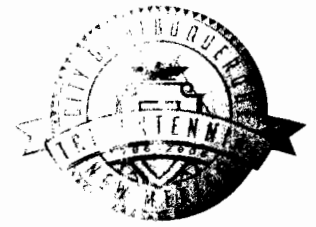


CITY OF ALBUQUERQUE



May 19, 2006

Ray Macy, P.E.
The Group
2340 Menaul Blvd. NE
Albuquerque, NM 87107

**Re: The Falls Restaurant Grading and Drainage Plan
Engineer's Stamp dated 5-18-06 (A13/D10B)**

Dear Mr. Macy,

Based upon the information provided in your submittal dated 5-18-06, the above referenced plan is approved for Foundation Permit, Building Permit and Grading Permit. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

Also, prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit. If you have any questions feel free to call the Municipal Development Department Hydrology Section at 768-3654 (Charles Caruso).

If you have any questions, you can contact me at 924-3695.

Sincerely,

Curtis A. Cherne, E.I.
Engineering Associate, Planning Dept.
Development and Building Services

C: file
Charles Caruso, DMD

SECTION _____

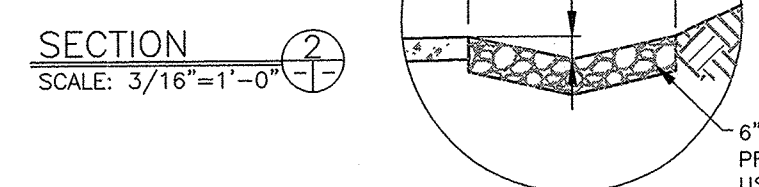
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SECTION _____ (2)
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S/W SWALE DETAIL

SECTION _____

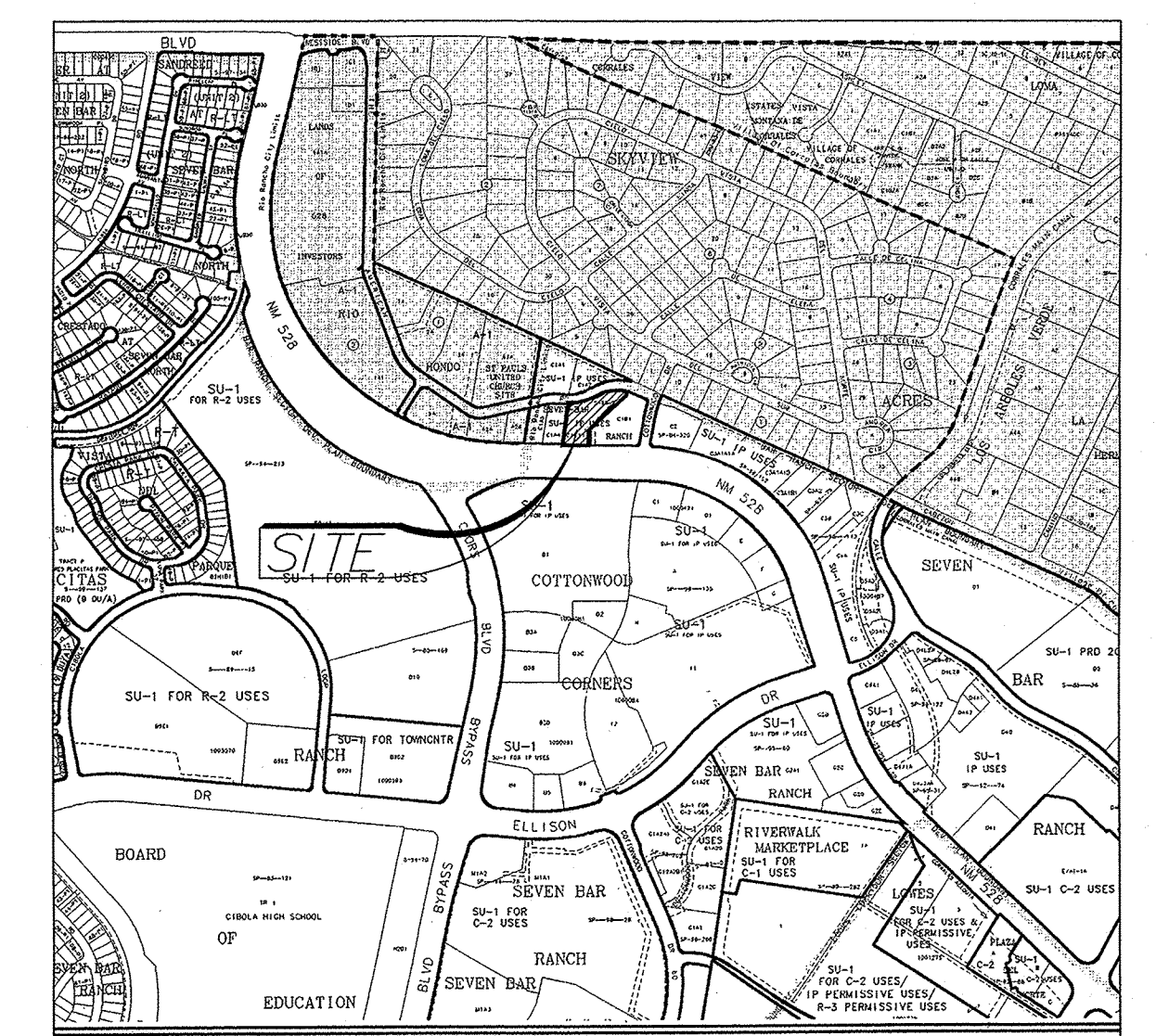
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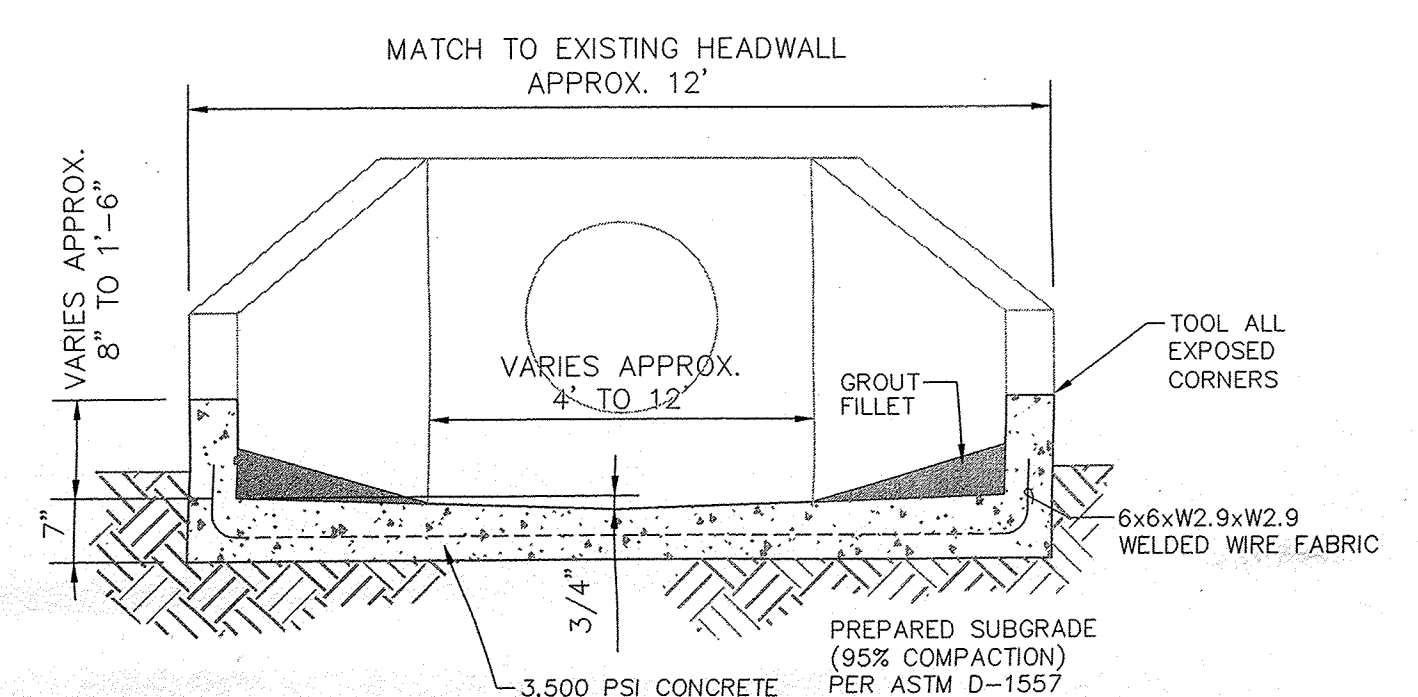
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- NOTE TO CONTRACTORS
1. AN EXCAVATION/CONSTRUCTION PERMIT WILL BE REQUIRED BEFORE BEGINNING ANY WORK WITHIN THE CITY RIGHT-OF-WAY.
 2. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED, EXCEPT AS OTHERWISE STATED OR PROVIDED FOR HEREON, SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1986 EDITION AS REVISED THROUGH UPDATE #7.
 3. TWO WORKING DAYS PRIOR TO ANY EXCAVATION, THE CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL SYSTEM (260-1990) FOR LOCATION OF EXISTING UTILITIES.
 4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL CONSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
 5. BACKFILL COMPACTION SHALL BE ACCORDING TO TRAFFIC/STREET USE.
 6. MAINTENANCE OF THESE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY SERVED.
 7. WORK ON ARTERIAL STREETS SHALL BE PERFORMED ON A 24-HOUR BASIS.




