City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 8, 2001

Shahab Biazar, P.E.
ADVANCED ENGINEERING
10205 Snowflake Ct., NW
Albuquerque, NM 87114

RE: **Grading and Drainage Certification**
The Branch Law Firm Annex
(H-13/D038) (1401 Rio Grande Blvd NW)
Engineer's Stamp dated 4/7/2000
Engineering Certification dated 12/28/2000

Dear Mr. Biazar:

Based upon the information provided in your submittal dated 12/28/2000, the above referenced site is approved for Certificate of Occupancy.

If I can be of further assistance, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Senior Civil Engineer, PWD

C: Vickie Chavez, COA
Teresa Martin,COA
file

DRAINAGE INFORMATION SHEET

H-13/D038

PROJECT TITLE: Branch Law Firm **ZONE ATLAS/DRNG. FILE #:** ~~H-13/D038~~

DRB #: _____ **EPC #:** _____ **WORK ORDER #:** _____

LEGAL DESCRIPTION: Tracts 221B, 221C, 221D, & 221A2, Map 35 of MRGCD-1957 Deed Sec. 7 T 10 R3E NMPM

CITY ADDRESS: *Located at 1401 Rio Grande Boulevard, NW, Albuquerque, NM*

ENGINEERING FIRM:	Advanced Engineering and Consulting, LLC	**CONTACT:**	Shahab Biazar
ADDRESS:	10205 Snowflake Ct. NW Alb., NM 87114	**PHONE:**	505-899-5570
OWNER:	Turner Branch	**CONTACT:**	
ADDRESS:	2025 Rio Grande NW	**PHONE:**	505-243-3500
ARCHITECT:	*Masterworks Architects, Inc.*	**CONTACT:**	*Jim Clark*
ADDRESS:	*516 Eleventh St , NW*	**PHONE:**	*505-242-1866*
SURVEYOR:		**CONTACT:**	
ADDRESS:		**PHONE:**	
CONTRACTOR:		**CONTACT:**	
ADDRESS:		**PHONE:**	

TYPE OF SUBMITTAL:

	DRAINAGE REPORT
	DRAINAGE PLAN
	CONCEPTUAL GRADING & DRAINAGE PLAN
	GRADING PLAN
	EROSION CONTROL PLAN
X	ENGINEER'S CERTIFICATION
	OTHER

PRE-DESIGN MEETING:

	YES
	NO
	COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

	SKETCH PLAN APPROVAL
	PRELIMINARY PLAT APPROVAL
	S. DEV. PLAN FOR SUB'D. APPROVAL
	S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
	SECTOR PLAN APPROVAL
	FINAL PLAT APPROVAL
	FOUNDATION PERMIT APPROVAL
	BUILDING PERMIT APPROVAL
X	CERTIFICATE OF OCCUPANCY APPROVAL
	GRADING PERMIT APPROVAL
	PAVING PERMIT APPROVAL
	S. A. D. DRAINAGE REPORT
	DRAINAGE REQUIREMENTS
X	AS - BUILT CERTIFICATION

DATE SUBMITTED: 12-28-00

BY: *SHAHAB BIAZAR*

RECEIVED
DEC 28 2000
HYDROLOGY SECTION

ADVANCED ENGINEERING and CONSULTING, LLC

Consulting
Design
Development
Management
Inspection

December 27, 2000

Stuart Reeder, P.E.
City of Albuquerque
Hydrology Department
P. O. Box 1293
Albuquerque, New Mexico 87103

RE: **Final Certification for H-13/D038, Tract 221B, 221C, 221D, & 221A2, Map 35 of MRGCD-1957 Deed Sec. 7 T 10 R3E NMPM, Albuquerque, NM**
1401 Rio Grande Boulevard, NW

Dear Mr. Reeder,

Enclosed please find one copy of the as-built Grading Plan for Tract 221B, 221C, 221D, & 221A2, 1401 Rio Grande Boulevard, NW. We are requesting a final certification of occupancy for the site. The site is paved and the landscaping is completed. The grades are built according to the approved grading & drainage plan, dated April 7, 2000.

If you have any questions regarding this letter or any other items pertaining to this project, please do not hesitate to contact me.

Sincerely,

Shahab Biazar, P.E.

RECEIVED
DEC 28 2000
HYDROLOGY SECTION

Enclosure

cc: Turner Branch, Branch Law Firm
Randy Bush, Clayton Construction

JN: 2011
arp/SB

2011- cer.wpd

10205 Snowflake Court N.W., Albuquerque, N.M. 87114 PH (505) 899-5570 FAX (505) 897-4996 EMAIL AECLLC@aol.com

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

April 13, 2000

Shahab Biazar, P.E.
Advanced Engineering and Consulting, LLC
10205 Snowflake Ct., NW
Albuquerque, NM 87114

RE: GRADING AND DRAINAGE PLAN FOR THE BRANCH LAW FIRM ANNEX - PARKING ADDITION (H-13/D038) ENGINEER'S STAMP DATED 4/7/00

Dear Mr. Biazar,

Based upon the information provided in your April 10, 2000, submittal, the project referred to above is approved for grading permit.

Once the construction is complete, an Engineer Certification, per the DPM checklist, will be required.

If you have any questions, please call me at 924-3988.

Sincerely,

Stuart Reeder, P.E.

Stuart Reeder, P.E.
Hydrology Division

xc: Whitney Reierson
file

DRAINAGE INFORMATION SHEET

PROJECT TITLE: The Branch Law Firm Annex - Parking Addition ZONE ATLAS/DRNG. FILE #: H-13-Z / D38

DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: Tract 221B, 221C, 221D, 221A2, Map 35 of MRGCD-1957 Deed Sec. 7 T 10 R3E NMPM

CITY ADDRESS: 1401 Rio Grande Boulevard, NW

ENGINEERING FIRM: *Advanced Engineering and Consulting, LL* CONTACT: Shahab Biazar

ADDRESS: 10205 Snowflake Ct. NW, Alb., NM 87114 PHONE: (505) 899-5570

OWNER: The Branch Law Firm Annex CONTACT: _____

ADDRESS: 1401 Rio Grande Boulevard, NW PHONE: _____

ARCHITECT: Masterworks Archittects, Inc CONTACT: Jim Clark

ADDRESS: 516 Eleventh Street NW, 87102-1806 PHONE: (505) 242-1866

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

X DRAINAGE PLAN

_____ CONCEPTUAL GRADING & DRAINAGE PLAN

X GRADING PLAN

_____ EROSION CONTROL PLAN

_____ ENGINEER'S CERTIFICATION

_____ OTHER

PRE-DESIGN MEETING:

_____ YES

X NO

_____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

_____ SKETCH PLAN APPROVAL

_____ PRELIMINARY PLAT APPROVAL

_____ S. DEV. PLAN FOR SUB'D. APPROVAL

_____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL

_____ SECTOR PLAN APPROVAL

_____ FINAL PLAT APPROVAL

_____ FOUNDATION PERMIT APPROVAL

_____ BUILDING PERMIT APPROVAL

_____ CERTIFICATE OF OCCUPANCY APPROVAL

X GRADING PERMIT APPROVAL

_____ PAVING PERMIT APPROVAL

_____ S. A. D. DRAINAGE REPORT

_____ DRAINAGE REQUIREMENTS

_____ Other

RECEIVED
APR 10 2000
HYDROLOGY SECTION

DATE SUBMITTED: 04 / 07 / 00

BY: Shahab Biazar, P.E.

DRAINAGE REPORT
FOR

THE BRANCH LAW FIRM ANNEX PARKING LOT ADDITION

Prepared by:

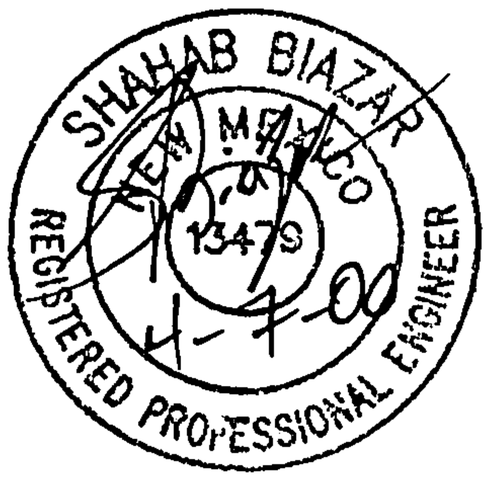
ADVANCED ENGINEERING and CONSULTING, LLC

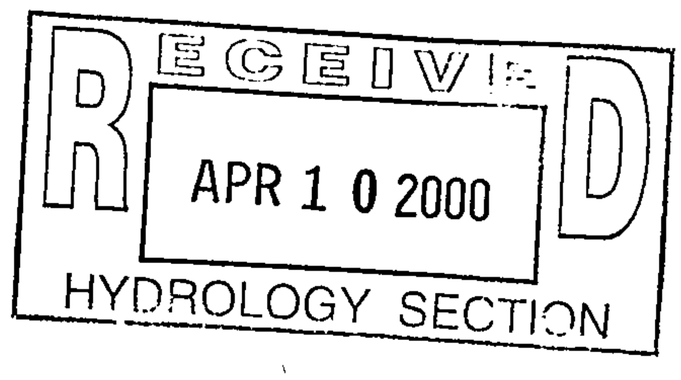
10205 Snowflake Ct. NW
Albuquerque, New Mexico 87114

Prepared For:

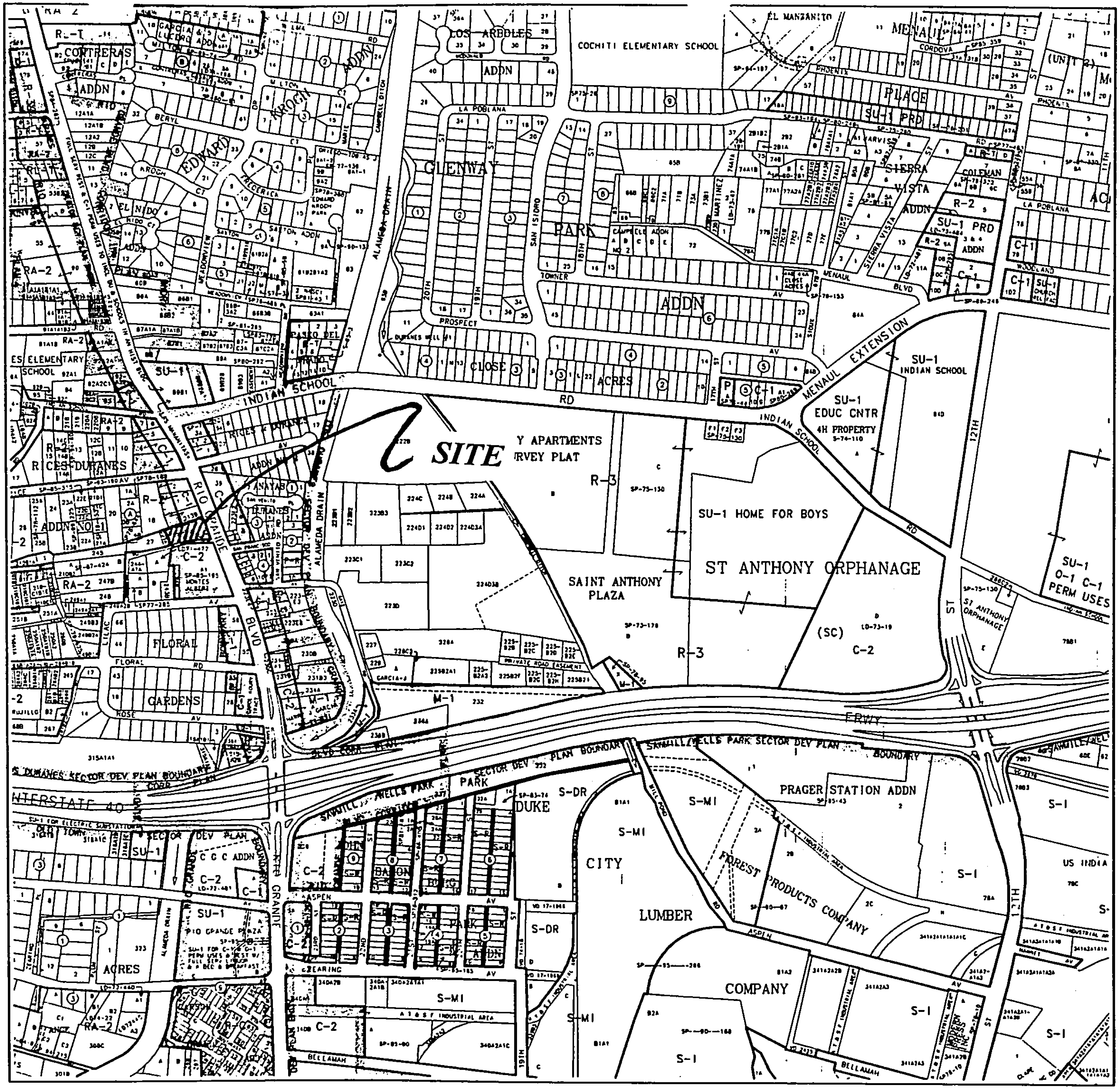
Masterworks Architects, Inc.
516 Eleventh Street, NW
Albuquerque, New Mexico 87102-1806

