

DS #:

4311-1

APN:

125-29-502.031

PROJECT:

Jim Marsh Chrysler Jeep - Update for Building Addition

SUBMITTAL:

6th Submittal & Supplement

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		November 9, 2015
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: Jim Marsh Chrysler Jeep – Update for Building Addition		COPIES TO: Dwyer Engineering
Cross Streets:	SEC of Centennial Parkway & Riley Street	Jim Marsh American Corp.
File Number:	F:\Depot\DSMemos\DS4311F.doc	Bart Anderson, P.E., DevCo
Parcel Number:	125-29-502-031	
Zoning Action:	SDR-61291	
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	7/10/2008	7/25/2008	Not Approved	\$400.00	Paid: \$400
2 nd Submittal	4/7/2011	4/21/2011	Approved	\$400.00	166222: \$400
3 rd Submittal	7/9/2013	7/23/2013	Not Approved	\$400.00	325530: \$400
4 th Submittal	4/10/2014	4/23/2014	Not Approved	\$400.00	353369: \$400
5 th Submittal	6/25/2014	7/7/2014	Approved	\$400.00	361397: \$400
6 th Submittal & Supplement	9/29/2015 & 11/5/2015	11/9/2015	See Comments Below	\$100.00	416673: \$100
TOTAL FEES (LDDRS):				\$2,100.00	----

REMARKS:

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

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

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

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

END OF REMARKS

ays

T/R/S: T19S/R60E/29
AREA G-29



**LAS VEGAS
CITY COUNCIL**

CAROLYN G. GOODMAN
MAYOR

STEVEN D. ROSS
MAYOR PRO TEM

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CITY MANAGER

CITY OF LAS VEGAS
DEPARTMENT OF PLANNING

DEVELOPMENT SERVICES CENTER
333 NORTH RANCHO DRIVE
3RD FLOOR
LAS VEGAS, NEVADA 89106

VOICE 702.229.6301

FAX 702.474.0352

TTY 7-1-1

www.lasvegasnevada.gov



/city of las vegas

November 4, 2015

Reid: 11/6/15

Mr. Zip Bauck
Jim Marsh American Corp.
8555 W. Centennial Parkway
Las Vegas, Nevada 89149

**RE: SDR-61291 [PRJ-60694] - SITE DEVELOPMENT PLAN REVIEW
PLANNING COMMISSION MEETING OF NOVEMBER 3, 2015**

Dear Applicant:

Your request for a Major Amendment to a previously approve Site Development Plan Review (SDR-40077) FOR A PROPOSED 29,280 SQUARE-FOOT MOTOR VEHICLE SALES (NEW) USE AND A WAIVER OF TOWN CENTER DEVELOPMENT STANDARDS TO ALLOW SERVICE BAYS TO FACE A PUBLIC RIGHT-OF-WAY on 3.27 acres at the southeast corner of Centennial Parkway and Riley Street (APN 125-29-502-031), T-C (Town Center) Zone [GC-TC (General Commercial - Town Center) Special Land Use Designation], Ward 6 (Ross) [PRJ-60694], was considered by the Planning Commission on November 3, 2015.

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

Planning

1. Conformance to the Conditions of Approval for Variance (VAR-40379), Variance (VAR-40380), Waiver (WVR-40381), and Site Development Plan Review (SDR-40077) shall be required, except as modified herein.
2. 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.
3. All development shall be in conformance with the elevation and floor plans date stamped 09/15/15 and site plan and landscape plans date stamped 10/05/15, except as amended by conditions herein.
4. A cross access agreement between the site and the parcel adjacent to the east perimeter shall be required and recorded, unless a remapping action to combine the parcels is recorded prior to any building permits being issued.
5. 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.

2014 WINNER OF THE U.S. CONFERENCE OF MAYORS CLIMATE PROTECTION AWARD

6. These Conditions of Approval shall be affixed to the cover sheet of any plan set submitted for building permit.
7. 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.
8. Prior to the submittal of a building permit application, the applicant shall meet with Department of Planning staff to develop a comprehensive address plan for the subject site. A copy of the approved address plan shall be submitted with any future building permit applications related to the site.
9. All City Code requirements and design standards of all City Departments must be satisfied, except as modified herein.

Public Works

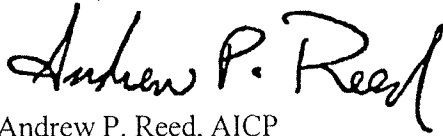
10. Remove all substandard public street improvements and unused driveway cuts adjacent to this site, if any, and replace with new improvements meeting Current City standards concurrent with development of this site. All existing paving damaged or removed by this development shall be restored at its original location and to its original width concurrent with development of this site.
11. All delivery vehicles shall maneuver for loading and unloading on site; there shall be no parking, loading or unloading of vehicles within the Centennial Parkway or Riley Street public rights-of-way.
12. Vehicles shall neither be displayed nor stored within the public right-of-way adjacent to this site.
13. 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, submittal of construction drawings or the submittal of a Final Map for this site, whichever may occur first. Provide and improve all drainageways as recommended in the approved drainage plan/study.
14. Site development to comply with all applicable conditions of approval for SDR-40077 and all other applicable site-related actions.

This action by the Planning Commission on **November 3, 2015** 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 submitted please access <http://www.lasvegasnevada.gov/CheckStatus/DevelopmentApp.htm>, or contact the Department of Planning and Development at 702.229.6301 after **November 16, 2015**.

SDR-61291 [PRJ-60694] - Page Three
November 4, 2015

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,

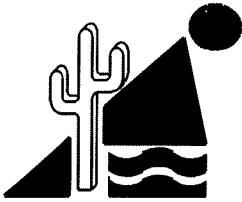
A handwritten signature in black ink that reads "Andrew P. Reed". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Andrew P. Reed, AICP
Planning Supervisor
Case Planning Division

AR:nl

cc:

Mr. Richard Threlfall, Architect
6512 W. Diablo Drive
Las Vegas, Nevada 89118



Dwyer Engineering Inc.

CIVIL ENGINEERS, LAND SURVEYORS, WATER RIGHTS, LAND USE PLANNING
7310 SMOKE RANCH RD. SUITE E
LAS VEGAS, NEVADA 89128
PHONE: (702) 254-2200
FAX: (702) 254-2236

LETTER OF TRANSMITTAL

Date: Sep 29, 2015 Job No.: 15433

TO: Albert Sung, PE
CLV Flood Control

RE: Jim Marsh

WE ARE SENDING YOU: ☒ Attached ☐ Under separate cover via _____ the following items
☐ Mylars ☐ Vellums ☐ Blueprints ☒ Documents ☐ Survey Cut Sheets ☐ Copy of Letter ☐ Diskette

COPIES	DATE	No.	DESCRIPTION
1 ea	9/28/15		Drainage Study
1 ea	9/28/15	1	Dwyer Check in the amount of \$100 - Submittal Fee

THESE ITEMS ARE TRANSMITTED as checked below:

☐ For Approval ☐ For Review & Comment ☐ Pick Up ☐ Email
☐ For Your Use ☐ By Mail ☐ Air Freight ☐ For Signature
☒ As Requested ☒ Dropped Off ☐ By Courier ☐

Remarks:

Copy To: File Signed: David A. Dwyer, P.E.

Dwyer Engineering

Rec'd: 9/29/15

DS 4311-1

Update #1 to the Technical Drainage Study

for

Jim Marsh Chrysler Jeep

G-29

City of Las Vegas, Nevada

\$/00-

Prepared for:

Jim Marsh Chrysler Jeep
8555 W. Centennial Parkway
Las Vegas, NV 89149

SDR-61291

Prepared by:

Dwyer Engineering
7310 Smoke Ranch Road, Suite E
Las Vegas, Nevada 89128
Tel: (702) 254-2200
Fax: (702) 254-2236

September 28, 2015

Project No. 15433

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE STUDY INFORMATION FORM

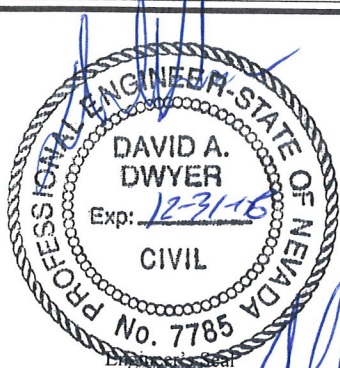
Name of Development: Jim Marsh Chrysler Jeep DATE: September 28, 2015Location of development: a) Descriptive (Cross Streets) North/South Centennial Parkway East/West Riley Streetb) Sect. 29 Twn. 19S Rng 60EName of Owner: Jim Marsh American CorporationAssessors Parcel No.: 125-29-502-031Telephone No.: (702) 946-9042Facsimile No.: (702) 946-6934Address: 8555 W. Centennial ParkwayLas Vegas, NV 89149Contact Person-Name: David A. Dwyer, P.E.Telephone No: 702-254-2200Email: ddwyer@dwyerengineering.comFirm: Dwyer EngineeringAddress: 7310 Smoke Ranch Road, Suite E, Las Vegas, Nevada 89128

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: 3.27 acres Being Developed/Disturbed 3.27 acres2. 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.)? Commercial5. Approximate upstream land area, which drains to the subject site? 0 +/- acres6. Has the site drainage been evaluated in the past? YES ☒ NO ☐ If yes, please documentation:Technical Drainage Study for Jim Marsh Chrysler Jeep--Parking Addition (DS 4311)

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

The site flows will discharge to the east as shown in the historical pattern.8. Briefly describe your proposed schedule for the subject project: ASAP

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

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

Local Entity File No.

REFERENCE:

STANDARD FORM 1

September 28, 2015

Albert Sung, P.E.
City of Las Vegas Flood Control
333 N. Rancho Drive
Las Vegas, Nevada 89106

Re: Update #1 to the Technical Drainage Study for Jim Marsh Chrysler Jeep

Mr. Sung:

Dwyer Engineering has prepared this drainage study as an update to the approved Technical Drainage Study for Jim Marsh Chrysler Jeep. This study addresses the improvements for the proposed commercial building only. The original study was approved on June 21, 2000 (see approval letter in the reference material). This site was also approved on July 7, 2014 as a parking addition (see approval letter in the reference material).

Location

The project area is within the Northeast Quarter (NE 1/4) of Section 29, Township 19 South, Range 60 East, Mount Diablo Meridian, City of Las Vegas, Nevada. The site is located on the southeast corner of Centennial Parkway and Riley Street (portion of APN 125-29-502-031). See Figure 1 and 1A, *Vicinity Map* and *APN Map*. Figure 2 has also been provided showing an aerial view of the existing development in the area.

FEMA Floodplain Information

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) Community-Panel Number 32003C1745F, effective date September 27, 2002 indicates the site is located within a FEMA Zone 'X'. A Zone 'X' is described by FEMA as areas outside of the 0.2% annual chance floodplain. A map depicting the FEMA flood zones in the vicinity of the site is included in the appendix of this study. (Figure 3- FIRM Map)

CCRFCD Master Plan Information

As shown on Figure F-19 from the *Flood Control Master Plan Update of the Las Vegas Valley* (see Figures 4 and 5 in the Appendix), prepared by PBS&J, Louis Berger Group, etc., the subject site is not adjacent to a proposed Master Plan Flood Control Facility. Figure H-19 has also been provided (see Figure 6 in the appendix) and the site is a part of basin NWBE2-C.

Drainage Description

The existing offsite flows impacting the site come from the west. As shown in the approved Technical Drainage Study for Jim Marsh Chrysler Jeep, Centennial Parkway and Riley Street convey flows along the frontage of the site. The site entrances and landscaped areas along the adjacent streets have been elevated so that no flow enters the site. The proposed project has been graded in a similar fashion to the existing parking lot. The proposed commercial building is part of onsite basin labeled SITE2 and COM (see reference material). The basins were combined in to one basin called ON1 in the Addendum #1 to the Technical Drainage Study for Jim Marsh Chrysler Jeep (see reference material). The basin generates 6 cfs in the 10-year condition and 10 cfs in the 100-year condition. The site is conveyed to the eastern property line where a portion of the flow is captured by an existing drop inlet and the remaining portion of the flow is conveyed through an internal driveway between the two properties.