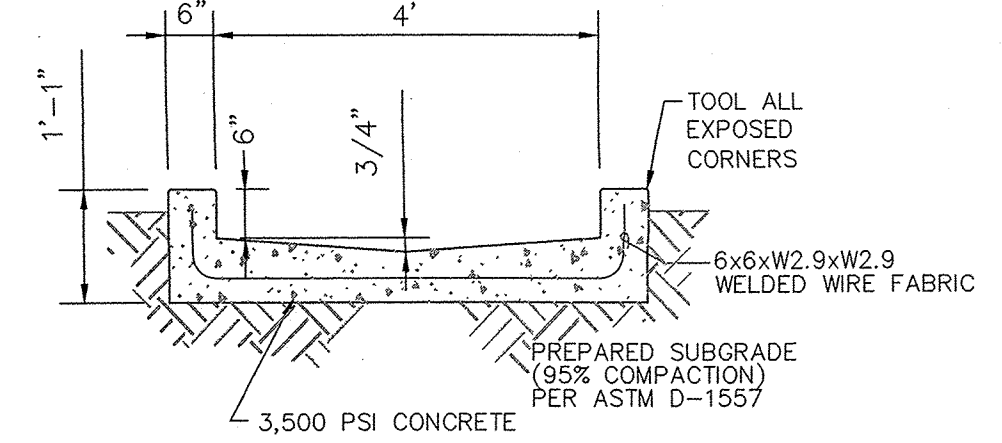
 VICINITY MAP
ZONE ATLAS MAP A-13 & A-14 SCALE: 1"=1000'



SECTION _____


SCALE: 1/2"=1'-0"

