Comment No. 3a: On Page 3, of the TDS, the sheet flow indicated to flow of the railroad tracks in paragraph 2 is listed at a total of 5 cfs in the 10 year and 11 cfs in the 100 year.

Response: See response to comment No. 3 above.

Comment No. 3b: On Page 5, of the TDS, the flow for CP2 in Table 1 is listed at a total of 5 cfs in the 10 year and 11 cfs in the 100 year.

Response: The Existing Peak Flow table has been updated, see below.

Table 1. Peak Flow Summary

Existing Condition		
Source	**100-Year Flow (cfs)**	**10-Year Flow (cfs)**
OFFA*	30	17
OWENS*	6	4
EXSITES*	1	<1
CP1*	37	21
EXSITE*	6	3
EXSITEN	2	1
CP2	8	4

*=Referenced from MD Development

Comment No. 3c: On Page 5, of the TDS, the existing flow rate in Table 3, discharging into UPRR R.O.W., is listed at a total of 5 cfs in the 10 year and 11 cfs in the 100 year.

Response: The table has been updated. See below.

Table 3. Discharge to UPRR Comparison

Source	100-Year Flow (cfs)	10-Year Flow (cfs)
Existing Flow Rate (includes additional basin to the north)	8	4
Susan Cannavo Approved Flows (did not include basin to the north)	6	3
MD Development Approved Flows (did not include basin to the north)	4	2
Proposed Flows	**5**	**3**

Comment No. 3d: The flow for CP2 in the Table on the Existing On-Site Conditions Map is listed at a total of 5 cfs in the 10 year and 11 cfs in the 100 year.

Response: See Figure 9 for updated table.

Comment No. 4: On Page 6, of the TDS, the normal depth for cross-section HS2 in Table 4 for the 10-year flow in the Ultimate Conditions is listed as 0.47 feet. The normal depth in the street capacity calculations is 0.40 feet. Please review and revise accordingly.

Response: See Table 4 below for the corrected depth of flow in the 10-year ultimate condition.

Table 4. Street Capacity Summary

Location	Q (cfs)	D (feet)	V (fps)	DxV	Remarks
100-Year Flow – Ultimate Conditions					
HS1) Owens - Upstream*	6	0.28	4.52	1.27	VxD <8 is met; D less than 2 ft
HS2) Owens - Downstream*	40	0.47	6.84	3.21	VxD <8 is met; D less than 2 ft
10-Year Flow – Ultimate Conditions					
HS1) Owens - Upstream*	4	0.26	4.22	1.10	VxD <6 is met; D less than 1; 10-yr dry lane is met
HS2) Owens - Downstream*	22	0.40	5.95	2.38	VxD <6 is met; D less than 1

*=Referenced from MD Development

Comment No. 5: The proposed minimum elevation for Building 2 is listed at an elevation of 1983.2 in Table 5, on page 7 of the TDS. The elevation of Building 2 on the grading plan is set at elevation 1982.30. Please review and revise accordingly.

Response: See Table 5 below for updated finished floor elevation for building 2.

Table 5. Minimum Finished Floor Elevation Determination

Owens Ave	Top of Curb	Free-board	FF Based on TC in Street	Flowline Elevation	Depth of Flow	Free-board	Finished Floor Based on Depth of Flow	Proposed Minimum Elevation
Building 1	73.0	1	74.0	72.5	0.3	0.3	1973.1	1982.30
Building 2	66.0	1	67.0	65.5	0.5	0.5	1966.4	1982.30

Comment No. 6: On page 7, of the TDS, the Section on Best Management Practices indicates the discharge for the newly paved parking area has been designed to allow stormwater to travel over a rip rap area along the east

property line before discharging to UPRR right-of-way via sheet flow. Call out the rip rap and the discharge location on the Grading Plan.

Response: See the grading plan for requested riprap and discharge location callouts.

Comment No. 7: The Existing Condition and the Developed Condition HEC-1 runs, dated January 15, 2020, have an input error on line 18. The Six-Hour Storm Distribution input has been entered incorrectly. The values of 19.7 and 20.1 have been input instead of the values of 19.9 and 20.0, respectively. Please review and revise accordingly.

Response: The HEC-1 has been adjusted to show the requested values. The original, approved study used the values of 19.7 and 20.1; however, the values were revised which yielded no changes to the calculated runoff. See appendix A for the HEC-1 output sheets.

Comment No. 8: The Existing Condition and the Developed Condition HEC-1 runs, dated January 15, 2020, appear to be missing the basin area (BA) for Basin ESITEN and Basin DSITEN, respectively. Please review and revise accordingly.

Response: The HEC-1 has been adjusted to include the proper basin areas. The basin input has affected the original calculated runoff. All tables and figures have been revised to show the corrected flows. See appendix A for the HEC-1 output sheets.

Comment No. 9: The Planning Commission Conditions of Approval state that the site will be enclosed with a twelve-foot concrete block wall. A block wall around the perimeter of the site is not indicated on the Improvement Plans for this project. Please review and revise accordingly.

Response: The plans have been updated to include the twelve-foot decorative wall. Block wall openings, 2-foot by 18-inches placed at every 20 feet, will allow the flows from the north basin, DSITEN of 3 cfs in the 100 year storm to follow the historical flow patterns and pass across the site and enter the UPRR land. See Table 6 below for runoff generated by the basin. Block wall calculations are in appendix B.

Table 6. Peak Flow Summary

Developed Condition		
Source	**100-Year Flow (cfs)**	**10-Year Flow (cfs)**
OFFA*	30	17
OWENS*	6	4
DSITES	5	3
CP1	40	22
DSITEN	2	3

*=Referenced from MD Development

Comment No. 10: The Flood Zone Data on the Existing On-Site Conditions Map, Figure 9; the Developed On-Site Conditions Map, Figure 10; and the Grading Plan, Sheet C2.0; list the Community Panel No. as 32003C2160E. The Panel No. should end with a "F" instead of an "E". Please review and revise accordingly.

Response: The Flood Insurance Rate Map, Clark County, Nevada, Community Panel No. 32003 C 2160 F (effective date November 16, 2011), published by the Federal Emergency Management Agency (FEMA), indicates that the site is in a Zone X. A Zone X is determined to be an area outside the 0.2% annual chance floodplain. This information has been updated on all figures and plans.

Comment No. 11: Provide rip rap sizing calculations.

Response: Basin DSITES drains to the southeast corner of the site through a curb opening and passes over riprap before it enters Owens. This basin generates 5 cs in the 100-year storm. The riprap area will consist of rocks with an average diameter of 3 inches with a blanket thickness of 6 inches. See appendix B for calculations.

Comment No. 12: Any area of a surface parking lot that abuts a public street shall be screened by perimeter landscaping or a decorative masonry wall with a minimum height of three (3) feet above the finish grade of the parking lot where it abuts the landscaping (Title 17, Zoning Ordinance Chapter 17.24, Development Standards, 17.24.060 Landscaping).

Response: A three-foot masonry wall has been added to the plans.

Comment No. 13: Show existing improvements on the Grading Plan, i.e. existing overhead billboard signs, power poles, overhead power lines, water lines, fences, etc. Coordinate with the representative in the City of North Las Vegas Utility Department regarding access and maintenance for the Utility Department's underground utilities.

Response: The Grading plan has been updated to included requested information.

Comment No. 14: Provide a concrete flume from the discharge point for Basin DSITES to Owens Avenue. Provide a sidewalk underdrain to convey the flow to the street.

Response: A two-foot flume will be implemented to convey runoff from the site to the proposed two-foot under sidewalk drain where it will discharge into Owens Avenue. See appendix C for flume calculations.

Comment No. 15: There is a Construction Note call out for "L" Type curb on Sheet C2.0 of the Grading Plan where "A" Type curb is shown. Please review and revise accordingly.

Response: Noted, plans have been revised.

Comment No. 16: Call out the curb openings on Sheet C2.0 of the Grading Plan where the newly paved parking area discharges stormwater to the rip rap area.

Response: Noted, plans have been revised.

Comment No. 17: On Sheet C2.1 of the Grading Plan, Section D/C2.2 is called out on the western boundary. Section D/C2.2 indicates the installation of a retaining wall. The limits of the retaining wall need to be shown on the Grading Plan with the Top of Retaining Wall (TRW) and Top of Footing (TF) elevations. Please review and revise accordingly.

Response: Noted, plans have been revised.

Comment No. 18: Call out the installation of the trash enclosure on the Grading Plan, Sheet C2.1.

Response: Noted, plans have been revised.

Comment No. 19: Section "C" on Sheet C2.2 indicates a retaining wall with a maximum height of 4.0 feet flush with the top of curb. Will some means be provided for fall protection at this location?

Response: A 36-inch wrought iron fence will be installed to provide fall protection.

Comment No. 20: Typical Sections "A", "B", and "E" do not indicate the existing and/or proposed fence/block wall at the property line. Please review and revise accordingly.

Response: Noted, plans have been revised.

We trust that this letter addresses the comments and conditions raised with the Technical Drainage Study Update for Red Realty – Cultivation Facility CNLV #29-2020. If you have any further questions, please feel free to contact this office.

Sincerely,
Baughman & Turner, Inc.

Sunshine M. Woods
Staff Engineer

SW/ms

cc: KNIT

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN  1998               *
*           VERSION 4.1                *
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*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

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

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

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


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

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    2         ID   KNIT DESIGNING COMMUNITY
    3         ID
    4         ID   Existing Condition
    5         ID
    6         ID    File  N:\KNIT\DOCS\HYDROLOGY\HEC1\KNIT 228 OWENS.DAT
    7         ID
    8         ID
    9         IT       5                    300
   10         IO       5
   11         IN       5
   12         JR    PREC    0.57     1.0
              * **********************
              * Existing Conditions  *
              * **********************

   13         KK    OFFA
   14         BA  0.0163
   15         PB    2.77
   16         PC    0.00       2     5.7       7     8.7    10.8    12.4      13      13      13
   17         PC      13      13      13    13.3      14    14.2    14.8    15.8    17.2    18.1
   18         PC      19    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
   19         PC    25.1    25.6      27    27.8    28.1    28.3    29.5    32.2    35.2    40.9
   20         PC    49.9      59      71    74.4    78.1    81.2    81.9    83.5    85.1    85.6
   21         PC      86    86.8    87.6    88.8      91    92.6    93.7      95      97    97.6
   22         PC    98.2    98.5    98.7    98.9      99    99.3    99.3    99.4    99.5    99.8
   23         PC    99.8    99.9     100
   24         LS              98
   25         UD   0.14

   26         KK  OWENS
   27         BA  0.0027
   28         LS              98
   29         UD   0.050

   30         KK  ESITES
   31         BA  0.0004
   32         LS              94
   33         UD   0.050

   34         KK     CP1
   35         HC       3

   36         KK  EXSITE
   37         BA  0.0025
   38         LS              94
   39         UD   0.080

   40         KK  ESITEN
   41         BA  0.0010
   42         LS              94
   43         UD   0.050
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

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* = Referenced

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            46          ZZ
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                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW
   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    13       OFFA
                .
                .
    26          .      OWENS
                .          .
                .          .
    30          .          .      ESITES
                .          .          .
                .          .          .
    34        CP1.........................
                .
                .
    36          .      EXSITE
                .          .
                .          .
    40          .          .      ESITEN
                .          .          .
                .          .          .
    44          .        CP2............
 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
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 *              JUN  1998                *
 *            VERSION 4.1                *
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 *  RUN DATE   20FEB20  TIME  10:07:43   *
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 ***************************************
 *                                     *
 *    U.S. ARMY CORPS OF ENGINEERS     *
 *    HYDROLOGIC ENGINEERING CENTER    *
 *          609 SECOND STREET          *
 *       DAVIS, CALIFORNIA 95616       *
 *           (916) 756-1104            *
 *                                     *
 ***************************************

                        KNIT DESIGNING COMMUNITY

                        Existing Condition

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                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
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                       ITIME       0000  STARTING TIME
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                      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
                      .57      1.00
1

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


                                                                 RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION      AREA     PLAN           RATIO 1  RATIO 2
                                                         .57      1.00

 HYDROGRAPH AT
+                 OFFA          .02      1   FLOW          17.      30.
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HYDROGRAPH AT						
+	OWENS *	.00	1	FLOW	4.	6.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ESITES *	.00	1	FLOW	0.	1.
				TIME	3.50	3.50
3 COMBINED AT						
+	CP1 *	.02	1	FLOW	20.	36.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	EXSITE *	.00	1	FLOW	2.3	5.6
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ESITEN	.00	1	FLOW	1.	2.
				TIME	3.50	3.50
2 COMBINED AT						
+	CP2	.00	1	FLOW	4.	7.8
				TIME	3.50	3.50

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

⇒ to Owens

per MD Development Addendum

(Adjusted to match 'EXSITE' MD Development.)

