

DS #: 4573

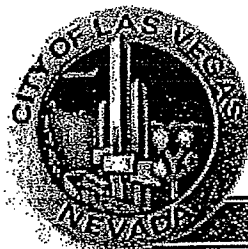
APN: 126-24-517-004

PROJECT: City Stop #11

SUBMITTAL: 1st

SCANNED BY/DATE: _____

CHECKED BY/DATE: _____



CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		October 10, 2012
TO: Land Development Services Department of Public Works		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for:	
	City Stop #11	
Cross Streets:	SWC of Elkhorn Road & Hualapai Way	
File Number:	F:\Depot\DSMemos\DS4573A.doc	
Parcel Number:	126-24-517-004	
Zoning Action:	SDR-44850	
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES	NO X
		COPIES TO: Baughman & Turner, Inc. Providence Plaza, LLC Bart Anderson, P.E., DevCo CCRFC

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	9/26/2012	10/10/2012	See Comments Below	\$400.00	297083: \$400
TOTAL FEES (LDDRS):					----

REMARKS:

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

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

1. A low point is proposed to collect onsite storm discharge with a CM Type drop inlet at the proximity of the northeast corner of the proposed building. Address whether an emergency overflow path is available in a worst case scenario such as the complete clogging of the drop inlet during a storm event.
2. Per *Section A/DT1*, a flow line is proposed in the landscape area between an existing retaining wall and a proposed onsite drive. However, the flow line is not found in the grading plan. Show the flow line and label with FL elevations at regular intervals.
3. *Section C/DT1* shows a flow line right at the property line between the two parcels. This will create a maintenance responsibility problem in the future. Position the flow line to be completely within the subject property. Revise the section and show the flow line on the grading plan accordingly.
4. The location of *Section F/DT1* on the grading plan appears to not matching what is shown in the detail. Review and revise accordingly.
5. *Section G/DT1* is missing in the detail sheet. Provide as such in the next submittal.
6. Provide a note on the grading plan: **ALL ONSITE STORM DRAINS AND THE ASSOCIATED FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.**

7. Add a note in all pertinent sheets for the construction of all storm drain drop inlets per a newly adopted USDCCA Drawing No. 421 (*Stormwater Quality Management Stamp and Sign Detail*).

In an effort to increase administrative efficiency, the City of Las Vegas Public Works Department requires all soil reports, drainage studies and traffic impact analysis submittals to be accompanied by an electronic copy of the submittal. Electronic documents must be submitted with one original hard copy of the study. Electronic documents should be on a universal computer-readable digital output replicating your submittal to be used for archival or display purposes. This may be more than one file if necessary. An Indexed Portable Document Format (PDF) or Print Ready CAD file formats with a minimum of 300dpi are the desired formats, but provided it is a high quality digitized replication of the submittal, other formats may be acceptable. If figures are in color, they must be scanned in color and saved as a separate file. The new submittal requirement is effective on **July 1, 2011**. If there are any questions regarding these new requirements, please contact Albert Sung in the Flood Section at (702) 229-2001 or Rick Schroder in Traffic Engineering at (702) 229-6327.

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

END OF REMARKS
ays

T/R/S: T19S/R59E/24
AREA K-24

*** FAX TX REPORT ***

TRANSMISSION OK

JOB NO. 4951
 DESTINATION ADDRESS 8782695
 PSWD/SUBADDRESS
 DESTINATION ID
 ST. TIME 10/10 17:29
 USAGE T 00' 36
 PGS. 2
 RESULT OK

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		October 10, 2012
TO: Land Development Services Department of Public Works		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: City Stop #11	COPIES TO: Baughman & Turner, Inc.
Cross Streets:	SWC of Elkhorn Road & Hualapai Way	Providence Plaza, LLC
File Number:	F:\Depot\DSMemos\DS4573A.doc	Bart Anderson, P.E., DevCo
Parcel Number:	126-24-517-004	CCRFC
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1 st Submittal	9/26/2012	10/10/2012	See Comments Below	\$400.00	297083: \$400
			TOTAL FEES (LDDRS):		----

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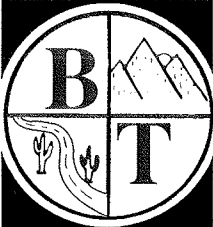
Rec'd: 9/26/12

DS 4573

K-24

\$400

SDR-44850



BAUGHMAN & TURNER, INC.

CONSULTING ENGINEERS AND LAND SURVEYORS

1210 HINSON LAS VEGAS, NEVADA 89102

PHONE (702) 870-8771 FAX (702) 878-2695

**TECHNICAL DRAINAGE STUDY FOR
CITY STOP #11
SECTION 24, TOWNSHIP 19 SOUTH, RANGE 59 EAST
CITY OF LAS VEGAS, NEVADA**

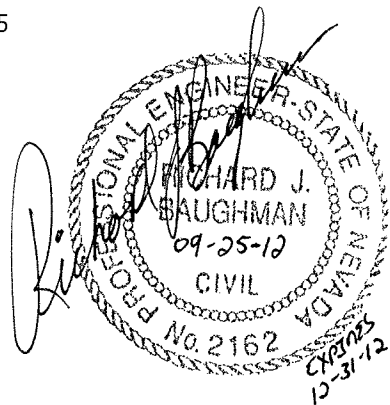
September 25, 2012

PREPARED FOR:

FAMILIAN DEVELOPMENT
4534 W. HACIENDA AVENUE, SUITE A
LAS VEGAS, NEVADA 89118

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: City Stop Providence Plaza Date: September 7, 2012
 Location of Development: a) Descriptive (Cross Streets) North/South: Hualapai Way
East/West: Elkhorn Road
 b) Section: 24 Township: 19 S Range: 59 E
 c) APN: 126-24-517-004

Name of Owner: Providence Plaza, LLC
 Telephone No.: (702) 227-9267 Fax No.: (702) 878-2695 E-Mail Address: _____
 Address: 4534 W. Hacienda, Suite A Las Vegas, NV 89118

Contact Person-Name: Pamela Pitcher Telephone No.: 702-870-8771
 *E-Mail Address: pamo@baughmanturner.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:

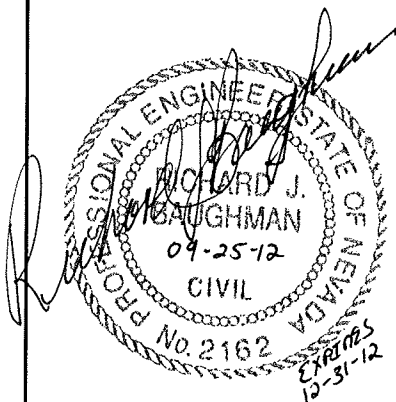
☐ Rezoning	☐ Subdivision Map	☐ Clearing and Grading Only
☐ Parcel Map	☐ Planned Unit Development	☐ Other (Please specify below)
☐ Large Parcel Map	☒ Building Permit	

1. Total Owned Land Area: At Site: 1.12 ac Being Developed/Disturbed: 1.12 ac
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ Yes** ☒ No
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☒ Yes** ☐ No
4. Proposed type of development (Residential, Commercial, Etc.): Commercial – Convenience Store
5. Approximate upstream land area which drains to the subject site: 1.12 acres
6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: TDS for Greenstreet @POD 122, DS4232 approved October 30, 2007 by VTN Nevada
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Southeast to drop inlet and Hualapai Way
8. Briefly describe your proposed schedule for the subject project: _____
Construction to begin in Winter 2012

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. _____	



Engineer's Seal

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

Baughman & Turner, Inc.

Consulting Engineers & Land Surveyors

1210 HINSON ST.
LAS VEGAS, NEVADA 89102-1604

PHONE (702) 870-8771
FAX (702) 878-2695

September 25, 2012
24-19-59

City of Las Vegas Development Services

Attn.: Mr. Albert Sung, PE

123 South Rancho Drive
Las Vegas, Nevada 89102

Re: Technical Drainage Study for City Stop #11 (Providence)

Dear Mr. Sung,

Transmitted herewith for your approval are two (2) copies of the hydrology study City Stop # 11 at Providence. The property lies at the southwest corner of Elkhorn Lane and Hualapai Way. The proposed development is for a City Stop convenience store and car wash on 1.12 acres.

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

Sincerely,

Baughman & Turner, Inc.



Pamela J. Pitcher
Hydrology & Traffic Manager

PJP/po

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	GENERAL DESCRIPTION.....	1
	A. Location.....	1
	B. Property Description.....	1
	C. Master Planning Information	1
	D. Floodplain Information.....	2
	E. Previous Hydrology Studies	2
III.	HYDROLOGY	2
	A. Existing Offsite Drainage Conditions.....	2
	B. Existing Onsite Drainage Conditions.....	3
	C. Developed Offsite Drainage Conditions.....	4
	D. Developed Onsite Drainage Conditions.....	4
	E. Compliance with Regulations and Adopted Plans	4
IV.	HYDROLOGIC/HYDRAULIC CRITERIA.....	4
	A. Soil Classification.....	4
	B. Precipitation	5
	C. Time of Concentration and Lag Time.....	5
	D. Summary of Findings.....	5
	E. Facility Design Calculations	6
	1. Street Capacity.....	6
	2. Finished Floor Calculations	7
	3. Storm Drain, Inlet and Outlet	8
	4. Proposed Facilities.....	8
V.	CONCLUSIONS	8
	A. Compliance with Agency Regulations	8
	B. Overall Facility Effectiveness	8
VI.	REFERENCES	9

APPENDIX

- A. Soil Classification, Curve Number
- B. Precipitation
- C. Time of Concentration
- D. HEC-1 Printouts – Existing Condition
- E. HEC-1 Printouts – Developed Condition
- F. Street Capacity and Drive Aisle Calculations
- G. Storm Drain Calculations
- H. Previous Studies – Greenstreet @ POD 122
- I. City Zoning Requirements
- J. Form 2, City Checklist

I. INTRODUCTION

This study analyzes the development of City Stop, a convenience store with drive-thru and car wash. The site has been analyzed previously in several drainage studies associated with the Cliff's Edge Master Plan development including the *Technical Drainage Study for Greenstreet @ POD 122* by VTN Nevada (DS 4232) which discusses the site specifically. The study analyzed the offsite flows to the site as well as the development of the parcel. The study was approved on October 30m 2007. Analysis presented herein was established after first consulting with the Clark County Regional Control District's (CCRFCD) 2008 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 1.12-acre site is located in a portion of the North Half (N ½) of the Northeast Quarter (NE¼) of Section 24, Township 19 South, Range 59 East, M.D.B.&M., City of Las Vegas, Clark County, Nevada. The property lies 300 ft south of the intersection of Elkhorn Road and Hualapai Way (see Figure 1, Vicinity Map). The site is more specifically described as Assessor's Parcel Numbers 126-24-517-004 (see Figure 2, Assessor's Parcel Map).

B. Property Description

The property is about 1.12 acres of developed land. Currently the site is developed as an information center for the Providence at Cliff's Edge Development. Commercial development borders the north property line; residential homes border the south and west property lines. Hualapai Way borders the east property line. There is an existing retaining wall along the south and east property lines. An existing low point at the southeast corner of the site directs flows to an existing drop inlet. (See Figure 3 and 4, Aerial Map). The parcel is being re-developed as a convenience store and car wash.

C. Master Planning Information

The Clark County Regional Flood Control District's (CCRFCD) 2008 Master Plan Update, a comprehensive plan to facilitate construction of regionally significant flood control structures to alleviate flooding in the Las Vegas Valley, has one existing facilities adjacent to the site.

A review of the 2008 CCRFCD's Master Plan Update Amendment, Figure F-13, (see Figure 5, Flood Control Facilities), indicates that there is an exiting regional facility adjacent to the site in Hualapai Way. Structure BCHU 0054 (Beltway Channel-Hualapai) is an existing 54-inch RCP.

The proposed development is located in a portion of sub-basin NWBA3-C, as shown on

Master Plan Figure H-13 (see Figure 6, Hydrologic Sub-basins).

D. Floodplain Information

The Flood Insurance Rate Map, Clark County, Nevada, Community Panel No. 32003 C 1750 E (effective date September 27, 2002), 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 studies were reviewed in the preparation of this study. Reference material from these studies are included in Appendix H.

- 1) Technical Drainage Study for Greenstreet @ POD 122, dated September 7, 2007, by VTN Nevada, approved October 30, 2007 (DS #4232).

The Greenstreet study defines all the offsite flows reaching the site, on-site flows and determines the flows in Hualapai Way. The study is referred to hereafter as Greenstreet. This study references material from the Master Drainage Study for Cliff's Edge (DS3404), Technical Drainage for Cliff's Edge Infrastructure, Phase I (DS3576), Technical Drainage for Cliff's Edge Infrastructure, Phase II (DS3617), Technical Drainage for Cliff's Edge Information Center (DS3825), and Technical Drainage for Liberty Square @ Providence (DS4148). See Appendix H for reference text and calculations.

The referenced studies have been reviewed and Baughman & Turner, Inc. concurs with their results.

III. HYDROLOGY

A. Existing Onsite and Offsite Drainage Conditions

According to the Greenstreet drainage study, the offsite flows impacting the site extends west to include Liberty Square at Providence, an existing residential community, and north to include the commercial development of Liberty Square at Providence. The offsite area is fully developed and designated as DEVOF1 and a portion of DEVON1 (See Figure 8, reference exhibit Figure 5C, Developed Condition Basin Map). The Greenstreet study estimated the runoff from basin DEVOF1 to be about 9 and 19 cfs during the 10- and 100-year storms, respectively. According to that study,

"Runoff generated from Basin DEVOF1 will route along the perimeter street located to the west boundary of the proposed site. The flow from basin DEVOF1 will be

captured by an existing drop inlet located at the entrance on Hualapai Way, as presented in the approved TDS for Liberty Square @ Providence. The offsite flow in the perimeter streets (Hualapai Way) was referenced from the developed condition from the Cliff's Edge Master Drainage Study (MDS). In general, the flow in Elkhorn Road is routed east within the respective right-of-way and flow in Hualapai Way routed south within its right-of-way."

For this study a portion of basin DEVON1 is considered offsite. In the approved Greenstreet DS, DEVON1 was analyzed as one (1) basin, although development was in two phases. Phase 1 is the existing commercial development to the north and the City Stop parcel is Phase 2. The Greenstreet DS broke the two Phases out in the manner described next.

"Runoff generated by Phase 1 and Phase 2 have been calculated based on the flow/area ratio method. Phase 1 site is estimated to generate 10 cfs during the 100-yr storm event and Phase 2 (this site) is estimated to generate 3 cfs during the 100-year storm event."

Runoff generated by Phase 1 will be collected by an existing 15' Type CM drop inlet in the southeast corner of Phase 1 and discharged to the existing 24-inch on-site storm drain. This storm drain will discharge to the existing 54-inch storm drain in Hualapai Way. Runoff associated with Phase 1 is intended to be collected in the drop inlet and not impact Phase 2 (City Stop site).

B. Existing Onsite Drainage Conditions

As mentioned above, according to the drainage study for Greenstreet the existing site will generate approximately 3 cfs in the 100-yr storm. Runoff is directed to a low point near the southeast corner of the site where a single grate Type CM drop inlet collects the flows and discharges them into the existing storm drain in Hualapai Way

C. Developed Offsite Drainage Conditions

The offsite is fully developed, therefore, the developed offsite conditions are the same as the existing offsite conditions.

D. Developed Onsite Drainage Conditions

The developed site is divided into two (2) basins; DON2 and DON3 (see Figure 9, Developed Onsite Drainage Basin Map .) Basin DON2 is the northern portion of the site. Basin DON2 generates 2 and 1 cfs which travels east, as in the existing condition, to a low point where a proposed single grate Type CM drop inlet collects the flows and discharges them into the existing storm drain in Hualapai Way. Basin DON3 is the southerly portion of the site. Basin DON3 generates about 1 and 1 cfs in the 10- and 100-yr, 6-hour storm. The flow from basin DON3 is directed to the southwest corner of the site and discharges to the

entry to Liberty Square. The flow from basin DON3 will be captured by an existing drop inlet located at the entrance to the site on Hualapai Way, as presented in the approved TDS for Liberty Square @ Providence.

IV. HYDROLOGIC/HYDRAULIC CRITERIA

A. Soil Classification

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 191, Dalian. The soil has a weighted hydrologic soils group of B. The curve number for the on and offsite, existing and developed drainage areas were calculated using Table 602 sheet 1 of 4, for Urban Districts: Commercial and Business. Calculations for the CN values are referenced from the Greenstreet DS. The developed onsite curve number is 93. The soils information is included in Appendix A.

B. Precipitation

The project and associated offsite basins are located outside the McCarran Airport Rainfall area as shown on Figure 513 of the HCDDM. "Precipitation values were referenced from the approved Master Drainage Study for Cliff's Edge, which were calculated using the NOAA 2 Atlases and area precipitation adjustment ratios." The aforementioned HCDDM figures and tables are included in Appendix B.

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:

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

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 D and E.

Table 1. Peak Flow Summary

Existing Condition		
Source	100-Year Flow (cfs)	10-Year Flow (cfs)
DEVON1-Phase 1*	10	4.62
DEVON1-Phase 2*	3	1.38
DEVOF1*	19	9
CP-1*	32	15

*Flows referenced from Greenstreet study

Table 2. Peak Flow Summary

Developed Site Condition		
Source	100-Year Flow (cfs)	10-Year Flow (cfs)
DEVON1-Phase 1*	10	4.62
DON2	2	1
DON3	1	1
DEVOF1*	19	9
CP-1*	32	15

*Flows referenced from Greenstreet study

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 program designed by ACOE (Army Corps of Engineers) to evaluate rainfall runoff models. The results are shown in the Table above. A summary of input parameters and the HEC-1 printouts can be found in Appendices D and E.

E. Facility Design Calculations**1. Street Capacity**

Street capacity analyses were performed to determine the depth of flow in the drive aisles on site and Hualapai Way. Table 3 summarizes the 100 and 10-year flow in the streets.

Table 3. Street Capacity Summary

Location	Q (cfs)	D (feet)	V (fps)	D x V	Remarks
100-Year Flow – Developed Conditions					
Section 1	2	0.11	1.26	0.14	VxD <8 is met; D less than 2 ft. is met
Section 2	2	0.21	1.71	0.34	VxD <8 is met; D less than 2 ft. is met
Section 3	19	0.41	3.53	1.45	VxD <8 is met; D less than 2 ft. is met
Section 4	1	0.15	1.94	0.29	VxD <8 is met; D less than 2 ft. is met
HUAL-13*	132	0.88	4.22	3.71	VxD <8 is met; D less than 2 ft. is met
10-Year Flow – Developed Conditions					
HUAL-13*	0	-	-	-	VxD <6 is met; D less than 1;

*Referenced from the Technical Drainage Study for Cliff's Edge Phases I and II

All the roadways meet the 100-year City of Las Vegas criteria for depth and VxD (i.e. VxD less than 8), as well as, the 10-year criteria for VxD (i.e. VxD less than 6). See Appendix F for street capacity calculations.

2. Finished Floor Calculations

Finished Floor Elevation analysis for the buildings was determined according to the specifications outlined in the CCRFCD's Hydrologic Criteria and Drainage Design Manual. Table 4 summarizes the analysis. Per the criteria, the finished floors should be set a minimum of twice the depth of flow above the drive aisles flowlines, twice the depth above the street flowlines and 6-inches above the highest adjacent top of curb. All the proposed finished floors meet these criteria.

Table 4. Minimum Future Finished Floor Elevation Determination

Street	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	Minimum Finished Floor
Entry	52.35	0.5	52.85	51.85	0.41	0.41	52.67	2852.85 < 2853.30
Section 1	51.70	0.5	52.20	51.20	0.11	0.11	51.42	2852.20 < 2853.30
Section 4	51.65	0.5	52.15	51.15	0.15	0.15	51.45	2852.15 < 2853.30

Car Wash Section 3	54.33	0.5	54.83	53.83	0.41	0.41	54.65	2854.83<2855.00
-------------------------------	-------	-----	-------	-------	------	------	-------	---------------------------

The finished floor elevation of the City Stop building has been set at 2853.30 and the car wash has been set at 2854.65 which meets all criteria. On-site flows will be directed away from buildings by positive grading. The proposed finished floors have been set above the surrounding flowlines and street flows.

3. Storm Drain Inlet

According to the Greenstreet @ POD 122 study, "An existing storm drain system that was constructed with the Cliff's Edge Infrastructure within Elkhorn and Hualapai way, was designed to collect all of the tributary 10-year flows, and enough of the 100-year flow to keep the flow contained within the limits of each right-of-way." The study determined that the existing 15' Type CM drop inlet on the north parcel (Phase 1) will collect the expect 10 cfs and discharge them into an existing 24-inch storm drain on-site. Additionally, the existing single grate Type CM drop inlet was designed to collect the expected 3 cfs generated by this site Phase I).

The layout of the proposed site requires the relocation of the existing drop inlet. The drop inlet will be relocated just north of the existing location. The drop inlet will still discharge into the existing 24-inch storm drain. See Appendix G for the drop inlet calculations.

4. Proposed Facilities

The drainage facilities required for this site consist of:

- a) Positive onsite grading;
- b) The lowest finished floor will be elevated to Clark County/City of Las Vegas standards
- c) relocate the single grate CM Type drop inlet
- e) remove and replace 15 ft of 24-inch RCP storm drain
- f) install 60" Type I storm drain manhole
- f) install slot gutter

V. CONCLUSIONS

A. Compliance with Agency Regulations

All design criteria has been established after first consulting with the CCRFCD's 2002 Master Plan Update, FEMA regulations and policies, and the CCRFCD's Hydrologic Criteria and Drainage Design Manual. City of Las Vegas will review this study as it relates to development standards and overall facility effectiveness. Regional Flood Control will review this study as it relates to Regional facilities.

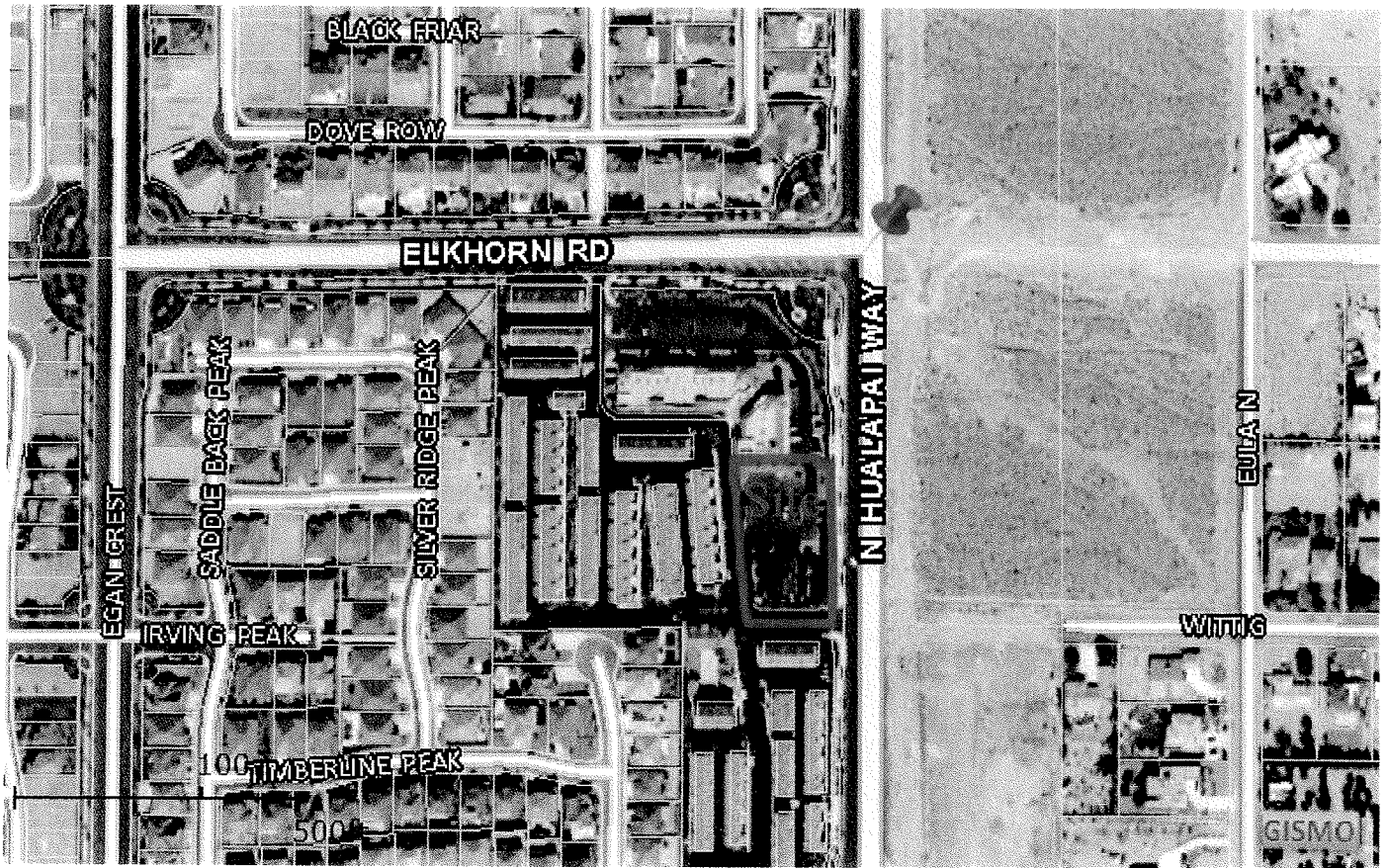
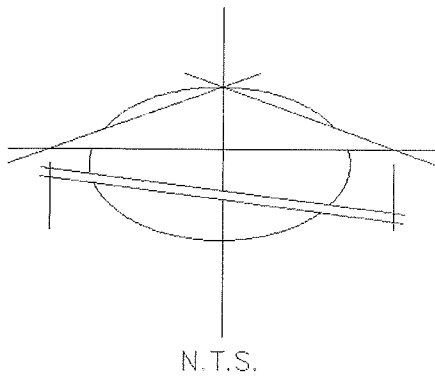
B. Overall Facility Effectiveness

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 within the existing street system to Clark County standards. Due to existing drainage issues, existing flow patterns will be altered slightly to allow offsite storm water to discharge to Windmill Lane.

VI. REFERENCES

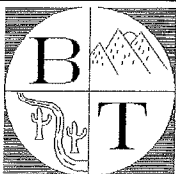
The following documents were used in the preparation of this hydrology study update:

- 1) DRAINAGE DESIGN MANUAL, 1999 - Hydrologic Criteria and Drainage Design Manual, Clark County Regional Flood Control District.
- 2) CCRFCD, 2008 - Flood Control Master Plan Update, Volumes 1 and 2, Clark County Regional Flood Control District, James M. Montgomery Consulting Engineers, Inc., September, 2002.
- 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, 2002 - Flood Insurance Rate Maps, Clark County, Nevada, U.S. Federal Emergency Management Agency, September 27, 2002.
- 5) HEC, 1988 - HEC-1 Flood Hydrograph Package, Users Manual, U.S. Army Corps of Engineers, the Hydrologic Engineering Center, Davis, California, 1988.
- 6) Providence at Cliff's Edge, 2007 - Technical Drainage for Greenstreet @ POD 122, dated September 7, 2007, by VTN Nevada, approved October 30, 2007.



GENERAL AERIAL VIEW

FIGURE 3

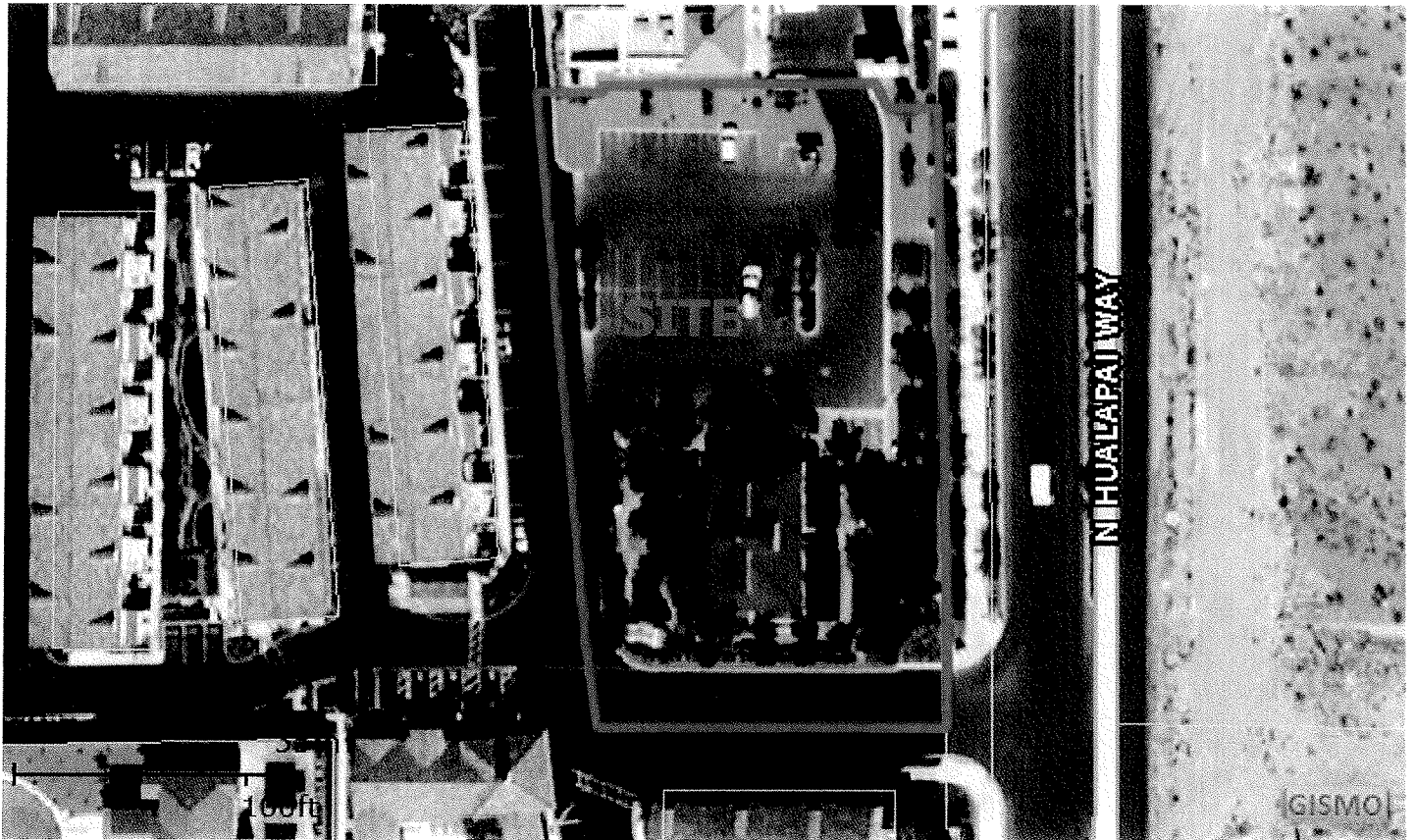
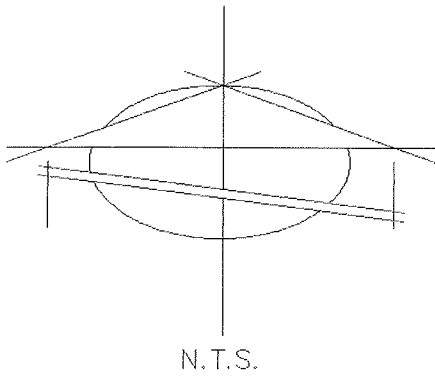


BAUGHMAN & TURNER, INC.
 CIVIL ENGINEERS LAND SURVEYORS LAND PLANNERS
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 (702) 870-8771

PREPARED FOR :

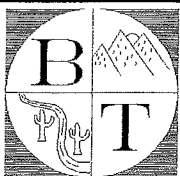
**City Stop
 Providence**

DATE: Sept 2012
 DESIGN: PJP
 DRAWN: PJP
 FIGURE NO:
 JOB:



AERIAL VIEW

FIGURE 4



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PREPARED FOR :

**City Stop
 Providence**

DATE: Sept 2012
 DESIGN: PJP
 DRAWN: PJP
 FIGURE NO: 4
 JOB:

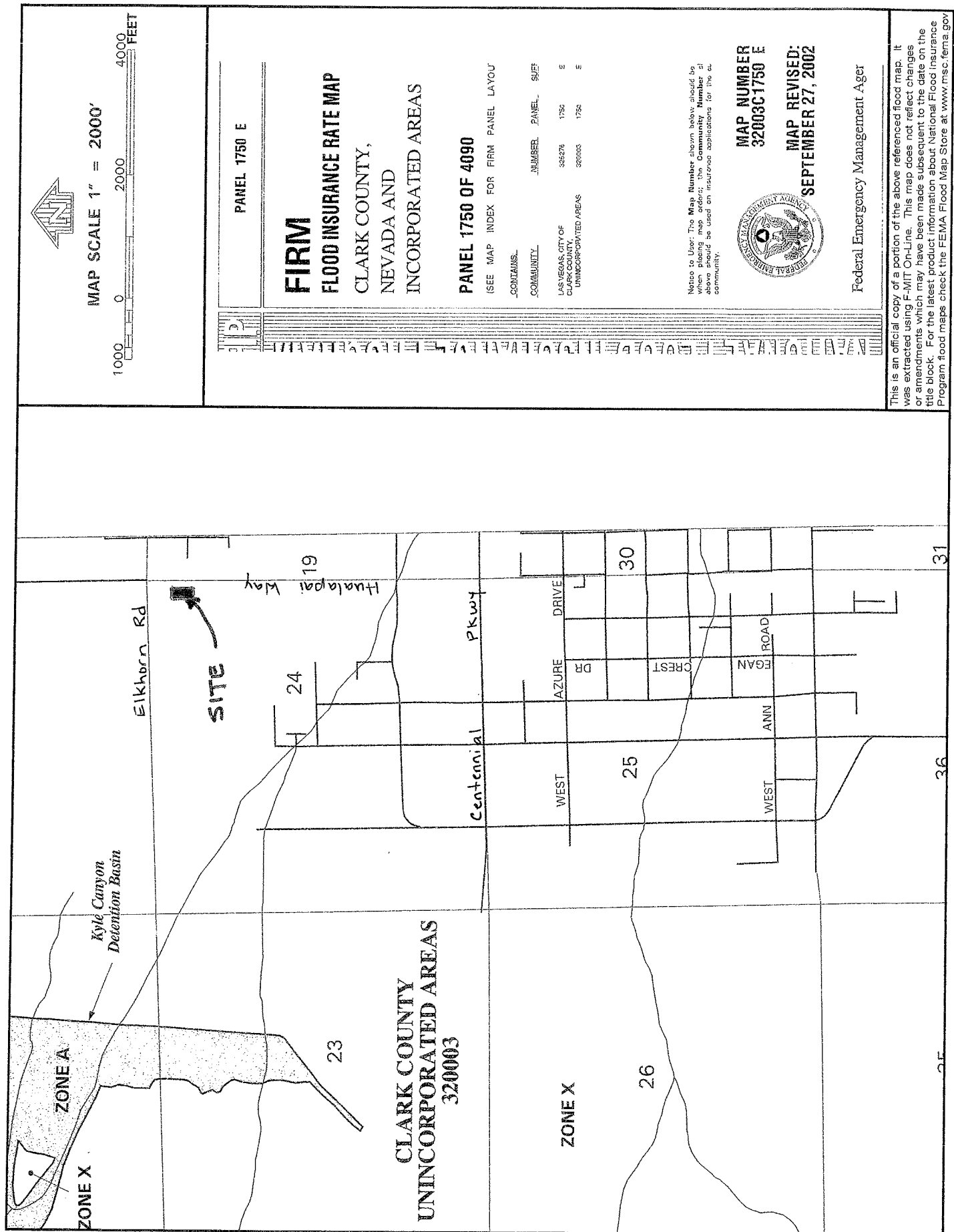
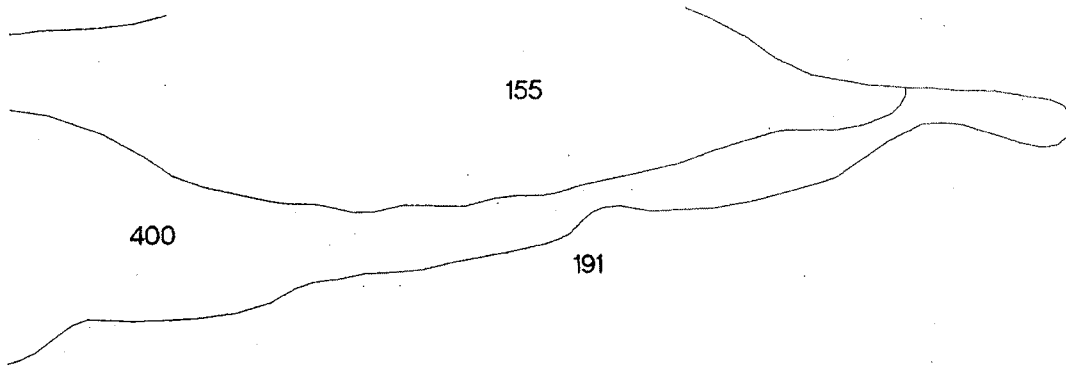
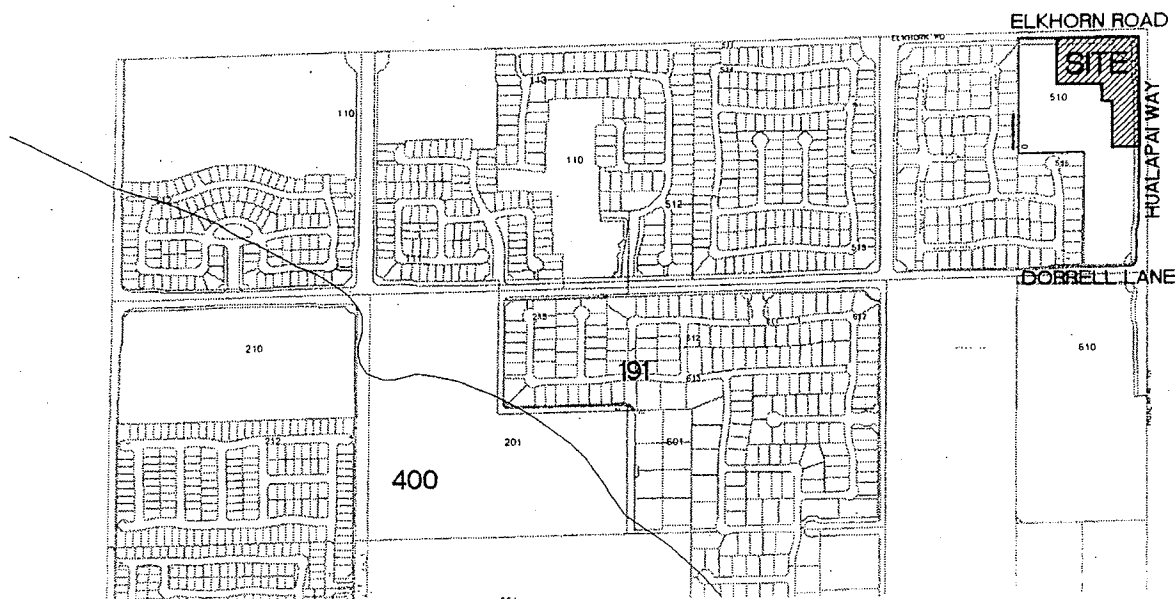


FIGURE 1



REFERENCE



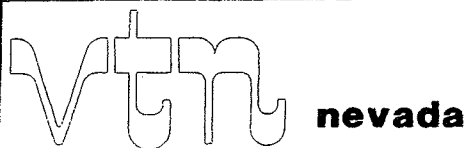
GRAPHIC SCALE



1" = 1000'

LEGEND

- - SITE BOUNDARY
- 191 - SOIL NUMBER



2727 S. RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148

POD 122 AT CLIFFS EDGE (GREENSTREET) SOILS MAP

FIGURE 4

SCALE	HORZ.	1000
	VERT.	N/A
W.O. NO.		6862
DRAWN BY:		SB
DATE:		JULY 2007
SHEET		1 OF 1

CURVE NUMBERS FOR SOILS

Soil #191 Dalian very cobbly fine sandy loam, 2 to 8 percent slopes.				
Soil	Percent	Group	Existing ₁	Commercial ₂
Dalian	85%	B	77	92
Tencee	10%	D	88	95
Arizo	5%	A	63	89
Total	100%		78	93

Notes:

- 1- Referenced from Table 602 (4 of 4), Desert Shrub, Poor Condition
- 2- Referenced from Table 602 (1 of 4), Urban District, Commercial and business

Curve Number calculations for basins

Basin	Existing	Commercial	CN Value
EXON1	80.00%	20%	81
EXOF1	0.00%	100%	93
INON1	0.00%	100%	93
INOF1	0.00%	100%	93
DEVON1	0.00%	100%	93
DEVOF1	0.00%	100%	93

REFERENCE

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RUNOFF CURVE NUMBERS (URBAN AREAS¹)

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area ²	A	B	C	D
<i>Fully developed urban areas (vegetation established)</i>					
Open space (lawns, parks, golf courses, cemeteries, etc.):					
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)...		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	82	82	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) ³	77	86	91	94
--	----	----	----	----

1 Average runoff condition, and $I_p = 0.25$.

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

sandy loam about 4 inches thick. The upper 7 inches of the underlying material is light yellowish brown extremely gravelly fine sandy loam, the next 6 inches is light yellowish brown very gravelly sandy loam, and the lower part to a depth of 61 inches is light yellowish brown extremely gravelly fine sandy loam. Pebbles cover 50 to 75 percent of the surface.

Included in this unit are about 5 percent Tencee soils on erosional fan remnants and 10 percent Arizo soils, flooded, in channels. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another.

Permeability of this Dalian soil is moderately rapid. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used mainly as habitat for desert wildlife and for recreation. It is also used for urban development.

This unit is well suited to the construction of dwellings.

Septic tank absorption fields generally function well unless the density of housing is too high.

Roads are easily constructed and maintained.

The main limitation for lawns and landscaping is the pebbles on the surface and throughout the soil. Topsoil is needed for best results when landscaping, particularly in areas used for lawns. Lawn grasses, shrubs, and trees that are not sensitive to lime-induced chlorosis are well suited to use in landscaping. Annual applications of iron chelates reduce the effects of chlorosis.

Intermittent streams form the drainageways in this unit. These drainageways are subject to rare or occasional periods of high-velocity flooding. Care should be taken during urbanization to accommodate the runoff from the drainageways. If drains become plugged during a major flood, accelerated erosion and damage to roads, buildings, and other structures can occur.

This map unit is in capability subclasses IVs, irrigated, and VIIs, nonirrigated. It is in horticultural group 2.

→ **191—Dalian very cobbly fine sandy loam, 2 to 8 percent slopes.** This very deep, well drained soil is on fan skirts. It formed in alluvium derived dominantly from limestone and dolomite.

Typically, about 85 percent of the surface is covered with a desert pavement of rock fragments. The surface layer is light yellowish brown very cobbly fine sandy loam about 5 inches thick. The underlying material to a depth of 60 inches or more is light yellowish brown very gravelly sandy loam to extremely gravelly fine sandy loam.

Included in this unit are about 10 percent Tencee soils on erosional fan remnants and 5 percent Arizo soils, flooded, in channels. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another.

Permeability of this Dalian soil is moderately rapid. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate if the surface is disturbed. This soil is subject to rare periods of flooding during prolonged, high-intensity storms. Channeling and deposition are common along streambanks.

Most areas of this unit are used as habitat for desert wildlife and for recreation. A few areas are used for urban development.