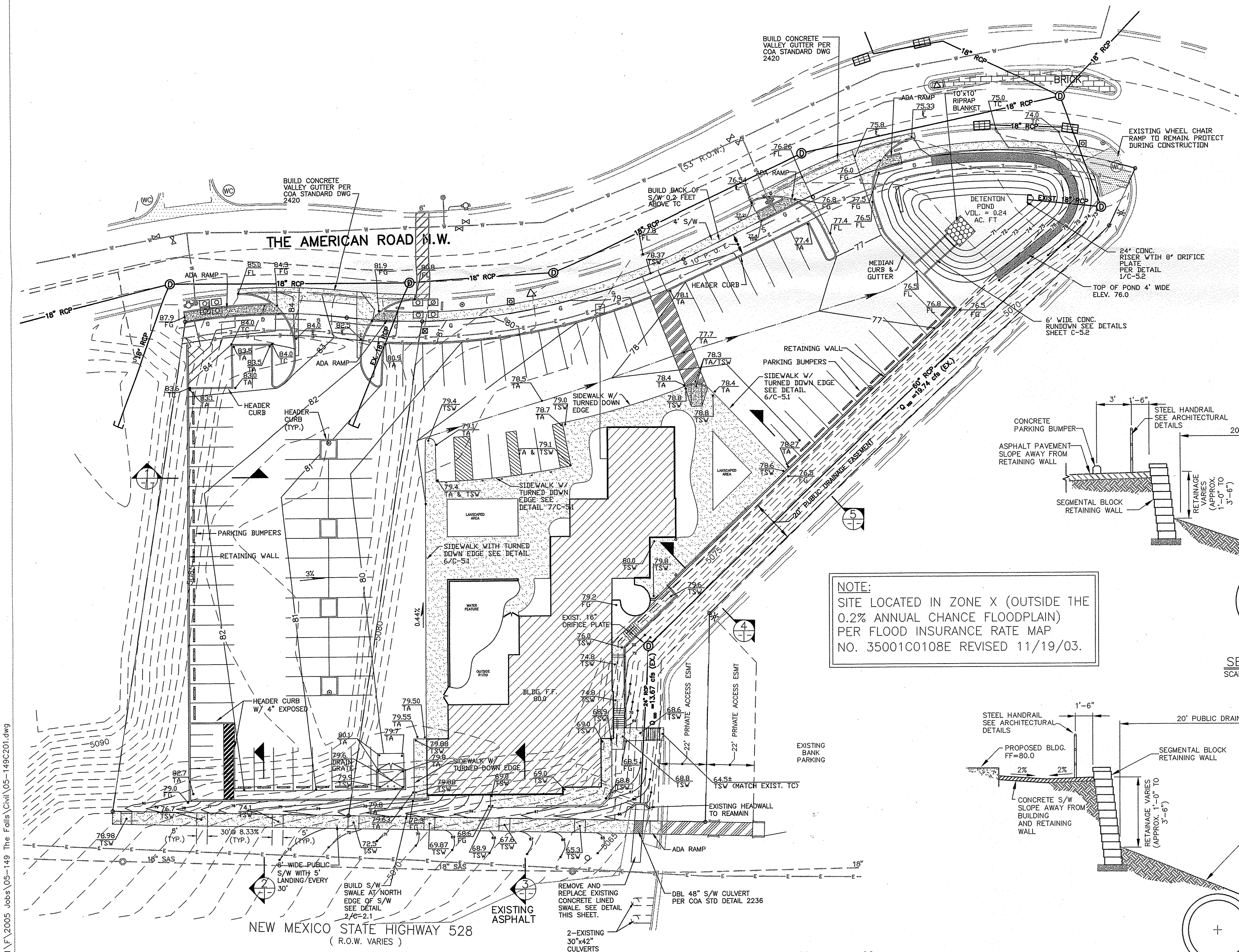




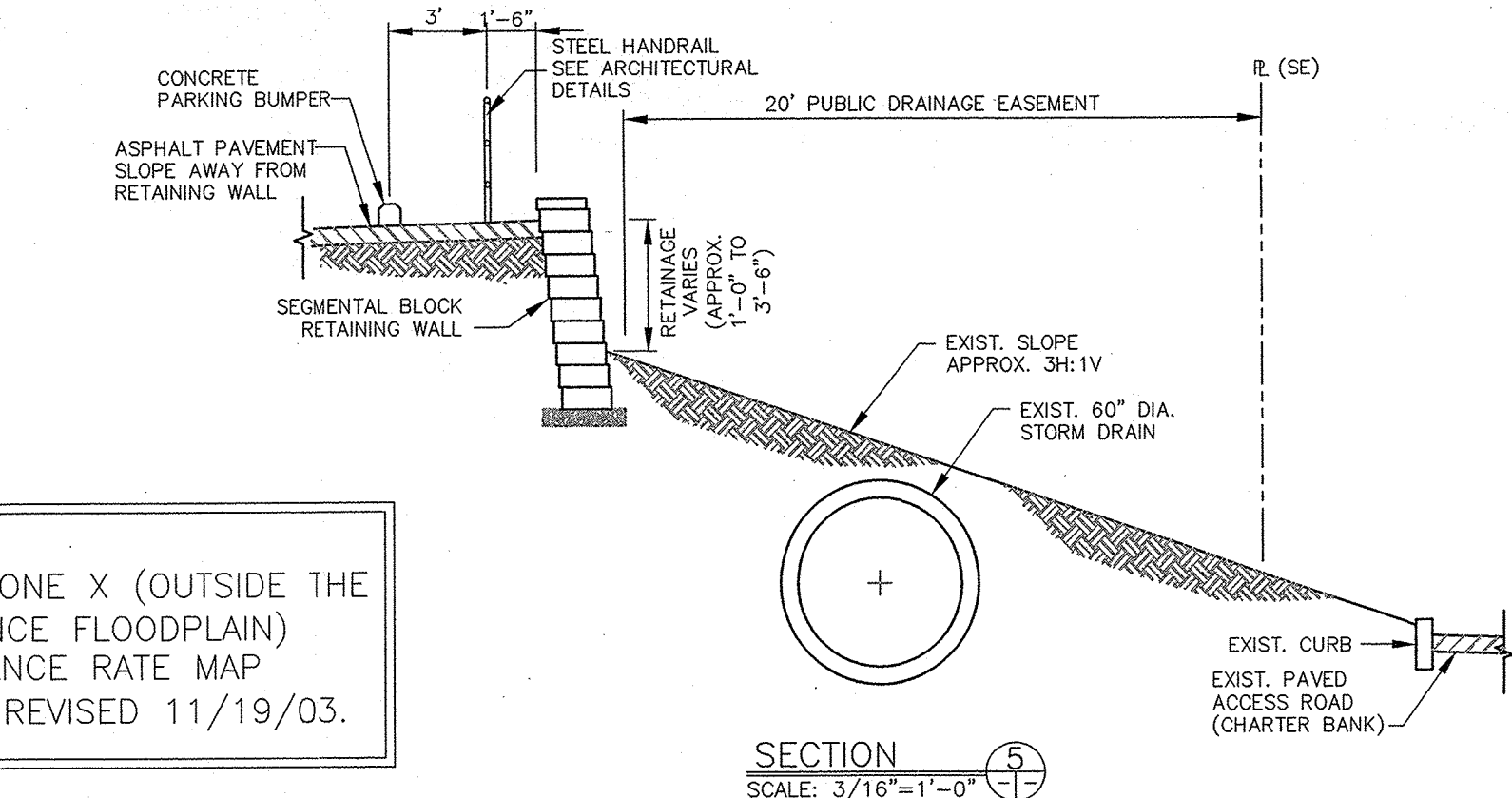
SECTION _____


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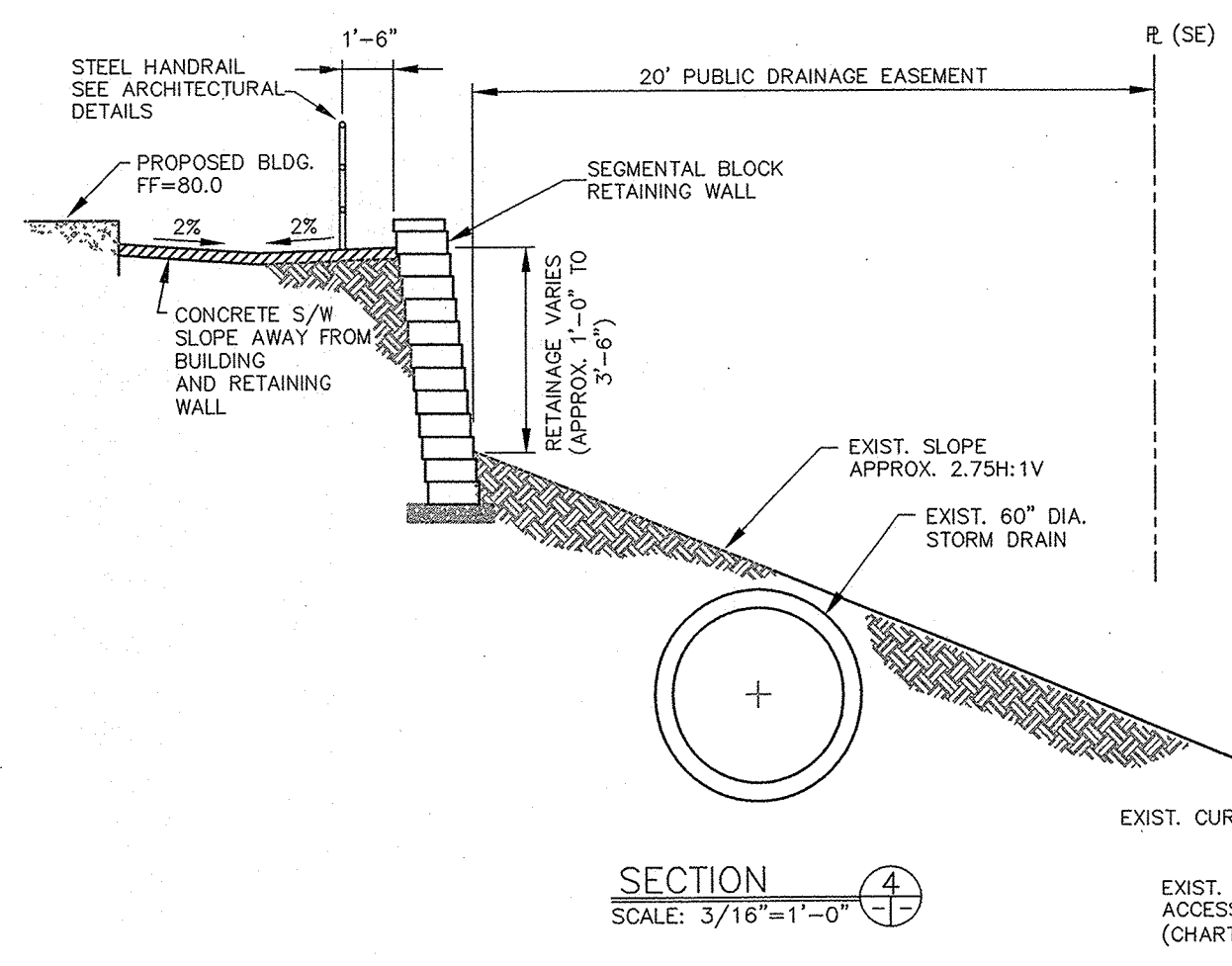






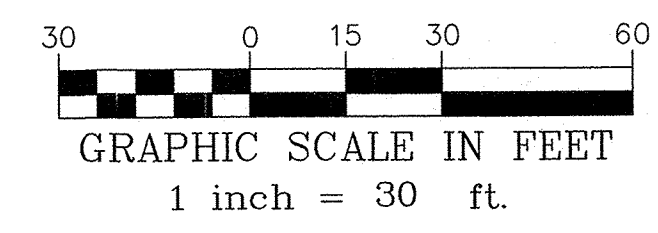
NOTE:
SITE LOCATED IN ZONE X (OUTSIDE THE
0.2% ANNUAL CHANCE FLOODPLAIN)
PER FLOOD INSURANCE RATE MAP
NO. 35001C0108E REVISED 11/19/03.





SECTION
SCALE: 3/16"=1'-0" 