April, 2000





Shahab Biazar
PE NO. 13479



GRAPHIC SCALE IN FEET

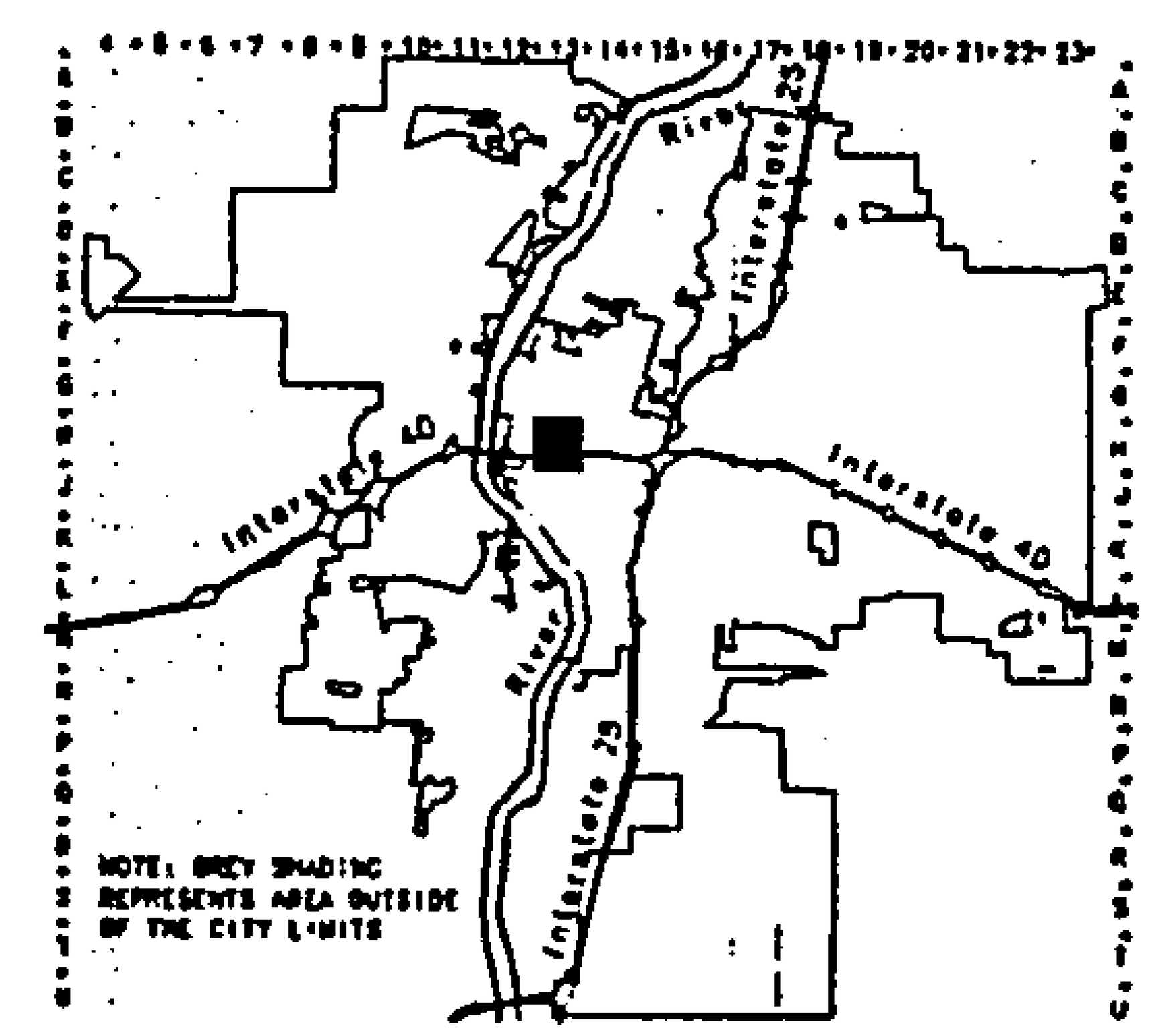
250 0 500 1000

CITY OF Albuquerque

Albuquerque Geographic Information System

PLANNING DEPARTMENT

Map Amended through February 20, 1996



LEGAL DESCRIPTION

TION

R3E

SEC 7

UNIFORM PROPERTY CODE

1-013-059

H-13-Z

Location

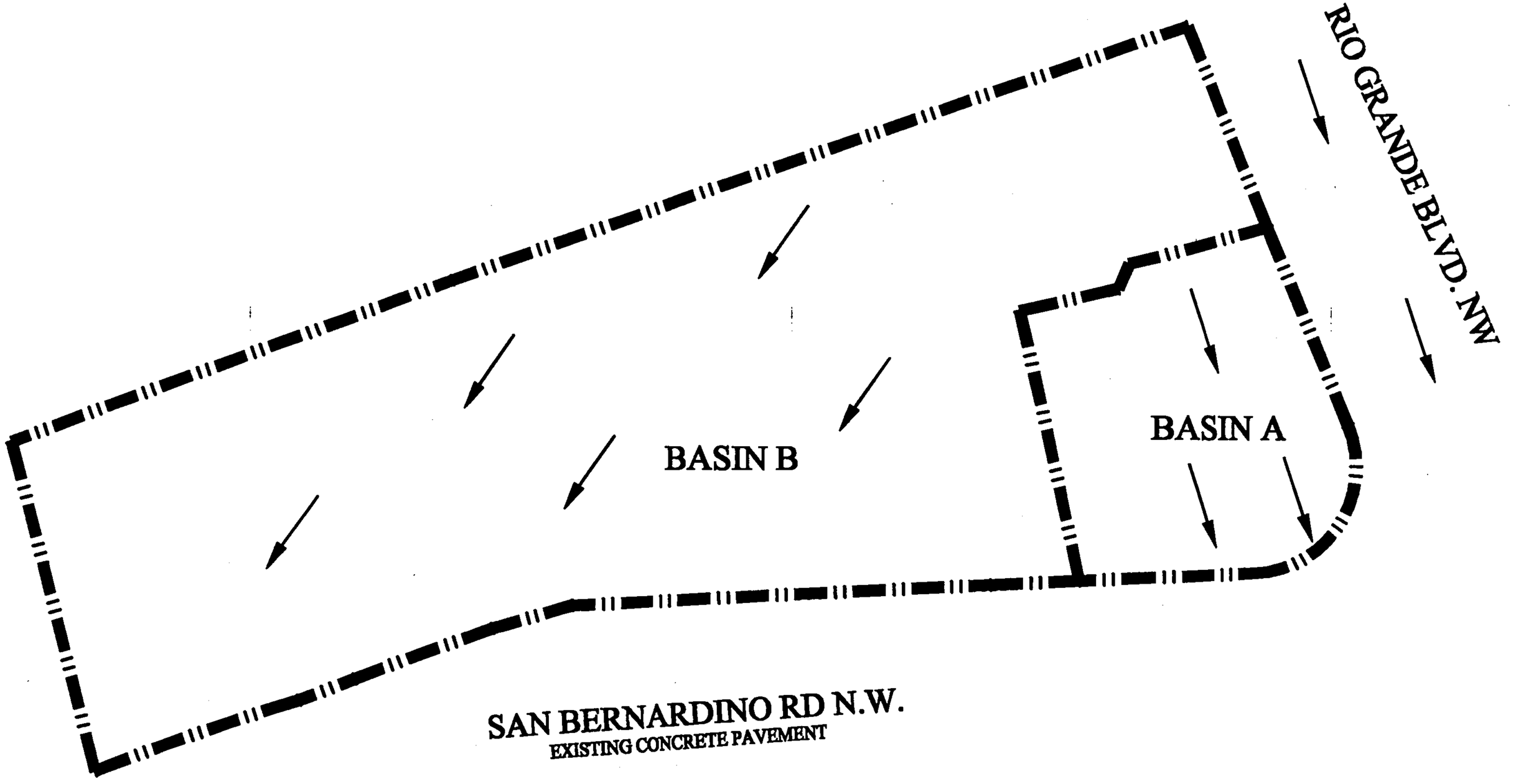
Tracts 221B, 221C, 221D, and 221A2, Map 35 of the MRGCD-1957 Deed Sec. 7 T10N R3E NMPM, Albuquerque, New Mexico is at 1401 Rio Grande Boulevard NW (at the northwest corner of Rio Grande Boulevard NW and San Bernardino Road NW).

Purpose

Advanced Engineering and Consulting, LLC on behalf of Branch Law Firm has prepared this grading and drainage plan for the proposed parking addition to this site. This grading and drainage plan is prepared to obtain grading approval for the new parking lot addition.

Existing Drainage Conditions

The site is flat. No offsite runoff enters this site. Rio Grande Boulevard NW intercepts the runoff to the east. The runoff to the west drains west and south to San Bernardino Road NW and does enter this site. The runoff to the north, for the most part, drains to the west and then to San Bernardino Road NW. The previous grading and drainage plan was submitted (under City Drainage No. H13/D38) for the building and parking additions. Additional right-of-way was dedicated under a recent replat of this site. Under this new submittal we have re-analyzed the basin based on historical conditions. The entire site drains to San Bernardino Road at a flow rate of 0.89 cfs (Basin A with a runoff rate of 0.23 cfs and Basin B with a runoff rate of 0.66 cfs).



