

Renae

→ 6020 Academy - 511

Maria Holmes - 831 - 3787

402 52nd SW



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

February 21, 2003

Ron R. Bohannon
Tierra West, LLC
8509 Jefferson NE
Albuquerque, New Mexico 87113

**RE: Grading and Drainage Plan For Los Tres Hermanos (K11-D66) Dated
January 20, 2003**

Dear Mr. Bohannon:

The above referenced grading and drainage plan received February 21, 2003 is approved for grading permit. Please have the contractor obtain a Top Soil Disturbance Permit. Upon completion of the project please submit a certification for the project per the DPM.

Sincerely,

Carlos A. Montoya
City Floodplain Administrator

DRAINAGE AND TRANSPORTATION SHEET

(REV. 1/11/2002)

PROJECT TITLE: Los Tres Hermanos ZONE MAP/DRG. FILE #: K-11 *DL6*

DRB #: EPC #: WORK ORDER #: 700281

LEGAL DESCRIPTION: Lots 4, 5, 7-29, 44, 45, & 48-51

CITY ADDRESS: Los Tres Hermanos

ENGINEERING FIRM: Tierra West, LLC CONTACT: RONALD R. BOHANNAN

ADDRESS: 8509 Jefferson NE PHONE: (505) 858-3100

CITY, STATE: Albuquerque, NM ZIP CODE: 87113

OWNER: AMC Development Services CONTACT: Jeff Jesionowski

ADDRESS: 400 Gold SW, Suite 750 PHONE: 338-2285

CITY, STATE: Albuquerque, NM ZIP CODE: 87102

ARCHITECT: CONTACT:

ADDRESS: PHONE:

CITY, STATE: ZIP CODE:

SURVEYOR: Surv-Tek CONTACT: Russ Hugg

ADDRESS: 5643 Paradise Blvd. NW PHONE: 897-3366

CITY, STATE: Albuquerque, NM ZIP CODE: 87114

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

CITY, STATE: ZIP CODE:

CHECK TYPE OF SUBMITTAL:

☒ DRAINAGE REPORT

☐ DRAINAGE PLAN

☐ CONCEPTUAL GRADING & DRAINAGE PLAN

☒ GRADING PLAN

☐ EROSION CONTROL PLAN

☐ ENGINEER'S CERTIFICATION (HYDROLOGY)

☐ CLOMR/LOMR

☐ TRAFFIC CIRCULATION LAYOUT (TCL)

☐ ENGINEERS CERTIFICATION (TCL)

☐ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)

☐ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

☐ SIA / FINANACIAL GUARANTEE RELEASE

☐ 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 (PERM.)

☐ CERTIFICATE OF OCCUPANCY (TEMP.)

☒ GRADING PERMIT APPROVAL

☐ PAVING PERMIT APPROVAL

☐ WORK ORDER APPROVAL

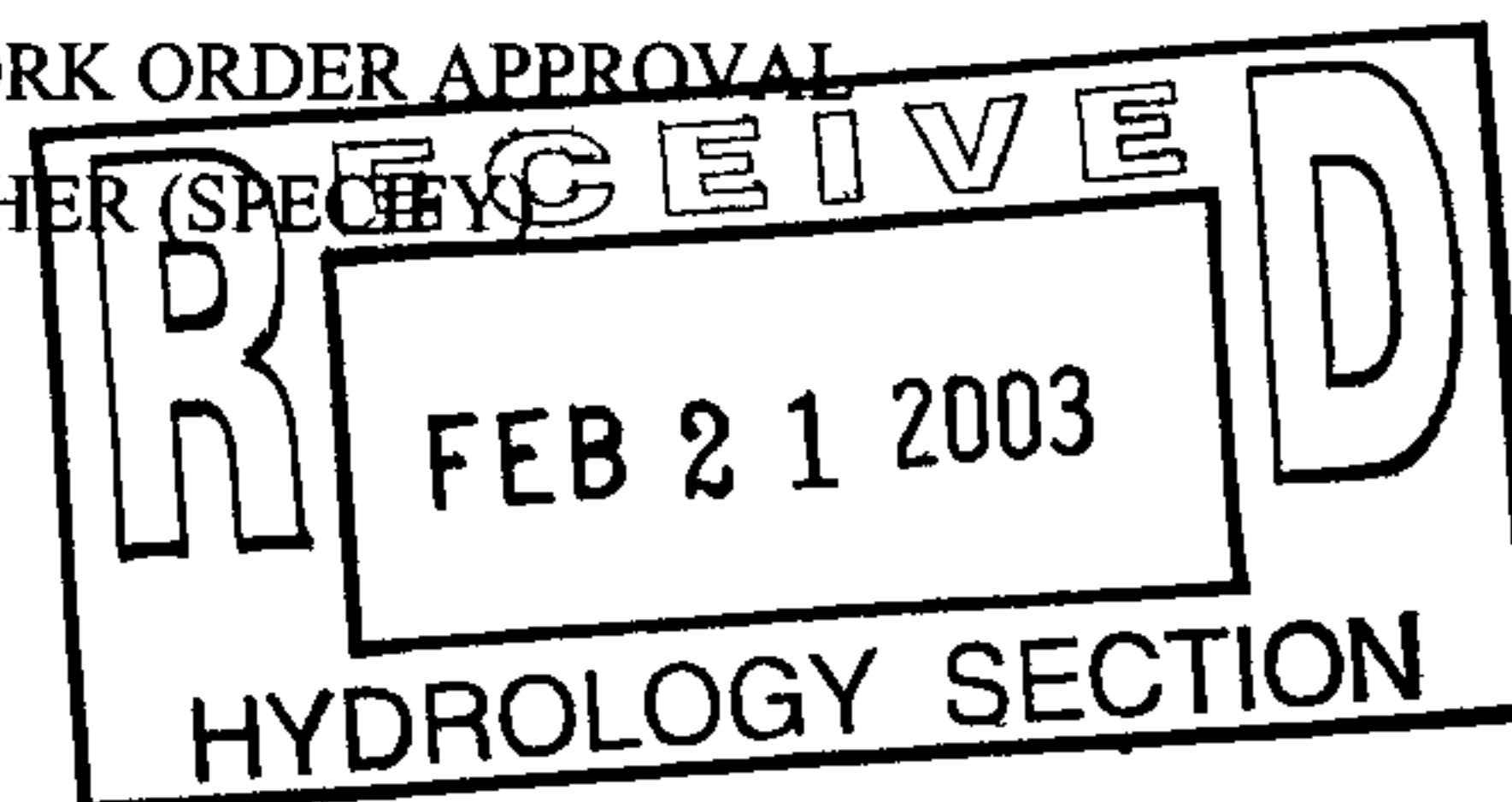
☐ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

☐ YES

☒ NO

☐ COPY PROVIDED



DATE SUBMITTED: 1/21/2003 BY RONALD R. BOHANNAN, P.E.

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plans:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report:** Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.

TIERRA WEST, LLC

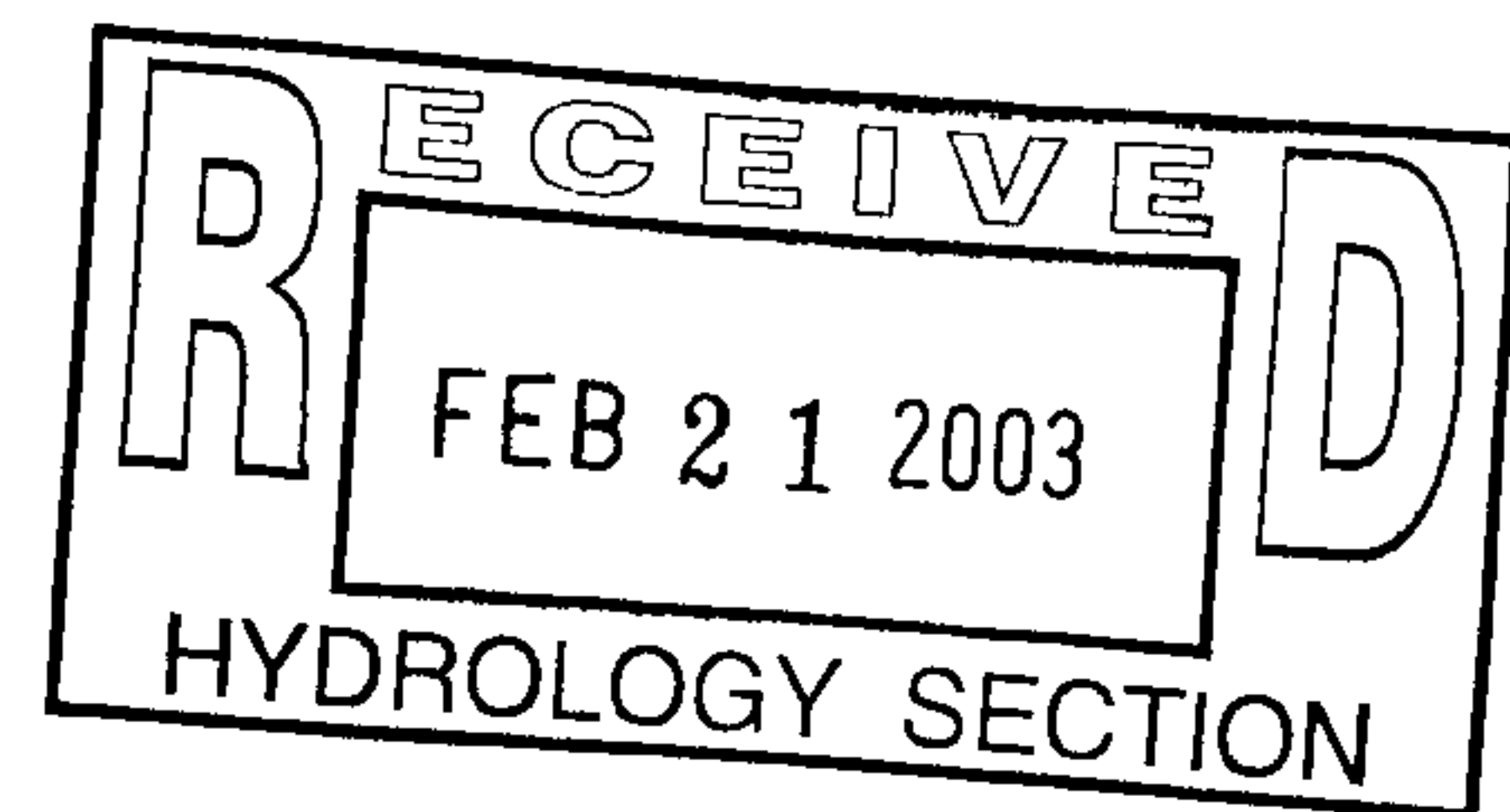
8509 Jefferson NE
Albuquerque, NM 87113

(505) 858-3100
fax (505) 858-1118

twllc@tierrawestllc.com
1-800-245-3102

January 23, 2003

Mr. Carlos Montoya, P.E.
Flood Plan Administrator
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103



**RE: Los Tres Hermanos Drainage Report (K11-D66)
Engineer's Stamp Dated November 11, 2002**

Dear Mr. Montoya:

Our office reviewed the comments received in your letter dated December 16, 2002 and addressed the them as follows:

1. At the north boundary of Crestview you indicate that you are connecting to existing curb and gutter. A field visit showed that this is incorrect. Please correct this statement.
The new connection point on Crestview is shown on sheet 4 of 12 in the DRC Drawings.
2. Curb and gutter is going to have to be built from Gonzales to Churchill on Crestview.
The new curb and gutter is shown on sheet 4 of 12 in the DRC Drawings.
3. Please show a street profile from Gonzales to Churchill on Crestview. Use this profile to determine capacity of 100-year storm street runoff.
The plan and profile from Crestview is shown on sheet 4 of 12 in the DRC Drawings and the storm runoff was recalculated and shown in the revised Drainage Report.
4. The last existing lot (307 Crestview SW shown on Crestview on the west side is low compared to the street grades. Please show existing lot grades and compare them with the street grades.
As shown on sheet 4 of 12 in the DRC Drawings, all of the driveways are compatible with the new street grades except for Lot 32. The driveway for Lot 32 will have to be raised to match the new street grades. The finished floor of the existing house will allow for the adjustment of the driveway.

5. A site visit showed that the inlets at Crestview and Churchill do not collect the runoff from the new development. New inlets will be required at this intersection.
Crestview Drive was redesigned to create a sump area on the north end of the street and new inlets are to be constructed. These improvements are shown on sheet 10 of 12 in the DRC Drawings.

We feel that all of your concerns were addressed in the revised plans and revised Drainage Report. Should you have any questions or need additional information regarding this matter, please do not hesitate to call me.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. Bohannon', with a long horizontal flourish extending to the right.

Ronald R. Bohannon, P.E.