The main limitation for construction of dwellings is the hazard of flooding. Dikes and channels that have outlets for floodwater can be used to protect buildings from flooding.

Dikes and channels that have outlets for floodwater can be used to protect onsite sewage disposal systems from flooding.

Channeling and deposition can be minimized and maintenance costs reduced by protecting roads from flooding.

The main limitations for lawns and landscaping are the cobbles and pebbles on the surface and throughout the soil. Topsoil is needed for best results when landscaping, particularly in areas used for lawns. Lawn grasses, shrubs, and trees that are not sensitive to lime-induced chlorosis are well suited to use in landscaping. Annual applications of iron chelates reduce the effects of chlorosis.

This map unit is in capability subclass VIIs, nonirrigated, and in horticultural group 2.

192—Dalian-McCullough complex, 0 to 4 percent slopes. This map unit is on fan skirts.

This unit is 55 percent Dalian very gravelly fine sandy loam, 0 to 4 percent slopes, and 35 percent McCullough very gravelly very fine sandy loam, gravelly substratum, 0 to 4 percent slopes. Both the Dalian and McCullough soils are on alluvial fan skirts. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are about 5 percent Las Vegas soils on basin floor remnants and 5 percent Tencee soils on erosional fan remnants. Included areas make up about 10 percent of the total acreage.

The Dalian soil is very deep and well drained. It formed in alluvium derived from various kinds of rock. Typically, about 75 percent of the surface is covered with a desert pavement of pebbles. The surface layer is light yellowish brown very gravelly fine sandy loam about 5 inches thick. The underlying material to a depth of 60 inches or more is light yellowish brown very gravelly sandy loam.

Permeability of the Dalian soil is moderately rapid. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding		High water table		Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Months	Depth	Months	Depth	Thick-ness	Depth	Hard-ness	Uncoated steel	Concrete
				<u>Ft</u>		<u>In</u>		<u>In</u>			
270----- Land	B	Rare-----	---	3.5-6.0	Mar-Sep	>60	---	---	---	High-----	High.
278----- Land	D	Rare-----	---	1.5-3.0	Jan-Dec	>60	---	---	---	High-----	High.
282----- Land	C	Rare-----	---	3.0-3.5	Jan-Dec	>60	---	---	---	High-----	High.
300, 301----- Las Vegas	D	Rare-----	---	>6.0	---	>60	---	3-14	Thick	High-----	High.
302*: Las Vegas-----	D	Rare-----	---	>6.0	---	>60	---	3-14	Thick	High-----	High.
McCarran-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
Grapevine-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
305*: Las Vegas-----	D	Rare-----	---	>6.0	---	>60	---	3-14	Thick	High-----	High.
Destazo-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
307*: Las Vegas-----	D	Rare-----	---	>6.0	---	>60	---	3-14	Thick	High-----	High.
Skyhaven-----	C	Rare-----	---	>6.0	---	>60	---	24-40	Thick	High-----	High.
325, 326----- McCarran	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
341----- Paradise	C	Rare-----	---	3.0-5.0	Dec-Mar	>60	---	---	---	High-----	Low.
360*: Rock outcrop.											
St. Thomas-----	D	None-----	---	>6.0	---	4-20	Hard	---	---	High-----	Low.
380----- Skyhaven	C	Rare-----	---	>6.0	---	>60	---	24-40	Thick	High-----	High.
390----- Spring	C	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
400----- Tencee	D	None-----	---	>6.0	---	>60	---	7-20	Thick	High-----	Low.
415----- Aztec	B	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
417*: Aztec-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
Rock outcrop.											
418*: Aztec-----	E	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
Nickel-----	B	None-----	---	>6.0	---	40-60	Hard	---	---	High-----	Low.
Knob Hill-----	E	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding		High water table		Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Months	Depth	Months	Depth	Thick-ness	Depth	Hard-ness	Uncoated steel	Concrete
				<u>Ft</u>		<u>In</u>		<u>In</u>			
182*: Caliza-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Pittman-----	C	None-----	---	>6.0	---	>60	---	20-30	Thick	High-----	Low.
Arizo-----	A	Occasional	Mar-Sep	>6.0	---	>60	---	---	---	High-----	Low.
183----- Caliza	B	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
184----- Caliza	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
187----- Caliza	B	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
190----- Dalian	B	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
191----- Dalian	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
192*: Dalian-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
McCullough-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
200----- Glencarb	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Moderate.
206----- Glencarb	C	Occasional	Jul-Sep	3.0-5.0	Jul-Jun	>60	---	---	---	High-----	High.
222----- Glencarb	C	Rare-----	---	3.0-5.0	Jul-Jun	>60	---	---	---	High-----	High.
236----- Glencarb	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
237----- Glencarb	B	Rare-----	---	>6.0	---	>60	---	40-60	Thick	High-----	Low.
240----- Goodsprings	D	None-----	---	>6.0	---	>60	---	9-20	Thick	High-----	Low.
252, 255----- Grapevine	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
260----- Jean	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
262*: Jean-----	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Jean-----	A	Occasional	Jun-Sep	>6.0	---	>60	---	---	---	High-----	Low.
Goodsprings-----	D	Rare-----	---	>6.0	---	>60	---	9-20	Thick	High-----	Low.
263*: Jean-----	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Jean-----	A	Occasional	Jun-Sep	>6.0	---	>60	---	---	---	High-----	Low.
264----- Jean	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES

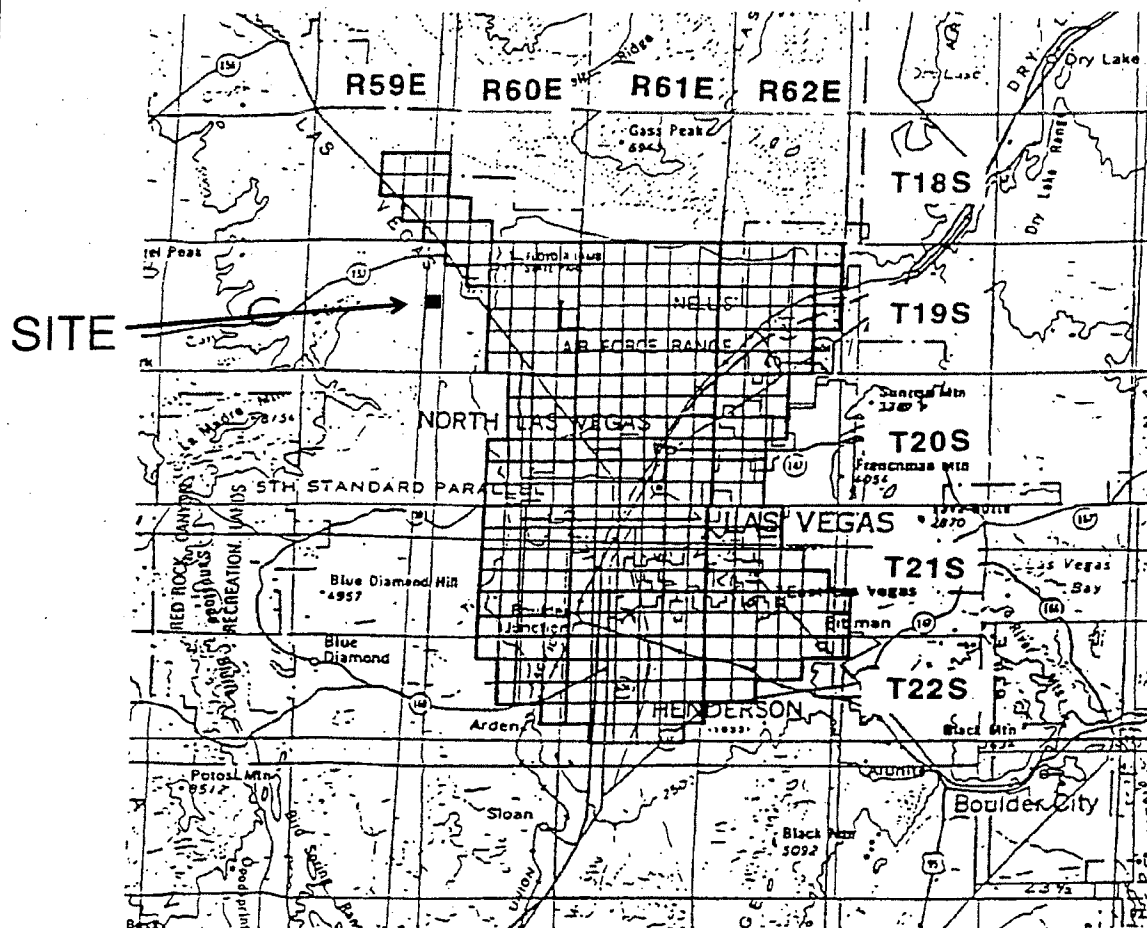
["Flooding" and "water table" and terms such as "rare" and "occasional" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydro-logic group	Flooding		High water table		Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Months	Depth	Months	Depth	Thick-ness	Depth	Hard-ness	Uncoated steel	Concrete
				<u>Ft</u>		<u>In</u>		<u>In</u>			
105*: McCullough-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
Jean-----	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Bluepoint-----	A	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
107-----	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Arizo.											
112-----	A	Occasional	Mar-Sep	>6.0	---	>60	---	---	---	High-----	Low.
Arizo											
113-----	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
Arizo											
117-----	A	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Arizo											
120-----	A	Rare-----	---	4.0-6.0	Jun-Sep	>60	---	---	---	High-----	Moderate.
Bluepoint											
127, 128, 129-----	A	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Bluepoint											
130*: Bracken-----	B	None-----	---	>6.0	---	40-60	Soft	---	---	High-----	High.
Destazo-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
132-----	B	None-----	---	>6.0	---	40-60	Soft	---	---	High-----	High.
Bracken											
133*: Bracken-----	B	None-----	---	>6.0	---	40-60	Soft	---	---	High-----	High.
Rock outcrop.											
134-----	B	None-----	---	>6.0	---	40-60	Soft	---	---	High-----	High.
Bracken											
140-----	C	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
Casaga											
150-----	D	None-----	---	>6.0	---	>60	---	4-20	Thick	High-----	Low.
Cave											
151-----	D	None-----	---	>6.0	---	>60	---	10-20	Thick	High-----	Low.
Cave											
152, 155-----	D	None-----	---	>6.0	---	>60	---	4-20	Thick	High-----	Low.
Cave											
160-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
Destazo											
181*: Caliza-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Pittman-----	C	None-----	---	>6.0	---	>60	---	20-30	Thick	High-----	Low.

See footnote at end of table.

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

McCARRAN AIRPORT RAINFALL AREA



TOWNSHIP	RANGE	SECTIONS	TOWNSHIP	RANGE	SECTIONS
18 South	59 East	13-15,22-26,36	20 South	62 East	4-9,16-20,29-32
18 South	60 East	30-32	21 South	60 East	1-4,9-16,21-28,33-36
19 South	60 East	1-6,8-16,21-28,33-36	21 South	61 East	ALL SECTIONS
19 South	61 East	ALL SECTIONS	21 South	62 East	4-9,15-23, 25-36
19 South	62 East	2-11,14-23,27-34	22 South	60 East	1-4,10-15,24
20 South	60 East	1-3,10-15,21-28,33-36	22 South	61 East	1-24,26-29
20 South	61 East	ALL SECTIONS	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

RAINFALL CALCULATIONS

DEVELOPMENT: POD 122 @ CLIFFS EDGE (GREEN STREET)

WO#: 6862

The project site is not included in the McCarran Airport Rainfall Area as shown by Figure 513 in the *Hydrologic Criteria and Drainage Design Manual*. Precipitation values are taken from the NOAA ATLAS 2, then adjusted per *Table 501* in the *Hydrologic Criteria and Drainage Design Manual*.

STREET INTERSECTION	TOWNSHIP	RANGE	SECTION
Elkhorn Hualapai	T19 South	R59 East	24

STORM EVENT	RAINFALL DEPTH (IN)	RATIO TO NOAA ATLAS 2 ADJUSTMENT RATIO	DESIGN DEPTH (IN)
10-YEAR	1.40	1.24	1.74
100-YEAR	2.20	1.43	3.15

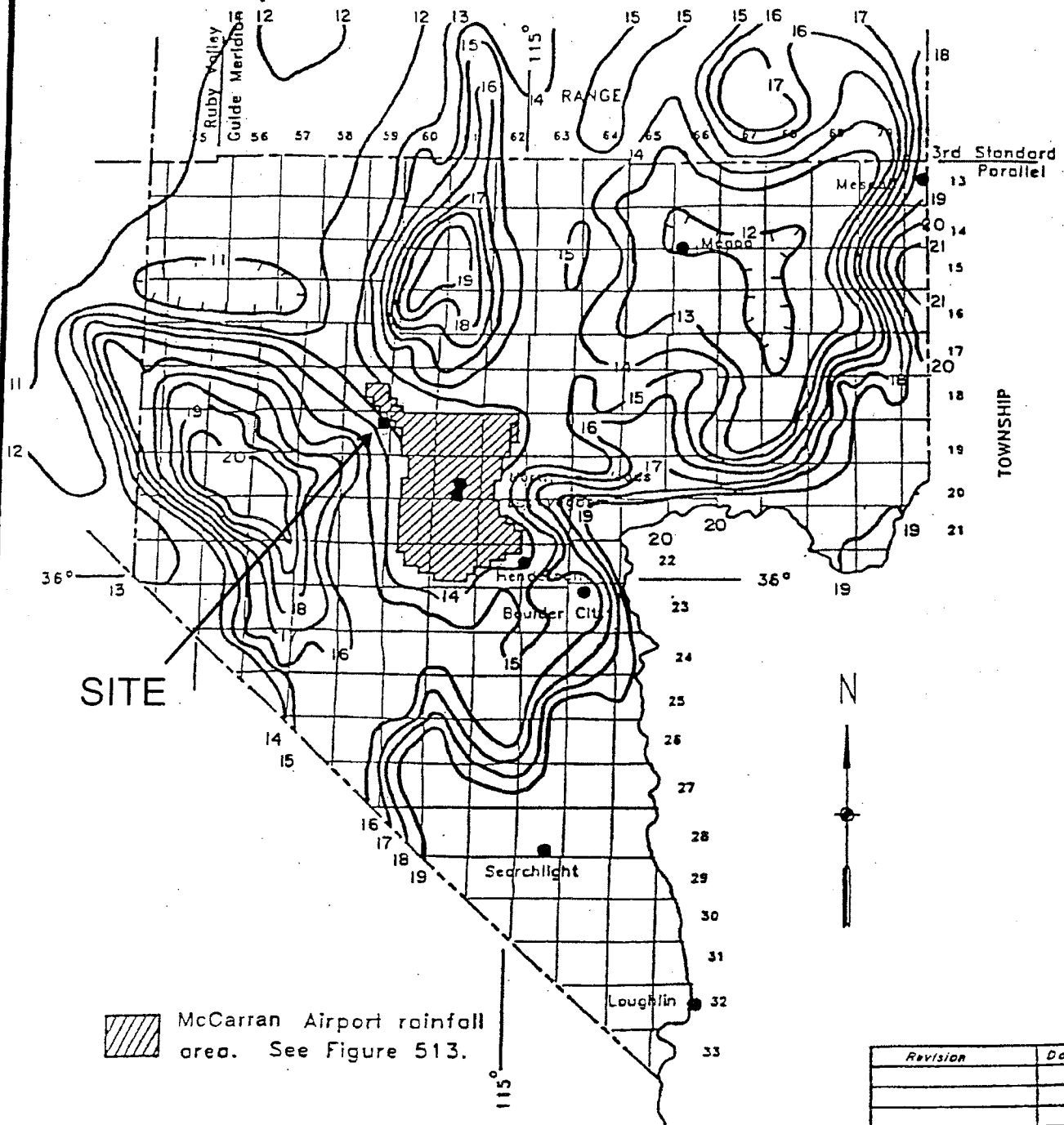
10-YEAR/100-YEAR DESIGN RAINFALL DEPTH RATIO:

0.55

REFERENCE

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

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

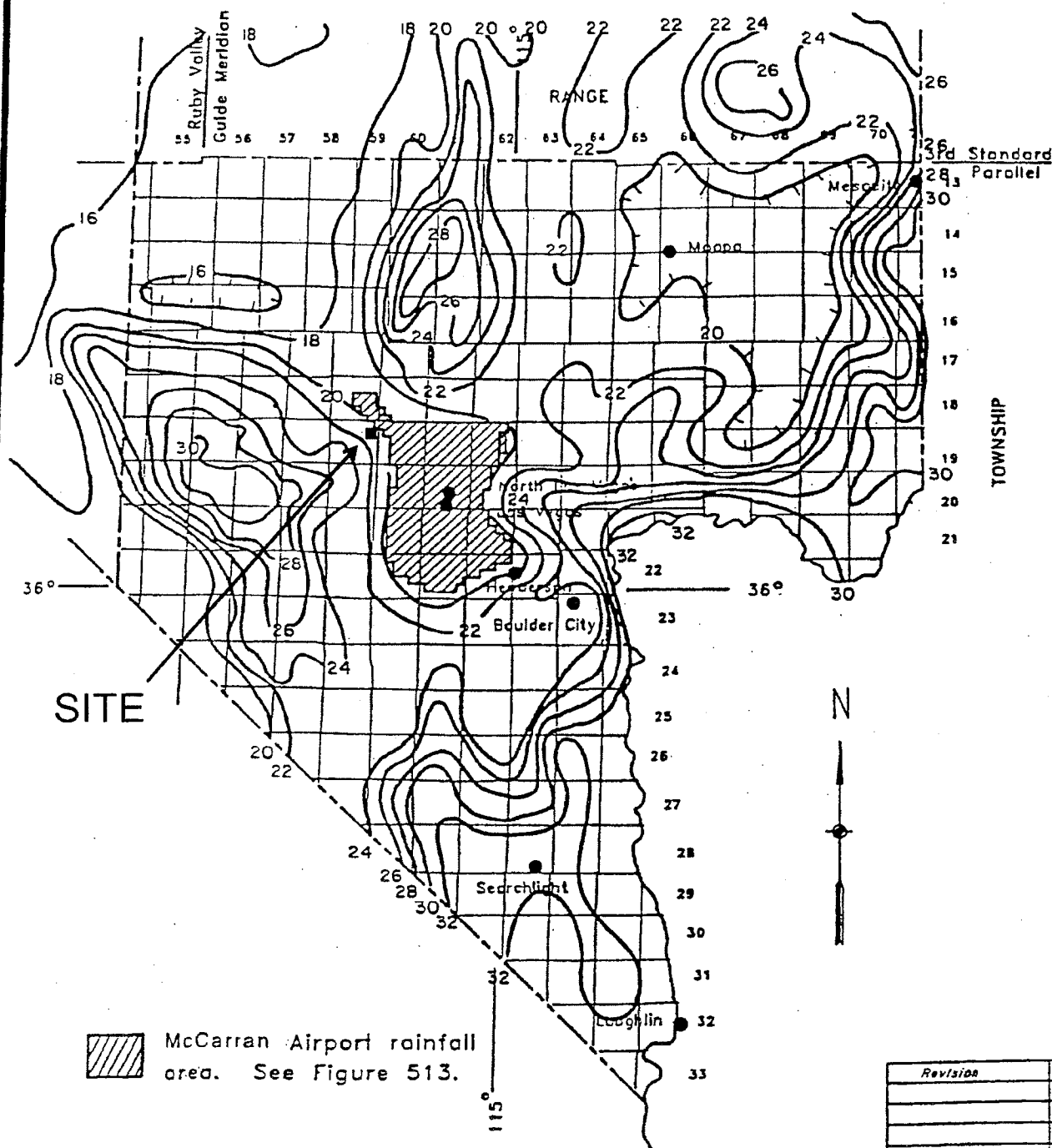


McCarran Airport rainfall area. See Figure 513.

Revision	Date

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

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



EXISTING

STANDARD FORM 4

DEVELOPMENT: POD 122 @ CLIFFS EDGE (GREEN STREET)

W.O. # 6862 CALCULATED BY: SB

V1 applies to the first 500 feet of travel distance applies to the remaining travel distance		V2 Developed	
Existing:			
$P1 = 148 \cdot S^{1/2}$	$P2 = 294 \cdot S^{1/2}$	$P1 = 202 \cdot S^{1/2}$	$P2 = 306 \cdot S^{1/2}$

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

$$T_c = 0.0132C_n - 0.39$$

$$T_t = \frac{L}{60V}$$

$$T_c = T_t + T_r$$

Minimum existing Tc is 10 minutes. Minimum developed Tc is 5 minutes																	
SUB-BASIN DATA				INITIAL/OVERLAND TIME (Ti)				TRAVEL TIME (Tt)					Tc CHECK (URBANIZED BASINS)		FINAL Tc	LAG TIME	REMARKS
DESIG.	Cn	K	AREA Ac.	AREA MI ²	LENGTH Ft	SLOPE %	Ti Min.	LENGTH Ft	SLOPE %	V1 fps	V2 fps	Tt Min.	TOTAL LENGTH (11)	Tc Min.	Min.	TLAG Hr.	
(1)		(2)	(3)		(4)	(5)	(6)	(7)	(8)	(9a)	(9b)	(10)		(12)			
EXON1	81	0.679	3.6	0.0057	85	1.2	6.60	802	3.1	2.6	5.2	4.16			10.76	0.108	ONSITE EXISTING
EXOF1	93	0.838	5.5	0.0086	102	3.0	3.30	928	3.1	3.6	5.4	3.65	1029.80	15.72	6.96	0.070	OFFSITE EXISTING
INON1	93	0.838	3.6	0.0057	85	1.2	4.12	802	3.1	3.6	5.4	3.27	886.85	14.93	7.39	0.074	ONSITE DEVELOPED
INOF1	93	0.838	5.5	0.0086	102	3.0	3.30	928	3.1	3.6	5.4	3.65	1029.8	15.72	6.96	0.070	OFFSITE EXISTING
DEVON1	93	0.838	3.6	0.0057	85	1.2	4.12	802	3.1	3.6	5.4	3.27	886.85	14.93	7.39	0.074	ONSITE DEVELOPED
DEVOF1	93	0.838	5.5	0.0086	102	3.0	3.31	928	3.1	3.6	5.4	3.65	1030.00	15.72	6.96	0.070	OFFSITE DEVELOPED

REFERENCE

TRAVEL TIME CALCULATIONS

DEVELOPMENT: POD 122 @ CLIFFS EDGE (GREEN STREET)
W.O. # 6862 CALCULATED BY: SB

$$Velocity = CS^{\frac{1}{2}}$$

C1 applies to the first 500 feet of travel distance			
C2 applies to the remaining travel distance			
Existing:		Developed	
C1=14.8	C2=29.4	C1=20.2	C2=30.6

Basin	Length (ft)	High Elev (ft)	Low Elev (ft)	Slope (ft/ft)	First 500 feet		Remaining Travel Distance	
					C1	V1 (fps)	C2	V2 (fps)
EXON1	802	2867	2842	0.031	14.8	2.6	29.4	5.2
EXOF1	928	2871	2842	0.031	20.2	3.6	30.6	5.4
INON1	802	2867	2842	0.031	20.2	3.6	30.6	5.4
INOF1	928	2871	2842	0.031	20.2	3.6	30.6	5.4
DEVON1	802	2867	2842	0.031	20.2	3.6	30.6	5.4
DEVOF1	928	2871	2842	0.031	20.2	3.6	30.6	5.4

REFERENCE

TIME OF CONCENTRATION

PROJECT NO. : 28-22-61

CALCULATED BY: pp

Sub-Basin Data

T-Check

check	Final T
-------	---------

Developed Condition Onsite[illegible]
$$T_{\text{laq}} = 0.6T_c$$

STANDARD FORM 4

REFERENCE

Existing Condition

6862-DEV.OUT

```

*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* SEPTEMBER 1990 *
* VERSION 4.0 *
* RUN DATE 07/02/2007 TIME 16:44:40 *
*****
    
```

```

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

```

X X XXXXXX XXXX X
X X X X X XX
X X X X X X
XXXXXX XXXX X XXXX X
X X X X X X
X X X X X X
X X XXXXXX XXXX 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 -AMSK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
 NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE, SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
 DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
 KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
*** FREE ***
1 ID PDD 122 @ CLIFFS EDGE
2 ID DEVELOPED Condition
3 ID FILE: 6862-DEV.DAT
4 ID 10/100 YR STORM EVENT
5 ID
6 IT 5 0 0 300
7 IN 5 0 0
8 IO 5 0 0
9 JR PREC .55 1.00
10 KK DEVOF1
11 KM DEVELOPED OFFSITE BASIN
12 BA .0086
13 PB 3.15
14 PC .000 .020 .057 .070 .087 .108 .124 .130 .130 .130
15 PC .130 .130 .130 .133 .140 .142 .148 .158 .172 .181
16 PC .190 .197 .199 .200 .201 .204 .214 .229 .241 .249
17 PC .251 .256 .270 .278 .281 .283 .295 .322 .352 .409
18 PC .499 .590 .710 .744 .781 .812 .819 .835 .851 .856
19 PC .860 .868 .876 .888 .910 .926 .937 .950 .970 .976
20 PC .982 .985 .987 .989 .990 .993 .993 .994 .995 .998
21 PC .998 .999 1.00
22 LS 0 93
23 UD 0.070
24 KK DEVON1
25 KM DEVELOPED ONSITE BASIN
26 BA .0057
27 LS 0 93
28 UD .074
29 KK CP-1
30 KM COMBINE DEVOF1 AND DEVON1
31 HC 2
32 ZZ
    
```

```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW
NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW
10 DEVOF1
24 DEVON1
29 CP-1
    
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* SEPTEMBER 1990 *
* VERSION 4.0 *
* RUN DATE 07/02/2007 TIME 16:44:40 *
*****
    
```

```

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

PODD 122 @ CLIFFS EDGE
DEVELOPED Condition
FILE: 6862-DEV.DAT
10/100 YR STORM EVENT

8 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 ACRES-FEET
SURFACE AREA ACRES
TEMPERATURE DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION
 NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
 RATIOS OF PRECIPITATION
 .55 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
				.55	1.00
+ HYDROGRAPH AT	DEV0F1	.01	1 FLOW	9.	19.
			TIME	3.50	3.50
+ HYDROGRAPH AT	DEVON1	.01	1 FLOW	6.	13.
			TIME	3.50	3.50
+ 2 COMBINED AT	CP-1	.01	1 FLOW	15.	32.
			TIME	3.50	3.50

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

DEVELOPMENT: GREENSTREET @ POD 122

DESCRIPTION: FLOW CALCULATION BASED ON FLOW/AREA RATIO

W.O.#: 6862

DATE: 9/7/2007

FLOW/AREA RATIOS						
BASIN	TOTAL AREA	100-YR FLOW	PHASE	PHASE AREA	PHASE AREA/TOTAL AREA PERCENTAGE RATIO	PHASE FLOW
	(AC)	(CFS)		(ACRES)		(CFS)
DEVON1	3.6	13	1	2.83	79%	(10)
			2	0.77	21%	(3)

Existing
Offsite

Existing
Onsite

REFERENCE

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* SEPTEMBER 1990 *
* VERSION 4.0 *
*
* RUN DATE 09/17/2012 TIME 17:12:34 *
*

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

X X X XXXXXX XXXX X
X X X X X XX
X X X X X X
XXXXXXX XXXX X XXXX
X X X X X X
X X X X X X
X X XXXXXX XXXX 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 City Stop 11
3 ID Developed Condition
4 ID
5 ID File u:\pam\hecla\citystdv.hcl
6 ID
7 IT 5 300
8 IO 5
9 IN 5
10 JR PREC 0.55 1.0
* *****

[illegible]

1

11	DON2
24	.
	.
	.

```
*****  
FLOOD HYDROGRAPH PACKAGE (HEC-1) *  
SEPTEMBER 1990 *  
VERSION 4.0 *  
  
RUN DATE 09/17/2012 TIME 17:12:34 *  
*****
```

City Stop 11
Developed Condition

File u:\pam\hecla\citystdv.hcl

8 IO OUTPUT CONTROL VARIABLES 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 1 NUMBER OF PLANS
NPLAN

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.55 1.00

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
				.55 1.00

HYDROGRAPH AT

+ DON2 .00 1 FLOW 1. 2.
TIME 3.50 3.50

HYDROGRAPH AT

+ DON3 .00 1 FLOW 1. 1.
TIME 3.50 3.50

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

Section 1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01000	ft/ft
Discharge	2.00	ft ³ /s

Section Definitions

Station (ft)	Elevation (ft)
0+00	51.36
0+27	51.20
0+42	51.35
0+42	51.85
0+43	51.85

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 51.36)	(0+43, 51.85)	0.017

Results

Normal Depth	0.11	ft
Elevation Range	51.20 to 51.85	ft
Flow Area	1.59	ft ²
Wetted Perimeter	29.25	ft
Top Width	29.25	ft
Normal Depth	0.11	ft
Critical Depth	0.11	ft
Critical Slope	0.01119	ft/ft
Velocity	1.26	ft/s
Velocity Head	0.02	ft
Specific Energy	0.13	ft
Froude Number	0.95	
Flow Type	Subcritical	

Section 1

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	0.11	ft
Critical Depth	0.11	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.01119	ft/ft

Cross Section for Section 1

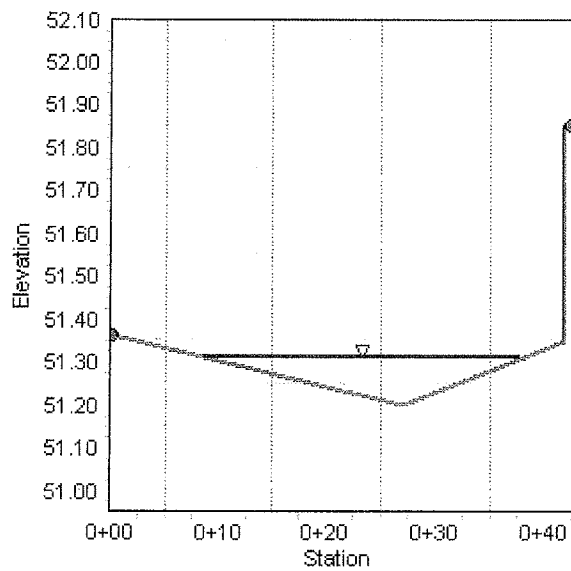
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01000	ft/ft
Normal Depth	0.11	ft
Discharge	2.00	ft ³ /s

Cross Section Image



Section 2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00800	ft/ft
Discharge	2.00	ft ³ /s

Section Definitions

Station (ft)	Elevation (ft)
0+00	52.30
0+43	51.50
0+43	52.00
0+44	52.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 52.30)	(0+44, 52.00)	0.017

Results

Normal Depth	0.21	ft
Elevation Range	51.50 to 52.30	ft
Flow Area	1.17	ft ²
Wetted Perimeter	11.42	ft
Top Width	11.21	ft
Normal Depth	0.21	ft
Critical Depth	0.20	ft
Critical Slope	0.00925	ft/ft
Velocity	1.71	ft/s
Velocity Head	0.05	ft
Specific Energy	0.25	ft
Froude Number	0.93	
Flow Type	Subcritical	

Section 2

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	0.21	ft
Critical Depth	0.20	ft
Channel Slope	0.00800	ft/ft
Critical Slope	0.00925	ft/ft

Cross Section for Section 2

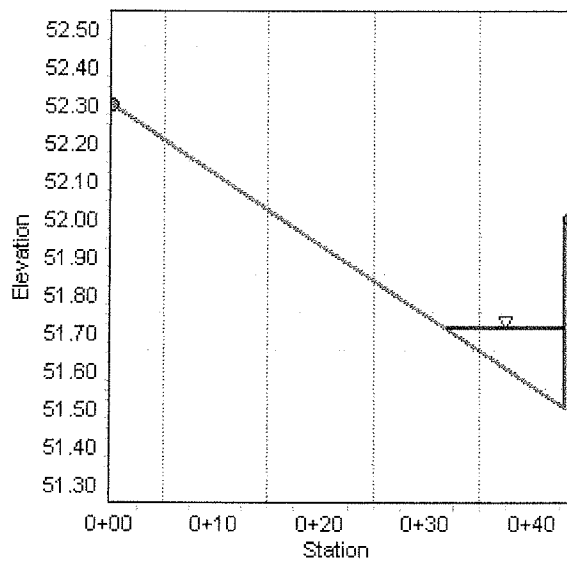
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00800	ft/ft
Normal Depth	0.21	ft
Discharge	2.00	ft ³ /s

Cross Section Image



Section 3

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01340	ft/ft
Discharge	19.00	ft ³ /s

Section Definitions

Station (ft)	Elevation (ft)
-0+01	53.55
0+00	53.55
0+00	53.05
0+33	52.07
0+63	53.10

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(-0+01, 53.55)	(0+63, 53.10)	0.017

Results

Normal Depth	0.41	ft
Elevation Range	52.07 to 53.55	ft
Flow Area	5.37	ft ²
Wetted Perimeter	26.00	ft
Top Width	25.98	ft
Normal Depth	0.41	ft
Critical Depth	0.47	ft
Critical Slope	0.00683	ft/ft
Velocity	3.53	ft/s
Velocity Head	0.19	ft
Specific Energy	0.61	ft
Froude Number	1.37	
Flow Type	Supercritical	

Section 3

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	0.47	ft
Channel Slope	0.01340	ft/ft
Critical Slope	0.00683	ft/ft

Cross Section for Section 3

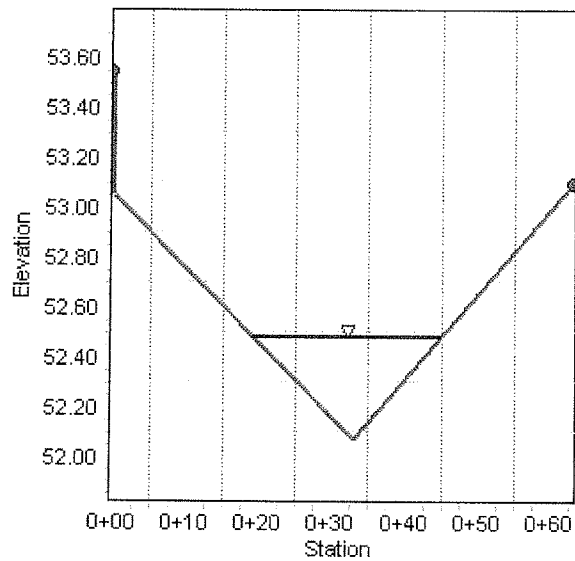
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01340	ft/ft
Normal Depth	0.41	ft
Discharge	19.00	ft ³ /s

Cross Section Image



Section 4

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00970	ft/ft
Discharge	1.00	ft ³ /s

Section Definitions

Station (ft)	Elevation (ft)
0+00	51.40
0+01	51.40
0+01	50.90
0+13	51.15
0+13	51.65
0+13	51.65

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 51.40)	(0+13, 51.65)	0.013

Results

Normal Depth	0.15	ft
Elevation Range	50.90 to 51.65	ft
Flow Area	0.51	ft ²
Wetted Perimeter	7.17	ft
Top Width	7.03	ft
Normal Depth	0.15	ft
Critical Depth	0.16	ft
Critical Slope	0.00587	ft/ft
Velocity	1.94	ft/s
Velocity Head	0.06	ft
Specific Energy	0.21	ft
Froude Number	1.27	

Section 4

Results

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	0.15	ft
Critical Depth	0.16	ft
Channel Slope	0.00970	ft/ft
Critical Slope	0.00587	ft/ft

Cross Section for Section 4

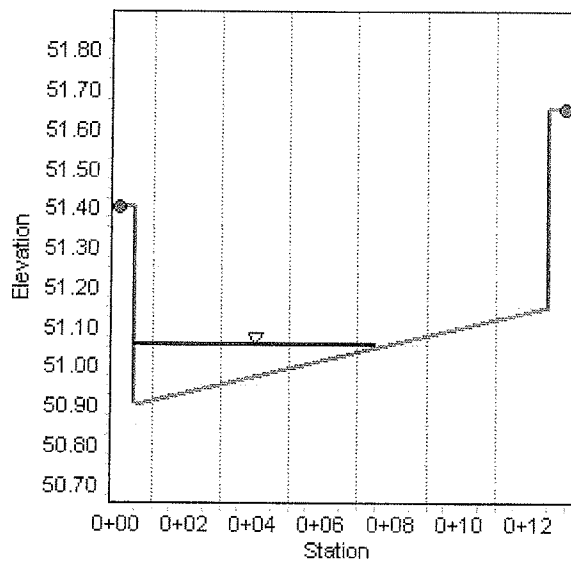
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.00970 ft/ft
Normal Depth 0.15 ft
Discharge 1.00 ft³/s

Cross Section Image



FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 09/25/2012

Project No. :
Project Name.:
Computed by :

Inlets on Sag: Equal-Length Combination Inlet

Roadway and Discharge Data

	Cross Slope	L. Depression
Sx	Pavement Cross Slope (ft/ft)	0.0100
Sw	Gutter Cross Slope (ft/ft)	0.0100
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	1.08

Inlet Interception

	Inlet Type *Sag*	Curb-Opening
L	Curb-Opening Length (ft)	2.50
H	Curb-Opening Height (in)	5.00
	Inlet Type *Sag*	Parallel Bar P-1-7/8
T	Width of Spread (ft)	20.73
WGR	Grate Width (ft)	1.50
L	Grate Length (ft)	2.50
	Inlet Type *Sag*	Equal Length Combination
d_ave	Depth of Flow (ft)	0.245
d_curb	Depth at Curb (ft)	0.297
Qi	Intercepted Flow (cfs)	1.990

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM		DATE: October 30, 2007
TO: Land Development Services Department of Public Works		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for:	
	Greenstreet @ POD 122 (Providence) – Phase 1 & Phase 2	
Cross Streets:	SWC of Elkhorn Road & Hualapai Way	
File Number:	F:\Depot\DSMemos\DS4232B.doc	
Parcel Number:	126-24-510-003	
Zoning Action:	SDR-18031; VAR-18090 & TMP-21653	
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES	NO X
COPIES TO:		VTN Nevada
		Greenstreet Properties
		Bart Anderson, P.E., DevCo
		CCRFC
		CCDDS

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1 st Submittal	9/10/2007	9/24/2007	Not Approved	\$400.00	77343: \$400
2 nd Submittal	10/18/2007	10/29/2007	See Comments Below	\$400.00	80168: \$400
TOTAL FEES (LDDRS):				\$800.00	----

REMARKS:

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

	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to Clark County Department of Development Services concurrence.
X	is conditionally approved subject to City of Las Vegas Building & Safety Department's approval on structural calculations as required in Condition #2

1. Provide a copy of the final map which must contain a note to state or to the effect that: "All areas not occupied by the Buildings must be public drainage easements to be privately maintained by the Homeowners Association". Provide the same note on the grading plans.

The following comment is for Phase 2:

2. Sheet SD1: It appears that D.I. #3 is more than 10' deep which will require a special detail and structural calculations. Provide structural detail and calculations to *City of Las Vegas Building and Safety Department* for their review and approval prior to the final approval of the drainage study.

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

END OF REMARKS

ays

T/R/S: T19S/R59E/24
AREA F-24

DS4232
09/10/2007
\$400.00 F-24

TECHNICAL DRAINAGE STUDY

FOR

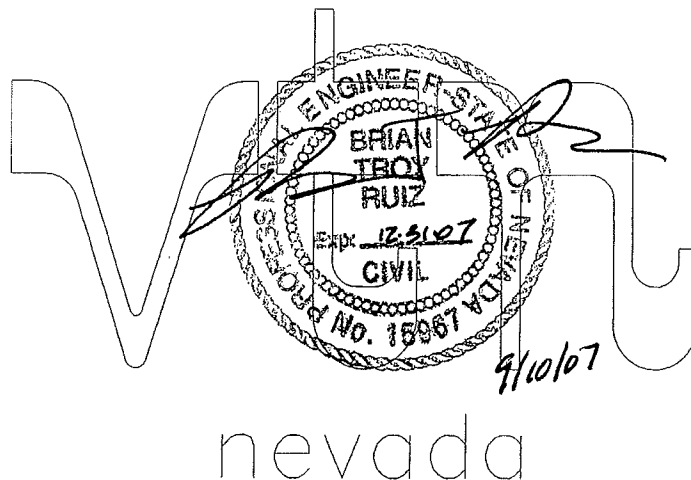
GREENSTREET @ POD 122

CITY OF LAS VEGAS

W.O. # 6862

Prepared for:
GREENSTREET PROPERTIES

Submitted to:
**CITY OF LAS VEGAS
DEPARTMENT OF PUBLIC WORKS**



I. INTRODUCTION

A. STUDY OVERVIEW AND PURPOSE

This study provides technical drainage and flood control information for Greenstreet @ Pod 122, which is located with a portion of Pod 122 of Cliffs Edge (a.k.a. Providence). The proposed site will consist of commercial development with approximately 4-acres area. The construction of this proposed site is divided into 2 phases, with Phase 1 being the north half and Phase 2 being the south half of the site. Approval of this study will allow construction of this project.

Please note that the remaining of Pod 122 is planned as residential development (Liberty Square) with an approved Technical Drainage Study by City of Las Vegas. This drainage study shows the anticipated runoff for that portion of the site (refer to basin OFF1 on Figures 5A, 5B, and 5C).

B. LOCATION

Greenstreet @ Pod 122 is located within a portion of the Northeast Quarter (NE ¼) of Section 24 Township 19 South, Range 59 East, M.D.M., Clark County, Nevada. Specifically, the site is bounded to the east by Hualapai Way and to the north by Elkhorn Road. (Refer to Figure 1, *Vicinity Map*).

C. DESCRIPTION

The proposed development presently consists of arid rangeland with desert shrub vegetative cover (poor hydrologic condition). The site generally slopes to the east at approximately 3.5%. The site is bound by Hualapai Way to the east, Elkhorn Road to the north and existing Liberty Square @ Providence to the south and west, all of which are currently under construction. The portion of Pod 122 where the Cliff's Edge Information Center is located will be developed into Phase 2 of this proposed commercial site. Refer to Figure 2, *Site Map*.

D. FLOODPLAIN INFORMATION

The site is delineated on the Federal Emergency Management Agency (FEMA) Community Panel Number 32003C1750 E, Clark County, Nevada and Incorporated Areas, effective date September 27, 2002. As shown by this map, the site is located within a Zone "X", which is described as areas outside of the 500-year flood. (Refer to Figure 3 in the Appendix).

E. MASTER PLANNING INFORMATION

The site is delineated on Figures F-3 and H-3, which are referenced from the 2002 CCRFCD Master Plan Update (MPU) and included in the Appendix. The site lies within the MPU basin NWBA3-C and is adjacent to the existing MPU facility RCHB 0395 (78"- RCP) located in the Elkhorn Road alignment.

F. PREVIOUS HYDROLOGY STUDIES

Routing patterns, flow values and discharge locations for the site and tributary offsite areas were referenced from the following approved studies.

- Master Drainage Study for Cliffs Edge (DS3404)
- Technical Drainage Study for Cliffs Edge Infrastructure, Phase I (DS3576)
- Technical Drainage Study for Cliffs Edge Infrastructure, Phase II (DS3617)
- Technical Drainage Study for Cliffs Edge Information Center (DS3825)
- Technical Drainage Study for Liberty Square @ Providence (DS4148)

The referenced studies have been reviewed and the hydrologic and hydraulic calculations contained within them have been determined to be reasonable.

II. HYDROLOGIC ANALYSIS

A. METHOD OF ANALYSIS

The hydrologic modeling for this study was prepared using the SCS Unit Hydrograph Method in conjunction with the HEC-1 computer program from the U.S. Army Corps of Engineers (COE) as outlined in the Clark County Regional Flood Control District Hydrologic Criteria and Drainage Design Manual. The results of the HEC-1 analyses have been included in the Appendix.

