

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 01/28/2003rd)

PROJECT TITLE: Stinson Park Subdivision
 DRB #: 1003004 EPC #: _____

ZONE MAP/DRG. FILE #: L-10-7 D26
 WORK ORDER #: _____

LEGAL DESCRIPTION: Tracts 414, 415B, 415C, 415D, and 416, Lands of Atrisco Grant Unit 3
 CITY ADDRESS: _____

ENGINEERING FIRM: Tierra West, LLC
 ADDRESS: 8509 Jefferson Street NE
 CITY, STATE: Albuquerque, NM

CONTACT: Marcella Jaramillo, PE
 PHONE: (505) 858-3100
 ZIP CODE: 87113

OWNER: Clearbrook Investments, Inc.
 ADDRESS: 8801 Jefferson NE, Bldg A
 CITY, STATE: Albuquerque, NM 87113

CONTACT: Scott Henry
 PHONE: (505) 858-1800
 ZIP CODE: 87113

ARCHITECT: _____
 ADDRESS: _____
 CITY, STATE: _____

CONTACT: _____
 PHONE: _____
 ZIP CODE: _____

SURVEYOR: _____
 ADDRESS: _____
 CITY, STATE: _____

CONTACT: _____
 PHONE: _____
 ZIP CODE: _____

CONTRACTOR: Hydro-Systems
 ADDRESS: PO Box 92195
 CITY, STATE: Albuquerque, NM

CONTACT: Mike Smith
 PHONE: (505) 344-3840
 ZIP CODE: 87199-2195

CHECK TYPE OF SUBMITTAL:

- ☒ DRAINAGE REPORT
- ☐ DRAINAGE PLAN 1st SUBMITTAL, *REQUIRES TCL or equal*
- ☐ DRAINAGE PLAN RESUBMITTAL
- ☐ 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

Fee paid

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) **Drainage Approval**

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☐ YES
- ☒ NO
- ☐ COPY PROVIDED

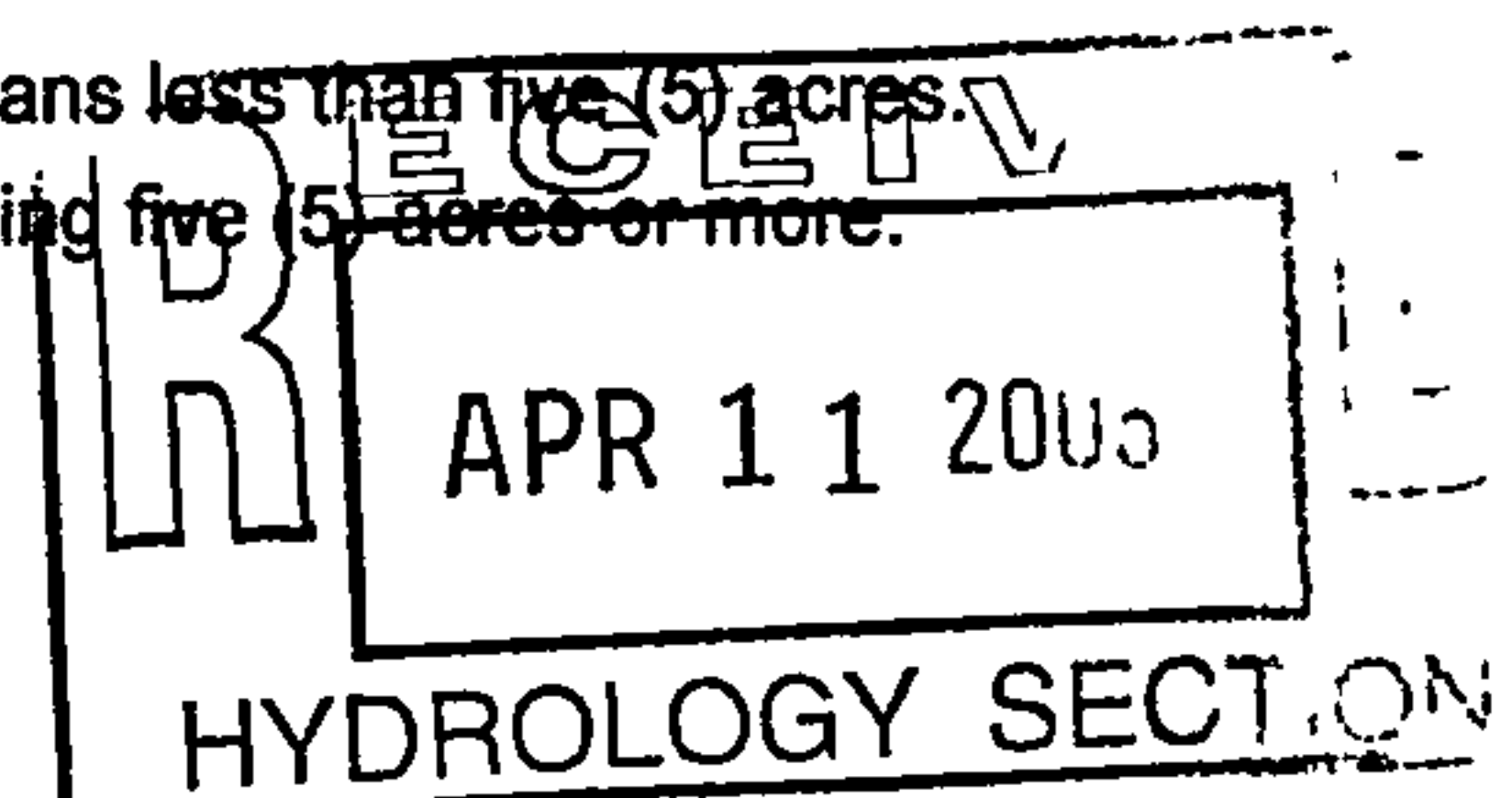
DATE SUBMITTED: April 11, 2006 BY: Marcella V. Jaramillo, P.E.

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.



DRAINAGE REPORT

for

**Stinson Park Subdivision
Tract 414, 415B, 415C, 415D & 416,
Lands of Atrisco Grant Unit 3
Albuquerque, New Mexico**

Prepared by

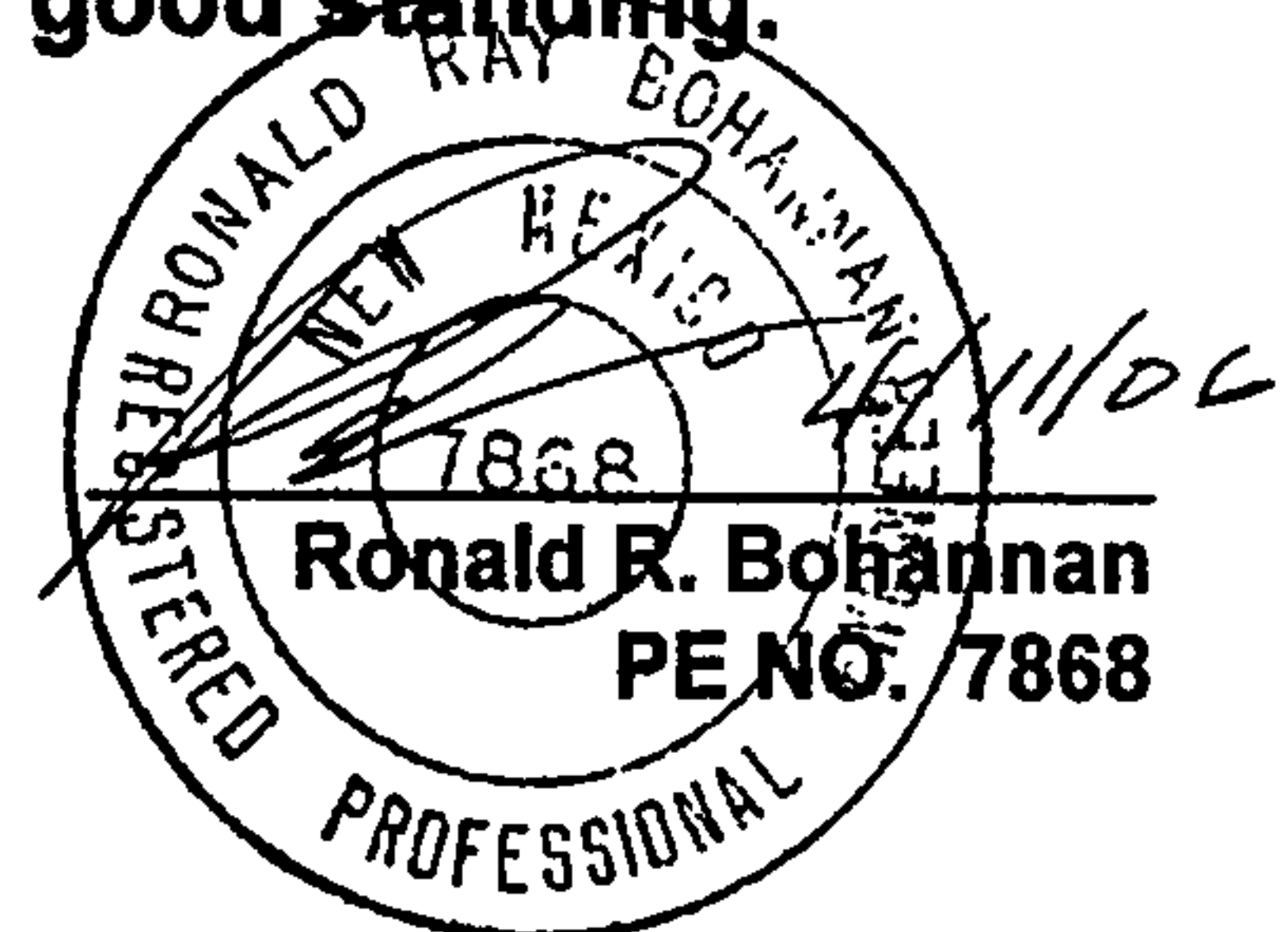
**Tierra West, LLC
8509 Jefferson NE
Albuquerque, New Mexico 87113**

Prepared for

**Clearbrook Investments, Inc.
8901 Adams NE, Suite A
Albuquerque, NM 87113**

April 2006

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 25058

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Grading and Drainage Plan Map Pocket 2

Location

Lots 414, 415B, 415C, 415D, and 416 of the Lands of Atrisco Grant, Unit 3, the Stinson Park Subdivision site is located between Tower Road and San Ygnacio Road adjacent to Stinson Street, and situated between Coors Boulevard and Unser Boulevard. The 15-acre site is bordered on the north by Tract 413A and 413B of the Lands of Atrisco Grant, Unit 3 and Tower Road, by Tract 417 Lands of Atrisco Grant, Unit 3 to the west, by San Ygnacio Road to the south, and by Tract 415A Lands of Atrisco Grant, Unit 3 and Stinson Street to the east. The purpose of this report is to provide the drainage analysis and management plan for the RD zoned site to include the proposed Stinson Park Subdivision, a 90-unit single family subdivision.

Zone Atlas Page

The site is located on the City of Albuquerque Zone Atlas Map L-10 and is shown on the attached sheet.

Project History

This site was previously owned by Albuquerque Excavators and designed through preliminary plat by Rio Grande Engineering. This previous design included an approved grading and drainage plan entitled *Drainage Report for Stinson Park Subdivision*, dated December 2004 (City of Albuquerque Hydrology file L10/D26, DRB #1003004). The site was graded in accordance with the grading plan included in the approved grading and drainage report. After the site was graded, all work ceased on the project and eventually the property was purchased by Clearbrook Investments, Inc. and the design

was taken over by Tierra West, LLC. This drainage report reflects design changes and analysis completed by Tierra West, LLC per the requirements of the City of Albuquerque.

Drainage Basin Designations

For the purpose of this report, the existing and developed drainage basins were designated and shown on the Basin Maps in Map Pocket 1.

