Appendix E – Reference Materials

- Technical Drainage Study for City of Las Vegas Fire Station No. 5 (Fire Station Study, February 2003)

DS #: 3221

DS INDEX:

APN: 139-31-801-014

PROJECT: CLV FIRE STATION NO. 5

SUBMITTAL: 1ST

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: February 7, 2003
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 of Las Vegas Fire Station No. 5**			**COPIES TO:** Aztec
Cross Streets:	NWC of Charleston Blvd. & Hinson Street			City of Las Vegas, Architectural Serv
File Number:	F:\Depot\DSMemos\DS3221C.doc			Bart Anderson, P.E., DEVCO
Parcel Number:	139-31-801-014			CCRFCD
Zoning Action:				
FEMA Flood Zone	YES	NO	X	
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID G.R. #
1st Submittal	10/15/2002	10/29/2002	Not Approved	$250.00	93190: $250
2nd Submittal	12/5/2002 & 1/6/2003	1/7/2003	Conditional approval	$250.00	95710: $250
CCRFCD	2/6/2003	2/7/2003	Concurrence	N/C	N/C
			TOTAL FEES (LDDRS):	**$500.00**	—

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

The following comments are repeated until they are complete:

1. *The Grading Plan indicates a high point at the west end of the proposed 10-foot pubic drainage easement. In a site visit, it was noted that a gate exists along the east property wall of the Elks Lodge RV and appears that is the low point of the Elks Lodge RV property. Revise Grading Plan such that the proposed drainage easement and proposed block wall opening is centered with the existing low point to ensure that the Elks Lodge RV will drain. In addition, show an elevation for finished grade at the proposed block wall opening.*

2. *The proposed 10' public drainage easement (privately maintained) in the site must be recorded by separate document prior to final approval of improvement plans.*

3. *The Grading Plan indicates the removal of the existing block wall that separates the Fire Station from the Elks Lodge RV. Secure a notarized letter of permission from the property owner, Elks Lodge, allowing the removal of the existing block wall. This letter is required prior to final approval of construction drawings.*

4. *Show and label the existing 30' public drainage easement on the grading plan (Sheet C-7).*

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 City of Las Vegas Flood Control Section. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the City of Las Vegas reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

END OF REMARKS
ays/rac

T/R/S: T20S/R61E/31
AREA M-31

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

February 4, 2003

Mr. Randy Fultz, P.E.
City of Las Vegas Public Works
731 S. Fourth St
Las Vegas, NV 89101

DS3221
M-31
N/C

DISTRICT CONCURRENCE: CITY OF LAS VEGAS FIRE STATION NO. 5 (DS3221)

Dear Mr. Fultz:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated October 7, 2002 and Addendum No. 1 dated November 18, 2002, for the above-mentioned project as submitted by Aztec Engineering. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Public Works dated January 7, 2002.

District concurs with acceptance of this Technical Drainage Study by City of Las Vegas Public Works.

District's review of this project was limited to issues of Regional Flood Control Significance as defined in *Uniform Regulations for the Control of Drainage.*

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, information submitted by Aztec Engineering may be superseded. Compliance with regulatory elements and design standards specified in *Uniform Regulations for the Control of Drainage* does not imply a guarantee that properties will be free from flooding or flood damage. The District, its officials, or employees assume no liability for information, data, or conclusions presented by consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review.

GALE WM. FRASER, II, P.E.
General Manager/Chief Engineer

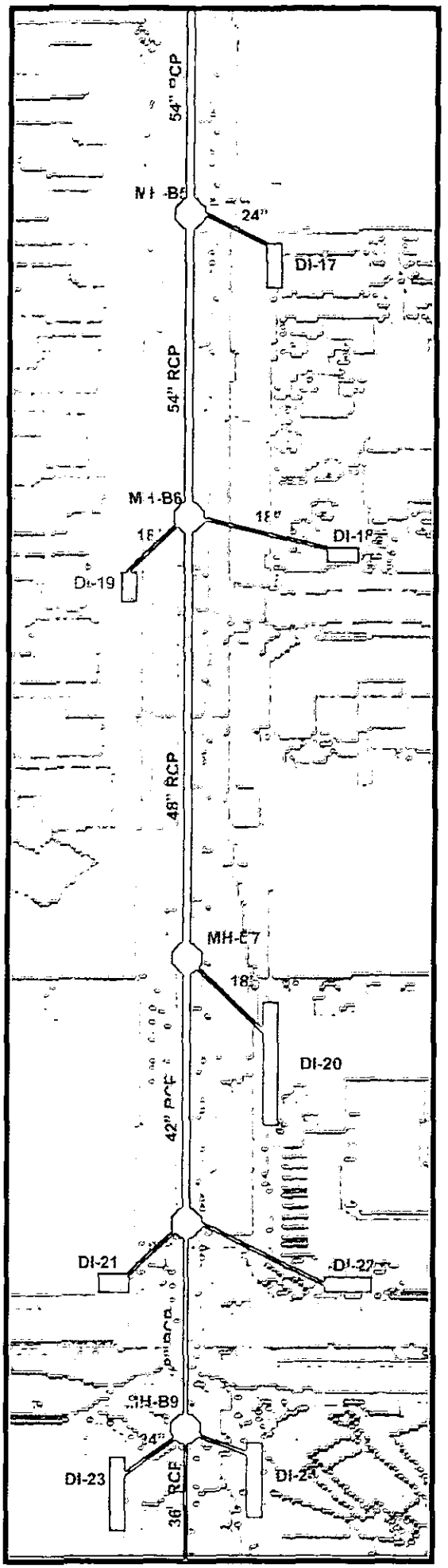
BY: _____
Andrew R. Trelease, P.E.
Senior Civil Engineer

ART:css

c: Allen E. Pavelka, P.E., Aztec Engineering

File: 20-61.31.AZT

600 S. Grand Central Parkway, Suite 300 • Las Vegas, Nevada 89106-4511
(702) 455-3139 • FAX: (702) 455-3870
Website: *http://www.ccrfcd.org*



TECHNICAL DRAINAGE STUDY

3301
W21
FOR
$720 paid

CITY OF LAS VEGAS
FIRE STATION NO. 5

Located at 1020 Hinson Street
West Side of Hinson,
Approximately 335' North of Charleston Boulevard
SE¼, Sec. 31, T20S, R61E
APN. 139-31-801-014 (a portion of)
City of Las Vegas, Nevada

October 7, 2002

Prepared for:

City of Las Vegas
Department of Public Works
Office of Architectural Services
400 East Stewart Avenue
Las Vegas, Nevada 89101

Prepared by:

AZTEC

3320 North Buffalo Drive, Suite 106
Las Vegas, Nevada 89129
Phone 702.396.3426, Fax 702.396.3758

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: City of Las Vegas Fire Station No. 5 Date: October 7, 2002

Location of Development: a) Descriptive (Cross Streets) 1020 Hinson Street, approximately 335 feet north of Charleston Boulevard

b) Sect. 31 Twn. 20S Rng. 61E

Name of Owner: City of Las Vegas Assessors Parcel No. 139-31-801-014 (a portion of)

Telephone No: 702-229-6535 Facsimile No:

Address: c/o Sam Tolman, 400 East Stewart Avenue, Las Vegas, NV 89101

Contact Person-Name: Allen E. Pavelka, P.E. Telephone No: (702) 396-3426

Firm: AZTEC Engineering

Address: 3320 North Buffalo Drive, Suite 106 Las Vegas, Nevada 89129

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	X	Building Permit		

1. Total Owned Land Area: At Site: 14± Acres Being Developed/Disturbed: 1.5± Acres
2. Is a portion of 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.)? Fire Station
5. Approximate upstream land area which drains to the subject site? 0.79± Acres
6. Has the site drainage been evaluated in the past? YES [NO] If yes, please identify documentation:
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Entire site to drain into the adjacent street (i.e., Hinson Street)
8. Briefly describe your proposed schedule for the subject project: ASAP

PROFESSIONAL ENGINEER-STATE OF NEVADA
ALLEN E. PAVELKA
CIVIL
No. 08329
10-7-02

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.

Revision	Date

Local Entity File No.