B. RAINFALL CRITERIA

Precipitation values were referenced from the approved Master Drainage Study for Cliffs Edge, which were calculated using the NOAA 2 Atlases and area precipitation adjustment ratios included in the CCRFCD Hydrologic Criteria and Drainage Design Manual. A copy of the rainfall calculations has been included in the Appendix.

C. RUNOFF COMPUTATION

The site consists of soil type 191 (see Figure 4, Soils Map, in the Appendix). Curve Numbers (CNs) were calculated for the soil group based on existing and developed conditions. Existing Condition curve numbers were taken from Table 602, Sheet 4 of 4, utilizing a cover description of Desert Shrub in poor hydrologic condition. Developed condition curve numbers were taken from Table 602 sheet 1 of 4, for Urban Districts: Commercial and Business. Calculations for the CN values are included in the Appendix.

The lag times quantify how long before basins are contributing to flow at the outlet and is a representative scale of an individual basin that were determined using Standard Form 4. Velocities used in Standard Form 4 have been calculated using the equation $V = CS^{1/2}$ from the Clark County Regional Flood Control District Hydrologic Criteria and Drainage Design Manual. The coefficient $C = 14.8$ represents wide channel flow with $D = 0.25$ and $n = 0.04$ for undeveloped conditions. The coefficient $C = 29.4$ represents wide channel flow with $D = 0.7$ and $n = 0.04$ for undeveloped conditions. The coefficient $C = 20.2$ represents street flow with $n =$

0.016 and a depth in the gutter of 0.3 feet for developed conditions. The coefficient $C = 30.6$ represents curb height street flow for developed conditions.

Travel Time velocities have been calculated based on the equation $V = CS^{1/2}$ from section 602.1 of the Clark County Regional Flood Control District Hydrologic Criteria and Drainage Design Manual (Manual). For basins analyzed in this study, the first 500 feet of the Travel Time Length uses the V_1 set of C coefficients from the Manual and the remaining Travel Time Length uses the larger V_2 set of coefficients. The Standard Form 4 computes the Travel Time separately for the V_1 and V_2 portions of the basin and adds them together to give the total Travel Time for the basin. Based on the hydrologic properties and land usages of the basins within this study, we feel that the 500-foot break point provides a conservative but representative assumption to where enough flow can be generated within the basin to warrant the use of the higher velocity coefficients. In summary,

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

D. PEAK FLOWS

The following table summarizes the peak flow generated by each offsite and onsite basin for the listed conditions. A discussion of each drainage condition may be found in the following section of this report. Please refer to the Appendix for all HEC-1 calculations.

TABLE 1. HEC-1 ANALYSIS PEAK FLOW SUMMARY

GREENSTREET @ POD 122		
BASIN/CONCENTRATION POINT	OFFSITE PEAK FLOW (CFS)	ONSITE PEAK FLOW (CFS)
EXISTING CONDITION		
EXON1	2	7
EXOF1	9	19
CP-1	11	27
INTERIM/DEVELOPED CONDITION		
INON1/DEVON1	6	13
INOF1/DEVOF1	9	19
CP-1	15	32

III. DRAINAGE BASIN DESCRIPTIONS

A. EXISTING CONDITION ANALYSIS

(Refer to Figure 5A: Existing Condition Basin Map)

1. OFFSITE DRAINAGE BASIN DESCRIPTION

Since the perimeter streets surrounding the site, and Liberty Square @ Providence (adjacent to the western perimeter of the site) are either built or currently being

constructed, the tributary offsite area (basin EXOF1) was assumed to be developed in the existing condition. Basin EXOF1 is estimated to generate 9 cfs and 19 cfs during 10-year and 100-year storm event respectively.

Runoff generated from basin EXOF1 will routed along the perimeter street located to the west boundary of the proposed site. The flow from basin EXOF1 will be captured by an existing drop inlet located at the entrance on Hualapai Way, as presented in the approved Technical Drainage Study for Liberty Square @ Providence. A copy of referenced Figure 5C, *Ultimate Condition Basin Map* from the approved Liberty Square @ Providence has been included in the Appendix.

The offsite flow in the perimeter streets (Elkhorn Road and Hualapai Way) were referenced from the developed condition from the Cliff's Edge Master Drainage Study (MDS). In general, the flow in Elkhorn Road is routed east within the respective right-of-ways, and flow in Hualapai Way routed south within its right-of-way.

2. ONSITE DRAINAGE BASIN DESCRIPTION

In the existing condition, the onsite area was delineated into one basin, EXON1. With the existing Cliffs Edge Information Center being in placed, approximately 20% of existing basin EXON1 is assumed to be commercial, while the remaining 80% of the area is assumed to be undeveloped land. The undeveloped portion of existing basin EXON1 will drain into an existing sump pit with riprap, constructed by the approved Cliffs Edge Information Center as shown on Figure 5A Existing Condition Basin Map. A single grate Type CM drop inlet was constructed along with the Cliffs Edge Information Center to capture the flow generated by the Information Center. Based on the approved Cliffs Edge Information Center's study, the existing 24-inch storm drain system capable of conveying 20 cfs during 100-year storm event was designed to drain area tributary to the Information Center. Please refer to the Developed Condition Basin Map referenced from the approved Cliffs Edge Information Center study in Appendix

B. INTERIM CONDITION ANALYSIS

1. OFFSITE DRAINAGE BASIN DESCRIPTION

In the interim condition, the flows and drainage patterns are the same as described in the existing condition, with the offsite basin named INOF1.

2. ONSITE DRAINAGE BASIN DESCRIPTION

As mention previously, the construction of the proposed Greenstreet @ Pod 122 will be separated into two phases, with Phase 1 being the north portion of the site and Phase 2 being where Cliffs Edge Information Center is currently situated. For the onsite interim condition, it is assumed that Phase 1 is constructed and Phase 2 (Information Center) remains in its existing state. Since both the Information Center and Phase 1 are considered to be commercial development, onsite basin INON1 is calculated assuming commercial curve number for the entire basin. Basin INON1 is estimated to generate 6

cfs and 13 cfs during 10-year and 100-year storm event respectively. The grading of Phase 1 will match in with the existing grades of the Information Center in order to maintain the similar drainage patterns. A 15-foot Type CM drop inlet is proposed in order to capture runoff generated from developed Phase 1. Runoff generated by Phase 1 and Phase 2 have been calculated based on the flow/area ratio method. Phase 1 site is estimated to generate 10 cfs during the 100 year storm event and Phase 2 site is estimated to generate 3 cfs during the 100 year storm event. See appendix for flow/area ratio calculation. The existing Information Center (future Phase 2) will remain unchanged with all existing drainage facilities in place.

C. DEVELOPED CONDITION ANALYSIS

1. OFFSITE BASIN DESCRIPTION

In the developed condition, the offsite flows and drainage patterns are the same as described in the existing and interim conditions, with the offsite basin named DEVON1.

2. ONSITE BASIN DESCRIPTION

In the developed condition, both Phase 1 and Phase 2 of the proposed site are assumed to be constructed. Developed onsite basin DEVON1 is estimated to generate the same amount of runoff compared to the interim condition site due to the similarity of basin size and curve number. Basin DEVON1 will discharge into the existing 24-inch storm drain system previously proposed by the approved Cliffs Edge Information study. A single grate Type CM sump drop inlet is proposed near the southeast corner of the site to capture the discharge generated from Phase 2. The 15' Type CM drop inlet proposed in Phase 1 will remain in place and be utilized for draining flow from Phase 1.

IV. FACILITY DESIGN CALCULATIONS

A. STREET FLOW

To determine the extent of flood protection needed to protect the site, the depth of flow within the streets adjacent to the site needs to be determined. The program FlowMaster, by Haestad Methods, has been utilized to determine the normal depth and velocity of the anticipated storm flows in the adjacent streets. The hydraulic calculations for the streets adjacent to the site were referenced from the *Technical Drainage Studies for Cliff's Edge Phases I and II*. Table 2 below shows that the streets meets the 2002 Clark County Regional Flood Control District (CCRFC) Hydrologic Criteria and Drainage Design Manual requirement for velocity x depth (V x D) to be less than 6 in the 10-year storm event and less than 8 in the 100-year storm event.

$$\frac{10}{15} \times \frac{1}{4} = .5$$

TABLE 2. STREET FLOW SUMMARY

FlowMaster Section	Discharge (cfs)	Slope (%)	Velocity (ft/s)	Normal Depth (ft)	V x D
FM-1	10	1.66	2.98	0.37	1.10
FM-2	10	1.00	2.71	0.39	1.06
FM-3	10	1.00	3.12	0.54	1.68
FM-4	3	1.46	2.21	0.28	0.62
FM-5	3	2.43	3.82	0.34	1.30
OFFSITE STREETS*					
HUAL-13	132	0.73	4.22	0.88	3.71

*Referenced from the *Technical Drainage Study or Cliff's Edge Phases I and II*.

All finished floor has been verified to be at a minimum of twice the depth of flow from the adjacent flow line and adequately flood protected. Detail FlowMaster calculations can be found in the Appendix.

The proposed site is elevated above Hualapai Way to the east and Elkhorn Road to the north. The depth of flow in Hualapai Way is 0.88' during the 100-year storm event and no surface flow is anticipated on Elkhorn Road per the approved Master Drainage Study for Cliffs Edge.

B. STORM DRAIN SYSTEM

An existing storm drain system that was constructed with the Cliff's Edge Infrastructure within Elkhorn Road and Hualapai Way, was designed to collect all of the tributary 10-year flows, and enough of the 100-year flow to keep the flow contained within the limits of each right-of-way. Supporting reference material from the *MDS*, and the Technical Drainage Studies for Cliff's Edge Infrastructure Phase 1 and Phase 2 has been included in the Appendix.

An existing 36-inch RCP laterals that extend from the 60-inch RCP storm drain main in Hualapai Way was provided to capture the flows generated by the site. According to the Technical Drainage Studies for Cliff's Edge Infrastructure Phase 2, the lateral was sized to accommodate 35-cfs. Please refer to the referenced Cliffs Edge Storm Drain and Flowmaster Exhibit included in the Appendix. As shown on Figure 5C, *Developed Condition Basin Map* the proposed site (including the approved residential site, Liberty Square) will discharge 32-cfs (100-year storm) to that lateral, which is less than anticipated flow.

Based on the approved Technical Drainage Study for Cliffs Edge Information Center, a 24-inch storm drain system was constructed along with the Cliffs Edge Information Center, designed to convey 20 cfs. Refer to referenced material in Appendix. During the construction of Phase 1 of the proposed site, the existing sump pit will be removed and will be replaced with a 15' Type CM drop inlet. A portion of the existing 24-inch storm drain upstream of the proposed 15' drop inlet will be removed. See grading plans for Phase 1 in Appendix.

A single grate Type CM drop inlet is proposed to connect into the existing 24-inch drop inlet near the southeast corner of the site, during the Phase 2 construction. This drop inlet will be used for collecting runoff generated from Phase 2. Please refer to the Appendix for storm drain calculations and grading plans in Appendix.

V. CONCLUSIONS**A. COMPLIANCE WITH AGENCY REQUIREMENTS**

This Technical Drainage Study for Greenstreet @ Pod 122 has been developed in accordance with criteria established in the Clark County Regional Flood Control District Hydrologic Criteria and Drainage Design Manual, and the City of Las Vegas. The proposed development does not adversely affect any proposed or existing Clark County Regional Flood Control District Master Plan Update facilities.

B. OVERALL FACILITY EFFECTIVENESS

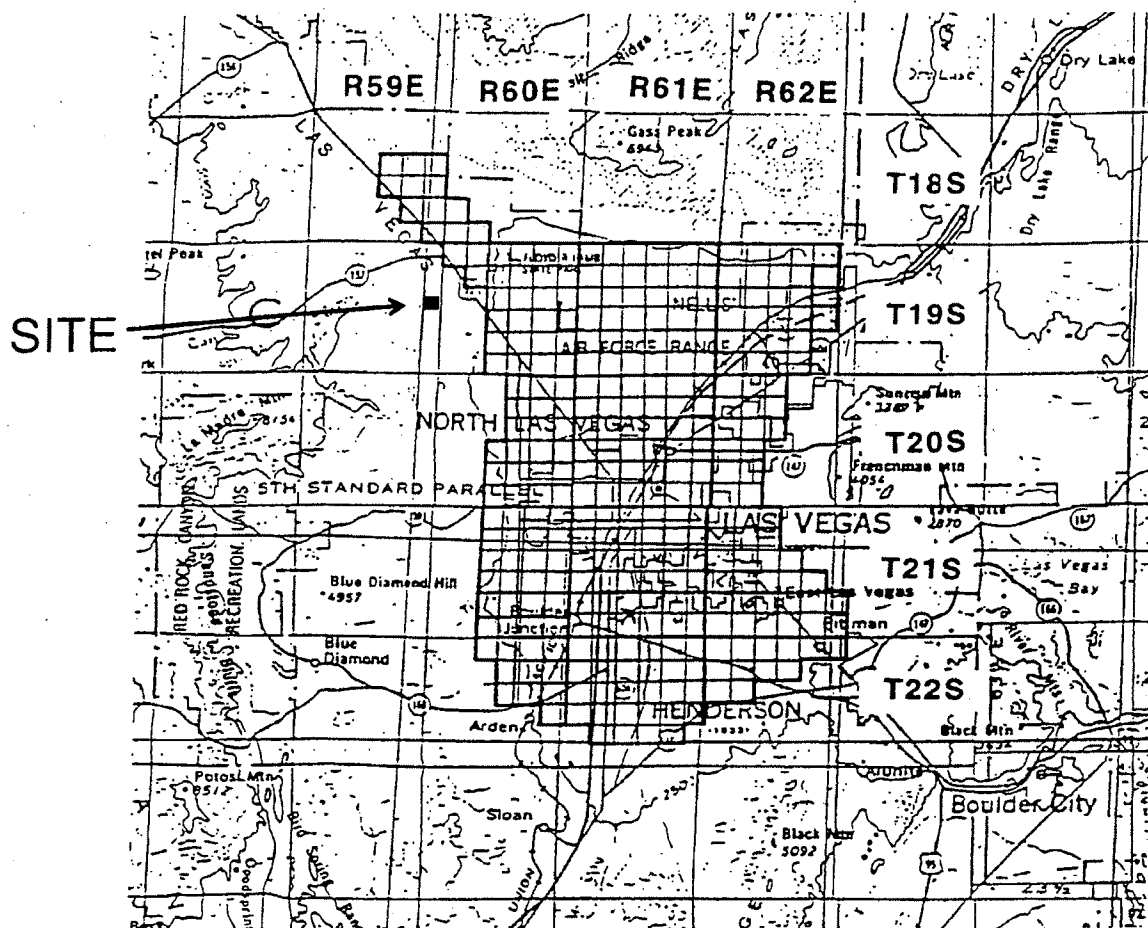
Greenstreet @ Pod 122 shall be designed to control storm water runoff for the 6-hour, 10-year, and 100-year floods as calculated in this study. There are no adverse effects on upstream or downstream properties due to the proposed drainage system or infrastructure improvements.

REFERENCES

1. *Hydrologic Criteria and Drainage Design Manual*, Clark County Regional Flood Control District, 1999.
2. *CCRFCD Las Vegas Valley Flood Control Master Plan Update*, by PBS&J, dated September 2002.
3. *Flood Insurance Rate Map*, Community Panel Number 32003C1750 E, Clark County, Nevada and Incorporated Areas, effective date September 27 2002, and is a digital duplication of the FIRM Map derived from the Clark County GIS database.
4. *Soil Survey of Las Vegas, Nevada, Part of Clark County*, by the United States Department of Agriculture, Soil Conservation Service.
5. *Master Drainage Study for Cliffs Edge*, by VTN Nevada, dated August 2003 (DS3404).
6. *Technical Drainage Study for Cliffs Edge Infrastructure Phase I*, by VTN Nevada, dated May 2004 (DS3576).
7. *Technical Drainage Study for Cliffs Edge Infrastructure Phase II*, by VTN Nevada, dated July 2004 (DS3617).
8. *Technical Drainage Study for Cliffs Edge Information Center*, by VTN Nevada, dated May 2005 (DS3825)
9. *Technical Drainage Study for Liberty Square @ Providence*, by VTN Nevada, dated March 2007 (DS4148)

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

McCARRAN AIRPORT RAINFALL AREA



TOWNSHIP	RANGE	SECTIONS	TOWNSHIP	RANGE	SECTIONS
18 South	59 East	13-15, 22-26, 36	20 South	62 East	4-9, 16-20, 29-32
18 South	60 East	30-32	21 South	60 East	1-4, 9-16, 21-28, 33-36
19 South	60 East	1-6, 8-16, 21-28, 33-36	21 South	61 East	ALL SECTIONS
19 South	61 East	ALL SECTIONS	21 South	62 East	4-9, 15-23, 25-36
19 South	62 East	2-11, 14-23, 27-34	22 South	60 East	1-4, 10-15, 24
20 South	60 East	1-3, 10-15, 21-28, 33-36	22 South	61 East	1-24, 26-29
20 South	61 East	ALL SECTIONS	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

RAINFALL CALCULATIONS

DEVELOPMENT: POD 122 @ CLIFFS EDGE (GREEN STREET)

WO#: 6862

The project site is not included in the McCarran Airport Rainfall Area as shown by Figure 513 in the *Hydrologic Criteria and Drainage Design Manual*. Precipitation values are taken from the NOAA ATLAS 2, then adjusted per Table 501 in the *Hydrologic Criteria and Drainage Design Manual*.

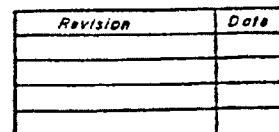
STREET INTERSECTION	TOWNSHIP	RANGE	SECTION
Elkhorn Hualapai	T19 South	R59 East	24

STORM EVENT	RAINFALL DEPTH (IN)	RATIO TO NOAA ATLAS 2 ADJUSTMENT RATIO	DESIGN DEPTH (IN)
10-YEAR	1.40	1.24	1.74
100-YEAR	2.20	1.43	3.15

10-YEAR/100-YEAR DESIGN RAINFALL DEPTH RATIO:

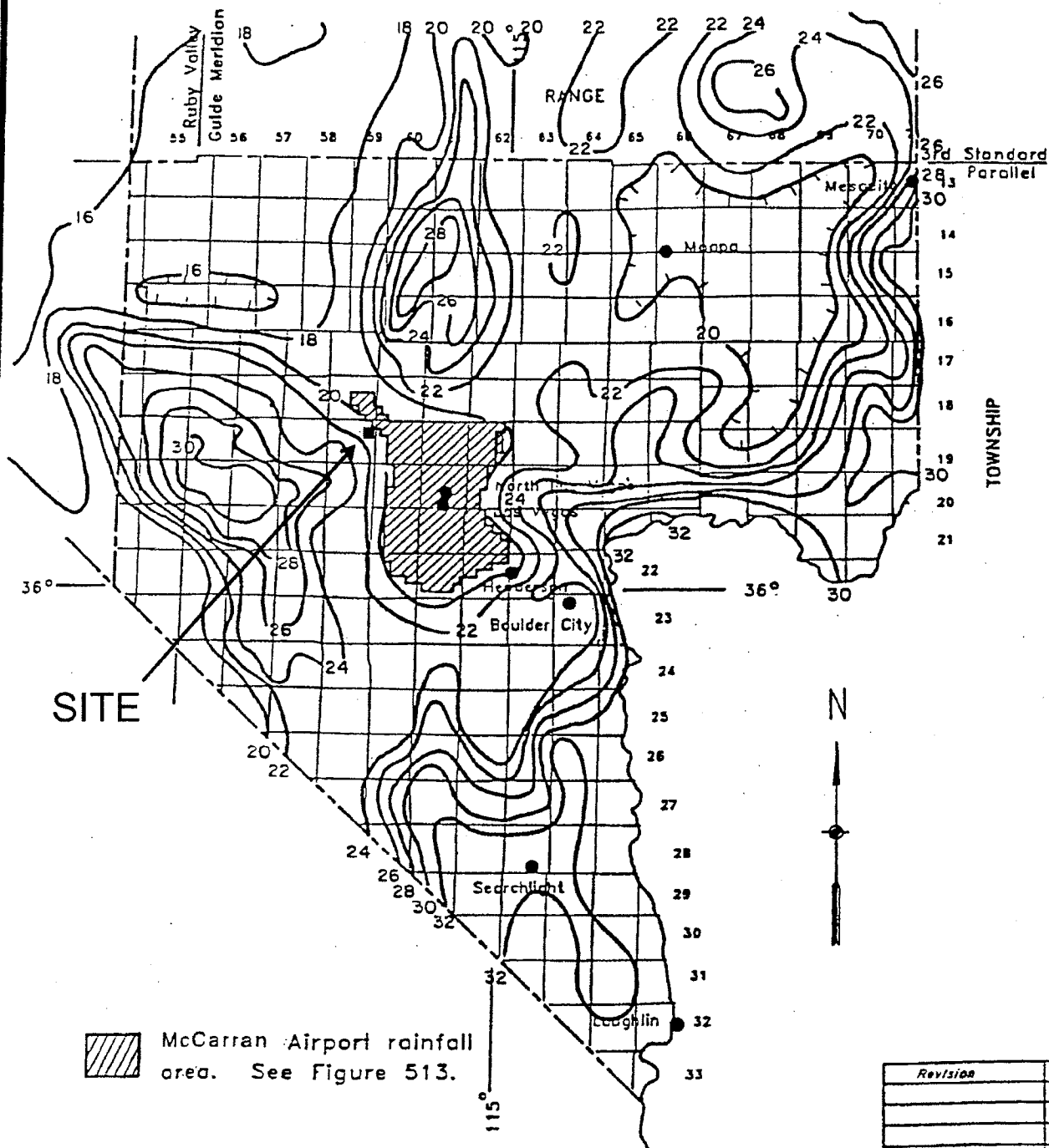
0.55

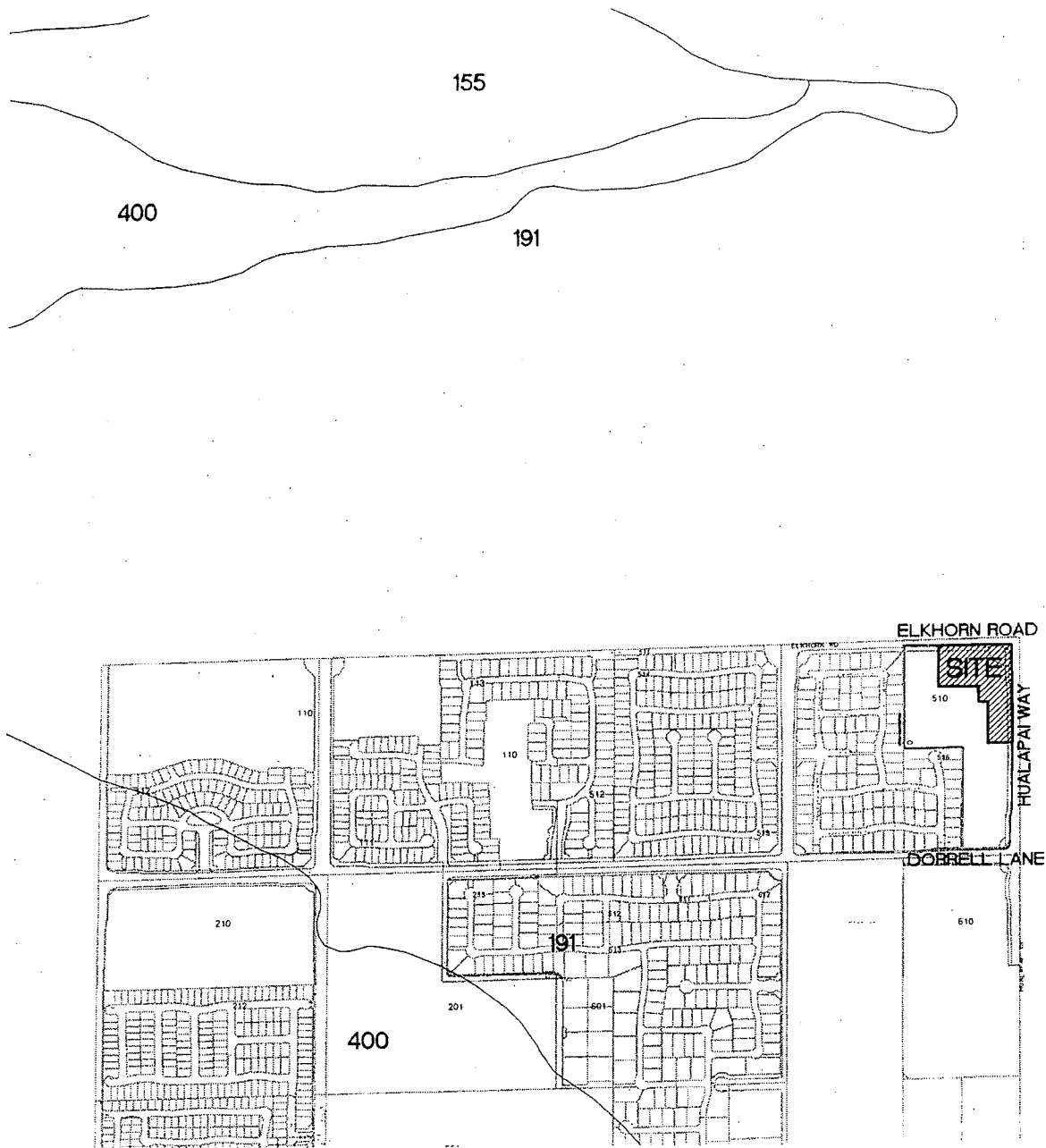
RAINFALL DEPTH-DURATION-FREQUENCY
10-YEAR, 6-HOUR
(DEPTHS IN TENTHS OF INCHES)



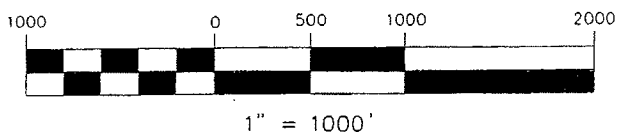
HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

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



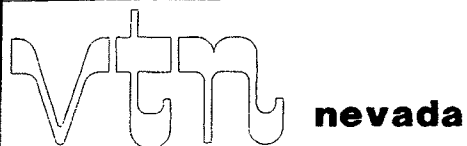


GRAPHIC SCALE



LEGEND

- - SITE BOUNDARY
- 191 - SOIL NUMBER



2727 S. RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148

POD 122 AT CLIFFS EDGE
(GREENSTREET)
SOILS MAP

FIGURE 4

SCALE	HORZ.	1000
	VERT.	N/A
W.O. NO.		6862
DRAWN BY:		SB
DATE:		JULY 2007
SHEET		1 OF 1

CURVE NUMBERS FOR SOILS

Soil #191 Dalian very cobbly fine sandy loam, 2 to 8 percent slopes.				
Soil	Percent	Group	Existing ₁	Commercial ₂
Dalian	85%	B	77	92
Tencee	10%	D	88	95
Arizo	5%	A	63	89
Total	100%		78	93

Notes:

- 1- Referenced from Table 602 (4 of 4), Desert Shrub, Poor Condition
- 2- Referenced from Table 602 (1 of 4), Urban District, Commercial and business

Curve Number calculations for basins

Basin	Existing	Commercial	CN Value
EXON1	80.00%	20%	81
EXOF1	0.00%	100%	93
INON1	0.00%	100%	93
INOF1	0.00%	100%	93
DEVON1	0.00%	100%	93
DEVOF1	0.00%	100%	93

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RUNOFF CURVE NUMBERS (URBAN AREAS¹)

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area ²	A	B	C	D
<i>Fully developed urban areas (vegetation established)</i>					
Open space (lawns, parks, golf courses, cemeteries, etc.):					
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) ...		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	82	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
See Table 602A					
<i>Developing urban areas</i>					
Newly graded areas (pervious areas only, no vegetation) ³		77	86	91	94

1 Average runoff condition, and $I_p = 0.25$.

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

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RUNOFF CURVE NUMBERS (SEMIARID RANGELANDS¹)

Cover description		Curve numbers for hydrologic soil group—			
Cover type	Hydrologic condition ²	A ³	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	68	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

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

²Poor: < 30% ground cover (litter, grass, and brush overstory).

Fair: 30 to 70% ground cover.

Good: > 70% ground cover.

³Curve numbers for group A have been developed only for desert shrub.

Revision	Date

WRC
ENGINEERING

REFERENCE:

SCS TR-55, USDA, June 1986.

TABLE 602
4 of 4

sandy loam about 4 inches thick. The upper 7 inches of the underlying material is light yellowish brown extremely gravelly fine sandy loam, the next 6 inches is light yellowish brown very gravelly sandy loam, and the lower part to a depth of 61 inches is light yellowish brown extremely gravelly fine sandy loam. Pebbles cover 50 to 75 percent of the surface.

Included in this unit are about 5 percent Tencee soils on erosional fan remnants and 10 percent Arizo soils, flooded, in channels. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another.

Permeability of this Dalian soil is moderately rapid. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used mainly as habitat for desert wildlife and for recreation. It is also used for urban development.

This unit is well suited to the construction of dwellings.

Septic tank absorption fields generally function well unless the density of housing is too high.

Roads are easily constructed and maintained.

The main limitation for lawns and landscaping is the pebbles on the surface and throughout the soil. Topsoil is needed for best results when landscaping, particularly in areas used for lawns. Lawn grasses, shrubs, and trees that are not sensitive to lime-induced chlorosis are well suited to use in landscaping. Annual applications of iron chelates reduce the effects of chlorosis.

Intermittent streams form the drainageways in this unit. These drainageways are subject to rare or occasional periods of high-velocity flooding. Care should be taken during urbanization to accommodate the runoff from the drainageways. If drains become plugged during a major flood, accelerated erosion and damage to roads, buildings, and other structures can occur.

This map unit is in capability subclasses IVs, irrigated, and VIIs, nonirrigated. It is in horticultural group 2.

→ **191—Dalian very cobbly fine sandy loam, 2 to 8 percent slopes.** This very deep, well drained soil is on fan skirts. It formed in alluvium derived dominantly from limestone and dolomite.

Typically, about 85 percent of the surface is covered with a desert pavement of rock fragments. The surface layer is light yellowish brown very cobbly fine sandy loam about 5 inches thick. The underlying material to a depth of 60 inches or more is light yellowish brown very gravelly sandy loam to extremely gravelly fine sandy loam.

Included in this unit are about 10 percent Tencee soils on erosional fan remnants and 5 percent Arizo soils, flooded, in channels. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another.

Permeability of this Dalian soil is moderately rapid. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate if the surface is disturbed. This soil is subject to rare periods of flooding during prolonged, high-intensity storms. Channeling and deposition are common along streambanks.

Most areas of this unit are used as habitat for desert wildlife and for recreation. A few areas are used for urban development.

The main limitation for construction of dwellings is the hazard of flooding. Dikes and channels that have outlets for floodwater can be used to protect buildings from flooding.

Dikes and channels that have outlets for floodwater can be used to protect onsite sewage disposal systems from flooding.

Channeling and deposition can be minimized and maintenance costs reduced by protecting roads from flooding.

The main limitations for lawns and landscaping are the cobbles and pebbles on the surface and throughout the soil. Topsoil is needed for best results when landscaping, particularly in areas used for lawns. Lawn grasses, shrubs, and trees that are not sensitive to lime-induced chlorosis are well suited to use in landscaping. Annual applications of iron chelates reduce the effects of chlorosis.

This map unit is in capability subclass VIIs, nonirrigated, and in horticultural group 2.

192—Dalian-McCullough complex, 0 to 4 percent slopes. This map unit is on fan skirts.

This unit is 55 percent Dalian very gravelly fine sandy loam, 0 to 4 percent slopes, and 35 percent McCullough very gravelly very fine sandy loam, gravelly substratum, 0 to 4 percent slopes. Both the Dalian and McCullough soils are on alluvial fan skirts. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are about 5 percent Las Vegas soils on basin floor remnants and 5 percent Tencee soils on erosional fan remnants. Included areas make up about 10 percent of the total acreage.

The Dalian soil is very deep and well drained. It formed in alluvium derived from various kinds of rock. Typically, about 75 percent of the surface is covered with a desert pavement of pebbles. The surface layer is light yellowish brown very gravelly fine sandy loam about 5 inches thick. The underlying material to a depth of 60 inches or more is light yellowish brown very gravelly sandy loam.

Permeability of the Dalian soil is moderately rapid. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding		High water table		Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Months	Depth	Months	Depth	Thick-ness	Depth	Hard-ness	Uncoated steel	Concrete
				<u>Ft</u>		<u>In</u>		<u>In</u>			
270----- Land	B	Rare-----	---	3.5-6.0	Mar-Sep	>60	---	---	---	High-----	High.
278----- Land	D	Rare-----	---	1.5-3.0	Jan-Dec	>60	---	---	---	High-----	High.
282----- Land	C	Rare-----	---	3.0-3.5	Jan-Dec	>60	---	---	---	High-----	High.
300, 301----- Las Vegas	D	Rare-----	---	>6.0	---	>60	---	3-14	Thick	High-----	High.
302*: Las Vegas-----	D	Rare-----	---	>6.0	---	>60	---	3-14	Thick	High-----	High.
McCarran-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
Grapevine-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
305*: Las Vegas-----	D	Rare-----	---	>6.0	---	>60	---	3-14	Thick	High-----	High.
Destazo-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
307*: Las Vegas-----	D	Rare-----	---	>6.0	---	>60	---	3-14	Thick	High-----	High.
Skyhaven-----	C	Rare-----	---	>6.0	---	>60	---	24-40	Thick	High-----	High.
325, 326----- McCarran	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
341----- Paradise	C	Rare-----	---	3.0-5.0	Dec-Mar	>60	---	---	---	High-----	Low.
360*: Rock outcrop.											
St. Thomas-----	D	None-----	---	>6.0	---	4-20	Hard	---	---	High-----	Low.
380----- Skyhaven	C	Rare-----	---	>6.0	---	>60	---	24-40	Thick	High-----	High.
390----- Spring	C	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
400----- Tencee	D	None-----	---	>6.0	---	>60	---	7-20	Thick	High-----	Low.
415----- Aztec	B	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
417*: Aztec-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
Rock outcrop.											
418*: Aztec-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
Nickel-----	B	None-----	---	>6.0	---	40-60	Hard	---	---	High-----	Low.
Knob Hill-----	E	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.

See footnote at end of table.

David Turner

From: michael sumiyoshi [sumiyoshitwo@yahoo.com]

Sent: Wednesday, September 26, 2012 12:50 AM

To: JG; davidt@baughman-turner.com

Subject: Question regarding Use Variance or Permit

Jimmy and Dave,

Have either of you ever experienced where a tenant filed a variance or permit for using a Retail zoned property for manufacturing? I have a client who wants to make Baby food in a Commercial C-1 zoning but she will be manufacturing for shipping etc. She needs a kitchen set up which I have one but it is in a Shopping Center.

I've done the opposite MD or M1 with use permit/variance for Commercial use but never the opposite.

Thank you,

Michael Sumiyoshi

Property Manager, Commercial Sales / Leasing and Business Consulting
Southwestern Management and Realty Team

150 N. Durango Drive Suite 280. Las Vegas, Nevada, 89145

Cellular: 702-604-8095

E-mail: sumiyoshitwo@yahoo.com

9/26/2012

TABLE 15.--SOIL AND WATER FEATURES---Continued

Soil name and map symbol	Hydro-logic group	Flooding		High water table		Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Months	Depth	Months	Depth	Thick-ness	Depth	Hard-ness	Uncoated steel	Concrete
				<u>Ft</u>		<u>In</u>		<u>In</u>			
182*: Caliza-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Pittman-----	C	None-----	---	>6.0	---	>60	---	20-30	Thick	High-----	Low.
Arizo-----	A	Occasional	Mar-Sep	>6.0	---	>60	---	---	---	High-----	Low.
183-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Caliza											
184-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Caliza											
187-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Caliza											
190-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Dalian											
191-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Dalian											
192*: Dalian-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
McCullough-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
200-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Moderate.
Glencarb											
206-----	C	Occasional	Jul-Sep	3.0-5.0	Jul-Jun	>60	---	---	---	High-----	High.
Glencarb											
222-----	C	Rare-----	---	3.0-5.0	Jul-Jun	>60	---	---	---	High-----	High.
Glencarb											
236-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
Glencarb											
237-----	B	Rare-----	---	>6.0	---	>60	---	40-60	Thick	High-----	Low.
Glencarb											
240-----	D	None-----	---	>6.0	---	>60	---	9-20	Thick	High-----	Low.
Goodsprings											
252, 255-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
Grapevine											
260-----	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Jean											
262*: Jean-----	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Jean-----	A	Occasional	Jun-Sep	>6.0	---	>60	---	---	---	High-----	Low.
Goodsprings-----	D	Rare-----	---	>6.0	---	>60	---	9-20	Thick	High-----	Low.
263*: Jean-----	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Jean-----	A	Occasional	Jun-Sep	>6.0	---	>60	---	---	---	High-----	Low.
264-----	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Jean											

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare" and "occasional" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydro-logic group	Flooding		High water table		Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Months	Depth	Months	Depth	Thick-ness	Depth	Hard-ness	Uncoated steel	Concrete
				<u>Ft</u>		<u>In</u>		<u>In</u>			
105*: McCullough-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
Jean-----	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Bluepoint-----	A	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
107----- Arizo.	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
112----- Arizo	A	Occasional	Mar-Sep	>6.0	---	>60	---	---	---	High-----	Low.
113----- Arizo	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
117----- Arizo	A	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
120----- Bluepoint	A	Rare-----	---	4.0-6.0	Jun-Sep	>60	---	---	---	High-----	Moderate.
127, 128, 129----- Bluepoint	A	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
130*: Bracken-----	B	None-----	---	>6.0	---	40-60	Soft	---	---	High-----	High.
Destazo-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
132----- Bracken	B	None-----	---	>6.0	---	40-60	Soft	---	---	High-----	High.
133*: Bracken-----	B	None-----	---	>6.0	---	40-60	Soft	---	---	High-----	High.
Rock outcrop.											
134----- Bracken	B	None-----	---	>6.0	---	40-60	Soft	---	---	High-----	High.
140----- Casaga	C	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
150----- Cave	D	None-----	---	>6.0	---	>60	---	4-20	Thick	High-----	Low.
151----- Cave	D	None-----	---	>6.0	---	>60	---	10-20	Thick	High-----	Low.
152, 155----- Cave	D	None-----	---	>6.0	---	>60	---	4-20	Thick	High-----	Low.
160----- Destazo	B	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
181*: Caliza-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Pittman-----	C	None-----	---	>6.0	---	>60	---	20-30	Thick	High-----	Low.

See footnote at end of table.