HISTORICAL BASIN LAYOUT

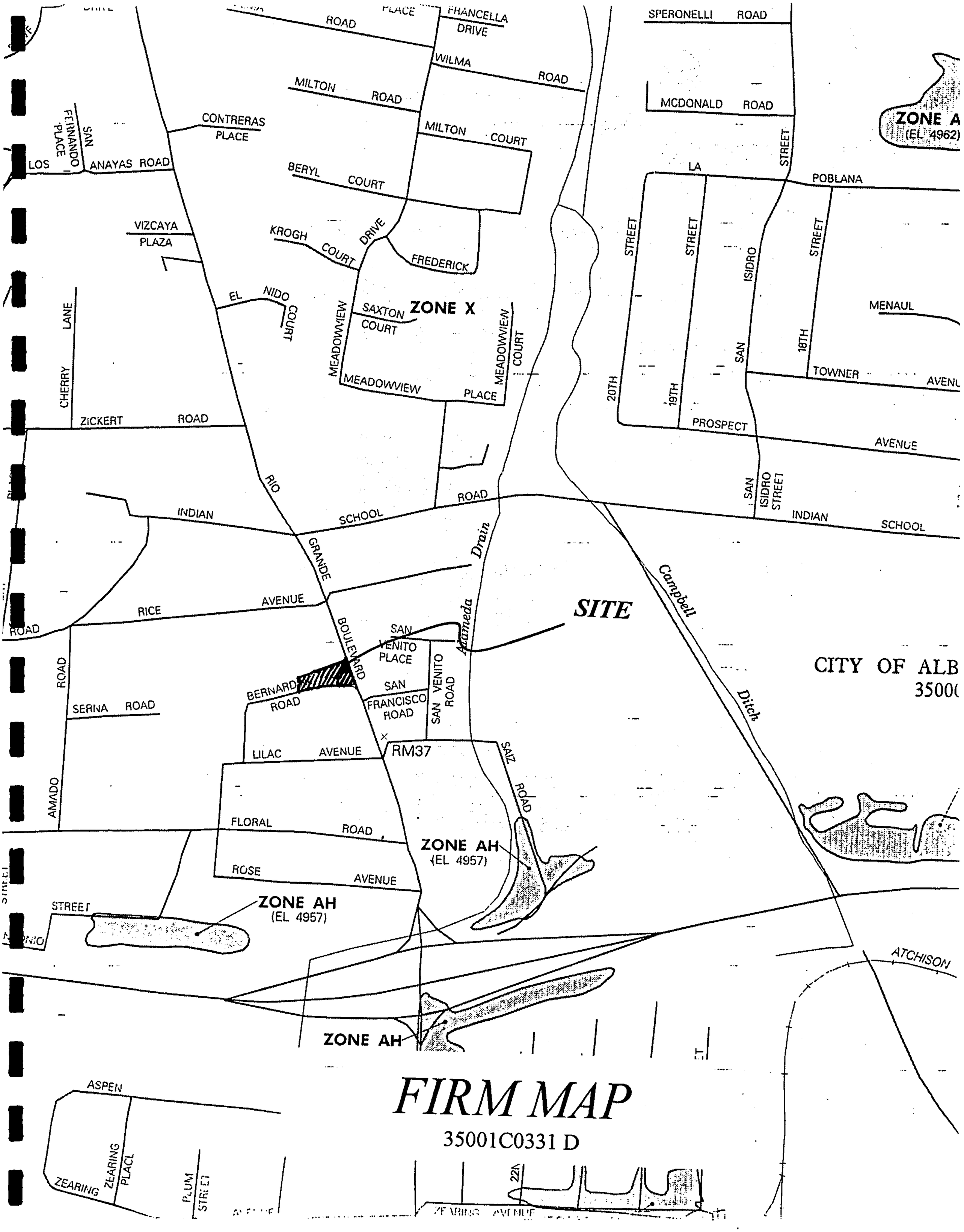
As shown on the attached FIRM Map number 35001C0331-D the site falls within a 500-year flood plain, Zone X.

Proposed Conditions and On-Site/Offsite Drainage Management Plan

The drainage patterns, for on-site and offsite, will remain the same. The runoff from Basin A will continue to drain to San Bernardino Road at a flow rate of 0.23 cfs and basin B will be detained and then discharged at a rate of 0.55 cfs (less than the historical discharge rate of 0.66 cfs). The discharge from the runoff from Basin B is controlled by two four inch opening within the site. The runoff back up into the parking area to a 100-year water surface elevation of 4959.89'. Incase of an event larger than 100-year storm, the runoff will overflow into the San Bernardino without flooding the building. See the grading and drainage plan for details.

Calculations

City of Albuquerque, Development Process Manuel, Section 22.2, Hydrology Section, revised January 1993, was used for the runoff calculations. The site falls under Zone 2 based on Figure A-1 of page A-1.



CITY OF ALB
35000

FIRM MAP

35001C0331 D

RUNOFF CALCULATIONS

The site is @ Zone 2

DEPTH (INCHES) @ 100-YEAR STORM

P_{60} = 2.01 inches

P_{360} = 2.35 inches

P_{1440} = 2.75 inches

DEPTH (INCHES) @ 10-YEAR STORM

P_{60} = 2.01 x 0.667
= 1.34 inches

P_{360} = 1.57

P_{1440} = 1.83

See the summary output from AHYMO calculations.

Also see the following summary tables.

RUNOFF CALCULATION RESULTS

BASIN	AREA (SF)	AREA (AC)	AREA (MI^2)
A	3066.67	0.0704	0.000110
B	15440.85	0.3545	0.000554

PROPOSED

BASIN	Q-100 CFS	Q-10 CFS	TREATMENT A, B, C, D
A	0.23	0.12	0%, 12.50%, 0%, 87.50%
B	1.47	0.92	0%, 25.00%, 0%, 75.00%

HISTORICAL (PRIOR TO DRAINAGE SUBMITTAL H13/D38)

BASIN	Q-100 CFS	Q-10 CFS	TREATMENT A, B, C, D
A	0.23	0.12	0%, 12.50%, 0%, 87.50%
B	0.66	0.20	70%, 20%, 10%, 0%

```
*
* ZONE 2
*
**********************************************************************
*      100-YEAR,  6-HR STORM (UNDER HISTORICAL CONDITIONS)           *
**********************************************************************
START                TIME=0.0
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                     RAIN DAY=2.75 IN DT=0.03333 HR
* BASIN A
COMPUTE NM HYD       ID=1 HYD NO=100.0 AREA=0.000110 SQ MI
                     PER A=100.00 PER B=12.50 PER C=0.00 PER D=87.50
                     TP=0.1333 HR MASS RAINFALL=-1

* BASIN B
COMPUTE NM HYD       ID=2 HYD NO=200.0 AREA=0.000554 SQ MI
                     PER A=70.00 PER B=20.00 PER C=10.00 PER D=0.00
                     TP=0.1333 HR MASS RAINFALL=-1
*
**********************************************************************
*       10-YEAR,  6-HR STORM (UNDER HISTORICAL CONDITIONS)           *
**********************************************************************
START                TIME=0.0
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=1.34 IN RAIN SIX=1.57 IN
                     RAIN DAY=1.83 IN DT=0.03333 HR

* BASIN A
COMPUTE NM HYD       ID=1 HYD NO=110.0 AREA=0.000110 SQ MI
                     PER A=100.00 PER B=12.50 PER C=0.00 PER D=87.50
                     TP=0.1333 HR MASS RAINFALL=-1

* BASIN B
COMPUTE NM HYD       ID=2 HYD NO=210.0 AREA=0.000554 SQ MI
                     PER A=70.00 PER B=20.00 PER C=10.00 PER D=0.00
                     TP=0.1333 HR MASS RAINFALL=-1
*
**********************************************************************
*       100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)            *
**********************************************************************
START                TIME=0.0
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                     RAIN DAY=2.75 IN DT=0.03333 HR
* BASIN A
COMPUTE NM HYD       ID=1 HYD NO=300.0 AREA=0.000110 SQ MI
                     PER A=100.00 PER B=12.50 PER C=0.00 PER D=87.50
                     TP=0.1333 HR MASS RAINFALL=-1

* BASIN B
COMPUTE NM HYD       ID=2 HYD NO=400.0 AREA=0.000554 SQ MI
                     PER A=0.00 PER B=25.00 PER C=0.00 PER D=75.00
                     TP=0.1333 HR MASS RAINFALL=-1
*
**********************************************************************
*        10-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)            *
**********************************************************************
START                TIME=0.0
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=1.34 IN RAIN SIX=1.57 IN
                     RAIN DAY=1.83 IN DT=0.03333 HR

* BASIN A
COMPUTE NM HYD       ID=1 HYD NO=310.0 AREA=0.000110 SQ MI
                     PER A=100.00 PER B=12.50 PER C=0.00 PER D=87.50
                     TP=0.1333 HR MASS RAINFALL=-1

* BASIN B
COMPUTE NM HYD       ID=2 HYD NO=410.0 AREA=0.000554 SQ MI
                     PER A=0.00 PER B=25.00 PER C=0.00 PER D=75.00
                     TP=0.1333 HR MASS RAINFALL=-1
*
FINISH
```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =04/09/2000
INPUT FILE = 2011

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.350
COMPUTE NM HYD	100.00	-	1	.00011	.23	.007	1.23787	1.500	3.202	PER IMP=	43.75
COMPUTE NM HYD	200.00	-	2	.00055	.66	.018	.62056	1.533	1.850	PER IMP=	.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.570
COMPUTE NM HYD	110.00	-	1	.00011	.12	.004	.66378	1.500	1.707	PER IMP=	43.75
COMPUTE NM HYD	210.00	-	2	.00055	.20	.005	.17990	1.533	.572	PER IMP=	.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.350
COMPUTE NM HYD	300.00	-	1	.00011	.23	.007	1.23787	1.500	3.202	PER IMP=	43.75
COMPUTE NM HYD	400.00	-	2	.00055	1.47	.053	1.78108	1.500	4.142	PER IMP=	75.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.570
COMPUTE NM HYD	310.00	-	1	.00011	.12	.004	.66378	1.500	1.707	PER IMP=	43.75
COMPUTE NM HYD	410.00	-	2	.00055	.92	.032	1.07281	1.500	2.583	PER IMP=	75.00
FINISH											

VOLUME CALCULATIONS

DETENTION POND

(parking lot / landscaping area ponding)

Ab - Bottom Of The Pond Surface Area
At - Top Of The Pond Surface Area
D - Water Depth
Dt - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = Ab * D + 0.5 * C * D^2

C = (At - Ab) / Dt

Ab =	0.00	@ 4959.47'
At =	10,957.67	@ 4960.50'
Dt =	1.03	
C =	10638.51	

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
4959.47	0	0.00000	0.00
4959.57	0.1	0.00122	0.06
4959.67	0.2	0.00488	0.18
4959.77	0.3	0.01099	0.32
4959.87	0.4	0.01954	0.50
4959.97	0.5	0.03053	0.70
4960.07	0.6	0.04396	0.92
4960.17	0.7	0.05984	1.16
4960.27	0.8	0.07815	1.41
4960.37	0.9	0.09891	1.69
4960.50	1.03	0.12955	2.07

<u>Weir Equation</u>
Q = CLH ^ (3/2)

C =	2.95	
L =	0.67	(WIDTH OF THE OPENING)
H (Ft) =	0.50	(MAX. DEPTH OF WATER AT THE OPENING)
Q (CFS)=	2.07	(FLOW)