REFERENCE: STANDARD FORM 1

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LIST OF FIGURES

LIST OF APPENDICES

1.4 SOILS INFORMATION

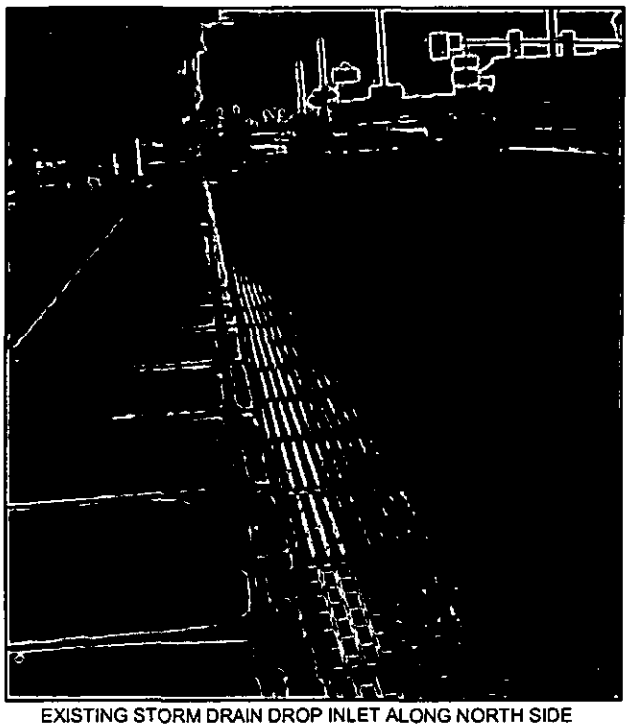
The proposed development is located within a soil type identified as 300 (see Figure 3). As shown in the Soil Survey of Las Vegas Valley Area, Nevada by the Soil Conservation Service, soil type 300 is characterized as "Las Vegas." Soil type 300 is classified with hydrologic group D, which is designated as "high runoff potential."

1.5 MASTER PLAN IMPROVEMENTS

The project site is not adjacent to any *proposed* Clark County Regional Flood Control District (CCRFCD) Facility as shown on Sheet F-14 of the February 1997 CCRFCD Master Plan Update of the Las Vegas Valley.

However, the project site is adjacent to an *existing* facility indicated as an 84-inch RCP storm drain (MECH 0034) along Hinson Street (see Figure 4A). The Master Plan specifies the existing 84-inch RCP has a capacity of 370 cfs.

A ~175-foot long storm drain drop inlet is located along the north side of Charleston Boulevard just west of Hinson Street. An existing 8' x 5' RCB connects the drop inlet with the existing CCRFCD facility (MECH 0034). Two additional storm drain drop inlets exist along the south side of Charleston Boulevard just west of Hinson Street. These drop inlets connect into the ~175-foot long drop inlet via 38" x 60" HERCP storm drain laterals. This existing storm drain system was constructed per the Meadows Detention Basin Improvement Plans (CLV Dwg No. 731-45B-1C).



EXISTING STORM DRAIN DROP INLET ALONG NORTH SIDE OF CHARLESTON BOULEVARD, WEST OF HINSON STREET

1.6 PREVIOUS DRAINAGE STUDIES

The *City of Las Vegas Flood Control Facilities Inventory and City Wide Hydrology Analysis* has been referenced to obtain the 10-year and 100-year flows at the intersection of Hinson Street and Charleston Boulevard. As shown on Sheet H-13, the 10-year and 100-year ultimate flows are 283 cfs and 611 cfs, respectively (see Figure 4B). Since, the existing CCRFCD facility has a capacity of 370 cfs, the resulting 10-year and 100-year surface flow is 0 cfs and 241 cfs, respectively. However, an existing high point is located along Hinson Street approximately 300 feet north of Charleston Boulevard. The 100-year flow depth (Q_{100} = 241 cfs) for Charleston Boulevard is 0.87 feet. The difference in elevations between the High Point (66.56') along Hinson Street and the flowline (64.75') at Charleston Boulevard is 1.8 feet. Therefore, the 100 year flow is does not overtop the existing high point along Hinson Street.

FLOW IN CHARLESTON BLVD DOES NOT IMPACT HINSON STREET

2.2 EXISTING OFF-SITE DRAINAGE BASINS

Existing off-site basins are delineated in Figure 5. **Basin OFF1** is the 0.79-acre parcel (APN. 139-31-801-007) located west of the project site. It is comprised of the proposed Elks RV Park, which is currently undeveloped. Basin OFF1 has a 10-year and 100-year existing flow of 0.3 cfs and 0.9 cfs, respectively. Flows from this basin are directed onto the existing fire station site via block wall openings and chainlink gate.

Basin OFF2 consists of the existing Elks Lodge. It is approximately 2.85 acres in size and flows generated are directed to the existing pan driveway located at the northeast corner of the Elks Lodge property. These flows then travel in a northerly direction along Hinson Street. Basin OFF2 has a 10-year and 100-year existing flow of 4.4 cfs and 8.2 cfs, respectively.

2.3 EXISTING ON-SITE DRAINAGE BASINS

Existing on-site basins are delineated in Figure 5. Basin **EX1** comprises the majority of the existing 0.88-acre fire station site and has a 10-year and 100-year existing flow of 1 cfs and 2 cfs, respectively. Flows from basin OFF1 combine with the flows from Basin EX1 at PT1. Total existing flows at PT1 are 1 cfs and 2.3 cfs for the 10-year and 100-year frequency storm, respectively.

The remaining northern portion of the existing fire station site and a portion of Hyde Park comprises Basin **EX2.** This basin drains from the west to the east. Basin EX2 generates 10-year and 100-year existing flows of 0.3 cfs and 1.5 cfs, respectively. Flows from this basin drain onto Hinson Street. Flows from PT1 and OFF2 combine with the flows from EX2 at PT2. Total existing flows at PT2 are 5.7 cfs and 12 cfs for the 10-year and 100-year frequency storm, respectively.

3.0 HYDROLOGIC ANALYSIS

3.1 HYDROLOGIC METHODOLOGY AND CRITERIA

Drainage improvements shall be designed to meet the requirements of the CCRFCD *Hydrologic Criteria and Drainage Design Manual.* The following drainage criteria have been used for this project.

3.1.1 Precipitation

According to Figure 513 of the CCRFCD *Hydrologic Criteria and Drainage Design Manual*, the project site lies within the McCarran Airport rainfall area. Hence, the precipitation analysis was based on a 6-hour duration with the estimates for the 10-year and 100-year frequency storm events.

The Modified Rational Method was used to calculate the existing and developed flows for the on-site and off-site basins. When combining basins using Standard Form 4, the initial time (t_i) was computed based on the time of concentration for the first basin. See Appendix A for supporting calculations.

3.1.2 Street Flow

Hinson Street has an 80-foot right-of-way width from Charleston Boulevard to the south property line of the fire station site. Beginning from the south property line, the right-of-way width transitions from 80 feet to 60 feet (southeast corner of Hyde Park Middle School).

Street improvements for Hinson Street will include new pavement to the west half of the roadway beginning from the south property line of the fire station site and extending to the east property line of Hyde Park Middle School. In addition, sidewalk, curb, and gutter will be installed along the west side of the roadway and will tie into the existing street improvements located at Hyde Park Middle School.

Flows conveyed to Hinson Street (beginning at high point) are directed from the existing Elks Lodge, existing fire station site, proposed Elks RV Park and a portion of Hyde Park. In the developed condition, flows conveyed to Hinson Street will be directed from the same locations (i.e., existing Elks Lodge, developed fire station site, proposed Elks RV Park and a portion of Hyde Park).

The street flow data for Hinson Street is summarized in Table 1 for the developed 10-year and 100-year frequency storms. Flow Master by Haestad Methods was used to calculate flow depths in the street and Appendix A includes the cross sections and supporting calculations.

TABLE 1 – DEVELOPED STREET FLOW DATA; CALCULATION OF V x D

Street Name	Frequency Storm	Q (cfs)	Depth (ft)	Velocity (fps)	* V x D
Hinson Street (Section A)	10-year	7.2	0.38	2.23	0.85
Hinson Street (Section A)	100-year	14.3	0.46	2.63	1.21

**Under current criteria, VxD should be less than 6 and less than 8 for the 10-year and 100-year frequency storms, respectively.*

4.0 PROPOSED DRAINAGE FACILITIES

4.1 OFF-SITE DRAINAGE FACILITIES

No off-site drainage facilities will be constructed with this project.