* = Referenced

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*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
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*           VERSION 4.1                 *
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REFERENCE

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*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*         (916) 756-1104                *
*                                       *
*****************************************
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X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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

1 HEC-1 INPUT PAGE 1

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    3         ID   Existing Condition
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    8         IO       5
    9         IN       5
   10         JR    PREC    0.57     1.0
              * **********************
              * Existing Conditions  *
              * **********************

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   13         PB    2.77
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   15         PC      13      13      13    13.3      14    14.2    14.8    15.8    17.2    18.1
   16         PC      19    19.7    19.7    20.1    20.1    20.4    21.4    22.9    24.1    24.9
   17         PC    25.1    25.6      27    27.8    28.1    28.3    29.5    32.2    35.2    40.9
   18         PC    49.9      59      71    74.4    78.1    81.2    81.9    83.5    85.1    85.6
   19         PC      86    86.8    87.6    88.8      91    92.6    93.7      95      97    97.6
   20         PC    98.2    98.5    98.7    98.9      99    99.3    99.3    99.4    99.5    99.8
   21         PC    99.8    99.9     100
   22         LS              98
   23         UD   0.140

   24         KK   ONENS
   25         BA  0.0027
   26         LS              98
   27         UD   0.050

   28         KK   EXSITES
   29         BA  0.0004
   30         LS              94
   31         UD   0.050

   32         KK     CP1
   33         HC       3

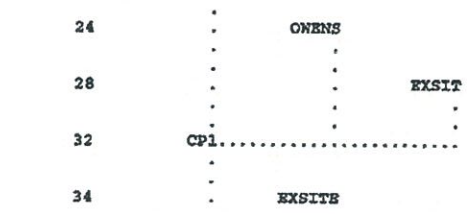
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   35         BA   .0025
   36         LS              94
   37         UD   0.080
   38         ZZ
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1 SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

   11       OFFA
             .
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(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   12JUN14  TIME  17:34:40   *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*            (916) 756-1104             *
*                                       *
*****************************************
```

Susan Cannavo
Existing Condition

File u:\pam\HEC-1A\CANVOEX\HC1-A

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  8 IO          OUTPUT CONTROL VARIABLES
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                     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
                  .57     1.00
1
```

REFERENCE

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 .57	RATIO 2 1.00
HYDROGRAPH AT						
+	OFFA	.02	1	FLOW	17.	30.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	OWENS	.00	1	FLOW	4.	6.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	EXSIT	.00	1	FLOW	0.	1.
				TIME	3.50	3.50
3 COMBINED AT						
+	CP1	.02	1	FLOW	20.	36.
				TIME	3.50	3.50

HYDROGRAPH AT

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1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              JUN  1998                *
 *            VERSION 4.1                *
 *                                       *
 *  RUN DATE   20FEB20  TIME  09:53:14   *
 *                                       *
 *****************************************
```

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

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

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

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

1 HEC-1 INPUT PAGE 1

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              *DIAGRAM
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    2         ID   KNIT DESIGNING COMMUNITY
    3         ID
    4         ID   Developed Condition
    5         ID
    6         ID    File  N:\KNIT\DOCS\HYDROLOGY\HEC1\KNIT 228 OWENS.DAT
    7         ID
    8         ID
    9         IT       5                    300
   10         IO       5
   11         IN       5
   12         JR    PREC    0.57     1.0
              * **********************
              * Developed Conditions  *
              * **********************

   13         KK    OFFA *
   14         BA  0.0163
   15         PB    2.77
   16         PC    0.00       2     5.7       7     8.7    10.8    12.4      13      13      13
   17         PC      13      13      13    13.3      14    14.2    14.8    15.8    17.2    18.1
   18         PC      19    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
   19         PC    25.1    25.6      27    27.8    28.1    28.3    29.5    32.2    35.2    40.9
   20         PC    49.9      59      71    74.4    78.1    81.2    81.9    83.5    85.1    85.6
   21         PC      86    86.8    87.6    88.8      91    92.6    93.7      95      97    97.6
   22         PC    98.2    98.5    98.7    98.9      99    99.3    99.3    99.4    99.5    99.8
   23         PC    99.8    99.9     100
   24         LS              98
   25         UD   0.14

   26         KK  OWENS *
   27         BA  0.0027
   28         LS              98
   29         UD   0.050

   30         KK  DSITES
   31         BA  0.0025
   32         LS              94
   33         UD   0.050

   34         KK     CP1
   35         HC       3

   36         KK  DSITEN
   37         BA  0.0015
   38         LS              94
   39         UD   0.050
   40         ZZ
```

* = Referenced

1 SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

   13       OFFA
              .
              .
   26                OWENS
```

```
                .           .
                .           .
    30          .           .      DSITES
                .           .           .
                .           .           .
    34        CP1.......................
                .
                .
    36          .      DSITEN

  (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
 1****************************************
  *                                      *
  *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
  *               JUN  1998              *
  *            VERSION 4.1               *
  *                                      *
  *  RUN DATE   20FEB20  TIME  09:53:14  *
  *                                      *
  ****************************************

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

                        KNIT DESIGNING COMMUNITY

                        Developed Condition

                         File  N:\KNIT\DOCS\HYDROLOGY\HEC1\KNIT 228 OWENS.DAT


    10 IO          OUTPUT CONTROL VARIABLES
                        IPRNT          5  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE

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

                    COMPUTATION INTERVAL      .08 HOURS
                         TOTAL TIME BASE    24.92 HOURS

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

       JP          MULTI-PLAN OPTION
                        NPLAN          1  NUMBER OF PLANS

       JR          MULTI-RATIO OPTION
                       RATIOS OF PRECIPITATION
                       .57      1.00
1

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


                                                                          RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION     AREA    PLAN                        RATIO 1  RATIO 2
                                                                    .57      1.00

 HYDROGRAPH AT
+                  OFFA       .02      1   FLOW                    17.      30.
                                            TIME                  3.58     3.58

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

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

   3 COMBINED AT
+                    CP1      .02      1   FLOW                    22.      40.
                                            TIME                  3.50     3.50