See AHYMO files for ponding calcuations.

```
*
* ZONE 2
*
*****************************************************************
*        100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)      *
*****************************************************************
START                   TIME=0.0
RAINFALL                TYPE=1 RAIN QUARTER=0.0 IN
                        RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                        RAIN DAY=2.75 IN DT=0.03333 HR
* BASIN A
COMPUTE NM HYD          ID=1 HYD NO=100.0 AREA=0.000110 SQ MI
                        PER A=0.00 PER B=12.50 PER C=0.00 PER D=87.50
                        TP=0.1333 HR MASS RAINFALL=-1

* BASIN B
COMPUTE NM HYD          ID=2 HYD NO=100.0 AREA=0.000554 SQ MI
                        PER A=0.00 PER B=25.00 PER C=0.00 PER D=75.00
                        TP=0.1333 HR MASS RAINFALL=-1
*
ROUTE RESERVOIR         ID=3 HYD NO=500.0 INFLOW ID=2 CODE=24
                        OUTFLOW(CFS)        STORAGE(AC-FT)   ELEVATION(FT)
                        0.00                0.00000          4959.47
                        0.06                0.00122          4959.57
                        0.18                0.00488          4959.67
                        0.32                0.01099          4959.77
                        0.50                0.01954          4959.87
                        0.70                0.03053          4959.97
                        0.92                0.04396          4960.07
                        1.16                0.05984          4960.17
                        1.41                0.07815          4960.27
                        1.69                0.09891          4960.37
                        2.07                0.12955          4960.50
*****************************************************************
*
* TOTAL DISCHARGE FROM THE SITE
*
ADD HYD                 ID=4 HYD NO=600.0 ID=1 ID=3
*
FINISH
```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =04/08/2000
INPUT FILE = 2011PD

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.350
COMPUTE NM HYD	100.00	-	1	.00011	.32	.011	1.94822	1.500	4.558	PER IMP=	87.50
COMPUTE NM HYD	100.00	-	2	.00055	1.47	.053	1.78108	1.500	4.142	PER IMP=	75.00
ROUTE RESERVOIR	500.00	2	3	.00055	.55	.053	1.78057	1.766	1.539	AC-FT=	.022
ADD HYD	600.00	1& 3	4	.00066	.72	.064	1.80756	1.567	1.695		
FINISH											

```
    AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
         RUN DATE (MON/DAY/YR) = 04/08/2000
         START TIME (HR:MIN:SEC) = 12:57:01
         INPUT FILE = 2011PD

*
* ZONE 2
*
*****************************************************************
*        100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)      *
*****************************************************************
START                TIME=0.0
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                     RAIN DAY=2.75 IN DT=0.03333 HR

                COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                DT =     .033330 HOURS       END TIME =     5.999400 HOURS
                   .0000   .0016   .0033   .0049   .0066   .0084   .0102
                   .0120   .0139   .0158   .0178   .0199   .0219   .0241
                   .0263   .0286   .0309   .0333   .0358   .0384   .0411
                   .0439   .0467   .0497   .0529   .0561   .0596   .0631
                   .0669   .0709   .0751   .0807   .0866   .0930   .1066
                   .1371   .1840   .2514   .3434   .4644   .6186   .8106
                  1.0449  1.2624  1.3533  1.4300  1.4982  1.5602  1.6174
                  1.6704  1.7200  1.7664  1.8102  1.8514  1.8904  1.9273
                  1.9622  1.9953  2.0268  2.0566  2.0850  2.0915  2.0976
                  2.1033  2.1088  2.1140  2.1191  2.1239  2.1285  2.1329
                  2.1373  2.1414  2.1454  2.1494  2.1531  2.1568  2.1604
                  2.1639  2.1673  2.1706  2.1739  2.1771  2.1802  2.1832
                  2.1862  2.1891  2.1919  2.1947  2.1975  2.2002  2.2028
                  2.2054  2.2080  2.2105  2.2130  2.2154  2.2178  2.2202
                  2.2225  2.2248  2.2270  2.2293  2.2315  2.2336  2.2358
                  2.2379  2.2399  2.2420  2.2440  2.2460  2.2480  2.2500
                  2.2519  2.2538  2.2557  2.2576  2.2594  2.2612  2.2631
                  2.2648  2.2666  2.2684  2.2701  2.2718  2.2735  2.2752
                  2.2769  2.2785  2.2802  2.2818  2.2834  2.2850  2.2866
                  2.2881  2.2897  2.2912  2.2928  2.2943  2.2958  2.2973
                  2.2987  2.3002  2.3017  2.3031  2.3045  2.3060  2.3074
                  2.3088  2.3102  2.3115  2.3129  2.3143  2.3156  2.3169
                  2.3183  2.3196  2.3209  2.3222  2.3235  2.3248  2.3261
                  2.3273  2.3286  2.3298  2.3311  2.3323  2.3335  2.3348
                  2.3360  2.3372  2.3384  2.3396  2.3408  2.3419  2.3431
                  2.3443  2.3454  2.3466  2.3477  2.3488  2.3500

* BASIN A
COMPUTE NM HYD       ID=1 HYD NO=100.0 AREA=0.000110 SQ MI
                     PER A=0.00 PER B=12.50 PER C=0.00 PER D=87.50
                     TP=0.1333 HR MASS RAINFALL=-1
```

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .38000 CFS UNIT VOLUME = .9711 B = 526.28 P60 = 2.0100
AREA = .000096 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .132088HR TP = .133300HR K/TP RATIO = .990905 SHAPE CONSTANT, N = 3.563124
UNIT PEAK = .33514E-01CFS UNIT VOLUME = .8709 B = 324.91 P60 = 2.0100
AREA = .000014 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

* BASIN B
COMPUTE NM HYD ID=2 HYD NO=100.0 AREA=0.000554 SQ MI
PER A=0.00 PER B=25.00 PER C=0.00 PER D=75.00
TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 1.6404 CFS UNIT VOLUME = .9922 B = 526.28 P60 = 2.0100
AREA = .000416 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .132088HR TP = .133300HR K/TP RATIO = .990905 SHAPE CONSTANT, N = 3.563124
UNIT PEAK = .33758 CFS UNIT VOLUME = .9605 B = 324.91 P60 = 2.0100
AREA = .000139 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

*
ROUTE RESERVOIR ID=3 HYD NO=500.0 INFLOW ID=2 CODE=24

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEVATION(FT)
0.00	0.00000	4959.47
0.06	0.00122	4959.57
0.18	0.00488	4959.67
0.32	0.01099	4959.77
0.50	0.01954	4959.87
0.70	0.03053	4959.97
0.92	0.04396	4960.07
1.16	0.05984	4960.17
1.41	0.07815	4960.27
1.69	0.09891	4960.37
2.07	0.12955	4960.50

* * * * * * * * * * * * * * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	4959.47	.000	.00
.80	.00	4959.47	.000	.00
1.60	1.03	4959.87	.019	.49
2.40	.05	4959.77	.011	.32
3.20	.01	4959.57	.001	.06

```
     4.00        .01    4959.49        .000        .01
     4.80        .01    4959.48        .000        .01
     5.60        .01    4959.48        .000        .01
     6.40        .00    4959.48        .000        .00
 PEAK DISCHARGE =          .546 CFS - PEAK OCCURS AT HOUR    1.77
 MAXIMUM WATER SURFACE ELEVATION =     4959.893
 MAXIMUM STORAGE =          .0221 AC-FT      INCREMENTAL TIME=      .033330HRS

**********************************************************************
*
* TOTAL DISCHARGE FROM THE SITE
*
ADD HYD             ID=4 HYD NO=600.0 ID=1 ID=3
*
FINISH

    NORMAL PROGRAM FINISH        END TIME (HR:MIN:SEC) = 12:57:01
```

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

June 7, 1999

Shabab Biazar, PE
Advanced Engineering and Consulting, LL
10205 Snowflake Ct. NW
Albuquerque, NM 87114

RE: BRANCH LAW FIRM ANNEX (H-13Z/D-038), GRADING & DRAINAGE RESUBMITTAL FOR GRADING AND BUILDING PERMIT APPROVAL. ENGINEER'S STAMP DATED 5-26-99

Dear Mr. Biazar:

The minor revisions made to the grading & drainage plan, to accommodate comments made from the Transportation Development Division, appear to have no significant impact to the previously approved plan (previous approval dated 5/3/99). This latest submittal is thereby approved for Grading and Building Permits.

Obviously, you will have to ensure Transportation Division officials that you have addressed their concerns prior to gaining their approval as well.

Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

For any work proposed within City right-of-way, a separate permit will be required.

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

If I can be of further assistance, feel free to call at 768-2766.

Sincerely,

Scott Davis
PWD, Hydrology Div.

c: file

DRAINAGE INFORMATION SHEET

PROJECT TITLE: The Branch Law Firm Annex ZONE ATLAS/DRNG. FILE #: H-13Z/D-038

DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: Tract 221B & 221C, Map 35 of MRGCD-1957 Deed Sec. 7 T 10 R3E NMPM, Albuquerque, NM

CITY ADDRESS: 1401 Rio Grande Boulevard, NW

ENGINEERING FIRM: *Advanced Engineering and Consulting, LL* CONTACT: Shahab Biazar

ADDRESS: 10205 Snowflake Ct. NW, Alb., NM 87114 PHONE: (505) 899-5570

OWNER: The Branch Law Firm Annex CONTACT: _____

ADDRESS: 1401 Rio Grande Boulevard, NW PHONE: _____

ARCHITECT: Masterworks Archittects, Inc CONTACT: Jim Clark

ADDRESS: 516 Eleventh Street NW, 87102-1806 PHONE: (505) 242-1866

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

_____ DRAINAGE REPORT

__X__ DRAINAGE PLAN

_____ CONCEPTUAL GRADING & DRAINAGE PLAN

__X__ GRADING PLAN

_____ EROSION CONTROL PLAN

_____ ENGINEER'S CERTIFICATION

_____ OTHER

PRE-DESIGN MEETING:

_____ YES

__X__ NO

_____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

_____ SKETCH PLAN APPROVAL

_____ PRELIMINARY PLAT APPROVAL

_____ S. DEV. PLAN FOR SUB'D. APPROVAL

_____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL

_____ SECTOR PLAN APPROVAL

_____ FINAL PLAT APPROVAL

_____ FOUNDATION PERMIT APPROVAL

__X__ BUILDING PERMIT APPROVAL

_____ CERTIFICATE OF OCCUPANCY APPROVAL

__X__ GRADING PERMIT APPROVAL

_____ PAVING PERMIT APPROVAL

_____ S. A. D. DRAINAGE REPORT

_____ DRAINAGE REQUIREMENTS

_____ Other

DATE SUBMITTED: 05 / 26 / 99

BY: Shahab Biazar, P.E.

ADVANCED ENGINEERING and CONSULTING, LLC

Consulting
Design
Development
Management
Inspection

May 26, 1999

Mr. Scott Davis
PWD, Hydrology Div.
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

RE: **Revised Grading and Drainage Plan for Branch Law Firm Annex, H-13Z/D-038**

Dear Mr. Davis:

Attached please find a copy of the revised grading and drainage plan for Branch Law Firm Annex. Mr. Mike Zamora from the Transportation Department had requested minor changes on the site plan. Additional spot elevations were added to the grading plan to reflect these recent modification. Site plan changes had no impact on the drainage patterns nor the calculations.

Should you have any question regarding this letter or any other matter pertaining to this project, feel free to contact me.

Sincerely,

Shahab Biazar, P.E.

Hydro-Letter.wpd

10205 Snowflake Court N.W., Albuquerque, N.M. 87114 PH (505) 899-5570 FAX (505) 897-4996 EMAIL AECLLC@aol.com

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

3 May 1999

Shahab Biazar
Advanced Engineering and Consulting, LL
10205 Snowflake Ct. NW
Albuquerque, NM 87114

RE: BRANCH LAW FIRM ANNEX (H-13Z/D-038) GRADING & DRAINAGE SUBMITTAL FOR GRADING & BUILDING PERMIT APPROVAL. ENGINEER'S STAMP DATED 4-5-99

Dear Mr. Biazar:

Based upon the information provided in your 4-5-99 submittal, the Hydrology Division approves the referenced site for Grading and Building permit once the attached comments from the Transportation Development Section are addressed. If, in addressing the transportation comments, changes are made to the plan that affect the proposed drainage plan, you will be required to resubmit the revised plan for additional Hydrology review.