Enclosure/s

cc: Jeff Jesionowski

JN: 21117
RRB/jdn

**DRAINAGE REPORT
FOR**

***LOS TRES HERMANOS &
52ND STREET & CRESTVIEW DRIVES***

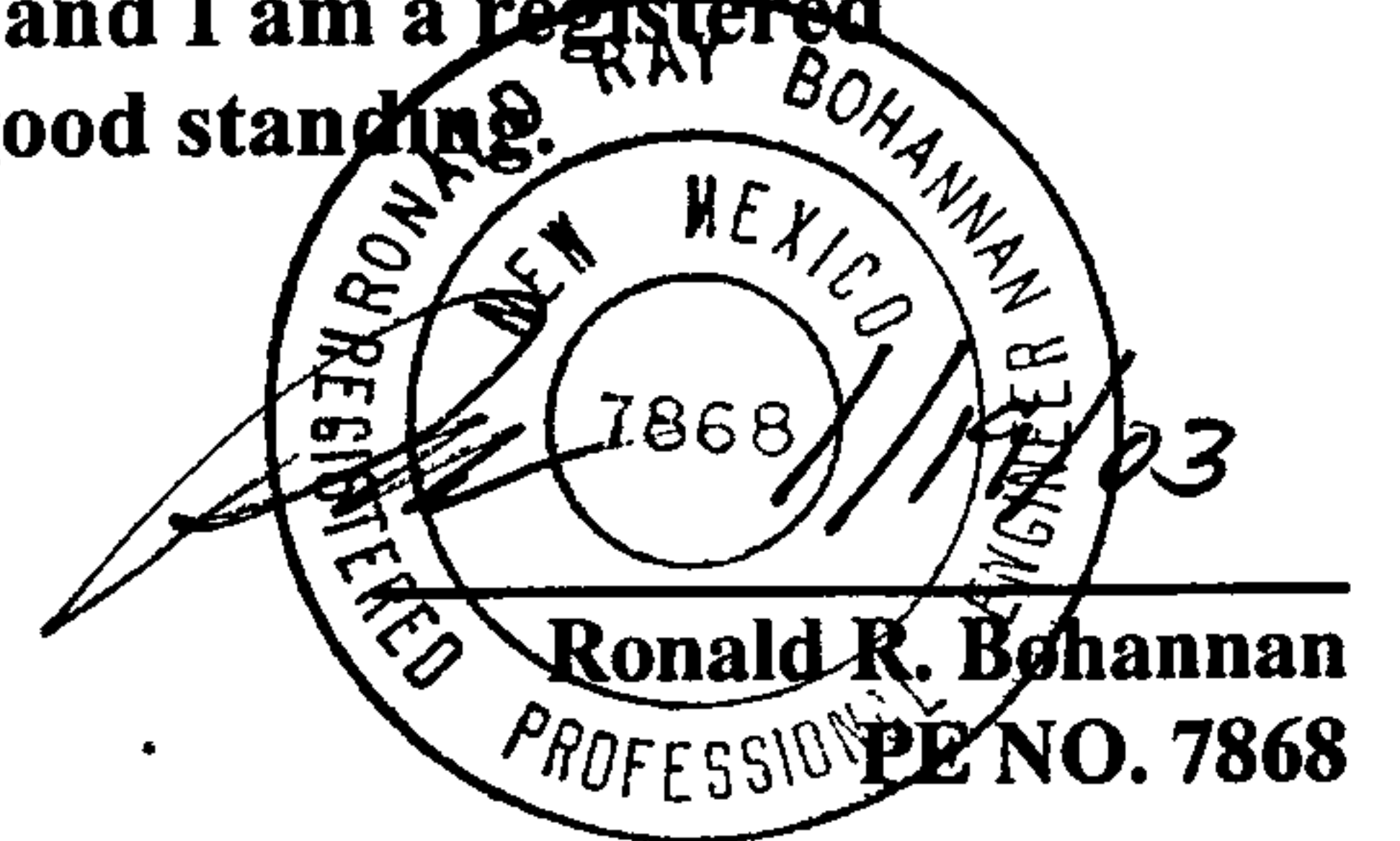
Prepared by:

**Tierra West, LLC
8509 Jefferson NE
Albuquerque, New Mexico 87113**

**Prepared for:
AMC Development Services**

January, 2003

**I certify that this report was prepared under my supervision, and I am a registered
professional engineer in the State of New Mexico in good standing.**



Job No 21117

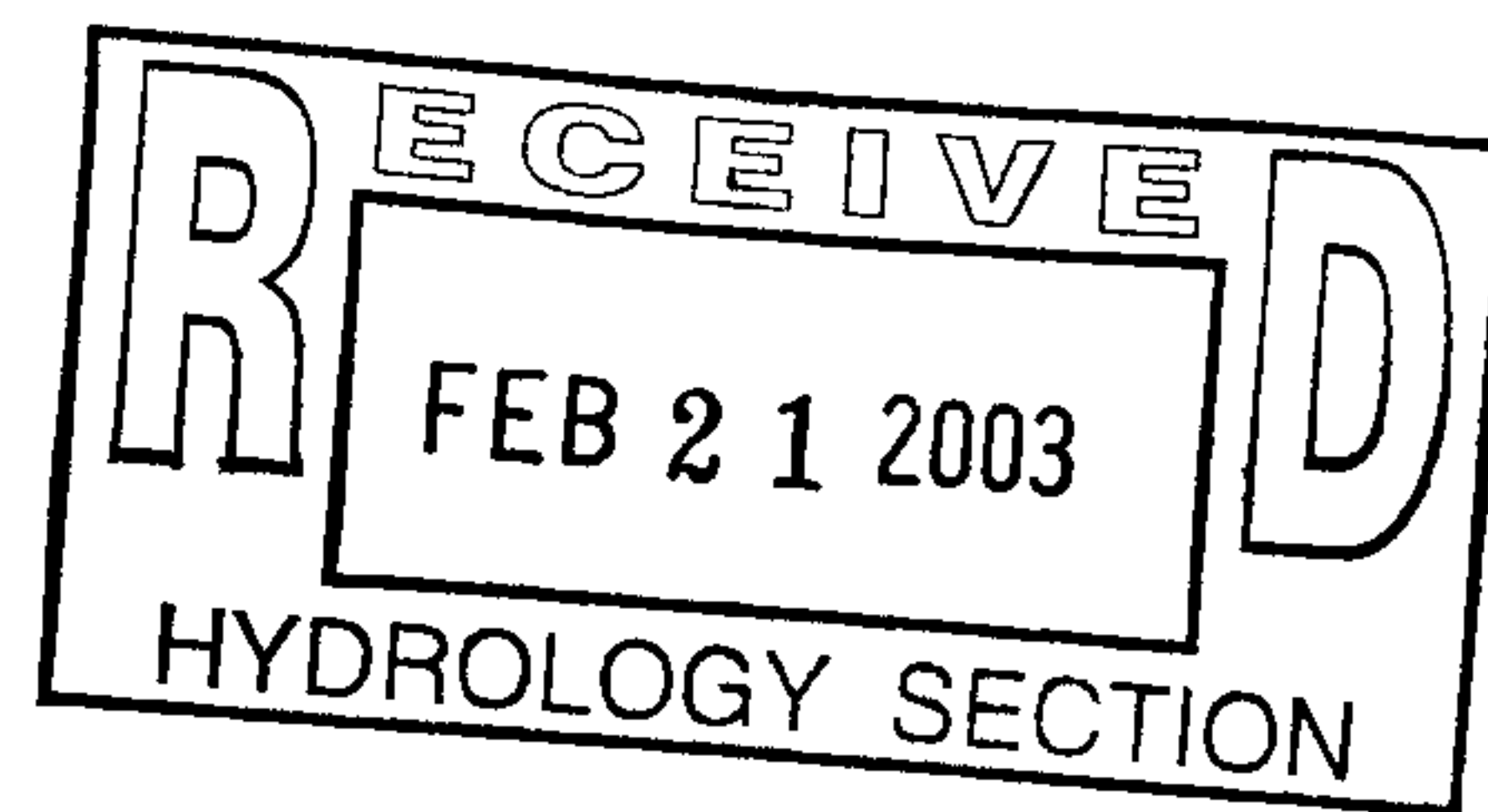


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MAP POCKET

Grading and Drainage Plan

Prelude

This report is being prepared at the request of the current owner, who proposes to develop approximately 31 single family lots in a subdivision originally platted in the early 1950's and entitled Los Tres Hermanos. In addition, we propose to develop two streets, 52nd Street and Crestview Drive, which abut the lots and but were constructed with temporary asphalt.

Location

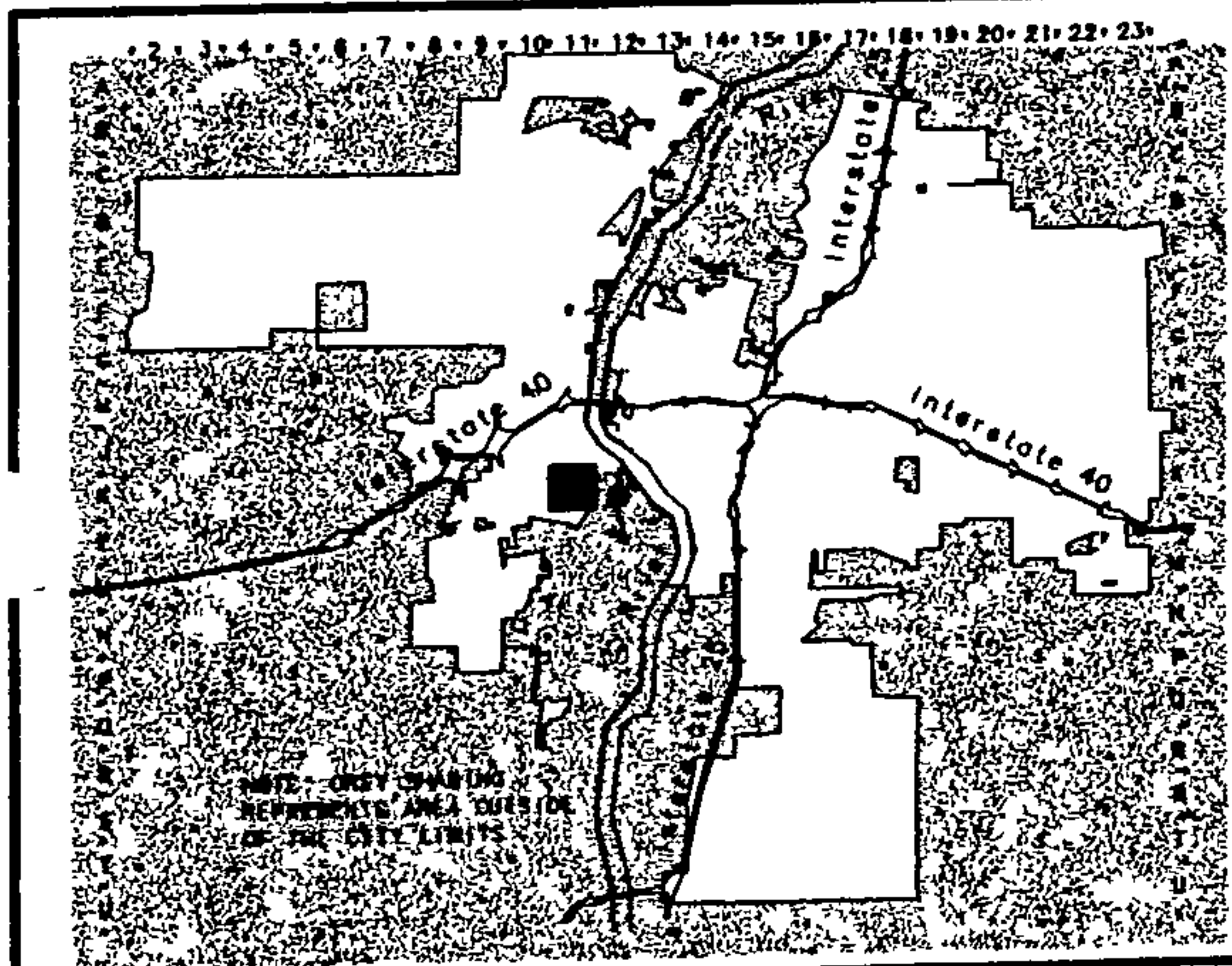
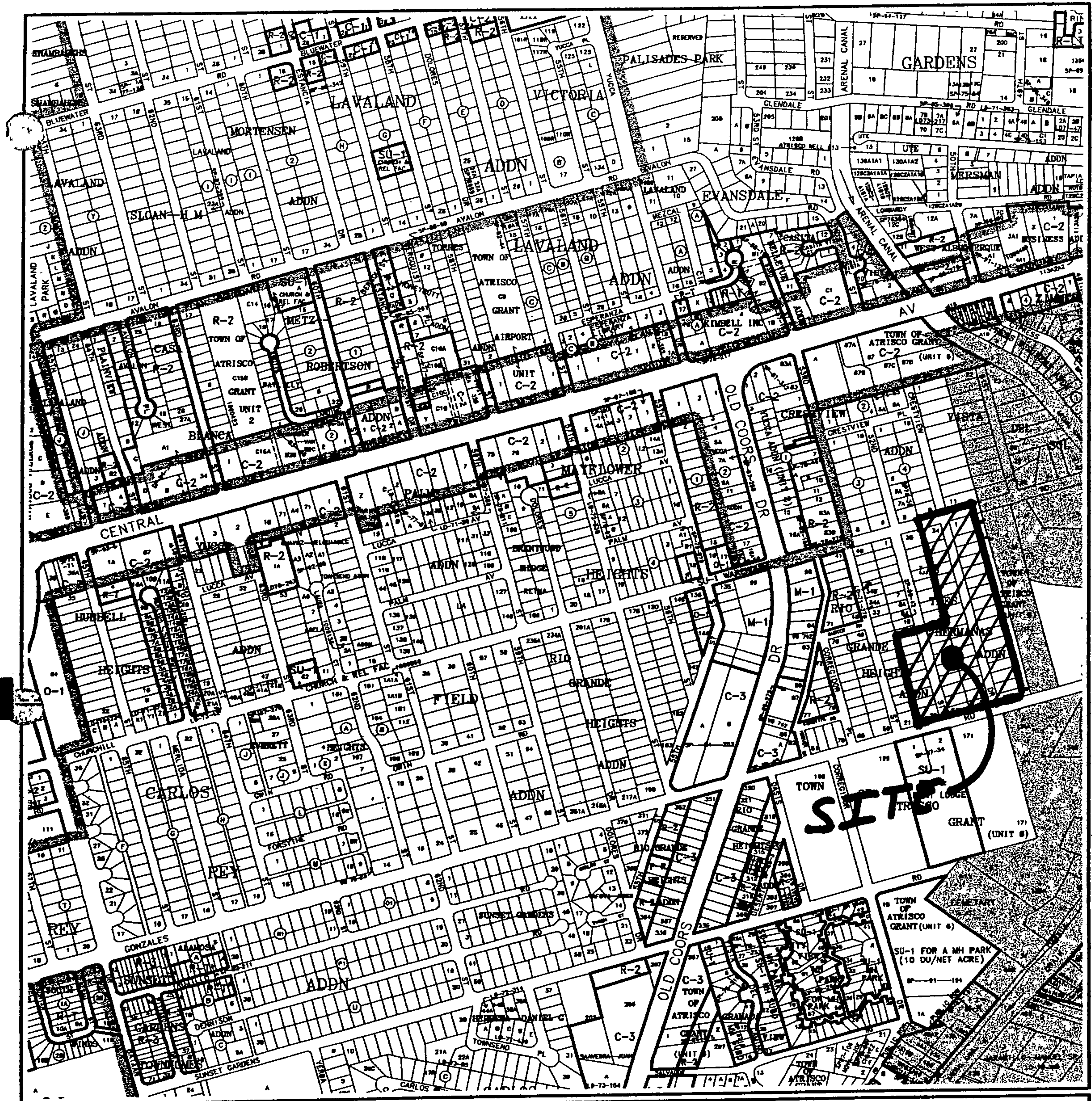
The subject site is located on the west side of Albuquerque near South Coors. Specifically, the site is located at the corner of Gonzales Road and 52nd Street. The exact location of the site is shown highlighted on the enclosed Zone Atlas page number K-11. The site will be built in one phase and contains 8.1797 acres more or less.