4.2 ON-SITE DRAINAGE FACILITIES

Developed on-site basins are shown on Figure 6. See Appendix A for supporting calculations.

On-site grading is set to shed flows away from the building pad and onto to the adjacent street. The drainage around the building pad is proposed as surface flow.

- The City of Las Vegas has opted to parcel the south 30 feet of the fire station site to be used as an access for the proposed Elks RV Park. When the Elks RV Park (OFF1) becomes developed the site will be graded to drain toward the access drive and ultimately onto Hinson Street. However, for the interim condition (prior to development of the Elks RV Park), Basin OFF1 will continue to drain onto the site via the existing block wall openings and chainlink gate.

- Flow from Basin ON1 will combine with the flow from Basin OFF1 at PT1. Combined developed flows at PT1 are 1.3 cfs and 3 cfs for the 10-year and 100-year frequency storms, respectively. These flows will be directed to Hinson Street via curb and gutter.

- Flow from Basin ON2 will be directed toward Hinson Street via curb and gutter. Total developed flows for Basin ON2 are 1.5 cfs and 3.1 cfs for the 10-year and 100-year frequency storms, respectively.

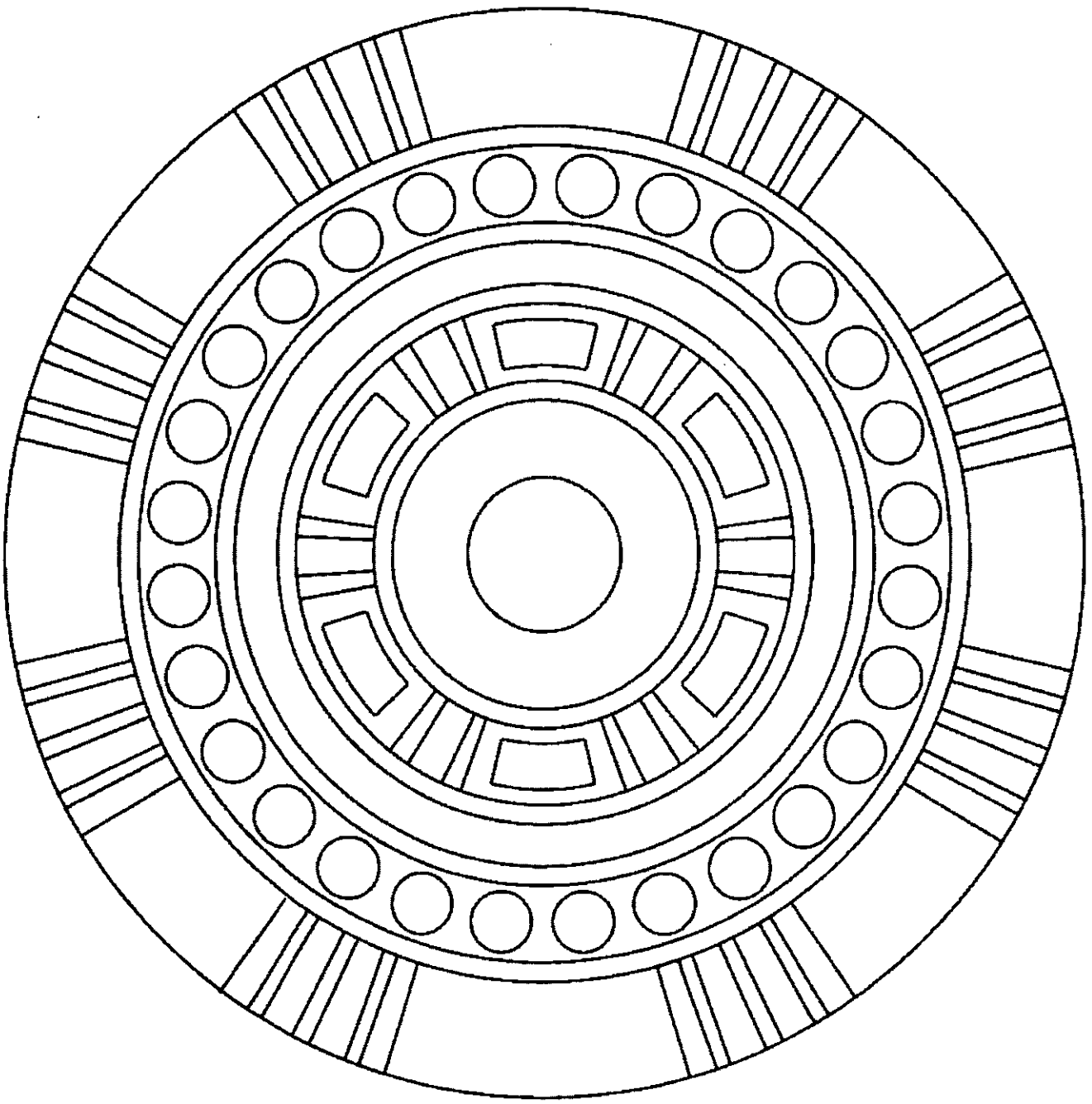
4.3 DRIVEWAY ELEVATIONS

All three driveways have continuous slopes toward the street. The 100-year inundation limit for all driveways has been identified on the Grading Plan as "PWL" (ponding water limit). The PWL line indicates that the off-site flows do not back up into the site and are safely kept away from the proposed development.

4.4 FINISHED FLOOR ELEVATIONS

The entire site is graded to shed flows away from the proposed building and direct the flows onto the adjacent street. Therefore, no sections were required next to the building pad to identify the interior flows. Adequate protection will be provided by maintaining the on-site finished floor elevation as follows:

- Finished Floor Elevation should be set at a vertical distance above the gutter flowline of at least twice the depth of flow in the gutter flowline up to a maximum of 18 inches above the water surface elevation in the street



STREET SECTION & CALCULATIONS

SECTION 1 - HINSON STREET (10-YEAR FLOW)
Worksheet for Irregular Channel

Project Description	
Worksheet	Irregular Channel - 1
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.8900	%
Discharge	7.20	cfs

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

Results		
Mannings Coefficient	0.016	
Water Surface Elevation	0.38	ft
Elevation Range	0.00 to 0.78	
Flow Area	3.2	ft²
Wetted Perimeter	25.20	ft
Top Width	24.34	ft
Actual Depth	0.38	ft
Critical Elevation	0.39	ft
Critical Slope	0.7584	%
Velocity	2.23	ft/s
Velocity Head	0.08	ft
Specific Energy	0.46	ft
Froude Number	1.08	
Flow Type	Supercritical	

MATCHED GEOMETRY FOR HS-1 STREET SECTION. HS-1 CONSERVATIVELY ANALYZED HINSON STREET AS HALF STREET.

Calculation Messages: Flow is divided.