 HYDROGRAPH AT
+                  DSITEN     .00      1   FLOW                     2.       3.
                                            TIME                  3.50     3.50
```

→ to Owens Ave

→ to UPRR

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

TIME OF CONCENTRATION

*=REFERENCE

BAUGHMAN & TURNER, INC.
CONSULTING ENGINEERS

PROJECT NO. : 23-22-60 **DEVELOPMENT :** MD Development MME (KNIT DESIGNING COMMUNITY)

FILE : Existing & Developed Condition **CALCULATED BY:** pp/sw **DATE :** 02/20/20

Sub-Basin Data					Initial/Overland Time (T_i)			Travel Time (T_t)					T_c	T_c Check (Urbanized Basins)		Final T_c	T_{lag}	Remarks
DESIG	CN	K	AREA (acres)	AREA (mi^2)	LENGTH (ft)	SLOPE (%)	T_i (min)	LENGTH (ft)	SLOPE (%)	V_1 (fps)	V_2 (fps)	T_t (min)	$T_c=T_i+T_t$ (min)	TOTAL (ft)	T_c (min)	T_c (min)	T_{lag} (hrs)	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Existing Condition																		
OFFA*	98	0.904	10.40	0.0163	385	1.00	6.9	1340	1.50	2.47	3.75	7.1	14.0	1725.0	19.6	14.0	0.140	Dev.
OWENS*	98	0.904	1.70	0.0027	43	2.00	1.8	740	4.720	4.39	6.65	2.5	4.3	783.0	14.4	4.3	0.050	Dev.
EXSITE*	94	0.851	1.60	0.0025	120	0.83	5.2	480	2.080	2.91	N/A	2.7	8.0	600.0	13.3	8.0	0.080	Dev.
EXSITES*	94	0.851	0.27	0.0004	80	1.67	3.4	275	2.910	3.45	N/A	1.3	4.7	355.0	12.0	4.7	0.050	Dev.
EXSITEN	94	0.851	0.66	0.0010	80	1.25	3.7	120	2.500	3.19	N/A	0.6	4.4	200.0	11.1	4.4	0.050	Dev.
Developed Condition Onsite																		
DSITEN	94	0.851	0.95	0.0015	60	5.0	2.0	120	2.50	3.19	N/A	0.6	2.7	180.0	11.0	2.7	0.050	Dev
DSITES	94	0.851	1.58	0.0025	100	2.0	3.6	180	2.20	3.00	N/A	1.0	4.6	280.0	11.6	4.6	0.050	Dev

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

$T_c=T_i+T_t$

$K=0.0132(CN)-.39$

$T_{lag} = 0.6T_c$

For the travel time (T_t) calculations,
V_1 applies to the first 500 feet of travel distance;
V_2 applies to the remaining travel distance.

Travel Time Velocity Formulas

Existing	Developed
$V_1 = 14.8*(S/100)^{1/2}$	$V_1 = 20.2*(S/100)^{1/2}$
$V_2 = 29.4*(S/100)^{1/2}$	$V_2 = 30.6*(S/100)^{1/2}$

All basins over one square mile are calculated by the equation $T_{lag}=20Kn(L*L_c/S^{0.5})^{0.33}$ and denoted by shaded gray (See Worksheet).

REFERENCE:

STANDARD FORM 4

Rip Rap Sizing Computation

Project Name:
Date:
File Name: Riprap Sizing Calcs v130321.xlsx
By:

Location:

Known Information:

Reference:

Rip Rap protection at

V =	Velocity (fps)	2.13	WSPG Hydraulic / Flowmaster Calculations
S_g =	Specific Gravity of Rock (typ=2.5)	2.5	Use Typical
s =	Longitudinal Channel Slope (ft/ft)	1.9	Grading Plan

Solve For:

d_{50} = 0.28 ft - Average Rock Size

d_{50} =	**3**	**in**	**- Average Rock Size**
Thickness =	**6**	**in**	**- Thickness of Rip Rap protection**
Manning's 'n' =	**0.039**		**- Roughness Coefficient**

Equations:

Based upon a Stable Channel Lining

$d_{50} = ((vel*S^{0.17})/(3*(S_g-1)))^2$ Equation 734*

$n = 0.0395(d_{50})^{1/6}$ Equation 732*

Recommendations:

* Equations taken from the Clark County Regional Flood Control District - Hydrologic Criteria and Drainage Design Manual

5740 S. Arville St., Suite 216 - Las Vegas, NV 89118
Ph. 702-284-5300 - Fx. 702-284-5399

Cross Section for Flows at curb opening to Owens

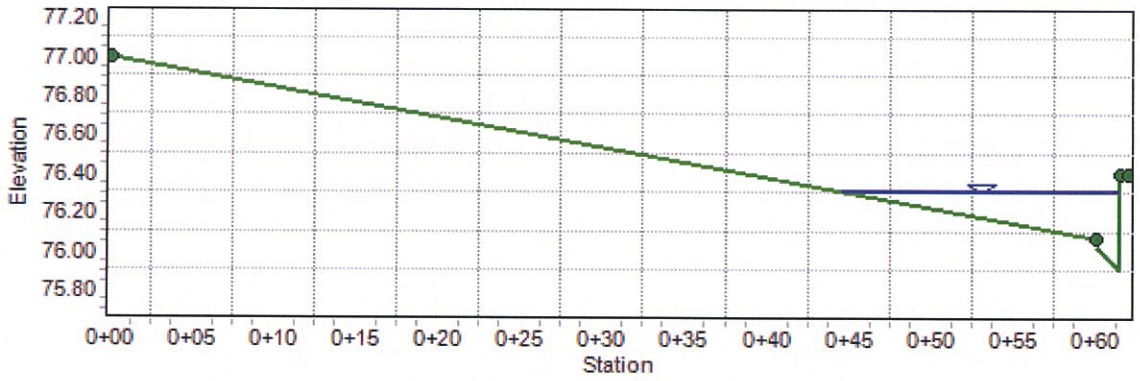
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00810	ft/ft
Normal Depth	0.41	ft
Discharge	5.00	ft³/s

Cross Section Image



Worksheet for Flows at curb opening to Owens

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00810	ft/ft
Discharge	5.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	77.00
0+60.00	76.07
0+60.00	76.03
0+61.50	75.90
0+61.50	76.40
0+62.00	76.40

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 77.00)	(0+60.00, 76.07)	0.017
(0+60.00, 76.07)	(0+61.50, 76.40)	0.013
(0+61.50, 76.40)	(0+62.00, 76.40)	0.013

Options

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

Results

Normal Depth	0.41	ft
Elevation Range	75.90 to 77.00 ft	
Flow Area	2.35	ft²
Wetted Perimeter	17.35	ft
Hydraulic Radius	0.14	ft

Worksheet for Flows at curb opening to Owens

Results

Top Width		16.90	ft
Normal Depth		0.41	ft
Critical Depth		0.41	ft
Critical Slope		0.00802	ft/ft
Velocity		2.13	ft/s
Velocity Head		0.07	ft
Specific Energy		0.48	ft
Froude Number		1.00	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.41	ft
Critical Depth	0.41	ft
Channel Slope	0.00810	ft/ft
Critical Slope	0.00802	ft/ft

BAUGHMAN & TURNER, INC.
Consulting Engineers and Land Surveyors

Block Wall Opening Computation

FACILITY DESCRIPTION

Project Name: Red Realty - Cultivation Facility
Date:
File Name: Block Wall Opening.xlsx
By:

Known Information:

H =	Height of Opening (ft)	2.00
L =	Length of Opening (ft)	1.34
Cf =	Clogging Factor (%)	50

Weir Conditions:

$Q=Cw*L*H_{clg}3/2$

Cw =	Weir Coefficient	2.70
H_{clg} =	Height with clogging	1.0
Q =	Flow allowed through opening	3.6

Orifice Conditions:

$Q=Co*A_{clg}*(2gH_{clg})1/2$

Co =	Orifice Coefficient	0.67
A_{clg} =	Area with clogging	1.34
Q =	Flow allowed through opening	5.1

Worst Case Scenario Occurs Under Weir Conditions

Allowed Flow Through Opening = 3.6 cfs

1210 Hinson Street - Las Vegas, NV 89102
Ph. 702-870-8771 - Fx. 702-878-2695

Cross Section for Flume

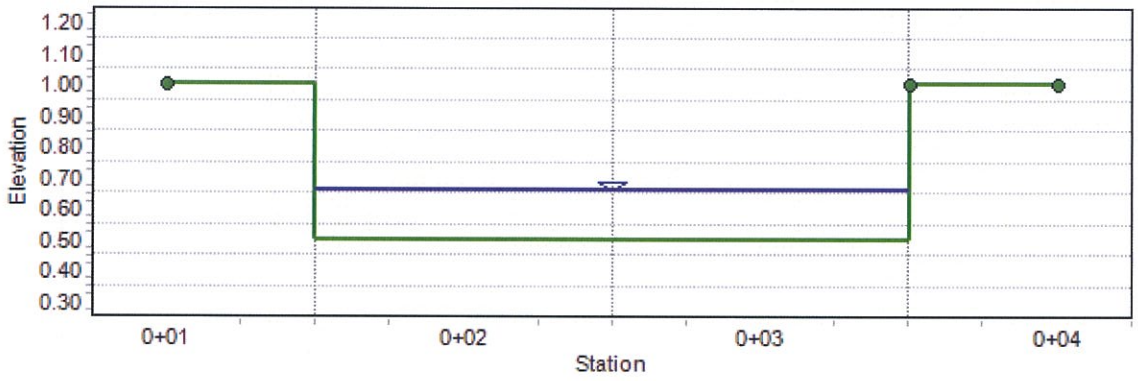
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.28000	ft/ft
Normal Depth	0.16	ft
Discharge	5.00	ft³/s

Cross Section Image



Worksheet for Flume

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.28000	ft/ft
Discharge	5.00	ft^3/s

Section Definitions

Station (ft)	Elevation (ft)
0+01.00	1.00
0+01.50	1.00
0+01.50	0.50
0+03.00	0.50
0+03.50	0.50
0+03.50	1.00
0+04.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+01.00, 1.00)	(0+03.50, 1.00)	0.013
(0+03.50, 1.00)	(0+04.00, 1.00)	0.013

Options

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

Results

Normal Depth	0.16	ft
Elevation Range	0.50 to 1.00 ft	
Flow Area	0.31	ft^2
Wetted Perimeter	2.31	ft
Hydraulic Radius	0.14	ft

Worksheet for Flume

Results

Top Width		2.00	ft
Normal Depth		0.16	ft
Critical Depth		0.61	ft
Critical Slope		0.00509	ft/ft
Velocity		15.96	ft/s
Velocity Head		3.96	ft
Specific Energy		4.12	ft
Froude Number		7.11	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth		0.00	ft
Length		0.00	ft
Number Of Steps		0	

GVF Output Data

Upstream Depth		0.00	ft
Profile Description			
Profile Headloss		0.00	ft
Downstream Velocity		Infinity	ft/s
Upstream Velocity		Infinity	ft/s
Normal Depth		0.16	ft
Critical Depth		0.61	ft
Channel Slope		0.28000	ft/ft