Conclusions

The current plans in this submittal show the finished floor elevation varying from 2511.00 feet to 2509.50 feet. The onsite basin area is minimal. Normal depth calculations have been prepared around the building at key locations. The proposed finished floor elevations are at least twice the depth of flow above the flowline. Onsite street flow calculations for the 10-year and 100-year, 6-hour storm events are summarized in the following table:

ONSITE STREET FLOW CALCULATIONS

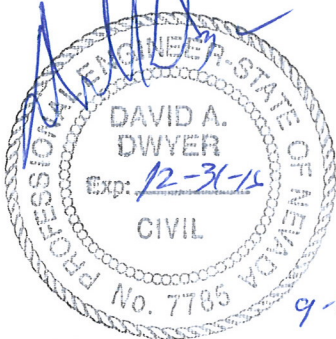
STREET	Q_{10}/Q_{100} (cfs)	D_{10}/D_{100} (ft)	V_{10}/V_{100} (ft/s)	V x D
Section 1-1	3/5	0.22/0.27	1.58/1.80	0.35/0.49
Section 2-2	3/5	0.23/0.28	1.63/1.85	0.37/0.52
Section 3-3	3/5	0.25/0.31	1.69/1.92	0.42/0.60

A trench drain system has been provided for the conveyance of flow under the internal driveway. A normal depth calculation has been provided in the appendix showing that the trench drain has adequate capacity.

I trust this satisfies your concerns regarding this project. If there are any questions, or additional information necessary, please contact this office.

Sincerely,

Dwyer Engineering



David A. Dwyer, P.E.
Principal

APPENDIX

Figures

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.

0 100 200 400 600 800

USE THIS SCALE(FEET) WHEN MAP REDUCED FROM 1:12,177 ORIGINAL

MAP LEGEND

_____	PARCEL BOUNDARY	_____	CONDOMINIUM UNIT
_____	SUB BOUNDARY	☐ AIR SPACE PCL	001 PARCEL NUMBER
_____	PIMLD BOUNDARY	☐ RIGHT OF WAY PCL	100 ACREAGE
_____	ROAD EASEMENT	☐ SUB-SURFACE PCL	202 PARCEL SUB/SEG NUMBER
_____	WATER/LEADER LINE	☐	PG 24-45 PLAT RECORDING NUMBER
_____	HISTORIC SUB BOUNDARY		5 BLOCK NUMBER
_____	HISTORIC PIMLD BOUNDARY		5 LOT NUMBER
_____	SECTION LINE		24.5 50V LOT NUMBER

ASSESSOR'S PARCELS - CLARK CO., NV.

Michele W. Shafer - Assessor

T19S R60E

BOOK

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
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126 125 137 138

29

SEG

N 2 NE 4

MAP

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
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125-29-5

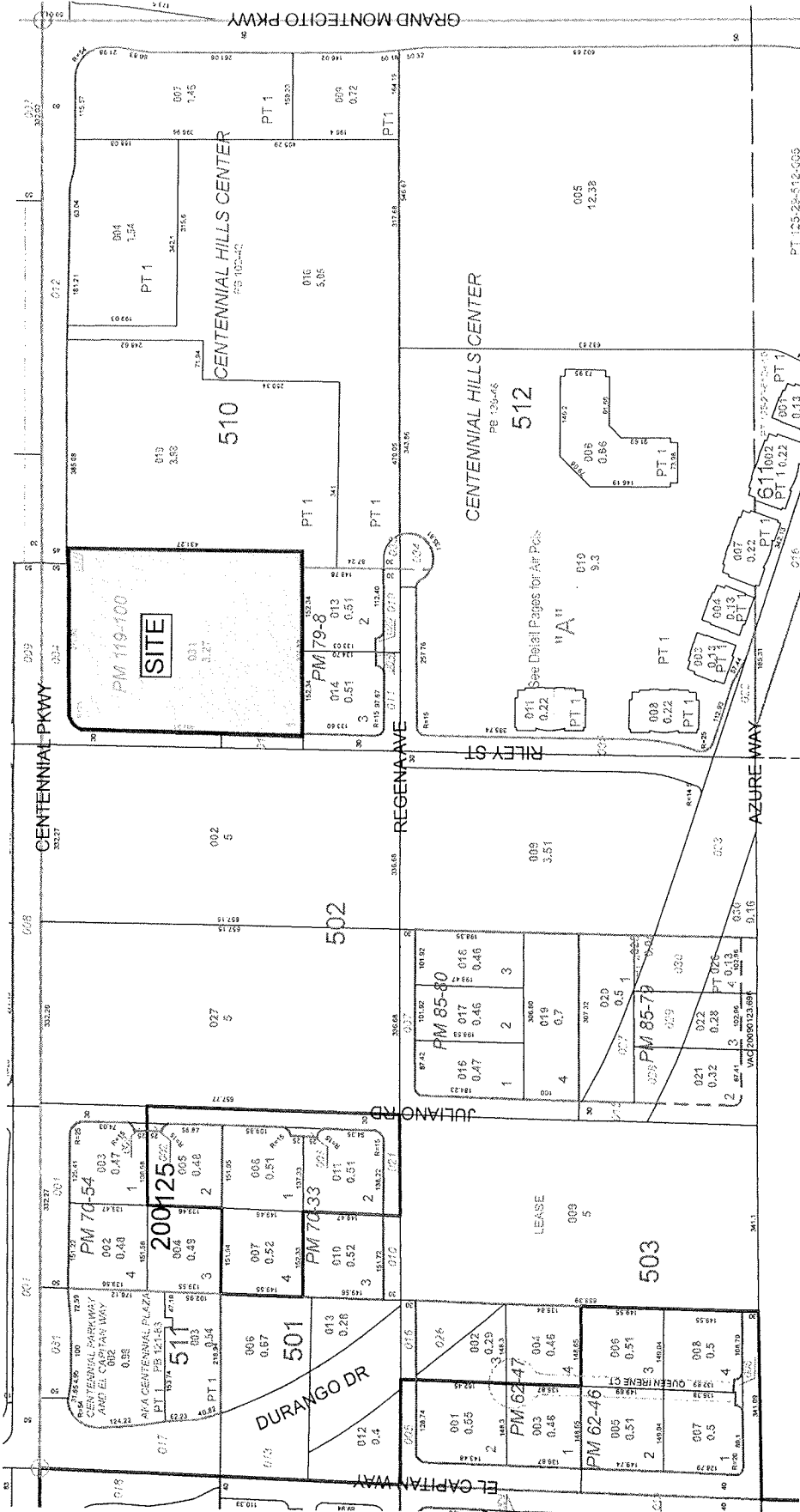
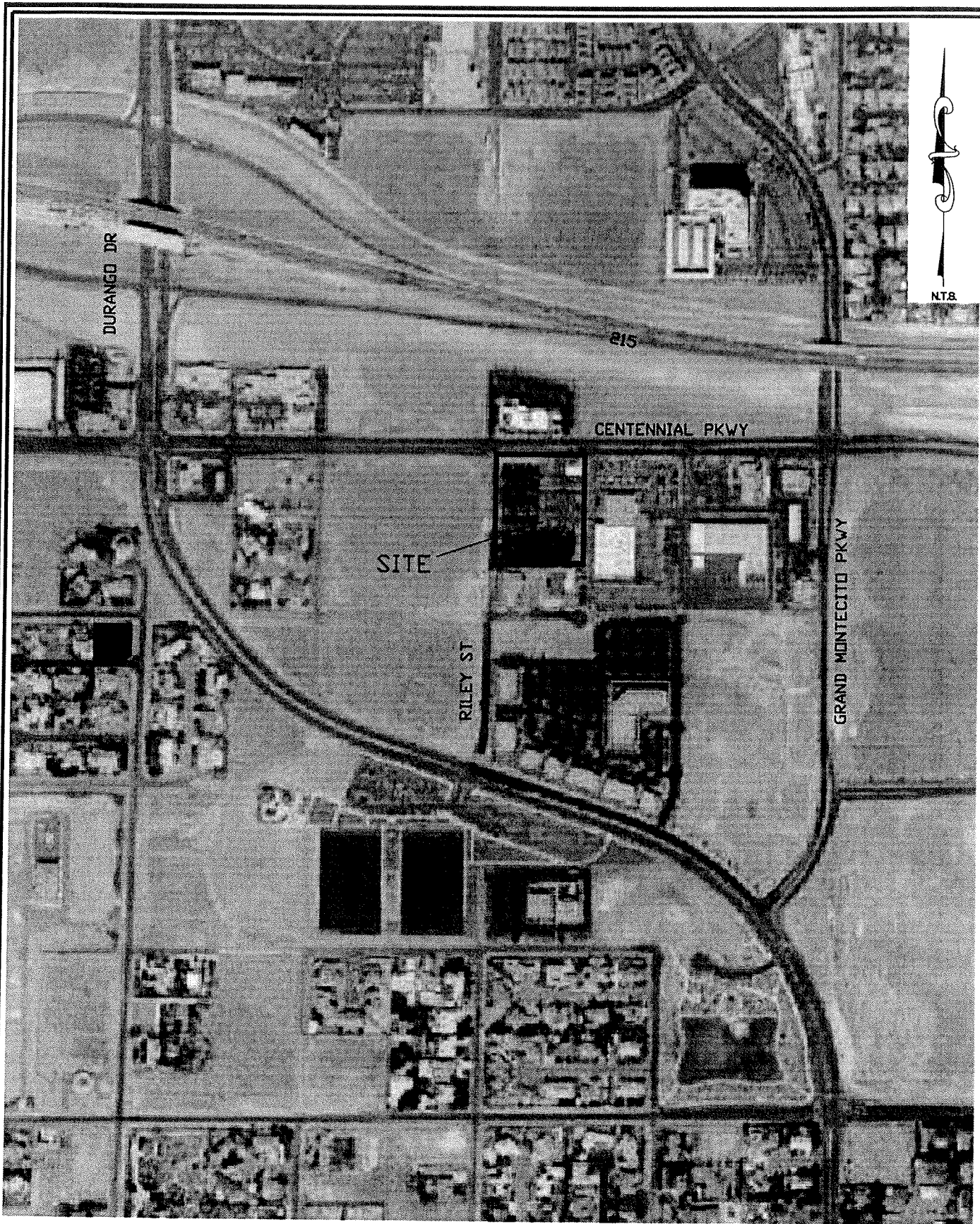