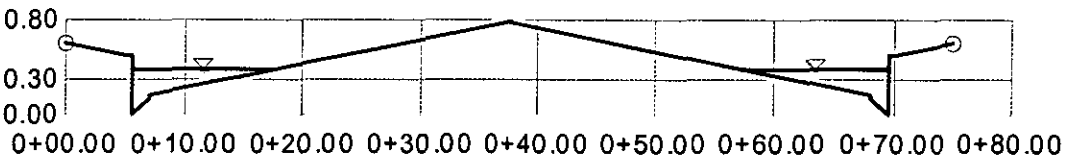
Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+75.00	0.016

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.50	0.50
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+37.50	0.78
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.50
0+70.00	0.50
0+75.00	0.60

SECTION 1 - HINSON STREET (10-YEAR FLOW)
Cross Section for Irregular Channel

Project Description	
Worksheet	Irregular Channel - 1
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.016	
Slope	0.8900	%
Water Surface Elevation	0.38	ft
Elevation Range	0.00 to 0.78	
Discharge	7.20	cfs



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NTS

SECTION 1 - HINSON STREET (100-YEAR FLOW)
Worksheet for Irregular Channel

Project Description	
Worksheet	Irregular Channel - 1
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.8900	%
Discharge	14.30	cfs

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

Results		
Mannings Coefficient	0.016	
Water Surface Elevation	0.47	ft
Elevation Range	0.00 to 0.78	
Flow Area	5.5	ft²
Wetted Perimeter	33.97	ft
Top Width	33.37	ft
Actual Depth	0.47	ft
Critical Elevation	0.49	ft
Critical Slope	0.6857	%
Velocity	2.60	ft/s
Velocity Head	0.11	ft
Specific Energy	0.58	ft
Froude Number	1.13	
Flow Type	Supercritical	

Calculation Messages: Flow is divided.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+75.00	0.016

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.50	0.50
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+37.50	0.78
0+68.00	0.17
0+68.00	0.13
0+69.50	0.50
0+70.00	0.50
0+75.00	0.60

AZTEC
37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

SECTION 1 - HINSON STREET (100-YEAR FLOW)
Cross Section for Irregular Channel

Project Description	
Worksheet	Irregular Channel - 1
Flow Element	Irregular Channel
Method	Manning's Formula
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Section Data		
Mannings Coefficient	0.016	
Slope	0.8900	%
Water Surface Elevation	0.46	ft
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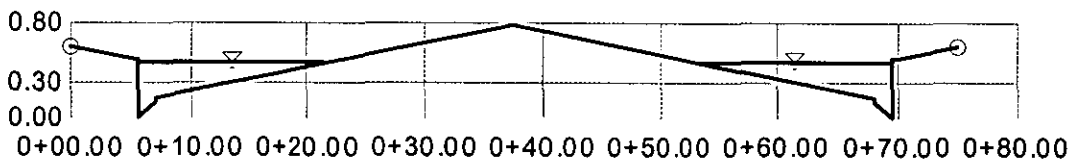
Discharge	14.30	cfs



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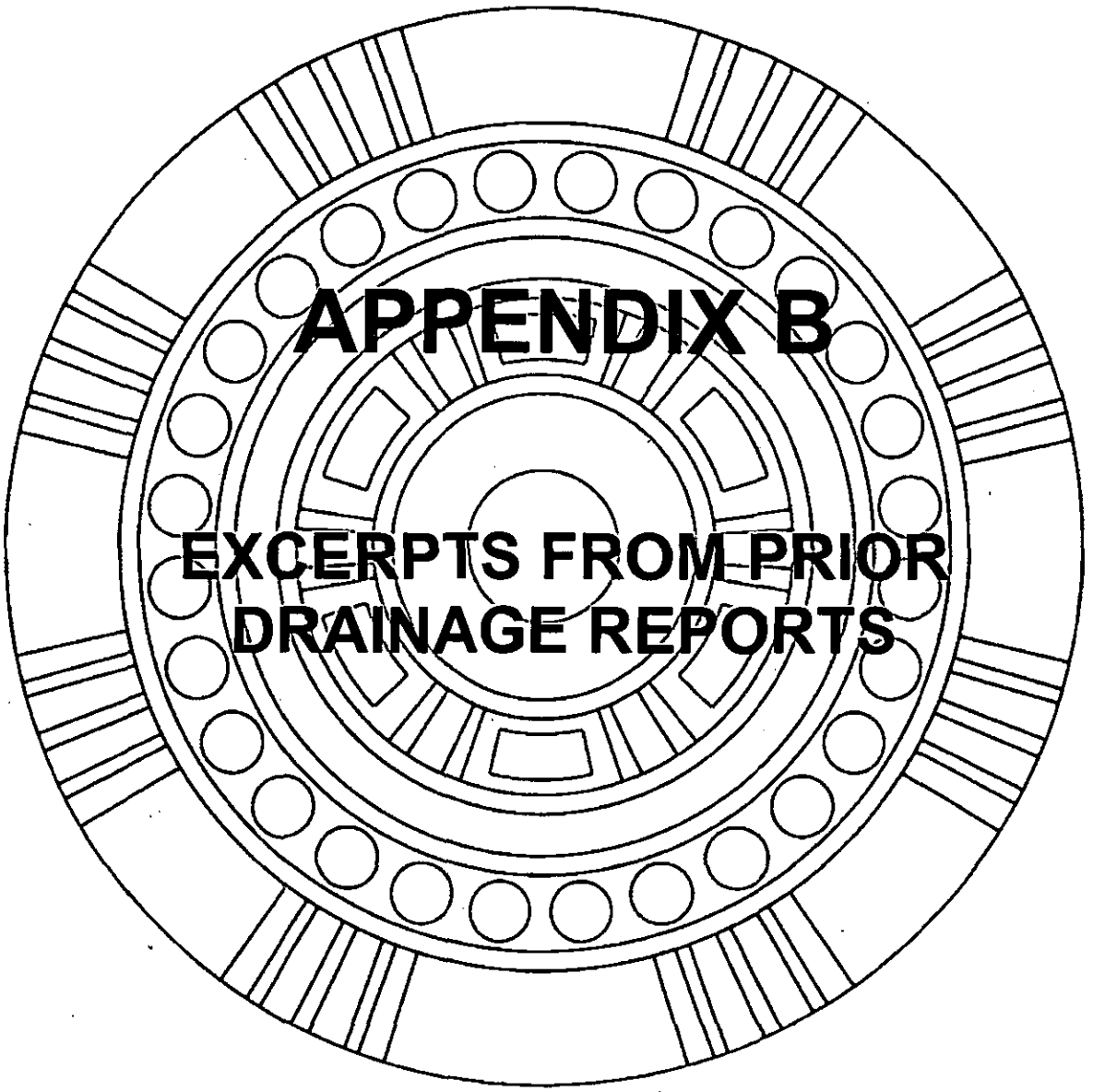

APPENDIX B

EXCERPTS FROM PRIOR DRAINAGE REPORTS

DS #: 3221

DS INDEX:

APN: 139-31-801-014

PROJECT: CLV FIRE STATION NO.5

SUBMITTAL: 2ND + OCRFCD

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: January 7, 2003
TO: **Land Development Services** Department of Public Works				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
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			TOTAL FEES (LDDRS):	**$500.00**	----

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:
X	is conditionally approved subject to Clark County Regional Flood Control District concurrence

1. **This drainage study is acceptable in concept**, however, the City of Las Vegas will not formally accept the study until the Clark County Regional Flood Control District (CCRFCD) has issued a letter of concurrence. The Engineer should contact the CCRFCD to confirm that they have begun their review.

2. The Grading Plan indicates a high point at the west end of the proposed 10-foot pubic drainage easement. In a site visit, it was noted that a gate exists along the east property wall of the Elks Lodge RV and appears that is the low point of the Elks Lodge RV property. Revise Grading Plan such that the proposed drainage easement and proposed block wall opening is centered with the existing low point to ensure that the Elks Lodge RV will drain. In addition, show an elevation for finished grade at the proposed block wall opening.

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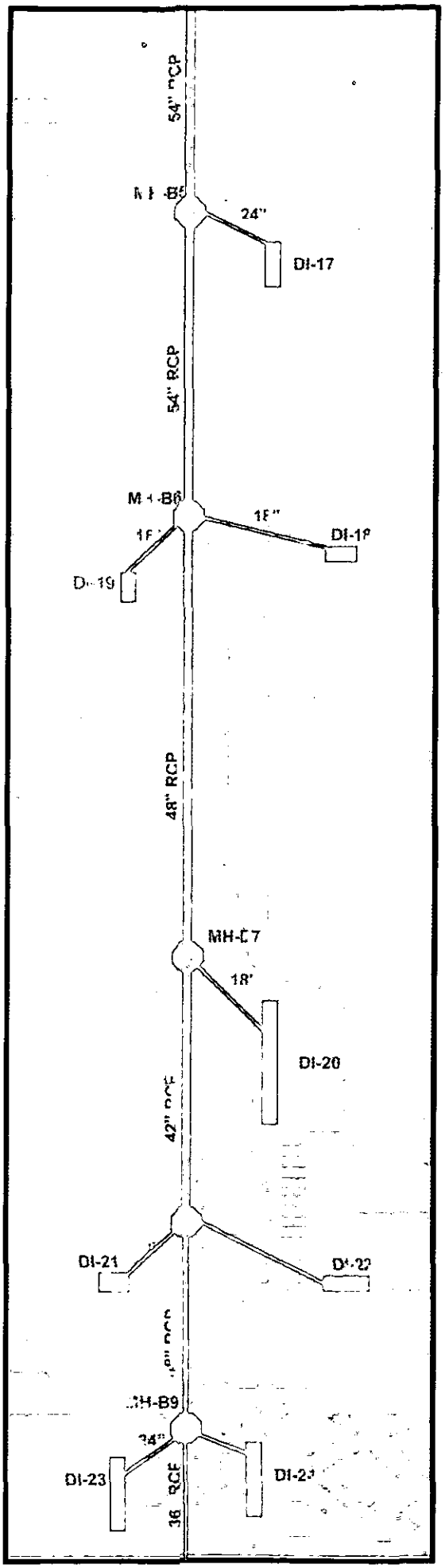
5. Show and label the existing 30' public drainage easement on the grading plan (Sheet C-7).