Once Transportation comments have been addressed, please attach a copy of this approved plan to the construction sets prior to sign off by Hydrology.

For any work to be performed within City right-of-way, a separate permit will be required.

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

If I can be of further assistance, feel free to call at 768-2766.

Sincerely,

Scott Davis
PWD, Hydrology Div.

c: Andrew Garcia
file

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

April 22, 1999

James Clarke III, Reg. Arch.,
Masterworks Architects Inc.
516 Eleventh St. N.W.
Albuquerque, New Mexico 87102

Re: Site Plan submittal for building permit approval for The Branch Law Firm, 1401 Rio Grande Blvd. N.W., M.R.G.C.D. Map No. 35. (Zone Map H-13-Z), Architect's Stamp dated 4/6/99.

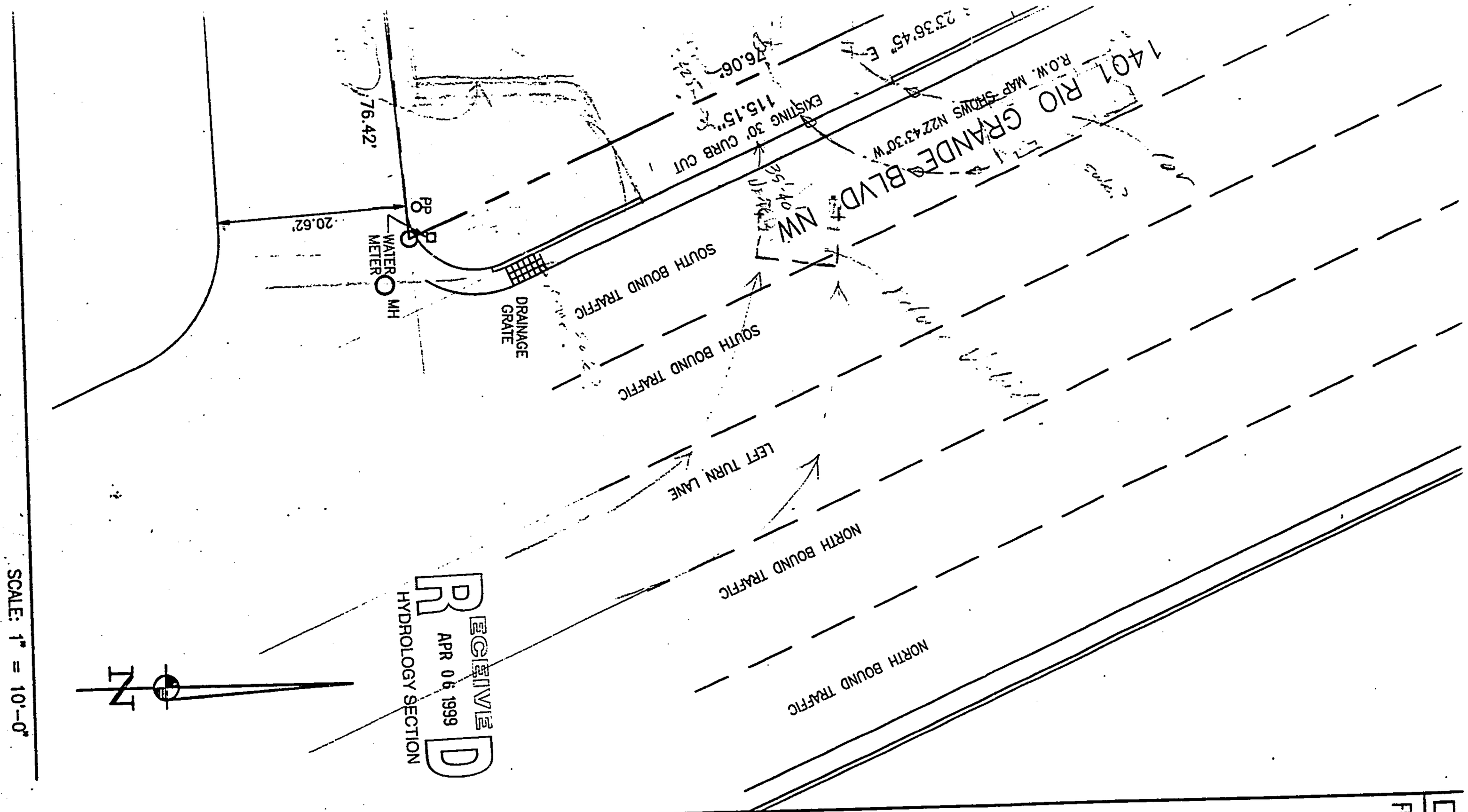
Dear Mr. Clarke,
The above referenced plan requires modification to the Site Plan prior to Building Permit release as follows:

- 25' radius curve needed on end islands along large vehicle route as shown. Called out as 25' but shown as 15'.__Minimum width of end islands-10'. . . . . __Verification needed that Rio Grande Cooridor Plan is being addressed.
- Copy of replat or current plat needed for office files, does not match latest Zone Atlas.
- New and existing elements noted on the Site Plan must be shown, labelled, and dimensioned correctly and accurately, this includes street edge of asphalt, limits of asphalt paving, all site sidewalks, street sidewalks and curb & gutter, all drive aisles, both drivepads, any drivepad of adjacent lot, if close to common property line, and any fencing(specifically at property lines), etc.__Need to see clear differentiation between new construction and existing on Site Plan.
- Label - "Construct drivepad per City of Albuq. Std. Detail Dwg. No. 2425" and show correctly.__If west edge of drivepad is to be closer than 5'-6" to west property line approval from that lot owner is needed. . . . . .__Check keyed note 2/A1.
- Dimension stalls, label "typical" or call out in individual locations, if not typical. . . . . __Call out to stripe lot per City Standard.
- Show, label, and dimension *new* street sidewalk on Rio Grande. City sidewalk ordinance requires minim. 6' *concrete* street sidewalk on Rio Grande. . . . . __Show and label new HC.ramp at street corner, must be A.D.A.
- Concrete curb needs to be constructed, per DPM Section23.7 B6(where needed and 4' minim. width landscape buffer),in parking lot adjacent to Rio Grande as shown and at south property line here; also at northeast corner of building as shown.__Label detail--"6" Header Curb Detail - ***Typical*** or at each individual location__If extruded concrete is used, top of surface of landscape mulching(gravel, bark, etc.) must be level with, or up to 1" below top of curb.
- Minim. 3' wide concrete walk needed across drive aisle from north row of parking, as shown to provide pedestrian access from parking. . . . . __Stairs at north side of bldg. may be in pedestrian path from parking to entrance. Needs to be clear.
- HC.ramp must be constructed at HC.parking as part of sidewalk, as shown.__Show ramp and slope of ramp using arrows.
- The curb cut may be left at 30 foot width, only if one-way traffic flow is maintained, which is required for this site to operate.
- Using traffic turning template, entrance from Rio Grande will not allow safe, effective use by standard car/pickup and Refuse vehicle as shown. Existing parking layout accessed from Rio Grande cannot continue to be used since volumes of traffic are being increased. Layout will need to be rearranged , as shown or equal. This will include HC. ramp construction and curbing construction here.Two options which will permit retaining two regular stalls and one HC. stall, are shown. Option 1 will involve rebuilding sidewalk to be flush with asphalt, which can be worked in with HC. access aisle. Option 2 will involve constructing ramp in existing sidewalk with minim. 8' wide HC. access aisle. __Remove stalls and wheelstops and diagonally hatch the area as shown.__Minim. 20' wide drive aisle needed along servic/emergency/ refuse truck route [c.r.] __Need to see confirmation of Fire and Solid Waste approvals regarding this.
- Need to see that all existing obstacles in City right-of-way, in existing sidewalks, have been picked up.
- All Civil Sheets (Drainage Plan, Site Plan and Landscape Plan) must be together at front of plan set.

Please provide revised Site Plan reflecting above requirements and copy of replat for my files. Also verification from stated sections is needed, including Zoning regarding Rio Grande Cooridor. If you have questions please come by so I can clarify as necessary.

Sincerely,

Mike Zamora,
Commercial Plan Checker



SHEET A1 OF 07

SITE LAYOUT PLAN
CODE ANALYSIS
SITE DETAILS

ADDITION TO
THE BRANCH LAW FIRM ANNEX
1401 RIO GRANDE BLVD. NW
ALBUQUERQUE, NEW MEXICO

FILE # 859SITE
05 APR 99

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

3 May 1999

Shahab Biazar
Advanced Engineering and Consulting, LL
10205 Snowflake Ct. NW
Albuquerque, NM 87114

RE: BRANCH LAW FIRM ANNEX (H-13Z/D-038) GRADING & DRAINAGE SUBMITTAL FOR GRADING & BUILDING PERMIT APPROVAL. ENGINEER'S STAMP DATED 4-5-99

Dear Mr. Biazar:

Based upon the information provided in your 4-5-99 submittal, the Hydrology Division approves the referenced site for Grading and Building permit once the attached comments from the Transportation Development Section are addressed. If, in addressing the transportation comments, changes are made to the plan that affect the proposed drainage plan, you will be required to resubmit the revised plan for additional Hydrology review.

Once Transportation comments have been addressed, please attach a copy of this approved plan to the construction sets prior to sign off by Hydrology.

For any work to be performed within City right-of-way, a separate permit will be required.

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

If I can be of further assistance, feel free to call at 768-2766.

Sincerely,

Scott Davis
PWD, Hydrology Div.

c: Andrew Garcia
file

DRAINAGE INFORMATION SHEET

PROJECT TITLE: The Branch Law Firm Annex ZONE ATLAS/DRNG. FILE #: H-13-Z 038

DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: Tract 221B & 221C, Map 35 of MRGCD-1957 Deed Sec. 7 T 10 R3E NMPM, Albuquerque, NM

CITY ADDRESS: 1401 Rio Grande Boulevard, NW

ENGINEERING FIRM: *Advanced Engineering and Consulting, LL* CONTACT: Shahab Biazar

ADDRESS: 10205 Snowflake Ct. NW, Alb., NM 87114 PHONE: (505) 899-5570

OWNER: The Branch Law Firm Annex CONTACT: _____

ADDRESS: 1401 Rio Grande Boulevard, NW PHONE: _____

ARCHITECT: Masterworks Archittects, Inc CONTACT: Jim Clark

ADDRESS: 516 Eleventh Street NW, 87102-1806 PHONE: (505) 242-1866

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

X DRAINAGE PLAN

_____ CONCEPTUAL GRADING & DRAINAGE PLAN

X GRADING PLAN

_____ EROSION CONTROL PLAN

_____ ENGINEER'S CERTIFICATION

_____ OTHER

PRE-DESIGN MEETING:

_____ YES

X NO

_____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

_____ SKETCH PLAN APPROVAL

_____ PRELIMINARY PLAT APPROVAL

_____ S. DEV. PLAN FOR SUB'D. APPROVAL

_____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL

_____ SECTOR PLAN APPROVAL

_____ FINAL PLAT APPROVAL

_____ FOUNDATION PERMIT APPROVAL

X BUILDING PERMIT APPROVAL

_____ CERTIFICATE OF OCCUPANCY APPROVAL

X GRADING PERMIT APPROVAL

_____ PAVING PERMIT APPROVAL

_____ S. A. D. DRAINAGE REPORT

_____ DRAINAGE REQUIREMENTS

_____ Other

DATE SUBMITTED: 04 / 05 / 99

BY: Shahab Biazar, P.E.