Purpose

The purpose of this drainage report is to present a grading and drainage solution for the proposed lots and proposed street grades on Crestview Drive and 52nd Street. We are requesting final grading permit approval at this time.

Existing Drainage Conditions

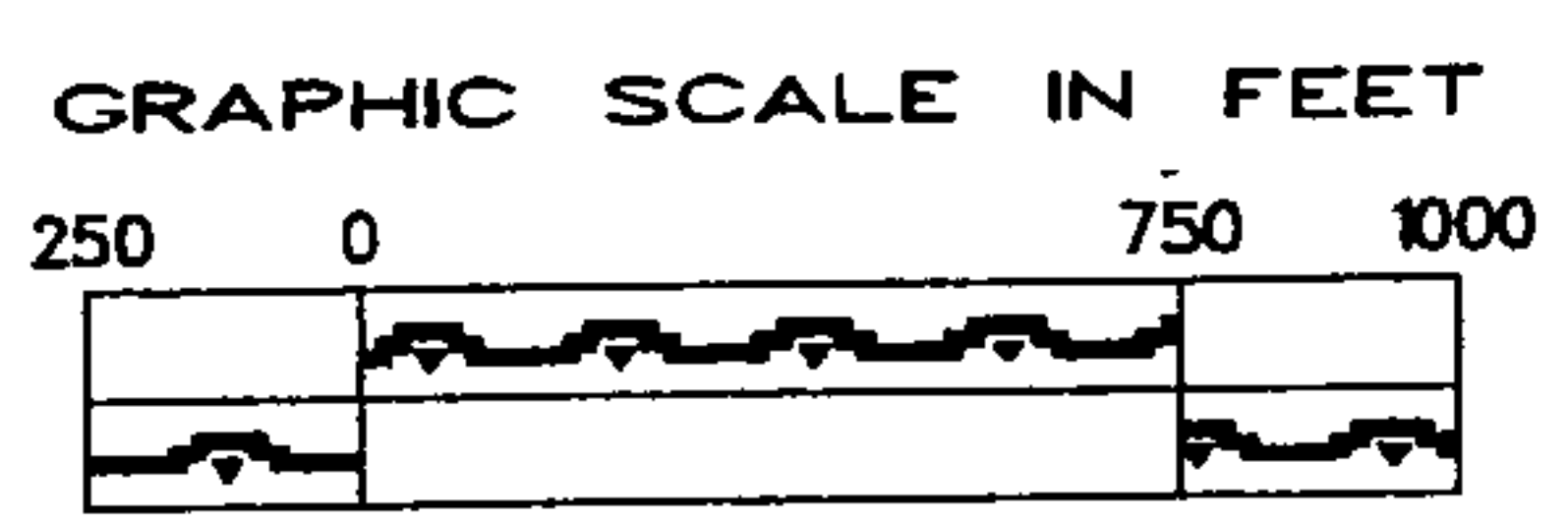
The site contains three basins and lies adjacent and slightly east to the Gonzales Road Pond installed by the City. The Pond is situated west of the site. Two of these basins drain north to Churchill Road and an existing storm drain system. The third drains south to Gonzales Road and then to the Gonzales Pond. The surrounding areas to the east and south fall away from the site and do not impact the project.



CITY OF
Albuquerque

Albuquerque Geographic Information System
PLANNING DEPARTMENT

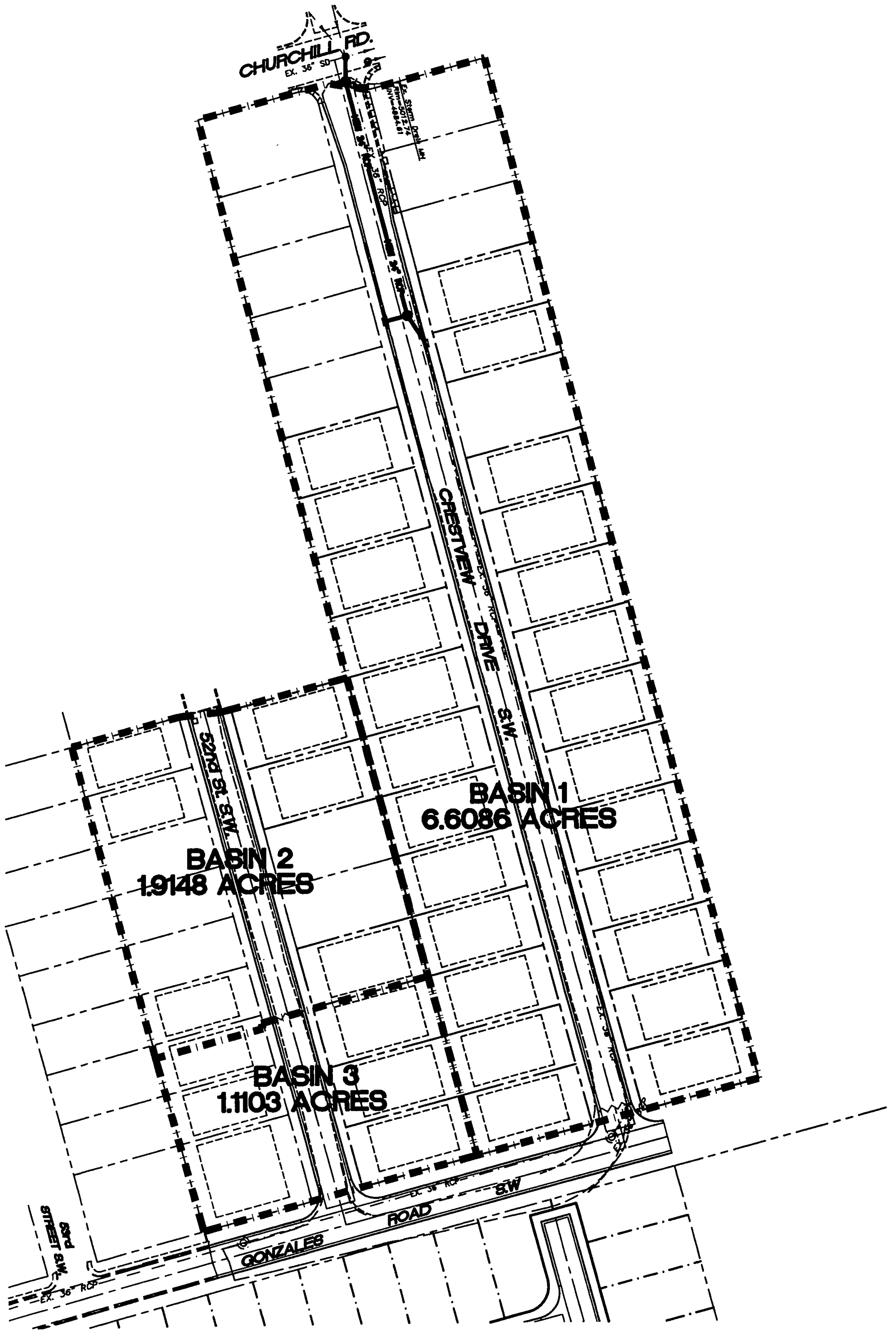
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Zone Atlas Page

K-11-Z

Map Amended through July 18, 2001



The property to the east drains east off of the bluff to the MRGCD canal. Gonzales Road drains west of the Gonzales Pond and does not affect the site. The lots on the north and west drain away from the project.

Flood Plain and Soil Condition

The site is located on FEMA Map No. 350002 panel 27 as shown on the attached excerpt. The map shows that the site does not lie within any 100-year flood plains.

The site contains two soil types: Madurez Wink (MWA) and Tijeras (TgB) as indicated on the Soil Map (sheet #42) from the Soil Conservation Service Survey of Bernalillo County. The Tijeras is gentle sloping old alluvial fan material with moderate runoff and soil erosion. The Madurez Wink series is a sandy loam with slow runoff and moderate to severe soil erosion. (See attached soil map for site location).

Proposed Conditions and On-Site Drainage Management Plan

The lots will be graded and all of the surface improvements will be built out in their entirety. Crestview Drive and 52nd Street will be built using a Procedure A. Gonzales Road is being built with the Vista Pacifica project and this work will tie to those street grades. The enclosed grading plan in the map pocket shows the grades for the subject lots, along with the improvements in 52nd Street, Gonzales Road, and Crestview Drive.

The development was divided into three basins to analyze the proposed conditions. Basin 1 will route flows to two new inlets placed in Crestview Drive. These inlets connect to an existing storm sewer located in Churchill Road. Basin 2 will route the north flow to existing drop inlets located in 52nd Street. Basins 1 and 2 discharge at 19.60 and 5.68 for the 100-year flows, respectively, and 10.65 and 3.09 for the 10-year flows.

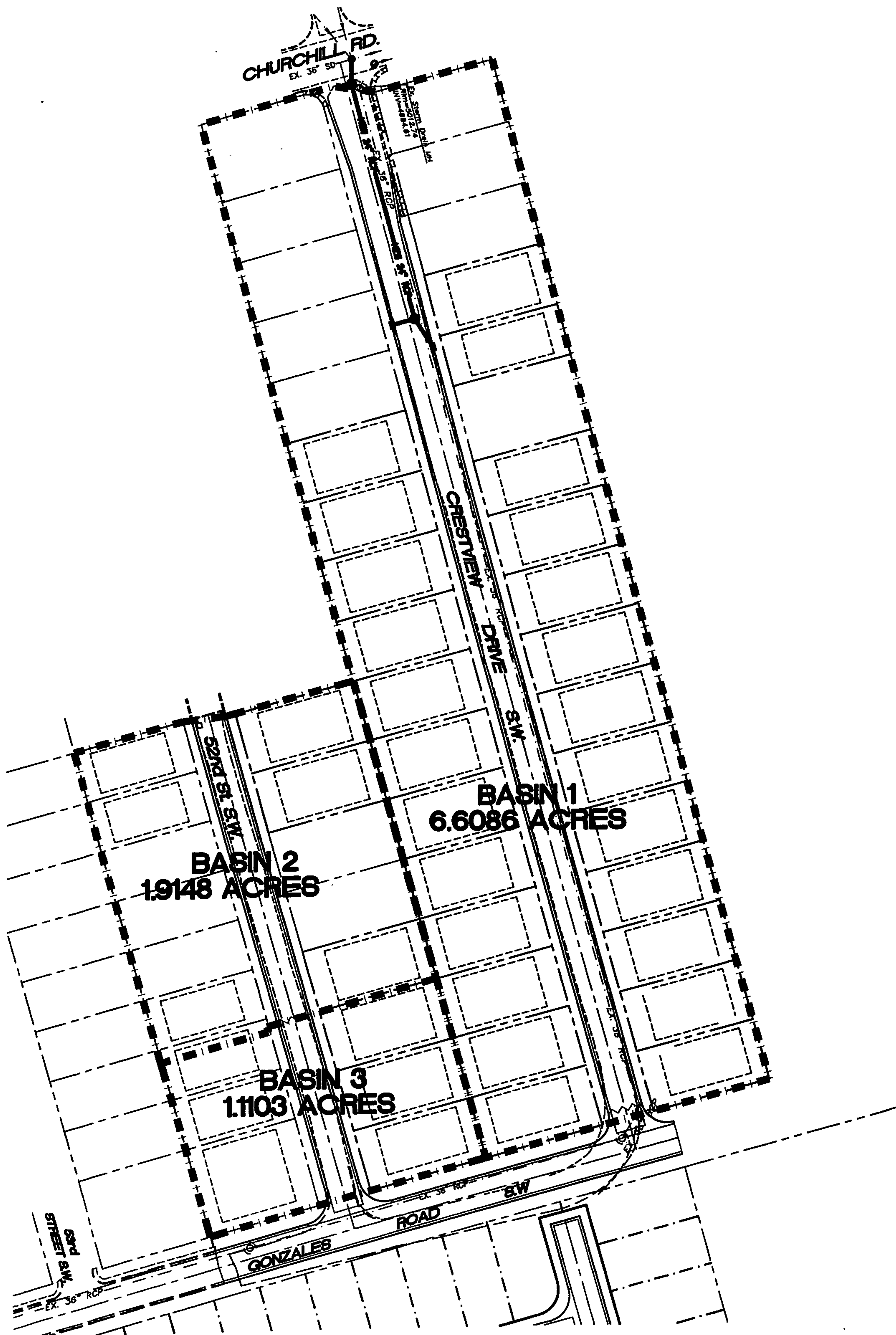
Basin 3 depicts the basin that flows back to Gonzales Road and the Gonzales Pond. Basin 3 represents the flows generated by these lots and discharges 3.30 and 1.80 for the 100-year and 10-year flows.

Street Capacity

The existing streets and proposed new streets are 32 ft. face to face and at .61 percent slope. The streets have capacity to handle the flows as shown on the street capacity calculations in the appendix.

Emergency Overflow

If clogged, the drain into Churchill will backup and continue down Churchill roadway.



**FIRM MAP
FLOOD INSURANCE RATE MAP
CITY OF ALBUQUERQUE**



Flood Zones
 Zone A  Zone AO  Zone AH  Zone AE
1999 AIR PHOTO (Metro Area Coverage)

NEW GIS QUERY

City of Albuquerque Home Page

Infrastructure List

As mentioned, 52nd Street, Crestview Drive, and the north side of Gonzales Road will be built under a Procedure A.

Calculations

The weighted E method from the “City of Albuquerque Development Process Manual Volume 11 – Design Criteria, 1997 Revision” was used to calculate the runoff and volume for the site.