Existing Undeveloped Basins: 1 and 2

Drainage Basin 1 includes the entire Stinson Park Subdivision. Basin 2, which includes the two adjacent properties to the north of the subdivision and half of Tower Road, is not part of the subdivision, but will contribute to the flow conveyed through the subdivision along Jaconita Place. Basin 1 and Basin 2 100-year flows are 42.10 cfs and 8.69 cfs, respectively.

Developed Condition Basins: 1, 2, 3a, 3b, 4a, and 4b

Basin 1 includes San Jon Court and all of the lots fronting San Jon Court, Lot 45-P1 through Lot 55-P1. Basin 2 is the same for both the undeveloped and developed conditions and represents the upland flows, as was previously described. Basin 3a includes Lot 81-P1 through Lot 82-P2, Lot 17-P1 through Lot 25-P1, and the segment of Jaconita Place that is fronted by those lots. Basin 3a also includes Lot 26-P1 through Lot 28-P1 and the segment of Sombrillo Avenue that fronts those lots. Basin 3b includes Lot 83-P1 through Lot 90-P1, Lot 1-P1 through Lot 16-P1, and the segment of

Jaconita Place that fronts those lots. Basin 4a includes Lot 29-P1 through Lot 44-P1 and the segment of Sombrillo Avenue that fronts those lots. Basin 4b includes Lot 56-P1 through Lot 80-P1 and Taos Place.

Existing Drainage Conditions

Existing site conditions do not include any impervious improvements, only the previous grading work done by the previous owner. The existing site's (Basin 1) total 100-year flow is 42.10 cfs and drains to the adjacent streets and/or is infiltrated into the ground. There are no existing inlets on the adjacent roadways to pick up the flow.

Basin 2 includes two lots adjacent to the NE corner of the Subdivision and adjacent to Tower Road and half of Tower Road. These lots, one unimproved and one with an existing house, are not a part of the Stinson Park Subdivision, but currently flow from the lots and from half of Tower Road, 8.69 cfs, drains to the north and runs west along the swale along the south side of Tower Road to the drainage pond at the SE corner of Unser Boulevard and Tower Road.

This site is included in the 1997 approved Tower/Sage Drainage Master Plan within the Tower/Sage Drainage Basin. The Master Plan along with Special Assessment District 222 improved drainage facilities to the west for upland flows. Included in these improvements was the Tower Park/Pond at 82nd Street, which detains all flow from the west and San Ygnacio Road and storm drain facilities in San Ygnacio Road through 82nd Street. The Master Plan calls for a storm drain to be constructed in San Ygnacio

Road to the Amole del Norte Channel. This segment of storm drain was constructed by AMAFCA in 2001. The adjacent upland properties east of Unser Boulevard and west of the subdivision drain to two inlets located at the intersection of San Ygnacio Road and Abeyta Street.

FIRM Map

The site is located on FIRM Map 35001C0336E and 35002C0336E as shown on the attached sheet. The map shows that the site lies within Zone AH (Elevation = 5075) and Zone AO (Depth = 1'). A LOMR will be completed with this project.

On-Site Drainage Management Plan

The proposed Drainage Management Plan is to drain the developed subdivision total 100-year flow and the flow from the off-site Basin 2, 64.99 cfs, through the internal streets to the south. The flow will be conveyed through the internal streets of the subdivision using both mountable roll type curb and standard curb (see Street Capacity Calculations in Appendix A). The flow will be collected in three Double 'C' Type drop-inlets located in the hammer head cul-de-sac of Jaconita Place, which will receive 33.12 cfs from Basins 2, 3a, and 3b, and three Double 'C' Type drop-inlets at the cul-de-sac of Taos Place, which will receive 31.86 cfs from Basins 1, 4a, and 4b. These inlets will connect to the existing 54" storm drain located within San Ygnacio Road, which outfalls into the Amole del Norte Channel.

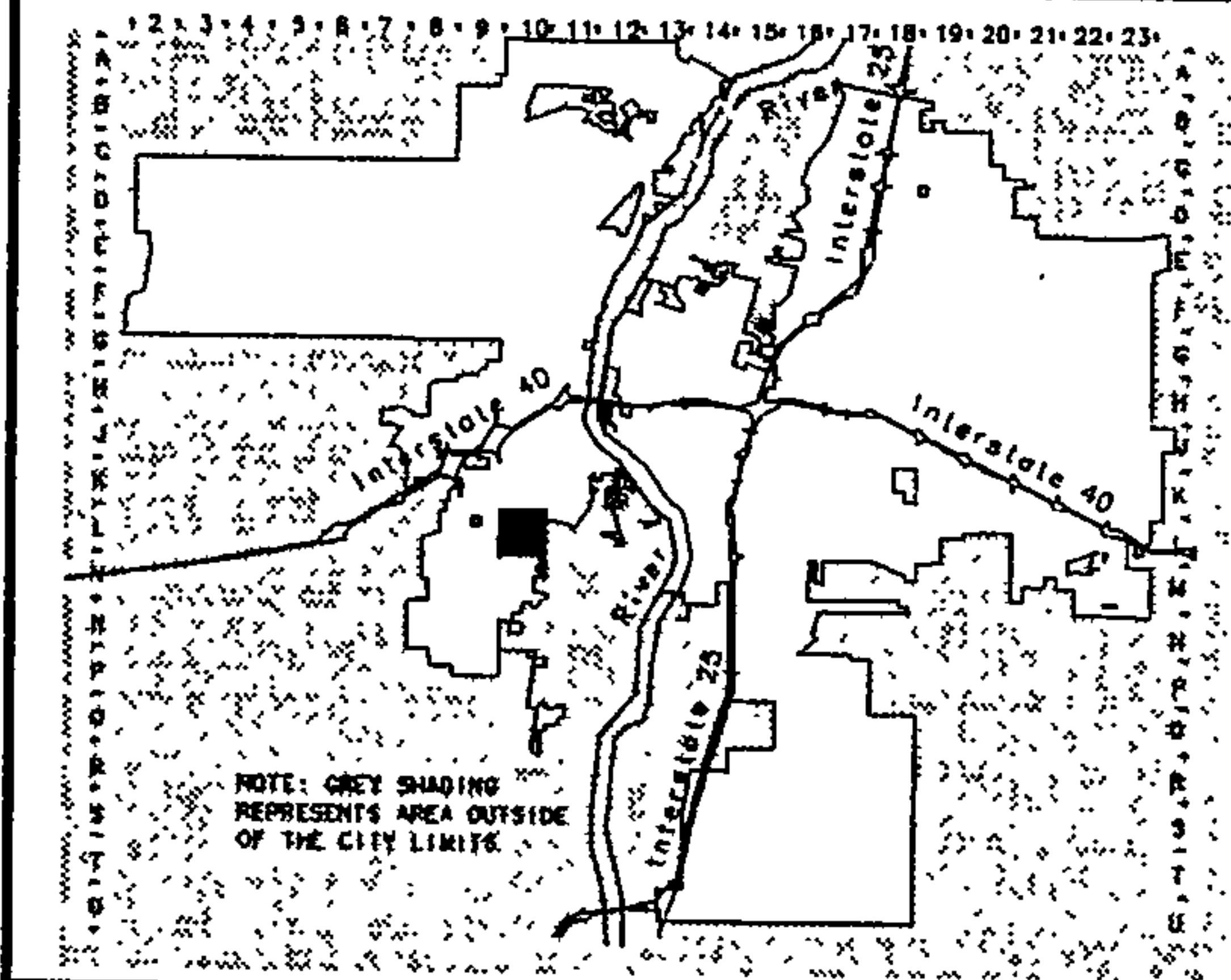
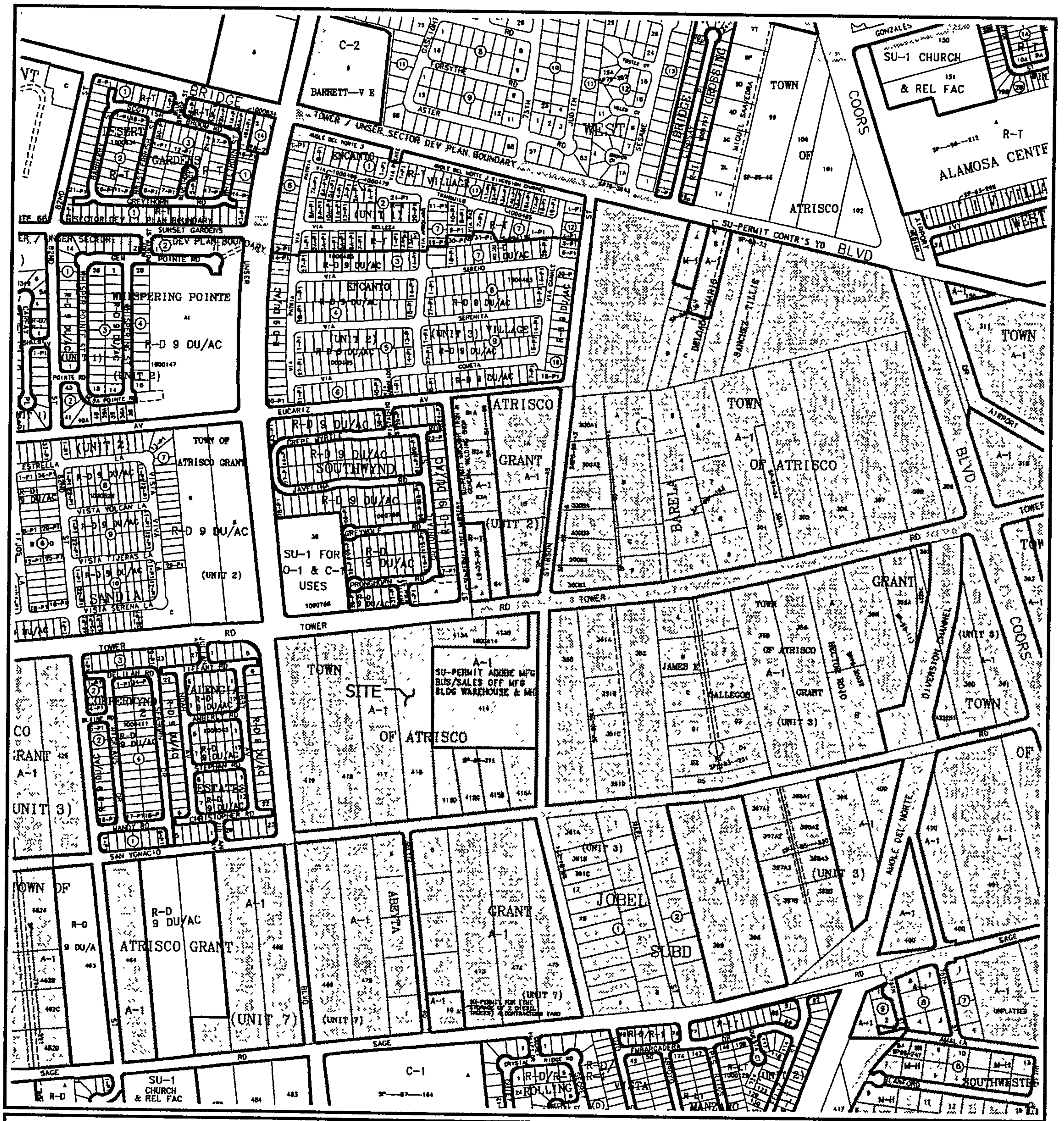
Calculations

The Weighted E method from the “City of Albuquerque Development Process Manual Volume II – Design Criteria, 1997 Revision” was used to calculate the runoff and volume for the site. Street capacity and inlet capacity calculations were computed using spreadsheets that are included in Appendix A.

Summary

The developed subdivision total 100-year flow and the 100-year flow from the off-site Basin 2, 64.99 cfs will be conveyed through the internal streets to the south, picked up by Double ‘C’ Type drop-inlets, and into the existing 54” storm drain that is located within San Ygnacio Road, which outfalls into the Amole del Norte Channel.