END OF REMARKS

ays/rac

T/R/S: T20S/R61E/31

AREA M-31



TECHNICAL DRAINAGE STUDY
ADDENDUM No. 1

DEC 5 2002

FOR

CITY OF LAS VEGAS
FIRE STATION NO. 5

3301 M31 Pd

Located at 1020 Hinson Street
West Side of Hinson,
Approximately 335' North of Charleston Boulevard
SE¼, Sec. 31, T20S, R61E
APN. 139-31-801-014 (a portion of)
City of Las Vegas, Nevada

November 18, 2002

Prepared for:

City of Las Vegas
Department of Public Works
Office of Architectural Services
400 East Stewart Avenue
Las Vegas, Nevada 89101

Prepared by:

AZTEC

3320 North Buffalo Drive, Suite 106
Las Vegas, Nevada 89129
Phone 702.396.3426, Fax 702.396.3758

TECHNICAL DRAINAGE STUDY
ADDENDUM NO. 1

City of Las Vegas
Fire Station No. 5

TABLE OF CONTENTS

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HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID G.R. #
1st Submittal	10/15/2002	10/29/2002	See Comments Below	$250.00	93190
			TOTAL FEES (LDDRS):	**$250.00**	—

REMARKS:

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

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

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

2. Show and identify an existing Clark County Regional Flood Control Facility in Hinson Street on the grading plan. Provide a 30'-wide public drainage easement (centered on the regional facility) from Hinson Street through the park parcel all the way north to Fulton Place. Submit an exhibit for the public drainage easement and a legal description to Carolyn Caviness (229-6342) of CLV Right-of-Way Section for recordation.

3. The existing Elk's Lodge RV Park drains through the Fire Station site. Provide a 10'-wide public drainage easement (privately maintained) through the site to Hinson Street.

4. Provide TC elevations on the east side of Hinson Street at regular interval. Show the right of way width on the grading plan.

5. The proposed finish floor of Fire Station No. 5 appears to be at 68.00. Label the finish floor in a more visible manner.

END OF REMARKS
ays

RECEIVED
AZTEC

T/R/S: T20S/R61E/31
AREA M-31

November 18, 2002

Mr. Albert Sung, P.E.
City of Las Vegas
Department of Public Works
Community Development
731 S. Fourth Street
Las Vegas, Nevada 89101

RE: TECHNICAL DRAINAGE STUDY, ADDENDUM NO. 1
for City of Las Vegas - *Fire Station No. 5*

Dear Mr. Sung:

This addendum letter has been prepared in response to your memorandum dated November 18, 2002. The following comments and responses are provided.

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

Response to CLV Comment 1:

Comment noted. A copy of the Technical Drainage Study and its addenda will be submitted to CCRFCD upon receipt of conditional letter of approval from the City of Las Vegas.

CLV Comment 2:
Show and identify an existing Clark County Regional Flood Control Facility in Hinson Street on the grading plan. Provide a 30'-wide public drainage easement (centered) on the regional facility) from Hinson Street through the park parcel all the way north to Fulton Place. Submit an exhibit for the public drainage easement and a legal description to Carolyn Caviness (229-6342) of CLV Right-of-Way Section for recordation.

Response to CLV Comment 2:

The Grading Plan has bee revised to show the existing CCRFCD facility within Hinson Street. A Parcel Map has been prepared and includes the dedication of the 30-foot public drainage easement (centered on the CCRCFD facility) from Hinson Street through the Hyde Park parcel to Fulton Place. The Parcel Map will be processed through the City of Las Vegas by David Roark, CLV Real Estate & Asset Management.

PROJECT DRAINAGE PATTERNS ARE CONSISTENT WITH THOSE OUTLINED BELOW FOR THE DEVELOPED CONDITION

CLV Comment 3:

The existing Elk's Lodge RV drains through the Fire Station site. Provide a 10'-wide public drainage easement (privately maintained) through the site to Hinson Street.

Response to CLV Comment 3:

A 10-foot public drainage easement (privately maintained) has been shown on the Grading Plan. This easement will be a temporary condition until the Elks Lodge RV is developed where upon the flows will be directed to the 30-foot driveway access being dedicated per the Parcel Map.

It should be noted that the existing block wall that separates the Elk's Lodge RV and the Fire Station site will be removed and replaced with a new wall. Based on Section 1600 of the CCRFCD Drainage Design Manual, a 16-inch x 48-inch block wall opening will be installed to continue to allow the Elk's Lodge RV to drain through the Fire Station site during the interim condition. The Elk's Lodge RV generates 0.9 cfs for the existing 100-year frequency storm.

CLV Comment 4:

Provide TC elevations on the east side of Hinson Street at regular interval. Show the right of way width on the grading plan.

Response to CLV Comment 4:

The Grading Plan has been revised to include TC elevations on the east side of Hinson Street as well as right-of-widths along Hinson Street.

CLV Comment 5:

The proposed finish floor of Fire Station No.5 appears to be at 68.00. Label the finish floor in a more visible manner.

Response to CLV Comment 5:

The Grading Plan has been revised to include the Finished Floor Elevation label within the building outline.

AZTEC hopes these are adequate responses to the City of Las Vegas Public Works' comments. If you have any questions about this addendum, please feel free to call me at 396-3426.

Prepared by:

Rosa A. Cortez, E.I.

Reviewed by:

Allen E. Pavelka, P.E.
11-18-02
Exp. 12-31-03

PROFESSIONAL ENGINEER-STATE OF NEVADA
ALLEN E. PAVELKA
CIVIL
No. 09029

AZTEC

DS #: 3221

DS INDEX:

APN: 139-31-801-014

PROJECT: CLV FIRE STATION NO.5

SUBMITTAL: DRAINAGE & GRADING

CITY OF LAS VEGAS
FIRE STATION NO. 5

APN. A PORTION OF 139-31-801-014

CITY OF LAS VEGAS
STATE OF NEVADA

SHEET INDEX

Mayor:
OSCAR B. GOODMAN

Councilmen:
GARY REESE
(Mayor Pro-Tem)
MICHAEL J. McDONALD
LARRY BROWN
LYNETTE B. McDONALD
LAWRENCE WEEKLY
MICHAEL MACK

City Manager:
DOUGLAS A. SELBY

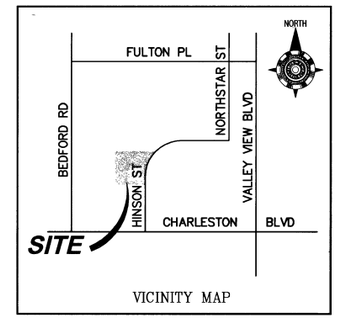
Director of Public Works:
RICHARD D. GOECKE

City Engineer:
CHARLES KAJKOWSKI, JR., P.E.

Funded By:
CITY OF LAS VEGAS

DEPARTMENT OF PUBLIC WORKS
400 EAST STEWART
LAS VEGAS, NV 89101
(702) 229-6276

BID NO.: 03-15341-02



VICINITY MAP

APN. A PORTION OF 139-31-801-014

APPROVALS

6-18-2003
CITY ENGINEER DATE
CHARLES KAJKOWSKI, JR., P.E. #4784

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

5.16.03
CITY OF LAS VEGAS FIRE & RESCUE DATE

6/18/03
M. MARGO WHEELER, ACIP, CURRENT PLANNING MANAGER DATE

THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING AND DEVELOPMENT DEPARTMENT.