Critical Slope		0.00509	ft/ft

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Scott Black
Richard J. Cherchio



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www.cityofnorthlasvegas.com

February 5, 2020

Mailed via: E-mail

John R. Gustafson, P.E.
Baughman & Turner, Inc.
1210 Hinson Street
Las Vegas, NV 89102

RE: **Technical Drainage Study for Red Realty – Cultivation Facility**
CNLV #29-2020

Dear Mr. Gustafson:

Staff has reviewed the Technical Drainage Study for Red Realty – Cultivation Facility, dated January 16, 2020 and offers the following comments:

1. Please be advised that the CNLV Drainage Study Checklist has been revised as of December 18, 2018. Please use the revised version on future submittals.

2. Concurrence must be obtained by the City of Las Vegas due to the proposed improvements proximity to the City of Las Vegas corporate City boundary.

3. The Existing Condition HEC-1 run has been revised to reflect the MD Development Addendum and lists the flow at CP2 discharging into UPRR Right-of-way as 6 cfs in the 10 year and 11 cfs in the 100 year.

    a. On Page 3, of the TDS, the sheet flow indicated to flow to the railroad tracks in paragraph 2 is listed at a total of 5 cfs in the 10 year and 11 cfs in the 100 year.
    b. On Page 5, of the TDS, the flow for CP2 in Table 1 is listed at a total of 5 cfs in the 10 year and 11 cfs in the 100 year.
    c. On Page 5, of the TDS, the existing flow rate in Table 3, discharging into UPRR R.O.W., is listed at a total of 5 cfs in the 10 year and 11 cfs in the 100 year.
    d. The flow for CP2 in the Table on the Existing On-Site Conditions Map is listed at a total of 5 cfs in the 10 year and 11 cfs in the 100 year.

    Please review and revise accordingly.

4. On page 6, of the TDS, the normal depth for cross-section HS2 in Table 4 for the 10-year flow in the Ultimate Conditions is listed as 0.47 feet. The normal depth in the street capacity calculations is 0.40 feet. Please review and revise accordingly.

5. The proposed minimum elevation for Building 2 is listed at an elevation of 1983.2 in Table 5, on page 7 of the TDS. The elevation of Building 2 on the grading plan is set at elevation 1982.30. Please review and revise accordingly.

6. On page 7, of the TDS, the Section on Best Management Practices indicates the discharge for the newly paved parking area has been designed to allow stormwater to travel over a rip rap area along the east property line before discharging to the UPRR right-of-way via sheet flow. Call out the rip rap and the discharge location on the Grading Plan.

7. The Existing Condition and the Developed Condition HEC-1 runs, dated January 15, 2020, have an input error on line 18. The Six-Hour Storm Distribution input has been entered incorrectly. The values of 19.7 and 20.1 have been input instead of the values of 19.9 and 20.0, respectively. Please review and revise accordingly.

8. The Existing Condition and the Developed Condition HEC-1 runs, dated January 15, 2020, appear to be missing the Basin Area (BA) for Basin ESITEN and Basin DSITEN, respectively. Please review and revise accordingly.

9. The Planning Commission Conditions of Approval state that the site will be enclosed with a twelve-foot concrete block wall. A block wall around the perimeter of the site is not indicated on the Improvement Plans for this project. Please review and revise accordingly.

10. The Flood Zone Data on the Existing On-Site Conditions Map, Figure 9; the Developed On-Site Conditions Map, Figure 10; and the Grading Plan, Sheet C2.0; list the Community Panel No. as 32003C2160E. The Panel No. should end with a "F" instead of an "E". Please review and revise accordingly.

11. Provide rip rap sizing calculations.

12. Any area of a surface parking lot that abuts a public street shall be screened by perimeter landscaping or a decorative masonry wall with a minimum height of three (3) feet above the finish grade of the parking lot where it abuts the landscaping (Title 17, Zoning Ordinance Chapter 17.24, Development Standards, 17.24.060 Landscaping).

13. Show existing improvements on the Grading Plan, i.e., existing overhead billboard signs, power poles, overhead power lines, water lines, fences, etc. Coordinate with the representative in the City of North Las Vegas Utility Department regarding access and maintenance for the Utility Department's underground utilities.

14. Provide a concrete flume from the discharge point for Basin DSITES to Owens Avenue. Provide a sidewalk underdrain to convey the flow to the street.

15. There is a Construction Note call out for "L" Type curb on Sheet C2.0 of the Grading Plan where "A" Type curb is shown. Please review and Revise accordingly.

16. Call out the curb openings on Sheet C2.0 of the Grading Plan where the newly paved parking area discharges stormwater to the rip rap area.

17. On Sheet C2.1 of the Grading Plan, Section D/C2.2 is called out on the western boundary. Section D/C2.2 indicates the installation of a retaining wall. The limits of the retaining wall need to be shown on the Grading Plan with the Top of Retaining Wall (TRW) and Top of Footing (TF) elevations. Please review and revise accordingly.

18. Call out the installation of the trash enclosure on the Grading Plan, Sheet C2.1.

19. Section "C" on Sheet C2.2 indicates a retaining wall with a maximum height of 4.0 feet flush with the top of curb. Will some means be provided for fall protection at this location?

20. Typical Sections "A", "B", and "E" do not indicate the existing and/or proposed fence/block wall at the property line. Please review and revise accordingly.

Please be advised that all land surface area disturbances over 1 acre and/or adjacent to a water way must submit a "Notice of Intent" to discharge to the Nevada Division of Environmental Protection, which certifies that a stormwater pollution prevention plan has been developed and is maintained on site. For more information including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm.

A detailed review of the grading plan will be performed by staff during the improvement plan review process. The City of North Las Vegas, its officials, consultant, or employees assume no liability for information, data, calculations and conclusions presented by the consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review. If you have any questions concerning this matter, please contact me at (702) 633-1933.