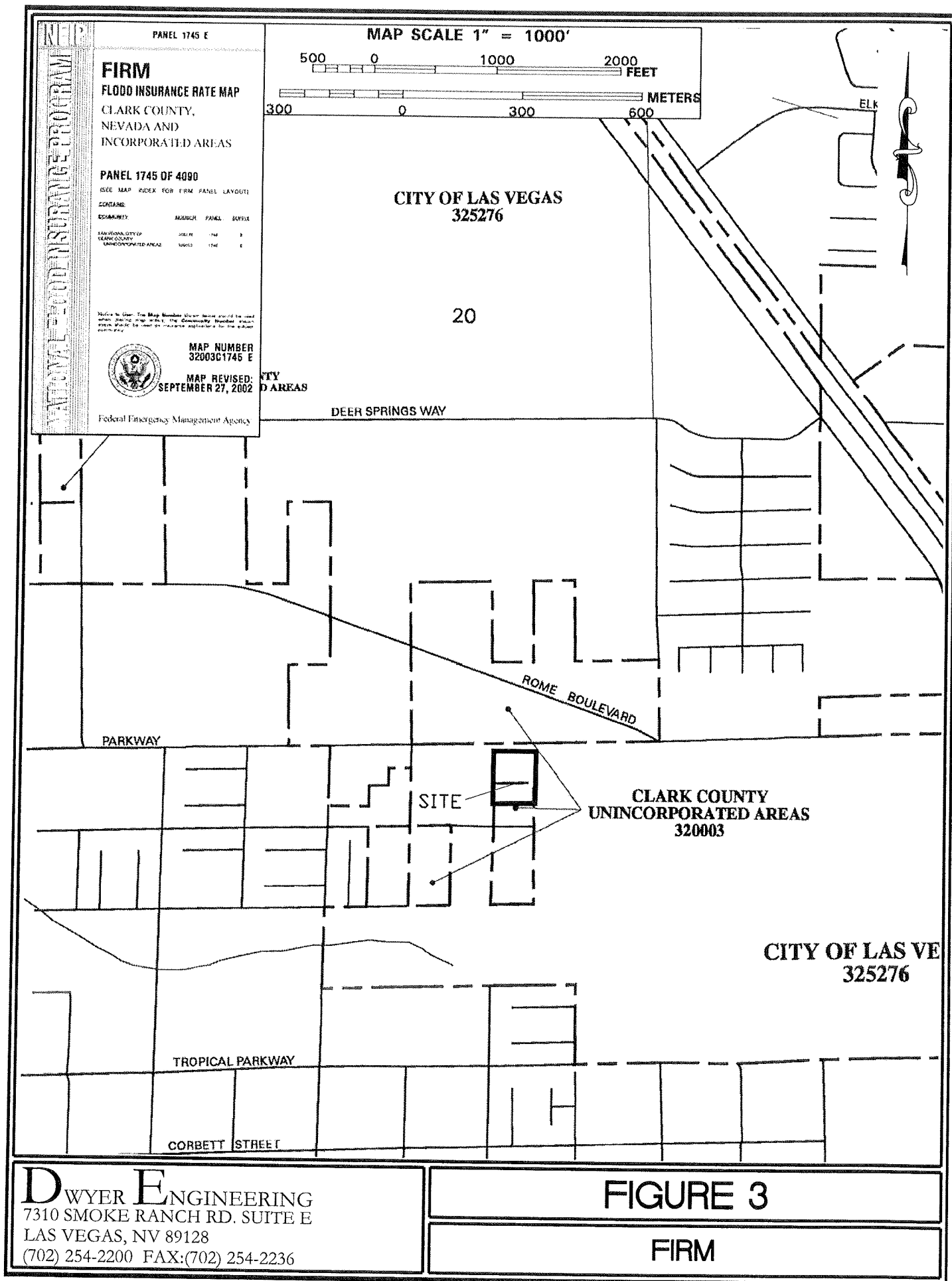
FIGURE 1A



DWYER **E**NGINEERING
7310 SMOKE RANCH RD. SUITE E
LAS VEGAS, NV 89128
(702) 254-2200 FAX:(702) 254-2236

FIGURE 2

SITE DESCRIPTION MAP



ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
ANRB 0000	E	ANN ROAD CHANNEL WEST - RAINBOW 10' X 7' RCB	1320	721	CNW2B5-C	WEST3	0.99	0.40
ANWE 0245	E	ANN ROAD CHANNEL WEST 10' X 8' RCB	1721	993	CNW2D1-C	WEST3	6.84	0.80
0279	E	10' X 8' RCB	553	743	2CNW2B5C	WEST3	6.37	0.80
0290	E	8' X 8' RCB	2050	743	2CNW2B5C	WEST3	6.37	0.70
0327	E	8' X 6' RCB	2360	161	RCHODB	WEST3	5.38	0.87
0371	E	6' X 6' RCB	760	161	RCHODB	WEST3	5.38	0.34
0385	E	54" RCP	1950	161	RCHODB	WEST3	5.38	1.17
CNWE 0150	E	CENTENNIAL PKWY CHANNEL WEST Conc Chnl 40"W 9.5'D 0:1 SS	2279	4233	CNW3B3-C	WEST3	5.64	0.42
0173	E	3: 18' X 8' RCBC @ Torrey Pines	200	4233	CNW3B3-C	WEST3	5.64	0.42
0176	E	Conc Chnl 40"W 9'D 0:1 SS	150	4233	CNW3B3-C	WEST3	5.64	0.41
0189	E	Conc Chnl 36"W 10'D 0:1 SS	1200	4067	CNW2D4-C	WEST3	5.15	0.42
0200	E	Conc Chnl 36"W 9'D 0:1 SS	2470	4067	CNW2D4-C	WEST3	5.15	1.00
0226	E	2: 18' X 8.5' RCBC @ Rio Vista	100	4067	CNW2D4-C	WEST3	5.15	0.51
0241	E	Conc Chnl 36"W 9.5'D 0:1 SS	405	3951	CNW2D3-C	WEST3	4.65	0.51
0251	E	Conc Chnl 36"W 9'D 0:1 SS	575	3951	CNW2D3-C	WEST3	4.65	0.51
0271	E	Conc Chnl 32"W 10'D 0:1 SS	229	3951	CNW2D3-C	WEST3	4.65	0.51
0274	E	32' X 10' RCBC @ Tenaya	142	3951	CNW2D3-C	WEST3	4.65	0.51
0277	E	Conc Chnl 32"W 9'D 0:1 SS	579	3951	CNW2D3-C	WEST3	4.65	0.64
0287	E	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	3259	3593	CNW2B2-C	WEST3	3.84	1.79
GO95 0000	P1	GOWAN OUTFALL - U.S. 95 CHANNEL Conc Chnl 12"W 4'D 2:1 SS	2640	299	GD17BG-C	ALLGOW3	0.36	0.30
0050	P1	Conc Chnl 12"W 4'D 2:1 SS	2450	299	GD17BG-C	ALLGOW3	0.36	0.30
GOA2 0000	P1	GOWAN OUTFALL - ALEXANDER BRANCH 8' X 5' RCB	2281	523	CPT41-C	ALLGOW3	0.61	0.90
GOAL 0111	P1	GOWAN OUTFALL - ALEXANDER ROAD FACILITIES 10' X 8' RCB	3000	880	CPT2B2	ALLGOW3	2.28	0.83
0168	P1	10' X 8' RCB	4200	880	CPT2B2	ALLGOW3	2.28	0.50
0247	P1	Conc Chnl 12"W 5.5'D 2:1 SS	2640	757	CGD20BMC	ALLGOW3	1.98	0.30
GOBU 0000	E	GOWAN NORTH - BUFFALO BRANCH 2: 12' X 6' RCB	1705	961	CGD14CBC	ALLGOW3	2.53	0.20
0032	E	2: 12' X 5' RCB	1248	850	CGD14AAC	ALLGOW3	2.30	0.25
0058	E	2: 11' X 4' RCB	1398	745	CGD17AAC	ALLGOW3	1.90	0.25
0085	E	11' X 5' RCB	1266	614	CGD17ABC	ALLGOW3	1.52	0.25
0112	P1	8' X 6' RCB	1535	484	CGD20ABC	ALLGOW3	1.15	0.54
0136	P1	7' X 6' RCB	1400	344	CGD20AAC	ALLGOW3	0.76	0.36
GOBW 0000	E	GOWAN BELTWAY WEST 48" RCP	2527	116	LMBWDB	ALLGOW4	10.68	4.37
0048	E	72" RCP	131	116	LMBWDB	ALLGOW4	10.68	2.21
0051	P1	72" RCP Outlet	1508	116	LMBWDB	ALLGOW4	10.68	0.30
0052	P1	589 ac-ft Lone Mountain-Beltway Detention Basin		5140	CLMBW1	GW3SC	3.50	
0082	P1	51,400 cfs PMF Spillway		51400	CLMBW1	GW3SC	3.50	
0096	P1	6' X 8' RCB Connector Pipe Under Beltway	839	5140	CLMBW1	GW3SC	3.50	0.30
0097	P1	54" RCP	394	525	UVB1-2	ALLGOW3	0.34	8.09
0100	P1	Energy Dissipator	143	525	UVB1-2	ALLGOW3	0.34	50.00
0106	P1	8' X 8' RCB Connector Pipe Under Lone Mountain	697	5140	CLMBW1	GW3SC	3.50	0.30
0128	P1	Conc Chnl 20"W 10'D 0:1 SS	190	3429	CWRBW1	ALLGOW3	6.06	25.00
0132	P1	Conc Chnl 14"W 10'D 0:1 SS	1286	2869	CHLBW1-C	GW3SC	1.84	5.00
0156	P1	Conc Chnl 16"W 10'D 0:1 SS	221	2869	CHLBW1-C	GW3SC	1.84	1.05
0160	P1	16' X 8' RCB	1230	2869	CHLBW1-C	GW3SC	1.84	1.05
GOBX 0000	P1	GOWAN BOX CANYON 66" RCP	794	753	LWBW1	ALLGOW3	0.48	9.45
GODU 0000	E	GOWAN NORTH - DURANGO BRANCH 12' X 6' RCB	2629	1150	CLV14-C	ALLGOW3	1.40	0.91
0050	E	8' X 6' RCB	865	835	CLV20-C	ALLGOW3	0.97	1.50
GOEC 0000	P1	GOWAN NORTH - EL CAPITAN BRANCH 10' X 7' RCB	1445	1233	CLWFR-C	ALLGOW3	2.20	1.36
0026	P1	10' X 8' RCB	1320	1162	CWRJS-C	ALLGOW3	1.95	0.91
0051	P1	10' X 7' RCB	1320	1027	CHLFR-C	ALLGOW3	1.69	1.06
0076	P1	10' X 6' RCB	1320	894	CARFR-C	ALLGOW3	1.45	1.06
0100	P1	10' X 6' RCB	1320	745	CEAFR-C	ALLGOW3	1.21	0.76
0126	P1	10' X 7' RCB	1320	635	CTRFRC	ALLGOW3	0.96	0.38
0152	P1	7' X 6' RCB	1320	485	CARFP-C	ALLGOW3	0.70	0.77
0176	P1	78" RCP	1320	363	CCPFR-C	ALLGOW3	0.46	1.15
GOL2 0000	E	GOWAN LONE MOUNTAIN SYSTEM-BRANCH 2 5' X 4' RCB	150	461	CRBW	ALLGOW3	0.44	14.60
0003	E	66" RCP	607	461	CRBW	ALLGOW3	0.44	1.97
0014	E	84" RCPC @ Alexander	125	461	CRBW	ALLGOW3	0.44	4.00
GOLM 0000	E	GOWAN LONE MOUNTAIN SYSTEM 78" RCP	2590	345	CLV15-C	ALLGOW4	11.88	1.80
0049	E	6' X 5' RCB	585	345	CLV15-C	ALLGOW4	11.88	1.87
0060	E	66" RCP	817	345	CLV15-C	ALLGOW4	11.88	2.40
0075	E	60" RCP	1385	345	CLV15-C	ALLGOW4	11.88	2.55
0101	E	54" RCP	701	190	LMTNDB	ALLGOW4	11.52	1.74
0115	E	48" RCP	1799	190	LMTNDB	ALLGOW4	11.52	3.08
0140	E	42" RCP	439	190	LMTNDB	ALLGOW4	11.52	1.60
0142	E	48" RCP	348	190	LMTNDB	ALLGOW4	11.52	2.14
0144	E	66" RCP	196	190	LMTNDB	ALLGOW4	11.52	5.44
0145	E	66" RCP Outlet	378	190	LMTNDB	ALLGOW4	11.52	0.90
0146	E	888 ac-ft Lone Mountain Detention Basin		7252	LMTNIN	GW3SC	6.13	
0147	E	36,000 cfs PMF Spillway		36000	LMTNIN	GW3SC	6.13	
0150	E	Drop Structure	481	6323	CGABW	GW3SC	5.12	
0162	E	28' X 8' RCBC @ Hualapai	625	6323	CGABW	GW3SC	5.12	1.86
0174	E	Conc Chnl 28"W 8'D 0:1 SS	2715	6173	CCLMT5	GW3SC	4.92	3.20
GOLO 0275	E	GOWAN OUTFALL - LONE MTN. ROAD BRANCH 8' X 6' RCB	3000	590	CPT3AA2	ALLGOW3	1.16	0.77
GONO 0000	E	GOWAN NORTH SYSTEM 8' X 8' RCB Outlet	184	558	GWNNDB	ALLGOW5	68.49	0.51
0001	E	8' X 8' RCB Outlet	156	558	GWNNDB	ALLGOW5	68.49	0.83
0006	E	30,780 cfs PMF Spillway		30780	GWNNDB	ALLGOW5	68.49	
0008	E	921 ac-ft Gowan North Detention Basin		4937	CCLV43-C*	GW4SC	11.93	
0009	E	3: 13' X 8' RCB	1662	4563	CLV43-C	GW4SC	11.24	0.62
0012	E	Conc Chnl 30"W 8'-9.5'D 0:1 SS	2665	4117	CCLV36-C	GW4SC	8.54	1.18
0062	E	Bridge 30"W 8.5'D @ Cimarron	80	3844	CCLV15-C	GW4SC	8.03	0.30
0063	E	Conc Chnl 30"W 8.5'-10'D 0:1 SS	2302	3844	CCLV15-C	GW4SC	8.03	1.00
0110	E	2: 12' X 8' RCAC @ Alexander	547	3352	CCRSFR-C*	GW3SC	6.10	1.00
0117	E	2: 12' X 8' RCAP	424	3352	CCRSFR-C*	GW3SC	6.10	1.10
0124	E	Conc Chnl 24"W 9'D 0:1 SS	887	3352	CCRSFR-C*	GW3SC	6.10	1.36
0141	E	Conc Chnl 24"W 9'-10.5'D 0:1 SS	2064	3352	CCRSFR-C	GW3SC	6.10	0.59
0181	E	Bridge 30"W 7'D @ Craig	142	2846	CRSFR-C	GW3SC	5.20	0.65
0183	E	Conc Chnl 22"W 8'-10.6'D 0:1 SS	2193	2846	CRSFR-C	GW3SC	5.20	0.72
0225	E	Conc Chnl Width Varies Depth Varies 0:1 SS	508	2605	CCLWFR-C	GW3SC	4.54	1.05
0230	E	13' X 5' RCB	256	1486	CCWRHW-C	GW3SC	2.34	2.78
0234	E	12' X 6' RCB	2010	1486	CCWRHW-C	GW3SC	2.34	1.67
0272	E	10' X 6' RCB	2797	1486	CCWRHW-C	GW3SC	2.34	3.15
0325	E	15' X 7' RCB	291	1486	CCWRHW-C	GW3SC	2.34	1.79
0335	E	15' X 7' RCB	529	1486	CWRHW-C	ALLGOW3	2.34	1.79
0350	P1	10' X 9' RCB	3473	1486	CWRHW-C	ALLGOW3	2.34	0.88
0411	P1	10' X 9' RCB	1320	1404	CARHW-C	ALLGOW3	1.89	0.76
0436	P1	10' X 7' RCB	1320	1173	CEAHW-C	ALLGOW3	1.53	1.14
0461	P1	10' X 9' RCB	1320	959	CTRHW-C	ALLGOW3	1.22	0.38
0486	P1	8' X 7' RCB	1320	747	CADHW-C	ALLGOW3	0.90	0.76
0511	P1	7' X 6' RCB	1320	546	CCPHW-C	ALLGOW3	0.60	1.14
GOOF 0511	E	GOWAN OUTFALL FACILITIES 8' X 5' RCB	8390	699	CPT6B-C	GW3SC	1.08	0.50
0531	E	8' X 5' RCB	1300	558	GWNNDB	ALLGOW5	68.49	0.50
0551	E	72" RCP	524	558	GWNNDB	ALLGOW5	68.49	0.62
0773	E	60" RCP	803	286	LV30-C	ALLGOW3	0.42	1.40
0775	E	60" RCP	1300	286	LV30-C	ALLGOW3	0.42	1.00
RCHB 0000	E	RANCHO ROAD SYSTEM - BELTWAY 2: 12' X 8.5' RCAP	1700	2631	CNW1C-W	WEST3	4.68	0.63
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 8' RCBC @ Beltway	428	2226	CNWBC6-C	WEST3	4.17	2.81
0083	P1	20' X 6' RCB	950	2226	CNWBC6-C	WEST3	4.17	2.49
0101	P1	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 Montecito	120	2226	CNWBC6-C	WEST3	4.17	1.00
0122	P1	Conc Chnl 16"-20"W 6'D 0:1 SS	350	2226	CNWBC6-C	WEST3	4.17	1.84
0130	P1	Conc Chnl 16"W 6'D 0:1 SS	1012	2226	CNWBC6-C	WEST3	4.17	2.67
RCHO 0000	E	RANCHO ROAD SYSTEM 60" RCP with 36" Orifice Plate	1183	161	RCHODB	WEST3	5.38	0.74
0025	E	321 ac-ft Rancho Road Detention Basin		3115	RCHOIN	WEST3	5.38	
0027	E	18,000 cfs PMF Spillway		18000	RCHOIN	WEST3	5.38	
0050	E	Energy Dissipator	65	402	CNW1A4-C	WEST3	0.51	
0052	E	Conc Chnl 10"W 10'D 0:1 SS	115	402	CNW1A4-C	WEST3	0.51	11.73
0054	E	10' X 5' RCB	115	402	CNW1A4-C	WEST3	0.51	0.50
0056	E	10' X 5' RCB	835	402	CNW1A4-C	WEST3	0.51	0.47
0071	E	72" RCP	3126	402	CNW1A4-C	WEST3	0.51	1.80