6/13/03
LAS VEGAS VALLEY WATER DISTRICT (SHEETS: 1, 2 & 6) DATE

5-14-03
NEVADA POWER COMPANY DATE

NEVADA POWER COMPANY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL BE "THIS ITEM" FOR TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NEVADA POWER COMPANY RESERVES THE RIGHT TO ADDRESS ANY REVISIONS OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO THE NEVADA PUBLIC UTILITY COMMISSION'S RULES AND REGULATIONS.

5-14-03
SPRINT TELEPHONE COMPANY DATE
"THE AFFIXED SPRINT NEVADA APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS."

5.22.03
SOUTHWEST GAS CORPORATION Kenya Henderson DATE

5.14.03
COX COMMUNICATIONS, LAS VEGAS, INC. DATE

REV	DESCRIPTION	BY	DATE	APPR	DATE

PROJ NO: AZ02084
DESIGN: LG
DRAWN: LG
DATE: 05/14/03
SCALE: AS SHOWN
CADFILE: FS05_01

PROFESSIONAL ENGINEER-STATE OF NEVADA
ALLEN D. PAYLOR
No. 9029
STAMP DATE: 5-14-03
EXP. DATE: 12/31/03

3320 N. Buffalo Drive
Suite 106
Las Vegas, NV 89129-7410
Tel: 702-395-3426
Fax: 702-395-3758
Web: aztecusa

AZTEC

CITY OF LAS VEGAS
FIRE STATION NO. 5
COVER SHEET

SHEET
C-1
1 OF 23 SHEETS

PROJECT ID
630.V27-2

May 14, 2003 - 8:02am
lgracia
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53753

LANDSCAPE NOTE

CONTRACTOR SHALL MAINTAIN ALL PARK IRRIGATION SYSTEM AND REPAIR ANY DAMAGE TO IRRIGATION SYSTEM THAT ARISES DURING CONSTRUCTION. THE CONTRACTOR SHALL RE-TURF THE 15' WIDE CONSTRUCTION/LANDSCAPE LIMITS AREA AND SHALL ALSO RE-TURF THE STAGING AREA.

FIRE STATION 5

FINISH FLOOR ELEV = 2168.00

FINISH FLOOR ELEV = 2167.25

CONSTRUCTION STAGING AREA

LANDSCAPE LIMITS

CONSTRUCTION/LANDSCAPE LIMITS

EXISTING HYDE PARK MIDDLE SCHOOL

60.00' ROW

30.00' PUBLIC DRAINAGE EASEMENT

TRANSITIONAL "A" CURB

(TRANSITIONING FROM 60' TO 80' ROW WIDTH)

HINSON STREET (PUBLIC)

EXISTING PARKING

PROPOSED ELKS RV PARK

EXISTING BLOCK WALL TO REMAIN IN PLACE

EXISTING BLOCK WALL TO BE REMOVED & REPLACED

10.00' PUBLIC DRAINAGE EASEMENT TO BE PRIVATELY MAINTAINED

UNDERGROUND FUEL TANK

TRAN

HIGH POINT/GRADE BREAK

PROJECT SITE

EXISTING ELKS LODGE

80.00' ROW

10+00 CHARLESTON BLVD.

NORTH

SCALE: 1"=20'

20 0 20 40

SCALE FEET

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.

FOR CONSTRUCTION WITHIN RIGHT-OF-WAY SEE SHEET C-9, PLAN AND PROFILE FOR HINSON STREET.

NOTE

SIGHT VISIBILITY RESTRICTION ZONE SEE SHEET C-5 FOR SVRZ INFORMATION

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

BENCHMARK

CITY OF LAS VEGAS VERTICAL CONTROL #7C01 3154 BEING AN ALUMINUM RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF CHARLESTON BOULEVARD AND BEDFORD ROAD. ELEVATION 2169.48 FEET NAVD88 661.258 METERS NAVD88

BASIS OF BEARING

SOUTH 89°46'33" EAST, BEING THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW1/4) OF THE SOUTHEAST QUARTER (SE1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.M. AS SHOWN BY MAP THEREOF ON FILE IN FILE 48 OF SURVEYS, PAGE 20 OF OFFICIAL RECORDS, IN THE COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA.

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

ALLEN E. PAVELKA, P.E. NO. 9029 — DATE 5-14-03

CONSTRUCTION NOTES

1. CONSTRUCT 24" "L" TYPE CURB & GUTTER PER USD NO. 216 (SEE SHEET C-15).
2. CONSTRUCT "A" TYPE CURB PER DETAIL 1 SHEET C-12.
3. CONSTRUCT CONCRETE PAVEMENT PER DETAIL 2 SHEET C-12.
4. CONSTRUCT VALLEY GUTTER PER DETAIL 3 SHEET C-12.
5. CONSTRUCT 4" CONCRETE SIDEWALK (5') PER USD NO. 234 (SEE SHEET C-15).
6. CONSTRUCT SIDEWALK RAMP PER USD NO. 235. (CASE I, A=8', B=8' UNLESS OTHERWISE NOTED) (SEE SHEET C-15).
7. CONSTRUCT COMMERCIAL DRIVEWAY PER USD NO. 222A (SEE SHEET C-15). CONSTRUCT CROSS GUTTER PER USD NO. 228 (SEE SHEET C-15)
8. CONSTRUCT SIDEWALK DRAIN PER USD NO. 236 (SEE SHEET C-16).
9. CONSTRUCT CMU WALL PER DETAIL 9 SHEET C-14.
10. PROPOSED LANDSCAPING - SEE LANDSCAPE PLAN.
11. CONSTRUCT COMMERCIAL DRIVEWAY (OPTION A) PER USD NO. 224 (SEE SHEET C-15).
12. INSTALL 16"x48" BLOCK WALL OPENING PER DETAIL 7, SHEET C-12.
13. ROTATE EXISTING MANHOLE SHAFT TO PLACE RIM ON NORTH SIDE OF PROPOSED CURB.
14. REMOVE & REPLACE 5' OF EXISTING VALLEY GUTTER WITH TRANSITION TO MATCH INTO SIDEWALK DRAIN.
15. CONSTRUCT CONCRETE RECTANGULAR CHANNEL PER DETAIL 8 SHEET C-12.
16. INSTALL TRASH ENCLOSURE WALL & GATE PER DETAIL 10 SHEET 14.
17. INSTALL CONCRETE PAD.

FULTON PL, NORTHSTAR ST, VALLEY VIEW BLVD, BEDFORD RD, HINSON ST, CHARLESTON BLVD, SITE, NORTH

VICINITY MAP

LEGEND & ABBRIVIATIONS

	CENTERLINE
	PROPERTY LINE
2480	EXISTING CONTOUR
88.50 TC	DESIGN ELEVATION
(88.50) TC	EXISTING ELEVATION
AC	ASPHALTIC CONCRETE PAVEMENT
AP	ANGLE POINT
EOP	EDGE OF PAVEMENT
FF	FINISH FLOOR
FG	FINISH GRADE
FL	FLOW LINE
HP	HIGH POINT
TC	TOP OF CURB
TOE	TOE OF SLOPE
TOP	TOP OF SLOPE
SW	SIDEWALK

DIMENSIONS NOTES

ALL DIMENSIONS ARE TO THE BACK OF CURB UNLESS NOTED OTHERWISE.

Avoid cutting underground utility lines. It's costly.

Call before you Dig.

1-800-227-2600

UNDERGROUND SERVICE (USA)

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.