Note that the Clark County Regional Flood Control District (District) has begun efforts to update the *Hydrological Criteria and Drainage Design Manual* (HCDDM) and is requesting participation from the engineering community. The District is collecting comments and suggestions on errors, clarifications, or changes needed to the current Manual and/or content and usability enhancements to be incorporated into the updated Manual. Additional information on procedures and deadline to provide feedback and comments are available online at (http://www.ccrfcd.org/hcddmupdate.html).

Sincerely,

Mark A. Escobedo

Mark Escobedo, P.E., CFM
Engineering Associate
Public Works/Development and Flood Control
City of North Las Vegas
(702) 633-1933

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Council Members
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www.cityofnorthlasvegas.com

October 14, 2019

Red Diamond Investors, LLC
10777 West Twain Ave., Ste. 300
Las Vegas, NV 89135

Re: **UN-75-19 (71422) 228 WEST OWENS AVENUE (Public Hearing).** Applicant: Red Diamond Investors, LLC. Request: A special use permit in an M-2 (General Industrial District) to allow the production of edible marijuana products or marijuana-infused products. Location: 228 West Owens Avenue. (APN 139-22-803-002)

Dear Applicant:

The Planning Commission, at its meeting of October 9, 2019, approved UN-75-19, per amended conditions. Condition Nos. 1-9 were deleted and replaced with new Condition No.1 to read:

The condition is:

Planning & Zoning:

1. This development shall comply with all conditions of UN-74-19.

The decision of the Planning Commission is final unless appealed within seven days of the date action was taken, in writing, to the City Clerk at which time a public hearing will be scheduled before the City Council.

Should you have questions regarding this application, please contact Robert Eastman, Planning & Zoning Manager, 702-633-1530.

Sincerely,

Julie Shields

Julie Shields, Executive/Recording Secretary
Land Development and Community Services

Cc: Robert Eastman, Planning & Zoning Manager

George M. Rogers, Architect
6325 S. Jones Blvd., Ste. 100
Las Vegas, NV 89118

Red Realty, LLC
9668 Stonily Lane
Las Vegas, NV 89178

Mayor
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Council Members
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www.cityofnorthlasvegas.com

October 14, 2019

Red Diamond Investors, LLC
10777 West Twain Ave., Ste. 300
Las Vegas, NV 89135

Re: **UN-74-19 (71417) 228 WEST OWENS AVENUE (Public Hearing).** Applicant: Red Diamond Investors, LLC. Request: A special use permit in an M-2 (General Industrial District) to allow a cultivation facility for marijuana. Location: 228 West Owens Avenue. (APN 139-22-803-002)

Dear Applicant:

The Planning Commission, at its meeting of October 9, 2019, approved UN-74-19, per added Condition No. 10.

The amended conditions are:

Planning & Zoning:

1. Unless expressly authorized through a variance, waiver or another approved method, this development shall comply with all applicable codes and ordinances.

2. Must permit and construct a building that meets the Industrial Design Guidelines and all applicable Development Standards for the vehicle repair activities.

3. Additional landscaping shall be provided along Owens Avenue on Parcel 139-22-899-013. The landscaping shall include trees every 20 feet on center, with shrubs and groundcover to provide 50% coverage within two years of planting.

Public Works:

4. All known geologic hazards shall be shown on any preliminary development plans and civil improvement plans submitted to the City. Subsequent identification of additional hazards may substantially alter development plans.

5. Approval of a drainage study is required prior to submittal of the civil improvement plans.

6. The size and number of access points and their locations are subject to review and approval by the City of North Las Vegas Traffic Engineer and must meet the standards set forth in *North Las Vegas Municipal Code* section 17.24.040. Conformance may require modifications to the site plan.

7. All driveway geometrics shall be in compliance with the *Uniform Standard Drawings for Public Works' Construction Off-Site Improvements* Drawing Number 222.1 and 222.5.

8. All Nevada Energy easements, appurtenances, lines and poles must be shown and shall be located entirely within the perimeter landscape area of this development. Distribution lines, existing or proposed, shall be placed underground if impacted by the proposed development of the parcel or if the pole impedes upon the proper ADA clearances for sidewalk. Under no circumstances will new down guy wires be permitted.

9. Approval of a traffic study is required prior to submittal of the civil improvement plans. Please contact Traffic Engineering at 633-2676 to request a scope. A queuing analysis may be required.

10. The property owner shall grant a twenty-four foot (24') wide ingress/egress and emergency access easement to the landlocked parcel (APN 139-22-803-001) north of the applicant's parcel, or as otherwise approved by the director of public works.

The decision of the Planning Commission is final unless appealed within seven days of the date action was taken, in writing, to the City Clerk at which time a public hearing will be scheduled before the City Council.

Should you have questions regarding this application, please contact Robert Eastman, Planning & Zoning Manager, 702-633-1530.

Sincerely,

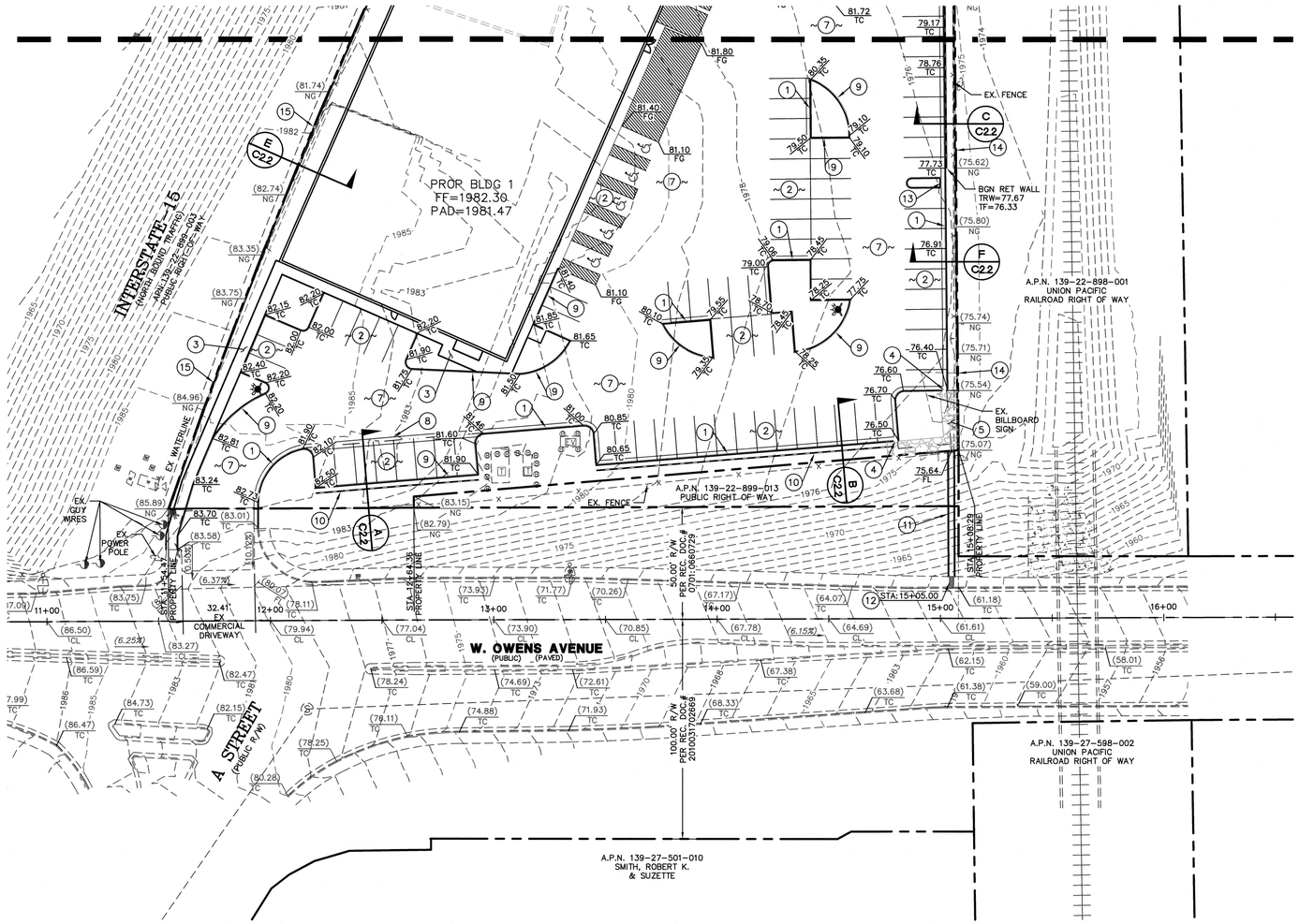
Julie Shields

Julie Shields, Executive/Recording Secretary
Land Development and Community Services

Cc: Robert Eastman, Planning & Zoning Manager

George M. Rogers, Architect
6325 S. Jones Blvd., Ste. 100
Las Vegas, NV 89118

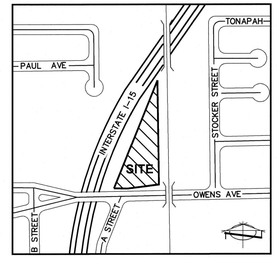
Red Realty, LLC
9668 Stonily Lane
Las Vegas, NV 89178



GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.



VICINITY MAP
NO SCALE

CONSTRUCTION NOTES

#	ITEM	UNIT	QUANTITY PUBLIC	PRIVATE	NDOT
(1)	INSTALL 24" "L" TYPE C & G PER CCAUSD #216.	LF	–	–	–
(2)	CONSTRUCT 2" AC OVER 4" TYPE II AGGREGATE BASE (PARKING STALL)	SY	–	–	–
	TYPE II AGGREGATE BASE	CY	–	–	–
(3)	INSTALL 4" THICK CONCRETE SIDEWALK PER CCAUSD #234.	SF	–	–	–
(4)	INSTALL 2 FT. CURB OPENING PER DETAIL 2 ON SHEET C2.2	EA	–	–	–
(5)	INSTALL RIP RAP D_{50}= 3", BLANKET THICKNESS 6". FOR BMP PER CCRFCD SEC 1503.4.5	SF	–	–	–