RECEIVED
APR 5 1999
HYDROLOGY SECTION

4/6/99 (4:25 PM)

Called Shahab regarding the TRAFFIC requirement

DDRAINAGE REPORT
FOR

THE BRANCH LAW FIRM ANNEX

Prepared by:

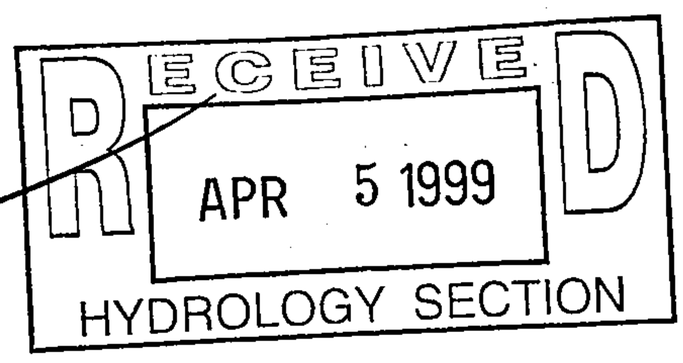
ADVANCED ENGINEERING and CONSULTING, LLC

10205 Snowflake Ct. NW
Albuquerque, New Mexico 87114

Prepared For:

Masterworks Architects, Inc.
516 Eleventh Street, NW
Albuquerque, New Mexico 87102-1806

April, 1999



Shahab Biazar
PE NO. 13479

GRAPHIC SCALE IN FEET

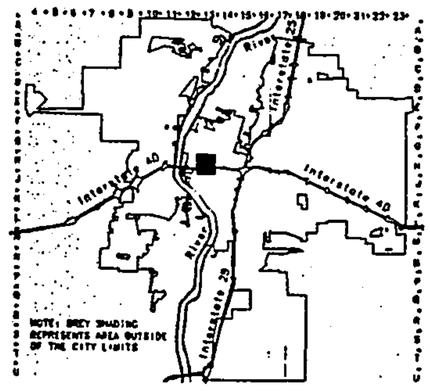
250 0 500 1000

CITY OF Albuquerque

AGIS Albuquerque Geographic Information System

PLANNING DEPARTMENT

Map Amended through February 20, 1996



LEGAL DESCRIPTION

TION

RGE

SEC 7

UNIFORM PROPERTY CODE

1-013-058

H-13-Z

Location

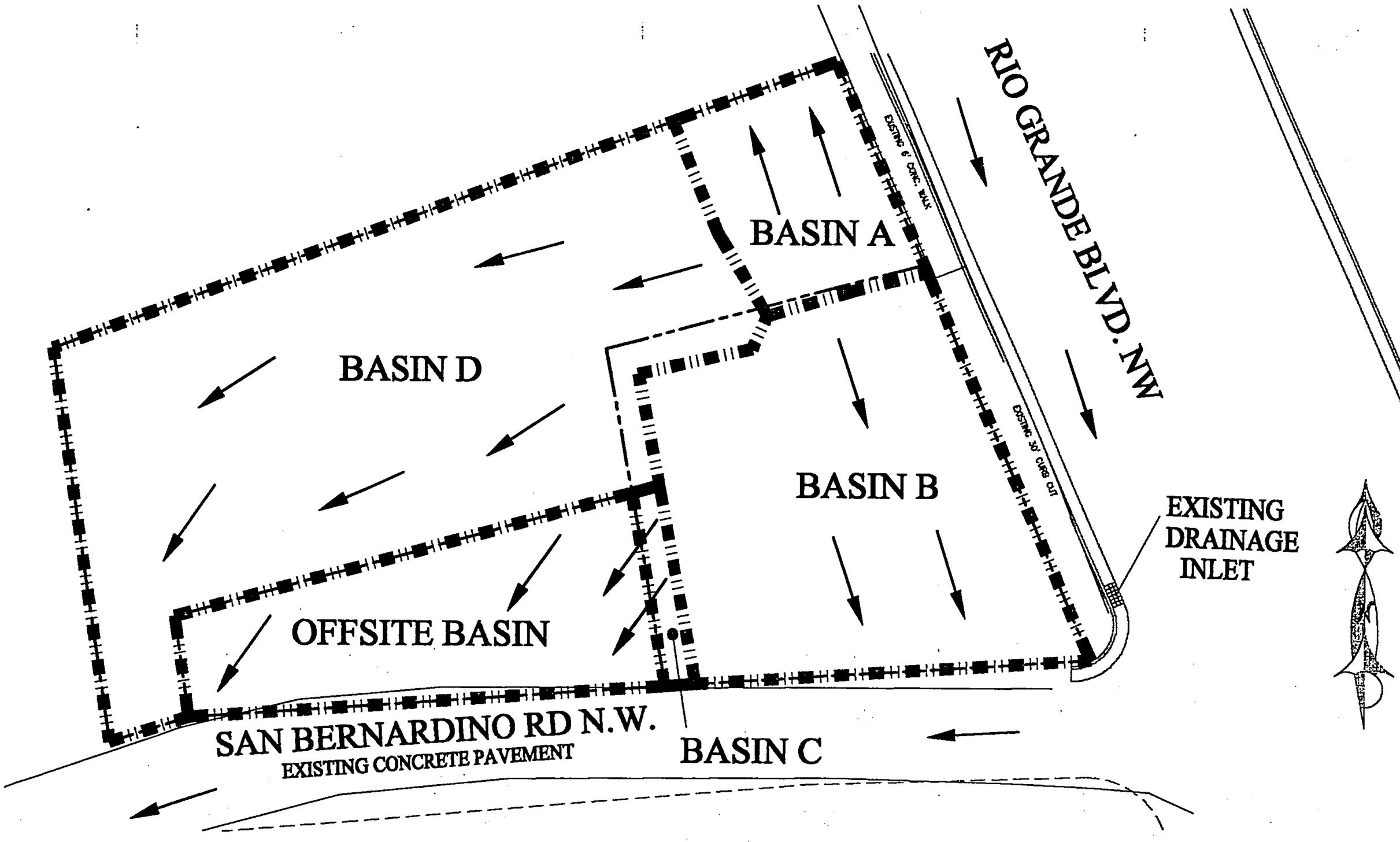
Tracts 221B and 221C, Map 35 Of The MRGCD-1957 Deed Sec. 7 T10N R3E NMPM, Albuquerque, New Mexico contains 0.2820 acres (12,284.59 sf). The site is at 1401 Rio Grande Boulevard NW (at the northwest corner of Rio Grande Boulevard NW and San Bernardino Road NW).

Purpose

Advanced Engineering and Consulting, LLC on behalf of Masterworks Architects, Inc. has prepared this grading and drainage plan for the proposed building and parking addition to this site. This grading and drainage plan is prepared to obtain grading approval as well as building permit approval.

Existing Drainage Conditions

The site is flat. No offsite runoff enters this site. Rio Grande Boulevard NW intercepts the runoff to the east. The runoff to the west drains west and south to San Bernardino Road NW and does enter this site. The runoff to the north, for the most part, drains to the west and then to San Bernardino Road NW and some small portion drains to an existing pond to the east (see grading plan for the location of the existing pond); once this pond exceeds its limits overflows to the west and does not enter this site. San Bernardino Road NW intercepts the runoff to the south. San Bernardino Road drains to the west and is constructed out of concrete due to its flatness.



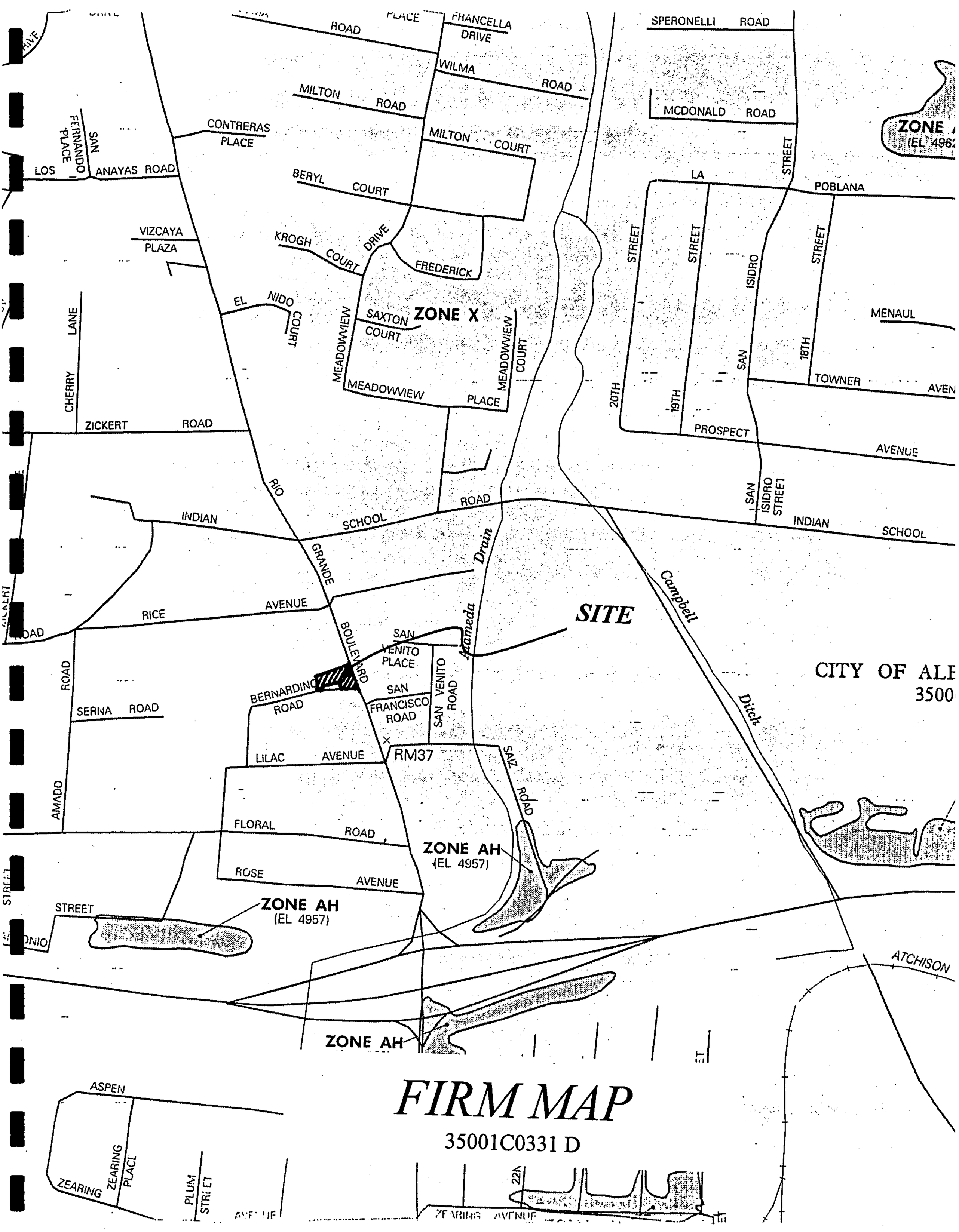
EXISTING BASIN LAYOUT

The on-site runoff is analyzed under several small basins. Basin A, an existing landscaped area, drains north the existing pond on the adjacent property at flow rate of 0.07 cfs. Basin B consists of the existing building and parking area and drains south to San Bernardino Road and then west at a runoff rate of 0.43 cfs. Basin C, small area behind the existing building (to the east), drains to the existing Tract 221D to the west and then to San Bernardino at a flow rate of 0.02 cfs. Basin D drains east and then south to San Bernardino Road through Tract 221D at a flow rate of 0.47 cfs. Therefore, the total discharge to San Bernardino Road, under the existing conditions is (0.43+0.02+0.47) 0.92 cfs.