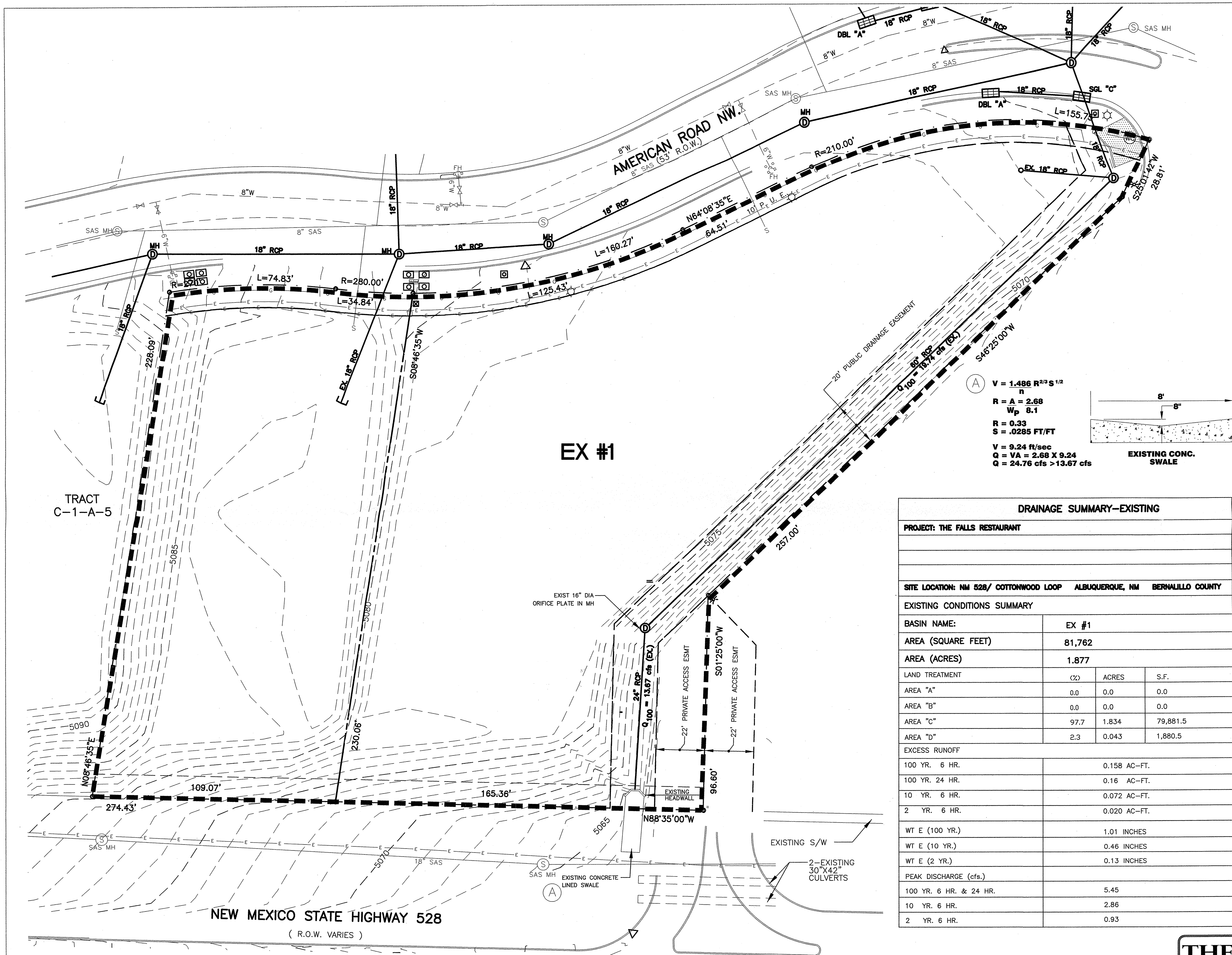


SECTION 
SCALE: 3/16"=1'-0"

 GRADING PLAN

PROJECT		REVISIONS
THE FALLS RESTAURANT		① 12/21/05
		② 01/27/06
		③ 04/17/06
THE FALLS RESTAURANT GROUP ALBUQUERQUE, NEW MEXICO		JOB NUMBER 0503
<p>This drawing is an instrument of service and the property of C.B.L. Architects, Ltd. This drawing may not be reproduced or reproduction hereof used without their written permission.</p>		SHEET TITLE GRADING PLAN
		 <p>C•B•L ARCHITECTS, LTD. ARCHITECTS • PLANNERS, AIA 1700 LOOWAVER BLVD NE, SUITE 300 ALBUQUERQUE, NM 87110 PHONE (505)766-1020 FAX (505)766-9305</p>
DATE 05/01/06	SHEET NO. C-2.1	

Time: 12:33:59
Date: 1/23/2006MDF
Drawing File: \\Server1\F\2005 Jobs\05-149 The Falls\Civil\05-149C201.dwg



I. PURPOSE AND SCOPE

The purpose of this drainage plan is to present the existing drainage conditions and proposed drainage management plan for a new restaurant building and related parking lot at a proposed site located adjacent to the north side of NM 528 on Albuquerque's West Side.

II. SITE DESCRIPTION AND HISTORY

The site, covering approximately 1.88 acres, is located between NM 528 and The American Road, NW one block west of Cottonwood Road (previously known as Ellison Drive). Ground elevations drop approximately 10' across the property from west to east. The proposed site and adjacent parcels to the west were graded and terraced in the late 1990's resulting from development of a commercial subdivision. The American Road was constructed as part of this development with full improvements including asphalt paving, concrete curb and gutter, water, sewer, storm drain, power, natural gas and telephone. Access to the proposed site improvements will be from The American Road. There are no significant arroyos or other prominent natural drainage courses across the property.

III. COMPUTATIONAL PROCEDURES

Hydrologic analysis was performed based on the methods and criteria in Section 22.2 of the City of Albuquerque Development Process Manual (DPM) published in July 1997.

IV. PRECIPITATION

The 100-year, 24-hour storm has been used as the design storm for this analysis since a detention basin is proposed to collect and control runoff leaving the site. The project is located within Zone 1 as identified in DPM Section 22.2. Tables in Section 22.2 were used to establish excess runoff volume and peak discharge rate from the design storm.

V. EXISTING DRAINAGE CONDITIONS OVERVIEW

The entire site was graded and terraced in the late 1990's creating two nearly flat building pad surfaces separated by 3H:1V earthen slopes. About 98% of the site is undeveloped. Weeds and a few native grasses and shrubs have grown back on the graded surface. A small portion of the property includes a paved access easement used primarily by the adjacent bank at the east edge of the site. On-site soils appear to be mostly sands and slightly silty sands.

Street and storm drain improvements in The American Road divert upland runoff away from the property. Curb inlets and an 18-inch diameter storm drain collect street runoff and controlled runoff from adjacent developments. At the east end of the property the 18-inch storm drain is directed southward toward NM 528 within a 20' wide public drainage easement. The storm drain increases to a 60-inch diameter pipe within the easement for a distance of approximately 290 feet. A 16-inch diameter orifice has been installed in a manhole at the south end of the 60-inch storm drain to control the rate of discharge. The 60-inch pipe is on a 0.30 percent grade and together with the restricting orifice serves as a buried detention facility. The invert elevation of the existing 60-inch pipe along the east edge of the site varies between elevation 5064 and 5065. As-built drawings indicate that 100-year runoff in the 60-inch storm drain is about 19.7 cfs. This is reduced to 13.7 cfs at the orifice discharge. From the south end of the 60-inch pipe a 24-inch diameter outfall storm drain has been constructed for a distance of about 76 feet. The 24-inch pipe discharges into an open channel located on the north side of NM 528.