Section II

Runoff Calculations

The Site is @ Zone 1				RUNOFF CALCULATIONS						
LAND TREATMENT				N= 3.78						
Proposed	Existing									
B = 60%	A = 100%									
D = 40%										
DEPTH (INCHES) @ 100-YEAR STORM				DEPTH (INCHES) @ 10-YEAR STORM						
P60 = 1.87				P60 = 1.87 x 0.667 = 1.247						
P360 = 2.20				P360 = 2.20 x 0.67 = 1.467						
P1440 = 2.66										
Zone 1										
Land Treatment										
From Table A-8 Soil Treatment		A	B	C	D					
Weighted E 100 yr.		0.44	0.67	0.99	1.97					
Weighted E 10 yr.		0.08	0.22	0.44	1.24					
Peak Discharge										
From Table A-9										
100 Yr		1.29	2.03	2.87	4.37					
10 Yr		0.24	0.76	1.49	2.89					
Volume Undeveloped										
	Soil Treatment Type	Acreage	100 Yr	10 Yr	Vol 100	Vol 10				
Basin 1	A	6.6086	0.4400	0.0800	0.2423	0.2643				
Basin 2	A	1.9148	0.4400	0.0800	0.0702	0.0766				
Basin 3	A	1.1103	0.4400	0.9800	0.0407	0.5440				
Volume Developed										
	Total	Acre "A"	Acre "B"	Acre "C"	Acre "D"		Weight E 100	E 10	V 100 Yr	V 10 Yr
Basin 1	6.6086	0.0000	3.9652	0.0000	2.6434		1.1900	0.6280	0.6553	0.3458
Basin 2	1.9148	0.0000	1.1489	0.0000	0.7659		1.1900	0.6280	0.1899	0.1002
Basin 3	1.1103	0.0000	0.6617	0.0000	0.4486		1.1952	0.6321	0.1106	0.0585
Peak Discharge										
	Total	Acre "A"	Acre "B"	Acre "C"	Acre "D"				Q 100 Yr	Q 10 Yr
Basin 1	6.6086	0.0000	3.9652	0.0000	2.6434				19.6010	10.6530
Basin 2	1.9148	0.0000	1.1489	0.0000	0.7659				5.6793	3.0866
Basin 3	1.1103	0.0000	0.6617	0.0000	0.4486				3.3036	1.7993

Street Capacity Calculations

Crestview & 52 Street

32' F-F Street Section

Slope= 0.061

For water depths less than 0.0625 feet

Y= Water depth

Area = $16 \cdot Y^2$

P= $\text{SQRT}(1025 \cdot Y^2) + Y$

n= 0.017

Depth (ft)	Area (ft ²)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0100	0.00	0.33	0.00	0.00	0.00	0.62	0.01	1.09	0.0112
0.0175	0.00	0.58	0.01	0.00	0.01	0.90	0.02	1.20	0.0221
0.0250	0.01	0.83	0.01	0.01	0.02	1.14	0.03	1.27	0.0341
0.0325	0.02	1.07	0.02	0.02	0.05	1.36	0.04	1.33	0.0468
0.0400	0.03	1.32	0.02	0.04	0.08	1.56	0.06	1.37	0.0602
0.0475	0.04	1.57	0.02	0.06	0.13	1.75	0.08	1.41	0.0741
0.0550	0.05	1.82	0.03	0.09	0.19	1.93	0.11	1.45	0.0884
0.0625	0.06	2.06	0.03	0.13	0.26	2.10	0.13	1.48	0.1031

For water depths greater than 0.0625 ft but less than 0.333 ft

Y1= Y-0.0625

A2= $A1 + 2 \cdot Y1 + 25 \cdot Y1^2$

P2= $P1 + \text{SQRT}(2501 \cdot Y1^2)$

Depth (ft)	Area (ft ²)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0630	0.06	2.09	0.03	0.13	0.27	2.10	0.13	1.48	0.1038
0.0900	0.14	3.47	0.04	0.34	0.68	2.50	0.22	1.47	0.1471
0.1200	0.26	5.00	0.05	0.78	1.57	3.01	0.36	1.53	0.2067
0.1500	0.43	6.53	0.07	1.51	3.02	3.52	0.53	1.60	0.2725
0.1968	0.78	8.91	0.09	3.33	6.67	4.26	0.84	1.69	0.3830
0.2100	0.90	9.59	0.09	4.02	8.05	4.46	0.94	1.72	0.4155
0.2400	1.21	11.12	0.11	5.92	11.83	4.91	1.18	1.77	0.4912
0.3096	2.08	14.67	0.14	12.24	24.48	5.88	1.82	1.86	0.6747
0.3330	2.43	15.86	0.15	15.05	30.10	6.19	2.06	1.89	0.7386

52nd Street

Crestview Drive

For water depths greater than 0.333 ft but less than 0.513 ft

Y2= Y - 0.333

A3= $A2 + Y2 \cdot 16 + 25 \cdot Y2^2$

P3= $P2 + \text{SQRT}(2501 \cdot Y2^2)$

Depth (ft)	Area (ft ²)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.3400	2.55	16.21	0.16	16.00	32.00	6.28	2.14	1.90	0.7589
0.3700	3.06	17.71	0.17	20.48	40.96	6.70	2.48	1.94	0.8467
0.4050	3.71	19.46	0.19	26.58	53.16	7.16	2.90	1.98	0.9505
0.4200	4.01	20.21	0.20	29.50	58.99	7.35	3.09	2.00	0.9953
0.4300	4.22	20.71	0.20	31.54	63.09	7.48	3.21	2.01	1.0254
0.4496	4.64	21.69	0.21	35.81	71.61	7.72	3.47	2.03	1.0847
0.4800	5.32	23.21	0.23	43.08	86.16	8.09	3.88	2.06	1.1774
0.5130	6.12	24.86	0.25	51.93	103.86	8.48	4.35	2.09	1.2791

Single 'C' Drop Inlet EFFECTIVE AREA

Area at the grate:

$$\begin{aligned} L &= 38.375" - 7(2@ \text{ middle bars}) \\ &= 34.875" \\ &= 2.906' \end{aligned}$$

$$\begin{aligned} W &= 25.5" - 13(2@ \text{ middle bars}) \\ &= 19" \\ &= 1.583' \end{aligned}$$

$$\begin{aligned} \text{Area} &= 1.583' \times 2.906' \\ &= 4.601 \text{ ft}^2 \end{aligned}$$

$$\begin{aligned} \text{Effective Area:} &= 4.601 - 4.601 (0.5 \text{ clogging factor}) \\ &= 2.30 \text{ ft}^2 \text{ at the grate} \end{aligned}$$

Area at the throat:

$$\begin{aligned} L &= 47.375@ \\ &= 3.95' \end{aligned}$$

$$\begin{aligned} H &= 10:@ - 42@ \\ &= 63@ \\ &= 0.5208' \end{aligned}$$

$$\begin{aligned} \text{Area} &= 3.95' \times 0.5208' \\ &= 2.06 \text{ ft}^2 \text{ at the throat} \end{aligned}$$

Total Area:

$$\begin{aligned} \text{Area} &= 2.30_{\text{grate}} + 2.06_{\text{throat}} \\ &= 4.36 \text{ ft}^2 \end{aligned}$$

Pipe Capacity

Pipe	D (in)	Slope (%)	Area (ft^2)	R	Q Provided (cfs)	Q Required (cfs)	Velocity (ft/s)
Option A							
1	18	1	1.77	0.375	10.53	9.80	5.55
2	18	1	1.77	0.375	10.53	9.80	5.55
3	24	1	3.14	0.500	22.68	19.60	6.24
4	24	1	3.14	0.500	22.68	19.60	6.24

Manning's Equation:

$$Q = 1.49/n * A * R^{(2/3)} * S^{(1/2)}$$

A = Area

R = D/4

S = Slope

n = 0.013

CHURCHILL RD.

EX. 36" SD

PIPE 4

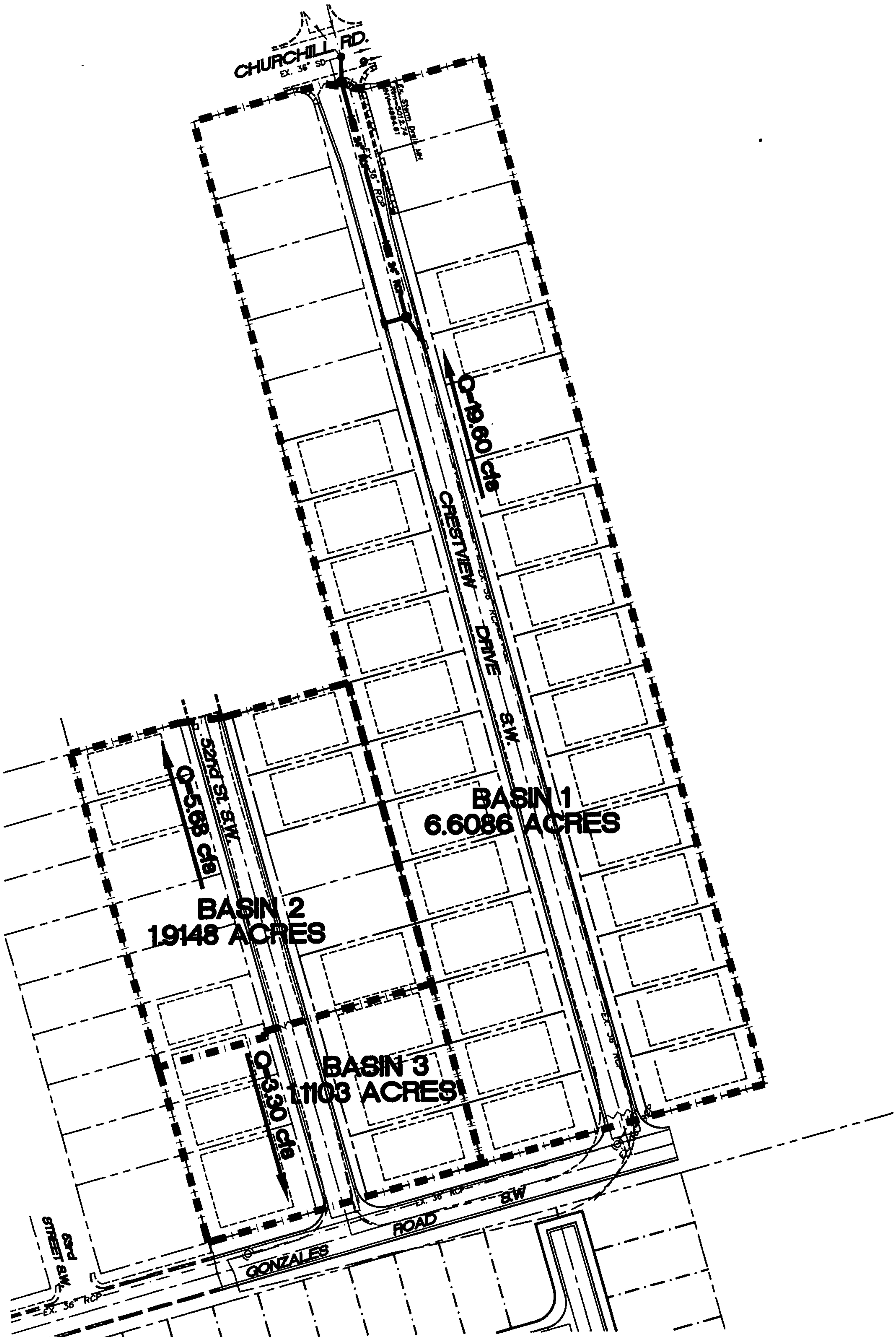
Ex. Storm Drain MH
Rim=5012.74
INV=4984.61

PIPE 3

EX. 36" RCP
NEW 24" RCP

PIPE 2

PIPE 1



CHURCHILL RD.
EX. 36° 50'

STREET
DRAIN
LINE
EX. 36° 50' RCP

0-19.60 CH

CRESTVIEW

DRIVE

S.W.

**BASIN 1
6.6086 ACRES**

**BASIN 2
1.9148 ACRES**

0-5.68 CH
2ND ST. S.W.

**BASIN 3
3.1103 ACRES**

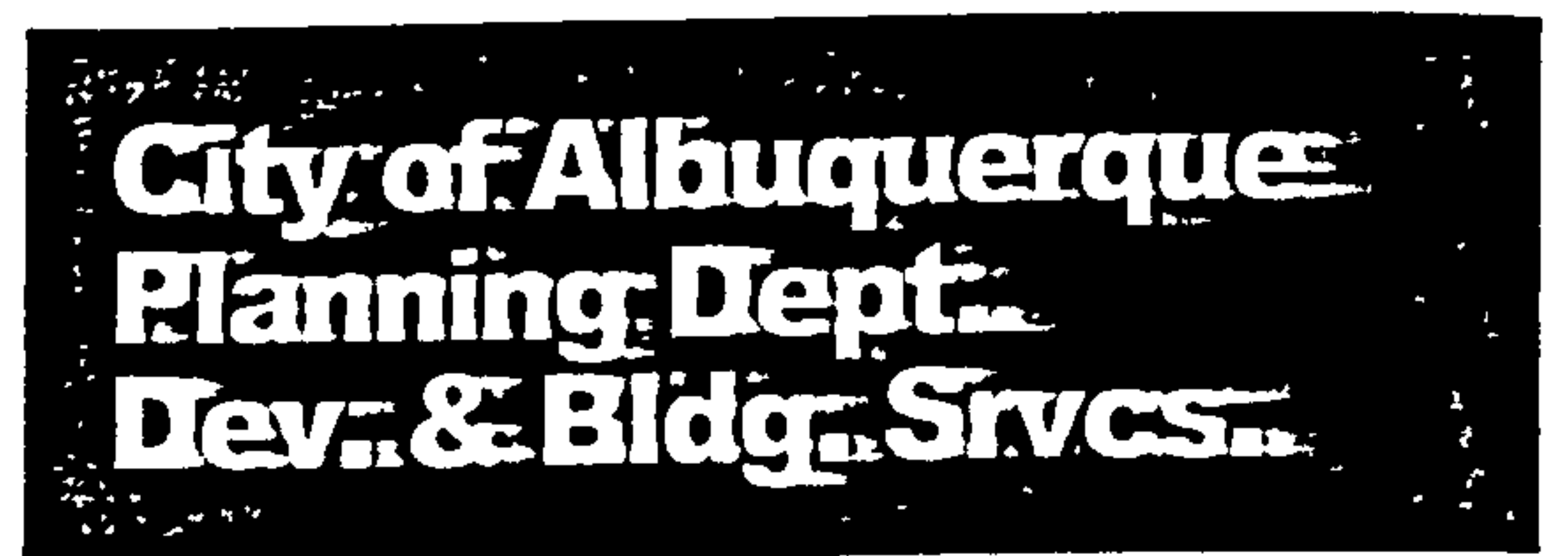
0-3.30 CH

EX. 36° RCP
ROAD
S.W.

GONZALES

3RD
STREET S.W.
EX. 36° RCP

City of Albuquerque
Planning Department
505-924-3900 (main number)
505-924-3864 (fax number)
Development and Building Services (One Stop Shop)
Plaza Del Sol Building, 2nd Floor
600 2nd Street NW
Albuquerque, NM 87102



Fax

To: Ron Bohannon From: Carlos A. Montoya

Copies to: _____

Fax: _____ Pages Sent: (including this page) 2

Phone: _____ Date: 2-18-03

Time: _____

☐ Urgent ☒ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

COMMENTS: Ron, I have a submittal
date of Nov 15, 2002. Then I have
a comment letter dated Dec 16, 2002.
After that I have no response.
I have attached my comment letter.