CALL BEFORE YOU DO OVERHEAD

1-702-593-6111

53760

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May 14, 2003 - 8:04am

Igracia

REV	DESCRIPTION	BY	DATE	AGEN. APP	DATE

PROJ NO: AZ02084
DESIGN: LG
DRAWN: LG
DATE: 05/14/03
SCALE: AS SHOWN
CADFILE: FS05_08

PROFESSIONAL ENGINEER - STATE OF NEVADA - ALLEN E. PAVELKA - CIVIL - No. 9029

STAMP DATE: 5-14-03
EXP. DATE: 12/31/03

AZTEC
3320 N. Buffalo Drive
Suite 106
Las Vegas, NV 89129-7410
Tel: 702-396-3426
Fax: 702-396-3758
Web: aztecusa

CITY OF LAS VEGAS
FIRE STATION NO. 5
GRADING PLAN

SHEET C-8
8 OF 23 SHEETS

PROJECT ID 630.V27-2

PROJECT SITE

EXISTING ELKS LODGE

FIRE STATION NO. 5

HINSON STREET

EXISTING HYDE PARK MIDDLE SCHOOL

60.00' ROW

SCALE 20 0 20 40 FEET

SCALE:1"=20'

NORTH

RADIUS = 125.00'
LENGTH = 196.37'
DELTA = 90°00'31"
TANGENT = 125.02'

65' (TRANSITIONING FROM 80' TO 60' ROW WIDTH)

CONSTRUCTION NOTES

1. CONSTRUCT 24" "L" TYPE CURB & GUTTER PER USD NO. 216 (SEE SHEET C-15).
2. CONSTRUCT 4" CONCRETE SIDEWALK (5') PER USD NO. 234 (SEE SHEET C-15).
3. CONSTRUCT SIDEWALK RAMP PER USD NO. 235. (CASE I, A=8', B=8' UNLESS OTHERWISE NOTED) (SEE SHEET C-15).
4. CONSTRUCT COMMERCIAL DRIVEWAY PER USD NO. 222A (SEE SHEET C-15). CONSTRUCT CROSS GUTTER PER USD NO. 228 (SEE SHEET C-15).
5. CONSTRUCT COMERCIAL DRIVEWAY (OPTION A) PER USD NO. 224 (SEE SHEET C-15).
6. CONSTRUCT SIDEWALK DRAIN PER USD NO. 236 (SEE DETAIL SHEET C-16).
7. REMOVE & REPLACE 5' OF EXISTING VALLEY GUTTER WITH TRANSITION TO MATCH INTO SIDEWALK DRAIN.
8. CONSTRUCT ASPHALT PAVEMENT PER DETAIL 5 SHEET C-12.

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

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY!
CALL BEFORE YOU DO OVERHEAD
1-702-593-6111

HINSON STREET
HORIZ. 1" = 20'
VERT. 1" = 2'

MATCH EXISTING
LEFT SIDE FLOW LINE
8" "L" TYPE CURB & GUTTER PER DETAIL 1 SHEET C-20
"L" TYPE CURB & GUTTER PER USD NO 216
MATCH EXISTING GROUND @ CENTERLINE
LEFT SIDE TOP OF CURB
MATCH EXISTING

W. ELEV 5.00

13+00 14+00 15+00 16+00 17+00 18+00

PROJ NO:	AZ02084
DESIGN:	LG
DATE:	05/14/03
SCALE:	AS SHOWN
CADFILE:	FS05_09

PROFESSIONAL ENGINEER-STATE OF NEVADA
ALLEN E. RAVENCROFT
CIVIL
No. 9029
STAMP DATE: 5-14-03
EXP. DATE: 12/31/03

3320 N. Buffalo Drive
Suite 105
Las Vegas, NV 89129-7410
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Fax: 702-395-3758
Web: aztec.us
AZTEC

CITY OF LAS VEGAS
FIRE STATION NO. 5

PLAN & PROFILE
HINSON STREET

SHEET C-9
9 OF 23 SHEETS

PROJECT ID 630.V27-2

Jun 09, 2003 - 1:17pm Igracia
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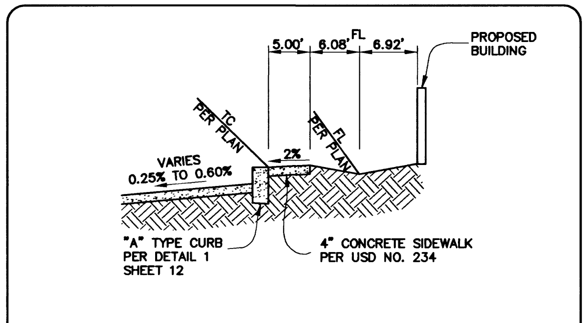
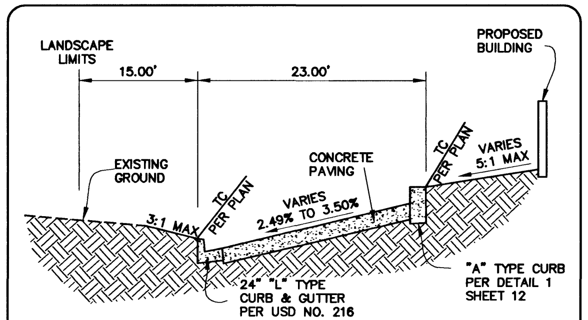
53761

F:\AZ02084\Cadd\dwg\fs05_12.dwg
lgracia
Jun 09, 2003 - 1:17pm
53764



H Grading Section
NO SCALE



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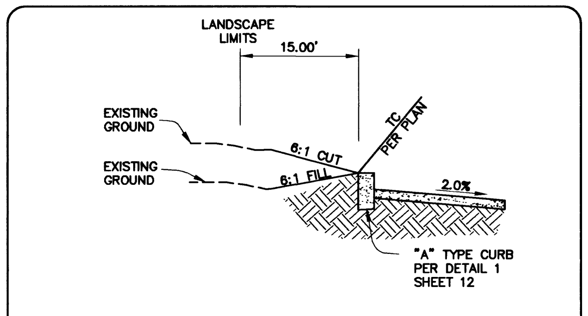

F Grading Section
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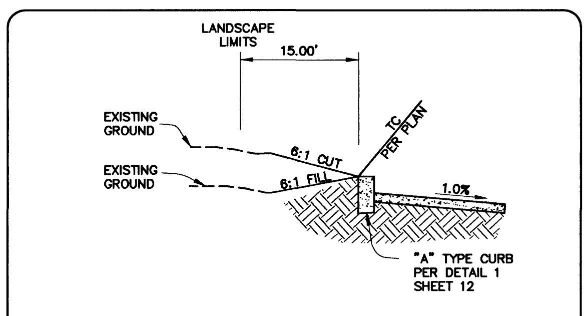

E Grading Section
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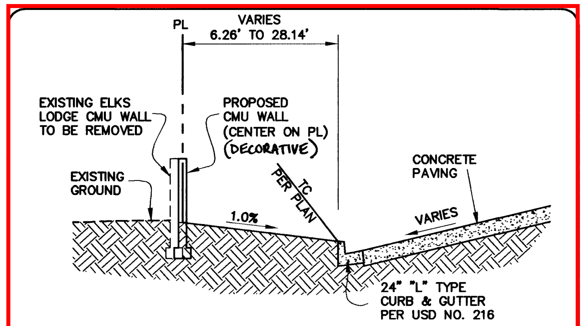
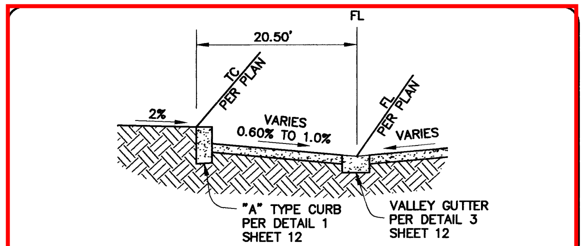
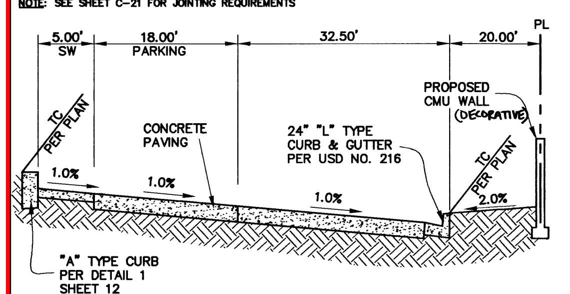