* 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).



2013 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE FACILITY INVENTORY FIGURE F - 19

LEGEND	ID (Facility Identifier)	AABP	Existing Facility.....E		
	Parent Stream Name		Proposed or Modified Facility.....P	Bottom Width.....W	Construction Features
	Stream Name		Contingency Level	Depth.....D	Cast in Place Concrete Pipe.....CIPCP
	River Mile	0000	Category B.....P0	Side Slope, H:V.....SS	Reinforced Concrete Arch Culvert.....RCAC
	Distance Above Confluence with Parent Stream (Miles)		Master Plan.....P1		Corrugated Metal Arch Pipe Culvert.....CMAP
	Miles in Hundredths		Preliminary Design.....P2		Reinforced Concrete Box.....RCB
			Design.....P3		Reinforced Concrete Box Culvert.....RCBC
					High Density Polyethylene.....HDPE



FIGURE 6

Hydraulic Calculations

Project Description

Friction Method	Manning Formula
-----------------	-----------------

Solve For	Normal Depth
-----------	--------------

Input Data

Channel Slope	0.00550	ft/ft
---------------	---------	-------

Discharge	5.00	ft ³ /s
-----------	------	--------------------

Section Definitions

Station (ft)

Elevation (ft)

0+00	1.00
------	------

0+50	0.00
------	------

0+78	1.00
------	------

Roughness Segment Definitions

Start Station

Ending Station

Roughness Coefficient

(0+00, 1.00)

(0+78, 1.00)

0.016

Options

Current Roughness Weighted Method Pavlovskii's Method

Open Channel Weighting Method Pavlovskii's Method

Closed Channel Weighting Method	Pavlovskii's Method
---------------------------------	---------------------

Results

Normal Depth 0.27 ft

Elevation Range 0.00 to 1.00 ft

Flow Area	2.78	ft ²
-----------	------	-----------------

Wetted Perimeter 20.84 ft

Hydraulic Radius	0.13	ft
------------------	------	----

Top Width	20.83	ft
-----------	-------	----

Normal Depth 0.27 ft

Critical Depth 0.25 ft

Critical Slope	0.00744	ft/ft
----------------	---------	-------

Velocity	1.80	ft/s
----------	------	------

Worksheet for 100 Yr Section 1

Results

Velocity Head	0.05	ft
Specific Energy	0.32	ft
Froude Number	0.87	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.27	ft
Critical Depth	0.25	ft
Channel Slope	0.00550	ft/ft
Critical Slope	0.00744	ft/ft

Project Description

Manning Formula

Normal Depth

0.00550 ft/ft

0.27 ft

5.00 ft³/s

Project Description

Input Data

Section Definitions

Roughness Segment Definitions

Options

Results

Bentley Systems, Inc. Haestad Methods SoBuild Client Master V8i (SELECTseries 1) [08.11.01.03]

Worksheet for 10 Yr Section 1

Results

Velocity Head	0.04	ft
Specific Energy	0.26	ft
Froude Number	0.84	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.22	ft
Critical Depth	0.21	ft
Channel Slope	0.00550	ft/ft
Critical Slope	0.00797	ft/ft

Project Description

Manning Formula

Normal Depth

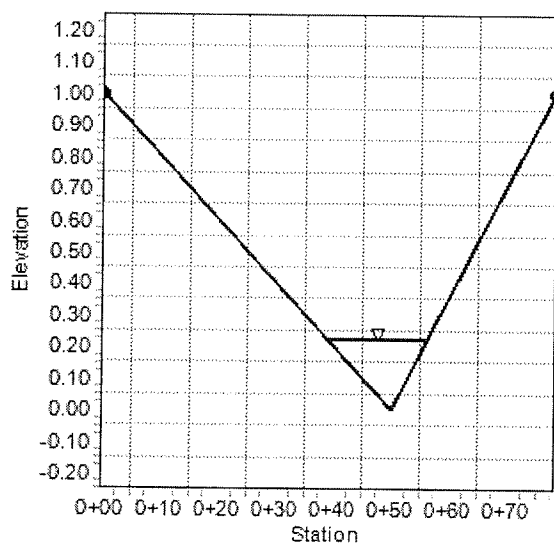
Input Data

0.00550 ft/ft

0.22 ft

3.00 ft³/s

Cross Section Image



Project Description

Input Data

Section Definitions

Roughness Segment Definitions

Options

Results

9/26/2015 6:38:38 PM Bentley Systems, Inc. Haestad Methods Software Bentley ProjectMaster V8i (SELECTseries 1) [08.11.01.03]
27 Siemens Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666 Page 1 of 2

Worksheet for 100 Yr Section 2

Results

Velocity Head	0.05	ft
Specific Energy	0.33	ft
Froude Number	0.88	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.28	ft
Critical Depth	0.26	ft
Channel Slope	0.00550	ft/ft
Critical Slope	0.00733	ft/ft

Project Description

Manning Formula

Normal Depth

Channel Slope

0.00550 ft/ft

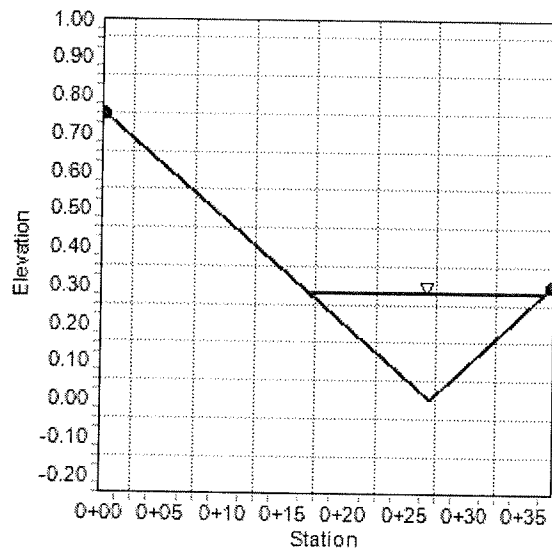
Normal Depth

0.28 ft

Discharge

5.00 ft³/s

Cross Section Image



Project Description

Input Data

Section Definitions

Roughness Segment Definitions

Options

Results

Bentley Systems, Inc. Haestad Methods Soild Engineering Master V8i (SELECTseries 1) [08.11.01.03]

Worksheet for 10 Yr Section 2

Results

Velocity Head	0.04	ft
Specific Energy	0.27	ft
Froude Number	0.84	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

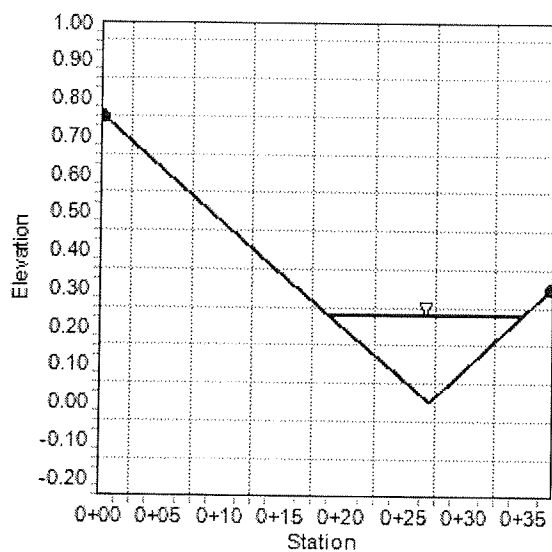
GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.23	ft
Critical Depth	0.22	ft
Channel Slope	0.00550	ft/ft
Critical Slope	0.00784	ft/ft