A LOMR will be completed for this project after the improvements are installed and certified.

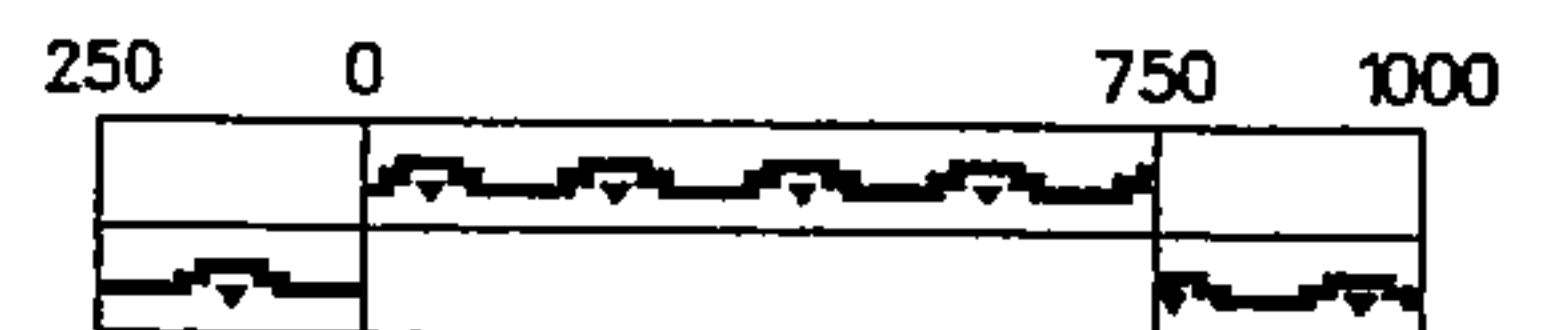


CITY OF
Albuquerque

Albuquerque Geographic Information System
PLANNING DEPARTMENT

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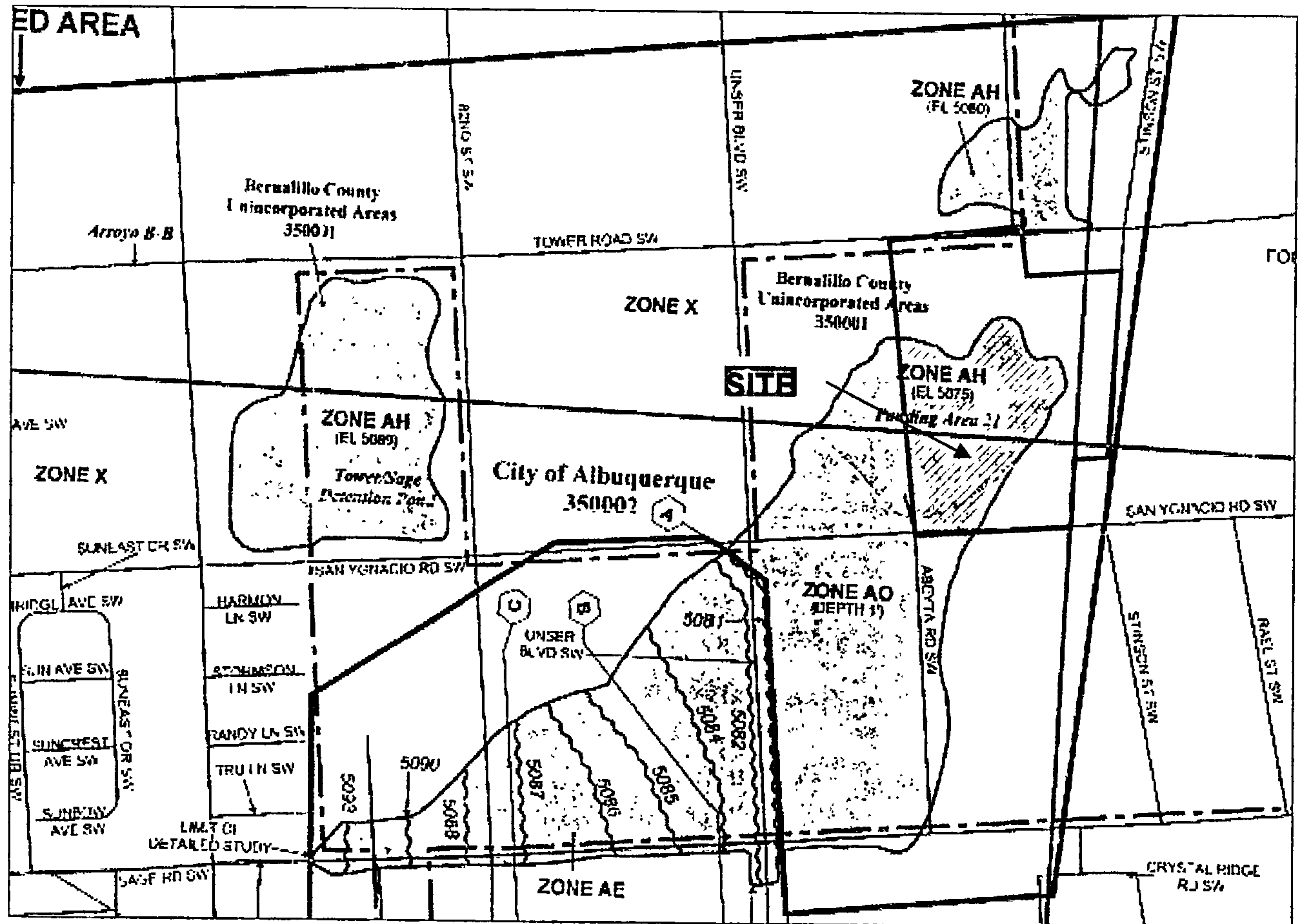
GRAPHIC SCALE IN FEET



Zone Atlas Page

L10-Z

Map Amended through July 31, 2003



FIRM Maps 35001C0336E and 35002C0336E

Appendix A

Runoff Calculations
Street Capacity Calculations
Inlet Capacity Calculations

Weighted E Method

											100-Year			10-Year		
Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
			%	(acres)	%	(acres)	%	(acres)	%	(acres)						
Developed Condition																
1	82,171	1.89	0%	0	0%	0.00	35%	0.66	65%	1.23	1.627	0.256	7.25	0.960	0.151	4.53
2*	118,270	2.72	35%	0.95	0%	0.00	9%	0.24	57%	1.55	1.366	0.309	8.69	0.774	0.175	5.06
3a	114,095	2.62	0%	0	0%	0.00	36%	0.94	64%	1.68	1.617	0.353	10.03	0.952	0.208	6.25
3b	163,826	3.76	0%	0	0%	0.00	36%	1.35	64%	2.41	1.617	0.507	14.40	0.952	0.298	8.97
4a	103,215	2.37	0%	0	0%	0.00	35%	0.83	65%	1.54	1.627	0.321	9.11	0.960	0.190	5.69
4b	175,625	4.03	0%	0	0%	0.00	35%	1.41	65%	2.62	1.627	0.547	15.50	0.960	0.323	9.68
Total	757,202	17.38	6%	0.95	0%	0.00	31%	5.44	63%	11.02			64.99			40.18
Undeveloped Condition																
1	638,992	14.67	0%	0.00	0%	0.00	100%	14.67	0%	0.00	0.990	1.210	42.10	0.440	0.538	21.86
2*	118,270	2.72	35%	0.95	0%	0.00	9%	0.24	57%	1.55	1.366	0.309	8.69	0.774	0.175	5.06
Total	757,262	17.38	18%	0.95	0%	0.00	54%	14.91	28%	1.55			50.79			26.92

* Basin 2 is not a part of this site but flows through the site through Jaconita Place.

Equations:

Weighted E = $E_a \cdot A_a + E_b \cdot A_b + E_c \cdot A_c + E_d \cdot A_d$ / (Total Area)

Volume = Weighted D * Total Area

Flow = $Q_a \cdot A_a + Q_b \cdot A_b + Q_c \cdot A_c + Q_d \cdot A_d$

Excess Precipitation, E (inches)		
Zone 1	100-Year	10 - Year
E _a	0.44	0.08
E _b	0.67	0.22
E _c	0.99	0.44
E _d	1.97	1.24

Peak Discharge (cfs/acre)		
Zone 1	100-Year	10 - Year
Q _a	1.29	0.24
Q _b	2.03	0.76
Q _c	2.87	1.49
Q _d	4.37	2.89

Street Capacity Summary

[illegible]

Street Capacity Calculations

SAN JON CT.

28' F-F Street Section with 4" curb

Slope= 0.006

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)
0.01	0.0016	0.33	0.00	0.00	0.00	0.19	0.00	0.34	0.00195
0.02	0.0064	0.66	0.01	0.00	0.00	0.31	0.01	0.38	0.00475
0.025	0.01	0.83	0.01	0.00	0.01	0.36	0.01	0.40	0.00632
0.035	0.0196	1.16	0.02	0.01	0.02	0.45	0.02	0.42	0.00971
0.045	0.0324	1.49	0.02	0.02	0.03	0.53	0.02	0.44	0.01337
0.052	0.043264	1.72	0.03	0.03	0.05	0.58	0.03	0.45	0.01607
0.06	0.0576	1.98	0.03	0.04	0.07	0.64	0.04	0.46	0.01927
0.0625	0.0625	2.06	0.03	0.04	0.08	0.66	0.04	0.46	0.02029

For water depths greater than 0.0625 ft but less than 0.3025 ft

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

Depth (ft)	Area (ft ²)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.063	0.063506	2.09	0.03	0.04	0.08	0.66	0.04	0.46	0.02041
0.1	0.172656	3.98	0.04	0.14	0.29	0.84	0.08	0.47	0.03274
0.13	0.311406	5.51	0.06	0.31	0.62	1.00	0.13	0.49	0.04573
0.16	0.495156	7.04	0.07	0.57	1.14	1.15	0.18	0.51	0.06013
0.2	0.810156	9.08	0.09	1.10	2.19	1.35	0.27	0.53	0.08087
0.207	0.873506	9.43	0.09	1.21	2.42	1.39	0.29	0.54	0.08465
0.2284	1.08237	10.53	0.10	1.61	3.22	1.49	0.34	0.55	0.09645
0.2969	1.904884	14.02	0.14	3.41	6.82	1.79	0.53	0.58	0.13631

For water depths greater than 0.3025 ft but less than 0.333 ft

Y2= Y - 0.3025
 A3= $A2 + Y2 \cdot 14$
 P3= $P2 + Y2$

Depth (ft)	Area (ft ²)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.303	1.911884	14.02	0.14	3.43	6.86	1.79	0.54	0.57	0.13748
0.3039	1.924484	14.02	0.14	3.47	6.93	1.80	0.55	0.58	0.13849
0.3062	1.956684	14.02	0.14	3.56	7.13	1.82	0.56	0.58	0.14107
0.31	2.009884	14.03	0.14	3.73	7.45	1.85	0.57	0.59	0.14534
0.307637	1.976803	14.03	0.14	3.63	7.25	1.83	0.56	0.58	0.14269
0.32	2.149884	14.04	0.15	4.17	8.33	1.94	0.62	0.60	0.15664
0.3317	2.313684	14.05	0.16	4.71	9.41	2.03	0.67	0.62	0.16995
0.333	2.331884	14.05	0.17	4.77	9.54	2.04	0.68	0.62	0.17144

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

Y3= Y - 0.333
 A4= $A3 + 14 \cdot Y3 + 25 \cdot Y3^2$
 P4= $P3 + \text{SQRT}(2501 \cdot Y3^2)$