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 16, 2002

Ronald R. Bohannon, PE
Tierra West, LLC
8509 Jefferson NE
Albuquerque, NM 87113

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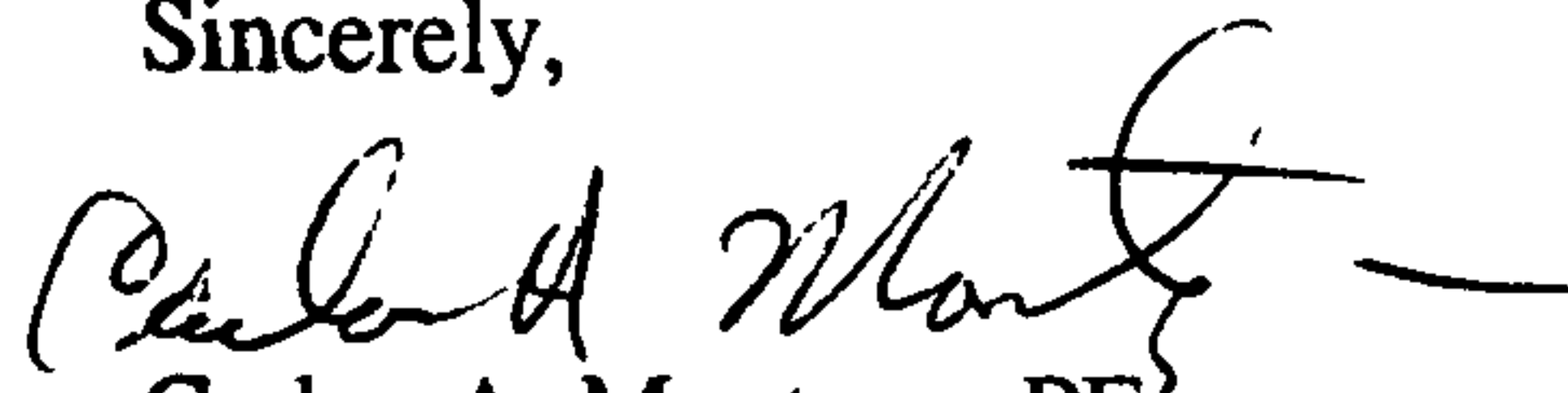
Dear Mr. Bohannon:

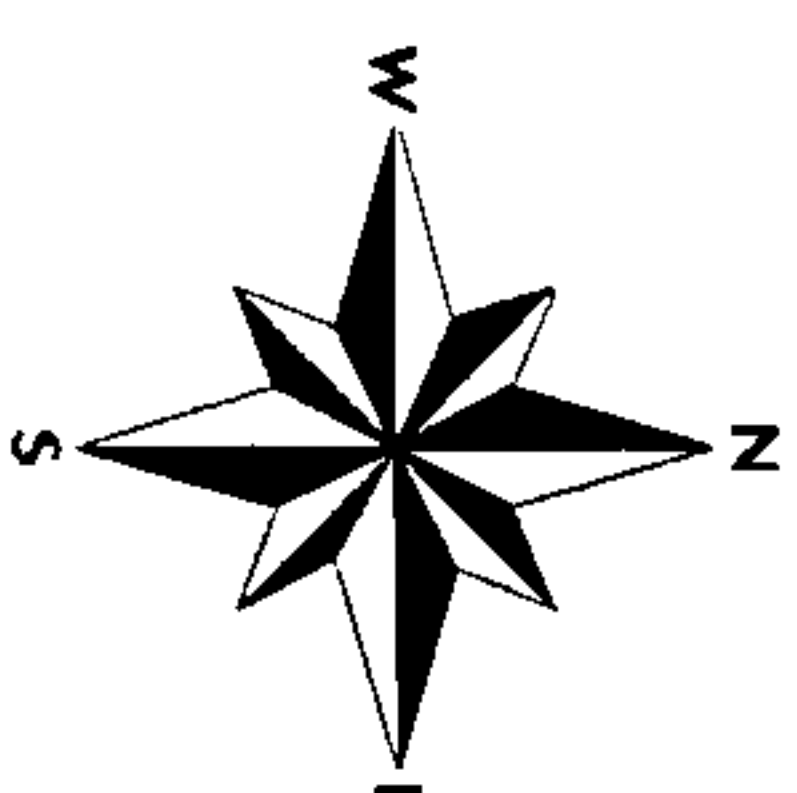
I have reviewed the referenced drainage report received November 15, 2002 and forward the following comments:

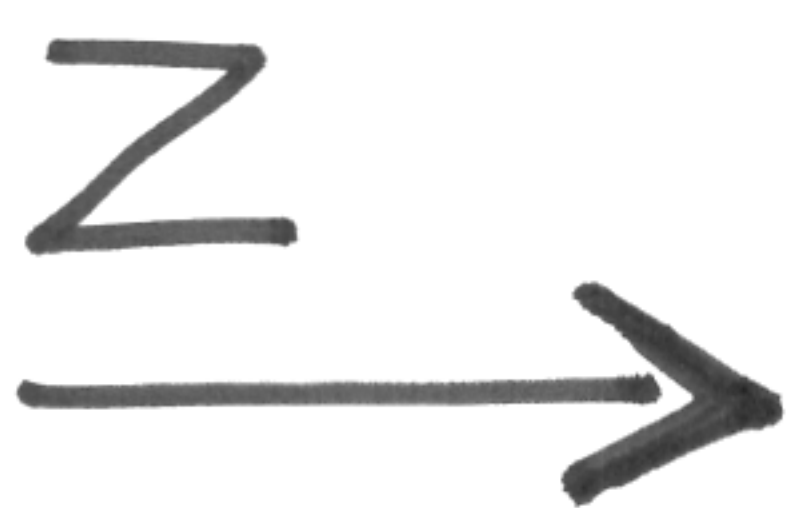
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If you have any questions please call me at 924-3982.

Sincerely,


Carlos A. Montoya, PE
City Floodplain Administrator





DRAINAGE AND TRANSPORTATION SHEET

(REV. 1/11/2002)

K-11/D66

PROJECT TITLE: Los Tres Hermanos ZONE MAP/DRG. FILE #: K-11
DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: Lots 4, 5, 7-14, 18-29, 44, 48-51, & 55
CITY ADDRESS: Los Tres Hermanos

ENGINEERING FIRM: Tierra West, LLC CONTACT: RONALD R. BOHANNAN
ADDRESS: 8509 Jefferson NE PHONE: (505) 858-3100
CITY, STATE: Albuquerque, NM ZIP CODE: 87113

OWNER: AMC Development Services CONTACT: Jeff Jesionowski
ADDRESS: 400 Gold SW, Suite 750 PHONE: 338-2285
CITY, STATE: Albuquerque, NM ZIP CODE: 87102

ARCHITECT: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: Surv-Tek CONTACT: Russ Hugg
ADDRESS: 5643 Paradise Blvd. NW PHONE: 897-3366
CITY, STATE: Albuquerque, NM ZIP CODE: 87114

CONTRACTOR: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

- ☒ DRAINAGE REPORT
☐ DRAINAGE PLAN
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☒ GRADING PLAN
☐ EROSION CONTROL PLAN
☐ ENGINEER'S CERTIFICATION (HYDROLOGY)
☐ CLOMR/LOMR
☐ TRAFFIC CIRCULATION LAYOUT (TCL)
☐ ENGINEERS CERTIFICATION (TCL)
☐ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
☐ OTHER

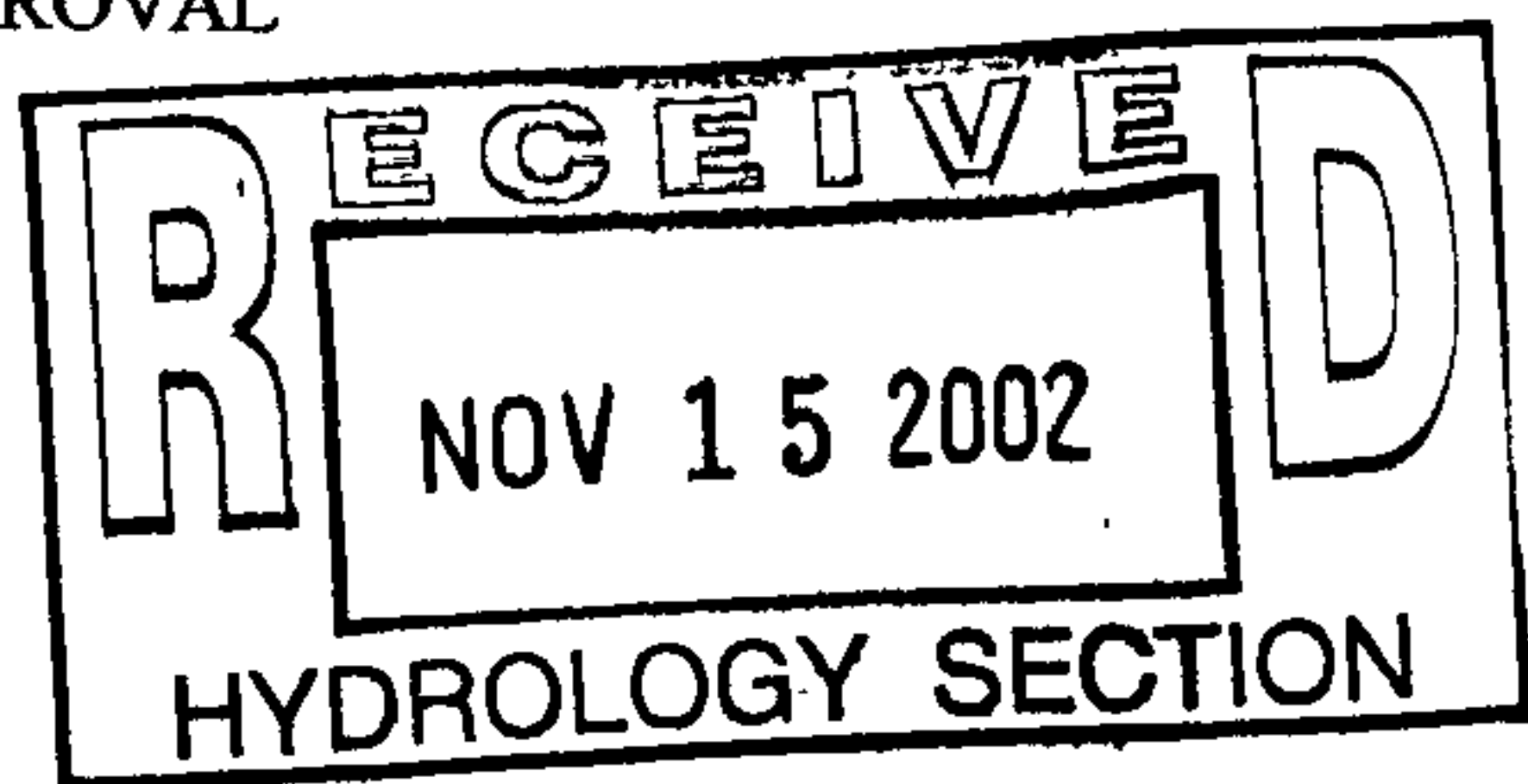
CHECK TYPE OF APPROVAL SOUGHT:

- ☐ SIA / FINANACIAL GUARANTEE RELEASE
☐ 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 (PERM.)
☐ CERTIFICATE OF OCCUPANCY (TEMP.)
☒ GRADING PERMIT APPROVAL
☐ PAVING PERMIT APPROVAL
☐ WORK ORDER APPROVAL
☐ OTHER (SPECIFY) _____

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☐ YES
☒ NO
☐ COPY PROVIDED

DATE SUBMITTED: 11/15/2002 BY RONALD R. BOHANNAN, P.E.



Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plans:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report:** Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.

TIERRA WEST, LLC

8509 Jefferson NE
Albuquerque, NM 87113

(505) 858-3100
fax (505) 858-1118

twllc@tierrawestllc.com
1-800-245-3102

November 15, 2002

Mr. Carlos Montoya, P.E.
Flood Plan Administrator
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

**RE: Los Tres Hermanos, 52nd Street & Gonzales Road
Zone Atlas Page K-11**

Dear Mr. Montoya:

Enclosed, please find the revised Grading and Drainage Plan for the above-referenced project. This plan covers the construction of Crestview Drive and 52nd Street, along with minor grading on the lots in Los Tres Hermanos. This plat was filed in the early 1950's, and we are not doing any platting action. All work will be performed under procedure "A".

If you have any questions or need additional information regarding this matter, please do not hesitate to call me.