STANDARD FORM 4

DEVELOPMENT: POD 122 @ CLIFFS EDGE (GREEN STREET)

W.O. # 6862 CALCULATED BY: SB

V1 applies to the first 500 feet of travel distance applies to the remaining travel distance		V2
Existing:	Developed	
$V1 = 1.48 \cdot S^{1/2}$	$V2 = 2.94 \cdot S^{1/2}$	$V2 = 3.06 \cdot S^{1/2}$
$V1 = 2.02 \cdot S^{1/2}$		

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

$$k = 0.0132C_n - 0.39$$

$$T_i = \frac{L}{60V}$$

$$T_c = T_i + T_r$$

SUB-BASIN DATA				INITIAL/OVERLAND TIME (Ti)				TRAVEL TIME (Tt)				Tc CHECK (URBANIZED BASINS)		FINAL Tc	LAG TIME	REMARKS
DESIG.	Cn	K	AREA AC.	AREA MI ²	LENGTH Ft	SLOPE %	Ti Min.	LENGTH Ft	SLOPE %	V1 fps	V2 fps	Tt Min.	TOTAL LENGTH	Tc Min.	TLAG Hr.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
EXON1	81	0.679	3.6	0.0057	85	1.2	6.60	802	3.1	2.6	5.2	4.16		10.76	0.108	ONSITE EXISTING
EXOF1	93	0.838	5.5	0.0086	102	3.0	3.30	928	3.1	3.6	5.4	3.65	1029.80	6.96	0.070	OFFSITE EXISTING
INON1	93	0.838	3.6	0.0057	85	1.2	4.12	802	3.1	3.6	5.4	3.27	888.85	7.39	0.074	ONSITE DEVELOPED
INOF1	93	0.838	5.5	0.0086	102	3.0	3.30	928	3.1	3.6	5.4	3.65	1029.8	6.96	0.070	OFFSITE EXISTING
DEVON1	93	0.838	3.6	0.0057	85	1.2	4.12	802	3.1	3.6	5.4	3.27	888.85	7.39	0.074	ONSITE DEVELOPED
DEVOF1	93	0.838	5.5	0.0086	102	3.0	3.31	928	3.1	3.6	5.4	3.65	1030.00	6.96	0.070	OFFSITE DEVELOPED

TRAVEL TIME CALCULATIONS

DEVELOPMENT: POD 122 @ CLIFFS EDGE (GREEN STREET)

W.O. # 6862

CALCULATED BY: SB

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

C1 applies to the first 500 feet of travel distance			
C2 applies to the remaining travel distance			
Existing:		Developed	
C1=14.8	C2=29.4	C1=20.2	C2=30.6

Basin	Length (ft)	High Elev (ft)	Low Elev (ft)	Slope (ft/ft)	First 500 feet		Remaining Travel Distance	
					C1	V1 (fps)	C2	V2 (fps)
EXON1	802	2867	2842	0.031	14.8	2.6	29.4	5.2
EXOF1	928	2871	2842	0.031	20.2	3.6	30.6	5.4
INON1	802	2867	2842	0.031	20.2	3.6	30.6	5.4
INOF1	928	2871	2842	0.031	20.2	3.6	30.6	5.4
DEVON1	802	2867	2842	0.031	20.2	3.6	30.6	5.4
DEVOF1	928	2871	2842	0.031	20.2	3.6	30.6	5.4

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* SEPTEMBER 1990
* VERSION 4.0
*
* RUN DATE 07/02/2007 TIME 16:47:09
*
*****

```

```

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

```

```

X X XXXXXXX XXXX X
X X X X X XX
X X X X X X
XXXXXX XXXX X XXXX X
X X X X X X
X X X X X X
X X XXXXXXX XXXX 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
1 *DIAGRAM
2 IO PDD 122 @ CLIFFS EDGE
3 ID INTERIM Condition
4 ID FILE: 6862-INT.DAT
5 ID 10/100 YR STORM EVENT
6 ID
7 IT 5 0 0 300
8 IN 5 0 0
9 IO 5 0 0
JR PREC .55 1.00
10 KK INOF1
11 KM INTERIM OFFSITE BASIN
12 BA .0086
13 PB 3.15
14 PC .000 .020 .057 .070 .087 .108 .124 .130 .130 .130
15 PC .130 .130 .130 .133 .140 .142 .148 .158 .172 .181
16 PC .190 .197 .199 .200 .201 .204 .214 .229 .241 .249
17 PC .251 .256 .270 .278 .281 .283 .295 .322 .352 .409
18 PC .499 .590 .710 .744 .781 .812 .819 .835 .851 .856
19 PC .860 .868 .876 .888 .910 .926 .937 .950 .970 .976
20 PC .982 .985 .987 .989 .990 .993 .993 .994 .995 .998
21 PC .998 .999 1.00
22 LS 93
23 UD 0.070
*
24 KK INON1
25 KM INTERIM ONSITE BASIN
26 BA .0057
27 LS 93
28 UD .074
*
29 KK CP-1
30 KM COMBINE INOF1 AND INON1
31 HC 2
*
32 ZZ

```

```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW
NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW
10 INOF1
.
24 INON1
.
29 CP-1 .....

```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* SEPTEMBER 1990
* VERSION 4.0
*
* RUN DATE 07/02/2007 TIME 16:47:09
*
*****

```

```

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

```

6862-INT.OUT

PODD 122 @ CLIFFS EDGE
INTERIM Condition
FILE: 6862-INT.DAT
10/100 YR STORM EVENT

8 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
 .55 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 .55	RATIO 2 1.00
HYDROGRAPH AT +	INOF1	.01	1 FLOW TIME	9. 3.50	19. 3.50
HYDROGRAPH AT +	INON1	.01	1 FLOW TIME	6. 3.50	13. 3.50
2 COMBINED AT +	CP-1	.01	1 FLOW TIME	15. 3.50	32. 3.50

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

6862-DEV.OUT

```

*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* SEPTEMBER 1990 *
* VERSION 4.0 *
* RUN DATE 07/02/2007 TIME 16:44:40 *
*****

```

```

*****
* 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 X
XXXXXXX XXXX XXXXX X
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
*** FREE ***
*DIAGRAM
1 ID POOD 122 @ CLIFFS EDGE
2 ID DEVELOPED Condition
3 ID FILE: 6862-DEV.DAT
4 ID 10/100 YR STORM EVENT
5 ID
6 IT 5 0 0 300
7 IN 5 0 0
8 IO 5 0 0
9 JR PREC .55 1.00
10 KK DEVOF1
11 KM DEVELOPED OFFSITE BASIN
12 BA .0086
13 PB 3.15
14 PC .000 .020 .057 .070 .087 .108 .124 .130 .130 .130
15 PC .130 .130 .130 .133 .140 .142 .148 .158 .172 .181
16 PC .190 .197 .199 .200 .201 .204 .214 .229 .241 .249
17 PC .251 .256 .270 .278 .281 .283 .295 .322 .352 .409
18 PC .499 .590 .710 .744 .781 .812 .819 .835 .851 .856
19 PC .860 .868 .876 .888 .910 .926 .937 .950 .970 .976
20 PC .982 .985 .987 .989 .990 .993 .993 .994 .995 .998
21 PC .998 .999 1.00
22 LS 0 93
23 UD 0.070
24 KK DEVON1
25 KM DEVELOPED ONSITE BASIN
26 BA .0057
27 LS 0 93
28 UD .074
29 KK CP-1
30 KM COMBINE DEVOF1 AND DEVON1
31 HC 2
32 ZZ

```

```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW
NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW
10 DEVOF1
24 DEVON1
29 CP-1

```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* SEPTEMBER 1990 *
* VERSION 4.0 *
* RUN DATE 07/02/2007 TIME 16:44:40 *
*****

```

```

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

```

PODD 122 @ CLIFFS EDGE
DEVELOPED Condition
FILE: 6862-DEV.DAT
10/100 YR STORM EVENT

8 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
 .55 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
				.55	1.00
HYDROGRAPH AT					
+	DEVOF1	.01	1 FLOW	9.	19.
			TIME	3.50	3.50
HYDROGRAPH AT					
+	DEVON1	.01	1 FLOW	6.	13.
			TIME	3.50	3.50
2 COMBINED AT					
+	CP-1	.01	1 FLOW	15.	32.
			TIME	3.50	3.50

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

DEVELOPMENT: GREENSTREET @ POD 122

DESCRIPTION: FLOW CALCULATION BASED ON FLOW/AREA RATIO

W.O.# : 6862

DATE: 9/7/2007

FLOW/AREA RATIOS						
BASIN	TOTAL AREA	100-YR FLOW	PHASE	PHASE AREA	PHASE AREA/TOTAL AREA PERCENTAGE	PHASE FLOW
	(AC)	(CFS)		(ACRES)	RATIO	(CFS)
DEVON1	3.6	13	1	2.83	79%	10
			2	0.77	21%	3

DROP INLET CALCULATIONS - SUMP

DEVELOPMENT GREENSTREET @ POD 122

LOCATION STA 10+67.57 DI #3 PHASE 2

CALCULATED BY SB

WORK ORDER # 6862

RESULTS

CURB OPENING LENGTH: 2.50 ft

NUMBER OF GRATES: 1 ea

FLOW INTERCEPTED BY CURB: 1.8 cfs

FLOW INTERCEPTED BY GRATE: 1.6 cfs

TOTAL FLOW INTERCEPTED: 3 cfs

CURB OPENING DROP INLET --- SUMP CONDITION

Flow depth, y..... 0.34 feet * (y/h) percentage 378 %
1/2 Inlet length, L..... 1.25 feet *
Lateral Width, W..... 1.50 feet * Weir flow..... 1.80 cfs
Orifice height, h..... 0.09 feet * Orifice flow..... 0.33 cfs

Note:

1. Orifice condition if depth is 40% greater than opening height
2. Equations from FHWA HEC-12 dated March, 1984.

RECTANGULAR GRATE DROP INLET --- SUMP CONDITION

Grate Length..... 2.5 feet *
Flow depth, y..... 0.34 feet *
Grate open area, A..... 2.25 sq.ft. *
Grate Perimeter, P..... 5.50 feet * Weir flow..... 1.64 cfs
Clogging percentage..... 50 % * Orifice flow..... 3.52 cfs

Note:

1. Orifice condition depends on bar config., grate size, depth.
2. Equations from FHWA HEC-12 dated March, 1984.
3. Grate open area, A, based on Neenah R-4999-L9 grate(0.9 Sq.Ft Open Area per linear ft.)

DROP INLET CALCULATIONS - ON GRADE

DEVELOPMENT GREENSTREET @ POD 122

LOCATION STA 12+96.22 DI #2 PHASE 1

CALCULATED BY SB

WORK ORDER # 6862

RESULTS

CURB OPENING LENGTH: 15 ft

GRATE LENGTH: 15 ft

TOTAL FLOW INTERCEPTED 13 cfs

CURB OPENING DROP INLET --- ON GRADE WITH LOCAL DEPRESSION

```
*****
* Gutter flow, Q..... 10 cfs * Frontal ratio, Eo..... 0.33 *
* Flow depth, V..... 0.54 feet * Eq cross-slope, Se..... 5.95 % *
* Street slope, S..... 1.00 % *
* Cross slope, Sx..... 2.90 % *
* Opening length, L..... 7.5 feet * 100% intercept..... 27.2 feet *
* Gutter depr, a..... 1.68 in * Efficiency..... 44.0 % *
* MANNING'S n..... 0.015 * Intercepted flow..... 4.6 cfs *
*****
```

Note:

1. Equations from FHWA HEC-12 dated March, 1984.

RECTANGULAR GRATE DROP INLET --- ON GRADE