Depth (ft)	Area (ft ²)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.335	2.359984	14.15	0.17	4.84	9.68	2.05	0.69	0.62	0.17254
0.3727	2.927086	16.04	0.18	6.38	12.75	2.18	0.81	0.63	0.19393
0.38	3.045109	16.40	0.19	6.71	13.42	2.20	0.84	0.63	0.19821
0.4196	3.731773	18.38	0.20	8.73	17.46	2.34	0.98	0.64	0.22215
0.4603	4.519216	20.42	0.22	11.20	22.39	2.48	1.14	0.64	0.24783
0.504	5.456909	22.60	0.24	14.33	28.65	2.63	1.32	0.65	0.27645
0.513	5.661884	23.05	0.25	15.03	30.07	2.66	1.36	0.65	0.28246

Street Capacity Calculations

JACONITA PL. - NORTH
28' F-F Street Section with 8" curb
 Slope= 0.006

For water depths less than 0.125 feet

Y= Water depth
 Area = $8 \cdot Y^2$
 P= $\text{SQRT}(257 \cdot Y^2) + Y$
 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)
0.01	0.00	0.17	0.00	0.00	0.00	0.19	0.00	0.33	0.0018848
0.02	0.00	0.34	0.01	0.00	0.00	0.30	0.01	0.38	0.0045908
0.04	0.01	0.68	0.02	0.01	0.01	0.48	0.02	0.42	0.0111278
0.06	0.03	1.02	0.03	0.02	0.04	0.63	0.04	0.45	0.0186349
0.08	0.05	1.36	0.04	0.04	0.08	0.76	0.06	0.47	0.0268376
0.1	0.08	1.70	0.05	0.07	0.14	0.88	0.09	0.49	0.0355923
0.12	0.12	2.04	0.06	0.11	0.23	1.00	0.12	0.51	0.0448091
0.125	0.13	2.13	0.06	0.13	0.26	1.02	0.13	0.51	0.0471777

For water depths greater than 0.125 ft but less than 0.365 ft

Y1= Y-0.125
 A2= $A1 + 2 \cdot Y1 + 25 \cdot Y1^2$
 P2= $P1 + \text{SQRT}(2501 \cdot Y1^2) + Y1$

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.13	0.14	2.38	0.06	0.14	0.27	1.00	0.13	0.49	0.0460163
0.16	0.23	3.91	0.06	0.23	0.46	1.01	0.16	0.45	0.0486259
0.2	0.42	5.95	0.07	0.48	0.95	1.15	0.23	0.45	0.0623776
0.24	0.69	8.00	0.09	0.90	1.81	1.32	0.32	0.47	0.0806096
0.2846	1.08	10.27	0.11	1.63	3.26	1.51	0.43	0.50	0.1037171
0.32	1.47	12.08	0.12	2.43	4.87	1.66	0.53	0.52	0.1234692
0.3551	1.91	13.87	0.14	3.45	6.89	1.81	0.64	0.53	0.1440036
0.365	2.05	14.37	0.14	3.77	7.55	1.85	0.67	0.54	0.1499436

For water depths greater than 0.365 ft but less than 0.667 ft

Y2= Y - 0.365
 A3= $A2 + Y2^2 \cdot 14$
 P3= $P2 + Y2$

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.37	2.12	14.38	0.15	3.99	7.98	1.89	0.70	0.55	0.1556607
0.4556	3.31	14.46	0.23	8.40	16.80	2.54	1.16	0.66	0.2556985
0.39	2.40	14.40	0.17	4.91	9.81	2.05	0.80	0.58	0.1786775
0.4715862	3.54	14.48	0.24	9.36	18.72	2.65	1.25	0.68	0.2747936
0.55	4.64	14.56	0.32	14.63	29.27	3.16	1.74	0.75	0.3701032
0.59	5.20	14.60	0.36	17.67	35.33	3.40	2.01	0.78	0.4196837
0.63	5.76	14.64	0.39	20.91	41.83	3.63	2.29	0.81	0.4698487
0.667	6.27	14.67	0.43	24.10	48.21	3.84	2.56	0.83	0.5167338

For water depths greater than 0.667 ft but less than 0.847 ft

Y3= Y - 0.667
 A4= $A3 + 14 \cdot Y3 + 25 \cdot Y3^2$
 P4= $P3 + \text{SQRT}(2501 \cdot Y3^2)$

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.7	6.76	16.32	0.41	25.44	50.89	3.76	2.63	0.79	0.5090958
0.72	7.09	17.32	0.41	26.43	52.87	3.73	2.69	0.77	0.5071856
0.74	7.43	18.32	0.41	27.55	55.10	3.71	2.74	0.76	0.5069788
0.76	7.79	19.32	0.40	28.79	57.58	3.70	2.81	0.75	0.508251
0.78	8.17	20.32	0.40	30.16	60.31	3.69	2.88	0.74	0.5108175
0.8	8.58	21.32	0.40	31.64	63.29	3.69	2.95	0.73	0.5145251
0.847	9.60	23.68	0.41	35.63	71.26	3.71	3.14	0.71	0.5270333

Street Capacity Calculations

JACONITA PL. - SOUTH

28' F-F Street Section with 8" curb

Slope= 0.006

For water depths less than 0.125 feet

Y= Water depth
Area = $8 \cdot Y^2$
P= $\text{SQRT}(257 \cdot Y^2) + Y$
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)
0.01	0.00	0.17	0.00	0.00	0.00	0.19	0.00	0.33	0.0018848
0.02	0.00	0.34	0.01	0.00	0.00	0.30	0.01	0.38	0.0045908
0.04	0.01	0.68	0.02	0.01	0.01	0.48	0.02	0.42	0.0111278
0.06	0.03	1.02	0.03	0.02	0.04	0.63	0.04	0.45	0.0186349
0.08	0.05	1.36	0.04	0.04	0.08	0.76	0.06	0.47	0.0268376
0.1	0.08	1.70	0.05	0.07	0.14	0.88	0.09	0.49	0.0355923
0.12	0.12	2.04	0.06	0.11	0.23	1.00	0.12	0.51	0.0448091
0.125	0.13	2.13	0.06	0.13	0.26	1.02	0.13	0.51	0.0471777

For water depths greater than 0.125 ft but less than 0.365 ft

Y1= Y-0.125
A2= $A1 + 2 \cdot Y1 + 25 \cdot Y1^2$
P2= $P1 + \text{SQRT}(2501 \cdot Y1^2) + Y1$

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.13	0.14	2.38	0.06	0.14	0.27	1.00	0.13	0.49	0.0460163
0.16	0.23	3.91	0.06	0.23	0.46	1.01	0.16	0.45	0.0486259
0.2	0.42	5.95	0.07	0.48	0.95	1.15	0.23	0.45	0.0623776
0.24	0.69	8.00	0.09	0.90	1.81	1.32	0.32	0.47	0.0806096
0.2846	1.08	10.27	0.11	1.63	3.26	1.51	0.43	0.50	0.1037171
0.32	1.47	12.08	0.12	2.43	4.87	1.66	0.53	0.52	0.1234692
0.3551	1.91	13.87	0.14	3.45	6.89	1.81	0.64	0.53	0.1440036
0.365	2.05	14.37	0.14	3.77	7.55	1.85	0.67	0.54	0.1499436

For water depths greater than 0.365 ft but less than 0.667 ft

Y2= Y - 0.365
A3= $A2 + Y2 \cdot 14$
P3= $P2 + Y2$

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.37	2.12	14.38	0.15	3.99	7.98	1.89	0.70	0.55	0.1556607
0.4556	3.31	14.46	0.23	8.40	16.80	2.54	1.16	0.66	0.2556985
0.39	2.40	14.40	0.17	4.91	9.81	2.05	0.80	0.58	0.1786775
0.5	3.94	14.51	0.27	11.16	22.33	2.84	1.42	0.71	0.3090234
0.5757478	5.00	14.58	0.34	16.56	33.12	3.32	1.91	0.77	0.4019485
0.59	5.20	14.60	0.36	17.67	35.33	3.40	2.01	0.78	0.4196837
0.63	5.76	14.64	0.39	20.91	41.83	3.63	2.29	0.81	0.4698487
0.667	6.27	14.67	0.43	24.10	48.21	3.84	2.56	0.83	0.5167338

For water depths greater than 0.667 ft but less than 0.847 ft

Y3= Y - 0.667
A4= $A3 + 14 \cdot Y3 + 25 \cdot Y3^2$
P4= $P3 + \text{SQRT}(2501 \cdot Y3^2)$

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.7	6.76	16.32	0.41	25.44	50.89	3.76	2.63	0.79	0.5090958
0.72	7.09	17.32	0.41	26.43	52.87	3.73	2.69	0.77	0.5071856
0.74	7.43	18.32	0.41	27.55	55.10	3.71	2.74	0.76	0.5069788
0.76	7.79	19.32	0.40	28.79	57.58	3.70	2.81	0.75	0.508251
0.78	8.17	20.32	0.40	30.16	60.31	3.69	2.88	0.74	0.5108175
0.8	8.58	21.32	0.40	31.64	63.29	3.69	2.95	0.73	0.5145251
0.847	9.60	23.68	0.41	35.63	71.26	3.71	3.14	0.71	0.5270333

Street Capacity Calculations

SOMBRILLO

28' F-F Street Section with 4" curb

Slope= 0.006

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)
0.01	0.0016	0.33	0.00	0.00	0.00	0.19	0.00	0.34	0.00195
0.02	0.0064	0.66	0.01	0.00	0.00	0.31	0.01	0.38	0.00475
0.025	0.01	0.83	0.01	0.00	0.01	0.36	0.01	0.40	0.00632
0.035	0.0196	1.16	0.02	0.01	0.02	0.45	0.02	0.42	0.00971
0.045	0.0324	1.49	0.02	0.02	0.03	0.53	0.02	0.44	0.01337
0.052	0.043264	1.72	0.03	0.03	0.05	0.58	0.03	0.45	0.01607
0.06	0.0576	1.98	0.03	0.04	0.07	0.64	0.04	0.46	0.01927
0.0625	0.0625	2.06	0.03	0.04	0.08	0.66	0.04	0.46	0.02029

For water depths greater than 0.0625 ft but less than 0.3025 ft

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

Depth (ft)	Area (ft ²)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.063	0.063506	2.09	0.03	0.04	0.08	0.66	0.04	0.46	0.02041
0.1	0.172656	3.98	0.04	0.14	0.29	0.84	0.08	0.47	0.03274
0.13	0.311406	5.51	0.06	0.31	0.62	1.00	0.13	0.49	0.04573
0.16	0.495156	7.04	0.07	0.57	1.14	1.15	0.18	0.51	0.06013
0.2	0.810156	9.08	0.09	1.10	2.19	1.35	0.27	0.53	0.08087
0.207	0.873506	9.43	0.09	1.21	2.42	1.39	0.29	0.54	0.08465
0.2284	1.08237	10.53	0.10	1.61	3.22	1.49	0.34	0.55	0.09645
0.2969	1.904884	14.02	0.14	3.41	6.82	1.79	0.53	0.58	0.13631

For water depths greater than 0.3025 ft but less than 0.333 ft

Y2= Y - 0.3025
A3= $A2 + Y2 \cdot 14$
P3= $P2 + Y2$

Depth (ft)	Area (ft ²)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.303	1.911884	14.02	0.14	3.43	6.86	1.79	0.54	0.57	0.13748
0.3039	1.924484	14.02	0.14	3.47	6.93	1.80	0.55	0.58	0.13849
0.3062	1.956684	14.02	0.14	3.56	7.13	1.82	0.56	0.58	0.14107
0.31	2.009884	14.03	0.14	3.73	7.45	1.85	0.57	0.59	0.14534
0.307637	1.976803	14.03	0.14	3.63	7.25	1.83	0.56	0.58	0.14269
0.32	2.149884	14.04	0.15	4.17	8.33	1.94	0.62	0.60	0.15664
0.328464	2.268373	14.05	0.16	4.55	9.11	2.01	0.66	0.62	0.16626
0.333	2.331884	14.05	0.17	4.77	9.54	2.04	0.68	0.62	0.17144

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

Y3= Y - 0.333
A4= $A3 + 14 \cdot Y3 + 25 \cdot Y3^2$
P4= $P3 + \text{SQRT}(2501 \cdot Y3^2)$

Depth (ft)	Area (ft ²)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.335	2.359984	14.15	0.17	4.84	9.68	2.05	0.69	0.62	0.17254
0.3727	2.927086	16.04	0.18	6.38	12.75	2.18	0.81	0.63	0.19393
0.38	3.045109	16.40	0.19	6.71	13.42	2.20	0.84	0.63	0.19821
0.4196	3.731773	18.38	0.20	8.73	17.46	2.34	0.98	0.64	0.22215
0.4603	4.519216	20.42	0.22	11.20	22.39	2.48	1.14	0.64	0.24783
0.504	5.456909	22.60	0.24	14.33	28.65	2.63	1.32	0.65	0.27645
0.513	5.661884	23.05	0.25	15.03	30.07	2.66	1.36	0.65	0.28246

Street Capacity Calculations

TAOS PL.