As shown on the attached FIRM Map number 35001C0331-D the site falls within a 500-year flood plain, Zone X.

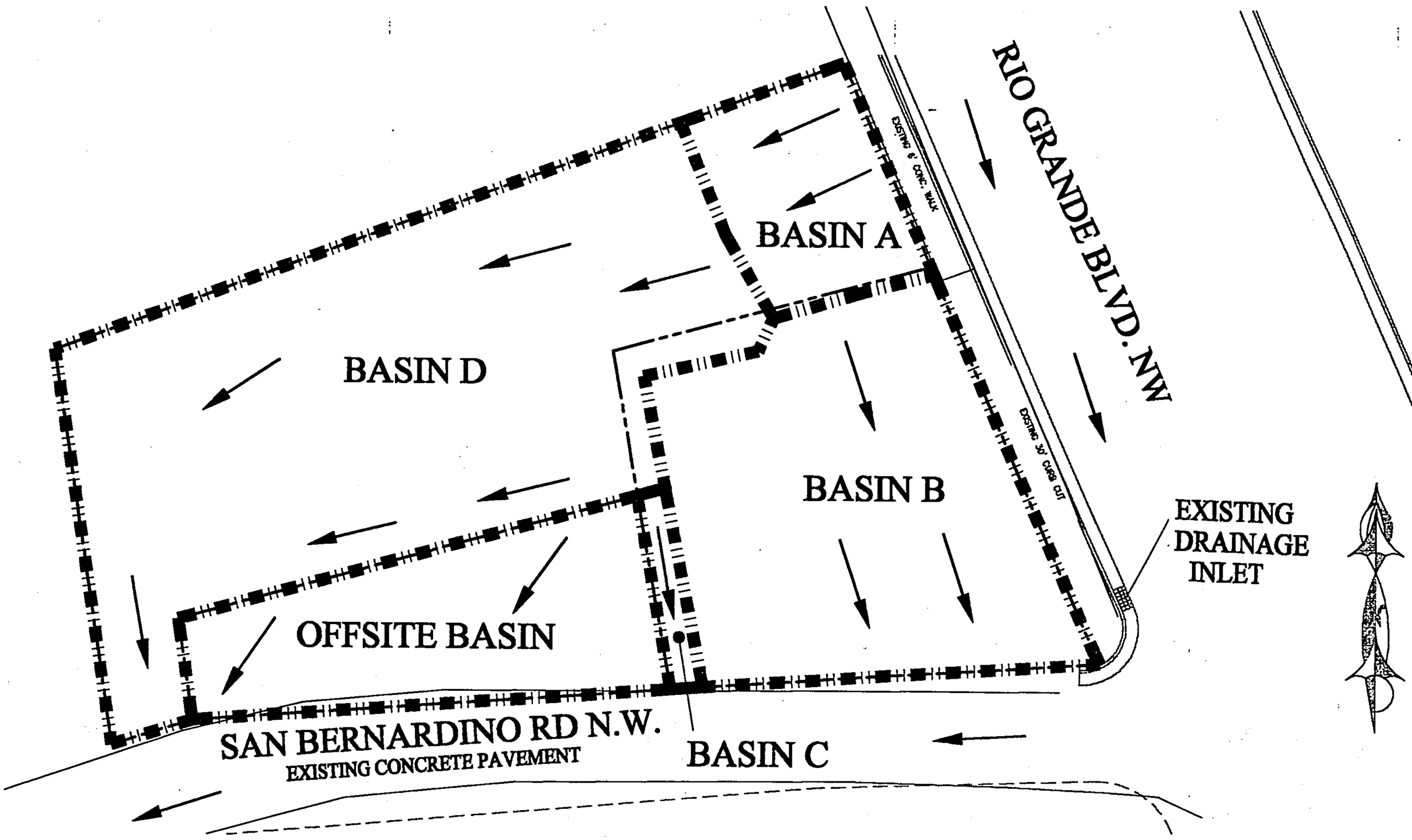
Proposed Conditions and On-Site/Offsite Drainage Management Plan

The drainage patterns, for on-site and offsite, for the most part will remain the same. The runoff from Basin A, instead of flowing to the north, will drain to Basin D at developed runoff rate of 0.12 cfs. Basin B, at developed runoff rate of 0.42 cfs, will continue to drain to San Bernardino Road. Portion of the paving within Basin B will be removed and then replaced with landscaping. Basin C, at developed runoff rate of 0.02 cfs, will also continue to drain to San Bernardino Road. Basin C will no longer drain to San Bernardino Road Through Tract 221D. Basin D, at developed runoff rate of 0.66 cfs, along with the runoff from Basin A (at a total runoff rate of 0.78 cfs) will pond on site and then discharged through landscaping area at a controlled flow rate of 0.39 cfs to San Bernardino Road. The runoff in Basin D is controlled via a 6"



FIRM MAP

35001C0331 D



PROPOSED BASIN LAYOUT

opening. See cross-section D on the grading plan for the opening detail. The 100-year water surface elevation (4960.26') is shown on the grading plan as well. The total discharged to the San Bernardino Road, under developed conditions, is (0.42+0.02+0.39) 0.83 cfs. Therefore, the discharge to San Bernardino Road is less than existing discharge (0.92 cfs) by 0.09 cfs.

Calculations

City of Albuquerque, Development Process Manuel, Section 22.2, Hydrology Section, revised January 1993, was used for the runoff calculations. The site falls under Zone 2 based on Figure A-1 of page A-1.

RUNOFF CALCULATIONS

The site is @ Zone 2

DEPTH (INCHES) @ 100-YEAR STORM

P_{60} = 2.01 inches

P_{360} = 2.35 inches

P_{1440} = 2.75 inches

DEPTH (INCHES) @ 10-YEAR STORM

P_{60} = 2.01 x 0.667
= 1.34 inches

P_{360} = 1.57

P_{1440} = 1.83

See the summary output from AHYMO calculations.

Also see the following summary tables.

RUNOFF CALCULATION RESULTS

BASIN	AREA (SF)	AREA (AC)	AREA (MI^2)
A	1204.20	0.027644628	0.000043
B	3995.93	0.09173393	0.000143
C	190.32	0.004369146	0.000007
D	6893.53	0.158253673	0.000247

PROPOSED

BASIN	Q-100 CFS	Q-10 CFS	TREATMENT A, B, C, D
A	0.12	0.08	0%, 23.61%, 0%, 76.39%
B	0.42	0.27	0%, 12.50%, 0%, 87.50%
C	0.02	0.01	0%, 31.93%, 0%, 68.07%
D	0.66	0.41	0%, 25.84%, 0%, 74.16%

EXISTING

BASIN	Q-100 CFS	Q-10 CFS	TREATMENT A, B, C, D
A	0.07	0.03	0%, 100%, 0%, 0%
B	0.43	0.29	0%, 0%, 3.86%, 96.14%
C	0.02	0.01	0%, 0%, 100%, 0%
D	0.47	0.24	0%, 23%, 77%, 0%

VOLUME CALCULATIONS

DETENTION POND

Ab - Bottom Of The Pond Surface Area
At - Top Of The Pond Surface Area
D - Water Depth
Dt - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = $Ab * D + 0.5 * C * D^2$

C = (At - Ab) / Dt

Ab =	0.00	@ 4959.85'
At =	2,291.38	@ 4960.35'
Dt =	0.50	
C =	4582.76	

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
4959.85	0	0.00000	0.00
4959.95	0.1	0.00053	0.05
4960.05	0.2	0.00210	0.13
4960.15	0.3	0.00473	0.24
4960.25	0.4	0.00842	0.37
4960.35	0.5	0.01315	0.52

<u>Weir Equation</u>
Q = CLH ^ (3/2)

C =	2.95	
L =	0.50	(WIDTH OF THE OPENING)
H (Ft) =	0.50	(MAX. DEPTH OF WATER AT THE OPENING)
Q (CFS)=	0.52	(FLOW)

See AHYMO files for ponding calcuations.

```
*
* ZONE 2
*
**********************************************************************
*        100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)       *
**********************************************************************
START                TIME=0.0
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                     RAIN DAY=2.75 IN DT=0.03333 HR
* BASIN A
COMPUTE NM HYD       ID=1 HYD NO=100.0 AREA=0.000043 SQ MI
                     PER A=0.00 PER B=23.61 PER C=0.00 PER D=76.39
                     TP=0.1333 HR MASS RAINFALL=-1
* BASIN B
COMPUTE NM HYD       ID=1 HYD NO=101.0 AREA=0.000143 SQ MI
                     PER A=0.00 PER B=12.50 PER C=0.00 PER D=87.50
                     TP=0.1333 HR MASS RAINFALL=-1
* BASIN C
COMPUTE NM HYD       ID=1 HYD NO=102.0 AREA=0.000007 SQ MI
                     PER A=0.00 PER B=31.93 PER C=0.00 PER D=68.07
                     TP=0.1333 HR MASS RAINFALL=-1
* BASIN D
COMPUTE NM HYD       ID=1 HYD NO=103.0 AREA=0.000247 SQ MI
                     PER A=0.00 PER B=25.84 PER C=0.00 PER D=74.16
                     TP=0.1333 HR MASS RAINFALL=-1
**********************************************************************
*         10-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)       *
**********************************************************************
*
START                TIME=0.0
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=1.34 IN RAIN SIX=1.57 IN
                     RAIN DAY=1.83 IN DT=0.03333 HR
* BASIN A
COMPUTE NM HYD       ID=1 HYD NO=110.0 AREA=0.000043 SQ MI
                     PER A=0.00 PER B=23.61 PER C=0.00 PER D=76.39
                     TP=0.1333 HR MASS RAINFALL=-1
* BASIN B
COMPUTE NM HYD       ID=1 HYD NO=111.0 AREA=0.000143 SQ MI
                     PER A=0.00 PER B=12.50 PER C=0.00 PER D=87.50
                     TP=0.1333 HR MASS RAINFALL=-1
* BASIN C
COMPUTE NM HYD       ID=1 HYD NO=112.0 AREA=0.000007 SQ MI
                     PER A=0.00 PER B=31.93 PER C=0.00 PER D=68.07
                     TP=0.1333 HR MASS RAINFALL=-1
* BASIN D
COMPUTE NM HYD       ID=1 HYD NO=113.0 AREA=0.000247 SQ MI
                     PER A=0.00 PER B=25.84 PER C=0.00 PER D=74.16
                     TP=0.1333 HR MASS RAINFALL=-1
**********************************************************************
*        100-YEAR,  6-HR STORM (UNDER EXISITNG CONDITIONS)       *
**********************************************************************
START                TIME=0.0
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                     RAIN DAY=2.75 IN DT=0.03333 HR
* BASIN A
COMPUTE NM HYD       ID=1 HYD NO=104.0 AREA=0.000043 SQ MI
                     PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
```

```
                    TP=0.1333 HR MASS RAINFALL=-1
  * BASIN B
  COMPUTE NM HYD    ID=1 HYD NO=105.0 AREA=0.000143 SQ MI
                    PER A=0.00 PER B=0.00 PER C=3.86 PER D=96.14
                    TP=0.1333 HR MASS RAINFALL=-1
  * BASIN C
  COMPUTE NM HYD    ID=1 HYD NO=106.0 AREA=0.000007 SQ MI
                    PER A=0.00 PER B=0.00 PER C=100.00 PER D=0.00
                    TP=0.1333 HR MASS RAINFALL=-1
  * BASIN D
  COMPUTE NM HYD    ID=1 HYD NO=107.0 AREA=0.000247 SQ MI
                    PER A=0.00 PER B=23.00 PER C=77.00 PER D=0.00
                    TP=0.1333 HR MASS RAINFALL=-1
  *
  ********************************************************************
  *     -    10-YEAR,  6-HR STORM (UNDER EXISTING CONDITIONS)       *
  ********************************************************************
  *
  START             TIME=0.0
  RAINFALL          TYPE=1 RAIN QUARTER=0.0 IN
                    RAIN ONE=1.34 IN RAIN SIX=1.57 IN
                    RAIN DAY=1.83 IN DT=0.03333 HR
  * BASIN A
  COMPUTE NM HYD    ID=1 HYD NO=114.0 AREA=0.000043 SQ MI
                    PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                    TP=0.1333 HR MASS RAINFALL=-1
  * BASIN B
  COMPUTE NM HYD    ID=1 HYD NO=115.0 AREA=0.000143 SQ MI
                    PER A=0.00 PER B=0.00 PER C=3.86 PER D=96.14
                    TP=0.1333 HR MASS RAINFALL=-1
  * BASIN C
  COMPUTE NM HYD    ID=1 HYD NO=116.0 AREA=0.000007 SQ MI
                    PER A=0.00 PER B=0.00 PER C=100.00 PER D=0.00
                    TP=0.1333 HR MASS RAINFALL=-1
  * BASIN D
  COMPUTE NM HYD    ID=1 HYD NO=117.0 AREA=0.000247 SQ MI
                    PER A=0.00 PER B=23.00 PER C=77.00 PER D=0.00
                    TP=0.1333 HR MASS RAINFALL=-1
  *
  FINISH
```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =04/04/1999