(6)	INSTALL TRASH ENCLOSURE SEE ARCHITECTURAL PLANS	EA	–	–	–
(7)	CONSTRUCT 3" AC OVER 6" TYPE II AGGREGATE BASE (DRIVE AISLE)	SY	–	–	–
	TYPE II AGGREGATE BASE	CY	–	–	–
(8)	INSTALL 3' WIDE VALLEY GUTTER PER DETAIL 2 ON SHEET C2.2	LF	–	–	–
(9)	INSTALL "A" TYPE CURB PER CCAUSD #219.	LF	–	–	–
(10)	INSTALL 3' BLOCK WALL	LF	–	207	–
(11)	INSTALL CONCRETE FLUME PER DETAIL 3 ON SHEET C2.2	LF	56	–	–
(12)	INSTALL SIDEWALK DRAIN PER CCAUSD #236	EA	1	–	–
(13)	INSTALL SLOT GUTTER PER DETAIL 4 ON SHEET C2.2	LF	–	–	–
(14)	INSTALL DECORATIVE MASONRY WALL WITH 2'X16" WALL OPENING @ 20' OC, HEIGHT=12'–0"	LF	–	–	–
(15)	INSTALL DECORATIVE MASONRY WALL HEIGHT=12'–0"	LF	–	–	–

LEGEND

- PROPERTY LINE
- STREET CENTERLINE
- LOT LINE
- BUILDING SETBACK LINE
- PROPOSED ROLL CURB
- EXISTING "L" CURB & GUTTER
- EXISTING CONTOUR LINES
- PROPOSED FLOW LINE
- SAW CUT LINE
- PROPOSED EDGE OF PAVEMENT
- EXIST. EDGE OF PAVEMENT
- PROPOSED BLOCK WALL
- PROPOSED SCARP
- EXIST. BLOCK WALL
- SAW CUT AREA
- MATCHLINE
- 00.00 LOC (00.00) LOC 0.00% — PROPOSED ELEVATION & LOCATION / EXISTING ELEVATION & LOCATION / PROPOSED GRADE
- CONSTRUCTION NOTE
- PROPOSED HYDRANT
- SIGHT VISIBILITY ZONE*
- ROADWAY EASEMENT

AC	ASPHALTIC CONCRETE
CL	CENTERLINE
TC	TOP OF CURB
EP	EDGE OF PAVEMENT
FG	FINISHED GRADE
TF	TOP OF FOOTING
TRW	TOP OF RETAINING WALL
TFW	TOP OF FLOOD WALL
TSW	TOP OF STEM WALL
BSW	BACK OF SIDEWALK
GB	GRADE BREAK
BVC	BEGIN VERTICAL CURVE
EVC	END VERTICAL CURVE
FF	FINISHED FLOOR
FL	FLOW LINE
HP	HIGH POINT
INV	INVERT
LF	LINEAR FEET
LP	LOW POINT
LS	LANDSCAPE
SWG	SOUTHWEST GAS
P.U.E.	PUBLIC UTILITY EASEMENT
P.D.E.	PRIVATE DRAINAGE EASEMENT
P.S.E.	PRIVATE SEWER EASEMENT
P.L.E.	PRIVATE LANDSCAPE EASEMENT

*NOTE: NOTHING OVER 24" IN HEIGHT ALLOWED IN SIGHT VISIBILITY ZONE EXCEPT TRAFFIC CONTROL DEVICES.

GEOTECHNICAL REPORT INFO

SITE SHALL BE GRADED IN ACCORDANCE WITH THE APPROVED GEOTECHNICAL REPORT PREPARED BY:

LAS VEGAS, NV -----
PHONE: -----
DISPATCH: -----
FAX: -----
PROJECT NO. -----
DATED -----
UPDATED -----

AREA OF DISTURBANCE

OFFSITE: 0.00 AC
ONSITE: 0.00 AC

EARTHWORK QUANTITIES

	OFFSITE:	ONSITE
CUT:	0 CY	0 CY
FILL:	0 CY	0 CY
NET:	0 CY	0 CY CUT

DRAINAGE EASEMENT NOTE

NO DEEP ROOTED TRESS OR SHRUBS TO BE PLANTED WITH THE CITY OF NORTH LAS VEGAS DRAINAGE EASEMENT.

BASIS OF BEARING:

SOUTH 89°47'07" WEST, BEING THE SOUTH LINE OF SECTION 22, TOWNSHIP 20 SOUTH RANGE 61 EAST M.D.B.&M. AS SHOWN ON MAP AS FILE 5, PAGE 66 ON FILE IN THE COUNTY RECORDERS OFFICE, CLARK COUNTY, NEVADA.

BENCHMARK

7C0122S4 – RIVET AND SQUARE ALUMINUM PLATE IN TOP OF CURB NORTH SIDE OF OWENS AVENUE AT THE EAST FACE OF AND UNDER THE RAILROAD BRIDGE CROSSING OWENS AVENUE.

ELEV: 596.674 METERS = 1957.59 FEET
NAVD 88

FLOOD ZONE DATA

THIS SITE IS LOCATED IN ZONE "X". ZONE "X" HAS BEEN DETERMINED TO BE AN AREA OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.

COMMUNITY PANEL NO. 32003C2160F
EFFECTIVE DATE NOVEMBER 16, 2011

ENGINEERS CERTIFICATE

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS, NEVADA.

JOHN R. GUSTAFSON, P.E. 13140 DATE

APPROVALS

Robert A. McLaughlin, P.E. CFM Date
Manager, Development and Flood Control Division

STORMWATER MANAGEMENT NOTES

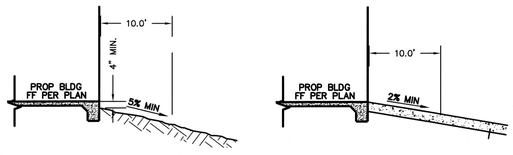
1. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATED IN, THE PUBLIC RIGHTS OF WAY OF CLARK COUNTY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.

2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN CLARK COUNTY TITLE 24.40 AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDANCE MANUAL.

3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.5

4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS, AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER ANY 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 EXCEPTION TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.

5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.



LANDSCAPE AREAS HARDSCAPE AREAS
TYPICAL SLOPES FROM BUILDING FOUNDATION

SLOPE REQUIREMENT DETAIL

LEGAL DESCRIPTION

APN 139-22-803-001

THAT CERTAIN REAL PROPERTY SITUATE, LYING, AND BEING IN THE COUNTY OF CLARK, STATE OF NEVADA, AND MORE PARTICULARLY DESCRIBED AS BEING A PORTION OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4), SECTION 22, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.M., AND MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS, TO WIT:

BEGINNING AT A POINT ON THE RIGHT OR EASTERLY HIGHWAY RIGHT OF WAY LINE OF I-15 (PROJECT I-015-1 (7)43 AT A POINT 180.00 FEET RIGHT OF AND MEASURED RADIALLY FROM THE CENTERLINE OF SAID I-15 AT HIGHWAY ENGINEERS STATION "B" 565+36.62 P.O.C.; SAID POINT OF BEGINNING FURTHER DESCRIBED AS BEARING N.36°06'39" E., A DISTANCE OF 544.92 FEET FROM THE SOUTH QUARTER COMER OF SECTION 22, T.20 S., R. 61 E., M.D.M.; THENCE FROM A TANGENT WHICH BEARS N. 27° 30' 00" E., CURVING TO THE RIGHT ALONG SAID RIGHT-OF-WAY LINE, WITH A RADIUS OF 2820 FEET, THROUGH AN ANGLE OF 06°00'05" AN ARC DISTANCE OF 295.38 FEET TO A POINT 180.00 FEET RIGHT OF AND AT RIGHT ANGLES TO HIGHWAY ENGINEERS STATION "B" 568+53.85 P.T.; THENCE N. 33°30'05" E., A DISTANCE OF 55.06 FEET TO A POINT 180.00 FEET RIGHT OF AND AT RIGHT ANGLES TO HIGHWAY ENGINEERS STATION "B" 570+08.89 P.O.T.; THENCE S. 00°35'10" E., A DISTANCE OF 299.39 FEET TO A POINT; THENCE S. 89°42'40" W., A DISTANCE OF 183.29 FEET TO THE POINT OF BEGINNING; SAID PARCEL CONTAINS AN AREA OF 28,626 SQUARE FEET, MORE OR LESS.

THE ABOVE DESCRIBED PARCEL SHALL HAVE NO ACCESS IN AND TO INTERSTATE ROUTE 15.

IT IS THE INTENT OF THIS INSTRUMENT TO CONVEY AND DOES CONVEY ALL THAT LAND LYING RIGHT OR EASTERLY OF THE HIGHWAY RIGHT OF WAY LINE FOR PROJECT I-015-1 (7)43; BETWEEN 180.00 FEET RIGHT OF HIGHWAY ENGINEERS STATION "B" 565+36.62 P.O.C., AND 180.00 FEET RIGHT OF HIGHWAY ENGINEERS STATION "B" 570+08.89 P.O.T.

APN 139-22-803-002

THAT PORTION OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 22, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SAID SECTION 22; THENCE ALONG THE SOUTH LINE THEREOF NORTH 89°47'07" EAST, 154.47 FEET; THENCE DEPARTING SAID SOUTH LINE NORTH 00°12'53" WEST, 50.28 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE SOUTHEASTERLY HAVING A RADIUS OF 2820.00 FEET, ALSO BEING A POINT ON THE EASTERLY RIGHT-OF-WAY LINE OF INTERSTATE ROUTE 15 AND ALSO BEING THE POINT OF BEGINNING, A RADIAL LINE TO SAID CURVE NORTH 71°03'08" WEST; THENCE ALONG SAID EASTERLY RIGHT-OF-WAY LINE AND ALONG THE ARC OF SAID CURVE TO THE RIGHT HAVING A CENTRAL ANGLE OF 08°37'03" HAVING AN ARC LENGTH OF 424.14 FEET; THENCE DEPARTING SAID RIGHT-OF-WAY LINE NORTH 89°47'07" EAST, 183.07 FEET TO A POINT ON THE WEST RIGHT-OF-WAY LINE OF THE UNION PACIFIC RAILROAD; THENCE ALONG SAID UNION PACIFIC RAILROAD RIGHT-OF-WAY LINE SOUTH 00°31'31" EAST, 363.69 FEET TO A POINT ON THE NORTH RIGHT-OF-WAY LINE OF OWENS AVENUE; THENCE ALONG SAID NORTH RIGHT-OF-WAY LINE SOUTH 85°05'52" WEST, 244.75 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY LINE SOUTH 00°12'53" EAST, 5.00 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY LINE SOUTH 89°47'07" WEST, 109.88 FEET TO THE POINT OF BEGINNING.