28' F-F Street Section with 8" curb

Slope= 0.006

For water depths less than 0.125 feet

Y= Water depth
Area = $8 \cdot Y^2$
P= $\text{SQRT}(257 \cdot Y^2) + Y$
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)
0.01	0.00	0.17	0.00	0.00	0.00	0.19	0.00	0.33	0.0018848
0.02	0.00	0.34	0.01	0.00	0.00	0.30	0.01	0.38	0.0045908
0.04	0.01	0.68	0.02	0.01	0.01	0.48	0.02	0.42	0.0111278
0.06	0.03	1.02	0.03	0.02	0.04	0.63	0.04	0.45	0.0186349
0.08	0.05	1.36	0.04	0.04	0.08	0.76	0.06	0.47	0.0268376
0.1	0.08	1.70	0.05	0.07	0.14	0.88	0.09	0.49	0.0355923
0.12	0.12	2.04	0.06	0.11	0.23	1.00	0.12	0.51	0.0448091
0.125	0.13	2.13	0.06	0.13	0.26	1.02	0.13	0.51	0.0471777

For water depths greater than 0.125 ft but less than 0.365 ft

Y1= Y-0.125
A2= $A1 + 2 \cdot Y1 + 25 \cdot Y1^2$
P2= $P1 + \text{SQRT}(2501 \cdot Y1^2) + Y1$

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.13	0.14	2.38	0.06	0.14	0.27	1.00	0.13	0.49	0.0460163
0.16	0.23	3.91	0.06	0.23	0.46	1.01	0.16	0.45	0.0486259
0.2	0.42	5.95	0.07	0.48	0.95	1.15	0.23	0.45	0.0623776
0.24	0.69	8.00	0.09	0.90	1.81	1.32	0.32	0.47	0.0806096
0.2846	1.08	10.27	0.11	1.63	3.26	1.51	0.43	0.50	0.1037171
0.32	1.47	12.08	0.12	2.43	4.87	1.66	0.53	0.52	0.1234692
0.3551	1.91	13.87	0.14	3.45	6.89	1.81	0.64	0.53	0.1440036
0.365	2.05	14.37	0.14	3.77	7.55	1.85	0.67	0.54	0.1499436

For water depths greater than 0.365 ft but less than 0.667 ft

Y2= Y - 0.365
A3= $A2 + Y2 \cdot 14$
P3= $P2 + Y2$

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.37	2.12	14.38	0.15	3.99	7.98	1.89	0.70	0.55	0.1556607
0.4556	3.31	14.46	0.23	8.40	16.80	2.54	1.16	0.66	0.2556985
0.39	2.40	14.40	0.17	4.91	9.81	2.05	0.80	0.58	0.1786775
0.5099376	4.07	14.52	0.28	11.82	23.65	2.90	1.48	0.72	0.3210796
0.55	4.64	14.56	0.32	14.63	29.27	3.16	1.74	0.75	0.3701032
0.5674656	4.88	14.57	0.33	15.93	31.86	3.26	1.85	0.76	0.3916772
0.63	5.76	14.64	0.39	20.91	41.83	3.63	2.29	0.81	0.4698487
0.667	6.27	14.67	0.43	24.10	48.21	3.84	2.56	0.83	0.5167338

For water depths greater than 0.667 ft but less than 0.847 ft

Y3= Y - 0.667
A4= $A3 + 14 \cdot Y3 + 25 \cdot Y3^2$
P4= $P3 + \text{SQRT}(2501 \cdot Y3^2)$

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.7	6.76	16.32	0.41	25.44	50.89	3.76	2.63	0.79	0.5090958
0.72	7.09	17.32	0.41	26.43	52.87	3.73	2.69	0.77	0.5071856
0.74	7.43	18.32	0.41	27.55	55.10	3.71	2.74	0.76	0.5069788
0.76	7.79	19.32	0.40	28.79	57.58	3.70	2.81	0.75	0.508251
0.78	8.17	20.32	0.40	30.16	60.31	3.69	2.88	0.74	0.5108175
0.8	8.58	21.32	0.40	31.64	63.29	3.69	2.95	0.73	0.5145251
0.847	9.60	23.68	0.41	35.63	71.26	3.71	3.14	0.71	0.5270333

CAPACITY OF DOUBLE 'C' STORM DROP INLET

Capacity of the grate:

$$\begin{aligned} L &= 88.75'' - 2(6'' \text{ ends}) - 6'' \text{ center piece} - 14(\frac{1}{2}'' \text{ middle bars}) \\ &= 63.75'' \\ &= 5.3125' \end{aligned}$$

$$\begin{aligned} W &= 25.5'' - 13(\frac{1}{2}'' \text{ middle bars}) \\ &= 19'' \\ &= 1.583' \end{aligned}$$

$$\begin{aligned} \text{Area} &= 1.583' \times 5.3125' \\ &= 8.41 \text{ ft}^2 \end{aligned}$$

$$\begin{aligned} \text{Effective Area} &= 8.41 - 8.41 (0.5 \text{ clogging factor}) \\ &= 4.21 \text{ ft}^2 \text{ at the grate} \end{aligned}$$

Orifice Equation

$$Q = CA \sqrt{2gH}$$

$$Q = 0.6 \times 4.21 \times \sqrt{2 \times 32.2 \times 0.67}$$

$$Q = 16.59 \text{ cfs}$$

Capacity of the throat:

$$\begin{aligned} L &= 88\text{-}\frac{3}{4}'' \\ &= 7.3958' \end{aligned}$$

Weir Equation

$$Q = CLH^{(3/2)}$$

$$Q = 2.95 \times 7.3958 \times 0.67^{(3/2)}$$

$$Q = 11.97 \text{ cfs}$$

Total Capacity:

$$Q = 16.59_{\text{grate}} + 11.97_{\text{throat}}$$

$$Q = 28.56 \text{ cfs}$$

MAP POCKET 1

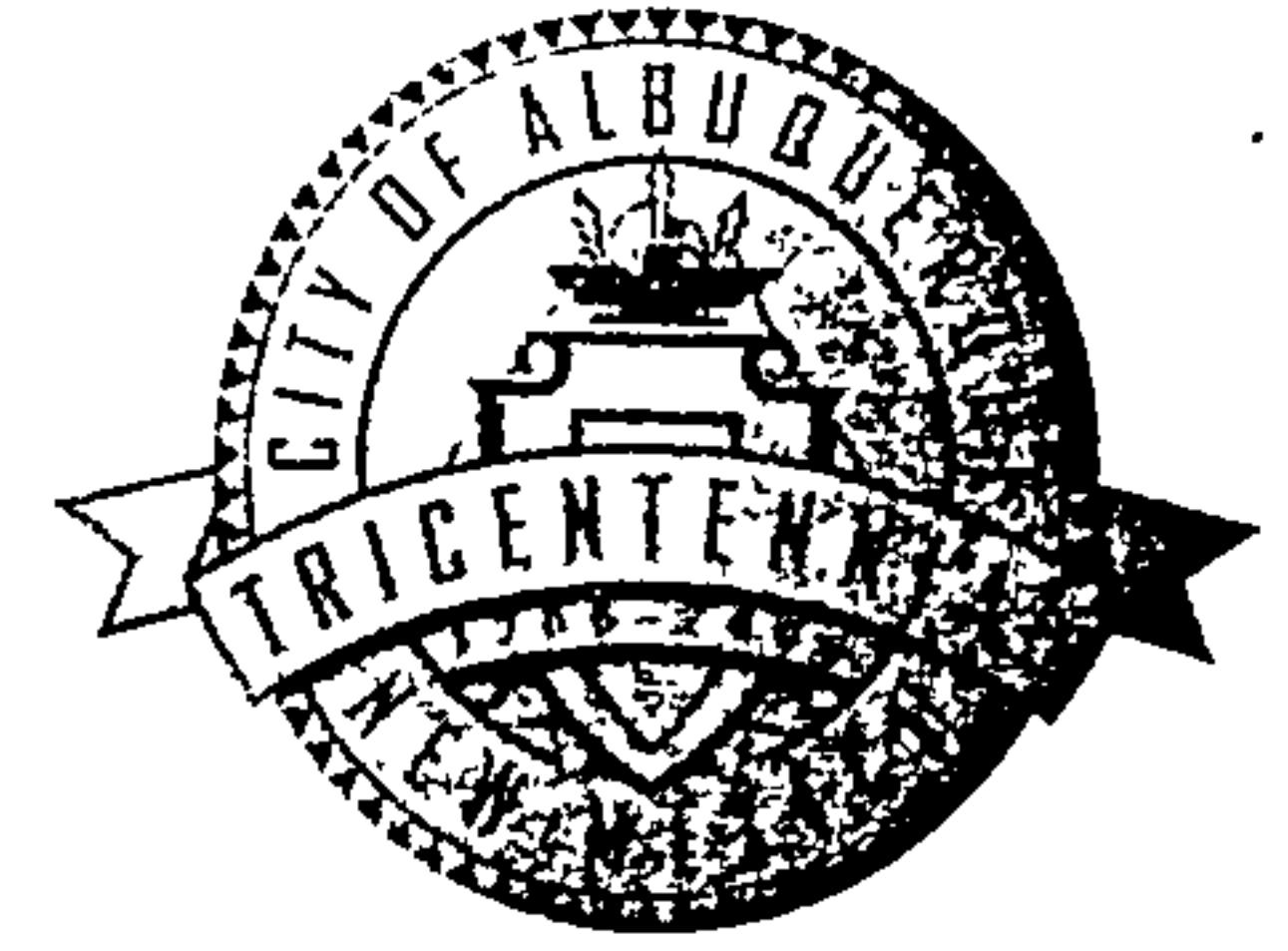
EXISTING & PROPOSED DRAINAGE BASIN MAPS

11
11
11
11
11

MAP POCKET 2

GRADING & DRAINAGE PLAN

CITY OF ALBUQUERQUE



September 5, 2007

Ronald R. Bohannon, P.E.
TIERRA WEST, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: Stinson Park Subdivision, (L-10/D026)

Engineers Certification for Release of Financial Guaranty

Engineers Stamp dated 04/05/2006

Engineers Certification dated 09/04/2007

Dear Mr. Bohannon,

P.O. Box 1293

Based upon the information provided in your submittal received 05/24/2006, the above referenced certification is approved for release of SIA and Financial Guarantee.

Albuquerque

However, prior to release of financial guaranty, the LOMR must be accepted by FEMA.

New Mexico 87103

If you have any questions, you can contact me at 924-3982.