```
*****
* Gutter flow, Q..... 10 cfs * Efficiency: *
* Flow velocity, V..... 3.12 fps * Frontal total *
* Flow depth, Y..... 0.54 feet * Side flow, R..... 72 % *
* Grate length, L..... 7.5 feet * Grate, E..... 79 % *
* Gutter width, W..... 1.5 feet * Top width, T..... 18.6 feet *
* Cross slope, Sx..... 2.90 % * Intercepted flow 8.2 cfs *
*****
```

Note:

1. Ratio of frontal flow intercepted to total frontal flow, $Rf=1.0$
2. Frontal to total gutter flow ratio is for composite cross slope.
3. Equations from FHWA HEC-12 dated March, 1984.

Worksheet for FM - 3

Results

Critical Slope	0.00608	ft/ft
Velocity	3.12	ft/s
Velocity Head	0.15	ft
Specific Energy	0.69	ft
Froude Number	1.27	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.54	ft
Critical Depth	0.59	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.00608	ft/ft

Cross Section for FM - 3

Project Description

Friction Method

Manning Formula

Solve For

Normal Depth

Input Data

Channel Slope

1.00000 %

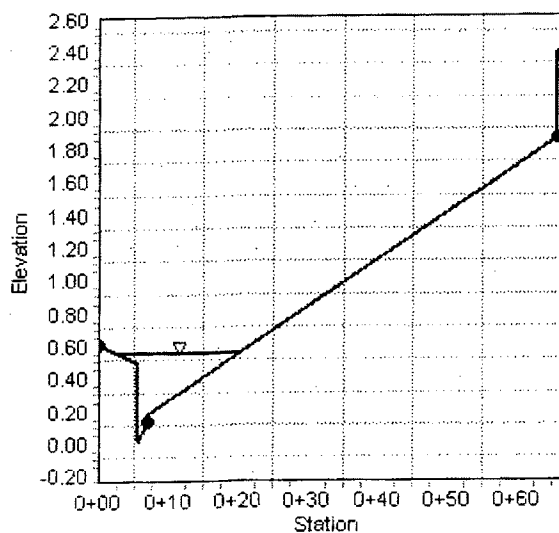
Normal Depth

0.54 ft

Discharge

10.00 ft³/s

Cross Section Image



Starting HGL and EGL

Outlet Tailwater Elevation 2838.86	Invert Elevation 2834.08	Critical Depth- Dc (ft) 1.30	Pipe Diameter- D (ft) 2.0	(Dc+D)/2 (ft) 1.65	Starting HGL (ft) 2838.86	Hv (ft) 0.27	Starting EGL (ft) 2839.13
--	--------------------------------	---------------------------------------	------------------------------------	--------------------------	---------------------------------	-----------------	---------------------------------

Phi Index

n Value	Phi
0.013	0.00492

STANDARD FORM 6

DEVELOPMENT: GREENSTREET @ POD 122
CALCULATED BY: SDB
STORM DRAIN SEGMENT: POD 122
DESCRIPTION: MAIN REACH
WOW 6862

Segment Desc.	Starting Station	Ending Station	Diameter (ft)	D/S Invert	U/S Invert	Length (ft)	Area (sq. ft)	Phi	Flow (cfs)	Slope (%)	Velocity (fps)	Hv (ft)	Sf (ft/ft)	Ave. Sf (ft/ft)	Headloss Calculations (ft)												U/S EGL Elevation	U/S HGL Elevation	Pressure Flow ?	D/S EGL of U/S Segment	Final U/S EGL	Final U/S HGL		
															Junction			Manhole			Bend			Inlet/outlet	misc	H Total								
															Ang	Kj	Hj	Ang	Km	Hm	Ang	Kb	Hb											
EXISTING DI	10+00.00	10+00.00	2.0	2834.08	2834.08	0.00	3.14	0.00492	13	N/A	4.14	0.27	0.00329	0.00329	0.22									0.5	0.13	0.13	2839.26	2839.99	YES	2836.35	2839.26	2838.99		
EXISTING PIPE	10+00.00	10+67.57	2.0	2834.08	2838.87	67.56	3.14	0.00492	13	7.09	4.14	0.27	0.00329	0.00329	0.22											0.22	2839.46	2839.22	YES	2841.14	2841.14	2840.87		
DI #3	10+67.57	10+67.57	2.0	2838.87	2838.87	0.00	3.14	0.00492	13	N/A	4.14	0.27	0.00329	0.00329	0.14											0.5	0.13	0.16	2841.30	2841.03	YES	2841.03	2841.30	2841.03
EXISTING PIPE	10+67.57	12+21.08	2.0	2838.87	2842.66	53.51	3.14	0.00492	10	7.08	3.18	0.16	0.00195	0.00262	0.14													0.14	2841.44	2841.28	YES	2844.82	2844.82	2844.66
SDMH #4	11+21.08	11+21.08	2.0	2842.66	2842.66	0.00	3.14	0.00492	10	N/A	3.18	0.16	0.00195	0.00195	0.32													0.32	2845.14	2844.98	YES	2849.35	2849.35	2849.19
EXISTING PIPE	11+21.08	12+88.15	2.0	2842.66	2847.19	164.98	3.14	0.00492	10	2.75	3.18	0.16	0.00195	0.00195	0.02													0.08	2849.41	2849.25	YES	2849.54	2849.54	2849.38
SDMH #1	12+88.15	12+88.15	2.0	2847.19	2847.38	0.00	3.14	0.00492	10	N/A	3.18	0.16	0.00195	0.00195	0.02													0.02	2849.55	2849.40	YES	2849.71	2849.71	2849.55
PIPE	12+88.15	12+96.22	2.0	2847.38	2847.55	8.07	3.14	0.00492	10	2.11	3.18	0.16	0.00195	0.00195	0.02																			
DI #2	12+96.22	12+96.22	2.0	2847.55	2847.55	0.00	3.14	0.00492	10	N/A	3.18	0.16	0.00195	0.00195												0.5	0.08	0.08	2849.79	2849.63				
														</																				

* Starting Tailwater Elevation referenced from approved Cliffs Edge Information Center Study

Worksheet for Circular Pipe - 1

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Roughness Coefficient	0.013
Channel Slope	7.08000 %
Diameter	2.00 ft
Discharge	13.00 ft ³ /s

Results

Normal Depth	0.63 ft
Flow Area	0.85 ft ²
Wetted Perimeter	2.39 ft
Top Width	1.86 ft
Critical Depth	1.30 ft
Percent Full	31.6 %
Critical Slope	0.00580 ft/ft
Velocity	15.29 ft/s
Velocity Head	3.63 ft
Specific Energy	4.26 ft
Froude Number	3.99
Maximum Discharge	64.75 ft ³ /s
Discharge Full	60.19 ft ³ /s
Slope Full	0.00330 ft/ft
Flow Type	SuperCritical

Used for Standard Form 6 Calc.

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
Average End Depth Over Rise	0.00 %
Normal Depth Over Rise	31.56 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s

Worksheet for Circular Pipe - 1

GVF Output Data

Normal Depth	0.63	ft
Critical Depth	1.30	ft
Channel Slope	7.08000	%
Critical Slope	0.00580	ft/ft

DS 4232
REC'D: 10/18/2007
\$400.00 F-24

ADDENDUME #1
TO THE
TECHNICAL DRAINAGE STUDY
FOR
GREENSTREET @ POD 122
CITY OF LAS VEGAS
W.O. # 6862

Prepared for:
GREENSTREET PROPERTIES

Submitted to:
CITY OF LAS VEGAS
DEPARTMENT OF PUBLIC WORKS



HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: GREENSTREET @ POD 122 Date: 10/18/07

Location of Development: a) Descriptive (Cross Streets) North/South Hualapai Way East/West Elkhorn Road
 b) Sect. 24 Twn. 19S Rng. 59E

Name of Owner: GREENSTREET PROPERTIES Assessors Parcel No: 126-24-510-003

Telephone No: (702) 876-5582 Facsimile No: (702) 365-5885

Address: 2320 PASEO DEL PRASO BLDG. B, SUITE# 202
LAS VEGAS NV 89102

Contact Person-Name WOEI Y. THEN, P.E. Telephone No: (702) 873-7550

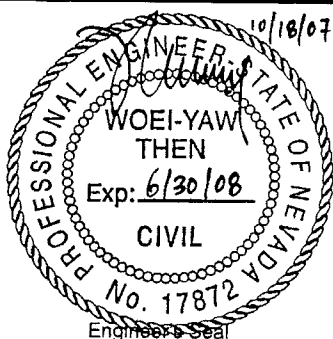
Firm: VTN NEVADA

Address: 2727 South Rainbow Boulevard, Las Vegas Nevada 89146

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: 3.6 Acres Being Developed/Disturbed: 3.6 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? 200 acres
6. Has the site drainage been evaluated in the past ☒ Yes ☐ No If yes, please identify documentation:
Master Drainage Study for Cliff's Edge (DS3404); Technical Drainage Study for Cliff's Edge Infrastructure Phase I (DS3576); Technical Drainage Study for Cliff's Edge Infrastructure Phase II (DS3617); Technical Drainage Study for Liberty Square (DS4148)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site:
Site drains east toward Hualapai Way storm drain system
8. Briefly describe your proposed schedule for the subject project: AS SOON AS POSSIBLE



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.

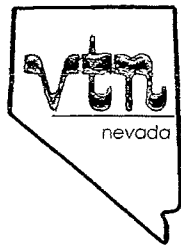
* Review and concurrence of the Clark County Regional Flood Control District is Required.

Local Entity File No. _____

Revision	Date

REFERENCE:

Standard Form 1



CONSULTING ENGINEERS • PLANNERS • SURVEYORS
PROVIDING QUALITY PROFESSIONAL
SERVICES SINCE 1960

October 18, 2007
W.O. #6862

City of Las Vegas
Department of Public Services
731 South Fourth Street
Las Vegas, Nevada 89101

Attention: Mr. Albert Sung, P.E.

**SUBJECT: ADDENDUM #1 TO THE TECHNICAL DRAINAGE STUDY FOR:
GREENSTREET @ POD 122**

Mr. Sung:

This Addendum #1 to the Technical Drainage Study is being submitted to the City of Las Vegas, Department of Public Works to address review comments to the above mentioned Technical Drainage Study that was issued on October 1, 2007.

THE FOLLOWING COMMENTS ARE FOR PHASE 1:

COMMENT #1

Sheet GR1: Label finish floor elevation of the existing buildings in the adjacent residential parcel.

Finish floor elevations of the existing buildings in the adjacent residential parcel have been added on the revised plans in Appendix.

COMMENT #2

The proposed D.I. #2 is at a sump condition. Address whether an emergency overflow path has been provided in case the inlet is completely clogged. Detail H/DT1 should be revised to label the vertical distance between the top of the landscape berm and the top of the parking curb. It appears that this vertical distance is the overflow path. Note that the finish floor elevation of the adjacent building must be set at a minimum of 18" above the overflow weir water surface. Review and revise accordingly.

The proposed D.I. #2 was analyzed as an on grade drop inlet. The previous submitted plans incorrectly show a sump inlet. The grades have been revised to show continuous grades in the revised plans in the

Appendix. No revision was performed on Detail H/DT1 since the emergency overflow path is not required in this case.

COMMENT #3

Label the existing onsite storm drain which D.I. #2 is tied to with City of Las Vegas recorded plan number.

The existing onsite storm drain which D.I.#2 is tied, has been labeled with City of Las Vegas recorded plan number 107Y-4816-HSD. See revised plans in Appendix.

COMMENT #4

Revise all drop inlets to Type "CM" or Neenah Pre-cast inlets. Contact Raul Cruz at 229-6171 for an AutoCAD detail to be included within the improvement plans if Type "CM" drop inlets are used. Label the depth of the inlet on the plan and in the detail.

All drop inlets has been revised to Type "CM" drop inlet and the detail for the Type "CM" drop inlet has been added in the revised plans located in the Appendix.

COMMENT #5

Detail A/DT1: Provide an arrow to show the direction of flow and label the slopes in the landscape strips on both sides of the property line.

The arrow and slopes value have been added for the landscape strips on both sides of the property lines. See revised plans in Appendix.

COMMENT #6

Details D/DT1 and E/DT1: It appears that the driveway section is sloping towards the new development instead of away as shown in the details. Revise the sketch and label with appropriate slope in the details.

Comment noted. Detail D/DT1 and E/DT1 has been revised to show the driveway section sloping towards the new development. See revised plans in Appendix.

THE FOLLOWING COMMENTS ARE FOR PHASE 2:**COMMENT #1**

Sheet GR1: Label finish floor elevation of the existing buildings in the adjacent residential parcel.

Finish floor elevations of the existing buildings in the adjacent residential parcel have been added on the revised plans in Appendix.

COMMENT #2

The proposed D.I. #3 is at a sump condition. Address whether an emergency overflow path has been provided in case the inlet is completely clogged. Detail L/DT1 should be revised to label the vertical distance between the top of the landscape berm and the top of the parking curb. It appears that this vertical distance is the overflow path. Note that the finish floor elevation of the adjacent building must be set at a minimum of 18" above the overflow weir water surface. Review and revise accordingly.

In case the inlet is completely clogged, the flow will overtop the landscape berm as an emergency overflow path onto Hualapai Way. Detail L/DT1 has been revised to label the vertical distance between the top of the landscape berm and the top of the parking curb. The finished floor has been verified to be 18" above the weir water surface elevation. The width of the weir calculation was assumed to be 10-feet wide. The weir calculation also assumes that the upstream drop inlet (DI#2 in Phase 1) is completely clogged, therefore total flow of 13 cfs was used in the calculation. Based on the weir calculation, the weir water surface elevation is at 51.07 and the closest building finished floor is at 53.9 which is more than 18" above the weir water surface elevation of the emergency overflow.

COMMENT #3

Sheet SD1: It appears that D.I. #3 is more than 10' deep which will require a special detail and structural calculations. Provide structural detail and calculations to City of Las Vegas Building and Safety Department for their review and approval prior to the final approval of the drainage study.

Special structural calculations for DI#3 are in the process to be forwarded to the City of Las Vegas Building and Safety Department for their review and approval. The approval notice will be forwarded to the City of Las Vegas once received. We requested a conditional approval of this drainage study to be granted.

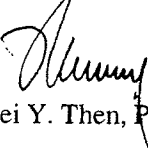
COMMENT #4

Revise all drop inlets to Type "CM" or Neenah Pre-cast inlets. Contact Raul Cruz at 229-6171 for an AutoCAD detail to be included within the improvement plans if Type "CM" drop inlets are used. Label the depth of the inlet on the plan and in the detail.

All drop inlets has been revised to Type "CM" drop inlet and the detail for the Type "CM" drop inlet has been added in the revised plans located in the Appendix.

Respectfully Submitted,

VTN Nevada


Woei Y. Then, P.E..

GREENSTREET @ POD 122
W.O.# 6862

**WEIR FLOW CALCULATIONS
AT PHASE 2 D.I. #3**

WEIR EQUATION

$$Q = C_d \times L \times H^{1.5} \quad \text{or} \quad H = \left(\frac{Q}{C_d \times L} \right)^{\frac{2}{3}}$$

Where:

L = Length of Weir, ft.

Q = Flow Capacity, cfs

H = Height of Weir, ft.

C_d = Weir Coefficient = 3.0

INPUT

Q = 13 cfs

C_d = 3.0

L = 10 ft.

RESULT

H = 0.57 ft.

WEIR WATER SURFACE ELEVATION (W.W.S.E.)

FLOWLINE = 50.50 ft

W.W.S.E. = 51.07 ft

W.O. # 6862

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		October 30, 2007
TO: Land Development Services Department of Public Works	FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works	
SUBJECT: Drainage Study for: Greenstreet @ POD 122 (Providence) - Phase 1 & Phase 2		COPIES TO: VTN Nevada
Cross Streets:	SWC of Elkhorn Road & Hualapai Way	Greenstreet Properties
File Number:	F:\Depot\DSMemos\DS4232B.doc	Bart Anderson, P.E., DevCo
Parcel Number:	126-24-510-003	CCRFGD
Zoning Action:	SDR-18031; VAR-18080 & TMP-21853	CCDDS
FEMA Flood Zone	YES NO X	
Proposed Storm Drain	YES NO X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1 st Submittal	9/10/2007	9/24/2007	Not Approved	\$400.00	77343: \$400
2 nd Submittal	10/18/2007	10/29/2007	See Comments Below	\$400.00	80168: \$400
TOTAL FEES (LDDRS):				\$800.00	

REMARKS:

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

	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to Clark County Department of Development Services concurrence.
X	is conditionally approved subject to City of Las Vegas Building & Safety Department's approval on structural calculations as required in Condition #2

1. Provide a copy of the final map which must contain a note to state or to the effect that: "All areas not occupied by the Buildings must be public drainage easements to be privately maintained by the Homeowners Association". Provide the same note on the grading plans.

The following comment is for Phase 2:

2. Sheet SD1: It appears that D.I. #3 is more than 10' deep which will require a special detail and structural calculations. Provide structural detail and calculations to City of Las Vegas Building and Safety Department for their review and approval prior to the final approval of the drainage study.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see <http://ndep.nv.gov/bwpc/storm01.htm> or call (775) 687-8429.

END OF REMARKS
ays

T/R/S: T19S/R59E/24
AREA F-24



LAS VEGAS
CITY COUNCIL

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MAYOR

STAVROS S. ANTHONY
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LOIS TARKANIAN
STEVEN D. ROSS

RICKI Y. BARLOW
BOB COFFIN
BOB BEERS

ELIZABETH N. FRETWELL
CITY MANAGER

May 9, 2012

Mr. Hank Gordon
Providence Plaza, LLC
1770 North Buffalo Drive, Suite #101
Las Vegas, Nevada 89128

**RE: SUP-44851 - SPECIAL USE PERMIT RELATED TO SUP-44852 AND
SDR-44850
PLANNING COMMISSION MEETING OF MAY 8, 2012**

Dear Mr. Gordon:

Your request for a Special Use Permit FOR GAMING (INCIDENTAL GAMING MACHINES ONLY) WITHIN A PROPOSED 5,730 SQUARE-FOOT CONVENIENCE STORE at 7161 North Hualapai Way (APN 126-24-517-004), PD (Planned Development) Zone [VC (Village Commercial) Cliff's Edge Special Land Use Designation], Ward 6 (Ross), was considered by the Planning Commission on May 8, 2012.

The Planning Commission voted to **APPROVE** your request, subject to the following:

Planning

1. Approval of and conformance to the Conditions of Approval for Site Development Plan Review (SDR-44850) shall be required.
2. Conformance to the approved conditions of Rezoning (ZON-2184).
3. This approval shall be void two years from the date of final approval, unless exercised pursuant to the provisions of LVMC Title 19.16. An Extension of Time may be filed for consideration by the City of Las Vegas.
4. Prior to occupancy, all necessary building permits shall be obtained and final inspections shall be completed in compliance with Title 19 and all codes as required by the Department of Building and Safety.

CITY OF LAS VEGAS
DEPARTMENT OF PLANNING
DEVELOPMENT SERVICES CENTER
333 NORTH RANCHO DRIVE
3RD FLOOR
LAS VEGAS, NEVADA 89108

VOICE 702.229.8301

FAX 702.474.0352

TTY 702.385.9108

www.lasvegasnevada.gov

Mr. Hank Gordon
Providence Plaza, LLC
SUP-44851 - Page Two
May 9, 2012

5. These Conditions of Approval shall be affixed to the cover sheet of any plan set submitted for building permit.
6. All City Code requirements and design standards of all City departments must be satisfied, except as modified herein.

This action by the Planning Commission on May 8, 2012 is final unless a written appeal is filed with the City Clerk within ten days of the date of the Planning Commission's decision as allowed by code or there is a review action filed by the City Council within the same time period. For additional information on appeals or review requests please access <http://www.lasvegasnevada.gov/CheckStatus/DevelopmentApp.htm>, or contact the Department of Planning and Development at 702.229.6301 after May 21, 2012. No building permits or business licenses related to these items shall be issued prior to the expiration of the required ten day waiting period, or until any filed appeal is resolved pursuant to LVMC Title 19.18.

Sincerely,



Steve Gebeke, AICP
Planning Supervisor
Case Planning Division

SG:clb

cc: Mr. Mark Fiorentino
Kaempfer Crowell
8345 West Sunset Road, Suite #250
Las Vegas, Nevada 89113



LAS VEGAS
CITY COUNCIL

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MAYOR

STAVROS S. ANTHONY
MAYOR PRO TEM

LOIS TARKANIAN
STEVEN D. ROSS
RICKI Y. BARLOW
BOB COFFIN
BOB BEERS

ELIZABETH N. FRETWELL
CITY MANAGER

May 9, 2012

Mr. Hank Gordon
Providence Plaza, LLC
1770 North Buffalo Drive, Suite #101
Las Vegas, Nevada 89128

**RE: SUP-44852 - SPECIAL USE PERMIT RELATED TO SUP-44851 AND
SDR-44850
PLANNING COMMISSION MEETING OF MAY 8, 2012**

Dear Mr. Gordon:

Your request for a Special Use Permit FOR LIQUOR SALES (FOR OFF-PREMISE CONSUMPTION) WITHIN A PROPOSED 5,730 SQUARE-FOOT CONVENIENCE STORE at 7161 North Hualapai Way (APN 126-24-517-004), PD (Planned Development) Zone [VC (Village Commercial) Cliff's Edge Special Land Use Designation], Ward 6 (Ross), was considered by the Planning Commission on May 8, 2012.

The Planning Commission voted to **APPROVE** your request, subject to the following:

Planning

1. The hours of operation for the car wash and deliveries shall be from 6 am to 8 pm.
2. The sale of alcohol shall be limited to beer/wine/coolers only.
3. Approval of and conformance to the Conditions of Approval for Special Use Permit (SUP-44851) and Site Development Plan Review (SDR-44850) shall be required.
4. Conformance to the approved conditions for Rezoning (ZON-2184).
5. This approval shall be void two years from the date of final approval, unless exercised pursuant to the provisions of LVMC Title 19.16. An Extension of Time may be filed for consideration by the City of Las Vegas.
6. Prior to occupancy, all necessary building permits shall be obtained and final inspections shall be completed in compliance with Title 19 and all codes as required by the Department of Building and Safety.
7. Approval of this Special Use Permit does not constitute approval of a liquor license.

CITY OF LAS VEGAS
DEPARTMENT OF PLANNING
DEVELOPMENT SERVICES CENTER
333 NORTH RANCHO DRIVE
3RD FLOOR
LAS VEGAS, NEVADA 89108

VOICE 702.229.6301

FAX 702.474.0352

TTY 702.386.9108

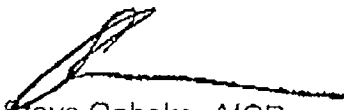
www.lasvegasnevada.gov

Mr. Hank Gordon
Providence Plaza, LLC
SUP-44852 - Page Two
May 9, 2012

8. This business shall operate in conformance to Chapter 6.50 of the City of Las Vegas Municipal Code.
9. All beer and wine coolers shall remain in the original manufacturer's configuration intended for resale.
10. The sale of single beers, malt beverages, or wine coolers of any size with alcohol by volume greater than 6% shall be prohibited. The sale of wines with an alcohol by volume of greater than 16% shall be prohibited.
11. These Conditions of Approval shall be affixed to the cover sheet of any plan set submitted for building permit.
12. All City Code requirements and design standards of all City departments must be satisfied, except as modified herein.

This action by the Planning Commission on **May 8, 2012** is final unless a written appeal is filed with the City Clerk within ten days of the date of the Planning Commission's decision as allowed by code or there is a review action filed by the City Council within the same time period. For additional information on appeals or review requests please access <http://www.lasvegasnevada.gov/CheckStatus/DevelopmentApp.htm>, or contact the Department of Planning and Development at 702.229.6301 after **May 21, 2012**. No building permits or business licenses related to these items shall be issued prior to the expiration of the required ten day waiting period, or until any filed appeal is resolved pursuant to LVMC Title 19.18.

Sincerely,



Steve Gebeke, AICP
Planning Supervisor
Case Planning Division

SG:clb

cc: Mr. Mark Florentino
Kaempfer Crowell
8345 West Sunset Road, Suite #250
Las Vegas, Nevada 89113



LAS VEGAS
CITY COUNCIL

CAROLYN G. GOODMAN
MAYOR

STAVROS S. ANTHONY
MAYOR PRO TEM

LOIS TARKANIAN

STEVEN D. ROSS

RICKI Y. BARLOW

BOB COFFIN

BOB BEERS

ELIZABETH N. FRETWELL
CITY MANAGER

May 9, 2012

Mr. Hank Gordon
Providence Plaza, LLC
1770 North Buffalo Drive, Suite #101
Las Vegas, Nevada 89128

**RE: SDR-44850 - SITE DEVELOPMENT PLAN REVIEW RELATED TO
SUP-44851 AND SUP-44852
PLANNING COMMISSION MEETING OF MAY 8, 2012**

Dear Mr. Gordon:

Your request for a Major Amendment to a previously approved Site Development Plan Review (SDR-18031) FOR A PROPOSED 5,730 SQUARE-FOOT CONVENIENCE STORE WITH GASOLINE SALES, DRIVE THROUGH RESTAURANT AND A 2,360 SQUARE-FOOT CAR WASH WITH A WAIVER TO ALLOW A THREE-FOOT LANDSCAPE BUFFER ALONG A PORTION OF THE EAST PERIMETER WHERE FIVE FEET WAS APPROVED on 3.40 acres at 7161 North Hualapai Way (APNs 126-24-517-003 and 004), PD (Planned Development) Zone [VC (Village Commercial) Cliff's Edge Special Land Use Designation], Ward 6 (Ross), was considered by the Planning Commission on May 8, 2012.

The Planning Commission voted to **APPROVE** your request, subject to the following:

Planning

1. Approval and conformance to Conditions of Approval for SUP-44857 and SUP-44852 shall be required, if approved.
2. Conformance to the Conditions of Approval for Rezoning (ZON-2184) shall be required.
3. This approval shall be void two years from the date of final approval, unless exercised pursuant to the provisions of LVMC Title 19.16. An Extension of Time may be filed for consideration by the City of Las Vegas.
4. All development shall be in conformance with the site plan, landscape plan, and building elevations, date stamped 03/15/12, except as amended by conditions herein.

CITY OF LAS VEGAS
DEPARTMENT OF PLANNING
DEVELOPMENT SERVICES CENTER
333 NORTH RANCHO DRIVE
3RD FLOOR
LAS VEGAS, NEVADA 89106

VOICE 702.229.8301
FAX 702.474.0352
TTY 702.386.9108
www.lasvegashnvada.gov

Mr. Hank Gordon
Providence Plaza, LLC
SDR-44850 - Page Two
May 9, 2012

5. A Waiver from Title 19.08 is hereby approved, to allow a three-foot buffer along a portion of the east perimeter where five feet was approved.
6. Relocate the trash containment area a minimum of 50 feet away from residentially zoned property.
7. Revised site plans reflecting the Title 19.08.110 Parking requirements as shown in Figure 2 - Handicapped Parking Dimensions are required prior to or at the time of submittal of building permits.
8. Any changes based upon right-of-way, traffic or drainage studies or street improvements required by the city or public utilities shall not reduce the widths of perimeter landscape buffers, height of walls or quantities of plant materials from that on submitted landscape plans date stamped 03/15/12. Any changes based upon subsequently submitted studies must be accommodated elsewhere on the site.
9. Prior to occupancy, all necessary building permits shall be obtained and final inspections shall be completed in compliance with Title 19 and all codes as required by the Department of Building and Safety.
10. These Conditions of Approval shall be affixed to the cover sheet of any plan set submitted for building permit.
11. All utility boxes exceeding 27 cubic feet in size shall meet the standards of LVMC Title 19.08.040.
12. Parking lot lighting standards shall be no more than 30 feet in height and shall utilize downward-directed lights with full cut-off luminaries. Lighting on the exterior of buildings shall be shielded and shall be downward-directed. Non-residential property lighting shall be directed away from residential property or screened, and shall not create fugitive lighting on adjacent properties.