CONTAINING 2.36 ACRES OR 102,957 SQUARE FEET OF LAND, MORE OR LESS.

OWNER/DEVELOPER

RED REALTY LLC
7250 PEAK DRIVE, SUITE 216
LAS VEGAS, NV 89128
(702)341-2291
MICHELLED@KNITSTUDIOS.COM

DISCLAIMER NOTE

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

CNLV PROJECT # ----









DATE	2/27/2020
DESIGN	JRG
DRAWN	JC
CHECK	JRG
SCALE	

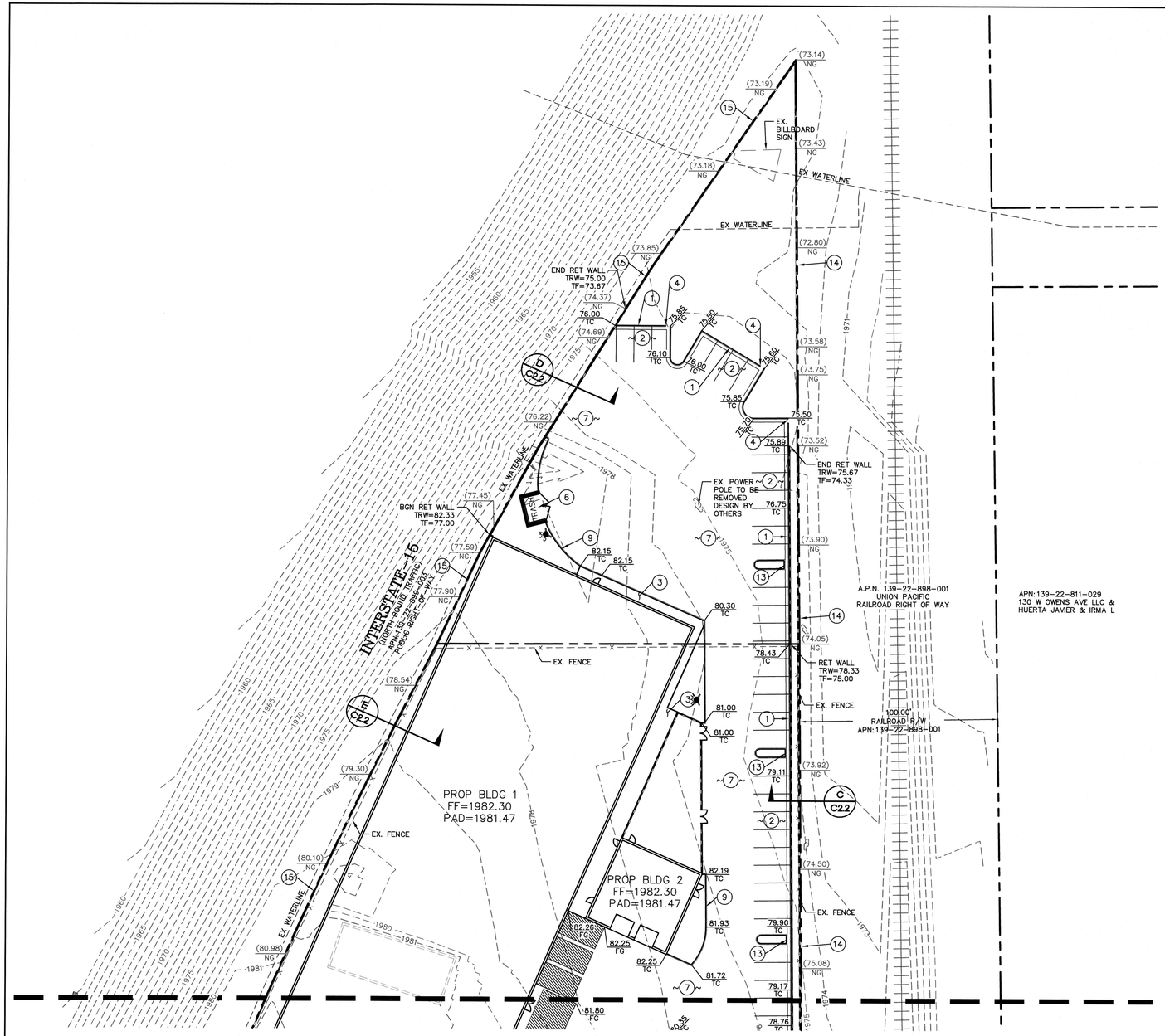
PREPARED FOR :
RED REALTY-CULTIVATION FACILITY
7250 PEAK DRIVE, SUITE 216
LAS VEGAS, NV 89128
(702)341-2291

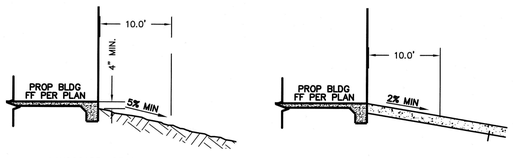
REV. NO.	DATE CREATED	REVISIONS	APP'D INITIALS	DATE APPROVED

BAUGHMAN & TURNER, INC
CIVIL ENGINEERS LAND SURVEYORS LAND PLANNERS
1210 HINSON STREET LAS VEGAS, NEVADA 89102
PHONE:(702) 870-8771 FAX:(702) 878-2695

RED REALTY-CULTIVATION FACILITY
GRADING PLAN 1
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.& M.
CITY OF NORTH LAS VEGAS NEVADA
APN 139-22-803-002

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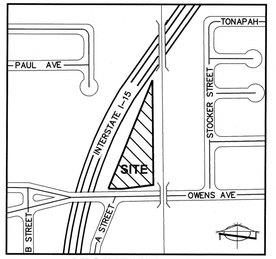


SLOPE REQUIREMENT DETAIL

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.



VICINITY MAP
NO SCALE

BASIS OF BEARING:

SOUTH 89°47'07" WEST, BEING THE SOUTH LINE OF SECTION 22, TOWNSHIP 20 SOUTH RANGE 61 EAST M.D.B.&M. AS SHOWN ON MAP AS FILE 5, PAGE 66 ON FILE IN THE COUNTY RECORDERS OFFICE, CLARK COUNTY, NEVADA.

OWNER/DEVELOPER

RED REALTY LLC
7250 PEAK DRIVE, SUITE 216
LAS VEGAS, NV 89128
(702)341-2291
MICHELLE@KNITSTUDIOS.COM

BENCHMARK

7C0122S4 – RIVET AND SQUARE ALUMINUM PLATE IN TOP OF CURB NORTH SIDE OF OWENS AVENUE AT THE EAST FACE OF AND UNDER THE RAILROAD BRIDGE CROSSING OWENS AVENUE.

ELEV: 596.674 METERS = 1957.59 FEET
NAVD 88

FLOOD ZONE DATA

THIS SITE IS LOCATED IN ZONE "X". ZONE "X" HAS BEEN DETERMINED TO BE AN AREA OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.

COMMUNITY PANEL NO. 32003C2160F
EFFECTIVE DATE NOVEMBER 16, 2011

CONSTRUCTION NOTES

#	ITEM	UNIT	QUANTITY PUBLIC	PRIVATE	NDOT
1	INSTALL 24" "L" TYPE C & G PER CCAUSD #216.	LF	–	–	–
2	CONSTRUCT 2" AC OVER 4" TYPE II AGGREGATE BASE (PARKING STALL)	SY	–	–	–
	TYPE II AGGREGATE BASE	CY	–	–	–
3	INSTALL 4" THICK CONCRETE SIDEWALK PER CCAUSD #234.	SF	–	–	–
4	INSTALL 2 FT. CURB OPENING PER DETAIL 2 ON SHEET C2.2	EA	–	–	–
5	INSTALL RIP RAP D_{50}= 3", BLANKET THICKNESS 6". FOR BMP PER CCRFCD SEC 1503.4.5	SF	–	–	–
6	INSTALL TRASH ENCLOSURE SEE ARCHITECTURAL PLANS	EA	–	–	–
7	CONSTRUCT 3" AC OVER 6" TYPE II AGGREGATE BASE (DRIVE AISLE)	SY	–	–	–
	TYPE II AGGREGATE BASE	CY	–	–	–
8	INSTALL 3' WIDE VALLEY GUTTER PER DETAIL 2 ON SHEET C2.2	LF	–	–	–
9	INSTALL "A" TYPE CURB PER CCAUSD #219.	LF	–	–	–
10	INSTALL 3' BLOCK WALL	LF	–	207	–
11	INSTALL CONCRETE FLUME PER DETAIL 3 ON SHEET C2.2	LF	56	–	–
12	INSTALL SIDEWALK DRAIN PER CCAUSD #236	EA	1	–	–
13	INSTALL SLOT GUTTER PER DETAIL 4 ON SHEET C2.2	LF	–	–	–
14	INSTALL DECORATIVE MASONRY WALL WITH 2'X16" WALL OPENING @ 20' OC, HEIGHT=12'–0"	LF	–	–	–
15	INSTALL DECORATIVE MASONRY WALL HEIGHT=12'–0"	LF	–	–	–

LEGEND

- PROPERTY LINE
- STREET CENTERLINE
- LOT LINE
- BUILDING SETBACK LINE
- PROPOSED ROLL CURB
- EXISTING "L" CURB & GUTTER
- EXISTING CONTOUR LINES
- PROPOSED FLOW LINE
- SAW CUT LINE
- PROPOSED EDGE OF PAVEMENT
- EXIST. EDGE OF PAVEMENT
- PROPOSED BLOCK WALL
- PROPOSED SCARP
- EXIST. BLOCK WALL
- SAW CUT AREA
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- 00.00 LOC — PROPOSED ELEVATION & LOCATION
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- PROPOSED HYDRANT
- SIGHT VISIBILITY ZONE*
- ROADWAY EASEMENT

AC	ASPHALTIC CONCRETE
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P.S.E.	PRIVATE SEWER EASEMENT
P.L.E.	PRIVATE LANDSCAPE EASEMENT

*NOTE: NOTHING OVER 24" IN HEIGHT ALLOWED IN SIGHT VISIBILITY ZONE EXCEPT TRAFFIC CONTROL DEVICES.

ENGINEERS CERTIFICATE

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS, NEVADA.

JOHN R. GUSTAFSON, P.E. 13140 — DATE

APPROVALS

Robert A. McLaughlin, P.E. CFM — Date
Manager, Development and Flood Control Division

DISCLAIMER NOTE

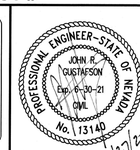
UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND AND OVERHEAD UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN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

CNLV PROJECT # ----









	DATE APPROVED
	APP'D INITIALS
	REVISIONS
	REV. NO.
	DATE CREATED

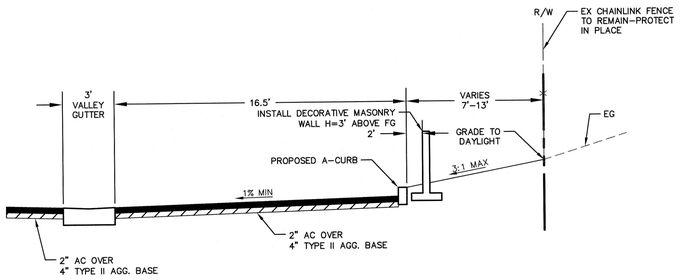
PREPARED FOR :
RED REALTY-CULTIVATION FACILITY
7250 PEAK DRIVE, SUITE 216
LAS VEGAS, NV 89128
(702)341-2291

DATE	11/14/2018	
DESIGN	JRG	
DRAWN	JC	
CHECK	JRG	
SCALE		

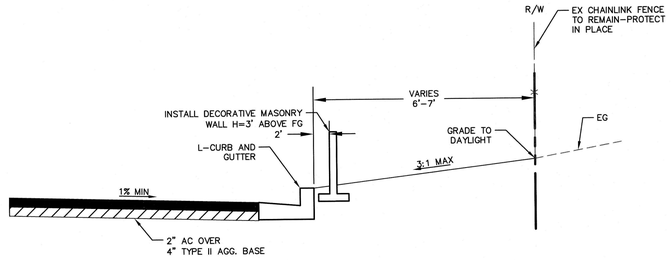
BAUGHMAN & TURNER, INC
CIVIL ENGINEERS LAND SURVEYORS LAS VEGAS, NEVADA
LAND PLANNERS
1210 HINSON STREET PHONE:(702) 870-8771 FAX:(702) 870-8771

RED REALTY-CULTIVATION FACILITY
GRADING PLAN 2
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.& M.
CITY OF NORTH LAS VEGAS, NEVADA
APN 139-22-803-002

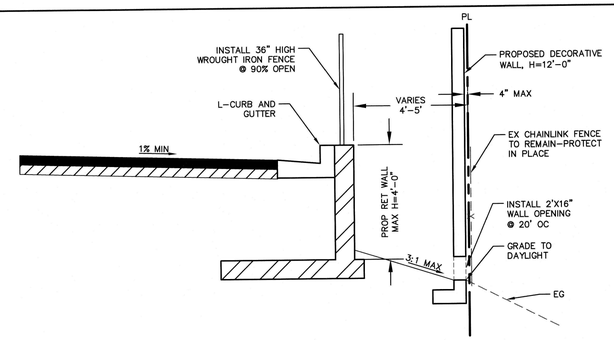
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PROJ. NO.
K095



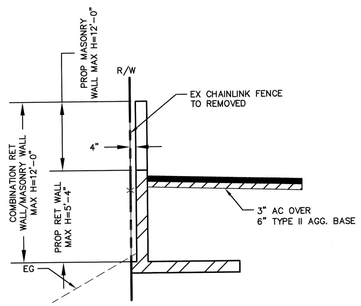
SECTION N.T.S. **A**



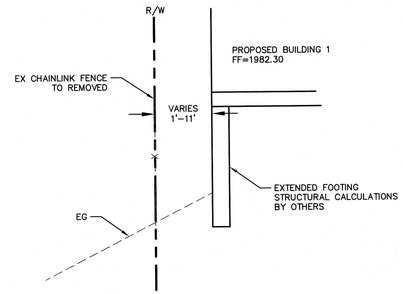
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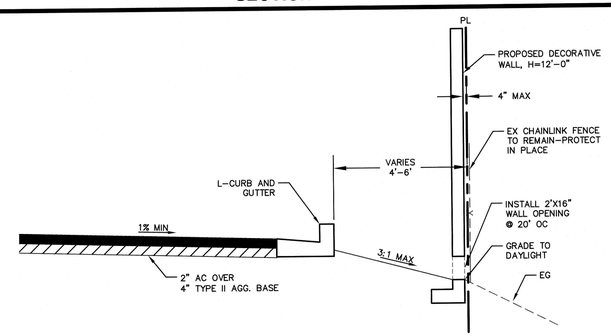
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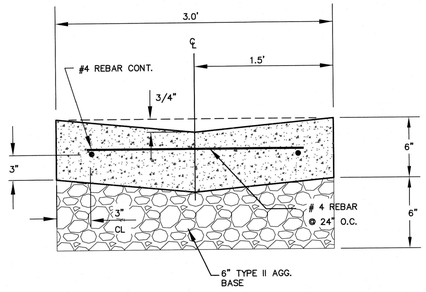
SECTION. N.T.S. **D**



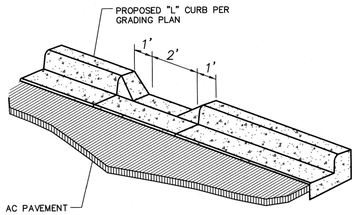
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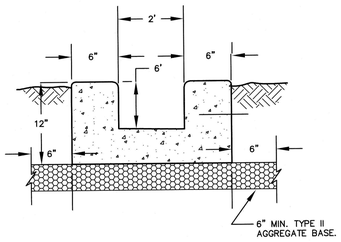
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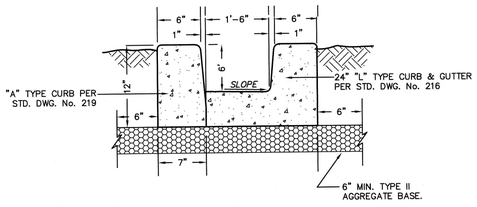
DETAIL-VALLEY GUTTER N.T.S. **1**



DETAIL-2' CURB OPENING N.T.S. **2**



CONCRETE FLUME N.T.S. **3**



SLOT GUTTER N.T.S. **4**

- N.T.S. **-**

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CNLV PROJECT # ----

Call before you Dig — Avoid cutting underground utility lines. It's costly. Call 811 OR 1-800-227-2600