Sincerely,

Timothy Sims

Plan Checker, Planning Dept. - Hydrology
Development and Building Services

www.cabq.gov

C: Marilyn Maldonado, COA# 761381
File

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 01/28/2003rd)

PROJECT TITLE: Stinson Park Subdivision
DRB #: 1003004 EPC #: _____

ZONE MAP/DRG. FILE #: L-10-7 *10024*
WORK ORDER #: 761381

LEGAL DESCRIPTION: Tracts 414, 415B, 415C, 415D, and 416, Lands of Atrisco Grant Unit 3
CITY ADDRESS: _____

ENGINEERING FIRM: Tierra West, LLC
ADDRESS: 5571 Midway Park Place NE
CITY, STATE: Albuquerque, NM

CONTACT: Jon Niski
PHONE: (505) 858-3100
ZIP CODE: 87109

OWNER: Clearbrook Investments, Inc.
ADDRESS: 8801 Jefferson NE, Bldg A
CITY, STATE: Albuquerque, NM 87113

CONTACT: Scott Henry
PHONE: (505) 858-1800
ZIP CODE: 87113

ARCHITECT: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

SURVEYOR: Precision Surveys
ADDRESS: 8500 Jefferson St. NE
CITY, STATE: Albuquerque

CONTACT: Larry Medrano
PHONE: 505-856-5700
ZIP CODE: 87113

CONTRACTOR: Hydro-Systems
ADDRESS: PO Box 92195
CITY, STATE: Albuquerque, NM

CONTACT: Mike Smith
PHONE: (505) 344-3840
ZIP CODE: 87199-2195

CHECK TYPE OF SUBMITTAL:

CHECK TYPE OF APPROVAL SOUGHT:

- ☐ DRAINAGE REPORT
☐ DRAINAGE PLAN 1st SUBMITTAL, **REQUIRES TCL or equal**
☐ DRAINAGE PLAN RESUBMITTAL
☐ 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

- ☒ 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

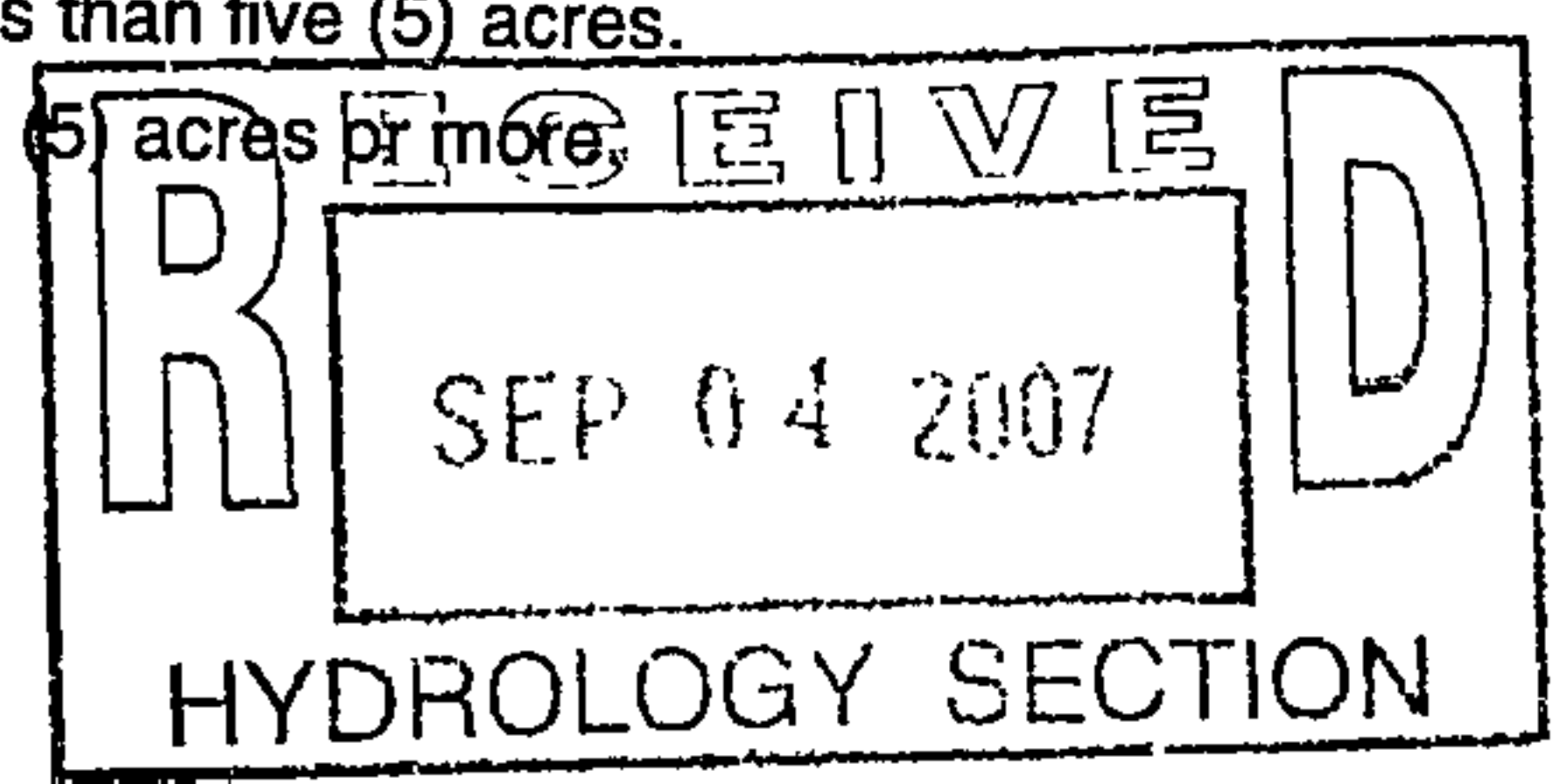
DATE SUBMITTED: 09-04-07 BY: Jon Niski

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.



Current DRC
Project Number: _____

FIGURE 12

Date Submitted: 01/25/05

Date Site Plan Approved: _____

Date Preliminary Plat Approved: 1/26/05

Date Preliminary Plat Expires: 1/26/06

DRB Project No.: 04DRB-01974

DRB Application No.: 1003004

ORIGINAL

INFRASTRUCTURE LIST

EXHIBIT "A"

TO SUBDIVISION IMPROVEMENTS AGREEMENT
DEVELOPMENT REVIEW BOARD (D.R.B.) REQUIRED INFRASTRUCTURE LIST

STINSON PARK

PROPOSED NAME OF PLAT AND/OR SITE DEVELOPMENT PLAN

TRACT 414, 415 B, C & D, 416, UNIT 3, LANDS OF ATRISCO GRANT
EXISTING LEGAL DESCRIPTION PRIOR TO PLATTING ACTION

2 3-6-06

5-18-06

Following is a summary of PUBLIC/PRIVATE Infrastructure required to be constructed or financially guaranteed for the above development. This Listing is not necessarily a complete listing. During the SIA process and/or in the review of the construction drawings, if the DRC Chair determines that appurtenant items and/or unforeseen items have not been included in the infrastructure listing, the DRC Chair may include those items in the listing and related financial guarantee. Likewise, if the DRC Chair determines that appurtenant or non-essential items can be deleted from the listing, those items may be deleted as well as the related portions of the financial guarantees. All such revisions require approval by the DRC Chair, the User Department and agent/owner. If such approvals are obtained, these revisions to the listing will be incorporated administratively. In addition, any unforeseen items which arise during construction which are necessary to complete the project and which normally are the Subdivider's responsibility will be required as a condition of project acceptance and close out by the City.

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
		8" 6"	Water line	Jaconita	Tower Road	San Ygnacio	/	/	/
		8" 6" 3	Waterline	Taos Place	Sombrillo Ave	San Ygnacio	/	/	/
		8" 6" 3	waterline	Sombrillo Ave	Jaconita Place	Stinson Street	/	/	/
		4"	waterline	San Jon Court	Taos Place	Terminus	/	/	/
		10"	waterline	Stinson	Tower	San Ygnacio	/	/	/
		8"	waterline	San Ygnacio	W. Property Line	Stinson	/	/	/
		8"	waterline	Tower	2630' West of Coors (Includes frontage) Tower Road	3440' West of Coors	/	/	/
		8"	Sewer Line	Jaconita	Tower Road	Terminus	/	/	/
		8"	Sewerline	Taos Place	Sombrillo Ave	Terminus	/	/	/
		8"	Sewerline	Sombrillo Ave	Juconita Place	Stinson Street	/	/	/

ORIGINAL

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
		8"	Sewerline	San Jon Court	Taos Place	Terminous ³	/	/	/
		8"	Sewerline	Tower Road	75 th St. ³	120' East of 75 th	/	/	/
		8"	Sewerline	San Ygnacio	W. Property Line	Amole Channel	/	/	/
		24" F-F	Residential Road with Curb and Gutter including 4' wide Sidewalk (DEFERRED) ¹	Jaconita	Tower Road	Terminous	/	/	/
		24" F-F	Residential Road with Curb and Gutter including 4' Sidewalk (DEFERRED) ¹	Taos Place	Sombrillo Ave	Terminous	/	/	/
		24" F-F	Residential Road with Curb and Gutter including 4' Sidewalk (DEFERRED) ¹	Sombrillo Ave	Juconita Place	Stinson Street	/	/	/
		24" F-F	Arterial Road with Curb and Gutter including 6' Sidewalk, and 6' bike lane (DEFERRED) ¹	San Jon Court	Taos Place	Terminous	/	/	/
		30" F-F	Arterial Road with Curb and Gutter including 6' Sidewalk, both sides, 6' bike lane all water, sewer, storm drainage required	Tower road	2630' West of Coors	3440' West of Coors	/	/	/
		8"	Sanitary Sewer	Tower Road ³ San Ygnacio	Jaconita ³ W. Property Line of Autumn View	Amole Del Norte	/	/	/
		24"	RCP storm drain and appurtanances	Public Drainage Eas.	Jaconita	San Ygnacio	/	/	/
		24"	RCP storm drain and appurtanances	Public Drainage Eas.	Taos Place	San Ygnacio	/	/	/
		48" ^{66"} ²	RCP storm drain and appurtanances	Tower Road	2630' West of Coors ² 75 th	3440' West of Coors ² Stinson	/	/	/
		24"	RCP storm drain and appurtanances	Stinson	San Jon Ct.	San Ygnacio	/	/	/
		NA	Approved. Letter of Map Revision required for release of SIA	Onsite	N/A	N/A	/	/	/
		NA ³	Drainage pond with easement and Covenant ³	Lot 25 ³	N/A ³	N/A ³	/	/	/

NAME OF PLAT AND/OR SITE PLAN STINSON PARK

ORIGINAL

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To
		24'	Temporary Paving	Stinson St.	S. Property Line	San Ygnacio
		24'	Temporary Paving	San Ygnacio	E. Property Line	Stinson St.
		24' F-E	Residential Paving, C&G Stinson	Stinson	Tower	Lot 53
		24' F-E	Residential Paving, C&G San Ygnacio	San Ygnacio	W. PL	Lot 64
		8"	Sewer Line	Amole Del Norte	San Ygnacio	Tower Rd.
		3' Varies	Temporary Paving	Stinson St.	Tower Rd.	Sombrilla Rd.

Private Inspector	City Inspector	City Cnst Engineer
----------------------	-------------------	-----------------------

1	1	1
1	1	1
1	1	1
1	1	1

1 Engineers Certification of Grading required for release of SIA and Financial Guarantee

2 site lighting shall be installed per DPM Standards.