13. A fully operational fire protection system, including fire apparatus roads, fire hydrants and water supply, shall be installed and shall be functioning prior to construction of any combustible structures.
14. All City Code requirements and design standards of all City Departments must be satisfied, except as modified herein.

Public Works

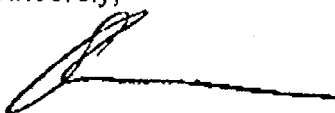
15. Meet with the Fire Protection Engineering Section of the Department of Fire Services to discuss fire requirements for the proposed use of this facility.

Mr. Hank Gordon
Providence Plaza, LLC
SDR-44850 - Page Three
May 9, 2012

16. All landscaping and private improvements installed with this project shall be situated and maintained so as to not create sight visibility obstructions for vehicular traffic at all development access drives and abutting street intersections.
17. An update to the previously approved Drainage Plan and Technical Drainage Study must be submitted to and approved by the Department of Public Works prior to the issuance of any grading or building permits or submittal of any construction drawings, whichever may occur first. Provide and improve all drainageways as recommended in the approved drainage plan/study.
18. Site development to comply with all applicable conditions of approval SDR-18031, TMP-21653 and all other applicable site-related actions.

This action by the Planning Commission on **May 8, 2012** is final unless a written appeal is filed with the City Clerk within ten days of the date of the Planning Commission's decision as allowed by code or there is a review action filed by the City Council within the same time period. For additional information on appeals or review requests please access <http://www.lasvegasnevada.gov/CheckStatus/DevelopmentApp.htm>, or contact the Department of Planning and Development at 702.229.6301 after **May 21, 2012**. No building permits or business licenses related to these items shall be issued prior to the expiration of the required ten day waiting period, or until any filed appeal is resolved pursuant to LVMC Title 19.18.

Sincerely,



Steve Gebeke, AICP
Planning Supervisor
Case Planning Division

SG:clb

cc: Mr. Mark Florentino
Kaempfer Crowell
8345 West Sunset Road, Suite #250
Las Vegas, Nevada 89113



CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 06/06/01)

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 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 Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (Design Manual).

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.)
✓		Copies of all conditions of approval for development related to this property. (e.g. zoning, use permit, tentative map, etc.) Verify compliance with conditions.

II. GRADING PLAN INFORMATION		
Yes	No	
✓		(1) 24" X 36" copy of the Grading Plan, (including all Detail Sheets) sealed by the engineer.
✓		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.
✓		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.)
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.
✓		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.
✓		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.
✓		Back of lot elevations and lot drainage pattern for all lots including common lots.

CITY OF LAS VEGAS MINIMUM DRAINAGE STUDY CRITERIA CHECKLIST

II. GRADING PLAN INFORMATION		
Yes	No	
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.
✓		On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners. (The project must pass flows through the site every 600 feet where the project is blocking flow paths.)
N/A		This project uses a solid grouted stem wall (or approved alternate) at the back of sidewalk to provide erosion protection for landscaped areas where the depth of flow in the roadway exceeds the back of walk elevation. A corresponding cross-section detail is included.
✓		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	
✓		Concrete valley gutters are required in parking lots with slopes less than 1 percent. Slopes through cul-de-sac must be at a 1 percent minimum where flow is drained through the cul-de-sac.
N/A		Ten-foot wide public drainage easements to be privately maintained are allowed for flow less than 20 cfs. The depth of flow entering the easement must be checked using the submerged weir calculation.
N/A		The limits of the flood zones and the base flood elevations (BFE) must be shown on all grading plans for all developments within a Special Flood Hazard Zone A, AO, AE, etc.
		Minimum finish floor elevation is 6 inches above highest adjacent top of curb. Finish floor calculations must include allowances for super elevations on curves and velocity head for tee intersections.
N/A		Finished floor elevations for buildings adjacent to public drainage easements must be a minimum of 18 inches above the Q100 weir of submerged weir elevation, whichever is greater.
N/A		Lots with "B and C Type Drainage" shall be required to install an underground nuisance drainage system or a 2-foot valley gutter through the lot. 16" x 24" minimum block wall openings are required for both options.
N/A		Bubblers are required across 80 foot and greater ROW streets. When flows exceed 10 cfs, bubblers larger than 18 inches will be required up to a maximum of 36". Inlets must be sized to match the pipe size provided.

- An appointment must be made to preview this checklist in conjunction with Clark County Regional Flood Control District Manual Standard Form 2 prior to the City accepting a new Drainage Study for review. The engineer may contact the Flood Control Section at 229-6541.

CITY OF LAS VEGAS MINIMUM DRAINAGE STUDY CRITERIA CHECKLIST

- Following the acceptance of the Drainage Study (meeting the minimum acceptable information above), there will be a charge of \$250 for each Drainage Study review submittal. These fees are payable at the time the Grading Permit is obtained.
- The Drainage Study must be accepted prior to submitting grading plans to the Land Development Section 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.

F:\Depot\DOCS\Memos\CHKLIST7.doc
21-Aug-01

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: <u>City Stop #11 Providence</u>		Map ID:
Firm Name: <u>Baughman & Turner</u>		Engineer: <u>Richard J. Baughman</u>
Address: <u>1210 Hinson St</u>		
City: <u>Las Vegas</u>	State: <u>NV</u>	Zip: <u>89102</u>
Phone Number: <u>870-8771</u>		Fax Number: <u>878-2695</u>
Property Owner: <u>Providence Plaza, LLC</u>		
Address: <u>4534 W. Hacienda, Suite A</u>		
City: <u>Las Vegas</u>	State: <u>NV</u>	Zip: <u>89118</u>
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 (CCRFCDD) Hydrologic Criteria and Drainage Design Manual (MANUAL).

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

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

I. GENERAL REQUIREMENT

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

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS

Yes No

- | | | |
|-------------------------------------|--------------------------|--|
| ☒ | ☐ | A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated. |
| ☒ | ☐ | A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated. |
| ☒ | ☐ | Off-site drainage basin maps for existing, interim and future conditions showing the existing topography, basin boundaries, concentration points, and flows in cfs. |
| ☒ | ☐ | 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. |
| ☒ | ☐ | Vicinity Map with local and major cross streets identified and a north arrow. |

III. DRAINAGE PLAN

Yes No

- | | | |
|-------------------------------------|--------------------------|---|
| ☒ | ☐ | Sheet size: 24" x 36" sealed by a registered engineer in the State of Nevada. |
| ☒ | ☐ | Minimum scale: 1" = 60'. |
| ☒ | ☐ | Project name. |
| ☒ | ☐ | Vicinity Map with local and major cross streets. |
| ☒ | ☐ | Revision box. |
| ☒ | ☐ | North arrow and bar scale. |
| ☒ | ☐ | Engineer's/consultant's address and phone number. |
| ☒ | ☐ | Elevation datum and benchmark. |
| ☒ | ☐ | Legend for symbols and abbreviations. |
| ☒ | ☐ | Cut/fill scarps, where applicable. |
| ☒ | ☐ | Street names, grades, widths. |
| ☒ | ☐ | Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street. |

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
☒	☐	Existing contours encompassing the site and 100 feet beyond with spot elevations for important locations, where appropriate.
☒	☐	Minimum finish floor elevations with top-of-curb elevations at upstream end of lot.
☒	☐	Proposed typical street sections.
☒	☐	Streets with off-set crowns.
☒	☐	Proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns and slopes.
☒	☐	Property lines.
☒	☐	Right-of-way lines and widths, existing and proposed.
☒	☐	Existing improvements and their elevations.
☒	☐	Delineation of proposed on-site drainage basins indicating area and 10-year and 100-year storm peak flows at basin concentration points.
☒	☐	Concentration points and drainage flow direction with Q_{100} and V_{100} and D_{100} in streets.
☒	☐	Cumulative flows, velocity, and direction of flow at upstream and downstream ends of site for the 10-year and 100-year flows.
☒	☐	Location and cross-section of street capacity calculations.
☒	☐	Cross-sectional detail for channels, including cutoff wall locations.
☒	☐	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.
☒	☐	Existing and proposed drainage easements and widths shown with sufficient detail. A cross sectional detail must be provided that shows appropriate lining and reinforcement.
☒	☐	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.
☒	☐	Location and detail of flood walls illustrating depth of flow, proposed grouting height, etc.

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes No

- | | | |
|-------------------------------------|--------------------------|--|
| ☒ | ☐ | 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. |
| ☒ | ☐ | Building and/or lot numbers. |
| ☒ | ☐ | Alignment of all existing, proposed, or future Regional Facilities adjacent to the site. |
| ☒ | ☐ | Limits of existing floodplain based on current FIRM or best available information; limits of proposed floodplains based on best available information. |
| ☒ | ☐ | 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. |
| ☒ | ☐ | 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. |
| ☒ | ☐ | Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent. |

IV. HYDROLOGIC ANALYSIS

Yes No

- | | | |
|-------------------------------------|--------------------------|--|
| ☒ | ☐ | Appropriate soil information and Soils Map for existing and future conditions with subbasins and property delineated. |
| ☒ | ☐ | 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. |
| ☒ | ☐ | 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. |
| ☒ | ☐ | Use of correct precipitation values in and around the McCarran Airport rainfall area. |
| ☒ | ☐ | A discussion in the text of the hydrologic analysis justifying subbasin boundaries and cutoffs, supporting assumptions, and calculations. |
| ☒ | ☐ | A summary table of stormwater flows showing basin area, Q_{10} and Q_{100} for both individual basins and combined basin flows, where applicable. |
| ☒ | ☐ | Copies of supporting technical information referenced from a previously approved study and a statement accepting these results. |
| ☒ | ☐ | On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners in accordance with current Nevada Drainage Law. |

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes No

N/A

Flow split calculations and supporting documentation or reference for the method of flow split calculations used.

✓

Normal depth street flow calculations and cross section diagrams for all interior and perimeter streets. Provide "d x v" products for the Q_{100} and Q_{10} flows representing the worst case for interior and all perimeter streets. $Q_{100} d \times v \leq 8$. $Q_{10} d \times v \leq 6$ and 12 foot dry lane for rights-of-way ≥ 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan.

✓

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.

✓

Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow or depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Buildings adjacent to drainage easements must always be provided with 18 inches of freeboard above the Q_{100} weir height or flow depth, which ever is greater.

N/A

A complete water surface profile analysis (HEC-2, HEC-RAS, etc.) for channel flows and FEMA Zone A flood zones.

- 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.

✓

Provide a 50 percent clogging factor in the capacity calculation for drop inlets.

✓

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.

✓

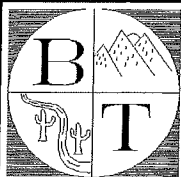
The mitigation of nuisance water, both during construction and in the fully developed condition, must be addressed.

REFERENCE:

STANDARD FORM 2



FIGURE 1



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

PREPARED FOR :

**City Stop
Providence**

DATE: Sept 2012
DESIGN: PJP
DRAWN: PJP
FIGURE NO: 1
JOB:

POD 117 PER "CLIFFS EDGE PARENT"
BOOK: 118 OF PLATS, PAGE 88.
APN 126-13-810-004
U S HOME CORPORATION
20040427:03160

ELKHORN ROAD

(PUBLIC)
PER CLV DWG #
10774816-ELK

SAW CUT
PER CLV DWG #
10774816-ELK

EX 24" RCP SD
PER CLV DWG #
10774816-ELK

EX 24" RCP SD
PER CLV DWG #
10774816-ELK

WALL TO BE CONSTRUCTED
WALL TO BE REMOVED

HUALAPAI WAY

PER CLV DWG #
10774816-ELK

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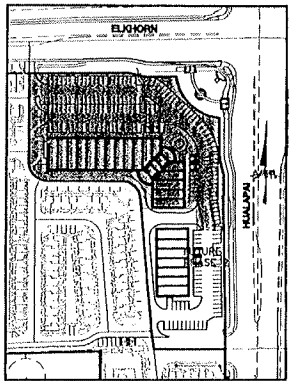
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10774816-ELK



KEY MAP

GRAPHIC SCALE



1" = 30'

NOTE: SEE SHEET 072 FOR LINE AND CURVE TABLES.

STORM DRAIN NOTE:
ALL ON-SITE STORM DRAINS ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOMEOWNERS ASSOCIATION.

FLOODZONE NOTE:
SITE IS LOCATED IN A ZONE X AS SHOWN ON FIRM PANEL 32003C1750E DATED SEPTEMBER 27, 2002.
A ZONE X IS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.

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

CONSTRUCTION ITEMS

1. CONSTRUCT 24" TYPE "L" CURB & GUTTER PER STD. DWG. 216.
2. CONSTRUCT TYPE "A" ISLAND CURB PER STD. DWG. 219.
3. SAWCUT AND REMOVE ASPHALT PAVING. MATCH EXISTING EDGE WITH NEW PAVING.
4. CONSTRUCT 36" CONCRETE VALLEY GUTTER PER DETAIL ON SHEET DT1.
5. CONSTRUCT HANDICAP RAMP AT CURB PER DETAIL ON SHEET DT2.
6. CONSTRUCT RETAINING WALLS PER THE CLARK COUNTY STANDARD DESIGN OR AN APPROVED WALL DESIGNED BY A STRUCTURAL ENGINEER. A WALL CONSTRUCTION PERMIT MUST BE OBTAINED PRIOR TO CONSTRUCTION. WALLS TO MEET CLIFFS EDGE DESIGN GUIDELINES.
7. CONSTRUCT STEP WITH 7" RISER, 15" RUN.
8. TYPICAL HANDICAP ACCESSIBLE PARKING PER TYPICAL DETAIL SHEET DT1.
9. TRASH ENCLOSURE, PER ARCHITECTURAL PLANS.
10. ADA RAMP WITH HANDRAIL PER ARCHITECTURAL PLANS.
11. ZERO FACE
12. SEE ARCHITECTURAL DRAWINGS FOR HANDRAILS.

LEGEND

- | | | | |
|---------|---------------------------------|-------|---|
| RG | ROUGH GRADE | EX | EX. CONTOUR(5' INTERVAL) |
| FL | FINISH GRADE | EX | EX. CONTOUR(1' INTERVAL) |
| TL | TOP OF CURB | PRO | PROPOSED CONTOUR |
| TRC | TOP OF ROLL CURB | PRO | PROPOSED PAD GRADE |
| EAC | EDGE OF ASPHALT PAVEMENT | FUT | FUT./EXIST. PAD GRADE |
| FUT | FUTURE | SLO | SLOPE AND FLOW DIRECTION |
| EXIST | EXISTING (EX) | EDG | EDGE OF EXIST. A.C. |
| VG | VALLEY GUTTER | SAW | SAW CUT & MATCH A.C. |
| H.P. | HIGH POINT | SWA | SIDEWALK RAMP |
| L.P. | LOW POINT | SWA | PAD SWALE SLOPES |
| O/C | OFFSET CROWN | SCA | SCARP AREA |
| BC | BEGIN CURB RETURN | LOT | LOT NUMBER |
| PT | POINT OF TANGENCY | BLO | BLOCK NUMBER |
| PRC | POINT OF REVERSE CURVATURE | RET | RETAINING HEIGHT (FEET)
(AS MEASURED FROM ROUGH GRADE) |
| RCC | POINT OF COMPOUND CURVATURE | SIG | SIGHT VISIBILITY ZONES |
| BVC | BEGIN VERTICAL CURVE | PRO | PROJECT BOUNDARY LINE |
| MVC | MID-POINT OF VERTICAL CURVE | SEB | SETBACK LINE |
| END | END VERTICAL CURVE | R/W | R/W OR P/L |
| PRVC | POINT OF REVERSE VERTICAL CURVE | CEN | CENTER LINE |
| PVI | POINT OF VERTICAL INTERSECTION | BAK | BACK OF CURB |
| TPW | TOP OF PLANTER WALL | UP | LIP OF GUTTER |
| TRW | TOP OF RETAINMENT WALL | EXI | EXIST. IMPROVEMENTS |
| THW | TOP OF HEAD WALL | FUT | FUTURE IMPROVEMENTS |
| TF | TOP OF FOOTING | RET | RETAINING WALL |
| TOE | TOE OF CHANNEL/SCARP | CONC | CONC. BLOCK WALL |
| TOE | TOE OF CHANNEL/SCARP | EXIST | EXIST. CONC. BLOCK WALL |
| TOE | TOE OF CHANNEL/SCARP | EXI | EXIST. DIRT ROAD |
| TOP/TOA | TOP OF BOX/ARCH STRUCTURE | EXI | EXIST. AC |
| PP | POWER POLE | CON | CONSTRUCTION PHASE LINE |
| TRANS. | TRANSITION | OR | OR UNIT BOUNDARY LINE |
| RET. | RETAINMENT | WAT | WATERSHED |
| INT. | INTERSECTION | SAW | SAW CUT, MATCH & REPLACE EXIST. ASPHALT |
| D.G. | DESIGN GRADE | | |
| TSW | TOP OF SIDEWALK | | |
| FF | FINISH FLOOR | | |
| GFT | GARAGE FINISH FLOOR | | |
| BFE | BASE FLOOD ELEVATION | | |
| RCP | REINFORCED CONCRETE PIPE | | |
| SD | STORM DRAIN | | |
| DI | DROP INLET | | |
| R/W | RIGHT-OF-WAY | | |
| S/W | SIDEWALK | | |
| BOL | BACK OF CURB LENGTH | | |
| P.U.E. | PUBLIC UTILITY EASEMENT | | |

BASIS OF BEARING

THE BASIS OF BEARINGS FOR THIS PROJECT IS NORTH 00°08'16" EAST BEING THE EAST LINE OF THE NORTHWEST QUARTER (1/4) OF THE SECTION 24, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CLARK COUNTY, NEVADA, AS SHOWN ON A RECORD OF SURVEY ON FILE IN THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE IN FILE 123 AT PAGE 32.

PROJECT BENCHMARK

PROJECT DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
CLARK COUNTY VERTICAL CONTROL: 1000-116
NAVD88 ELEVATION: 787.794 METERS (2584.62 FEET)
RIVET AND SQUARE ALUMINUM PLATE IN A CONCRETE CYPINDER, LOCATED 25' SOUTH & 50' EAST OF GRAND CANYON DRIVE AND RED COACH AVENUE, 1' WEST OF ELECTRICAL VAULT.

CITY OF LAS VEGAS BENCHMARK

DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
CITY OF LAS VEGAS BENCHMARK: BLV89-135S
NAVD88 ELEVATION: 869.606 METERS (2853.03 FEET)
RIVET AND PLATE IN CONCRETE CYPINDER NW CORNER OF HUALAPAI AND ELKHORN
NOTE: ADD 0.34' TO ABOVE CITY OF LAS VEGAS BENCHMARK BLV89-135S TO MATCH ORIGINAL PROJECT BENCHMARK, CLARK COUNTY BENCHMARK 1000-116 (2584.62 FEET) AS SHOWN ON RECORD OF SURVEY FILE 124 PAGE 94.

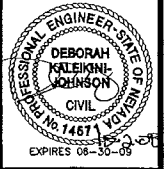
STORM DRAIN NOTE:
ALL ON-SITE STORM DRAINS ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

DRAINAGE EASEMENT NOTE:
ALL AREAS NOT OCCUPIED BY THE BUILDINGS MUST BE PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED.

GREENSTREET PROPERTIES

GRADING PLAN

DRAWN BY: JUAN
DESIGNED BY: JUAN
CHECKED BY: JUAN
PROJECT NO: 5882
SCALE: 1"=30' HORIZ. VERT. N/A



SHEET
6 OF 10 SHEETS
DRAWING NO.

CITY OF LAS VEGAS
2300 PASEO DEL PRADO BLVD. S. STE. #202
LAS VEGAS, NV 89102
(702) 876-5582 EXT. 35

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

**GREENSTREET PROPERTIES
PROVIDENCE
PHASE 1**

3rd Submittal

POD 117 PER "CLIFFS EDGE PARENT"
BOOK: 118 OF PLATS, PAGE 88.
APN 126-13-810-004
U S HOME CORPORATION
20040427:03160

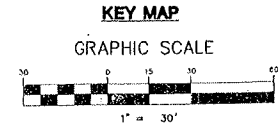
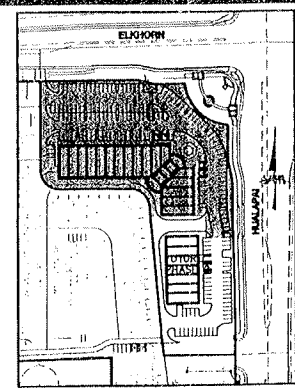
ELKHORN ROAD

PER CIV OWN #
10774816-ELK

AREAS OF REVISION
REFER TO REVISED
GRADING PLANS,
PER UPDATE # 2.

BACK OF CURB LINE TABLE		
NO.	BEARING	LENGTH
L1	S00°00'00"W	16.00'
L2	N90°00'00"W	55.00'
L3	N00°00'00"E	15.50'
L4	N90°00'00"E	64.00'
L5	N89°00'00"E	55.00'
L6	N90°00'00"W	14.94'
L7	S42°21'06"W	19.22'
L8	S47°38'54"E	64.00'
L9	S42°21'06"W	15.50'
L10	S47°38'54"E	55.00'
L11	S42°21'06"W	15.30'
L12	N82°33'33"E	15.54'
L13	N90°00'00"E	15.93'
L14	S00°00'00"W	64.00'
L15	N90°00'00"E	15.50'
L16	N90°00'00"W	15.50'
L17	S00°00'00"E	46.00'
L18	N90°00'00"W	14.76'
L19	S00°00'00"W	55.00'
L20	S00°00'00"W	63.98'
L21	S89°55'03"W	14.20'
L22	N00°00'00"E	14.78'
L23	S90°00'00"W	46.00'
L24	N00°00'00"E	15.50'
L25	S90°00'00"E	15.00'
L26	N00°00'00"W	37.00'
L27	S80°00'00"W	28.00'
L28	S90°00'00"W	37.00'
L29	N00°00'00"W	16.14'
L30	S00°00'00"W	36.50'
L31	S89°55'03"W	4.17'
L32	S00°00'00"W	13.00'
L33	S89°55'03"W	19.47'
L34	N04°26'45"W	23.24'
L35	N90°00'00"W	18.00'
L36	N00°00'00"E	14.32'
L37	S00°00'00"W	2.45'
L38	N80°00'00"W	2.02'
L39	S00°00'00"W	30.00'
L40	N90°00'00"E	3.44'
L41	S47°38'54"E	20.64'
L42	N90°00'00"E	19.00'
L43	N90°00'00"W	9.00'
L44	N90°00'00"E	16.77'
L45	N25°10'29"W	17.51'
L46	S00°00'00"E	8.89'
L47	S00°00'00"E	6.11'
L48	N25°10'29"W	22.95'
L49	S89°55'03"W	3.51'
L50	N04°26'45"W	43.00'

BACK OF CURB CURVE TABLE				
NO.	RADIUS	DELTA	LENGTH	TANGENT
C1	25.00'	90°00'00"	39.27	75.00
C2	2.00'	90°00'00"	3.14	2.00
C3	2.50'	180°00'00"	7.85	
C4	53.00'	19°51'54"	18.38	9.27
C5	2.50'	67°31'09"	2.95	1.67
C6	118.50'	37°07'07"	76.77	29.43
C7	2.50'	88°19'51"	3.85	2.13
C8	100.50'	00°32'59"	0.96	0.48
C9	2.50'	84°46'41"	3.70	2.02
C10	2.50'	100°48'41"	4.40	3.08
C11	76.00'	71°08'35"	94.37	34.23
C12	2.50'	88°02'43"	4.28	2.89
C13	2.00'	92°37'13"	3.23	2.09
C14	3.00'	96°39'08"	5.06	3.37
C15	77.50'	80°43'41"	38.75	23.57
C16	2.50'	103°35'16"	4.57	3.16
C17	52.00'	85°33'11"	77.65	48.11
C18	2.50'	95°41'25"	4.18	2.76
C19	77.50'	84°18'52"	40.47	24.80
C20	5.00'	90°00'00"	7.85	5.00
C21	2.50'	90°00'00"	3.93	2.50
C22	28.00'	42°21'06"	20.70	10.85
C23	8.00'	149°56'53"	20.94	20.94
C24	2.50'	77°24'01"	3.38	2.01
C25	2.50'	115°10'29"	5.03	3.37
C26	50.00'	25°10'29"	21.97	16.16
C27	2.51'	160°00'00"	7.89	—
C28	25.00'	25°10'29"	10.98	5.58
C29	2.50'	64°49'31"	2.83	1.59
C30	5.00'	80°33'16"	8.21	5.09



NOTE:
SEE SHEET D12 FOR LINE AND CURVE TABLES.

STORM DRAIN NOTE:
ALL ON-SITE STORM DRAINS ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOMEOWNERS ASSOCIATION.

FLOODZONE NOTE:
SITE IS LOCATED IN A ZONE X AS SHOWN ON FIRM PLAT 32003C1750E DATED SEPTEMBER 27, 2002. A ZONE X IS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.

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

CONSTRUCTION ITEMS

1. CONSTRUCT 24" TYPE "L" CURB & GUTTER PER STD. DWG. 216.
2. CONSTRUCT TYPE "A" ISLAND CURB PER STD. DWG. 219.
3. SAWCUT AND REMOVE ASPHALT PAVING. MATCH EXISTING EDGE WITH NEW PAVING.
4. CONSTRUCT 36" CONCRETE VALLEY GUTTER PER DETAIL ON SHEET D11.
5. CONSTRUCT HANDICAP RAMP. AT CURB PER DETAIL ON SHEET D12.
6. CONSTRUCT RETAINING WALLS PER THE CLARK COUNTY STANDARD DESIGN OR AN APPROVED WALL DESIGNED BY A STRUCTURAL ENGINEER. A WALL CONSTRUCTION PERMIT MUST BE OBTAINED PRIOR TO CONSTRUCTION. WALLS TO MEET CLIFFS EDGE DESIGN GUIDELINES.
7. CONSTRUCT STEP WITH 7" RISER, 15" RUN.
8. TYPICAL HANDICAP ACCESSIBLE PARKING PER TYPICAL DETAIL SHEET D11.
9. TRASH ENCLOSURE, PER ARCHITECTURAL PLANS.
10. ADA RAMP WITH HANDRAIL PER ARCHITECTURAL PLANS.
11. ZERO FACE.
12. SEE ARCHITECTURAL DRAWINGS FOR HANDRAILS.

LEGEND

- RG ROUGH GRADE
 - FC FINISH GRADE
 - EAC EXISTING ASPHALT PAVEMENT
 - TRC TOP OF CURB
 - TOP OF ROLL CURB
 - EDGE OF ASPHALT PAVEMENT
 - FUT. FUTURE
 - EXIST. EXISTING (EX)
 - VALLEY GUTTER
 - NATURAL GROUND
 - HIGH POINT
 - LOW POINT
 - C/L CENTER LINE
 - OFFSET CROWN
 - BACK OF CURB
 - BEGIN CURB RETURN
 - TOP OF FOOTING
 - GRADE BREAK
 - POINT OF CURVATURE
| PT | POINT OF TANGENCY |
| PRC | POINT OF REVERSE CURVATURE |
| POC | POINT OF COMPOUND CURVATURE |
| BVC | BEGIN VERTICAL CURVE |
| MVC | MID-POINT OF VERTICAL CURVE |
| EVC | END VERTICAL CURVE |
| PRVC | POINT OF REVERSE VERTICAL CURVE |
| PM | POINT OF VERTICAL INTERSECTION |
| TPW | TOP OF PLANTER WALL |
| TRW | TOP OF RETAINMENT WALL |
| THW | TOP OF HEAD WALL |
| TF | TOP OF FOOTING |
| TOF | TOP OF CHANNEL/SCARP |
| TOE | TOE OF CURB |
| TOB | TOE OF BOX/ARCH STRUCTURE |
| TOA | TOE OF ARCH STRUCTURE |
| TRANS. | TRANSITION |
| RET. | RETAINMENT |
| INT. | INTERSECTION |
| D.G. | DESIGN GRADE |
| TSW | TOP OF SIDEWALK |
| FF | FINISH FLOOR |
| GF | GARAGE FINISH FLOOR |
| BFE | BASE FLOOD ELEVATION |
| RCP | REINFORCED CONCRETE PIPE |
| SD | STORM DRAIN |
| DI | DROP INLET |
| R/W | RIGHT-OF-WAY |
| S/W | SIDEWALK |
| BCL | BACK OF CURB LENGTH |
| P.U.E. | PUBLIC UTILITY EASEMENT |
- EX. CONTOUR (5' INTERVAL)
 - EX. CONTOUR (1' INTERVAL)
 - PROPOSED CONTOUR
 - PROPOSED PAD GRADE
 - FUT./EXIST. PAD GRADE
 - SLOPE AND FLOW DIRECTION
 - EDGE OF EXIST. A.C.
 - SAW CUT & WATCH A.C.
 - SIDEWALK RAMP
 - PAD SWALE SLOPES
 - SCARP AREA
 - LOT NUMBER
 - BLOCK NUMBER
 - RETAINING HEIGHT (FEET) (AS MEASURED FROM ROUGH GRADE)
 - SIGHT VISIBILITY ZONES
 - PROJECT BOUNDARY LINE
 - SETBACK LINE
 - R/W OR P/L
 - CENTER LINE
 - BACK OF CURB
 - UP OF GUTTER
 - EXIST. IMPROVEMENTS
 - FUTURE IMPROVEMENTS
 - RETAINING WALL
 - CONC. BLOCK WALL
 - EXIST. CONC. BLOCK WALL
 - EXIST. DIRT ROAD
 - EXIST. AC
 - CONSTRUCTION PHASE LINE OR UNIT BOUNDARY LINE
 - MATCHLINE
 - SAW CUT, MATCH & REPLACE EXIST. ASPHALT

BASIS OF BEARING

THE BASIS OF BEARINGS FOR THIS PROJECT IS NORTH 00°00'16" EAST BEING THE EAST LINE OF THE NORTHWEST QUARTER (NE 1/4) OF THE SECTION 24, TOWNSHIP 19 SOUTH, RANGE 59 EAST, U.D.M., CLARK COUNTY, NEVADA, AS SHOWN ON A RECORD OF SURVEY ON FILE IN THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE IN FILE 123 AT PAGE 32.

PROJECT BENCHMARK

PROJECT DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAV88)
CLARK COUNTY VERTICAL CONTROL: 1000.6N6
NAV88 ELEVATION: 787.794 METERS (2584.62 FEET)