D Grading Section
NO SCALE



C Grading Section
NO SCALE

NOTE: SEE SHEET C-21 FOR JOINTING REQUIREMENTS



B Grading Section
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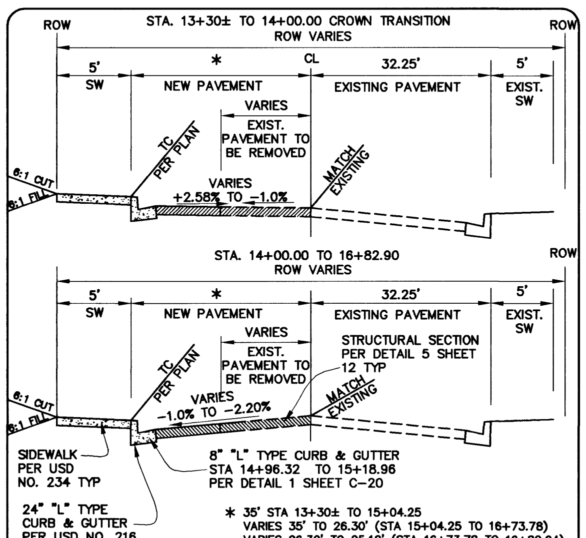
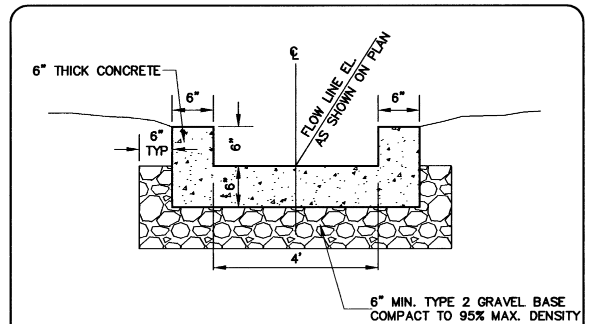
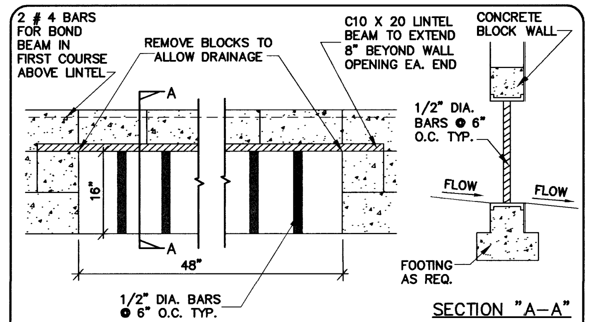


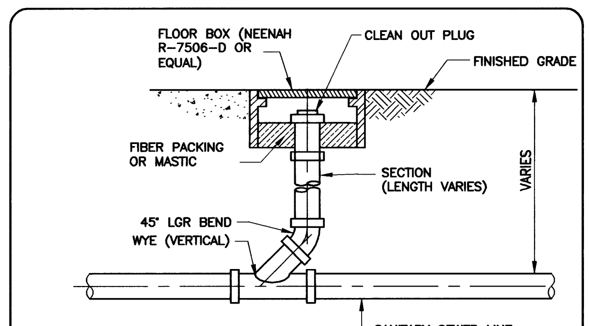
A Grading Section Hinson Street
NO SCALE



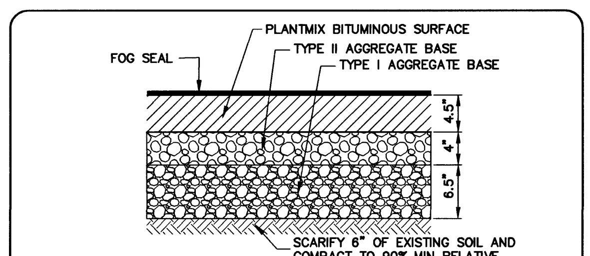
8 Concrete Rectangular Channel
NO SCALE



7 Block Wall Opening
NO SCALE



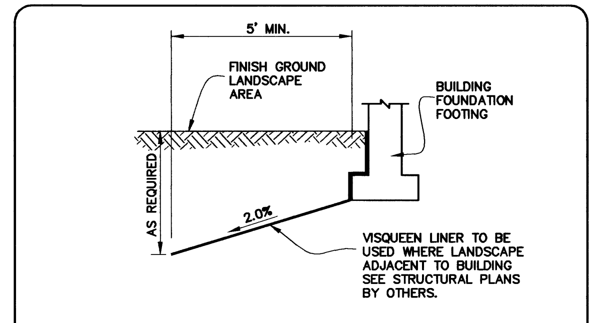
6 Cleanout Cover
NO SCALE



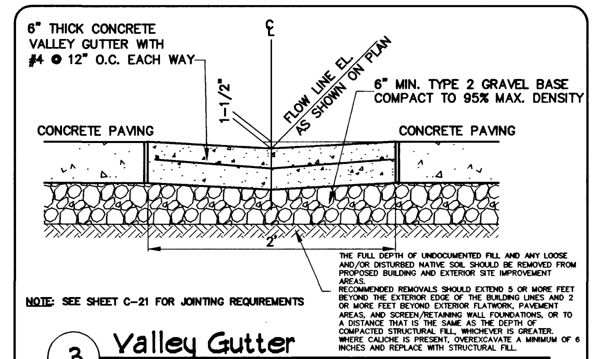
NOTES:

1. TYPE II AGGREGATE BASE COMPACTED TO 95% MAX. DENSITY

5 Pavement Section Hinson Street
NO SCALE

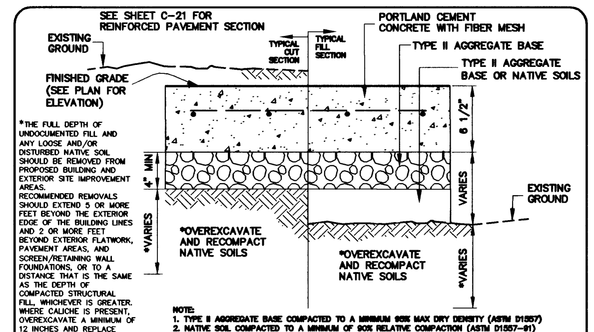


4 Visqueen Detail
NO SCALE



NOTE: SEE SHEET C-21 FOR JOINTING REQUIREMENTS

3 Valley Gutter
NO SCALE

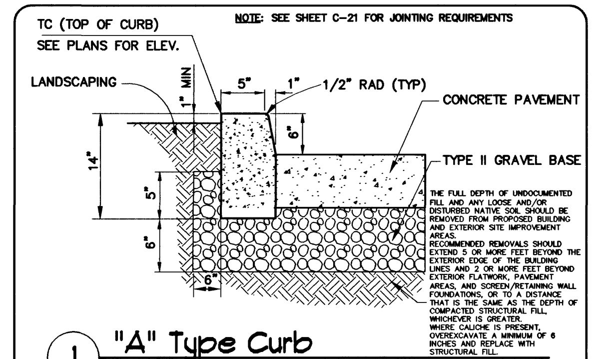


NOTE:

1. TYPE II AGGREGATE BASE COMPACTED TO A MINIMUM 95% MAX DRY DENSITY (ASTM D1557)
2. NATIVE SOIL COMPACTED TO A MINIMUM OF 90% RELATIVE COMPACTION (ASTM D1557-91)

2 Concrete Pavement
NO SCALE

NOTE: SEE SHEET C-21 FOR JOINTING REQUIREMENTS



1 "A" Type Curb
NO SCALE

PROJ NO:	AZ02084
DESIGN:	LG
DATE:	05/14/03
SCALE:	AS SHOWN
CADFILE:	FS05_12

PROFESSIONAL ENGINEER - STATE OF NEVADA
ALLEN E. PAVELKA
CIVIL
No. 9029

STAMP DATE: 5-14-03
EXP. DATE: 12/31/03

AZTEC
3320 N. Buffalo Drive
Suite 106
Las Vegas, NV 89129-7410
Tel: 702-396-3426
Fax: 702-396-3758
Web: aztec.us

CITY OF LAS VEGAS
FIRE STATION NO. 5
CONSTRUCTION DETAILS I

SHEET
C-12
12 OF 23 SHEETS

PROJECT ID
630.V27.2