Sincerely,

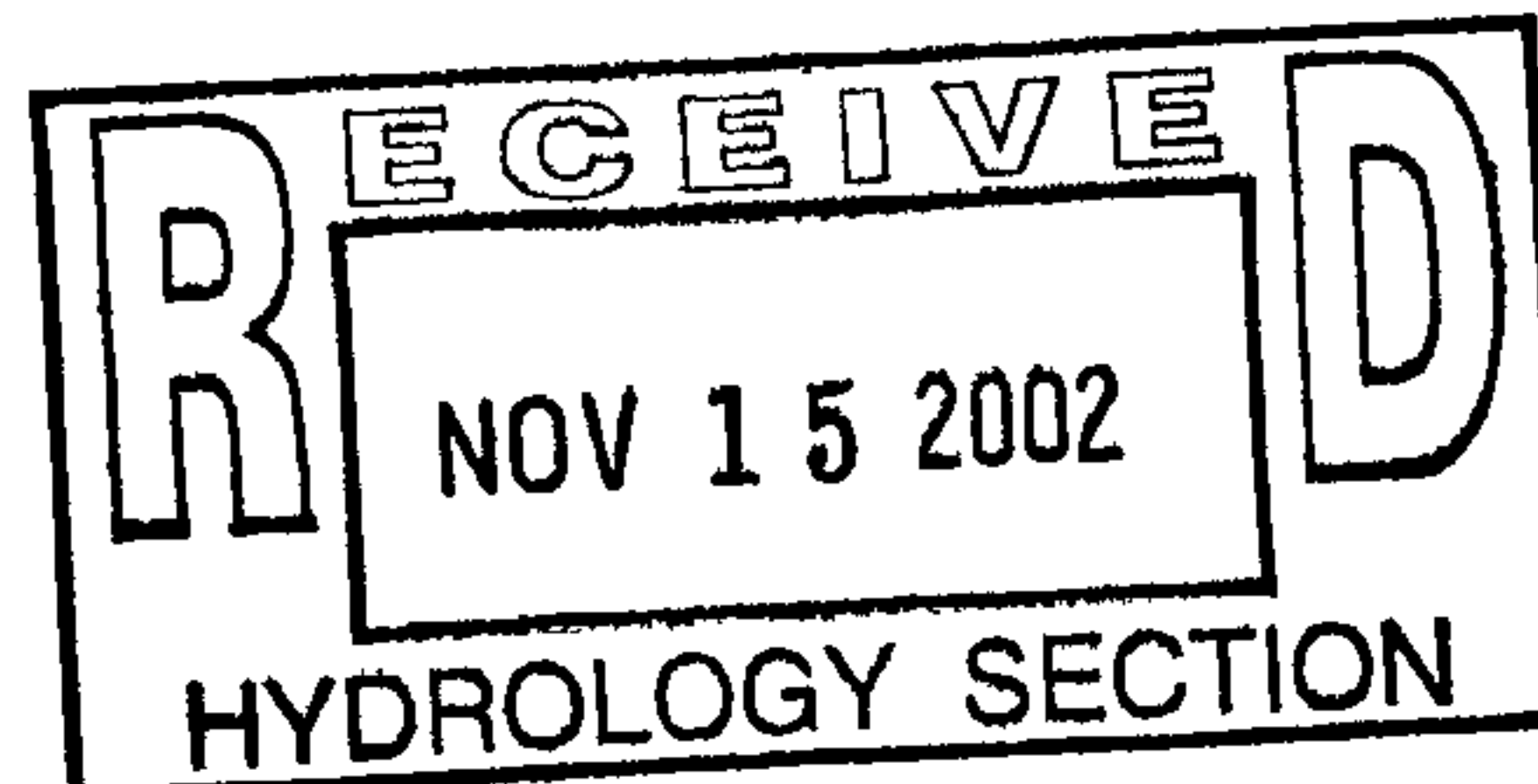


Ronald R. Bohannon, P.E.

Enclosure/s

cc: Jeff Jesionowski

JN: 21117
RRB/dg



2002 21117MONTTOYA11152002

**DRAINAGE REPORT
FOR**

***LOS TRES HERMANOS &
52ND STREET & CRESTVIEW DRIVES***

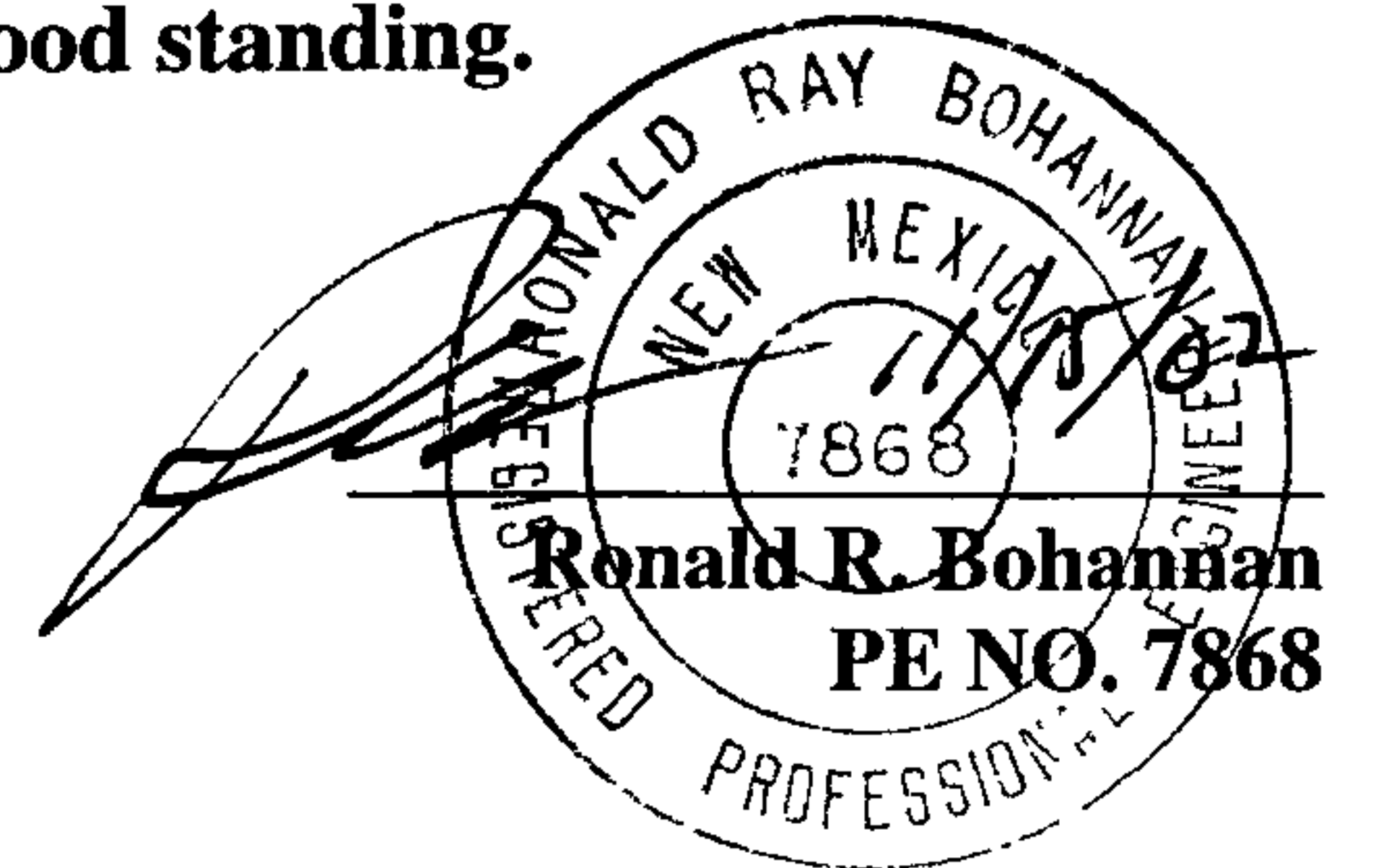
Prepared by:

**Tierra West, LLC
8509 Jefferson NE
Albuquerque, New Mexico 87113**

**Prepared for:
AMC Development Services**

November, 2002

I certify that this report was prepared under my supervision, and I am a registered professional engineer in the State of New Mexico in good standing.



Job No 21117

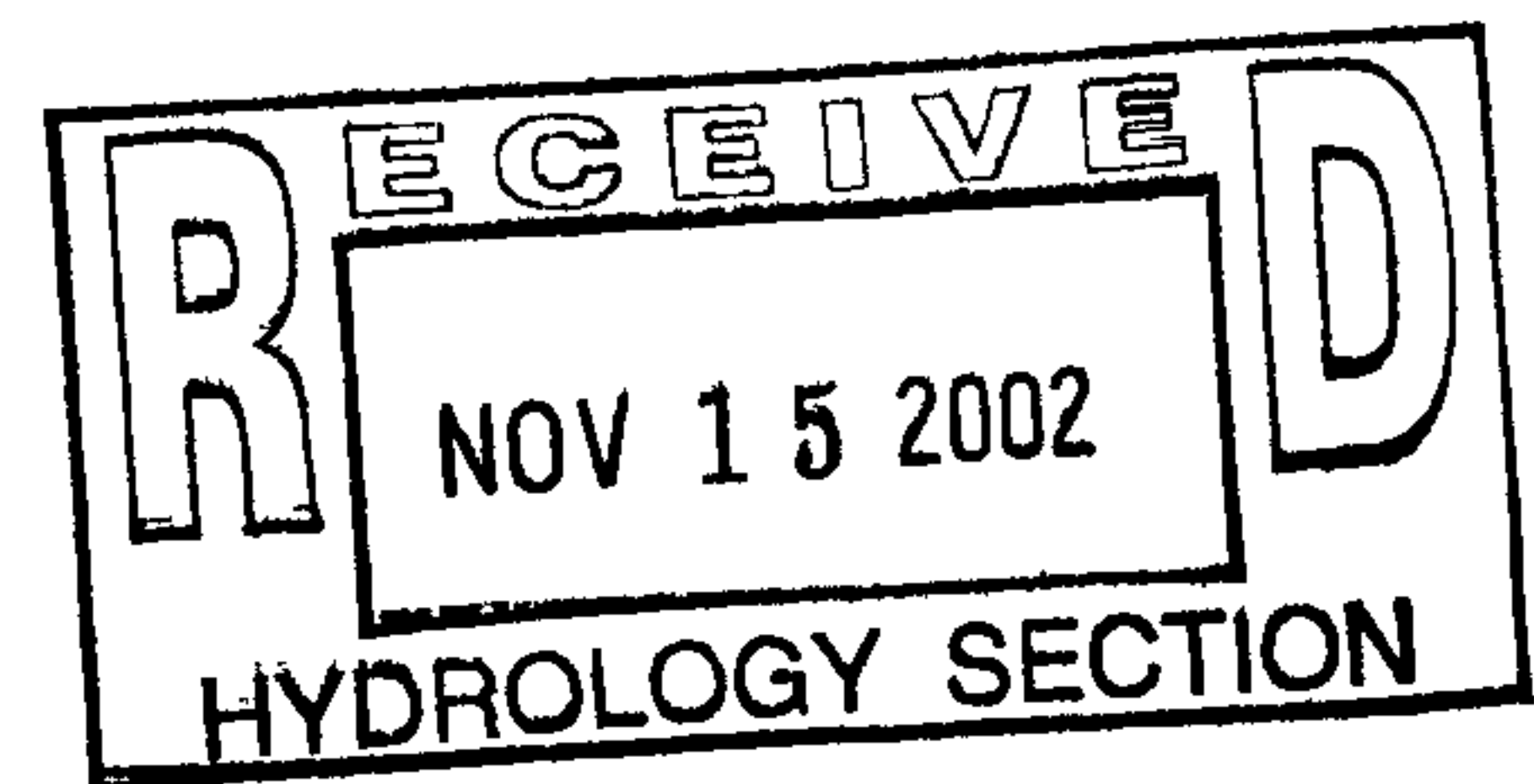


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MAP POCKET

Grading and Drainage Plan

APPENDIX I

Infrastructure List

Section I

Report

Prelude

This report is being prepared at the request of the current owner, who proposes to develop approximately 31 single family lots in a subdivision originally platted in the early 1950's and entitled Los Tres Hermanos. In addition, we propose to develop two streets, 52nd Street and Crestview Drive, which abut the lots and but were never constructed.