Project Description

Input Data

Cross Section Image



Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Discharge	5.00	ft ³ /s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+55	0.00
0+55	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 0.50)	0.016

Options

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

Results

Normal Depth		0.31	ft
Elevation Range	0.00 to 1.00 ft		
Flow Area		2.61	ft²
Wetted Perimeter		17.25	ft
Hydraulic Radius		0.15	ft
Top Width		16.94	ft
Normal Depth		0.31	ft
Critical Depth		0.29	ft
Critical Slope		0.00728	ft/ft
Velocity		1.92	ft/s

Worksheet for 100 Yr Section 3

Results

Velocity Head	0.06	ft
Specific Energy	0.37	ft
Froude Number	0.86	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.31	ft
Critical Depth	0.29	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00728	ft/ft

Project Description

Friction Method

Manning Formula

Solve For

Normal Depth

Input Data

Channel Slope

0.00530 ft/ft

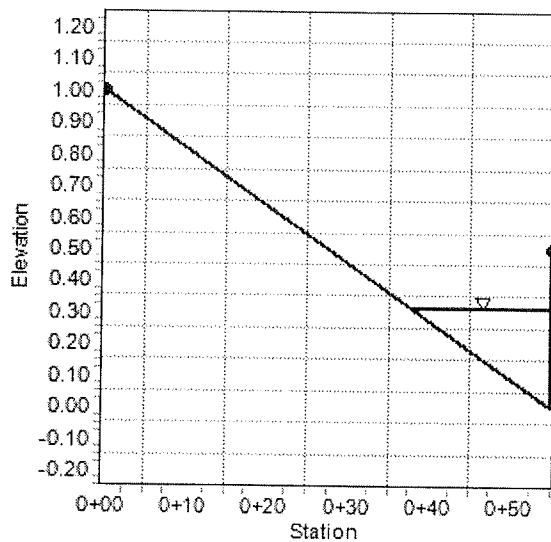
Normal Depth

0.31 ft

Discharge

5.00 ft³/s

Cross Section Image



Project Description

Solve For	Normal Depth
-----------	--------------

Discharge 3.00 ft³/s

Station (ft)	Elevation (ft)
0+00	1.00
0+55	0.00
0+55	0.50

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 0.50)	0.016

Closed Channel Weighting Method	Pavlovskii's Method
---------------------------------	---------------------

Velocity	1.69	ft/s
----------	------	------

Worksheet for 10 Yr Section 3

Results

Velocity Head	0.04	ft
Specific Energy	0.30	ft
Froude Number	0.83	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.25	ft
Critical Depth	0.24	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00779	ft/ft

Project Description

Manning Formula

Normal Depth

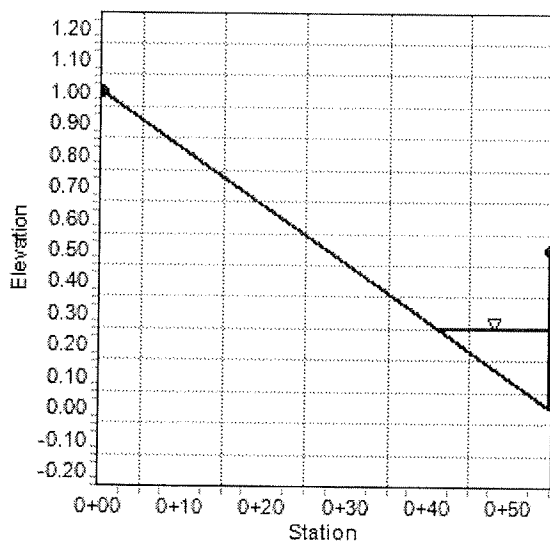
Input Data

0.00530 ft/ft

0.25 ft

3.00 ft³/s

Cross Section Image



Worksheet for Trench Drain

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00650	ft/ft
Bottom Width	1.92	ft
Discharge	10.00	ft³/s

Results

Normal Depth	0.93	ft
Flow Area	1.79	ft²
Wetted Perimeter	3.78	ft
Hydraulic Radius	0.47	ft
Top Width	1.92	ft
Critical Depth	0.94	ft
Critical Slope	0.00626	ft/ft
Velocity	5.59	ft/s
Velocity Head	0.49	ft
Specific Energy	1.42	ft
Froude Number	1.02	
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	0.93	ft
Critical Depth	0.94	ft
Channel Slope	0.00650	ft/ft
Critical Slope	0.00626	ft/ft

Cross Section for Trench Drain

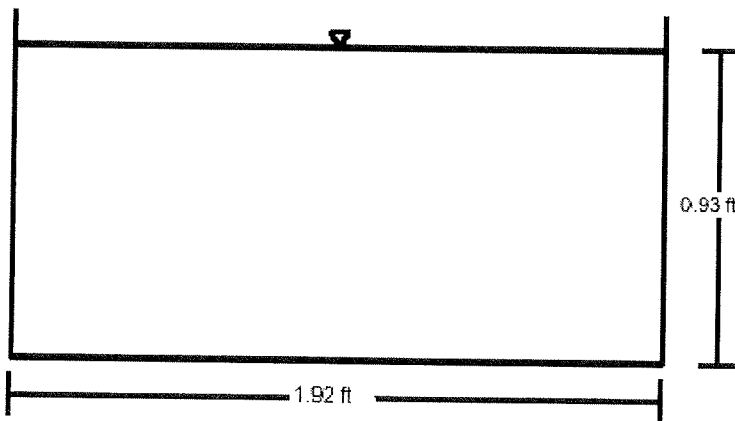
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00650	ft/ft
Normal Depth	0.93	ft
Bottom Width	1.92	ft
Discharge	10.00	ft ³ /s

Cross Section Image



V: 1
H: 1

Excerpts from the
Technical Drainage Study for
Jim Marsh Chrysler Jeep
(prepared by Dwyer Engineering)

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		July 7, 2014
TO: Land Development Services Department of Public Works		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	COPIES TO:	
Drainage Study for:	Dwyer Engineering	
Jim Marsh Chrysler Jeep – Parking Addition	Jim Marsh American Corp.	
Cross Streets:	SEC of Centennial Parkway & Riley Street	Bart Anderson, P.E., DevCo
File Number:	F:\Depot\DSMemos\DS4311E.doc	
Parcel Number:	125-29-502-012, -015, -028 & part of -029	
Zoning Action:	SDR-54205	
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	7/10/2008	7/25/2008	Not Approved	\$400.00	Paid: \$400
2 nd Submittal	4/7/2011	4/21/2011	Approved	\$400.00	166222: \$400
3 rd Submittal	7/9/2013	7/23/2013	Not Approved	\$400.00	325530: \$400
4 th Submittal	4/10/2014	4/23/2014	Not Approved	\$400.00	353369: \$400
5 th Submittal	6/25/2014	7/7/2014	See Comments Below	\$400.00	361397: \$400
TOTAL FEES (LDDRS):				\$2,000.00	----

REMARKS:

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

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

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

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

END OF REMARKS
ays

T/R/S: T19S/R60E/29
AREA G-29

TABLE 5: Ultimate Hec-1 Flow Summary

Basin	Area (acres)	10-Year (cfs)	100-Year (cfs)
ON1*	2.97	6	10
C1	----	6	10
RES2	1.66	1	3
OF1	3.80	5	11
OF2	7.47	11	21
C2	----	16	32
C3	----	23	44
OF3	6.53	10	18

*Combination of previous onsite basins SITE2 and COM

TABLE 6:

Centennial Parkway Ultimate/Worse case Conditions Flow Split Summary

100-ft. Main Street Data									60-ft. Lateral	
Total Flow	From Basin				Upstream of		Flow Remaining		Flow Leaving	
	OF3, Table 4				Riley		@ Centennial			
Comment	100-yr (cfs)	10-yr (cfs)	100-yr (cfs)	10-yr (cfs)	100-yr (cfs)	10-yr (cfs)	Slope (%)	Capacity (cfs)	100-yr (cfs)	10-yr (cfs)
See Reference 4	567	207	18	10	585	217	2.2	390.83	194.17	0
See References 3 & 6	518	289	18	10	536	299	2.2	390.83	145.17	0
Modified Reference 4 - storm drain in place	356	8	18	10	374	18	2.2	390.83	0	0

TABLE 7:

Riley Street Ultimate Conditions Storm Flow Summary

Split Flow			From Basin OF2				From C2			
Comments	100-yr (cfs)	10-yr (cfs)	See Table 1		Total Flow		See Table 1		Total Flow	
			100-yr (cfs)	10-yr (cfs)	100-yr (cfs)	10-yr (cfs)	100-yr (cfs)	10-yr (cfs)	100-yr (cfs)	10-yr (cfs)
See Reference 4	194.17	0	21	11	215.17	11	32	16	226.17	16
See References 3 & 6	145.17	0	21	11	166.17	11	32	16	177.17	16
Ref. 4 w/storm pipe	0	0	21	11	21	11	32	16	32	16

TABLE 8: Summary of Worse Case at Adjacent Drainage Sections

Cross Section	Min. Slope (%)	Adjacent 10-Year				Adjacent 100-Year			
		Flow (cfs)	Depth (ft.)	Vel. (fps)	V ₂ D	Flow (cfs)	Depth (ft.)	Vel. (fps)	V ₂ D
A-A (Ex. 30' w/ 3' gutter)	0.65	10	0.39	2.19	< 6	17	0.45	2.62	< 8
B-B (Regena Ave. Cul de sac)	0.50	23	0.50	2.05	< 6	44	0.59	2.34	< 8
C-C (onsite - south perimeter)	0.50	6	0.27	1.71	< 6	10	0.32	1.94	< 8
D-D (Adjacent 60' Riley St)	2.00	11	0.44	3.50	< 6	215.17	0.93	7.65	< 8
E-E (Adjacent 100' Centennial)	2.20	217	0.78	7.10	~ 5.5	390.83	0.95	8.93	~ 8.5

The comments in the subject memorandum have been reproduced with accompanying responses as follows:

Comment 1: Provide a copy of the zoning/planning conditions associated with this site (SDR-27078; ZON-27079 & WVR-27425) with the next submittal to verify compliance with conditions. *Flood Control* will not issue conditional approval of the drainage study without the associated zoning/planning conditions (issued by the *City Council*). Any associated conditions of approval that revise the site drainage parameters will require that the drainage study be revised and resubmitted.

Response 1: The site has been redesigned. Conditions for SDR-40077 supersede SDR-27078 and conditions for WVR-40381 supersede WVR-27425. New conditions along with ZON-27079 have been included in the appendix.

Comment 2: The grading plan shows that there is an existing 8"-stem wall at the back of the sidewalk along *Centennial Parkway*. However, Section A/2 does not reflect the wall. Note that the anticipated 100-year flow depth in *Centennial Parkway* shall be 0.95', the existing stem wall may not be removed because of onsite flood protection function. Address and resolve in the next submittal.

Response 2: The existing 8" stem wall has been shown on Section A/2.

Comment 3: Riley Street: Section B/2 does not show a CMU wall at the back of sidewalk while Section C/2 does. Note that a wall is required for onsite flood protection. Revise Section B/2 to add a wall accordingly. The bottom two courses of the wall must be 8"-CMU to be solid grouted.

Response 3: Riley Street is now detailed in four sections which are shown as details B/2, C/2, F/2, and H/2 on the detail sheet included in the appendix. Details B/2, F/2, and H/2 show an existing stem wall at the back of the sidewalk. Section C/2 shows a retaining/screen wall and will be solid grouted 2 courses above the back of curb along Riley Street. The existing stem wall and proposed retaining/screen wall will provide adequate flood protection.