Under existing conditions most of the site runoff presently collects within the terraced areas or drains to the south gutter line of The American Road. Runoff entering The American Road will drain to curb inlets then to the 18-inch storm drain. At the east edge of the site, runoff will drain off the existing earth slope onto the access easement and discharge by surface into the open channel at the north side of NM 528. Using current hydrology methods, total estimated runoff from the existing site during a 100-year, 24-hour storm is 0.16 acre-feet with a total peak discharge rate of 5.45 cfs.

VI. PROPOSED DRAINAGE MANAGEMENT PLAN

Planned improvements include construction of a new restaurant building with a footprint area of approximately 8,515 sq. ft. Parking lot and landscape improvements are also proposed. Because of the 10-foot elevation change across the The American Road frontage, and since the site is nearly ten feet higher than NM 528, several retaining walls are proposed. The highest wall will retain about 7.5 feet on the west property line near the northwest corner of the site.

Two developed basins are anticipated. Proposed Basin No. 1 is a long, narrow basin at the south and east edges of the site. Runoff leaving this basin will drain by surface to the open channel on the north side of NM 528. The 100-year, 24-hour volume is 0.032 acre-feet with a total peak flow rate of 0.93 cfs. Proposed Basin No. 2, will drain to a new detention pond at the northeast corner of the site. The 100-year, 24-hour excess runoff volume is 0.297 acre-feet with a total peak flow rate of 6.64 cfs.

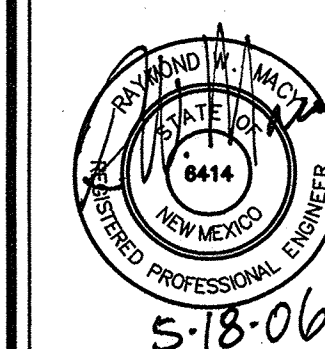
The proposed detention pond will have a volume of about 0.24 acre-feet below contour 5076. This is eighty percent of the 24-hour runoff volume of 0.297 acre-feet from the contributing developed runoff. An 18-inch diameter outfall pipe will be constructed from the pond to the existing storm drain with connection at an existing manhole just south of The American Road. The outfall pipe will be fitted with a 24-inch diameter RCP riser and grate. The grate will be set at elevation 5072, just above the pond bottom. An 8-inch diameter orifice plate will be installed at the up-stream end of the detention basin outfall pipe to limit runoff out of the pond to 4.54 cfs.

VII. CONCLUSION

Excess runoff from the existing site drains both by surface and through an existing storm drain to an existing open channel at the north edge of NM 528 near the southeast corner of the property. The total peak flow from the existing site is approximately 5.45 cfs. After development, a peak flow of 0.93 cfs will flow by surface from Proposed Drainage Basin No. 1 directly to the channel on NM 528. Runoff from the remaining 85 percent of the developed site will be directed to an on-site, earthen detention basin. Peak discharge from this developed area before entering the detention basin is about 6.64 cfs. The detention basin will connect by 18-inch storm drain to an existing underground 60-inch storm pipe. An 8-inch control orifice on the pond outfall pipe will limit runoff from the pond to approximately 4.54 cfs. With drainage controls in place, the total, peak developed runoff rate will be just under 5.47 cfs.

DRAINAGE SUMMARY—EXISTING			
PROJECT: THE FALLS RESTAURANT			
SITE LOCATION: NM 528/ COTTONWOOD LOOP ALBUQUERQUE, NM BERNALILLO COUNTY			
EXISTING CONDITIONS SUMMARY			
BASIN NAME:	EX #1		
AREA (SQUARE FEET)	81,762		
AREA (ACRES)	1.877		
LAND TREATMENT	(%)	ACRES	S.F.
AREA "A"	0.0	0.0	0.0
AREA "B"	0.0	0.0	0.0
AREA "C"	97.7	1.834	79,881.5
AREA "D"	2.3	0.043	1,880.5
EXCESS RUNOFF			
100 YR. 6 HR.	0.158 AC—FT.		
100 YR. 24 HR.	0.16 AC—FT.		
10 YR. 6 HR.	0.072 AC—FT.		
2 YR. 6 HR.	0.020 AC—FT.		
WT E (100 YR.)	1.01 INCHES		
WT E (10 YR.)	0.46 INCHES		
WT E (2 YR.)	0.13 INCHES		
PEAK DISCHARGE (cfs.)			
100 YR. 6 HR. & 24 HR.	5.45		
10 YR. 6 HR.	2.86		
2 YR. 6 HR.	0.93		