Location

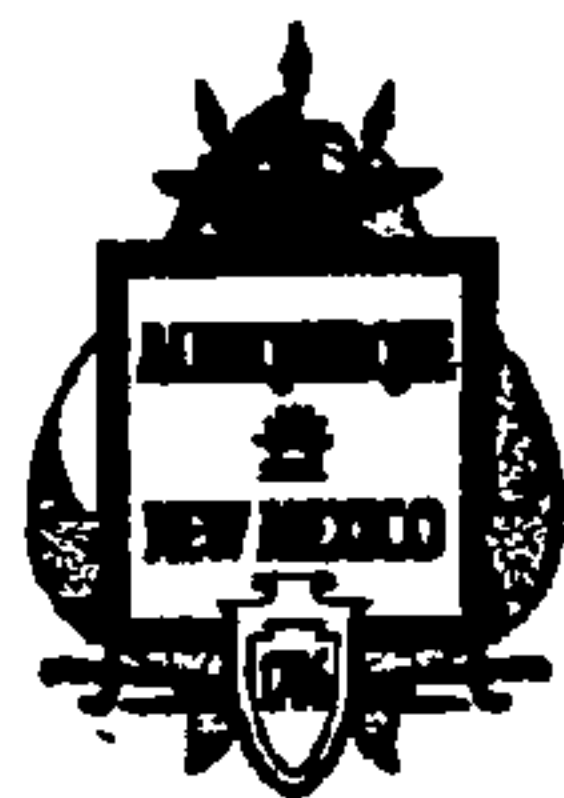
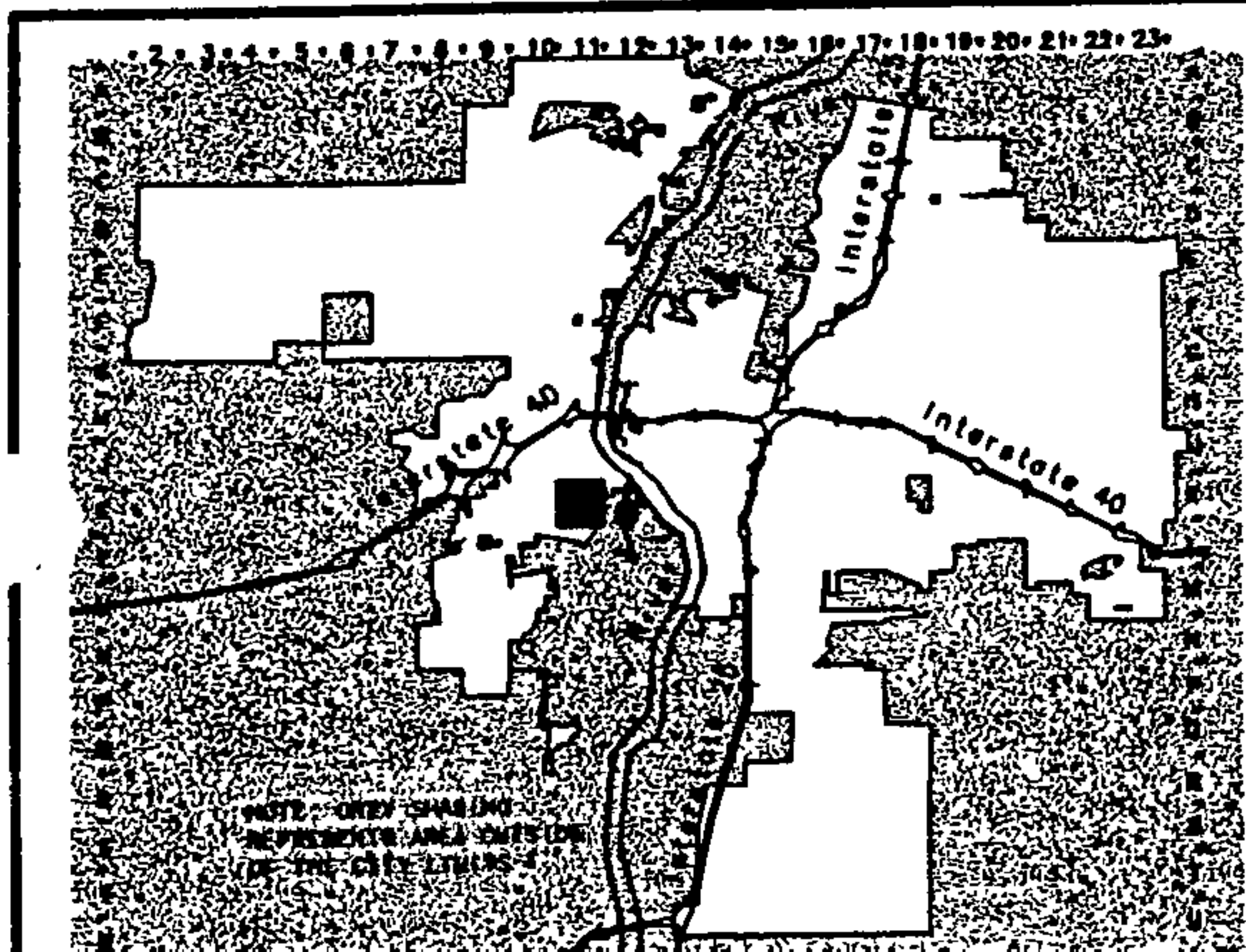
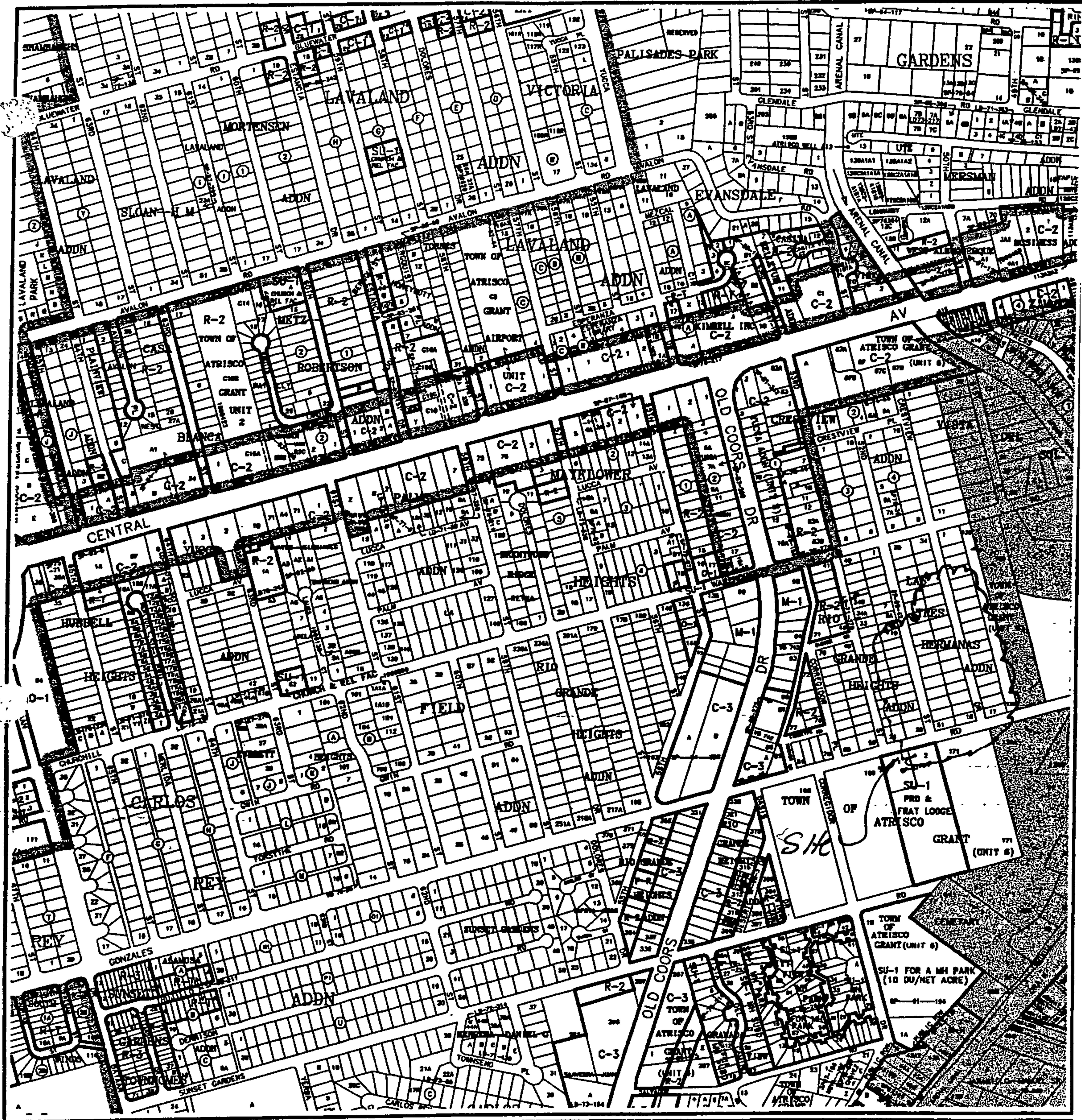
The subject site is located on the west side of Albuquerque near South Coors. Specifically, the site is located at the corner of Gonzales Road and 52nd Street. The exact location of the site is shown highlighted on the enclosed Zone Atlas page number K-11. The site will be built in one phase and contains 8.1797 acres more or less.

Purpose

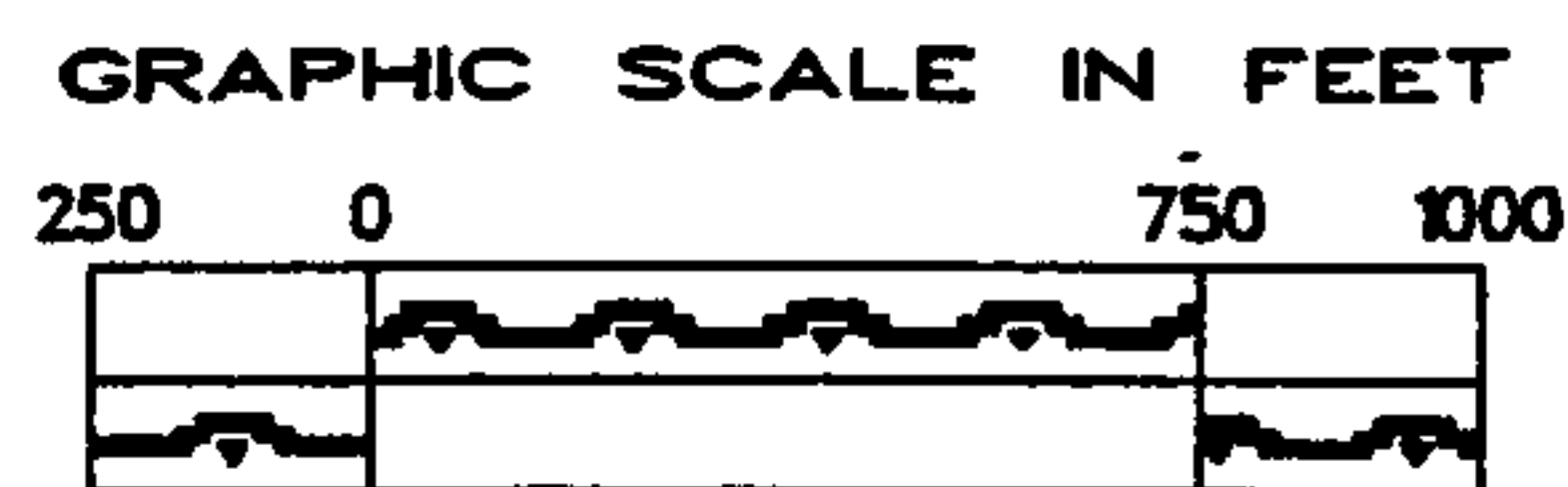
The purpose of this drainage report is to present a grading and drainage solution for the proposed lots and proposed street grades on Crestview Drive and 52nd Street. We are requesting final grading permit approval at this time.

Existing Drainage Conditions

The site contains three basins and lies adjacent and slightly east to the Gonzales Road Pond installed by the City. The Pond is situated west of the site. Two of these basins drain north to Churchill Road and an existing storm drain system. The third drains south to Gonzales Road and then to the Gonzales Pond. The surrounding areas to the east and south fall away from the site and do not impact the project.



CITY OF
Albuquerque
Albuquerque Geographic Information System
PLANNING DEPARTMENT
© Copyright 2001



Zone Atlas Page

K-11-Z

Map Amended through July 18, 2001

The property to the east drains east off of the bluff to the MRGCD canal. Gonzales Road drains west of the Gonzales Pond and does not affect the site. The lots on the north and west drain away from the project.

Flood Plain and Soil Condition

The site is located on FEMA Map No. 350002 panel 27 as shown on the attached excerpt. The map shows that the site does not lie within any 100-year flood plains.

The site contains two soil types: Madurez Wink (MWA) and Tijeras (TgB) as indicated on the Soil Map (sheet #42) from the Soil Conservation Service Survey of Bernalillo County. The Tijeras is gentle sloping old alluvial fan material with moderate runoff and soil erosion. The Madurez Wink series is a sandy loam with slow runoff and moderate to severe soil erosion. (See attached soil map for site location).

Proposed Conditions and On-Site Drainage Management Plan

The lots will be graded and all of the surface improvements will be built out in their entirety. Crestview Drive and 52nd Street will be built using a Procedure A. ^{? from original plan} Gonzales Road is being built with the Vista Pacifica project and this work will tie to those street grades. The enclosed grading plan in the map pocket shows the grades for the subject lots, along with the improvements in 52nd Street, Gonzales Road, and Crestview Drive.

The development was divided into three basins to analyze the proposed conditions. Basins 1 and 2 will route the north flow to drop inlets into Churchhill Road. These flows will be intercepted by a storm drain and conveyed to the existing storm drain. Basins 1 and 2 discharge at ~~15.10~~ and ~~5.93~~ for the 100-year flows, respectively, and 8.22 and 3.23 for the 10-year flows.

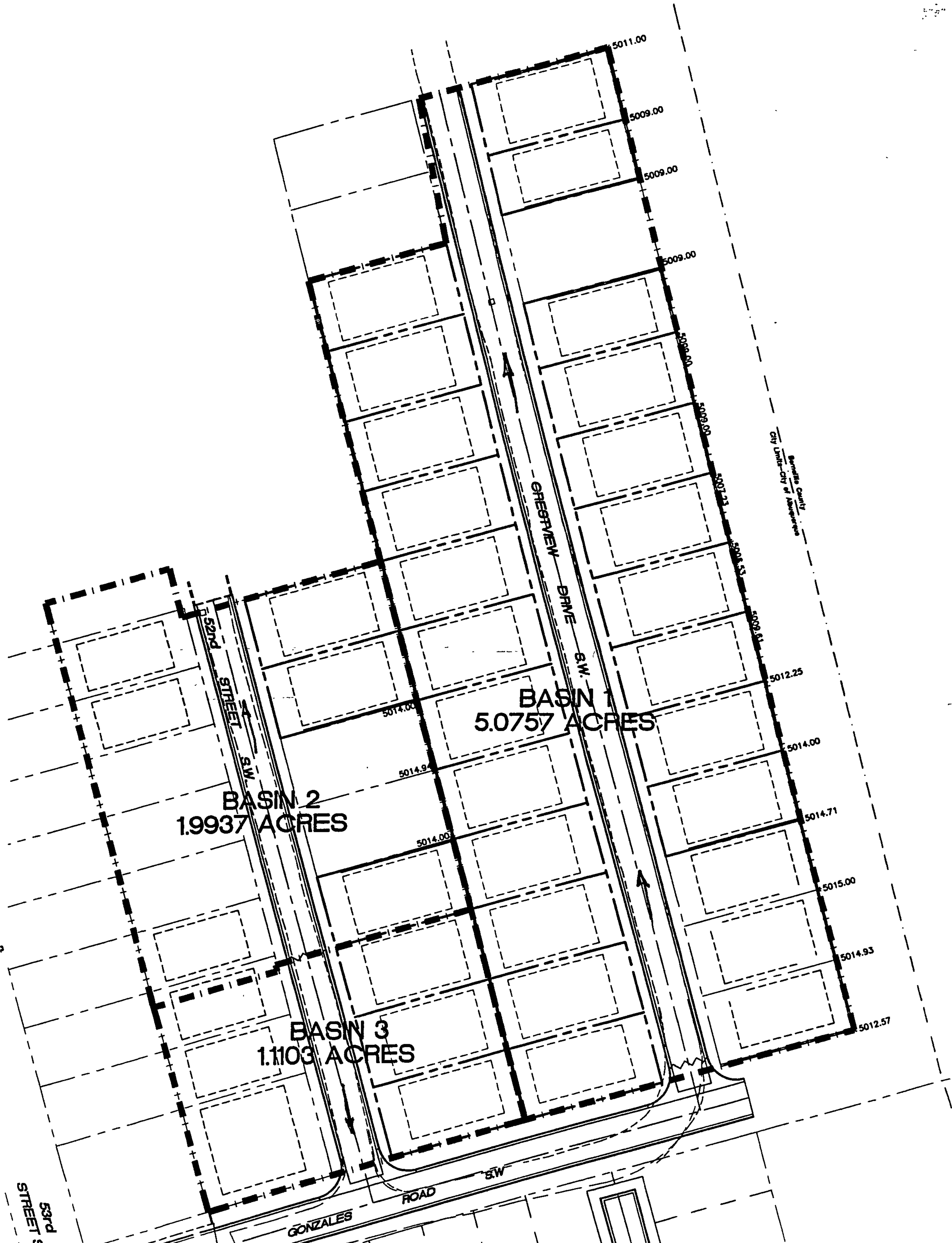
Basin 3 depicts the basin that flows back to Gonzales Road and the Gonzales Pond. Basin 3 represents the flows generated by these lots and discharges 8.30 and 1.80 for the 100-year and 10-year flows.

Street Capacity

The existing streets and proposed new streets are 32 ft. face to face and at .5 percent slope. The streets have capacity to handle the flows as shown on the street capacity calculations in the appendix.

Emergency Overflow

If clogged, the drain into Churchhill will backup and continue down Churchhill roadway.