3

AGENT / OWNER

David Sorls
NAME (print)Rio Grande Engineering
FIRMJMM 1/25/05
SIGNATURE - dateMAXIMUM TIME ALLOWED TO CONSTRUCT
THE IMPROVEMENTS WITHOUT A DRB

EXTENSION:

DEVELOPMENT REVIEW BOARD MEMBER APPROVALS

Morton 1/26/05 Christina Sanborn 1/26/05
DRB CHAIR - date PARKS & GENERAL SERVICES - date1-26-05
TRANSPORTATION DEVELOPMENT - date1/26/05
UTILITY DEVELOPMENT - dateBradley L. Bingham 1-26-05
CITY ENGINEER - date

AMAFCA - date

- date

- date

DESIGN REVIEW COMMITTEE REVISIONS

REVISION	DATE	DRC CHAIR	USER DEPARTMENT	AGENT / OWNER
1	2-1-06	Theresa	Theresa	R. Kline
2	3-6-06	Theresa	Bradley L. Bingham	Dee Krueger
3	5-18-06	Theresa	Bradley L. Bingham, M, B&B	Dee D. Krueger

PAGE 3 OF 3

C-10/DOZ 4

No. Of Lots 90
Nearest Major Streets Tower Road SW

FIGURE 12
SUBDIVISION IMPROVEMENTS
AGREEMENT-PUBLIC AND/OR PRIVATE
(Procedure B)

AGREEMENT TO CONSTRUCT
PUBLIC AND/OR PRIVATE SUBDIVISION IMPROVEMENTS

THIS AGREEMENT is made this 9th day of October, 2006 by and between the City of Albuquerque, New Mexico ("City"), a municipal corporation, whose address is P. O. Box 1293 (One Civic Plaza), Albuquerque, New Mexico 87103, and Homesite Five Ltd. Partnership ("Subdivider"), a [state the type of business entity, for instance, "New Mexico corporation," "general partnership," "joint venture," "individual," etc.:] A Limited Partnership, whose address is 8901 Adams NE, Ste. A, Albuquerque, NM 87113 and whose telephone number is 505.858.1800, is made in Albuquerque, New Mexico, and is entered into as of the date of final execution of this Agreement.

1. Recital. The Subdivider is developing certain lands within the City of Albuquerque, Bernalillo County, New Mexico, known as [describe:] Tract 414, 415B, 415C, 415D & 416, Lands of Atrisco Grant Unit 3, recorded on See attached, 19 in the records of the Bernalillo County Clerk at Book , Folio (the "Subdivision"). The Subdivider certifies that the Subdivision is owned by [state the name of the present real property owner exactly as shown on the real estate document conveying title in the Subdivision to the present owner:] Homesite Five Ltd. Partnership ("Owner").

The Subdivider has submitted and the City has approved a preliminary plat or Site Development Plan identified as Stinson Park Subdivision describing Subdivider's Property.

As a result of the development of the Subdivision, the Subdivision Ordinance ("S.O.") and/or the Zoning Code, Section 14-16-3-11, require the Subdivider, at no cost to the City, to install certain public and/or private Improvements, which are reasonably related to the development of the Subdivision, or to financially guarantee the construction of the public and/or private Improvements as a prerequisite to approval of the final plat of, or the Site Development Plan for the Subdivision.

2. Improvements and Construction Deadline. The Subdivider agrees to install and complete the public and/or private improvements described in Exhibit A, the required infrastructure listing ("Improvements"), to the satisfaction of the City, on or before the 1st day of August, 2008 ("Construction Completion Deadline"), at no cost to the City. The improvements are shown in greater detail on the Subdivider's proposed and approved plans, which have been filed with the City Engineer and are identified as Project No. 7613.81.

Note: To compute the Construction Completion Deadline: If a final plat will be filed after Subdivider meets the requirements of this Agreement, the Construction Completion Deadline can be no later than two years after execution of this Agreement. (See Subdivision Ordinance Section 14-14-3.) If a final plat will not be filed pursuant to this Agreement, the Construction Completion Deadline can be no later than one year after approval of the preliminary plat by the Development Review Board (DRB), unless the DRB grants an extension, not to exceed one additional year per extension, and the Subdivider processes an amendment to the Agreement. (See Subdivision Ordinance Section 14-14-3.) If this Agreement, with any amendments does not utilize the maximum time allowed for completion of construction, the Subdivider may obtain an extension of the Construction Completion Deadline if Subdivider shows adequate reason for the extension.



Work Order Requirements. The City agrees to issue a Work Order after:

A. The Subdivider causes to be submitted all documents, and meets all requirements listed in Development Process Manual, Volume 1, Chapter 5, Work Order Process, and figure 1, including submitting a Certificate of Insurance in a form acceptable to the City. The certificate must establish that the Subdivider has procured or has caused to be procured public liability insurance in the amount of not less than One Million Dollars (\$1,000,000) combined single limit for accidents or occurrences which cause bodily injury, death or property damage as a result of any condition of the Subdivision, the Improvements or the Subdivider's construction activities within, or related to the Subdivision. The insurance policy must name the City of Albuquerque, its employees and elected officials, as their interest may appear, as additional insured's. The Subdivider must maintain the insurance until the City accepts the public Improvements and/or approves the private Improvements. The cancellation provision must provide that, if the policy is either canceled prior to the expiration date of the policy or is materially changed or not renewed, the issuing company will mail 30 days written notice to the City, attention City Engineer.

B. The Subdivider complies with all applicable laws, ordinances and regulations, including, but not limited to the City Excavation Ordinance and Sidewalk Ordinance, and pays the following required engineering, staking, testing fees, and other related City fees and County Clerk recording fees:

<u>Type of Fee</u>	<u>Amount</u>
<u>Engineering Fee</u>	<u>3.25% of Actual Construction Cost</u>
<u>Excavation & Sidewalk Fees</u>	<u>As required per City-approved estimate</u>
<u>Street Restoration Fees</u>	<u>As required per City-approved estimate (Fig. 7)</u>

(Note: The Subdivider must pay the City all City fees which have been incurred during construction before the City will accept the Public Improvements.)

4. Surveying, Inspection and Testing. The improvements shall be inspected, surveyed and tested in accordance with all applicable laws, ordinances, and regulations, and according to the following terms:

A. Construction Surveying. Construction surveying for the construction of the Public Improvements shall be performed by Precision Surveys, and construction surveying of the Private Improvements shall be performed by Precision Surveys. If the construction surveying is performed by an entity other than the City, the City may monitor the construction surveying and the Subdivider shall ensure that the construction surveying entity provides all construction surveying field notes, plats, reports and related data to the City which the City requires for review. Record drawings shall be provided by the entity performing the survey. The Subdivider shall pay the City a reasonable fee for any construction surveying performed by the City.

B. Construction Inspection methods. Inspection of the construction of the Public Improvements shall be performed by Tierra West LLC, and inspection of the Private Improvements shall be performed by Tierra West LLC, both New Mexico Registered Professional Engineers. If the inspection is performed by an entity other than the City, the City may monitor the inspection and the Subdivider shall ensure that the inspecting entity provides all inspection results, reports and related data to the City, which the City requires for review. The City retains the right to perform its own general overall inspection of the construction project at any time prior to final acceptance of the Improvements, if deemed necessary or advisable by the City engineer. The Subdivider shall pay the City a reasonable fee for the level of inspection performed by the City.

C. Field Testing. Field-testing of the construction of the Public Improvements shall be performed by Vinyard & Associates, and field testing of the Private Improvements shall be performed by Vinyard & Associates, both certified testing laboratories under the supervision of a New Mexico Registered Professional Engineer, in accordance with the current City of Albuquerque Standard Specifications for the Public Works Construction. If any field-testing is performed by an



entity other than the City, the City may monitor the field testing and the Subdivider shall ensure that the field testing entity provides all field testing results, reports, and related data to the City which the City requires for review. The Subdivider shall pay the City a reasonable fee for any field-testing performed by the City.

D. Additional Testing. The City retains the right to perform all additional testing which the City Engineer deems is necessary or advisable and the Subdivider shall pay the City a reasonable fee therefore.

5. Financial Guaranty. If final plat approval is not requested prior to construction of the Subdivision, a financial guaranty is not required. If final plat approval is requested, the Subdivider must provide the City with a financial guaranty in an amount of not less than 125% of the estimated cost of constructing the Improvements, as approved by the City Engineer. The financial guaranty must be irrevocable and may be in the form of a letter of credit, escrow deposit or loan reserve letter issued by a Federally Insured Financial Institution; a bond issued by a surety qualified to do business in New Mexico; or other pledge of liquid assets which meets all City requirements. The City must be able to call the financial guaranty at any time within the sixty (60) days immediately following the Construction Completion Deadline.

To meet the Subdivision Ordinance requirements, the Subdivider has acquired or is able to acquire the following "Financial Guarantee:"

Type of Financial Guaranty: Loan Reserve Letter # 2340

Amount: \$ \$2,403,058.85

Name of Financial Institution or Surety providing Guaranty:

First Community Bank

Date City first able to call Guaranty: August 1, 2008

[Construction Completion Deadline]: August 1, 2008

If Guarantee other than a Bond, last day City able to call on Guaranty is:

October 1, 2008

Additional information: Infrastructure

6. Notice of Start of Construction. Before construction begins, the Subdivider shall deliver an acceptable Notice to Proceed to the City and shall arrange or a preconstruction conference and all required inspections.

7. Completion, Acceptance and Termination. When the City receives Subdivider's final acceptance package, the City shall review it for completeness and accuracy. (See DPM Volume 1, Chapter 5, Work Order Process, Step 9.) If the package is acceptable, the City shall approve the package and issue a Certificate of Completion and Acceptance for the Public Improvements and a Certificate of Completion for the Private Improvements. Thereafter, the Subdivider's obligations to the City pursuant to this Agreement shall terminate, with the exception of the bond or other guarantee which the Subdivider has provided to assure the materials and workmanship, as required by the Subdivision Ordinance. After the City approves the final acceptance package, the City will promptly release this Agreement and the Financial Guaranty.

8. Conveyance of Property Rights. When the Improvements are completed, if the City does not own the real property upon or in which the Public Improvements are constructed, the Subdivider will convey to the city all real and personal property rights which the City deems reasonably necessary, and all Public Improvements, free and clear of all claims, encumbrances and liens before the City will accept the Public Improvements. Conveyance may be made by appropriate dedication on the final plat of the Subdivision.

9. Reduction of Financial Guaranty Upon Partial Completion. The subdivider shall be entitled to a reduction of the Financial Guaranty as a result of completing construction of part of the Improvements if the following conditions are met:



A. Loan Reserve Financial Guaranty. If a loan reserve letter was provided as the Financial Guaranty, the Subdivider must follow the procedures and meet the requirements detailed in the Development Process Manual, Volume 1, Chapter 5.

B. Non-Loan Reserve Financial Guaranty. If a Financial Guaranty other than a loan reserve letter has been provided, the completed Improvements must be freestanding, functionally independent of any Improvements which have not yet been completed and completed in substantial compliance with the approved construction plans, as determined by City on-site inspection in order to qualify for a Financial Guaranty reduction. If the Improvements, which have been, completed meet all City requirements, the City Engineer will estimate the cost of completing the remaining Improvements. Thereafter, the subdivider must submit the following documents to the City for review and approval:

- (1) A revised Financial Guaranty in an amount of not less than 125% of the cost of completing the remaining Improvements, as estimated by the City;
- (2) A bond or other instrument acceptable to the City, which guarantees the completed Improvements against defective materials and workmanship for the period required by the Subdivision Ordinance.
- (3) Conveyance of real and personal property rights which meet the requirements of Section 8 of this Agreement.

After the City receives and approves the required documents, the City shall issue a Partial Certificate of Completion and Acceptance for the completed Public Improvements and a Certificate of Partial Completion for the completed Private Improvements.

10. Indemnification. Until the Improvements are accepted by the City, the Subdivider shall be solely responsible for maintaining the premises upon which the Improvements are being constructed in a safe condition. The Subdivider agrees to defend, indemnify and hold harmless the City and its officials, agents and employees from any claims, actions, suits or other proceedings arising from or out of the negligent acts or omissions of the Subdivider, its agents, representatives, contractors or subcontractors or arising from the failure of the Subdivider, its agents, representatives, contractors or subcontractors to perform any act or duty required of the Subdivider herein; provided, however, to the extent, if at all, Section 56-7-1 NMSA 1978 is applicable to this Agreement, this Agreement to indemnify will not extend to liability, claims, damages, losses or expenses, including attorney fees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications by the indemnitee, or the agents or employees of the indemnitee; or (2) the giving of or the failure to give directions or instructions by the indemnitee, where such giving or failure to give directions or instructions is the primary cause of bodily injury to persons or damage to property. The indemnification required hereunder shall not be limited as a result of the specifications of any applicable insurance coverage. Nothing herein is intended to impair any right or immunity under the laws of the State of New Mexico.