INPUT FILE = 9914

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.350
COMPUTE NM HYD	100.00	-	1	.00004	.12	.004	1.79966	1.500	4.530	PER IMP=	76.39
COMPUTE NM HYD	101.00	-	1	.00014	.42	.015	1.94822	1.500	4.541	PER IMP=	87.50
COMPUTE NM HYD	102.00	-	1	.00001	.02	.001	1.68841	1.500	4.424	PER IMP=	68.07
COMPUTE NM HYD	103.00	-	1	.00025	.66	.023	1.76984	1.500	4.182	PER IMP=	74.16
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.570
COMPUTE NM HYD	110.00	-	1	.00004	.08	.002	1.08754	1.500	2.832	PER IMP=	76.39
COMPUTE NM HYD	111.00	-	1	.00014	.27	.009	1.20523	1.500	2.915	PER IMP=	87.50
COMPUTE NM HYD	112.00	-	1	.00001	.01	.000	.99940	1.500	2.713	PER IMP=	68.07
COMPUTE NM HYD	113.00	-	1	.00025	.41	.014	1.06391	1.500	2.598	PER IMP=	74.16
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.350
COMPUTE NM HYD	104.00	-	1	.00004	.07	.002	.77821	1.533	2.616	PER IMP=	.00
COMPUTE NM HYD	105.00	-	1	.00014	.43	.016	2.07725	1.500	4.753	PER IMP=	96.14
COMPUTE NM HYD	106.00	-	1	.00001	.02	.000	1.12790	1.500	3.581	PER IMP=	.00
COMPUTE NM HYD	107.00	-	1	.00025	.47	.014	1.03512	1.500	2.989	PER IMP=	.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.570
COMPUTE NM HYD	114.00	-	1	.00004	.03	.001	.27828	1.533	1.072	PER IMP=	.00
COMPUTE NM HYD	115.00	-	1	.00014	.29	.010	1.30567	1.500	3.124	PER IMP=	96.14
COMPUTE NM HYD	116.00	-	1	.00001	.01	.000	.50906	1.500	1.929	PER IMP=	.00
COMPUTE NM HYD	117.00	-	1	.00025	.24	.006	.44598	1.533	1.531	PER IMP=	.00
FINISH											

Ponding Calculations (Input File)

```
*
* ZONE 2
*
*************************************************************************
*       100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)       *
*************************************************************************
START                TIME=0.0
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                     RAIN DAY=2.75 IN DT=0.03333 HR
* BASIN A
COMPUTE NM HYD       ID=1 HYD NO=100.0 AREA=0.000043 SQ MI
                     PER A=0.00 PER B=23.61 PER C=0.00 PER D=76.39
                     TP=0.1333 HR MASS RAINFALL=-1
* BASIN D
COMPUTE NM HYD       ID=2 HYD NO=101.0 AREA=0.000247 SQ MI
                     PER A=0.00 PER B=25.84 PER C=0.00 PER D=74.16
                     TP=0.1333 HR MASS RAINFALL=-1
*
ADD HYD              ID=3 HYD NO=102.00 ID=1 ID=2
*
ROUTE RESERVOIR      ID=1 HYD NO=502.0 INFLOW ID=3 CODE=24
                     OUTFLOW(CFS)       STORAGE(AC-FT)  ELEVATION(FT)
                          0.00               0.00000       4959.85
                          0.05               0.00053       4959.95
                          0.13               0.00210       4960.05
                          0.24               0.00473       4960.15
                          0.37               0.00842       4960.25
                          0.52               0.01315       4960.35
*************************************************************************
*
FINISH
```

→ See Vol. Calc Spreadsheet For Calculations

Ponding Calculations
(Output File)

```
    AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
          RUN DATE (MON/DAY/YR) = 04/04/1999
          START TIME (HR:MIN:SEC) = 19:14:29
          INPUT FILE = 9914PD

*
* ZONE 2
*
**************************************************************************
*         100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)              *
**************************************************************************
START                 TIME=0.0
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                      RAIN DAY=2.75 IN DT=0.03333 HR

                COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                DT =     .033330 HOURS        END TIME =     5.999400 HOURS
                  .0000   .0016   .0033   .0049   .0066   .0084   .0102
                  .0120   .0139   .0158   .0178   .0199   .0219   .0241
                  .0263   .0286   .0309   .0333   .0358   .0384   .0411
                  .0439   .0467   .0497   .0529   .0561   .0596   .0631
                  .0669   .0709   .0751   .0807   .0866   .0930   .1066
                  .1371   .1840   .2514   .3434   .4644   .6186   .8106
                 1.0449  1.2624  1.3533  1.4300  1.4982  1.5602  1.6174
                 1.6704  1.7200  1.7664  1.8102  1.8514  1.8904  1.9273
                 1.9622  1.9953  2.0268  2.0566  2.0850  2.0915  2.0976
                 2.1033  2.1088  2.1140  2.1191  2.1239  2.1285  2.1329
                 2.1373  2.1414  2.1454  2.1494  2.1531  2.1568  2.1604
                 2.1639  2.1673  2.1706  2.1739  2.1771  2.1802  2.1832
                 2.1862  2.1891  2.1919  2.1947  2.1975  2.2002  2.2028
                 2.2054  2.2080  2.2105  2.2130  2.2154  2.2178  2.2202
                 2.2225  2.2248  2.2270  2.2293  2.2315  2.2336  2.2358
                 2.2379  2.2399  2.2420  2.2440  2.2460  2.2480  2.2500
                 2.2519  2.2538  2.2557  2.2576  2.2594  2.2612  2.2631
                 2.2648  2.2666  2.2684  2.2701  2.2718  2.2735  2.2752
                 2.2769  2.2785  2.2802  2.2818  2.2834  2.2850  2.2866
                 2.2881  2.2897  2.2912  2.2928  2.2943  2.2958  2.2973
                 2.2987  2.3002  2.3017  2.3031  2.3045  2.3060  2.3074
                 2.3088  2.3102  2.3115  2.3129  2.3143  2.3156  2.3169
                 2.3183  2.3196  2.3209  2.3222  2.3235  2.3248  2.3261
                 2.3273  2.3286  2.3298  2.3311  2.3323  2.3335  2.3348
                 2.3360  2.3372  2.3384  2.3396  2.3408  2.3419  2.3431
                 2.3443  2.3454  2.3466  2.3477  2.3488  2.3500

* BASIN A
COMPUTE NM HYD        ID=1 HYD NO=100.0 AREA=0.000043 SQ MI
                      PER A=0.00 PER B=23.61 PER C=0.00 PER D=76.39
                      TP=0.1333 HR MASS RAINFALL=-1

    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    .12968     CFS    UNIT VOLUME =     .9169        B =    526.28       P60 = 2.0100
    AREA =       .000033 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .132088HR     TP =    .133300HR     K/TP RATIO =    .990905      SHAPE CONSTANT, N =  3.563124
    UNIT PEAK =    .24745E-01CFS    UNIT VOLUME =     .8709        B =    324.91       P60 = 2.0100
    AREA =       .000010 SQ MI     IA =     .50000 INCHES     INF =    1.25000 INCHES PER HOUR
```

```
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

* BASIN D
COMPUTE NM HYD       ID=2 HYD NO=101.0 AREA=0.000247 SQ MI
                     PER A=0.00 PER B=25.84 PER C=0.00 PER D=74.16
                     TP=0.1333 HR MASS RAINFALL=-1

    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    .72319     CFS    UNIT VOLUME =     .9840       B =    526.28      P60 = 2.0100
    AREA =       .000183 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .132088HR     TP =    .133300HR     K/TP RATIO =    .990905     SHAPE CONSTANT, N =  3.563124
    UNIT PEAK =    .15557     CFS    UNIT VOLUME =     .9154       B =    324.91      P60 = 2.0100
    AREA =       .000064 SQ MI     IA =     .50000 INCHES     INF =    1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

*
ADD HYD              ID=3 HYD NO=102.00 ID=1 ID=2
*
ROUTE RESERVOIR      ID=1 HYD NO=502.0 INFLOW ID=3 CODE=24
                     OUTFLOW(CFS)       STORAGE(AC-FT)  ELEVATION(FT)
                          0.00               0.00000       4959.85
                          0.05               0.00053       4959.95
                          0.13               0.00210       4960.05
                          0.24               0.00473       4960.15
                          0.37               0.00842       4960.25
                          0.52               0.01315       4960.35

  * * * * * * * * * * * * * * * * * * * *

    TIME      INFLOW     ELEV       VOLUME     OUTFLOW
    (HRS)     (CFS)      (FEET)     (AC-FT)    (CFS)

     .00         .00    4959.85        .000        .00
     .80         .00    4959.85        .000        .00
    1.60         .55    4960.25        .009        .38
    2.40         .02    4960.04        .002        .12
    3.20         .00    4959.86        .000        .01
    4.00         .00    4959.86        .000        .00
 PEAK DISCHARGE =          .391 CFS - PEAK OCCURS AT HOUR    1.67
 MAXIMUM WATER SURFACE ELEVATION =     4960.264
 MAXIMUM STORAGE =          .0091 AC-FT       INCREMENTAL TIME=     .033330HRS

**********************************************************************
*
FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 19:14:29
```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =04/04/1999

INPUT FILE = 9914PD

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 1 NOTATION
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.350
COMPUTE NM HYD	100.00	-	1	.00004	.12	.004	1.79966	1.500	4.530	PER IMP= 76.39
COMPUTE NM HYD	101.00	-	2	.00025	.66	.023	1.76984	1.500	4.182	PER IMP= 74.16
ADD HYD	102.00	1& 2	3	.00029	.79	.027	1.76282	1.500	4.233	
ROUTE RESERVOIR	502.00	3	1	.00029	.39	.027	1.76282	1.667	2.106	AC-FT= .009
FINISH										

Ponding Calculations

Summary Data