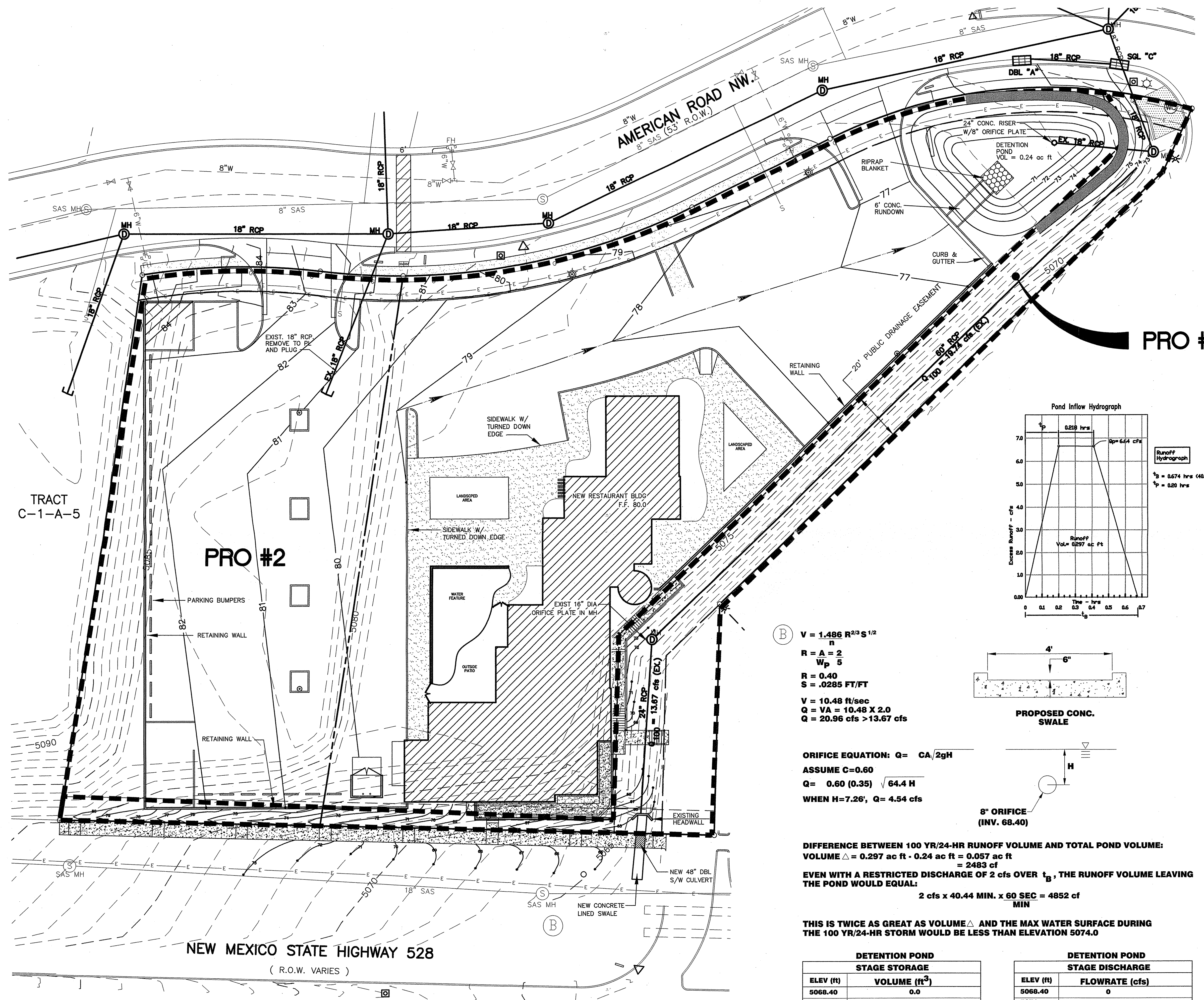
THE group
TELCK-HENSELY
ENGINEERING GROUP
2340 MENA, NE, SUITE 200
ALBUQUERQUE, NEW MEXICO 87107
Phone (505) 262-3202 FAX (505) 262-3004



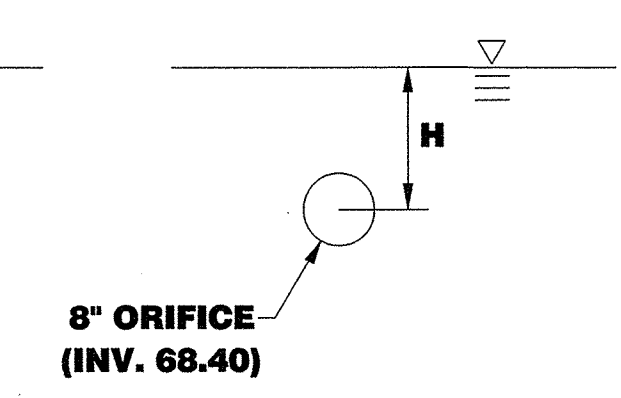
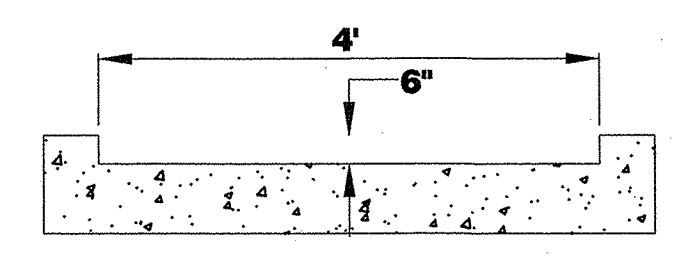
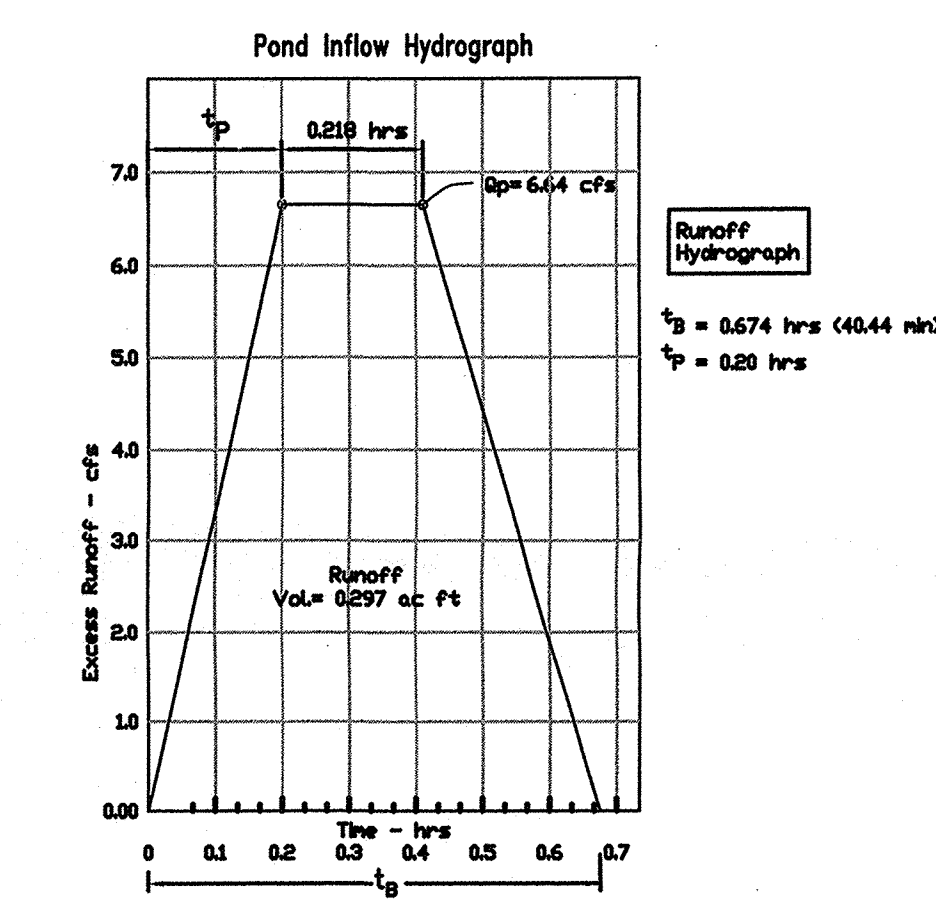
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1700 LOUISIANA BLVD NE, SUITE 300 ALBUQUERQUE, NM 87110
PHONE (505) 765-1020 FAX (505) 765-1025