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

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

PROFESSIONAL ENGINEER STATE OF NEVADA — JOHN R. GUSTAFSON — Exp. 6-30-21 — CIVIL — No. 13140 — 11/27/20

N.T.S.

DATE	REV. NO.	REVISIONS	APP'D. INITIALS	DATE APPROVED

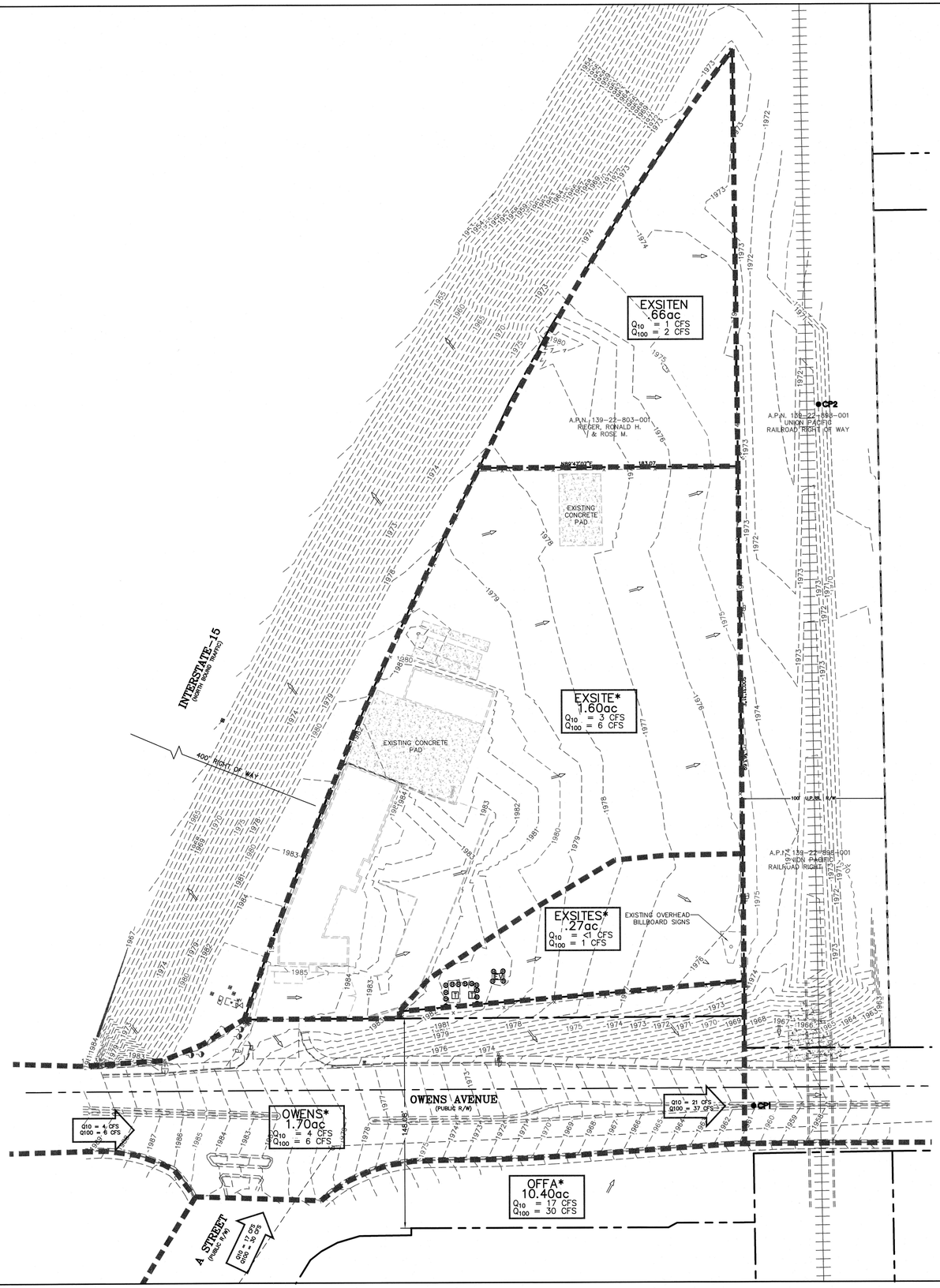
PREPARED FOR :
RED REALTY-CULTIVATION FACILITY
7250 PEAK DRIVE, SUITE 216
LAS VEGAS, NV 89128
(702)341-4291

DATE	2/27/2020
DESIGN	JRG
DRAWN	JC
CHECK	JRG
SCALE	

BAUGHMAN & TURNER, INC
CIVIL ENGINEERS LAND SURVEYORS LAND PLANNERS
1210 HINSON STREET LAS VEGAS, NEVADA
PHONE:(702) 870-8771 FAX:(702) 878-2695 89102

RED REALTY-CULTIVATION FACILITY
GRADING DETAILS
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.& M.
CITY OF NORTH LAS VEGAS NEVADA
APN 139-22-803-002

SHEET
C2.2
5 OF ----
PROJ. NO.
K095



BASIS OF BEARING

SOUTH 89°47'07" WEST, BEING THE SOUTH LINE OF SECTION 22, TOWNSHIP 20 SOUTH RANGE 61 EAST M.D.B.&M. AS SHOWN ON MAP AS FILE 5, PAGE 66 ON FILE IN THE COUNTY RECORDERS OFFICE, CLARK COUNTY, NEVADA.

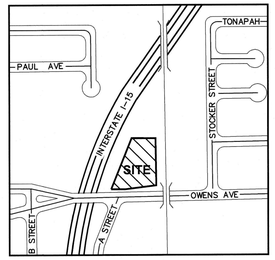
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7C0122S4 – RIVET AND SQUARE ALUMINUM PLATE IN TOP OF CURB NORTH SIDE OF OWENS AVENUE AT THE EAST FACE OF AND UNDER THE RAILROAD BRIDGE CROSSING OWENS AVENUE.
ELEV: 596.674 METERS = 1957.59 FEET
NAVD 88

FLOOD ZONE DATA

THIS SITE IS LOCATED IN ZONE "X". ZONE "X" HAS BEEN DETERMINED TO BE AN AREA OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.

COMMUNITY PANEL NO. 32003C2160F
EFFECTIVE DATE NOVEMBER 16, 2011



VICINITY MAP
NO SCALE

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

DRAINAGE LEGEND

- PROPERTY LINE
- LOT LINE
- STREET CENTERLINE
- PROPOSED WALL
- EXISTING WALL
- PROPOSED "L" CURB & GUTTER
- EXISTING "L" CURB & GUTTER
- XXXX — EXISTING CONTOUR LINES
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- SAWCUT AND REMOVE EXISTING ASPHALT
- 00.00 LOC — PROPOSED ELEVATION & LOCATION
- (00.00) LOC — EXISTING ELEVATION & LOCATION
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- AC — ASPHALTIC CONCRETE
- DRAINAGE BASIN BOUNDARY
- ●CP1 — COMBINATION POINT
- NAME Q_{10} = – cfs Q_{100} = – cfs — BASIN NAME & FLOW DATA
- Q_{10} = – CFS Q_{100} = – CFS — DIRECTION OF FLOWS
- # — STREET CAPACITY SECTION # = LOCATION (SEE DATA TABLE)

Existing Condition		
Source	100-Year Flow (cfs)	10-Year Flow (cfs)
OFFA*	30	17
OWENS*	6	4
EXSITES*	1	<1
CP1*	37	21
EXSITE*	6	3
EXSITEN	2	1
CP2	8	4

*=Referenced from MD Development

* = REFERENCED FROM MD DEVELOPMENT

DISCLAIMER NOTE

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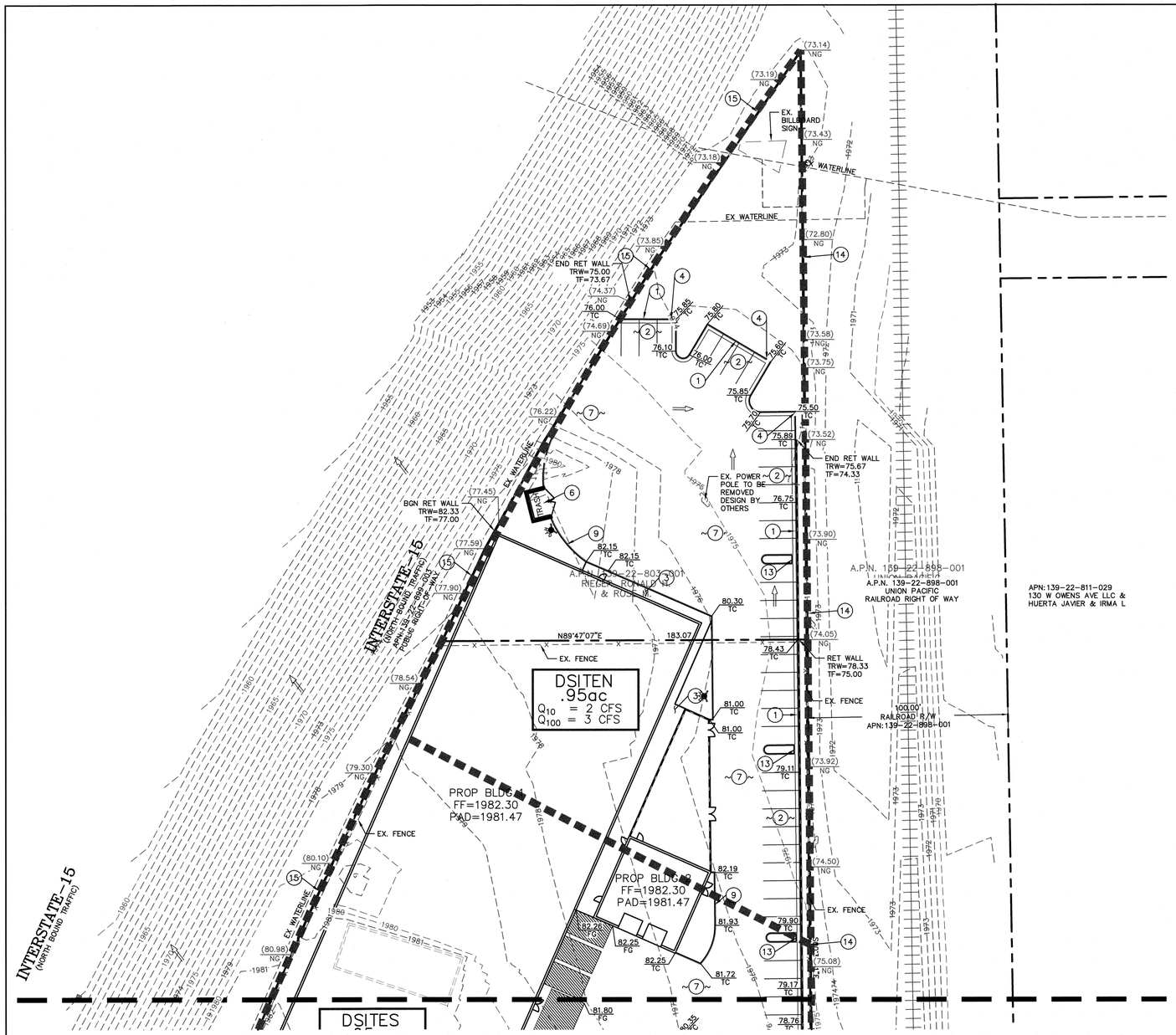
PREPARED FOR :
RED REALTY-CULTIVATION FACILITY
2505 CHANNEL PARK, SUITE 210
LAS VEGAS, NV 89128
(702)341-2291

DATE	2/20/2020
DESIGN	PP
DRAWN	JC
CHECK	JRG
SCALE	

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RED REALTY-CULTIVATION FACILITY
EXISTING ON-SITE CONDITIONS MAP
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.& M.
CITY OF NORTH LAS VEGAS NEVADA
APN 139-22-803-002

SHEET
FIG9
PROJ. NO.
K095



BASIS OF BEARING

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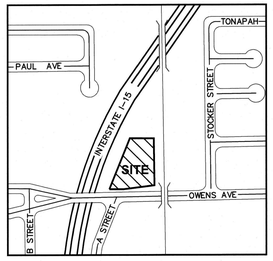
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7C0122S4 – RIVET AND SQUARE ALUMINUM PLATE IN TOP OF CURB NORTH SIDE OF OWENS AVENUE AT THE EAST FACE OF AND UNDER THE RAILROAD BRIDGE CROSSING OWENS AVENUE.
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COMMUNITY PANEL NO. 32003C2160F
EFFECTIVE DATE NOVEMBER 16, 2011



VICINITY MAP
NO SCALE

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

CONSTRUCTION NOTES

#	ITEM	UNIT	QUANTITY PUBLIC	PRIVATE	NDOT
1	INSTALL 24" "L" TYPE C & G PER CCAUSD #216.	LF	–	–	–
2	CONSTRUCT 2" AC OVER 4" TYPE II AGGREGATE BASE (PARKING STALL)	SY	–	–	–
	TYPE II AGGREGATE BASE	CY	–	–	–
3	INSTALL 4" THICK CONCRETE SIDEWALK PER CCAUSD #234.	SF	–	–	–
4	INSTALL 2 FT. CURB OPENING PER DETAIL 2 ON SHEET C2.2	EA	–	–	–
5	INSTALL RIP RAP D_{50}= 3", BLANKET THICKNESS 6". FOR BMP PER CCRFCD SEC 1503.4.5	SF	–	–	–
6	INSTALL TRASH ENCLOSURE SEE ARCHITECTURAL PLANS	EA	–	–	–
7	CONSTRUCT 3" AC OVER 6" TYPE II AGGREGATE BASE (DRIVE AISLE)	SY	–	–	–
	TYPE II AGGREGATE BASE	CY	–	–	–
8	INSTALL 3' WIDE VALLEY GUTTER PER DETAIL 2 ON SHEET C2.2	LF	–	–	–
9	INSTALL "A" TYPE CURB PER CCAUSD #219.	LF	–	–	–
10	INSTALL 3' BLOCK WALL	LF	–	207	–
11	INSTALL CONCRETE FLUME PER DETAIL 3 ON SHEET C2.2	LF	56	–	–
12	INSTALL SIDEWALK DRAIN PER CCAUSD #236	EA	1	–	–
13	INSTALL SLOT GUTTER PER DETAIL 4 ON SHEET C2.2	LF	–	–	–
14	INSTALL DECORATIVE MASONRY WALL WITH 2'X16" WALL OPENING @ 20' OC, HEIGHT=12'–0"	LF	–	–	–
15	INSTALL DECORATIVE MASONRY WALL HEIGHT=12'–0"	LF	–	–	–

DRAINAGE LEGEND

- PROPERTY LINE
- LOT LINE
- STREET CENTERLINE
- PROPOSED WALL
- EXISTING WALL
- PROPOSED "L" CURB & GUTTER
- EXISTING "L" CURB & GUTTER
- XXXX EXISTING CONTOUR LINES
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- SAWCUT AND REMOVE EXISTING ASPHALT
- 00.00 LOC — PROPOSED ELEVATION & LOCATION
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- CL CENTERLINE
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- # STREET CAPACITY SECTION # = LOCATION (SEE DATA TABLE)

Developed Condition		
Source	100-Year Flow (cfs)	10-Year Flow (cfs)
OFFA*	30	17
OWENS*	6	4
DSITES	5	3
CP1	40	22
DSITEN	2	3

Street Capacity Summary

Location	Q (cfs)	D (feet)	V (fps)	DxV	Remarks
100-Year Flow – Ultimate Conditions					
HS1) Owens - Upstream*	6	0.28	4.52	1.27	VxD <8 is met; D less than 2 ft
HS2) Owens - Downstream*	40	0.47	6.84	3.21	VxD <8 is met; D less than 2 ft
10-Year Flow – Ultimate Conditions					
HS1) Owens - Upstream*	4	0.26	4.22	1.10	VxD <6 is met; D less than 1; 10-yr dry lane is met
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*=Referenced from MD Development

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LAS VEGAS, NV 89128
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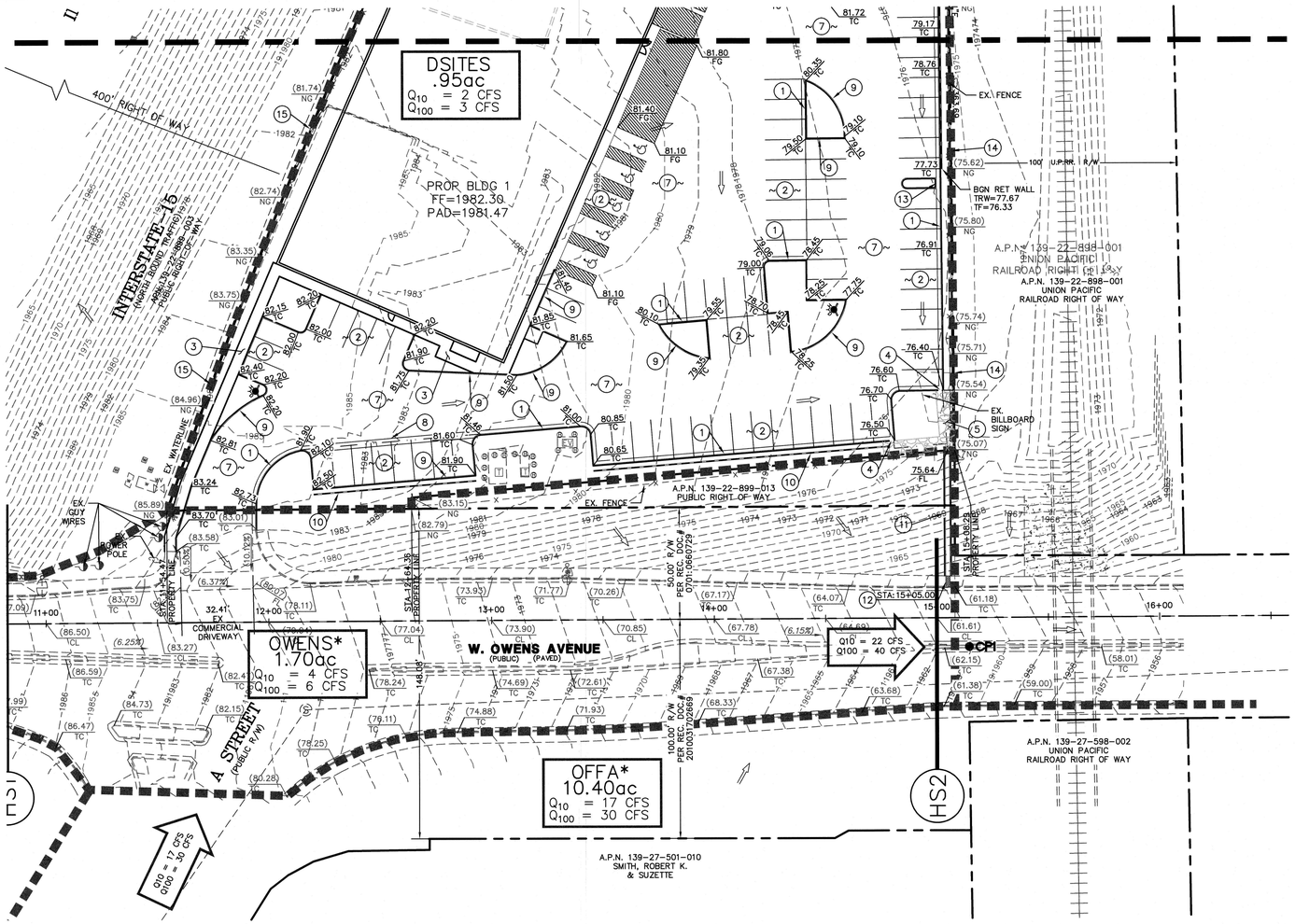
DATE	2/27/2020
DESIGN	SW
DRAWN	JC
CHECK	SW
SCALE	

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RED REALTY-CULTIVATION FACILITY
DEVELOPED ON-SITE CONDITIONS MAP
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.& M.
CITY OF NORTH LAS VEGAS NEVADA
APN 139-22-803-002

SHEET
FIG10

PROJ. NO.
K095



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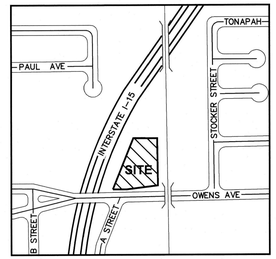
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CITY OF NORTH LAS VEGAS **APN 139-22-803-002**

SHEET
FIG10

PROJ. NO.
K095