RIVET AND SQUARE ALUMINUM PLATE IN A CONCRETE CYLINDER, LOCATED 25' SOUTH & 50' EAST OF GRAND CANYON DRIVE AND RED COACH AVENUE, 1' WEST OF ELECTRICAL VAULT.

CITY OF LAS VEGAS BENCHMARK

DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAV88)
CITY OF LAS VEGAS BENCHMARK: BLV99:135ES
NAV88 ELEVATION: 889.606 METERS (2918.03 FEET)
RIVET AND PLATE IN CONCRETE CYLINDER NW CORNER OF HUALAPAI AND ELKHORN

NOTE: ADD 0.34' TO ABOVE CITY OF LAS VEGAS BENCHMARK BLV99:135ES TO MATCH ORIGINAL PROJECT BENCHMARK, CLARK COUNTY BENCHMARK 1000-6N6 (2584.62 FEET) AS SHOWN ON RECORD OF SURVEY FILE 124 PAGE 34.

PREVIOUSLY APPROVED GRADING PLAN.

"I CERTIFY THAT THIS PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY (#4232) ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT."

DEBORAH KALEKINI-JOHNSON NO. 14571 DATE

Call before you dig

Underground

1-702-223-5611

STORM DRAIN NOTE:
ALL ON-SITE STORM DRAINS ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

DRAINAGE EASEMENT NOTE:
ALL AREAS NOT OCCUPIED BY THE BUILDINGS MUST BE PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED.

GREENSTREET PROPERTIES
CITY OF LAS VEGAS

GRADING PLAN

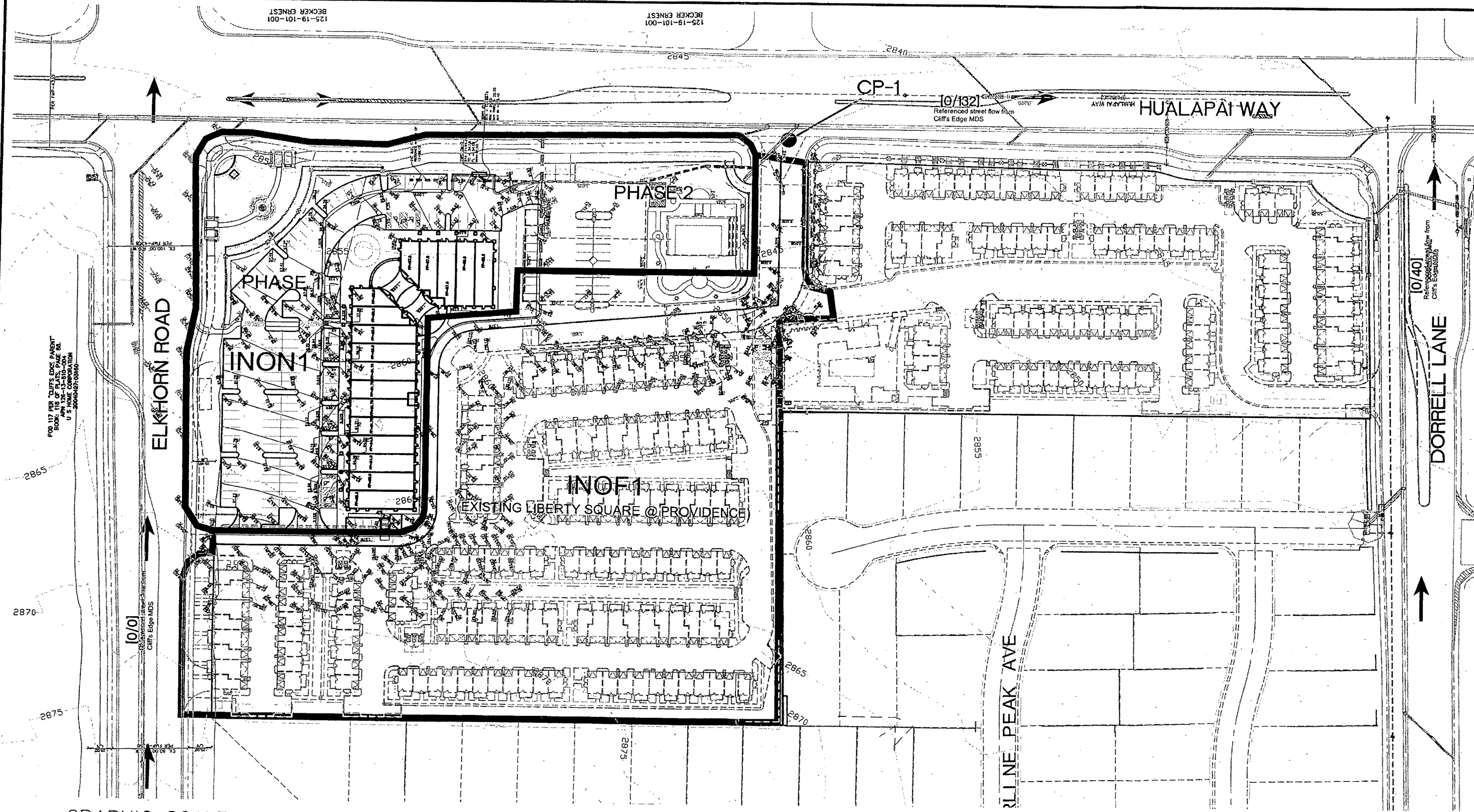
GREENSTREET PROVIDENCE PHASE 1

DRAWN BY: JUNE 07
DESIGNED BY: JUNE 07
CHECKED BY: JUNE 07
PROJECT NO: 6882
SCALE: 1"=30' HORZ
VERT. N/A

SHEET
GR1
6 OF 10 SHEETS
DRAWING NO.
10744964

DEBORAH KALEKINI-JOHNSON
CIVIL
EXPIRES 08-30-09

3rd Submittal



POD 117 PER "CLIFFS EDGE PARENT"
BOOK 116 OF PLATS, PAGE 80.
APR 12-13-2004
U.S. NAD 83
3004042710010

125-19-101-001
BECKER ERNEST

125-19-101-001
BECKER ERNEST

ELKHORN ROAD

HUALAPAI WAY

DORRELL LANE

RLI NE PEAK AVE

PHASE 1

PHASE 2

INON1

INOF1

(EXISTING LIBERTY SQUARE @ PROVIDENCE)

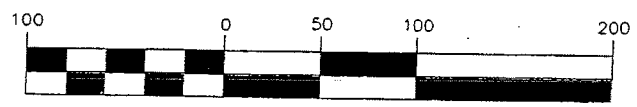
CP-1

10/132
Referenced street flow from
Cliff's Edge MDS

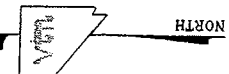
10/40
Referenced street flow from
Cliff's Edge MDS

10/01
Cliff's Edge MDS

GRAPHIC SCALE



1" = 100'

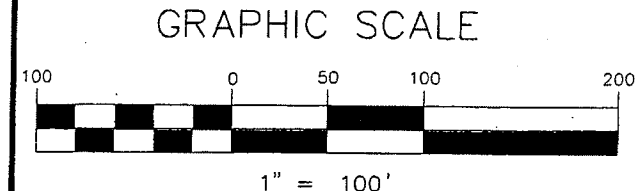
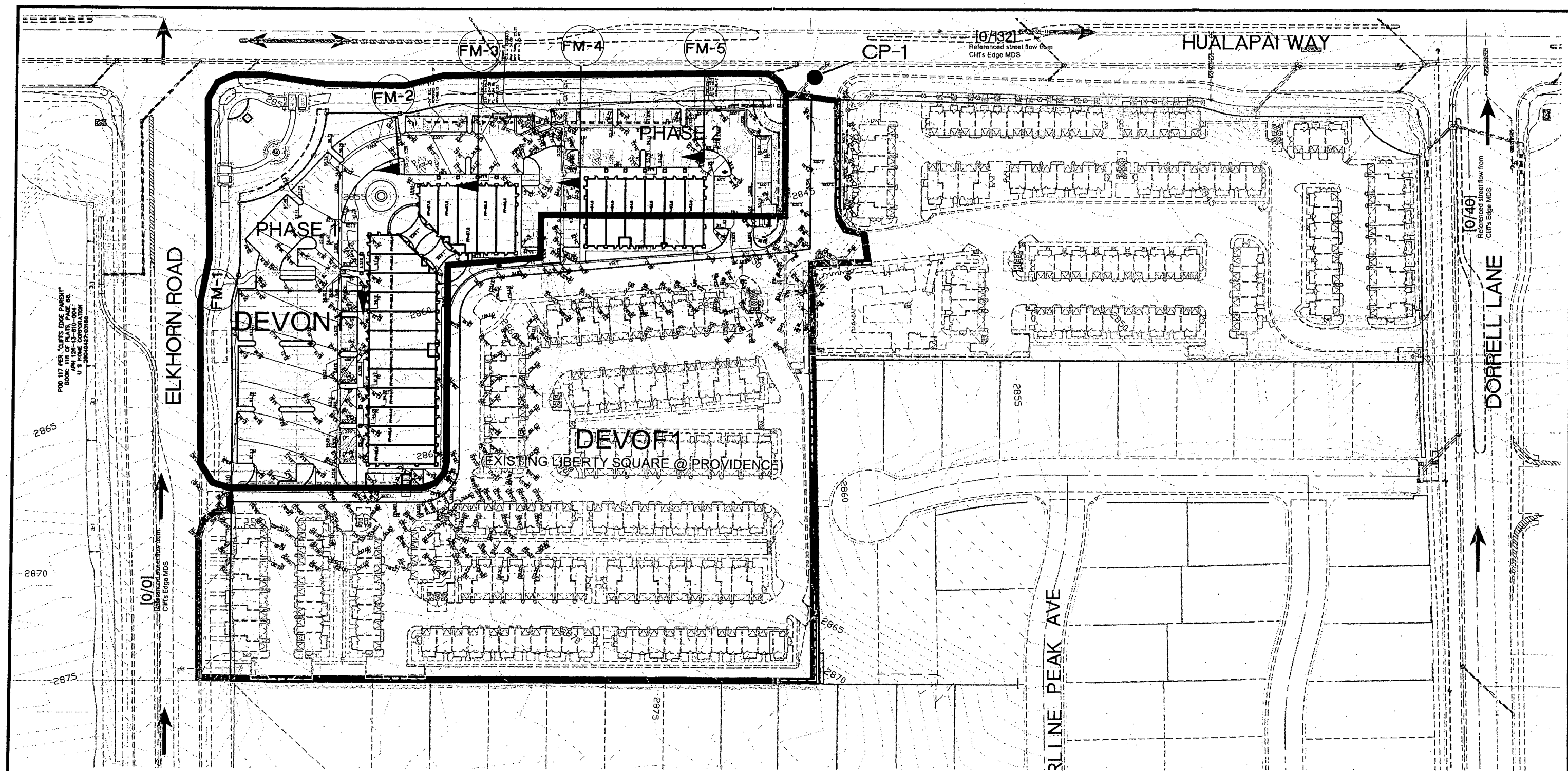


BASIN	10 YR (cfs)	100 YR (cfs)
INON1	6	13
INOF1	9	19
CP-1	15	32

LEGEND

- BASIN DELINEATION
- EXON1 - BASIN NAME
- PHASE LINE
- ← DIRECTION OF FLOW
- COMBINATION POINT

POD 122 @ CLIFFS EDGE (GREEN STREET)		FIGURE 5B WO# 6862
INTERIM CONDITION BASIN MAP		



BASIN	10 YR (cfs)	100 YR (cfs)
DEVON1	6	13
DEVON1	9	19
CP-1	15	32

POD 122 @ CLIFFS EDGE (GREENSTREET)					
Flowmaster Section	Discharge (cfs)	Slope (%)	Normal Depth (ft)	Velocity (ft/s)	DxV
*FM-1	10.00	1.66	0.37	2.98	1.10
*FM-2	10.00	1.00	0.39	2.71	1.06
*FM-3	10.00	1.00	0.54	3.12	1.68
*FM-4	3.00	1.46	0.28	2.21	0.62
*FM-5	3.00	2.43	0.34	3.82	1.30

* 10-year criteria has been met with 100-year flow, thus 10-year calculation not provided.

- LEGEND**
- BASIN DELINEATION
 - EXON1 - BASIN NAME
 - PHASE LINE
 - DIRECTION OF FLOW
 - COMBINATION POINT
 - ① FLOW MASTER SECTION

FLOW/AREA RATIOS						
BASIN	TOTAL AREA (AC)	100-YR FLOW (CFS)	PHASE	PHASE AREA (ACRES)	PHASE AREA/TOTAL AREA PERCENTAGE RATIO	PHASE FLOW (CFS)
DEVON1	3.6	13	1	2.83	79%	10
			2	0.77	21%	3

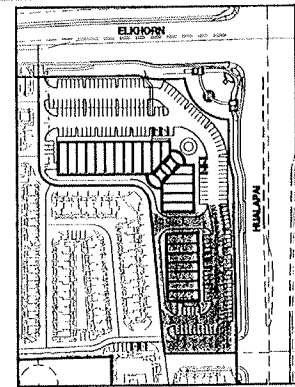
(POD 122 @ CLIFFS EDGE)
(GREENSTREET)

DEVELOPED CONDITION
BASIN MAP

FIGURE 5C

WO# 6862

BACK OF CURB LINE TABLE		
NO.	BEARING	LENGTH
L1	190°00'00" W	64.00'
L2	129°00'00" W	12.00'
L3	190°00'00" W	12.00'
L4	50°00'00" W	15.00'
L5	190°00'00" E	18.50'
L6	52°00'00" E	12.27'
L7	190°00'00" E	12.00'
L8	190°00'00" E	16.50'
L9	190°00'00" E	18.42'
L10	190°00'00" E	8.59'
L11	190°00'00" E	8.86'
L12	50°00'00" E	12.00'
L13	190°00'00" E	12.00'
L14	190°00'00" E	5.30'
L15	190°00'00" E	7.60'
L16	50°00'00" W	6.83'
L17	190°00'00" W	64.00'
L18	50°00'00" W	12.63'
L19	190°00'00" W	59.00'
L20	190°00'00" W	19.35'
L21	190°00'00" W	12.00'
L22	190°00'00" E	4.60'
L23	129°00'00" W	15.42'
L24	190°00'00" W	55.00'
L25	190°00'00" E	15.34'
L26	190°00'00" W	19.35'
L27	190°00'00" W	15.37'
L28	190°00'00" W	128.00'
L29	50°00'00" W	0.58'
L30	190°00'00" W	15.50'



GRAPHIC SCALE



NOTE:
SEE SHEET DT2 FOR LINE AND
CURVE TABLES.

STORM DRAIN NOTE:
ALL ON-SITE STORM DRAINS ARE
PRIVATELY OWNED AND TO BE
PRIVATELY MAINTAINED BY THE
HOMEOWNERS ASSOCIATION.

FLOODZONE NOTE:
SITE IS LOCATED IN A ZONE X AS SHOWN
ON FIRM PANEL 32003C1750E DATED
SEPTEMBER 27, 2002.
A ZONE X IS DETERMINED TO BE OUTSIDE
THE 0.2% ANNUAL CHANCE FLOOD PLAIN.

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

CONSTRUCTION ITEMS

- ① CONSTRUCT 24" TYPE "L" CURB & GUTTER PER STD. DWG. 216.
- ② CONSTRUCT TYPE "A" ISLAND CURB PER STD. DWG. 219.
- ③ SAWCUT AND REMOVE ASPHALT PAVING. MATCH EXISTING EDGE WITH NEW PAVING.
- ④ CONSTRUCT 36" CONCRETE VALLEY. VALLEY PERF DETAIL ON SHEET D12.
- ⑤ CONSTRUCT HANDICAP RAMP AT CURB PER DETAIL ON SHEET D12.
- ⑥ CONSTRUCT RETAINING WALLS PER THE CLARK COUNTY STANDARD SPEC OR AN APPROVED WALL DESIGNED BY A STRUCTURAL ENGINEER. A WALL CONSTRUCTION PERMIT MUST BE OBTAINED PRIOR TO CONSTRUCTION. WALLS TO MEET CURBS EDGE DESIGN GUIDELINES.
- ⑦ CONSTRUCT STEP WITH 7" RISER, 15" RUN.
- ⑧ TYPICAL HANDICAP ACCESSIBLE PARKING PER TYPICAL DETAIL SHEET D11.

LEGEND

R	ROUGH GRADE		EX. CONTOUR(5' INTERVAL)
FG	FINISH GRADE	- - - - - 2400 - - - - -	
FL	FLOW LINE		EX. CONTOUR(1' INTERVAL)
TC	TOP OF CURB		PROPOSED CONTOUR
TRC	TOP OF ROLL CURB		
EAC	EDGE OF ASPHALT PAVEMENT		
FUT	FUTURE	(42.1)	PROPOSED PAD GRADE
EXIST	EXISTING (EX.)	(42.1)	
VG	VALLEY GUTTER	< 2.1	FLO./EXIST. PAD GRADE
NG	NATURAL GROUND	0.500	SUPE AND FLOW DIRECTION
H.P.	HIGH POINT		
L.P.	LOW POINT		EDGE OF EXIST A.C.
C/L	CENTER LINE	//	SAW CUT & MATCH A.C.
O/C	OFFSET CROWN	OR / \	SIDEWALK RAMP
BC	BEGIN CURB RETURN		
BCR	BACK OF CURB RETURN		PAD SWALE SLOPES
TB	TOP OF FOOTING		SCARP AREA
GB	GRADE BREAK		
PC	POINT OF CURVATURE	27	LOT NUMBER
PT	POINT OF TANGENCY	(4)	BLOCK NUMBER
PRC	POINT OF REVERSE CURVATURE		
PCC	POINT OF COMPOUND CURVATURE		RETAINING HEIGHT (FEET) (AS MEASURED FROM ROUGH GRADE)
BVC	BEGIN VERTICAL CURVE		SIGHT VISIBILITY ZONES
MWC	MID-POINT OF VERTICAL CURVE		
EV	END VERTICAL CURVE		PROJECT BOUNDARY LINE
FRVC	POINT OF REVERSE VERTICAL CURVE		SETBACK LINE
IV	POINT OF VERTICAL INTERSECTION		R/W OR P/L
TPW	TOP OF PLANTER WALL		CENTER LINE
TRW	TOP OF RETAINMENT WALL		BACK OF CURB
THW	TOP OF HEAD WALL		LIP OF GUTTER
TF	TOP OF FOOTING		EXIST. IMPROVEMENTS
TOE	TOP OF CHANNEL/SCARP		FUTURE IMPROVEMENTS
TOE	TOP OF BOX/RATCH STRUCTURE		RETAINING WALL
TOB/TOA	POWER POLE		CONC. BLOCK WALL
TRANS.	TRANSITION		EXIST.CONC. BLOCK WALL
RET.	RETAINMENT		EXIST. DIRT ROAD
INT.	INTERSECTION		EXIST. AC
D.G.	DESIGN GRADE		CONSTRUCTION PHASE LINE
TSW	TOP OF SIDEWALK		URBIT BOUNDARY LINE
FF=	FINISH FLOOR		MATCHLINE
GF=	GARAGE FINISH FLOOR		
BFE=	BASE FLOOD ELEVATION		SAW CUT. MATCH & REPLACE EXIST. ASPHALT
RCP	REINFORCED CONCRETE PIPE		
SD	STORM DRAIN		
DI	DROP INLET		
R/W	RIGHT-OF-WAY		
S/W	SIDEWALK		
BCL	BOUNDARY LENGTH		
P.U.E.	PUBLIC UTILITY EASEMENT		

BASIS OF BEARING

THE BASIS OF BEARINGS FOR THIS PROJECT IS NORTH 00°08'16" EAST
BEING THE
EAST LINE OF THE NORTHWEST QUARTER (NE 1/4) OF THE SECTION 24,
TOWNSHIP 19
SOUTH, RANGE 59 EAST, M.D.M., CLARK COUNTY, NEVADA, AS SHOWN ON A
RECORD
OF SURVEY ON FILE IN THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE
IN FILE
123 AT PAGE 32.

PROJECT BENCHMARK

PROJECT DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
CLARK COUNTY VERTICAL CONTROL: 1C00:6N6
NAVD88 ELEVATION: 787.794 METERS (2584.62 FEET)
RIVET AND SQUARE ALUMINUM PLATE IN A CONCRETE
CYLINDER, LOCATED 25' SOUTH & 50' EAST OF GRAND CANYON DRIVE
AND RED COACH AVENUE, 1' WEST OF ELECTRICAL VAULT.

CITY OF LAS VEGAS BENCHMARK

CITY OF LAS VEGAS BENCHMARK: 8LV99:13SES
NAVD88 ELEVATION: 869.606 METERS (2853.03 FEET)

NOTE: ADD 0.34' TO ABOVE CITY OF LAS VEGAS BENCHMARK BLV99:13SES
MATCH ORIGINAL PROJECT BENCHMARK, CLARK COUNTY BENCHMARK 1C00-6
(2584.62 FEET) AS SHOWN ON RECORD OF SURVEY FILE 124 PAGE 94.

"I CERTIFY THAT THIS PLAN
IS IN CONFORMANCE WITH THE APPROVED
DRAINAGE STUDY (#) ON FILE AT
THE CITY OF LAS VEGAS FOR THIS PROJECT."

DEBORAH KALEIKIN JOHNSON NO. 14571 DATE 10/10/2007
 This grinding plan is a part of a rain gauge study.
 # 4232 Dig which was received on 10/10/2007 and approved by the
 10/30/07 Call 6 grc 9 before you Overhead
 1-702-227-2929
 1-702-425-7511
 1-702-227-2929
 IN SERVICE AND PREPARED TO ASSIST YOU AT ANY TIME

GREENSTREET PROPERTIES

2320 PASEO DEL PRADO BLDG. B, STE. #202
LAS VEGAS, NV 89102
(702) 876-5582 EXT.35

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89145-5148



CONSULTING
CORPORATION
PH. (702) 873-7550 FAX (702) 362-2597 WEB WWW.VTNV.COM

CONSULTING • CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS

[illegible]

GRADING PLAN

GREENSTREET ①
POD 122
PHASE 2

DRAWN BY:
RWM

DESIGNED BY:
MM/RMM

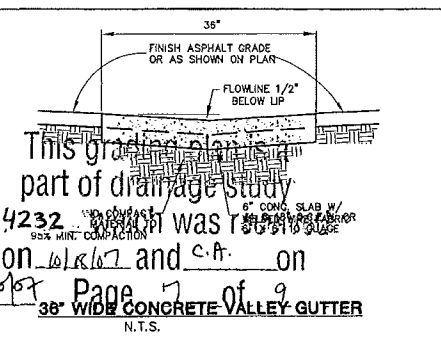
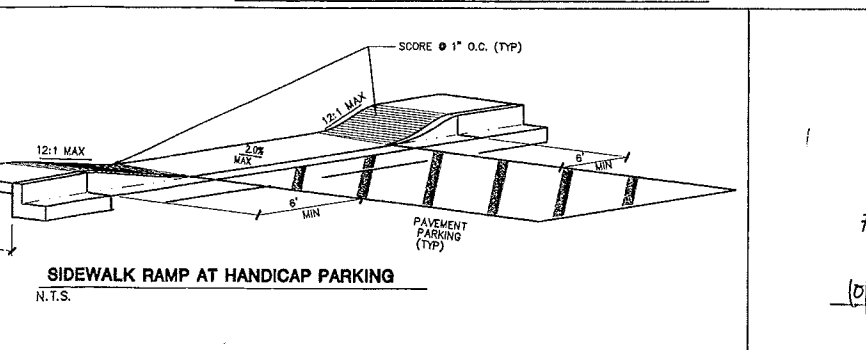
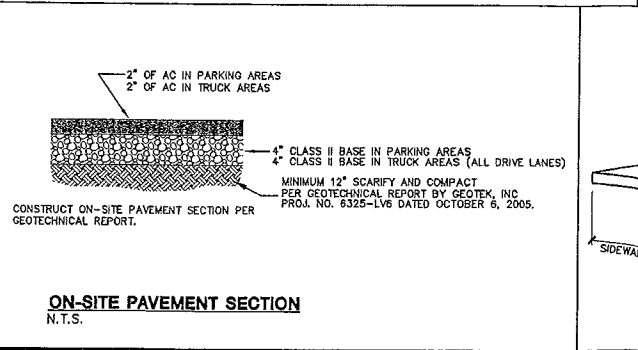
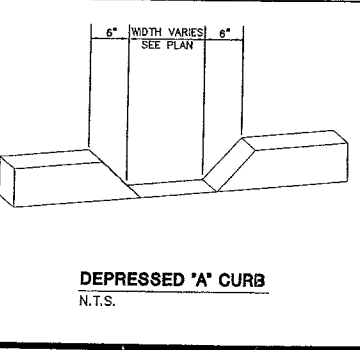
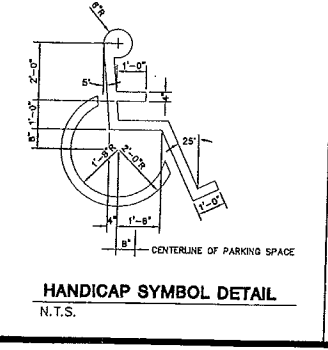
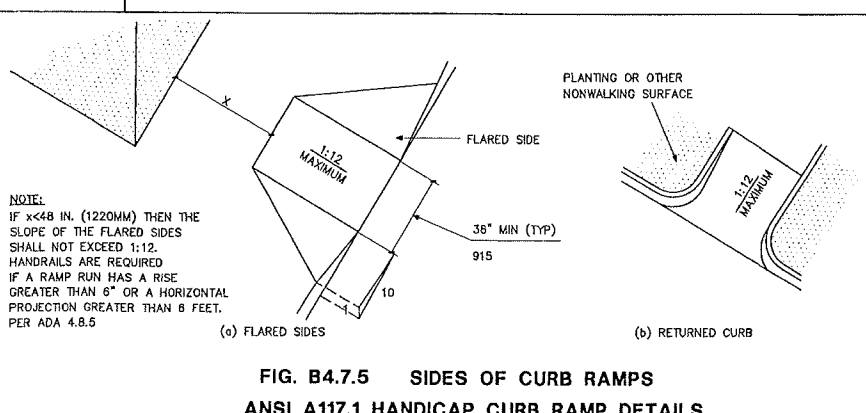
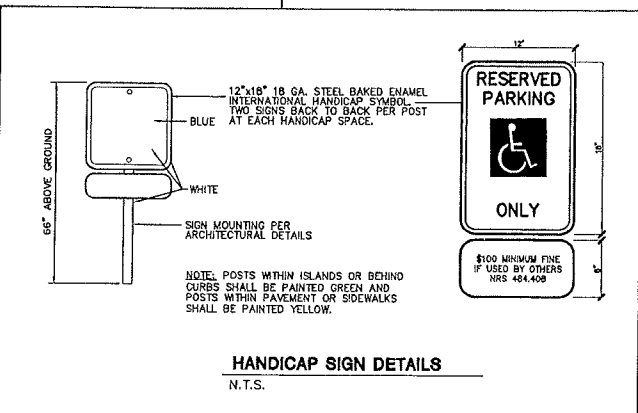
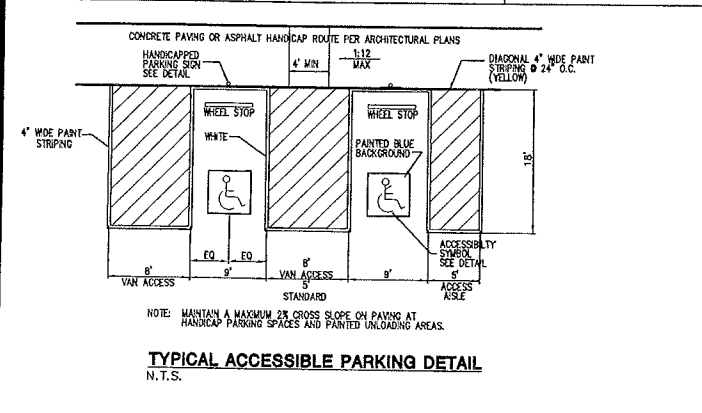
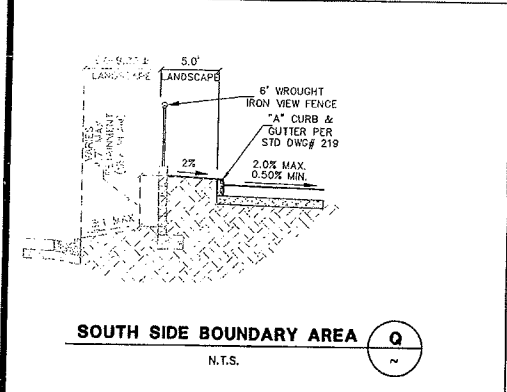
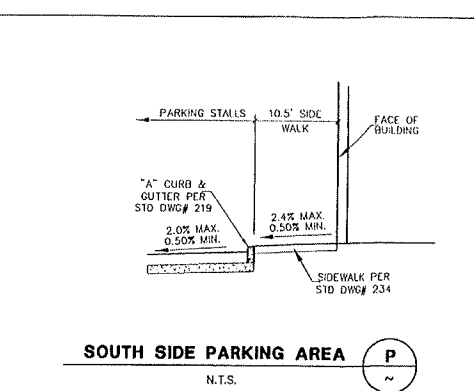
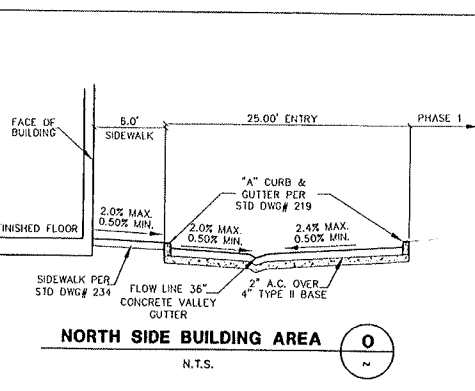
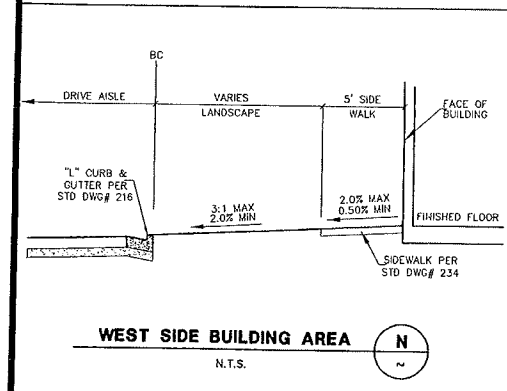
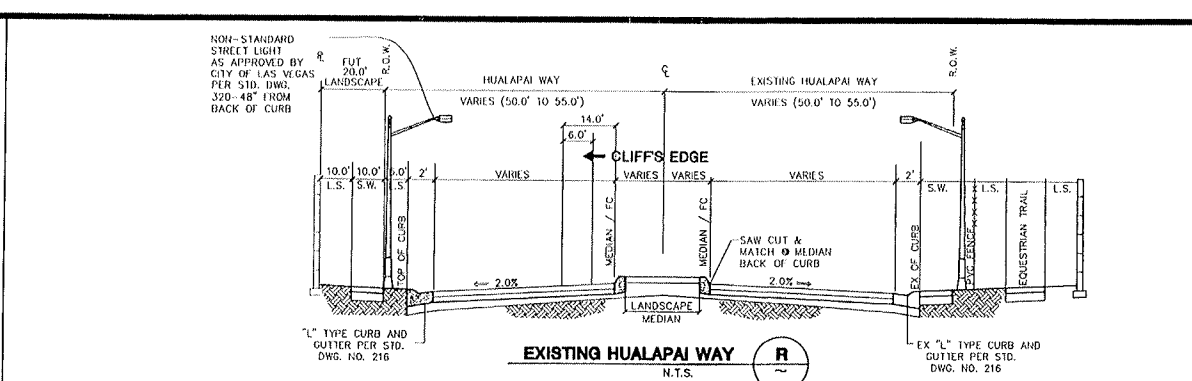
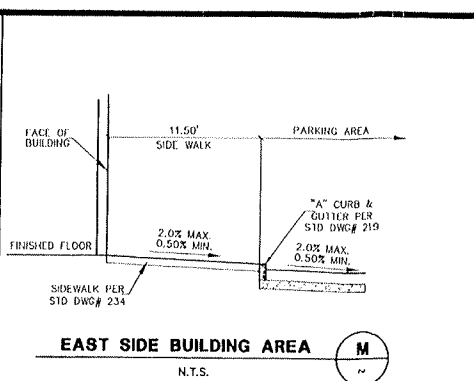
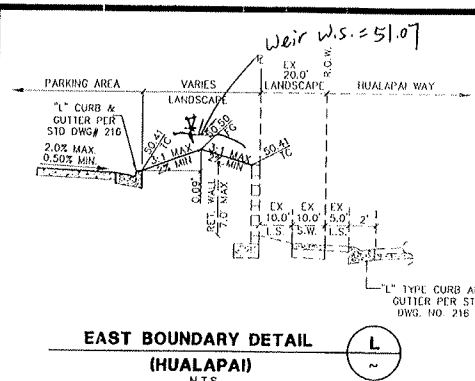
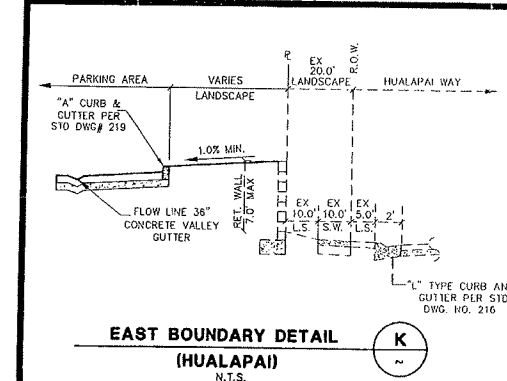
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PROJECT NO: SCALE: 1"=30' HORIZ

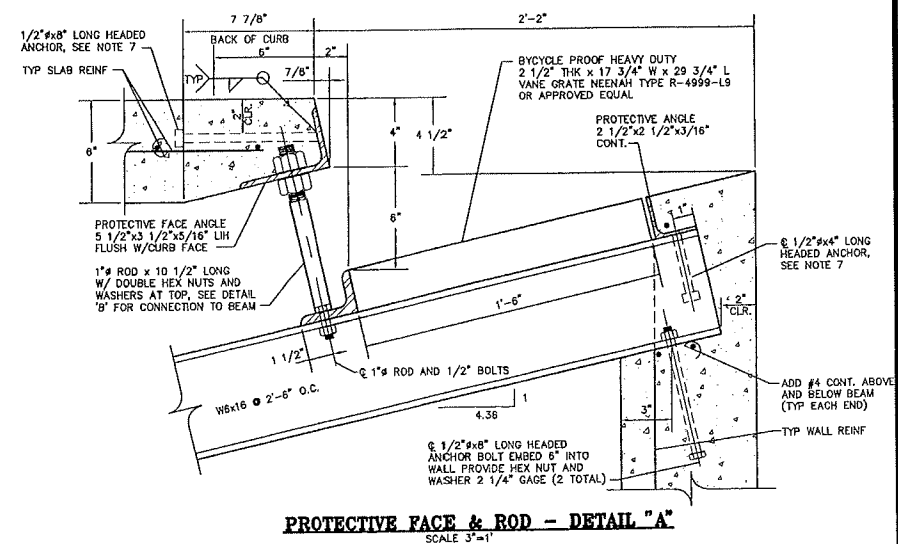
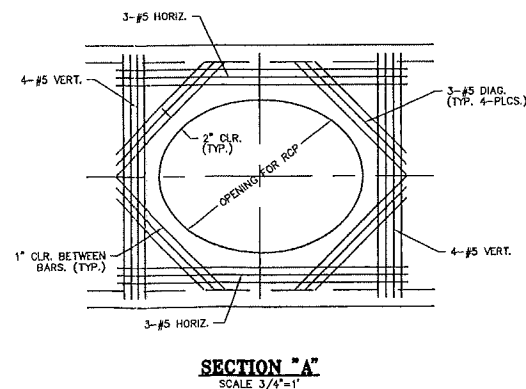
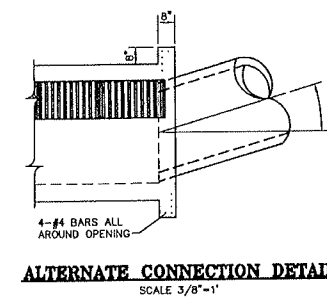
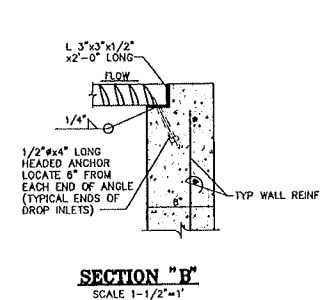
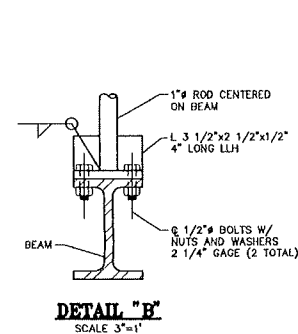
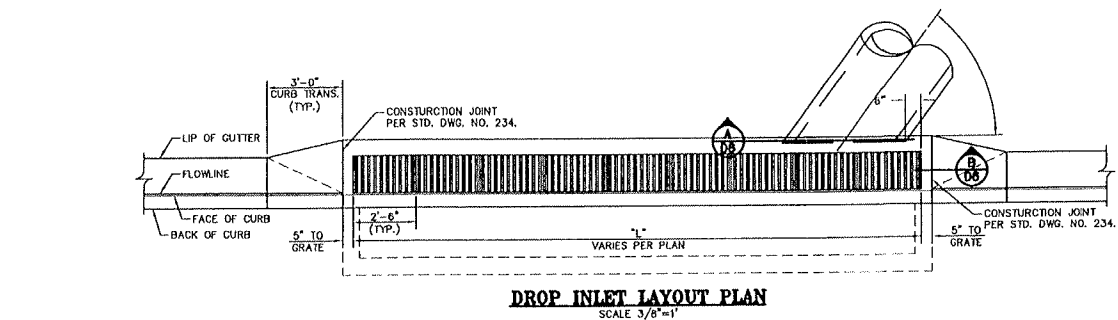
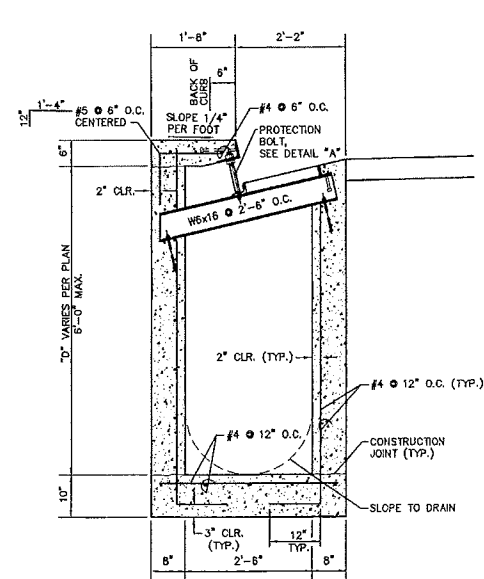
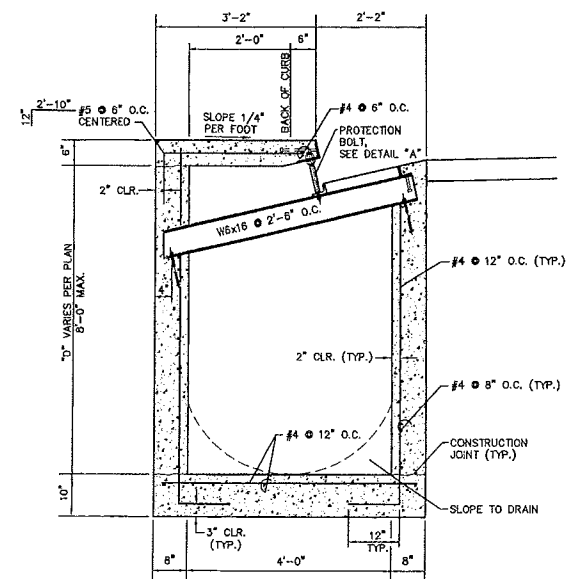
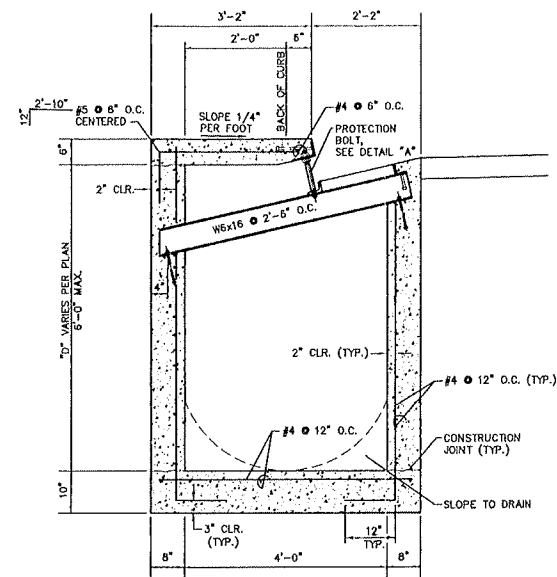
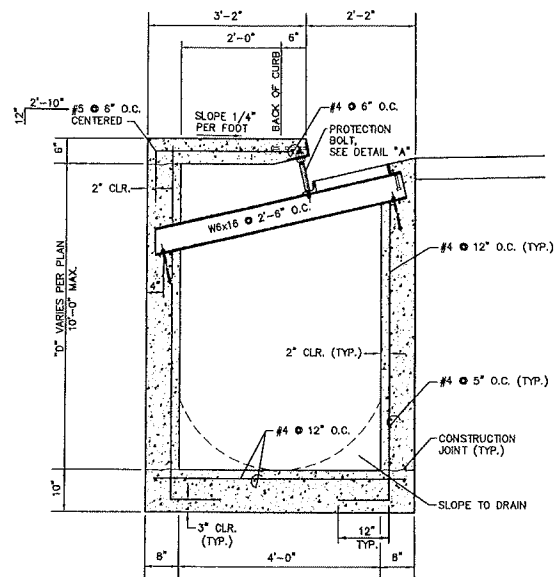
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SHEET
GR1
5 OF 8 SHEETS
DRAWING NO.



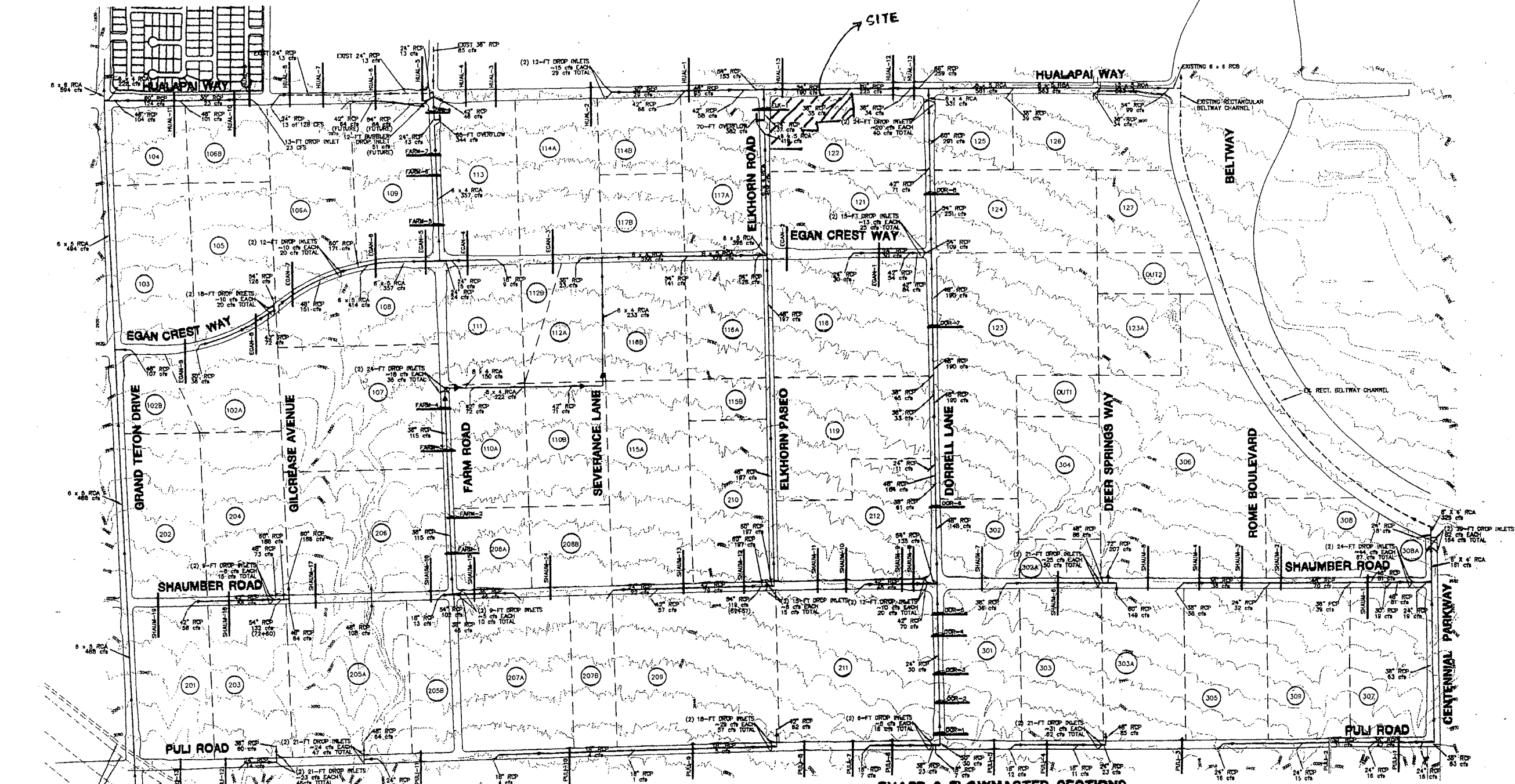
GREENSTREET PROPERTIES 2220 PASO DEL PRADO BLVD. B, STE. 202 LAS VEGAS, NV 89102 (702) 796-5582 EXT. 35		CITY OF LAS VEGAS 2727 SOUTH RAINBOW BOULEVARD LAS VEGAS, NEVADA 89146-9148 PH. (702) 873-7550 FAX (702) 362-2597 WEB WWW.VN.VN.COM CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS	
DETAIL SHEET GREENSTREET POD 122 PHASE 2		DRAWN BY: JUNE 07 DESIGNED BY: CHECKED BY: PROJECT NO: 9882 SCALE: N/A DATE: N/A	
SHEET DT1 6 OF 8 SHEETS DRAWING NO.		REV. DATE BY 1 11/10/07 JVS 2 11/10/07 JVS 3 11/10/07 JVS 4 11/10/07 JVS 5 11/10/07 JVS 6 11/10/07 JVS 7 11/10/07 JVS 8 11/10/07 JVS 9 11/10/07 JVS 10 11/10/07 JVS 11 11/10/07 JVS 12 11/10/07 JVS 13 11/10/07 JVS 14 11/10/07 JVS 15 11/10/07 JVS 16 11/10/07 JVS 17 11/10/07 JVS 18 11/10/07 JVS 19 11/10/07 JVS 20 11/10/07 JVS 21 11/10/07 JVS 22 11/10/07 JVS 23 11/10/07 JVS 24 11/10/07 JVS 25 11/10/07 JVS 26 11/10/07 JVS 27 11/10/07 JVS 28 11/10/07 JVS 29 11/10/07 JVS 30 11/10/07 JVS 31 11/10/07 JVS 32 11/10/07 JVS 33 11/10/07 JVS 34 11/10/07 JVS 35 11/10/07 JVS 36 11/10/07 JVS 37 11/10/07 JVS 38 11/10/07 JVS 39 11/10/07 JVS 40 11/10/07 JVS 41 11/10/07 JVS 42 11/10/07 JVS 43 11/10/07 JVS 44 11/10/07 JVS 45 11/10/07 JVS 46 11/10/07 JVS 47 11/10/07 JVS 48 11/10/07 JVS 49 11/10/07 JVS 50 11/10/07 JVS 51 11/10/07 JVS 52 11/10/07 JVS 53 11/10/07 JVS 54 11/10/07 JVS 55 11/10/07 JVS 56 11/10/07 JVS 57 11/10/07 JVS 58 11/10/07 JVS 59 11/10/07 JVS 60 11/10/07 JVS 61 11/10/07 JVS 62 11/10/07 JVS 63 11/10/07 JVS 64 11/10/07 JVS 65 11/10/07 JVS 66 11/10/07 JVS 67 11/10/07 JVS 68 11/10/07 JVS 69 11/10/07 JVS 70 11/10/07 JVS 71 11/10/07 JVS 72 11/10/07 JVS 73 11/10/07 JVS 74 11/10/07 JVS 75 11/10/07 JVS 76 11/10/07 JVS 77 11/10/07 JVS 78 11/10/07 JVS 79 11/10/07 JVS 80 11/10/07 JVS 81 11/10/07 JVS 82 11/10/07 JVS 83 11/10/07 JVS 84 11/10/07 JVS 85 11/10/07 JVS 86 11/10/07 JVS 87 11/10/07 JVS 88 11/10/07 JVS 89 11/10/07 JVS 90 11/10/07 JVS 91 11/10/07 JVS 92 11/10/07 JVS 93 11/10/07 JVS 94 11/10/07 JVS 95 11/10/07 JVS 96 11/10/07 JVS 97 11/10/07 JVS 98 11/10/07 JVS 99 11/10/07 JVS 100 11/10/07 JVS	



- NOTES:**

1. ALL EXPOSED METALS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
2. PROVIDE 1/2" (MIN.) CLEARANCE ALL AROUND THE STEEL BEAM, DRY PACK AFTER INSTALLATION.
3. WHEN REQUIRED BY LENGTH OF OPENING, PLATE ANGLE MAYBE DELIVERED IN SECTIONS AND BUTT WELDED IN PLACE.
4. ALL GALVANIZING DAMAGED BY WELDING SHALL RECEIVE TWO COATS OF GALVALLOY OR EQUAL.
5. CONCRETE SHALL BE MOVED CLASS BA, SEE SPECIAL PROVISIONS SECTION 501.
6. SEE GENERAL NOTES FOR STRUCTURES ON DWG. B.
7. ANGLE ANCHORS SHALL BE EMBEDDED MIDPOINT IN EACH ENDWALL AND EVENLY SPACED. (MAXIMUM SPACING OF 2')

This grading plan is a
part of drainage study
4232 which was received
on 11/8/67 and C.A. on
10/30/67. Page 8 of 9.



PHASE 1 FLOWMASTER SECTIONS

P&R DESCRIPTION		INLET	OUTLET	PIPE	VELOCITY	DEPTH	TIME	AREA	PERCENT
LINE	NO.	INLET	OUTLET	PIPE	VELOCITY	DEPTH	TIME	AREA	PERCENT
HA-1	69-61	76-78	100	0.55	0.15	0.05	0.49	0.05	2.40
HA-2	69-62	76-79	100	0.57	0.15	0.05	0.48	0.05	2.42
HA-3	69-63	76-80	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-4	69-64	76-81	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-5	69-65	76-82	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-6	69-66	76-83	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-7	69-67	76-84	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-8	69-68	76-85	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-9	69-69	76-86	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-10	69-70	76-87	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-11	69-71	76-88	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-12	69-72	76-89	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-13	69-73	76-90	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-14	69-74	76-91	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-15	69-75	76-92	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-16	69-76	76-93	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-17	69-77	76-94	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-18	69-78	76-95	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-19	69-79	76-96	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-20	69-80	76-97	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-21	69-81	76-98	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-22	69-82	76-99	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-23	69-83	76-100	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-24	69-84	76-101	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-25	69-85	76-102	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-26	69-86	76-103	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-27	69-87	76-104	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-28	69-88	76-105	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-29	69-89	76-106	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-30	69-90	76-107	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-31	69-91	76-108	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-32	69-92	76-109	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-33	69-93	76-110	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-34	69-94	76-111	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-35	69-95	76-112	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-36	69-96	76-113	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-37	69-97	76-114	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-38	69-98	76-115	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-39	69-99	76-116	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-40	69-100	76-117	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-41	69-101	76-118	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-42	69-102	76-119	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-43	69-103	76-120	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-44	69-104	76-121	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-45	69-105	76-122	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-46	69-106	76-123	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-47	69-107	76-124	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-48	69-108	76-125	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-49	69-109	76-126	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-50	69-110	76-127	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-51	69-111	76-128	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-52	69-112	76-129	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-53	69-113	76-130	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-54	69-114	76-131	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-55	69-115	76-132	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-56	69-116	76-133	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-57	69-117	76-134	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-58	69-118	76-135	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-59	69-119	76-136	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-60	69-120	76-137	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-61	69-121	76-138	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-62	69-122	76-139	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-63	69-123	76-140	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-64	69-124	76-141	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-65	69-125	76-142	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-66	69-126	76-143	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-67	69-127	76-144	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-68	69-128	76-145	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-69	69-129	76-146	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-70	69-130	76-147	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-71	69-131	76-148	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-72	69-132	76-149	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-73	69-133	76-150	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-74	69-134	76-151	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-75	69-135	76-152	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-76	69-136	76-153	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-77	69-137	76-154	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-78	69-138	76-155	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-79	69-139	76-156	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-80	69-140	76-157	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-81	69-141	76-158	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-82	69-142	76-159	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-83	69-143	76-160	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-84	69-144	76-161	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-85	69-145	76-162	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-86	69-146	76-163	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-87	69-147	76-164	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-88	69-148	76-165	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-89	69-149	76-166	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-90	69-150	76-167	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-91	69-151	76-168	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-92	69-152	76-169	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-93	69-153	76-170	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-94	69-154	76-171	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-95	69-155	76-172	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-96	69-156	76-173	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-97	69-157	76-174	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-98	69-158	76-175	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-99	69-159	76-176	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-100	69-160	76-177	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-101	69-161	76-178	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-102	69-162	76-179	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-103	69-163	76-180	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-104	69-164	76-181	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-105	69-165	76-182	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-106	69-166	76-183	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-107	69-167	76-184	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-108	69-168	76-185	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-109	69-169	76-186	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-110	69-170	76-187	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-111	69-171	76-188	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-112	69-172	76-189	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-113	69-173	76-190	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-114	69-174	76-191	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-115	69-175	76-192	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-116	69-176	76-193	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-117	69-177	76-194	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-118	69-178	76-195	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-119	69-179	76-196	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-120	69-180	76-197	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-121	69-181	76-198	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-122	69-182	76-199	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-123	69-183	76-200	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-124	69-184	76-201	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-125	69-185	76-202	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-126	69-186	76-203	100	0.50	0.15	0.05	0.46	0.05	2.31
HA-127	69-187	76-204	100	0.50	0.15	0.05			

DEVELOPED OFF-SITE		
NAME	Q10	Q100
DEV-1	2.7	3.5
DEV-2	3.4	4.3
DEV-3	4.1	5.1
DEV-4	4.8	5.9
DEV-5	5.5	6.7
DEV-6	6.2	7.5
DEV-7	6.9	8.3
DEV-8	7.6	9.1
DEV-9	8.3	9.9
DEV-10	9.0	10.7
DEV-11	9.7	11.5
DEV-12	10.4	12.3
DEV-13	11.1	13.1
DEV-14	11.8	13.9
DEV-15	12.5	14.7
DEV-16	13.2	15.5
DEV-17	13.9	16.3
DEV-18	14.6	17.1
DEV-19	15.3	17.9
DEV-20	16.0	18.7
DEV-21	16.7	19.5
DEV-22	17.4	20.3
DEV-23	18.1	21.1
DEV-24	18.8	21.9
DEV-25	19.5	22.7
DEV-26	20.2	23.5
DEV-27	20.9	24.3
DEV-28	21.6	25.1
DEV-29	22.3	25.9
DEV-30	23.0	26.7
DEV-31	23.7	27.5
DEV-32	24.4	28.3
DEV-33	25.1	29.1
DEV-34	25.8	29.9
DEV-35	26.5	30.7
DEV-36	27.2	31.5
DEV-37	27.9	32.3
DEV-38	28.6	33.1
DEV-39	29.3	33.9
DEV-40	30.0	34.7
DEV-41	30.7	35.5
DEV-42	31.4	36.3
DEV-43	32.1	37.1
DEV-44	32.8	37.9
DEV-45	33.5	38.7
DEV-46	34.2	39.5
DEV-47	34.9	40.3
DEV-48	35.6	41.1
DEV-49	36.3	41.9
DEV-50	37.0	42.7
DEV-51	37.7	43.5
DEV-52	38.4	44.3
DEV-53	39.1	45.1
DEV-54	39.8	45.9
DEV-55	40.5	46.7
DEV-56	41.2	47.5
DEV-57	41.9	48.3
DEV-58	42.6	49.1
DEV-59	43.3	49.9
DEV-60	44.0	50.7
DEV-61	44.7	51.5
DEV-62	45.4	52.3
DEV-63	46.1	53.1
DEV-64	46.8	53.9
DEV-65	47.5	54.7
DEV-66	48.2	55.5
DEV-67	48.9	56.3
DEV-68	49.6	57.1
DEV-69	50.3	57.9
DEV-70	51.0	58.7
DEV-71	51.7	59.5
DEV-72	52.4	60.3
DEV-73	53.1	61.1
DEV-74	53.8	61.9
DEV-75	54.5	62.7
DEV-76	55.2	63.5
DEV-77	55.9	64.3
DEV-78	56.6	65.1
DEV-79	57.3	65.9
DEV-80	58.0	66.7
DEV-81	58.7	67.5
DEV-82	59.4	68.3
DEV-83	60.1	69.1
DEV-84	60.8	69.9
DEV-85	61.5	70.7
DEV-86	62.2	71.5
DEV-87	62.9	72.3
DEV-88	63.6	73.1
DEV-89	64.3	73.9
DEV-90	65.0	74.7
DEV-91	65.7	75.5
DEV-92	66.4	76.3
DEV-93	67.1	77.1
DEV-94	67.8	77.9
DEV-95	68.5	78.7
DEV-96	69.2	79.5
DEV-97	69.9	80.3
DEV-98	70.6	81.1
DEV-99	71.3	81.9
DEV-100	72.0	82.7

COMBINATION POINTS		
NAME	Q10	Q100
CP-1	2.7	3.5
CP-2	3.4	4.3
CP-3	4.1	5.1
CP-4	4.8	5.9
CP-5	5.5	6.7
CP-6	6.2	7.5
CP-7	6.9	8.3
CP-8	7.6	9.1
CP-9	8.3	9.9
CP-10	9.0	10.7
CP-11	9.7	11.5
CP-12	10.4	12.3
CP-13	11.1	13.1
CP-14	11.8	13.9
CP-15	12.5	14.7
CP-16	13.2	15.5
CP-17	13.9	16.3
CP-18	14.6	17.1
CP-19	15.3	17.9
CP-20	16.0	18.7
CP-21	16.7	19.5
CP-22	17.4	20.3
CP-23	18.1	21.1
CP-24	18.8	21.9
CP-25	19.5	22.7
CP-26	20.2	23.5
CP-27	20.9	24.3
CP-28	21.6	25.1
CP-29	22.3	25.9
CP-30	23.0	26.7
CP-31	23.7	27.5
CP-32	24.4	28.3
CP-33	25.1	29.1
CP-34	25.8	29.9
CP-35	26.5	30.7
CP-36	27.2	31.5
CP-37	27.9	32.3
CP-38	28.6	33.1
CP-39	29.3	33.9
CP-40	30.0	34.7
CP-41	30.7	35.5
CP-42	31.4	36.3
CP-43	32.1	37.1
CP-44	32.8	37.9
CP-45	33.5	38.7
CP-46	34.2	39.5
CP-47	34.9	40.3
CP-48	35.6	41.1
CP-49	36.3	41.9
CP-50	37.0	42.7
CP-51	37.7	43.5
CP-52	38.4	44.3
CP-53	39.1	45.1
CP-54	39.8	45.9
CP-55	40.5	46.7
CP-56	41.2	47.5
CP-57	41.9	48.3
CP-58	42.6	49.1
CP-59	43.3	49.9
CP-60	44.0	50.7
CP-61	44.7	51.5
CP-62	45.4	52.3
CP-63	46.1	53.1
CP-64	46.8	53.9
CP-65	47.5	54.7
CP-66	48.2	55.5
CP-67	48.9	56.3
CP-68	49.6	57.1
CP-69	50.3	57.9
CP-70	51.0	58.7
CP-71	51.7	59.5
CP-72	52.4	60.3
CP-73	53.1	61.1
CP-74	53.8	61.9
CP-75	54.5	62.7
CP-76	55.2	63.5
CP-77	55.9	64.3
CP-78	56.6	65.1
CP-79	57.3	65.9
CP-80	58.0	66.7
CP-81	58.7	67.5
CP-82	59.4	68.3
CP-83	60.1	69.1
CP-84	60.8	69.9
CP-85	61.5	70.7
CP-86	62.2	71.5
CP-87	62.9	72.3
CP-88	63.6	73.1
CP-89	64.3	73.9
CP-90	65.0	74.7
CP-91	65.7	75.5
CP-92	66.4	76.3
CP-93	67.1	77.1
CP-94	67.8	77.9
CP-95	68.5	78.7
CP-96	69.2	79.5
CP-97	69.9	80.3
CP-98	70.6	81.1