Sanjalla County
City Limits - City of Albuquerque

BASIN 1
5.0757 ACRES

BASIN 2
1.9937 ACRES

BASIN 3
1.1103 ACRES

GREGVIEW DRAIN S.W.

ROAD

GONZALES

52nd STREET S.W.

53rd STREET S.W.

5011.00

5009.00

5009.00

5009.00

5009.00

5009.00

5009.00

5009.00

5009.00

5009.00

5014.00

5014.71

5015.00

5014.93

5012.57

5014.00

5014.93

5014.00

**FIRM MAP
FLOOD INSURANCE RATE MAP
CITY OF ALBUQUERQUE**



Flood Zones

 Zone A  Zone AO  Zone AH  Zone AE

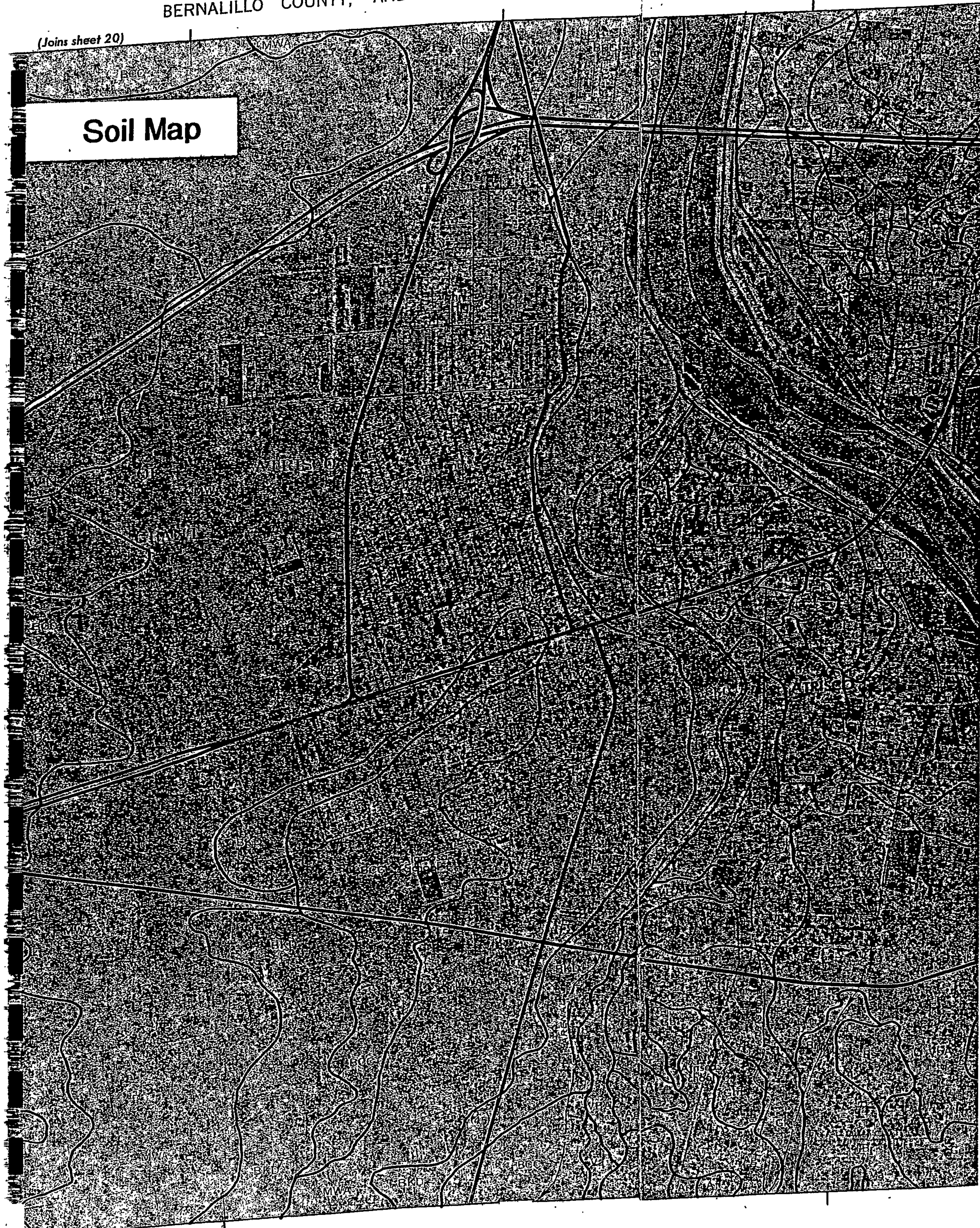
1999 AIR PHOTO (Metro Area Coverage)

NEW GIS QUERY

City of Albuquerque Home Page

(Joins sheet 20)

Soil Map



Infrastructure List

As mentioned, 52nd Street, Crestview Drive, and the north side of Gonzales Road will be built under a Procedure A.

Calculations

The weighted E method from the “City of Albuquerque Development Process Manual Volume 11 – Design Criteria, 1997 Revision” was used to calculate the runoff and volume for the site.

Section II

Runoff Calculations

The Site is @ Zone 1				RUNOFF CALCULATIONS						
LAND TREATMENT				N= 3.78						
Proposed	Existing									
B = 59.59	A = 100%									
D = 40.40%										
DEPTH (INCHES) @ 100-YEAR STORM				DEPTH (INCHES) @ 10-YEAR STORM						
P60 = 1.87				P60 = 1.87 x 0.667 = 1.247						
P360 = 2.20				P360 = 2.20 x 0.67 = 1.467						
P1440 = 2.66										
Zone 1										
Land Treatment										
From Table A-8 Soil Treatment		A	B	C	D					
Weighted E 100 yr.		0.44	0.67	0.99	1.97					
Weighted E 10 yr.		0.08	0.22	0.44	1.24					
Peak Discharge										
From Table A-9										
100 Yr		1.29	2.03	2.87	4.37					
10 Yr		0.24	0.76	1.49	2.89					
Volume Undeveloped										
	Soil Treatment Type	Acreage	100 Yr	10 Yr	Vol 100	Vol 10				
Basin 1	A	5.0757	0.4400	0.0800	0.1861	0.2030				
Basin 2	A	1.9937	0.4400	0.0800	0.0731	0.0797				
Basin 3	A	1.1103	0.4400	0.9800	0.0407	0.5440				
Volume Developed										
	Total	Acre "A"	Acre "B"	Acre "C"	Acre "D"		Weight E 100	E 10	V 100 Yr	V 10 Yr
Basin 1	5.0757	0.0000	3.0251	0.0000	2.0506		1.1952	0.6321	0.5055	0.2674
Basin 2	1.9937	0.0000	1.1882	0.0000	0.8055		1.1952	0.6321	0.1986	0.1050
Basin 3	1.1103	0.0000	0.6617	0.0000	0.4486		1.1952	0.6321	0.1106	0.0585
Peak Discharge										
	Total	Acre "A"	Acre "B"	Acre "C"	Acre "D"				Q 100 Yr	Q 10 Yr
Basin 1	5.0757	0.0000	3.0251	0.0000	2.0506				15.1021 ✓	8.2253
Basin 2	1.9937	0.0000	1.1882	0.0000	0.8055				5.9321 ✓	3.2309
Basin 3	1.1103	0.0000	0.6617	0.0000	0.4486				3.3036 ✓	1.7993

Street Capacity Calculations

Crestview & 52 Street

32' F-F Street Section

Slope= 0.05

For water depths less than 0.0625 feet

Y= Water depth
 Area = $16 \cdot Y^2$
 P= $\text{SQRT}(1025 \cdot Y^2) + Y$
 n= 0.017

Depth (ft)	rea (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0100	0.00	0.33	0.00	0.00	0.00	0.56	0.01	0.99	0.0098
0.0175	0.00	0.58	0.01	0.00	0.01	0.81	0.01	1.08	0.0194
0.0250	0.01	0.83	0.01	0.01	0.02	1.03	0.03	1.15	0.0300
0.0325	0.02	1.07	0.02	0.02	0.04	1.23	0.04	1.20	0.0413
0.0400	0.03	1.32	0.02	0.04	0.07	1.41	0.06	1.24	0.0531
0.0475	0.04	1.57	0.02	0.06	0.11	1.58	0.08	1.28	0.0654
0.0550	0.05	1.82	0.03	0.08	0.17	1.74	0.10	1.31	0.0781
0.0625	0.06	2.06	0.03	0.12	0.24	1.90	0.12	1.34	0.0911

For water depths greater than 0.0625 ft but less than 0.333 ft

Y1= Y-0.0625
 A2= $A1 + 2 \cdot Y1 + 25 \cdot Y1^2$
 P2= $P1 + \text{SQRT}(2501 \cdot Y1^2)$

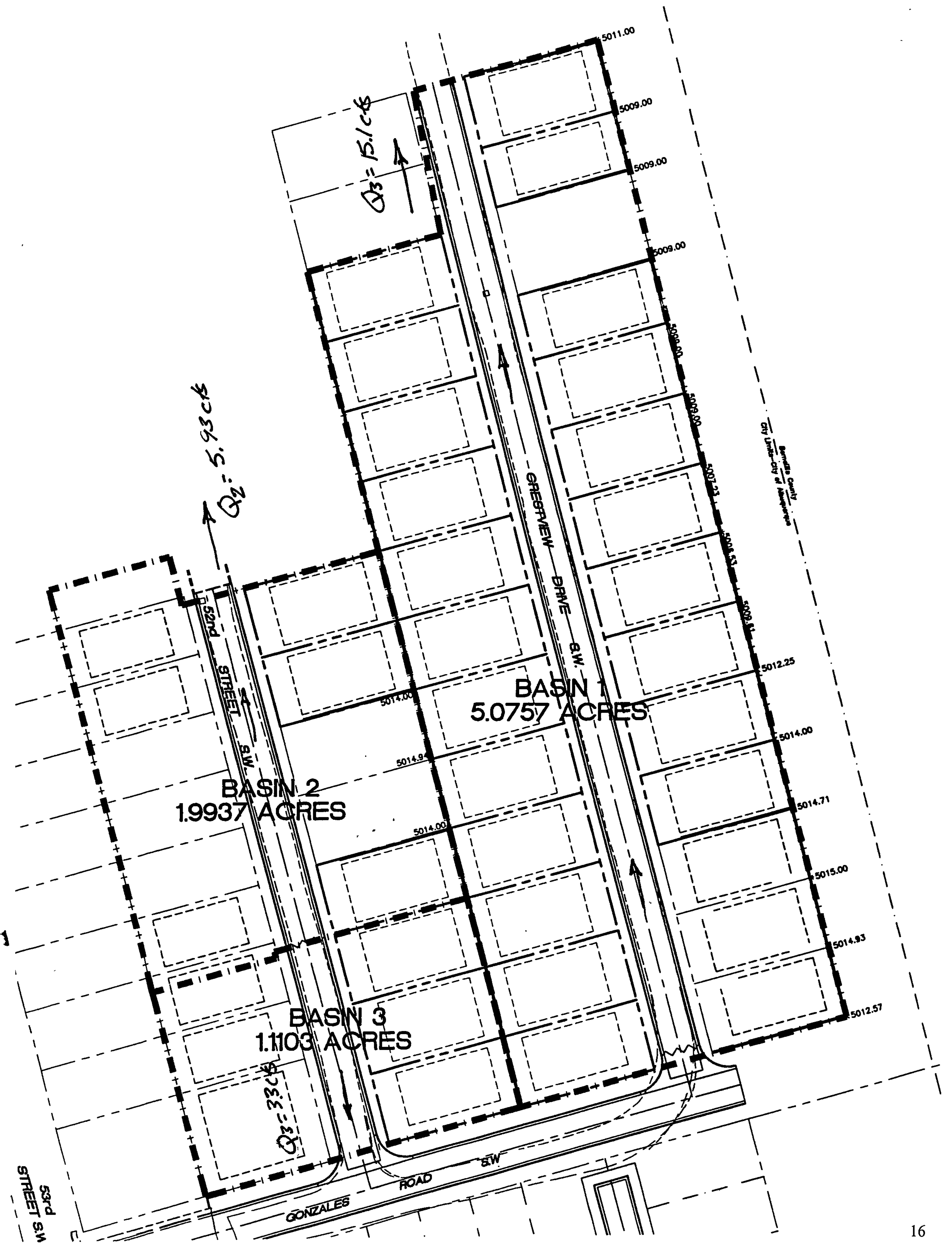
Depth (ft)	rea (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0630	0.06	2.09	0.03	0.12	0.24	1.90	0.12	1.34	0.0917
0.0900	0.14	3.47	0.04	0.31	0.62	2.26	0.20	1.33	0.1300
0.1200	0.26	5.00	0.05	0.71	1.42	2.73	0.33	1.39	0.1828
0.1500	0.43	6.53	0.07	1.37	2.73	3.18	0.48	1.45	0.2412
0.1968	0.78	8.91	0.09	3.02	6.04	3.86	0.76	1.53	0.3395
0.2100	0.90	9.59	0.09	3.64	7.29	4.04	0.85	1.55	0.3684
0.2400	1.21	11.12	0.11	5.36	10.71	4.44	1.07	1.60	0.4357
0.3096	2.08	14.67	0.14	11.08	22.17	5.32	1.65	1.69	0.5991
0.3330	2.43	15.86	0.15	13.62	27.25	5.60	1.86	1.71	0.6560

→ 52nd Street
 → Crestview

For water depths greater than 0.333 ft but less than 0.513 ft

Y2= Y - 0.333
 A3= $A2 + Y2 \cdot 16 + 25 \cdot Y2^2$
 P3= $P2 + \text{SQRT}(2501 \cdot Y2^2)$

Depth (ft)	rea (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.3400	2.55	16.21	0.16	14.49	28.97	5.69	1.93	1.72	0.6741
0.3700	3.06	17.71	0.17	18.54	37.09	6.06	2.24	1.76	0.7524
0.4050	3.71	19.46	0.19	24.07	48.13	6.48	2.62	1.79	0.8449
0.4200	4.01	20.21	0.20	26.71	53.41	6.65	2.79	1.81	0.8849
0.4300	4.22	20.71	0.20	28.56	57.12	6.77	2.91	1.82	0.9117
0.4496	4.64	21.69	0.21	32.42	64.83	6.99	3.14	1.84	0.9646
0.4800	5.32	23.21	0.23	39.00	78.01	7.32	3.52	1.86	1.0473
0.5130	6.12	24.86	0.25	47.02	94.03	7.68	3.94	1.89	1.1380



Bentley County
City Limits - City of Albuquerque

MAP POCKET

Grading and Drainage Plan