REFERENCED
FROM THE TDS

EXISTING
DURANGO AND
CENTENNIAL CENTER
IMPROVEMENTS PER
DS-39756 AND
HTE 06-36536

EXISTING CENTENNIAL/DURANGO
COMMERCIAL IMPROVEMENTS PER
DS-4096 AND HTE 07-23919

EXISTING CENTENNIAL PKWY.
AND PARKING LOT
IMPROVEMENTS PER
MARTIN & MARTIN, DS-2673

EXISTING
COMMERCIAL
EXIST. RESIDENTIAL
IMPROVEMENTS
PER HTE 95-22128

EXISTING RILEY STREET
IMPROVEMENTS PER
MARTIN & MARTIN, DS-2673

EXISTING
JIM MARSH
COMMERCIAL
PER DS-2673

EXIST.
McDONALDS
PER DS-3184

EXIST. RESIDENTIAL
IMPROVEMENTS PER
CLARK COUNTY
AN 93-475

EXISTING CENTENNIAL HILLS
PROFESSIONAL CENTER
IMPROVEMENTS PER DS-3941,
CLV # 13769

Existing Hec-1 Flow Summary			
Basin	Area (acres)	10-Yr (cfs)	100-Yr (cfs)
SITE	1.03	<1	1
COM	0.9	2	3
C1	---	2	4
RES	2.7	1	4
OF1	3.5	1	5
OF2	7.47	3	9
C2	---	4	14
C3	---	7	21
OF3	6.53	3	8

Centennial Parkway Existing Conditions Flow Split Summary Centennial / 100-ft. Main Street Data									
Contributors	Total Flow		From Existing Hec-1 Basin OF2		Main Street Upstream Riley		Flow Routing Slope (%) Capacity (cfs)		Riley St. / 60-ft. Lateral Flow Loading
	100-yr. (cfs)	10-yr. (cfs)	100-yr. (cfs)	10-yr. (cfs)	100-yr. (cfs)	10-yr. (cfs)			
Met. Box at Centennial & Flow & Julian Rd. See DS-1096 HTE 07-23919, Reference 4	867	207	8	3	575	210	2.2	30+83	18417
CLV Box at Centennial & Durango Dr. Reference 3 / Flow & Centennial Flow & Grand Marine Flow, See DS-3184, Reference 6	519	289	8	3	515	292	2.2	30+83	13517
Flow at Centennial & Durango Dr. intersection Reference 4 & 6 and flow for street & drain split flow impacts i.e. Reference 5 Flow data (split flow - Drainsplit & storage impacts) plus flow from Durango Dr.	356	8	8	3	364	11	2.2	30+83	0

Riley Street Existing Conditions Storm Flow Summary Flow at Basin OF2									
Contributors	Split Flow		See Existing Hec-1		Total Flow		See Existing Hec-1		Total Flow
	100-yr. (cfs)	10-yr. (cfs)	100-yr. (cfs)	10-yr. (cfs)	100-yr. (cfs)	10-yr. (cfs)	100-yr. (cfs)	10-yr. (cfs)	
See Reference 4	18417	0	9	3	19317	3	14	4	19417
See References 3 & 6	13517	0	9	3	14417	3	14	4	14517
Reference 4 split flow at drain place	0	0	9	3	9	3	14	4	0

- LEGEND
- BASIN BOUNDARY
 - BASIN IDENTIFICATION
 - COMBINED FLOW PER HEC-1
 - 10-YR/100-YR APPROVED FLOW
 - FLOW DIRECTION
 - FLOW SPLIT LOCATION - SEE FLOW SPLIT SUMMARY (SEE HYDRAULIC CALCULATIONS IN APPENDIX B)

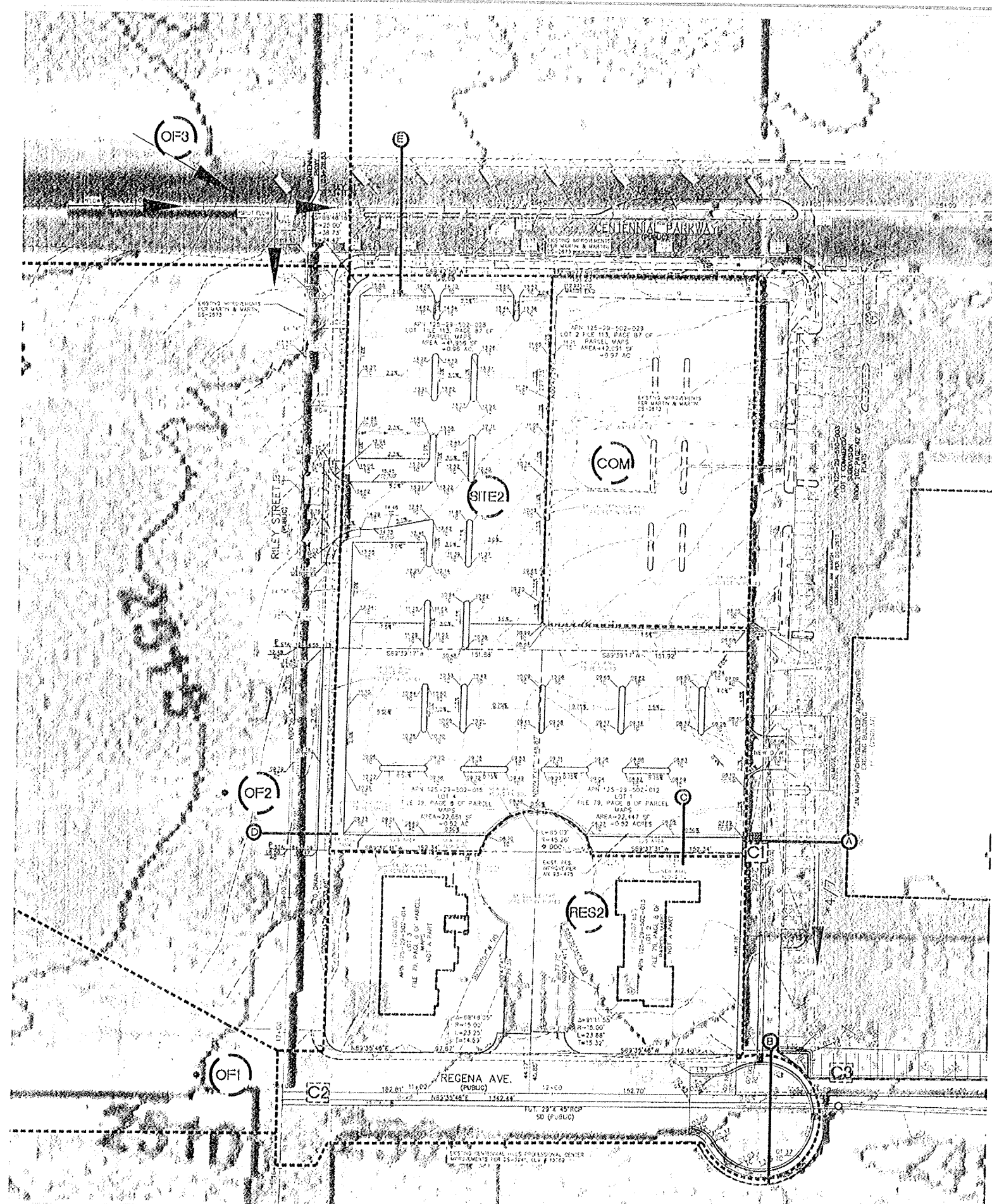
- * NOTE:
- 1) OFFSITE BASINS OF1, OF2, COM, RES2, AND SITE2 REVISED FROM APPROVED BASIN "OFF2" PER DS-2370 (SEE APRIL 2000 STUDY BY BARAJAS & ASSOCIATES/AUG. 2001 STUDY BY G.C. WALLACE, REFERENCE 7)
 - 2) JIM MARSH COMMERCIAL EXISTING ON-SITE FLOW PER DS-2673 (SEE BASIN "ON3" PER APRIL 2000 STUDY BY BARAJAS & ASSOCIATES/AUG. 2001 STUDY BY G.C. WALLACE, REFERENCE 7)
 - 3) CENTENNIAL PKWY FLOW PER FLOW SPLIT SUMMARY (SEE BELOW)

GRAPHIC SCALE

This grading plan is a
part of drainage study
730, which was received
on 11/19/02 and rejected on
7/23/03. Page 4 of 7

EXISTING DRAINAGE PLAN
JIM MARSH CHRYSLER JEEP
(CENTENNIAL PKWY & RILEY ST.)

72083
07/07/08
SP
DAD
FIGURE 7



Proposed Hec-1 Flow Summary

Basin	Area (acres)	10-Yr. (cfs)	100-Yr. (cfs)
SHF2	2.07	4	-
COM	0.9	2	3
C1	---	6	10
RES2	1.66	1	3
OF1	3.8	1	5
OF2	7.4	3	9
C2	---	4	11
C3	---	9	21
OF3	6.51	1	5

Ultimate Hec-1 Flow Summary

Basin	Area (acres)	10-Yr. (cfs)	100-Yr. (cfs)
SHF2	2.07	4	-
COM	0.9	2	3
C1	---	6	10
RES2	1.66	1	3
OF1	3.8	5	11
OF2	7.4	11	21
C2	---	16	32
C3	---	23	41
OF3	6.51	10	18

- LEGEND
- BASIN BOUNDARY
 - OF BASIN IDENTIFICATION
 - COMBINED FLOW PER HEC-1
 - 4/7 10-YR/100-YR APPROVED FLOW
 - FLOW DIRECTION
 - FLOW SPLIT LOCATION - SEE FLOW SPLIT SUMMARY (SEE HYDRAULIC CALCULATIONS IN APPENDIX D)
 - HYDRAULIC SECTION - SEE DRAINAGE SECTION SUMMARY (SEE HYDRAULIC CALCULATIONS IN APPENDIX D)

REFERENCED FROM THE TDS

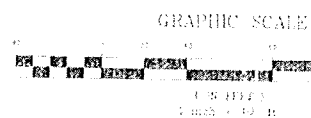
- NOTE
- 1.) OFFSITE BASINS OF1, OF2, COM, RES2, AND SHF2 REVIEWED FROM APPROVED BASIN "OFF2" PER DS-2376 (SEE APRIL 2000 STUDY BY BARAJAS & ASSOCIATES/AUG. 2001 STUDY BY G.C. WALLACE, REFERENCE 7)
 - 2.) JIM MARSH COMMERCIAL EXISTING ON-SITE FLOW PER IS-2673 (SEE BASIN "ON3" PER APRIL 2000 STUDY BY BARAJAS & ASSOCIATES/AUG. 2001 STUDY BY G.C. WALLACE, REFERENCE 7)
 - 3.) CENTENNIAL PRKY FLOW PER FLOW SPLIT SUMMARY (SEE BELOW)

Centennial Parkway Ultimate/Worst Case Conditions Flow Split Summary											
100-Yr. Main Street Data											
Total Flow	100-Yr. (cfs)		From Ultimate Level (Data G1)		Upstream 400 ft		Flow Bounding at Centennial		600-ft. Label 1 Flow Bounding		
	100yr. (cfs)	10yr. (cfs)	100yr. (cfs)	10yr. (cfs)	100yr. (cfs)	10yr. (cfs)	Shape (%)	Capacity (cfs)	Rating (cfs)	100yr. (cfs)	
Centennial											
Max. Flow at Centennial Flow & Riley Street See DS-4636, H10-0-2-2012, Reference 1	567	207	18	1	585	217	2.2	30083	1913	0	
CIV Flow at Centennial Flow & Douglas Dr., Reference 3: Flow at Centennial Flow & Riley Street Flow, See DS-3084, Reference 6	518	289	18	1	536	299	2.2	30083	1451	0	
Flow at Centennial Flow & Douglas Dr., see from Reference 1 & Riley Street shown as split flow inputs in the Reference 5 flow input split flow - Dispatch & stoppage inputs (4) plus flow at 4 Douglas Dr.	376	8	18	10	374	18	2.2	30083	0	0	