CP-99	71.3	81.9
CP-100	72.0	82.7

DEVELOPED OFF-SITE		
NAME	Q10	Q100
DEV-1	2.7	3.5
DEV-2	3.4	4.3
DEV-3	4.1	5.1
DEV-4	4.8	5.9
DEV-5	5.5	6.7
DEV-6	6.2	7.5
DEV-7	6.9	8.3
DEV-8	7.6	9.1
DEV-9	8.3	9.9
DEV-10	9.0	10.7
DEV-11	9.7	11.5
DEV-12	10.4	12.3
DEV-13	11.1	13.1
DEV-14	11.8	13.9
DEV-15	12.5	14.7
DEV-16	13.2	15.5
DEV-17	13.9	16.3
DEV-18	14.6	17.1
DEV-19	15.3	17.9
DEV-20	16.0	18.7
DEV-21	16.7	19.5
DEV-22	17.4	20.3
DEV-23	18.1	21.1
DEV-24	18.8	21.9
DEV-25	19.5	22.7
DEV-26	20.2	23.5
DEV-27	20.9	24.3
DEV-28	21.6	25.1
DEV-29	22.3	25.9
DEV-30	23.0	26.7
DEV-31	23.7	27.5
DEV-32	24.4	28.3
DEV-33	25.1	29.1
DEV-34	25.8	29.9
DEV-35	26.5	30.7
DEV-36	27.2	31.5
DEV-37	27.9	32.3
DEV-38	28.6	33.1
DEV-39	29.3	33.9
DEV-40	30.0	34.7
DEV-41	30.7	35.5
DEV-42	31.4	36.3
DEV-43	32.1	37.1
DEV-44	32.8	37.9
DEV-45	33.5	38.7
DEV-46	34.2	39.5
DEV-47	34.9	40.3
DEV-48	35.6	41.1
DEV-49	36.3	41.9
DEV-50	37.0	42.7
DEV-51	37.7	43.5
DEV-52	38.4	44.3
DEV-53	39.1	45.1
DEV-54	39.8	45.9
DEV-55	40.5	46.7
DEV-56	41.2	47.5
DEV-57	41.9	48.3
DEV-58	42.6	49.1
DEV-59	43.3	49.9
DEV-60	44.0	50.7
DEV-61	44.7	51.5
DEV-62	45.4	52.3
DEV-63	46.1	53.1
DEV-64	46.8	53.9
DEV-65	47.5	54.7
DEV-66	48.2	55.5
DEV-67	48.9	56.3
DEV-68	49.6	57.1
DEV-69	50.3	57.9
DEV-70	51.0	58.7
DEV-71	51.7	59.5
DEV-72	52.4	60.3
DEV-73	53.1	61.1
DEV-74	53.8	61.9
DEV-75	54.5	62.7
DEV-76	55.2	63.5
DEV-77	55.9	64.3
DEV-78	56.6	65.1
DEV-79	57.3	65.9
DEV-80	58.0	66.7
DEV-81	58.7	67.5
DEV-82	59.4	68.3
DEV-83	60.1	69.1
DEV-84	60.8	69.9
DEV-85	61.5	70.7
DEV-86	62.2	71.5
DEV-87	62.9	72.3
DEV-88	63.6	73.1
DEV-89	64.3	73.9
DEV-90	65.0	74.7
DEV-91	65.7	75.5
DEV-92	66.4	76.3
DEV-93	67.1	77.1
DEV-94	67.8	77.9
DEV-95	68.5	78.7
DEV-96	69.2	79.5
DEV-97	69.9	80.3
DEV-98	70.6	81.1
DEV-99	71.3	81.9
DEV-100	72.0	82.7

MISC.		
NAME	Q10	Q100
DV1	3.6	7.8
DV2	11	4.4
D3	3.7	3.7
D2	6	1.4
DV10	4.9	11.5
DV11	1.2	1.2
MY BEST	1.2	1.2
RE10	2.6	4.3
REC-3A	5.7	1.95
REC-10	1.6	1.74
REC-20	1.6	1.84
REC-3	9.5	2.5
REC-16	1.9	5.6
REC-1	1.7	4.19
REC-10A	4.5	2.2
REC-48	11.2	2.9
REC-4	1.1	1.1
REC-40	4.1	3.7
REC-100	1.2	2.1
REC-1A	1.1	1.1
REC-3A	1.1	1.1
REC-5	4.4	1.58
REC-57	2.7	2.48
REC-47	1.1	1.07

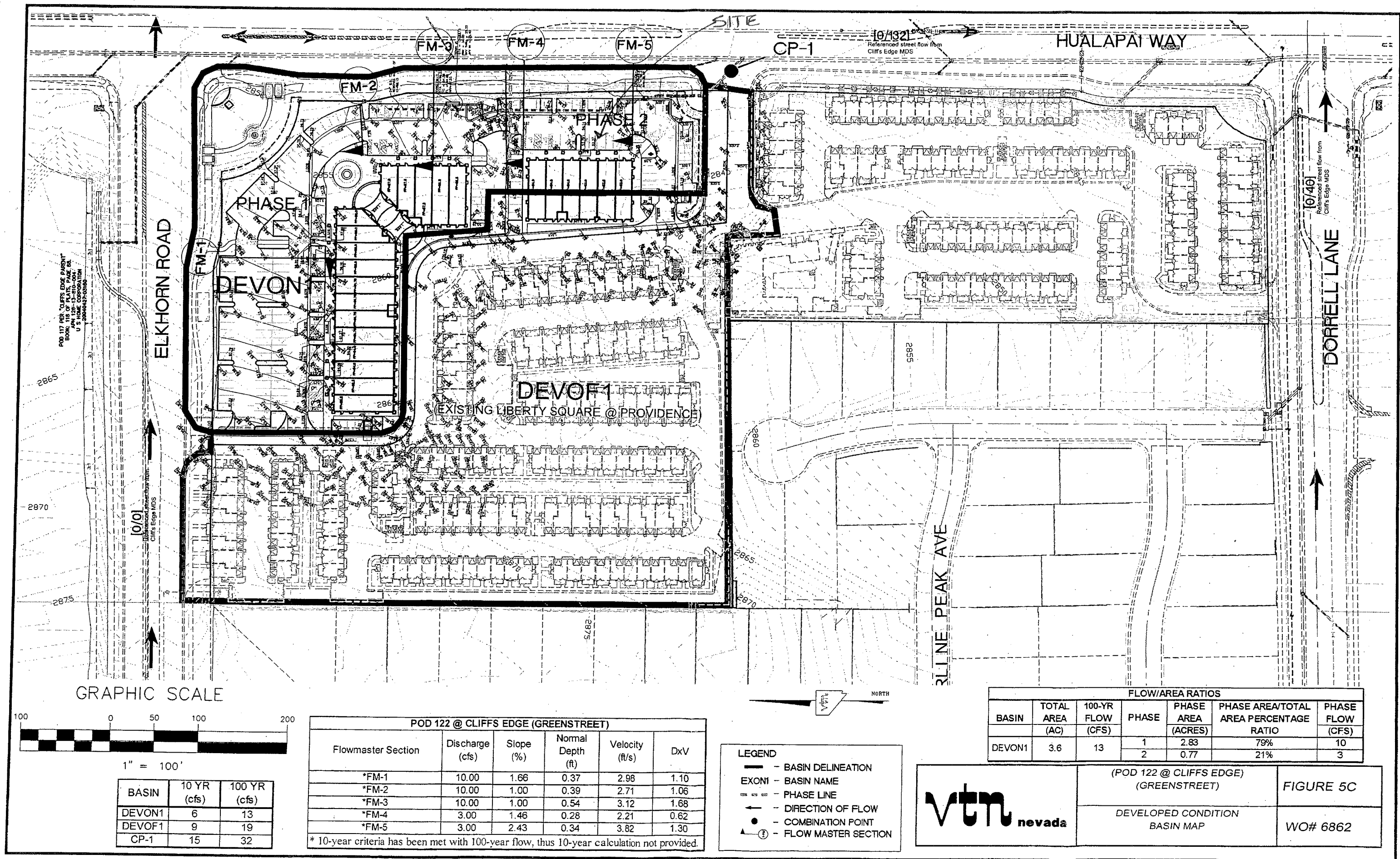
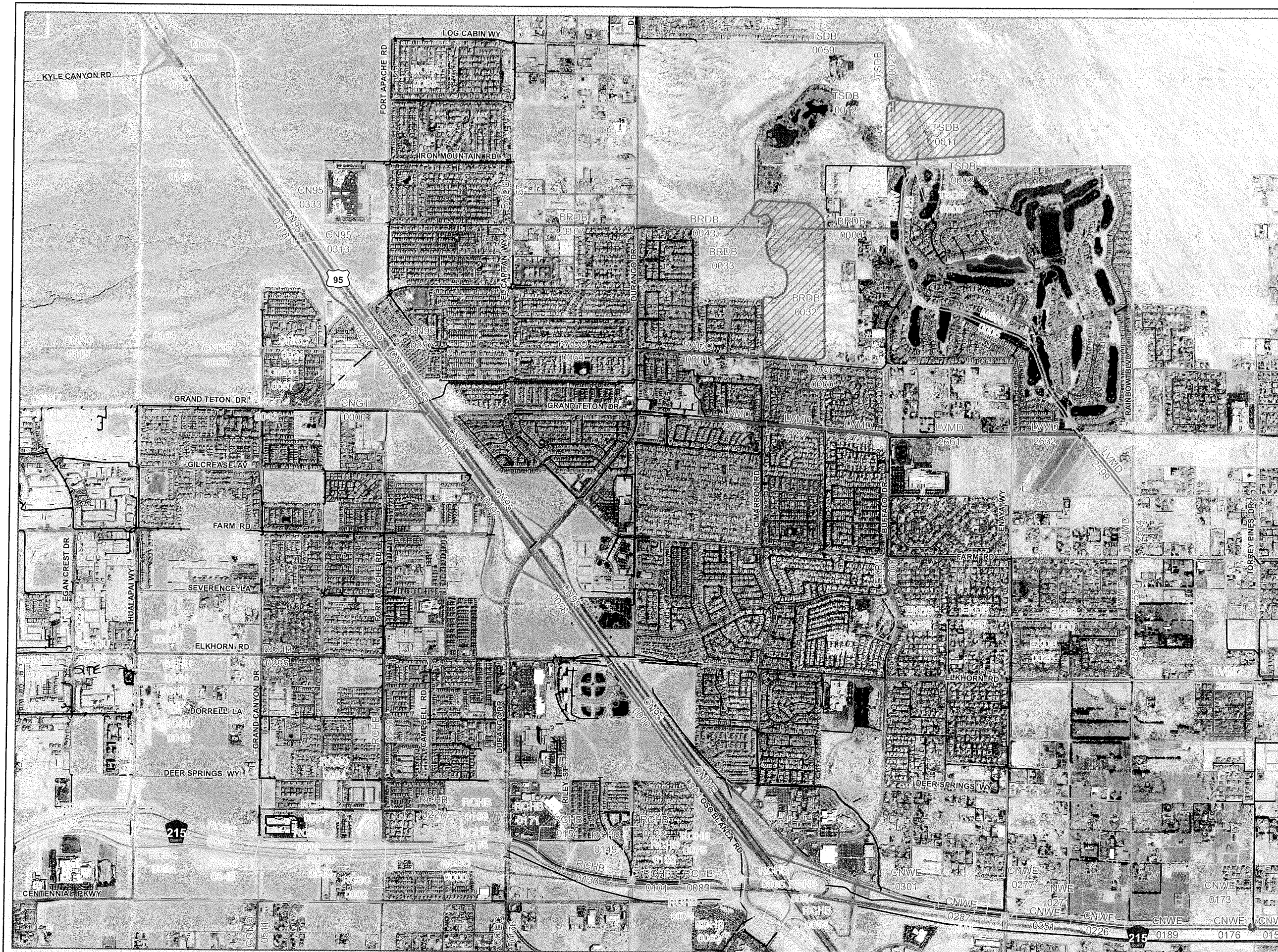


FIGURE 8



FIGURE 6



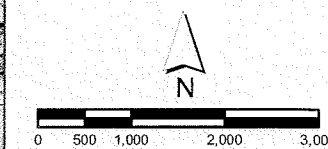
2008
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

**FIGURE F-13
FLOOD CONTROL FACILITIES**

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed 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 |



Scale: 1 inch = 2,000 feet
Refer to Figure G-2 for Aerial Source(s)

US95

1	2	3
4	5	6
7	8	9
10	11	12
13	14	15
16	17	18
19	20	21
22	23	24
25	26	27
28	29	30
31	32	33
34	35	36
37	38	39
40	41	42
43	44	45
46	47	48
49	50	51
52	53	54
55	56	57
58	59	60

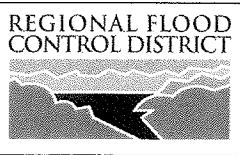
I-15



FIGURE 5

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
BCHU		BELTWAY CHANNEL - HUALAPAI						
0000	E	12' X 5' RCAP	853	501	CBA3-C	WEST3	0.84	1.11
0017	E	8' X 5' RCAP	1216	501	CBA3-C	WEST3	0.84	1.33
0040	E	66" RCP	60	222	DNW26-C	WEST3	0.51	1.04
0042	E	60" RCP	615	222	DNW26-C	WEST3	0.51	1.42
0054	E	54" RCP	770	222	DNW26-C	WEST3	0.51	1.23
BRDB		BRENT DRAINAGE SYSTEM						
0000	P3	36" RCP with 18" Orifice Plate	2170	37	BRDB	WEST3	2.48	0.40
0031	P3	45,080 cfs PMF Spillway		45080	CBRDB	WEST3	2.48	
0032	P3	450 ac-ft South Environmental Enhancement Area		1902	CBRDB	WEST3	2.48	
0033	P3	Energy Dissipator	100	957	CNW113-C	WEST3	1.58	
0043	P1	8' X 6' RCB	2920	957	CNW113-C	WEST3	1.58	2.10
0107	P1	8' X 6' RCB	2660	957	CNW113-C	WEST3	1.58	2.40
0157	P1	12' X 6' RCB	1260	741	CNW96-C	WEST3	0.95	0.25
CN95		CENTENNIAL PKWY CHANNEL WEST / U.S 95 BRANCH						
0000	P2	Conc Chnl 22"W 10"D 0:1 SS	2690	3340	CNWBB3-C	WEST3	3.36	2.17
0068	P1	3: 8' X 7' RCB	3380	3216	CNW103-C	WEST3	3.05	2.12
0102	P1	3: 8' X 6' RCB	1710	2888	2CNW89-C	WEST3	2.66	2.09
0167	P1	2: 10' X 6' RCB	1580	2160	2CNW71-E	WEST3	1.64	1.50
0199	P3	Conc Chnl 15"W 11"D 0:1 SS	1015	1609	2CNW72-C	WEST3	1.17	0.82
0218	P3	16' X 8' RCB	556	1609	2CNW72-C	WEST3	1.17	0.77
0257	P3	Transition Structure	100	1609	2CNW72-C	WEST3	1.17	0.77
0259	P3	16' X 8' RCB	2848	674	CNW74-C	WEST3	0.45	2.06
0313	P3	Transition Structure	240	674	CNW74-C	WEST3	0.45	1.50
0318	P3	14' X 6' RCB	797	333	NW62-S	WEST3	0.21	1.47
0333	P3	12' X 6' RCB	300	333	NW62-S	WEST3	0.21	5.50
CNGT		CENTENNIAL PKWY CHANNEL WEST / GRAND TETON BRANCH						
0000	P3	10' X 5' RCB	2290	600	CNW71-E	WEST3	0.47	2.63
0043	P0	6' X 6' RCB	3980	600	CNW71-E	WEST3	0.47	3.00
0118	E	6' X 5' RCAP	5472	363	KYLEDET*	KYLEDB	57.73	3.72
CNKC		CENTENNIAL PKWY CHANNEL WEST / KYLE CANYON BRANCH						
0000	E	12' X 4' RCB	377	999	CNW72-C	WEST3	0.71	4.58
0007	E	10' X 5' RCB	874	999	CNW72-C	WEST3	0.71	3.28
0024	E	8' X 5' RCB	1385	999	CNW72-C	WEST3	0.71	2.40
0050	P0	6' X 6' RCB	2830	999	CNW72-C	WEST3	0.71	3.00
0104	P0	6' X 5' RCB	565	452	NW45-S	WEST3	0.27	3.00
0115	P0	72" RCP	1513	452	NW45-S	WEST3	0.27	3.00
CNWE		CENTENNIAL PKWY CHANNEL WEST						
0150	P2	Conc Chnl 42"W 10"D 0:1 SS	720	4233	CNW3B3-C	WEST3	5.64	0.40
0173	P2	42' X 10' RCBC @ Torrey Pines	190	4233	CNW3B3-C	WEST3	5.64	0.40
0176	P2	Conc Chnl 32"W 12"D 0:1 SS	795	4233	CNW3B3-C	WEST3	5.64	0.40
0189	P2	Conc Chnl 32"W 10"D 0:1 SS	1845	4067	CNW2D4-C	WEST3	5.15	0.54
0226	P2	Conc Chnl 12"W 12"D 2:1 SS	1165	4067	CNW2D4-C	WEST3	5.15	1.00
0251	P2	Conc Chnl 12"W 12"D 2:1 SS	1135	3951	CNW2D3-C	WEST3	4.65	0.59
0271	P2	Conc Chnl 32"W 10"D 0:1 SS	185	3951	CNW2D3-C	WEST3	4.65	0.59
0274	E	32' X 10' RCBC @ Tenaya	130	3951	CNW2D3-C	WEST3	4.65	0.45
0277	P2	Conc Chnl 13"W 10"D 2:1 SS	590	3951	CNW2D3-C	WEST3	4.65	0.45
0287	P2	Conc Chnl 13"W 10"D 2:1 SS	605	3593	CNW2B2-C	WEST3	3.84	1.19
0301	P2	Conc Chnl 32"W 10"D 0:1 SS	235	3593	CNW2B2-C	WEST3	3.84	1.19
0304	P2	32' X 10' RCB	6510	3593	CNW2B2-C	WEST3	3.84	1.75
EKBU		ELKHORN SPRINGS AND BUFFALO						
0000	P1	78" RCP	860	375	NW134-C	WEST3	0.46	1.00
EKDB		ELKHORN SPRINGS DETENTION BASIN						
0000	E	Grass Chnl 15"W 5.8"D 3.5:1 SS	2575	238	CNW150-C	WEST3	1.41	0.39
0025	E	4' X 3' RCB	160	120	ELKBASIN	WEST3	0.84	0.50
0026	E	48" RCP	1270	120	ELKBASIN	WEST3	0.84	1.23
0049	E	60" RCP	1095	120	ELKBASIN	WEST3	0.84	0.13
0070	E	48 ac-ft Elkhorn Springs Detention Basin		629	CNW133-C	WEST3	0.84	
EKHU		ELKHORN AND HUALAPAI						
0000	E	6' X 5' RCB Overflow Structure	48	638	CNW26-C	WEST3	0.51	0.91
0001	E	6' X 5' RCAP	72	638	CNW26-C	WEST3	0.51	0.91
EKHU		ELKHORN AND HUALAPAI						
0003	E	6' X 4' RCAP	980	638	CNW26-C	WEST3	0.51	3.61
0020	E	6' X 5' RCAP	150	638	CNW26-C	WEST3	0.51	3.61
0023	E	8' X 5' RCAP	1200	638	CNW26-C	WEST3	0.51	0.90
GOEC		GOWAN NORTH - EL CAPITAN BRANCH						
0176	P1	78" RCP	1320	363	CCPFR-C	ALLGOW3	0.46	1.15
GONO		GOWAN NORTH SYSTEM						
0511	P1	7' X 6' RCB	1320	546	CCPHW-C	ALLGOW3	0.60	1.14
LVMD		LAS VEGAS WASH - MIDDLE						
2490	P2	2: 13' X 7' RCB	2555	2278	CNW168-C	CWEST3	4.69	0.40
2507	E	2: 13' X 9' RCB	2831	2278	CNW168-C	CWEST3	4.69	0.36
2525	P1	21' X 6' RCB	1140	1913	CNW159-C	CWEST3	3.91	0.40
2550	P1	21' X 6' RCB	1445	1664	CD161-C	CWEST3	3.41	0.40
2574	P1	21' X 6' RCB	1430	1664	CD161-C	CWEST3	3.41	0.60
2599	P1	Conc Chnl 30"W 5"D 2:1 SS	1577	1585	CNW162-C	CWEST3	3.08	0.40
2632	P1	13' X 5' RCB	1580	968	CNW138-C	WEST3	1.16	0.59
2661	P1	11' X 5' RCB	2640	968	CNW138-C	WEST3	1.16	1.00
2711	P1	8' X 5' RCB	1320	968	CNW138-C	WEST3	1.16	1.80
2737	P1	8' X 5' RCB	1320	818	CNW139-C	WEST3	0.93	1.81
2763	P1	78" RCP	1320	818	CNW139-C	WEST3	0.93	2.40
MOFA		MOCCASIN - FORT APACHE						
0024	P0	12' X 6' RCB	1520	394	DNW100-W	LOWER3	0.46	0.25
0053	P0	10' X 6' RCB	1345	258	DNW78-C	LOWER3	0.24	0.25
MOKY		MOCCASIN - KYLE CANYON BRANCH						
0078	P0	2: 13' X 7' RCB	965	1205	CNW50-E	LOWER3	1.06	0.40
0096	P0	2: 13' X 7' RCBC @ US 95	210	1066	CNW35-C	LOWER3	0.89	1.70
0100	P0	2: 13' X 7' RCB	1515	1066	CNW35-C	LOWER3	0.89	0.40
0129	P0	2: 11' X 7' RCB	675	779	CNW33-C	LOWER3	0.64	0.40
0142	P0	2: 9' X 7' RCB	430	779	CNW33-C	LOWER3	0.64	0.40
MSNV		MOUNTAIN SPA/VISTA RANCH						
0000	E	6: 12' X 5' RCBC @ Grand Teton	273	679	CNW163-C	CWEST3	1.67	0.40
0005	E	Grass Chnl 100"W 4.5"D 10:1 SS	6325	679	CNW163-C	CWEST3	1.67	0.40
0125	E	Grass Chnl 100"W 4.5"D 10:1 SS	1300	116	CNW147E	WEST3	1.54	0.40
RACO		RACEL STREET COLLECTOR						
0000	P3	96" RCP Baffled Energy Dissipator	54	497	CNW111S	WEST3	0.55	4.20
0001	P3	78" RCP	3245	497	CNW111S	WEST3	0.55	2.46
0064	P3	78" RCP	2650	423	DNW111S	WEST3	0.44	2.09
RCBC		RANCHO ROAD SYSTEM - BELTWAY CHANNEL						
0000	E	6' X 5' RCB	1962	222	FADB	WEST3	1.60	1.04
0002	E	54" RCP Outlet with 41" Orifice	503	222	FADB	WEST3	1.60	2.38
0003	E	2,341 cfs PMF Spillway		2341	FADBIN	WEST3	1.60	
0004	E	76 ac-ft Fort Apache Detention Basin		1255	FADBIN	WEST3	1.60	
0007	E	Energy Dissipator	100	1255	FADBIN	WEST3	1.60	
0009	E	12' X 6' RCBC @ Fort Apache Detention Basin	133	1255	FADBIN	WEST3	1.60	1.79
0012	E	Conc Chnl 12"W 6'-7"D 0:1 SS	1937	1255	FADBIN	WEST3	1.60	3.15
0048	E	12' X 6' RCBC @ Grand Canyon	140	1040	CMNA1	WEST3	1.32	3.15
0051	E	Conc Chnl 12"W 6'-8"D 0:1 SS	2660	1040	CMNA1	WEST3	1.32	3.44
0096	E	1: 10' X 6' and 1: 6' X 6' RCBC @ Hualapai Way	190	1040	CMNA1	WEST3	1.32	1.93
0100	E	Conc Chnl 12"W 5.5"D 0:1 SS	2085	598	CDMNA1	WEST3	0.48	2.88
0140	E	Conc Chnl 10"W 5"D 0:1 SS	2155	598	CDMNA1	WEST3	0.48	1.65
RCHB		RANCHO ROAD SYSTEM - BELTWAY						
0034	E	Conc Chnl 21"W 8"D 0:1 SS	1000	2631	CNW1C-W	WEST3	4.68	1.19
0053	E	2: 12' X 8' RCBC @ South Ramp Connector	85	2304	CDW1C1	WEST3	4.31	1.40
0054	E	Conc Chnl 21"W 8"D 0:1 SS	432	2304	CDW1C1	WEST3	4.31	1.51
0062	E	Transition Structure	130	2304	CDW1C1	WEST3	4.31	1.51
0065	E	24' X 7' RCB	480	2304	CDW1C1	WEST3	4.31	0.30
0074	E	24' X 6' RCB	50	2226	CNWBC6-C	WEST3	4.17	0.30
0075	E	20' X 6' RCBC @ Beltway	428	2226	CNWBC6-C	WEST3	4.17	2.81
0083	P2	20' X 6' RCB	950	2226	CNWBC6-C	WEST3	4.17	2.49
0101	P2	Conc Chnl 20"W 7"D 0:1 SS	980	2226	CNWBC6-C	WEST3	4.17	2.38
0120	E	20' X 6' RCBC @ Grand Montecilo	120	2226	CNWBC6-C	WEST3	4.17	1.00
RCHB		RANCHO ROAD SYSTEM - BELTWAY						
0122	P2	Conc Chnl 16'-20"W 6"D 0:1 SS	350	2226	CNWBC6-C	WEST3	4.17	1.84
0130	P2	Conc Chnl 16"W 6"D 0:1 SS	1012	2226	CNWBC6-C	WEST3	4.17	2.67
0149	P2	Conc Chnl 16"W 6'-7"D 0:1 SS	87	1888	CNWBC3	WEST3	3.75	2.27
0151	P2	Conc Chnl 16"W 7'D 0:1 SS	1255	1888	CNWBC3	WEST3	3.75	2.65
0171	E	16' X 6' RCBC @ El Capitan Way	234	1888	CNWBC3	WEST3	3.75	1.75
0175	E	Conc Chnl 14"W 7'D 0:1 SS	1220	1888	CNWBC3	WEST3	3.75	2.93
0198	E	Conc Chnl 14"W 7'D 0:1 SS	225	1402	CNWBA6-C	WEST3	3.61	2.93
0227	P1	11' X 8' RCB	1885	1402	CNWBA6-C	WEST3	3.61	2.17
0250	P1	11' X 8' RCB	3200	1402	CNWBA6-C	WEST3	3.61	1.06
0295	P1	7' X 6' RCB	5525	973	CNW66-C	WEST3	1.75	3.30
TSDB		TULE SPRINGS DRAINAGE SYSTEM						
0000	E	2: 10' X 4' RCBC @ Echo Grande	100	26	TULEDB	WEST3	1.35	1.04
0002	P3	36" RCP with 22" Orifice Plate	320	26	TULEDB	WEST3	1.35	0.33
0010	P3	14,013 cfs PMF Spillway		14013	CTULEDB	WEST3	1.35	
0011	P3	117 ac-ft North Environmental Enhancement Area		804	CTULEDB	WEST3	1.35	
0012	P3	Energy Dissipator	260	376	CNW148-C	WEST3	0.52	
0023	P1	84" RCP	1320	376	CNW148-C	WEST3	0.52	0.80
0059	P1	78" RCP	2640	376	CNW148-C	WEST3	0.52	1.03

* 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

2008 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

FACILITY INVENTORY
FIGURE F - 13

LEGEND

ID (Facility Identifier)

Parent Stream Name

Stream Name

River Mile

Distance Above Confluence with Parent Stream (Miles)

Miles in Hundredths

AABB

0000

Existing Facility..... E

Proposed or Modified Facility..... P

Contingency Level

Category B..... P0

Master Plan..... P1

Preliminary Design..... P2

Design..... P3

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..... RCP

Reinforced Concrete Pipe Culvert..... RCPC

Storm Sewer Pipe..... SSP

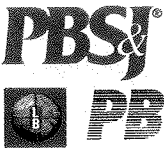


FIGURE 5a

NOTES

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

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

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

MAP LEGEND

PARCEL BOUNDARY

SUB BOUNDARY

PM/LD BOUNDARY

ROAD EASEMENT

MATCH / LEADER LINE

HISTORIC LOT LINE

HISTORIC SUB BOUNDARY

HISTORIC PM/LD BOUNDARY

SECTION LINE

CONDOMINIUM UNIT

AIR SPACE PCL

RIGHT OF WAY PCL

SUB-SURFACE PCL

ASSESSOR'S PARCELS - CLARK CO., NV.

Michele W. Shafe - Assessor

BOOK

T19S R59E

SEC.

24

MAP

N 2 NE 4

126-24-5

001 ROAD PARCEL NUMBER

001 PARCEL NUMBER

1.00 ACREAGE

202 PARCEL SUB/SEQ NUMBER

PB 24-45 PLAT RECORDING NUMBER

5 BLOCK NUMBER

5 LOT NUMBER

GL5 GOV. LOT NUMBER

098 099 100 101

127 126 125 124

136 137 138 139

6 5 4 3 2 1

7 8 9 10 11 12

18 17 16 15 14 13

19 20 21 22 23 24

30 29 28 27 26 25

31 32 33 34 35 36

8 4 8 4

5 1 5 1

6 2 6 2

7 3 7 3

8 4 8 4

5 1 5 1

Scale: 1" = 200'

Rev: 03/25/2011

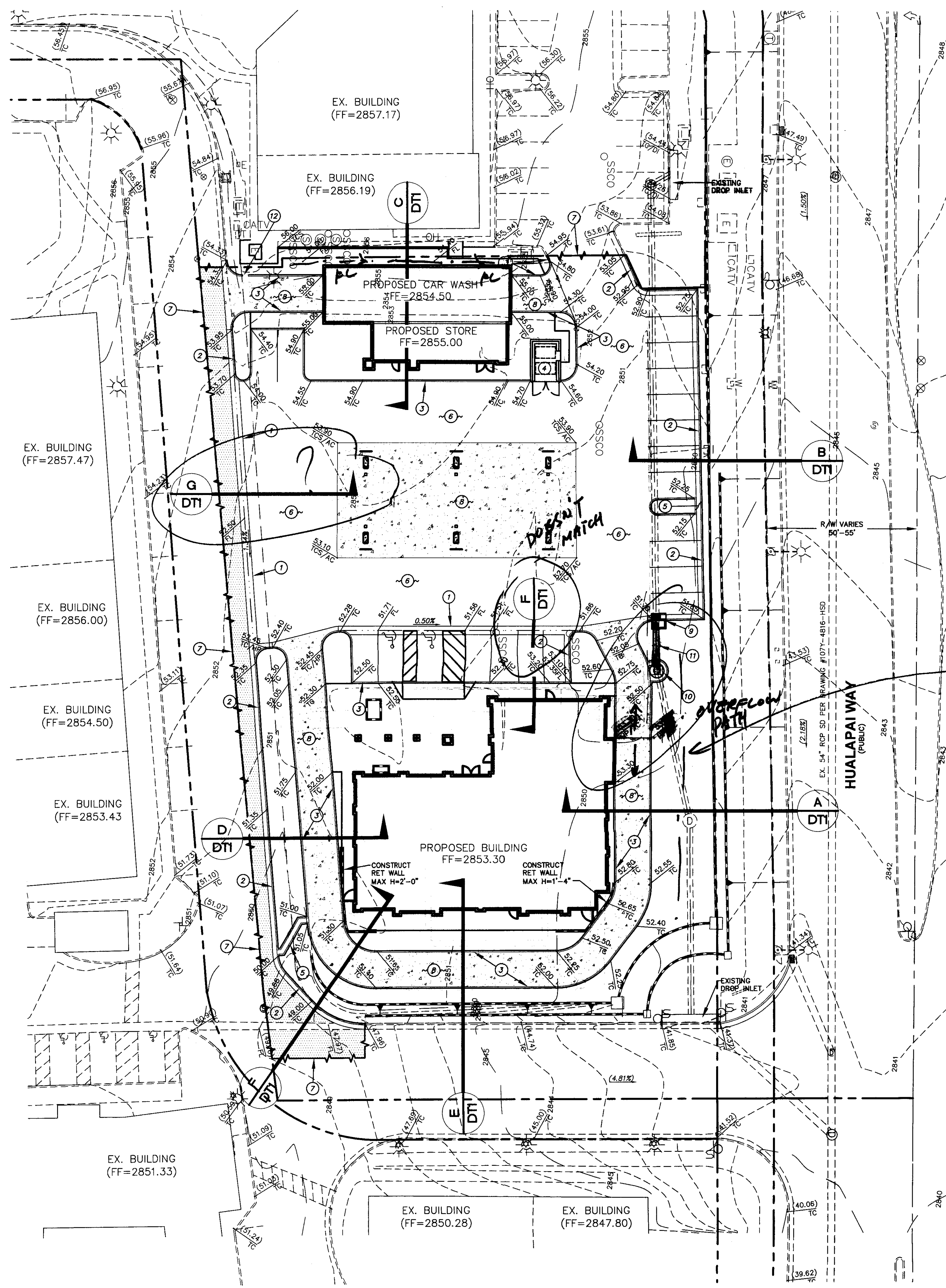
CLARK COUNTY

ASSESSOR

NEVADA

TAX DIST 200

FIGURE 2

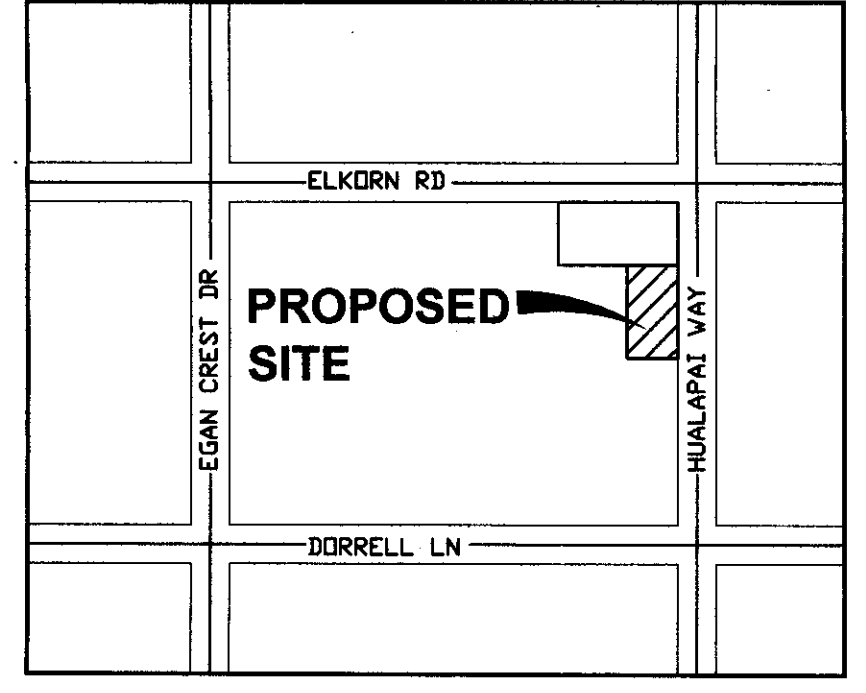


CONSTRUCTION NOTES

#	ITEM	UNIT	PUBLIC	PRIVATE	QUANTITY
1	INSTALL 3" VALLEY GUTTER PER DETAIL 1 SHEET DT01	LF	-	-	652
2	INSTALL 24" "L" TYPE C & G PER CCAUSD DWG. #216	LF	-	-	381
3	INSTALL "A" TYPE CURB PER CCAUSD #	LF	-	-	1151
4	INSTALL TRASH ENCLOSURE SEE ARCHITECT PLANS FOR DIMENSIONS	EA	-	-	1
5	INSTALL SLOT GUTTER PER DETAIL 2 SHEET DT01	LF	-	-	5
6	INSTALL 3" MIN. AC OVER 4" TYPE II A.B.	SY	-	-	1484
7	SAWCUT NEAT AND MATCH EXISTING GRADE	LF	-	-	357
8	INSTALL 6" CONCRETE OVER 4" TYPE II AGGREGATE BASE	SY	-	-	933
9	INSTALL SINGLE GRATE CM TYPE DROP INLET	EA	-	-	1
10	INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #403	EA	-	-	1
11	INSTALL 24" RCP	LF	-	-	15
12	INSTALL 2' CURB OPENING PER DETAIL 3 SHEET DT01	EA	-	-	1

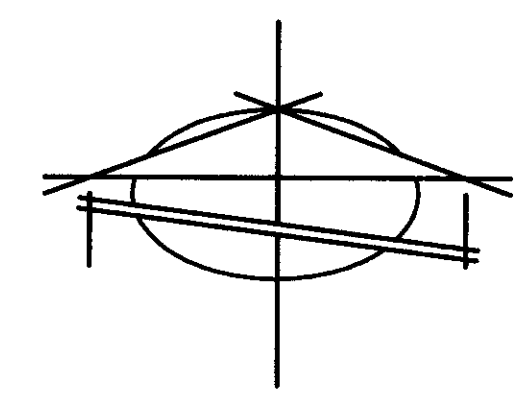
ALL ONSITE STORM DRAINS AND THE ASSOCIATED FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED.

Show how the Landscape drains? with PL @ regular intervals

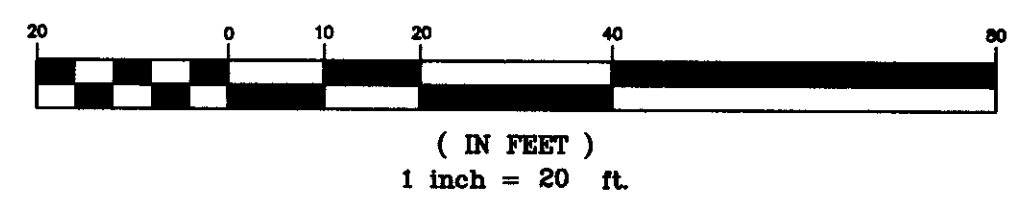


VICINITY MAP

NOT SCALE



GRAPHIC SCALE



LEGEND

- PROPERTY LINE
- R/W LINE
- STREET CENTERLINE
- BUILDING SETBACK LINE
- EXISTING "L" CURB & GUTTER
- EXISTING CONTOUR LINES
- PROPOSED SCREEN/RETAINING WALL
- EXISTING SCREEN/RETAINING WALL
- PROPOSED FLOW LINE
- EXIST. EDGE OF PAVEMENT
- CUT/FILL TRANSITION LINE
- SAWCUT LINE
- CONCRETE
- PROPOSED AC
- PROPOSED ELEVATION & LOCATION
- EXISTING ELEVATION & LOCATION
- PROPOSED GRADE
- CONSTRUCTION NOTE
- PROPOSED HYDRANT
- CENTERLINE
- EDGE OF PAVEMENT
- FINISHED GRADE
- GRADE BREAK
- FINISHED FLOOR
- HIGHPOINT
- ASPHALTIC CONCRETE
- FLOW LINE
- TOP OF GRATE
- EXISTING CENTERLINE
- SIDEWALK
- NATURAL GRADE
- GARAGE FINISH FLOOR
- BACK OF CURB
- TOP OF WALL

LEGAL DESCRIPTION

BEING A PORTION OF LOT ONE (1) OF THAT CERTAIN PLAT KNOWN AS "LIBERTY SQUARE AT PROVIDENCE", ON FILE IN THE OFFICE OF THE COUNTY RECORDER, CLARK COUNTY, NEVADA, IN BOOK 139 OF PLATS, AT PAGE 53, LOCATED WITHIN THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 24, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER OF SAID LOT ONE (1); THENCE SOUTH 90°00'00" WEST, 154.85 FEET; THENCE ALONG THE WESTERLY LINE OF SAID LOT ONE (1), NORTH 07°11'28" WEST, 38.11 FEET; THENCE NORTH 05°05'38" WEST, 252.37 FEET; THENCE DEPARTING SAID WESTERLY LINE, NORTH 89°47'32" EAST, 22.35 FEET TO A POINT ON THE EASTERLY LINE OF SAID LOT ONE (1); THENCE SOUTHERLY ALONG SAID EASTERLY LINE AS FOLLOWS: THENCE SOUTH 01°08'07" EAST, 222.79 FEET; THENCE SOUTH 00°08'16" WEST 59.60 FEET TO THE POINT OF BEGINNING.

CONTAINS 1.12 ACRES, AS DETERMINED BY COMPUTER METHODS.

TOGETHER WITH A NON-EXCLUSIVE EASEMENT FOR INGRESS AND EGRESS OVER THE SHARED DRIVEWAY ACCESS AS DEFINED AND SET FORTH IN THAT CERTAIN DECLARATION OF BASEMENT, COVENANTS, CONDITIONS, AND RESTRICTIONS, RECORDED JUNE 1, 2007, IN BOOK 20070801 AS DOCUMENT NO. 04751, ON FILE IN THE OFFICE OF THE COUNTY RECORDER, CLARK COUNTY, NEVADA.

FLOODNOTE

ZONE "X" - THE SITE DOES NOT LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AND HAS BEEN DETERMINED TO BE INSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS SHOWN ON FIRM COMMUNITY PANEL NO. 32003C1750C DATED SEPTEMBER 27, 2002.

BASIS OF BEARING

NORTH 00°08'16" EAST, BEING THE BEARING OF THE EAST LINE OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 24, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CLARK COUNTY, NEVADA, AS SHOWN ON THAT CERTAIN RECORD OF SURVEY ON FILE IN THE OFFICE OF THE COUNTY RECORDER, CLARK COUNTY, NEVADA, IN FILE 124 OF SURVEYS, AT PAGE 94.

BENCHMARK

8LV0019NHW6 - RIVET AND PLATE CONCRETE PAD(LVWV) NE COR. DORRELL LN. & HUALAPAI WAY. ELEV: 863.83416 METERS 2834.10 FEET

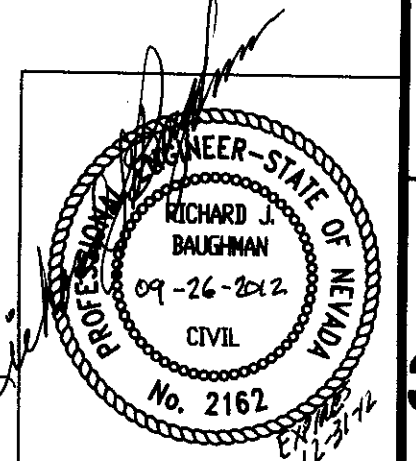
NAVD 88

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.

Avoid cutting underground utility lines. It's costly. Call before you Dig 1-800-227-2600 UNDERGROUND SERVICE (USA)

Avoid overhead power line contact. Call before you OVERHEAD 1-702-227-2929 NEVADA POWER ENVIRONMENT AND SAFETY SERVICES DEPARTMENT



This grading plan is a part of drainage study #4573 which was received on 9/26/12 and Bjarlen 10/10/12. Page 2 of 3

CITY STOP #11 AT PROVIDENCE GRADING PLAN

SECTION 24, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.B. & M. CITY OF LAS VEGAS

BAUGHMAN & TURNER, INC. CIVIL ENGINEERS

LAND PLANNERS 1210 HINSON STREET LAS VEGAS, NEVADA 89102 PHONE: (702) 870-8771 FAX: (702) 878-2695

BRUCE FAMILIAN 4534 W. HAGENDA, SUITE 100 LAS VEGAS, NEVADA 89118 PHONE: (702) 227-9287 FAX: (702) 352-7085

DATE: SEPTEMBER 2012

DESIGN: MJ

DRAWN: CR

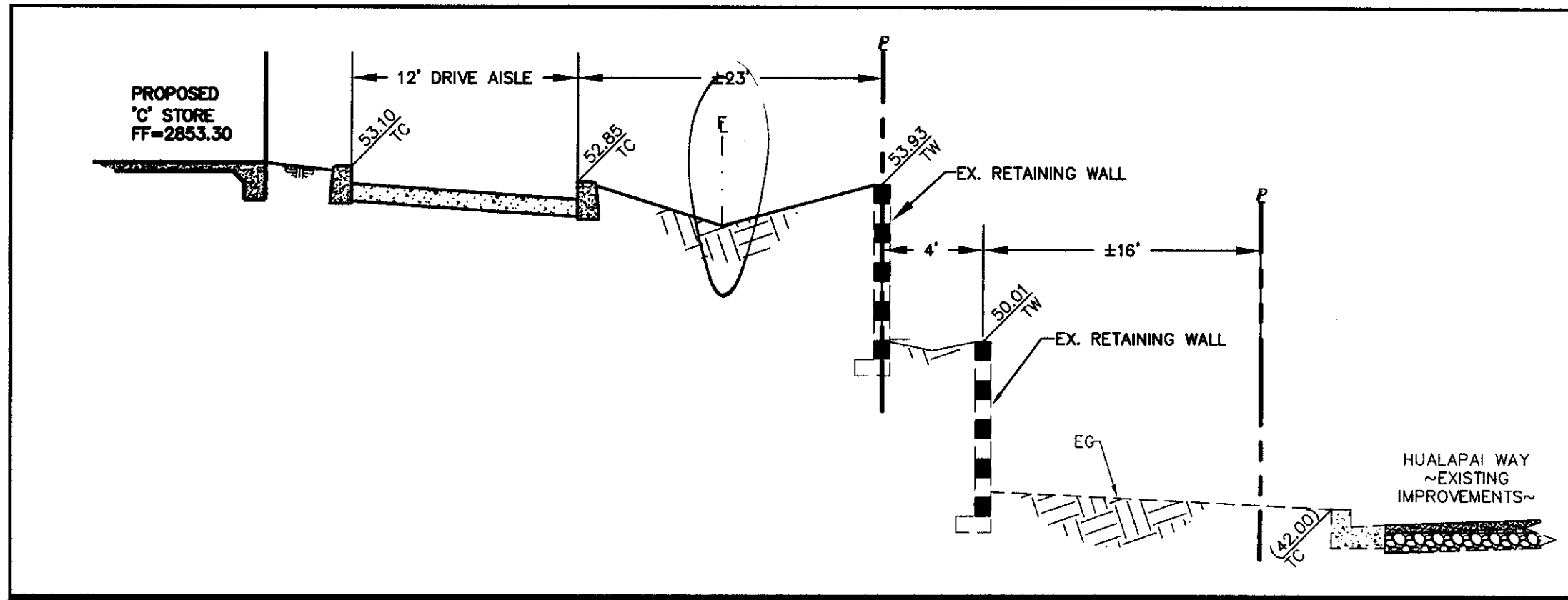
CHECK: R.B.

SCALE: 1"=20'

SHEET GP1

3 of 6

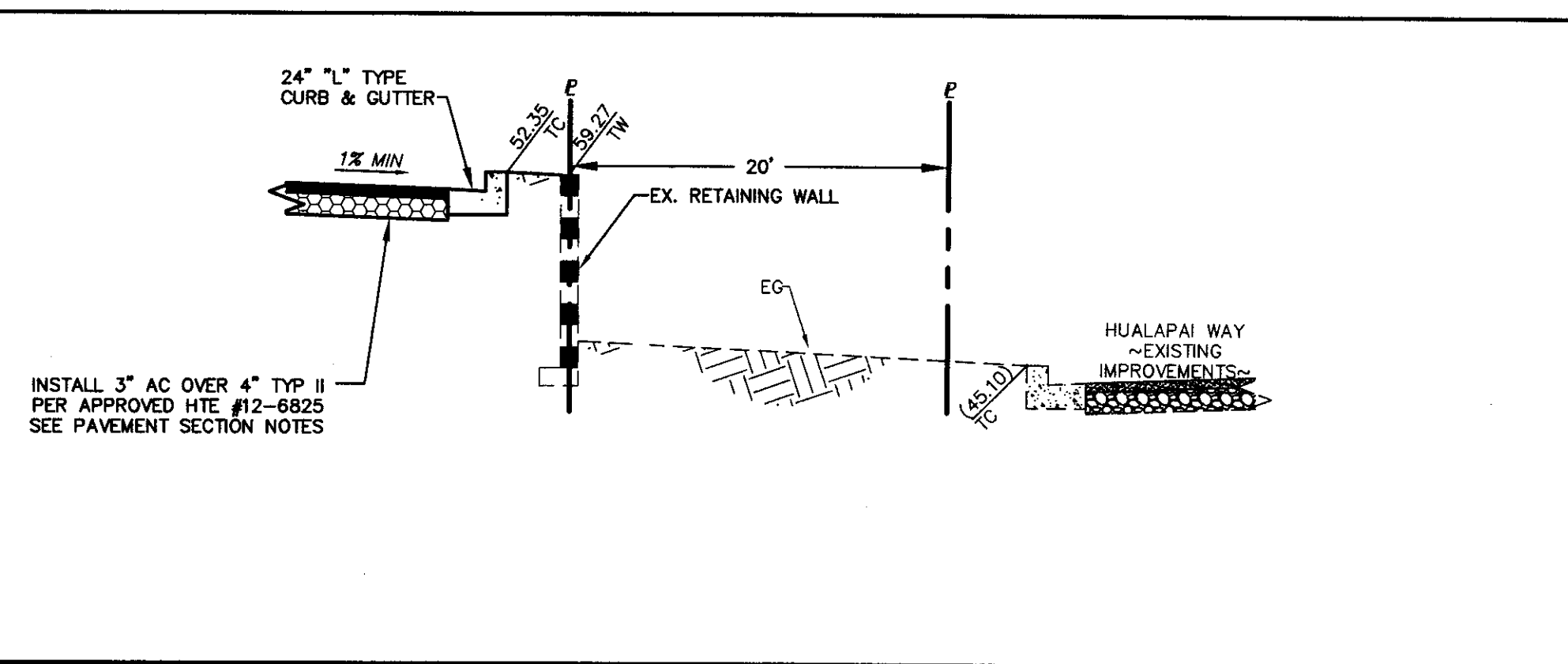
PROJ. NO. FAMILIAN PROVIDENCE



SECTION

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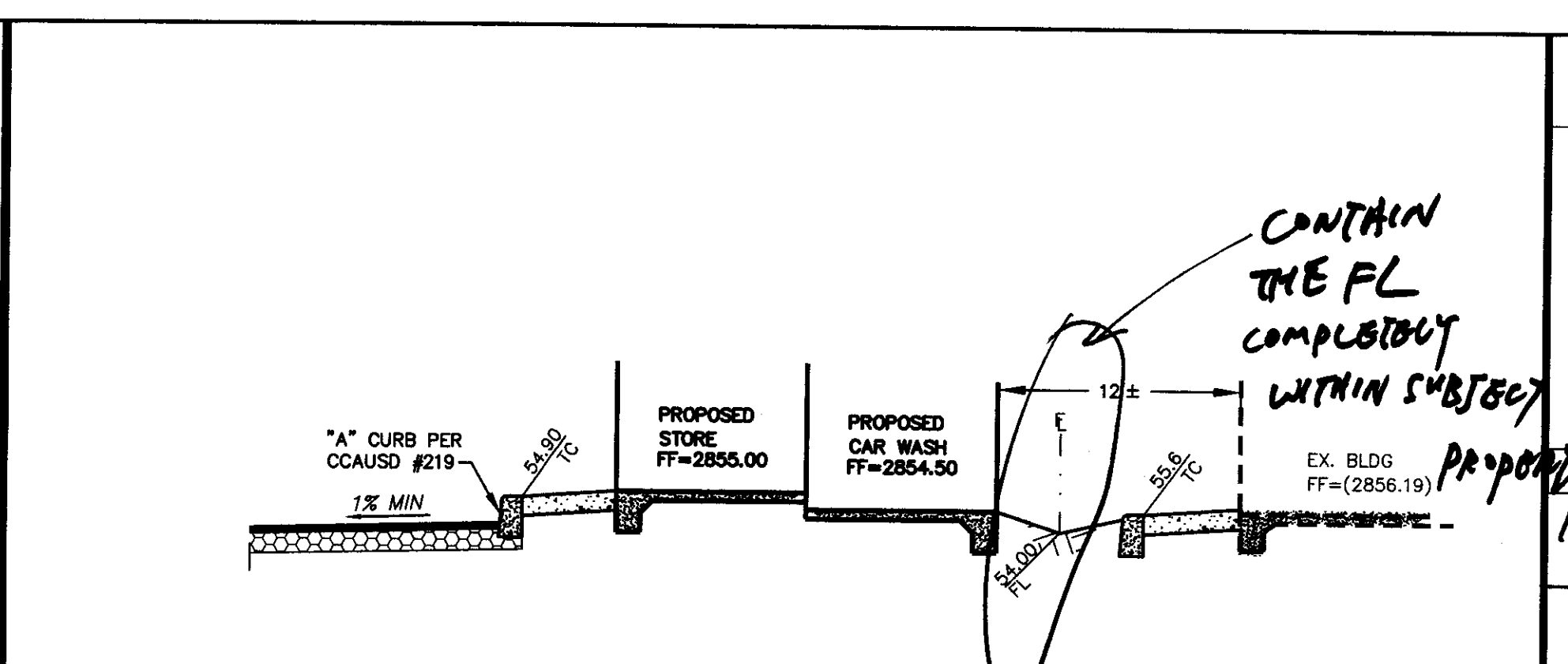
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SECTION

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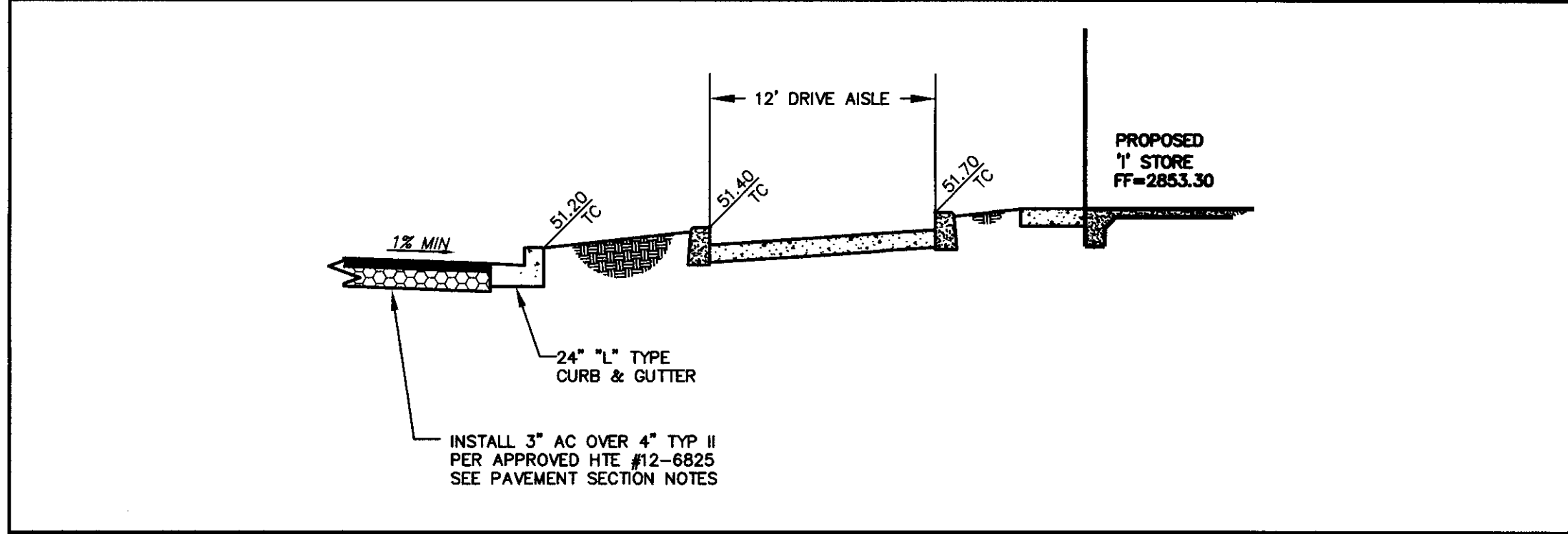
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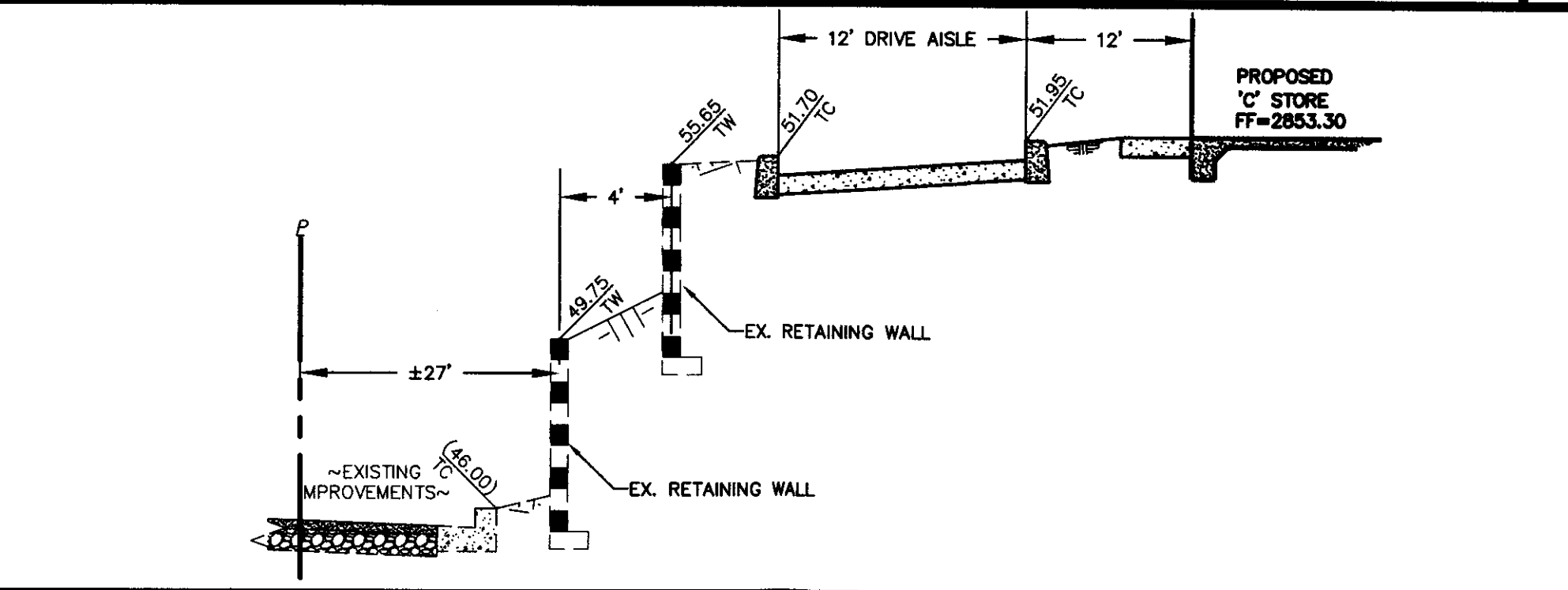
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SECTION

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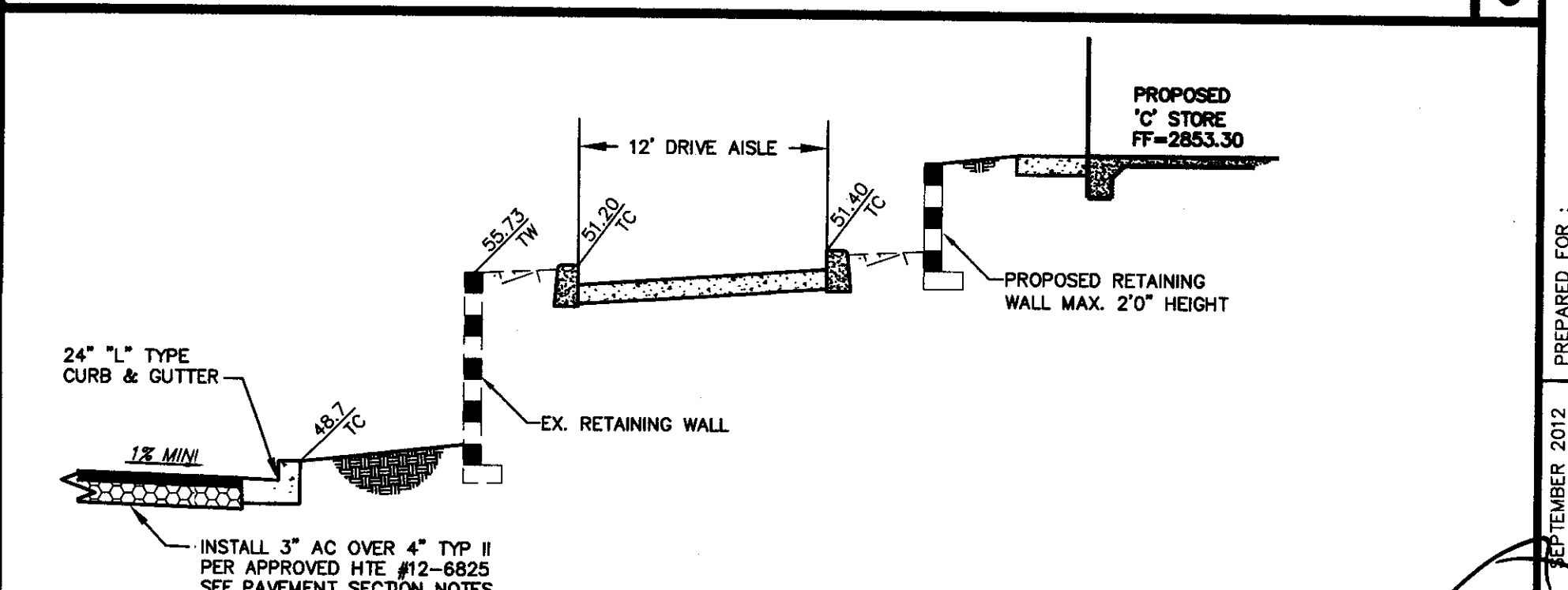
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SECTION

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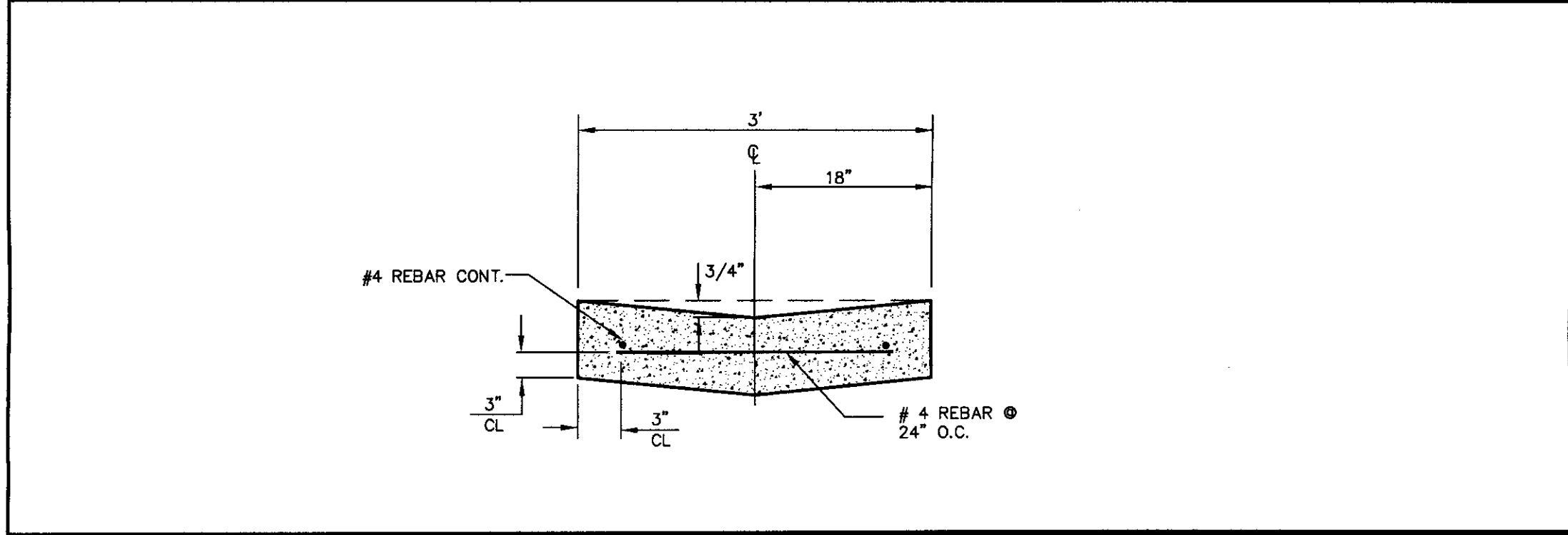
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SECTION

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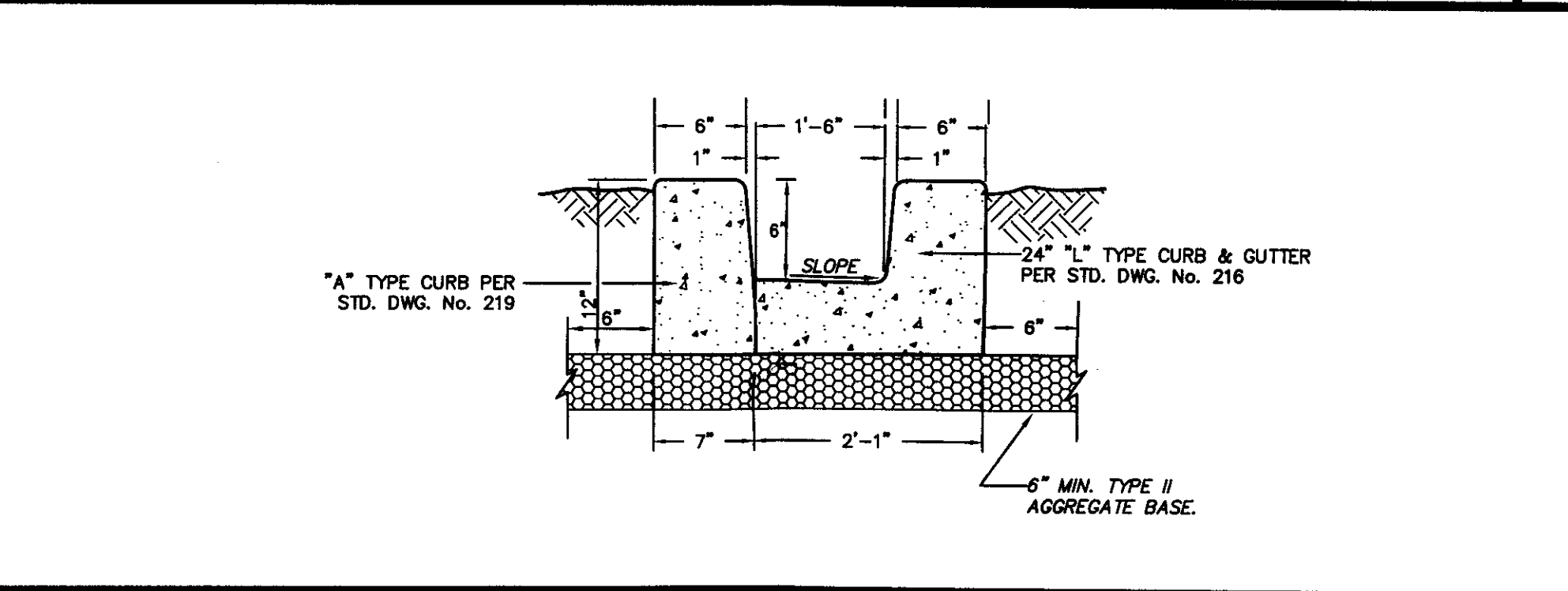
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VALLEY GUTTER

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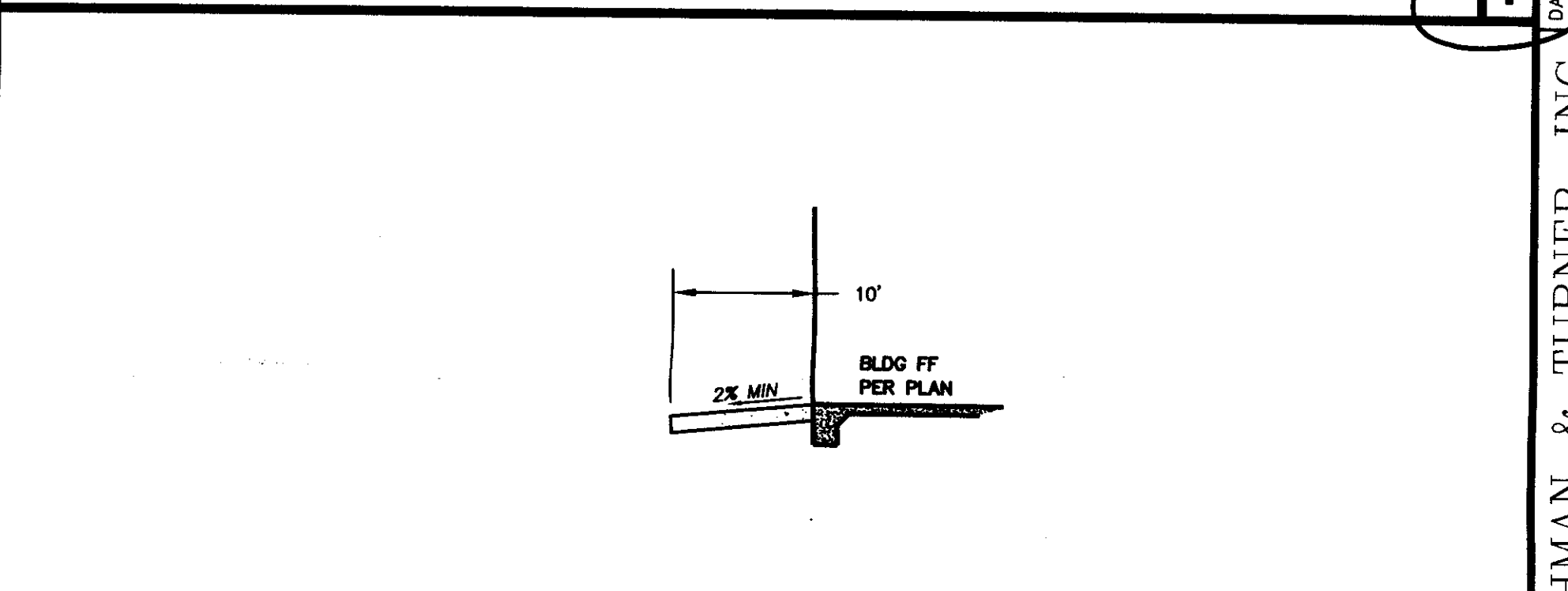
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SLOT GUTTER

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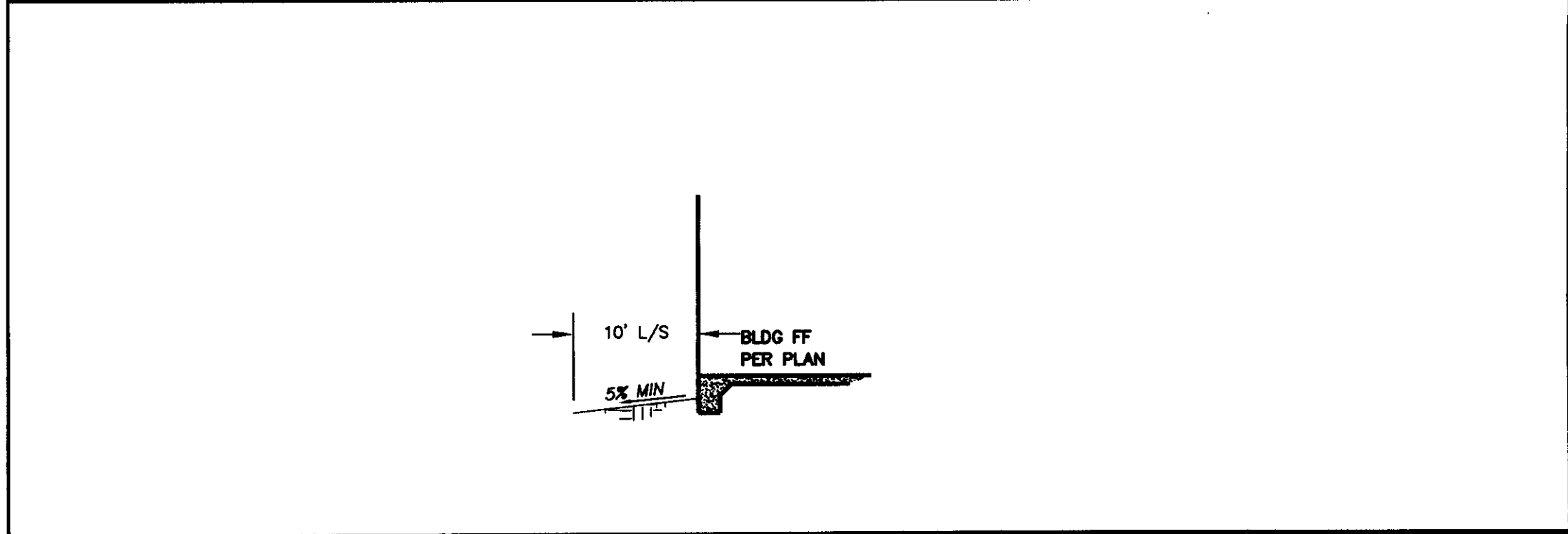
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TYPICAL BUILDING SECTION- CONCRETE

N.T.S.

3



TYPICAL BUILDING SECTION-LANDSCAPE

N.T.S.

4

SECTION G ?

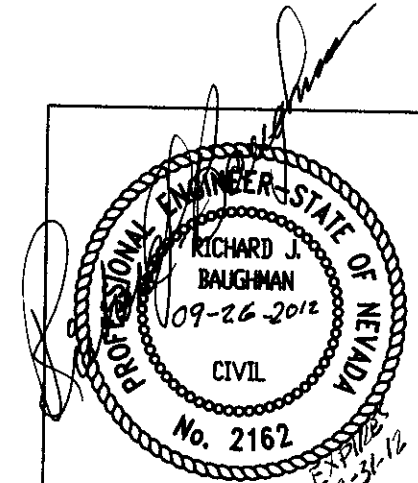
This grading plan is a part of drainage study # 4573 which was received on 9/26/12 and signed on 10/10/12. Page 3 of 3.

DISCLAIMER NOTE

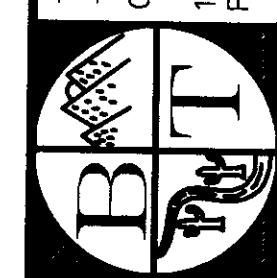
UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND AND OVERHEAD UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN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

Avoid cutting underground utility lines. It's costly. Call before you Dig 1-800-227-2600 UNDERGROUND SERVICE (USA)

Avoid overhead power line contact! Call before you OVERHEAD 1-702-227-2929 NEVADA POWER ENVIRONMENT AND SAFETY SERVICES DEPARTMENT



CITY STOP #11 AT PROVIDENCE
SECTION 24, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.B. & M. CITY OF LAS VEGAS
SHEET DT1 OF 4 of 6
PROJ. NO. FAMILIAN PROVIDENCE



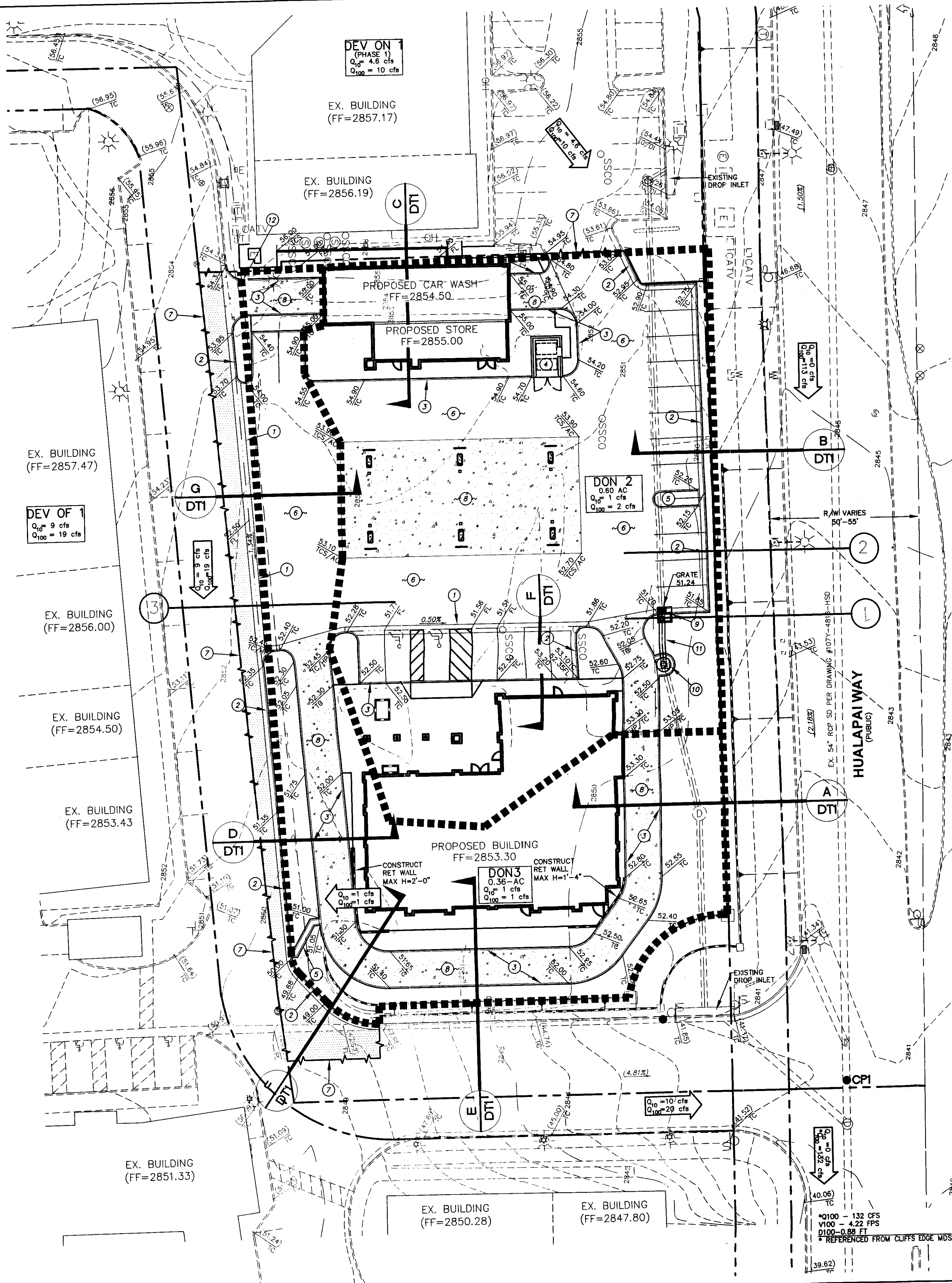
BAUGHMAN & TURNER, INC.
CIVIL ENGINEERS
1210 HINSON STREET
LAS VEGAS, NEVADA 89102
PHONE: (702) 870-8771 FAX: (702) 878-2695

PREPARED FOR: BRUCE FAMILIAN
LAS VEGAS, NEVADA 89118
PHONE: (702) 227-9287 FAX: (702) 882-1089

DATE	DESIGN	DRAWN	CHECK	SCALE
SEPTEMBER 2012	MJ	OR	RJB	NTS

REVISIONS	No.	DATE
-----------	-----	------

APP'D	No.	DATE
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CONSTRUCTION NOTES

#	ITEM	UNIT	PUBLIC	PRIVATE	QUANTITY
1	INSTALL 3" VALLEY GUTTER PER DETAIL 1 SHEET DT01	LF	-	-	652
2	INSTALL 24" "L" TYPE C & G PER CCAUSD DWG. #216	LF	-	-	381
3	INSTALL "A" TYPE CURB PER CCAUSD #	LF	-	-	1151
4	INSTALL TRASH ENCLOSURE SEE ARCHITECT PLANS FOR DIMENSIONS	EA	-	-	1
5	INSTALL SLOT GUTTER PER DETAIL 2 SHEET DT01	LF	-	-	5
6	INSTALL 3" MIN. AC OVER 4" TYPE II A.B.	SY	-	-	1484
7	SAWCUT NEAT AND MATCH EXISTING GRADE	LF	-	-	357
8	INSTALL 6" CONCRETE OVER 4" TYPE II AGGREGATE BASE	SY	-	-	933
9	INSTALL SINGLE GRATE CM TYPE DROP INLET	EA	-	-	1
10	INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #403	EA	-	-	1
11	INSTALL 24" RCP	LF	-	-	15
12	INSTALL 2' CURB OPENING PER DETAIL 3 SHEET DT01	EA	-	-	1

Street Capacity Summary					
Location	Q (cfs)	D (feet)	V (fps)	D x V	Remarks
100-Year Flow - Developed Conditions					
Section 1	2	0.11	1.26	0.14	VxD < 8 is met; D less than 2 ft. is met
Section 2	2	0.21	1.71	0.34	VxD < 8 is met; D less than 2 ft. is met
Section 3	19	0.41	3.53	1.45	VxD < 8 is met; D less than 2 ft. is met
Section 4	1	0.15	1.94	0.29	VxD < 8 is met; D less than 2 ft. is met
HUAL-13*	132	0.88	4.22	3.71	VxD < 8 is met; D less than 2 ft. is met
10-Year Flow - Developed Conditions					
HUAL-13*	0	-	-	-	VxD < 6 is met; D less than 1'

*Referenced from the Technical Drainage Study for Cliff's Edge Phases I and II

LEGAL DESCRIPTION

BEING A PORTION OF LOT ONE (1) OF THAT CERTAIN PLAT KNOWN AS "LIBERTY SQUARE AT PROVIDENCE", ON FILE IN THE OFFICE OF THE COUNTY RECORDER, CLARK COUNTY, NEVADA IN BOOK 138 OF PLATS, AT PAGE 53, LOCATED WITHIN THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 24, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF SAID LOT ONE (1); THENCE SOUTH 90°00'00" WEST, 154.85 FEET; THENCE ALONG THE WESTERLY LINE OF SAID LOT ONE (1), NORTH 07°11'28" WEST, 38.11 FEET; THENCE NORTH 05°05'36" WEST, 252.37 FEET; THENCE DEPARTING SAID WESTERLY LINE, NORTH 89°47'32" EAST, 22.35 FEET TO A POINT ON THE EASTERLY LINE OF SAID LOT ONE (1); THENCE SOUTHERLY ALONG SAID EASTERLY LINE AS FOLLOWS: THENCE SOUTH 01°08'07" EAST, 222.79 FEET; THENCE SOUTH 00°08'16" WEST 59.60 FEET TO THE POINT OF BEGINNING.

CONTAINS 1.12 ACRES, AS DETERMINED BY COMPUTER METHODS.

TOGETHER WITH A NON-EXCLUSIVE EASEMENT FOR INGRESS AND EGRESS OVER THE SHARED DRIVEWAY ACCESS AS DEFINED AND SET FORTH IN THAT CERTAIN DECLARATION OF BASEMENT, COVENANTS, CONDITIONS, AND RESTRICTIONS, RECORDED JUNE 1, 2007, IN BOOK 20070601 AS DOCUMENT NO. 04731, ON FILE IN THE OFFICE OF THE COUNTY RECORDER, CLARK COUNTY, NEVADA.

FLOODNOTE

ZONE "X" - THE SITE DOES NOT LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AND HAS BEEN DETERMINED TO BE INSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS SHOWN ON FIRM COMMUNITY PANEL NO. 32003C1750E DATED SEPTEMBER 27, 2002.

BASIS OF BEARING

NORTH 00°08'16" EAST, BEING THE BEARING OF THE EAST LINE OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 24, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CLARK COUNTY, NEVADA, AS SHOWN ON THAT CERTAIN RECORD OF SURVEY ON FILE IN THE OFFICE OF THE COUNTY RECORDER, CLARK COUNTY, NEVADA, IN FILE 124 OF SURVEYS, AT PAGE 94.

BENCHMARK

BLV9019NW6 - RIVET AND PLATE CONCRETE PAD (LVWD) NE COR. DORRELL LN. & HUALAPAI WAY.
ELEV: 863.83416 METERS
2834.10 FEET

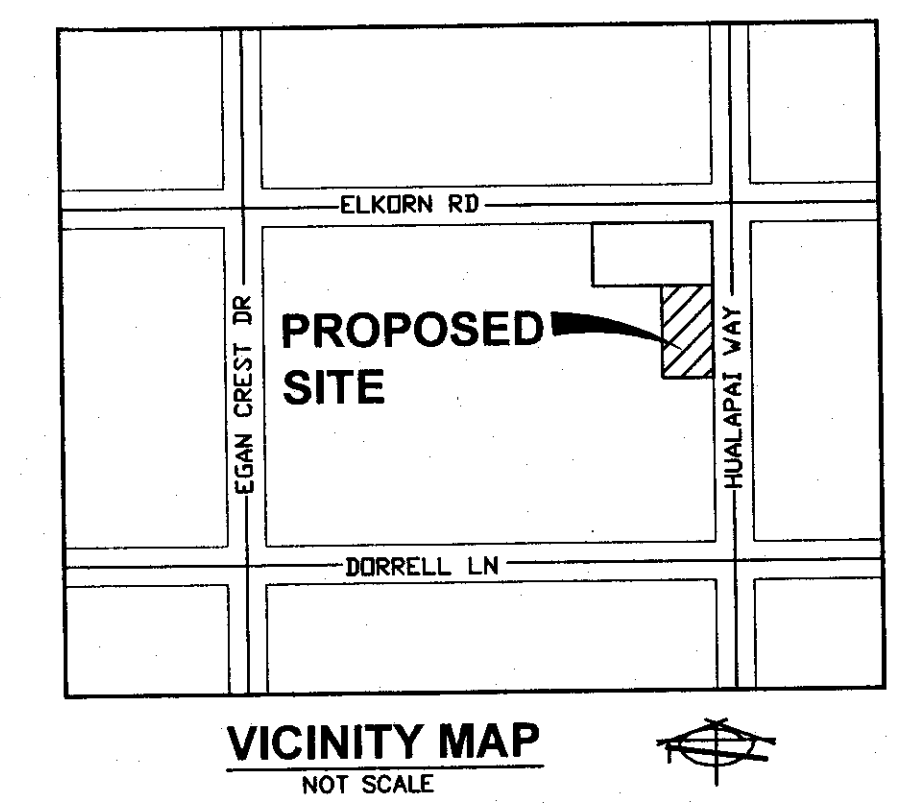
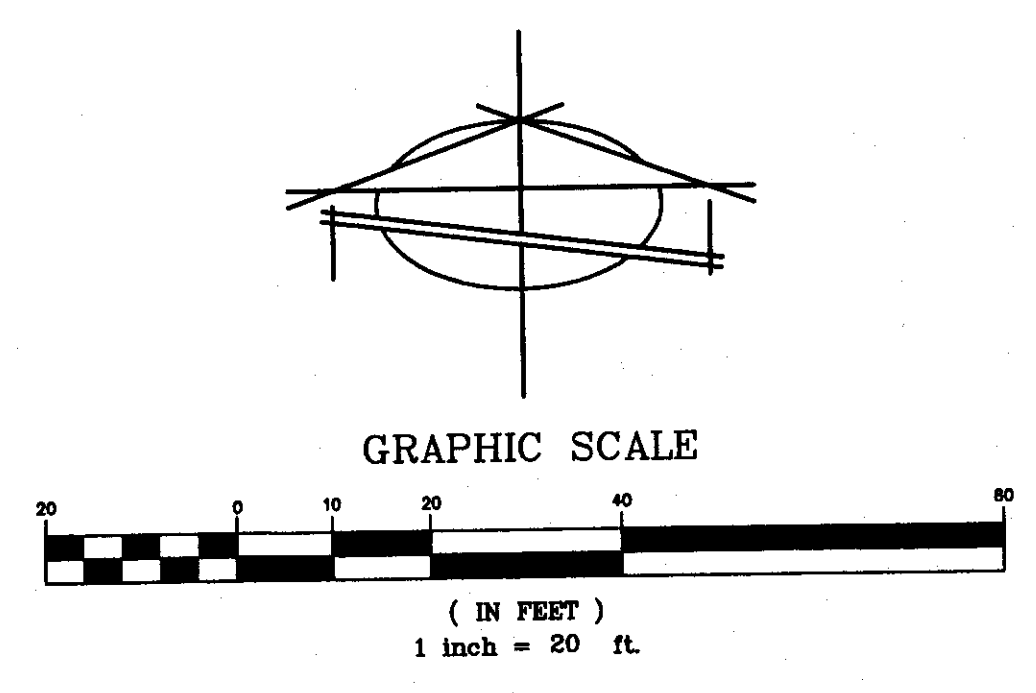
NAVD 88

DISCLAIMER NOTE

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before you dig
1-800-227-2600
UNDERGROUND SERVICE (USA)

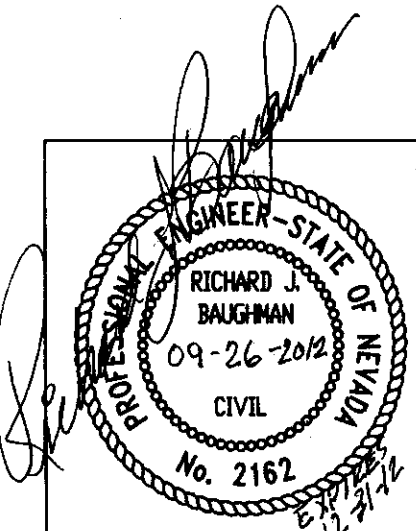
Avoid overhead power line contact
before you OVERHEAD
1-702-227-2929
NEVADA POWER ENVIRONMENT AND SAFETY SERVICE (NEPES)



LEGEND

- PROPERTY LINE
- R/W LINE
- STREET CENTERLINE
- BUILDING SETBACK LINE
- EXISTING "L" CURB & GUTTER
- EXISTING CONTOUR LINES
- PROPOSED SCREEN/RETAINING WALL
- EXISTING SCREEN/RETAINING WALL
- PROPOSED FLOW LINE
- EXIST. EDGE OF PAVEMENT
- CUT/FILL TRANSITION LINE
- SAWCUT LINE
- CONCRETE
- PROPOSED AC
- PROPOSED ELEVATION & LOCATION
- EXISTING ELEVATION & LOCATION
- PROPOSED GRADE
- CONSTRUCTION NOTE
- PROPOSED HYDRANT
- CENTERLINE
- EDGE OF PAVEMENT
- FINISHED GRADE
- GRADE BREAK
- FINISHED FLOOR
- HIGHPOINT
- ASPHALTIC CONCRETE
- FLOW LINE
- TOP OF GRATE
- EXISTING CENTERLINE
- SIDEWALK
- NATURAL GRADE
- GARAGE FINISH FLOOR
- BACK OF CURB
- TOP OF WALL
- BASIN BOUNDARY
- COMBINATION POINT
- FLOW PATH
- BASIN NAME & DATA
- FLOW ARROW W/HYDROLOGY DATA
- DRIVE AISLE CAPACITY LOCATION

This grading plan is a part of drainage study #4573 which was received on 9/26/12 and Rejected on 10/10/12. Page 1 of 3



PREPARED FOR:
BRUCE FAMILIAN
4534 W. HAZEN AVE. SUITE A
LAS VEGAS, NEVADA 89102
PHONE: (702) 227-2929
FAX: (702) 592-7089

DATE: SEPTEMBER 2012
DESIGN: MJ
DRAWN: CR
CHECK: R.B.
SCALE: 1"=20'

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CITY STOP #11 AT PROVIDENCE
ON-SITE DEVELOPMENT DRAINAGE MAP
SECTION 24, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.B. & M.
CITY OF LAS VEGAS

APR. 126-24-517-004

SHEET
FIG 9

PROJ. NO.
FAMILIAN PROVIDENCE