DATE 05/01/06
SHEET NO. 1 OF 1
MAY 18 2006

HYDROLOGY SECTION



DRAINAGE SUMMARY			
PROJECT: THE FALLS RESTAURANT			
SITE LOCATION: NM 528 / COTTONWOOD LOOP ALBUQUERQUE, NM BERNALILLO COUNTY			
PRECIPITATION ZONE: 1 PER COA DPM TABLE A-1 CHAPTER 22			
PROPOSED CONDITIONS SUMMARY			
BASIN NAME:		PRO 1 DRAINS TO NM 528 AND BANK ACCESS ROAD	
AREA (SQUARE FEET)		12,560	
AREA (ACRES)		0.288	
LAND TREATMENT	(%)	ACRES	S.F.
AREA "A"	0.0	0.0	0.0
AREA "B"	0.0	0.0	0.0
AREA "C"	75.5	0.217	9,486
AREA "D"	24.4	0.071	3,074
EXCESS RUNOFF			
100 YR. 6 HR.		0.0295 AC-FT.	
100 YR. 24 HR.		0.032 AC-FT.	
10 YR. 6 HR.		0.015 AC-FT.	
2 YR. 6 HR.		0.0065 AC-FT.	
WT E (100 YR.)		1.23 INCHES	
WT E (10 YR.)		0.64 INCHES	
WT E (2 YR.)		0.27 INCHES	
PEAK DISCHARGE (cfs)			
100 YR. 6 HR. & 24 HR.		0.93	
10 YR. 6 HR.		0.53	
2 YR. 6 HR.		0.22	
PROPOSED CONDITIONS SUMMARY			
BASIN NAME:		PRO 2 DRAINS TO PROPOSED ONSITE DETENTION POND	
AREA (SQUARE FEET)		69,202	
AREA (ACRES)		1.589	
LAND TREATMENT	(%)	ACRES	S.F.
AREA "A"	0.0	0.0	0.0
AREA "B"	0.0	0.0	0.0
AREA "C"	13	0.205	8,900
AREA "D"	87	1.384	60,302
EXCESS RUNOFF			
100 YR. 6 HR.		0.244 AC-FT.	
100 YR. 24 HR.		0.297 AC-FT.	
10 YR. 6 HR.		0.151 AC-FT.	
2 YR. 6 HR.		0.085 AC-FT.	
WT E (100 YR.)		1.84 INCHES	
WT E (10 YR.)		1.14 INCHES	
WT E (2 YR.)		0.64 INCHES	
PEAK DISCHARGE (cfs)			
100 YR. 6 HR. & 24 HR.		6.64	
10 YR. 6 HR.		4.31	
2 YR. 6 HR.		2.44	



$$V = 1.486 R^{2/3} S^{1/2}$$
$$R = \frac{A}{W_p} = \frac{2}{5}$$
$$R = 0.40$$
$$S = .0285 \text{ FT/FT}$$
$$V = 10.48 \text{ ft/sec}$$
$$Q = VA = 10.48 \times 2.0$$
$$Q = 20.96 \text{ cfs} > 13.67 \text{ cfs}$$

ORIFICE EQUATION: $Q = CA\sqrt{2gh}$
ASSUME $C=0.60$
 $Q = 0.60 (0.35) \sqrt{64.4 H}$
WHEN $H=7.26'$, $Q = 4.54 \text{ cfs}$

DIFFERENCE BETWEEN 100 YR/24-HR RUNOFF VOLUME AND TOTAL POND VOLUME:
VOLUME $\Delta = 0.297 \text{ ac ft} - 0.24 \text{ ac ft} = 0.057 \text{ ac ft}$
 $= 2483 \text{ cf}$
EVEN WITH A RESTRICTED DISCHARGE OF 2 cfs OVER t_B , THE RUNOFF VOLUME LEAVING THE POND WOULD BE EQUAL:
 $2 \text{ cfs} \times 40.44 \text{ MIN.} \times 60 \text{ SEC} = 4852 \text{ cf}$

THIS IS TWICE AS GREAT AS VOLUME Δ AND THE MAX WATER SURFACE DURING THE 100 YR/24-HR STORM WOULD BE LESS THAN ELEVATION 5074.0

DETENTION POND STAGE STORAGE		DETENTION POND STAGE DISCHARGE	
ELEV (ft)	VOLUME (ft ³)	ELEV (ft)	FLOWRATE (cfs)
5068.40	0.0	5068.40	0
5071	8	5071	2.53
5072	1040	5072	3.04
5073	2532	5073	3.48
5074	4536	5074	3.87
5075	7111	5075	4.22
5076	10313	5076	4.54

PROJECT
THE FALLS RESTAURANT

THE FALLS RESTAURANT GROUP
ALBUQUERQUE, NEW MEXICO

REVISIONS
△ 12/21/05
△ 01/27/06
△ 04/17/06

JOB NUMBER
0503

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ALBUQUERQUE, NEW MEXICO 87107
Phone (505) 262-3202 FAX (505) 262-3004

SHEET TITLE
DRAINAGE PLAN DEVELOPED

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ARCHITECTS • PLANNERS, AIA
1700 LOUISIANA BLVD NE, SUITE 300 ALBUQUERQUE, NM 87110
PHONE (505) 765-1020 FAX (505) 765-0225

DATE
05/01/06

SHEET NO.
13

HYDROLOGY SECTION