Comments	Split Flow		From Basin OF1				From C2			
	100-yr. (cfs)	10-yr. (cfs)	See Ultimate Ikc-1		Total Flow		See Ultimate Ikc-1		Total Flow	
			100-yr. (cfs)	10-yr. (cfs)	100-yr. (cfs)	10-yr. (cfs)	100-yr. (cfs)	10-yr. (cfs)	100-yr. (cfs)	10-yr. (cfs)
See Reference 1	1911*	0	21	11	2151*	11	32	16	2261*	16
See Reference 2 & 6	1451*	0	21	11	1661*	11	32	16	1771*	16
Ref. 4 w/s-sample	0	0	21	11	21	11	32	16	42	16

Summary of Worst Case at Adjacent Drainage Sections

Cross-Section	Min. Slope (%)	Adjacent 10-Year				Adjacent 100-Year			
		Flow (cfs)	Depth (ft)	Vel. (fps)	VAD	Flow (cfs)	Depth (ft)	Vel. (fps)	VAD
A-A (Ex. 30' w/ 3" gutter)	0.65	10	0.39	2.19	< 6	17	0.45	2.62	< 8
B-B (Regena Ave. Cnd de sac)	0.50	23	0.50	2.05	< 6	44	0.59	2.31	< 8
C-C (onsite - south perimeter)	0.50	1	0.36	1.70	< 6	7	0.42	1.91	< 8
D-D (Adjacent 60' Riley St)	2.00	11	0.41	3.50	< 6	20	0.51	2.31	< 8
E-E (Adjacent 100' Centennial)	2.20	217	0.78	7.10	< 5.5	3083	0.75	7.10	< 5.5



This grading plan is a part of drainage study # 1311, which was received on 7/10/02 and revised on 7/29/02. Page 9 of 5

PROPOSED/ULTIMATE DRAINAGE PLAN
JIM MARSH CHRYSLER JEEP
(CENTENNIAL PRKY & RILEY ST.)

APPROVED
REVISIONS
DATE
BY
CHECKED
DATE
BY
DESIGNED
DATE
BY
DRAWN
DATE
BY

7/20/03
07/08/08
N/A

SP
DAD
SHEET
FIGURE 8

Excerpts from the
Technical Drainage Study for
Jim Marsh Auto Dealer @
Centennial and Durango
(prepared by Barajas & Associates)

CITY OF LAS VEGAS			DATE:	
INTER-OFFICE MEMORANDUM			June 21, 2000	
TO: Land Development Services Department of Public Works			FROM: Randy L. Fultz, P.E. <i>ays</i> Flood Control Project Manager Department of Public Works	
SUBJECT:		Drainage Study for:		COPIES TO:
		Jim Marsh Auto Dealer at Centennial & Durango		Barajas & Associates, Inc.
Cross Streets:	Southwest corner of Centennial Parkway and Durango Drive			Gilbert Development Company
FILE NO.	F:\Depot\DSMEMOS\DS2673C.doc			Tetra Southwest.
Parcel Number:	125-29-502-004 & 011			Cheri Edelman, DEVCO
Zoning Action:				Clark County Public Works, attn. Mike Hand
FEMA Flood Zone	YES	No	X	Rodney Mills, FAX 801-530-3150
Proposed Storm Drain	YES	No	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES
1 st Submittal	4/21/00	5/1/2000	Not Accepted	\$250.00
Express Plan Check	6/21/00	6/21/00	Accepted	\$250.00
Update #1	03/13/01	03/15/01	Accepted	\$250.00
TOTAL FEES				\$750.00

REMARKS:

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

X	is acceptable in concept subject to conformance to all City standards and the following conditions.
	must be resubmitted or supplemented including the following:
	Must have Clark County Regional Flood Control District concurrence

1. Provide a signed and sealed copy of the drainage study update letter to City of Las Vegas Flood Control prior to revisions to the approved improvement plans.

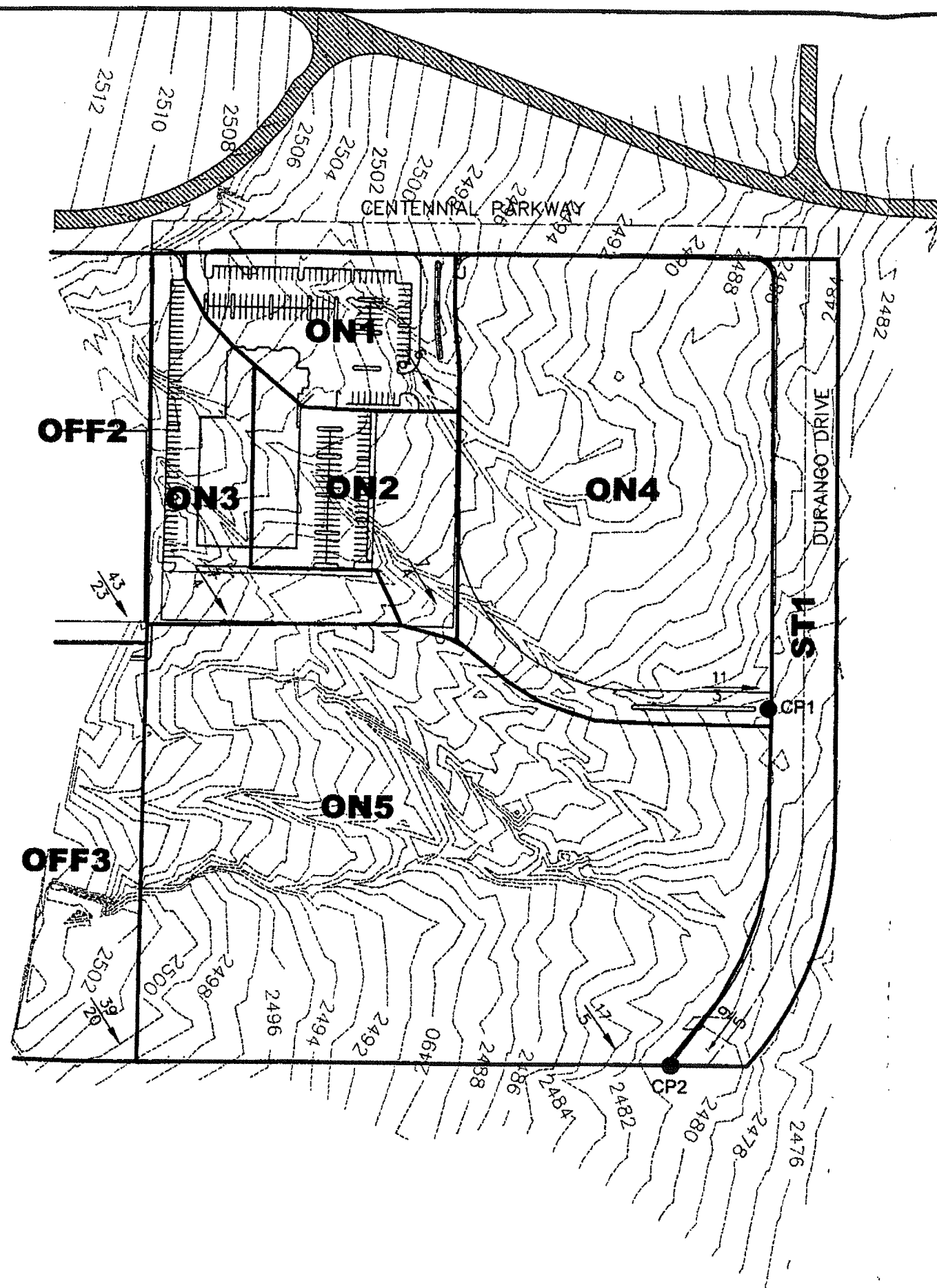
NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the CLV Flood Control Section. Additionally, conditional acceptance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

END OF REMARKS

Dws/ays/jwb

T/R/S: T19S/R60E/09

AREA G-29



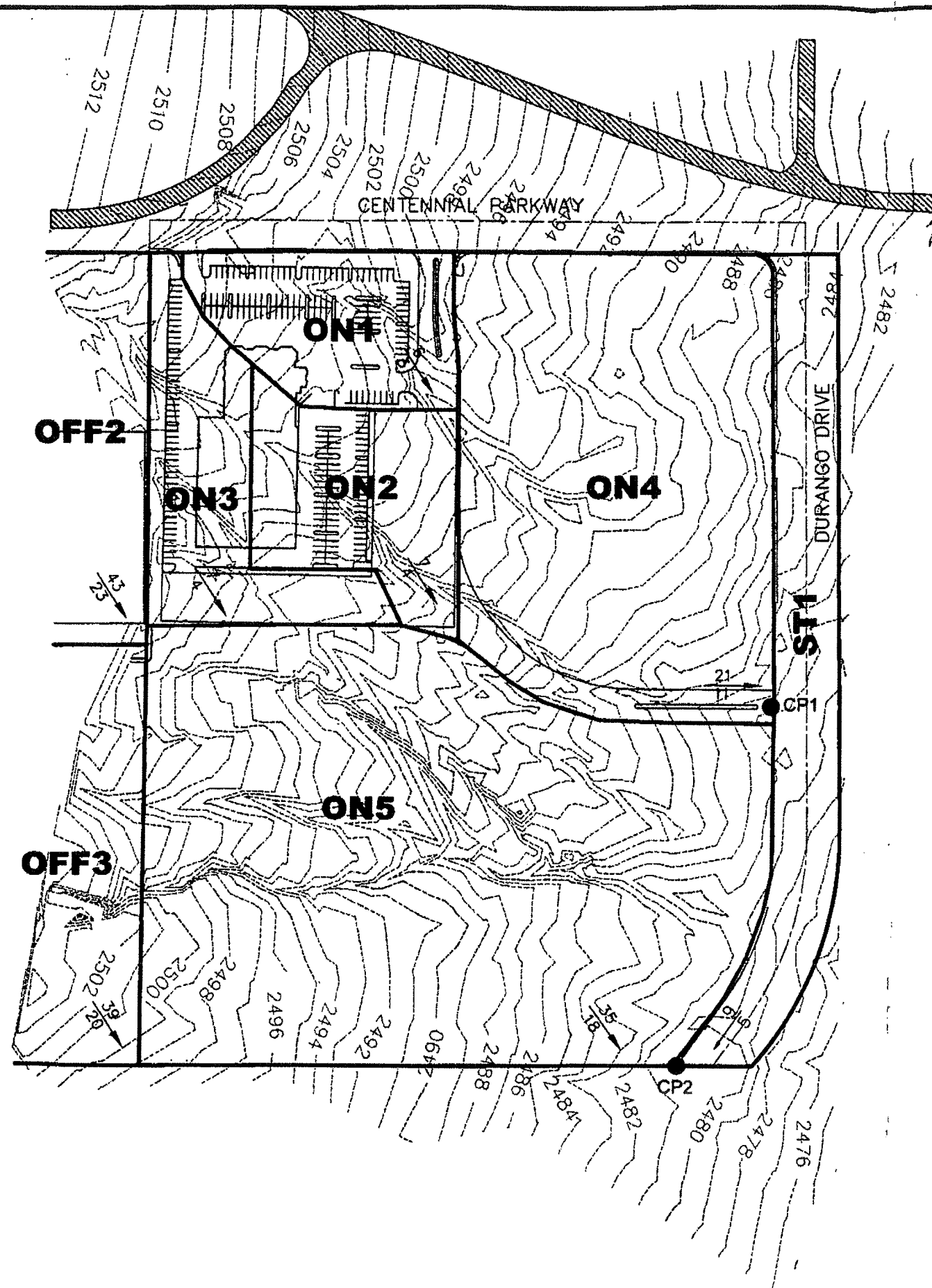
SCALE 1" = 200'

	Area (acres)	Q100 (cfs)	Q10 (cfs)
ON1	2.0	6	3
ON2	2.1	7	4
ON4	7.7	11	3
CP1	-	22	9
ON3	2.2	7	4
OFF2	15.9	43	23
OFF3	14.3	39	20
ON5	13.1	17	5
ST1	3.0	9	5
CP2	-	132	63

**ONSITE DEVELOPED
BASINS (INTERIM)
FIGURE 7a**

BARAJAS & ASSOCIATES

8260 W. CHARLESTON
LAS VEGAS, NV 89117
(702) 360-4477
(702) 360-4480 FAX



SCALE 1" = 200'

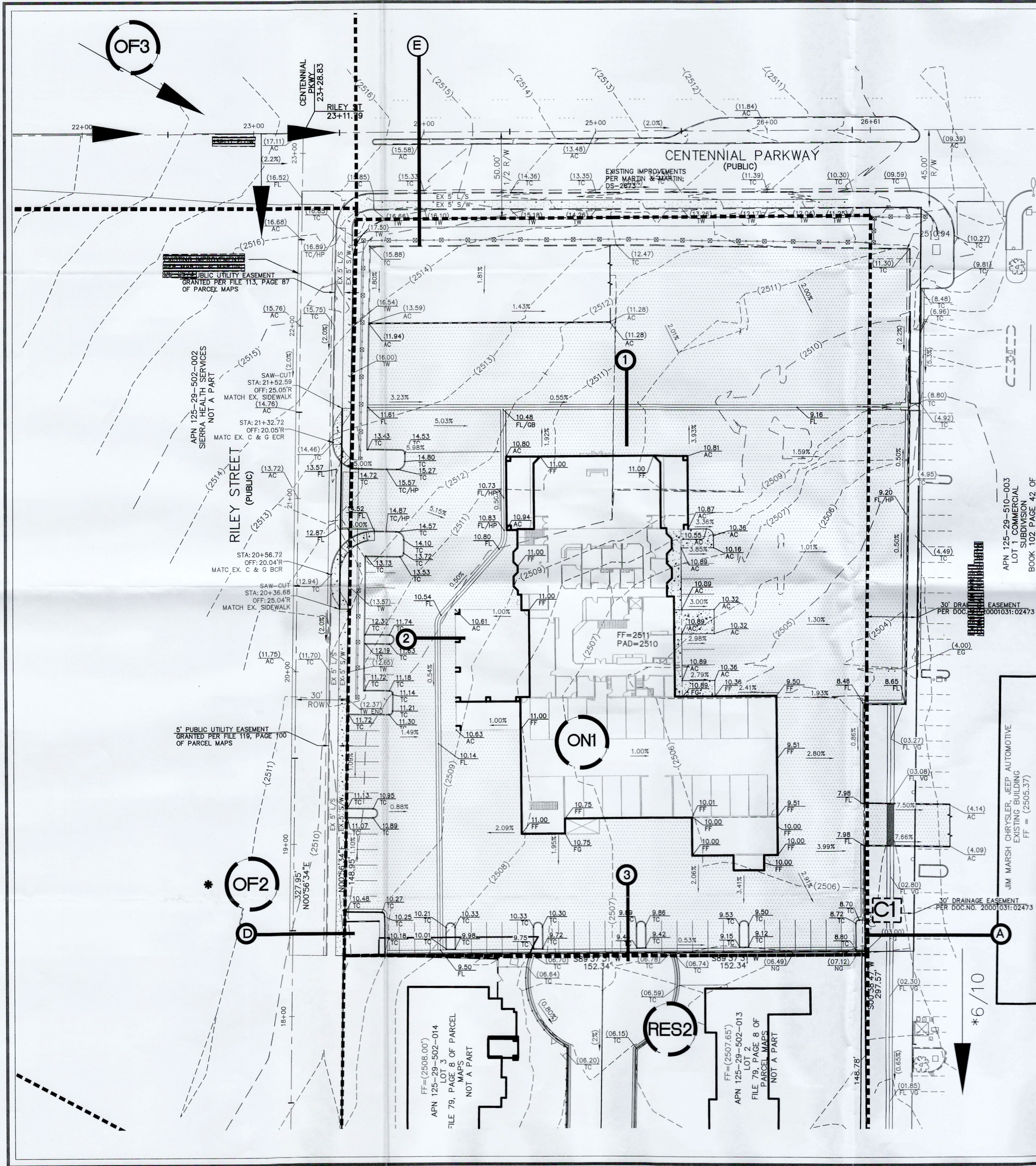
	Area (acres)	Q100 (cfs)	Q10 (cfs)
ON1	2.0	6	3
ON2	2.1	7	4
ON4	7.7	21	11
CP1	-	34	18
ON3	2.2	7	4
OFF2	15.9	43	23
OFF3	14.3	39	20
ON5	13.1	35	18
ST1	3.0	9	5
CP2	-	164	85

ONSITE DEVELOPED BASINS (DEVELOPED) FIGURE 7b

BARAJAS & ASSOCIATES

8260 W. CHARLESTON
LAS VEGAS, NV 89117
(702) 360-4477
(702) 360-4480 FAX

Drainage Plan and Project Plans

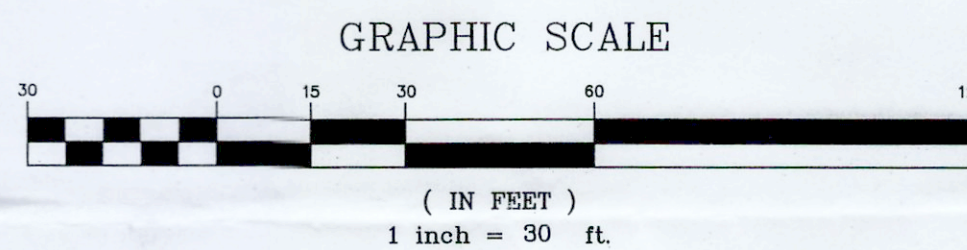


Proposed Hec-1 Flow Summary			
Basin	Area (acres)	10-Yr. (cfs)	100-Yr. (cfs)
ON1	2.97	6	10
C1	---	6	10
RES2	1.66	1	3
OF1	3.8	1	5
OF2	7.47	3	9
C2	---	4	14
C3	---	9	24
OF3	6.53	3	8

Ultimate Hec-1 Flow Summary			
Basin	Area (acres)	10-Yr. (cfs)	100-Yr. (cfs)
ON1	2.97	6	10
C1	---	6	10
RES2	1.66	1	3
OF1	3.8	5	11
OF2	7.47	11	21
C2	---	16	32
C3	---	23	44
OF3	6.53	10	18

- LEGEND**
- BASIN BOUNDARY
 - OF1 BASIN IDENTIFICATION
 - C1 COMBINED FLOW PER HEC-1
 - 4/7 10-YR/100-YR APPROVED FLOW
 - FLOW DIRECTION
 - ⊕ FLOW SPLIT LOCATION
 - ⊕ HYDRAULIC SECTION

- * NOTE:**
- OFFSITE BASINS OF1, OF2, COM, RES2, AND SITE2 REVISED FROM APPROVED BASIN "OFF2" PER DS-2376 (SEE APRIL 2000 STUDY BY BARAJAS & ASSOCIATES/AUG. 2001 STUDY BY G.C. WALLACE, REFERENCE 7)
 - JIM MARSH COMMERCIAL EXISTING ON-SITE FLOW PER DS-2673 (SEE BASIN "ON3" PER APRIL 2000 STUDY BY BARAJAS & ASSOCIATES/AUG. 2001 STUDY BY G.C. WALLACE, REFERENCE 7)
 - CENTENNIAL PKWY FLOW PER FLOW SPLIT SUMMARY (SEE BELOW)



Centennial Parkway Ultimate/Worse case Conditions Flow Split Summary									
100-ft. Main Street Data									
Comment	Total Flow		From Ultimate Hec-1 Basin OF1		Upstream of Riley		Flow Remaining @ Centennial		60-ft. Lateral Flow Leaving
	100-yr. (cfs)	10-yr. (cfs)	100-yr. (cfs)	10-yr. (cfs)	100-yr. (cfs)	10-yr. (cfs)	Slope (%)	Capacity (cfs)	100-yr. (cfs)
Max. Flow at Centennial Pkwy & Julian Rd.; See DS-4096/HIE 07-23919, Reference 4	567	207	18	10	585	217	2.2	390.83	194.17
CLV Flow at Centennial Pkwy & Durango Dr., Reference 3 / Flow at Centennial Pkwy & Grand Montecito Pkwy, See DS-3184, Reference 6	518	289	18	10	536	299	2.2	390.83	145.17
Flow at Centennial Pkwy & Durango Dr. based on Reference 4 & modified for storm drain and split flow impacts (i.e. Reference 5 Flow minus (split flow + Drop inlet & storm pipe intercept) plus flow east of Durango Dr.)	356	8	18	10	374	18	2.2	390.83	0

NOTE: REFERENCES INCLUDED IN THE ORIGINAL APPROVED STUDY

Riley Street Ultimate Conditions Storm Flow Summary									
Comments	Split Flow		From Basin OF2				From C2		
	100-yr. (cfs)	10-yr. (cfs)	See Ultimate Hec-1	100-yr. (cfs)	10-yr. (cfs)	Total Flow	See Ultimate Hec-1	100-yr. (cfs)	Total Flow
	100-yr. (cfs)	10-yr. (cfs)	100-yr. (cfs)	10-yr. (cfs)	100-yr. (cfs)	10-yr. (cfs)	100-yr. (cfs)	10-yr. (cfs)	10-yr. (cfs)
See Reference 4	194.17	0	21	11	215.17	11	32	16	226.17
See References 3 & 6	145.17	0	21	11	166.17	11	32	16	177.17
Ref. 4 w/storm pipe	0	0	21	11	21	11	32	16	32

NOTE: REFERENCES INCLUDED IN THE ORIGINAL APPROVED STUDY

Summary of Worse Case at Adjacent Drainage Sections									
Cross-Section	Min. Slope (%)	Flow (cfs)	Adjacent 10-Year			Adjacent 100-Year			
			Depth (ft.)	Vel. (fps)	VxD	Flow (cfs)	Depth (ft.)	Vel. (fps)	VxD
A-A (Ex. 30' w/ 3' gutter)	0.65	10	0.39	2.19	< 6	17	0.45	2.62	< 8
B-B (Regena Ave. Cul de sac)	0.50	23	0.50	2.05	< 6	44	0.59	2.34	< 8
C-C (onsite - south perimeter)	0.50	6	0.27	1.71	< 6	10	0.32	1.94	< 8
D-D (Adjacent 60' Riley St)	2.00	11	0.44	3.50	< 6	215.17	0.93	7.65	< 8
E-E (Adjacent 100' Centennial)	2.20	217	0.78	7.10	< 5.5	390.83	0.95	8.93	< 8.5

ONSITE STREET FLOW CALCULATIONS

STREET	Q ₁₀ /Q ₁₀₀ (cfs)	D ₁₀ /D ₁₀₀ (ft)	V ₁₀ /V ₁₀₀ (fps)	V x D
Section 1-1	3/5	0.22/0.27	1.58/1.80	0.35/0.49
Section 2-2	3/5	0.23/0.28	1.63/1.85	0.37/0.52
Section 3-3	3/5	0.25/0.31	1.69/1.92	0.42/0.60

This grading plan is a part of drainage study #4311-1 which was received on 9/29/15 and April on 11/9/15. Page 3 of 3

Job No.	15433
FILE No.	09/28/15
REUSE OF DOCUMENTS	
APPROVED	
REVISIONS	
NO.	DATE
DESCRIPTION	
SEP 28 '15	
STAMP	
Dwyer Engineering Inc.	
WATER RIGHTS	
CIVIL ENGINEERS	
LAND SURVEYORS	
7700 S. RAYMOND BLVD. SUITE 100	
LAS VEGAS, NEVADA 89123	
PROPOSED/ULTIMATE DRAINAGE PLAN	
JIM MARSH CHRYSLER JEEP	
(CENTENNIAL PKWY & RILEY ST.)	
CITY OF LAS VEGAS, NEVADA	
APN 125-29-502-031	
JOB No.	15433
DATE	09/28/15
VERT. SCALE	N/A
HORIZ. SCALE	
DRAWN BY:	
CHECKED BY:	DAD
SHEET	