11. Assignment. This Agreement shall not be assigned without the prior written consent of the City and the Subdivider and the express written concurrence of any financial institution or surety, which has undertaken to guarantee the completion of the Improvements. The City's approval will not be withheld unreasonably. If so assigned, this Agreement shall extend to and be binding upon the successors and assigns of the parties hereto.

12. Release. If the Subdivision or any part thereof is sold, conveyed or assigned, the City will not release the Subdivider from its obligations under this Agreement and will continue to hold the Subdivider responsible for all Improvements until a successor in interest to the Subdivider has posted a suitable financial guaranty and entered into a Subdivision Improvements Agreement with the City. Thereafter, when the Subdivider's successor in interest has provided a substitute financial guaranty acceptable to the City, the City will release this Agreement and any related Financial Guaranty.



13. Payment for complete Improvements. If the Subdivider fails to satisfactorily complete construction of the Improvements by the Construction Completion Deadline, the City may construct or cause the Improvements to be constructed as shown on the final plat and in the approved plans and specifications. The Subdivider shall be jointly and severally liable to pay to, and indemnify the City for the total cost, including, but not limited to engineering, legal and contingent costs, together with any damages, either direct or consequential, which the City may sustain as a result of Subdivider's failure to perform as required by this Agreement. If the direct or indirect costs and damages to the City exceed the amount of the City's Claim of Lien or any Financial Guaranty, the Subdivider shall be liable to, and shall pay, the City for all such costs and damages. The surety or sureties shall be jointly and severally liable to pay to and indemnify the City for the total cost to the extent of their obligations pursuant to the Financial Guaranty.

14. Binding on Subdivider's Property. The provisions of this Agreement constitute covenants running with Subdivider's Property for the benefit of the City and its successors and assigns until terminated, and are binding on the Subdivider and the Owner and their heirs, successors and assigns.

15. Notice. For purposes of giving formal written notice, including notice of change of address, the Subdivider's and the City's addresses are as stated in the first paragraph of this Agreement. Notice may be given either in person or by certified U.S. mail, postage paid. Notice will be considered to have been received within six days after the notice is mailed if there is no actual evidence of receipt.

16. Entire Agreement. This Agreement contains the entire agreement of the parties and supersedes any and all other agreements or understandings, oral or written, whether previous to the execution hereof or contemporaneous herewith.

17. Changes to Agreement. Changes to this Agreement are not binding unless made in writing, signed by both parties.

18. Construction and Severability. If any part of this Agreement is held to be invalid or unenforceable, the remainder of the Agreement will remain valid and enforceable if the remainder is reasonably capable of completion.

19. Captions. The captions to the sections or paragraphs of this Agreement are not part of this Agreement and will not affect the meaning or construction of any of its provisions.

20. Form not Changed. Subdivider agrees that changes to this form are not binding unless initialed by the Subdivider and signed by the City's Legal Department on this form.

21. Authority to Execute. If the Subdivider signing below is not the Owner of the Subdivision, the Owner must execute the Power of Attorney below.

Executed on the date stated in the first paragraph of this Agreement.

SUBDIVIDER:

CITY OF ALBUQUERQUE

By [Signature]

Name: Cynthia A. King

Title: Vice-President - Finance

Dated: of Clearbrook Investment Inc.

Managing Partner of
Homesite Inc 261

Figure 12 - page 5

Approved by:

[Signature]

City Engineer

Dated: 10-09-06

Ulf 1010100

10-6-06

July 27, 2006 orig
resigned Oct 5, 2006

1/00

Figure 12 - page 6

1/00

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Page: 5 of 6
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Bern. Co. AGRE
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Mary Herrera

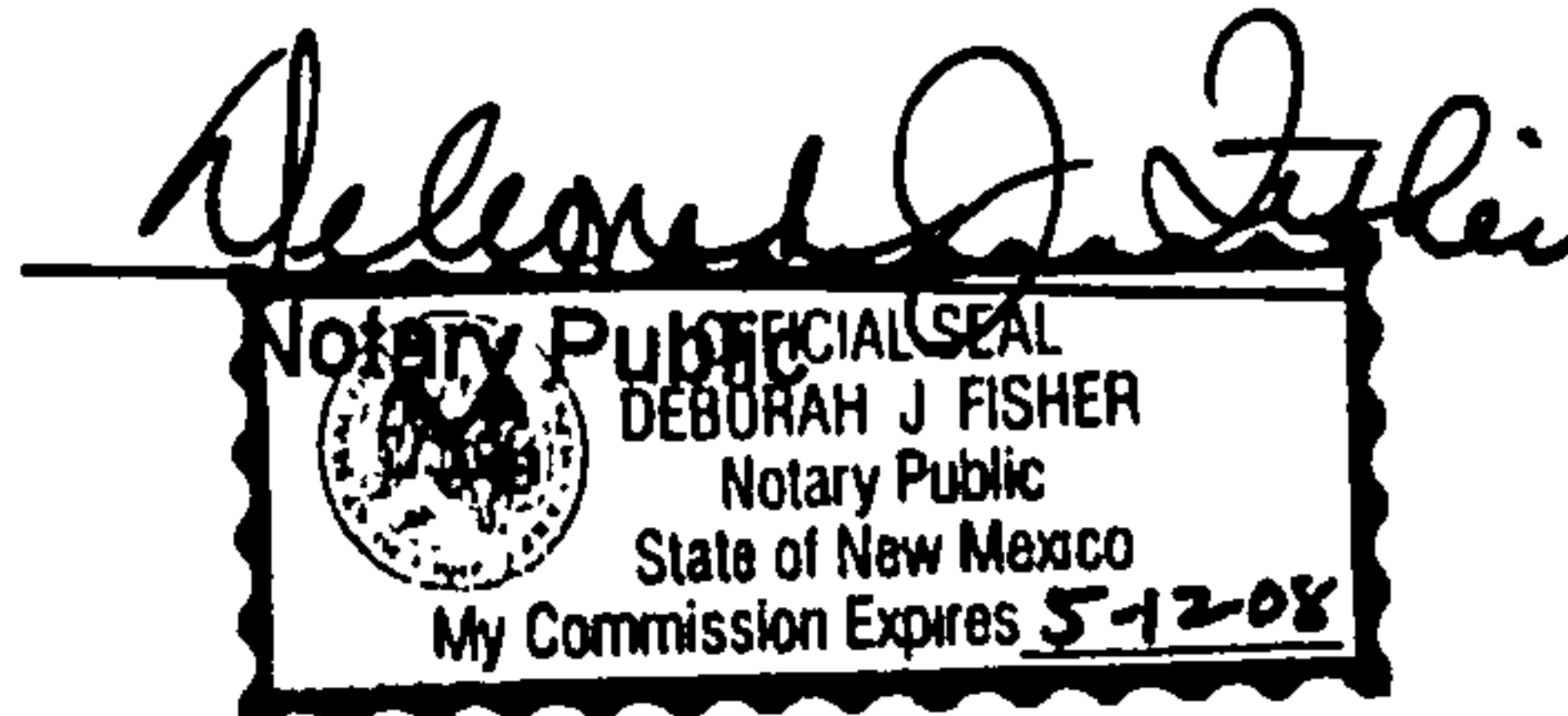
SUBDIVIDER'S NOTARY

STATE OF New Mexico)
) ss.
COUNTY OF Bernalillo)

This instrument was acknowledged before me on 5th day of October, 2006 by
[name(s) of person(s):] Cynthia A. King, [title or capacity, for instance, "President" or "Owner":]
Vice-President of [Subdivider:] Clearbrook Investments Inc., Managing Partner of Homesite
Five Ltd. Partnership.

My Commission Expires:

May 12, 2008



CITY'S NOTARY

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on 9th day of October, 2006 by
Richard Bourke, City Engineer, of the City of Albuquerque, a municipal corporation, on behalf of
said corporation.

My Commission Expires:

11-25-2007

Gloria D. Saavedra
Notary Public

EXHIBIT A AND POWER OF ATTORNEY ATTACHED



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8541829
Page: 6 of 6
10/10/2006 02:37P
BK-A125 Pg-3857

Current DRC
Project Number: _____

FIGURE 12

Date Submitted: 01/25/05

Date Site Plan Approved: _____

Date Preliminary Plat Approved: 1/26/05

Date Preliminary Plat Expires: 1/26/06

DRB Project No.: 04DRB-01974

DRB Application No.: 1003004

25058
DRB
ORIGINAL

INFRASTRUCTURE LIST

EXHIBIT "A"

TO SUBDIVISION IMPROVEMENTS AGREEMENT

DEVELOPMENT REVIEW BOARD (D.R.B.) REQUIRED INFRASTRUCTURE LIST

STINSON PARK

PROPOSED NAME OF PLAT AND/OR SITE DEVELOPMENT PLAN

TRACT 414, 415 B, C & D, 416, UNIT 3, LANDS OF ATRISCO GRANT

EXISTING LEGAL DESCRIPTION PRIOR TO PLATTING ACTION

2 3-6-06

5-18-06

Following is a summary of PUBLIC/PRIVATE Infrastructure required to be constructed or financially guaranteed for the above development. This Listing is not necessarily a complete listing. During the SIA process and/or in the review of the construction drawings, if the DRC Chair determines that appurtenant items and/or unforeseen items have not been included in the infrastructure listing, the DRC Chair may include those items in the listing and related financial guarantees. Likewise, if the DRC Chair determines that appurtenant or non-essential items can be deleted from the listing, those items may be deleted as well as the related portions of the financial guarantees. All such revisions require approval by the DRC Chair, the User Department and agent/owner. If such approvals are obtained, these revisions to the listing will be incorporated administratively. In addition, any unforeseen items which arise during construction which are necessary to complete the project and which normally are the Subdivider's responsibility will be required as a condition of project acceptance and close out by the City.

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
FG 76/381	Constructed 76/381	6"	Water line	Jaconita	Tower Road	San Ygnacio	/	/	/
		6"	Waterline	Taos Place	Sombrillo Ave	San Ygnacio	/	/	/
		6"	waterline	Sombrillo Ave	Jaconita Place	Stinson Street	/	/	/
		4"	waterline	San Jon Court	Taos Place	Terminus	/	/	/
		10"	waterline	Stinson	Tower	San Ygnacio	/	/	/
		8"	waterline	San Ygnacio	W. Property Line	Stinson	/	/	/
		8"	waterline	Tower	2630' West of Coors (includes frontage) Tower Road	3440' West of Coors	/	/	/
		8"	Sewer Line	Jaconita		Terminus	/	/	/
		8"	Sewerline	Taos Place	Sombrillo Ave	Terminus	/	/	/
		8"	Sewerline	Sombrillo Ave	Juconita Place	Stinson Street	/	/	/

ORIGINAL

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
741381	741381	8"	Sewerline	San Jon Court	Taos Place	Terminous	/	/	/
		8"	Sewerline	Tower Road	75th St.	120' East of 75th	/	/	/
		8"	Sewerline	San Ygnacio	W. Property Line	Amole Channel	/	/	/
		24" F-F	Residential Road with Curb and Gutter including 4' wide Sidewalk (DEFERRED)	Jaconita	Tower Road	Terminous	/	/	/
		24" F-F	Residential Road with Curb and Gutter including 4' Sidewalk (DEFERRED)	Taos Place	Sombrillo Ave	Terminous	/	/	/
		24" F-F	Residential Road with Curb and Gutter including 4' Sidewalk (DEFERRED)	Sombrillo Ave	Juconita Place	Stinson Street	/	/	/
		24" F-F	Arterial Road with Curb and Gutter including 6' Sidewalk, and 6' bike lane (DEFERRED)	San Jon Court	Taos Place	Terminous	/	/	/
		30" F-F	Arterial Road with Curb and Gutter including 6' Sidewalk, both sides, 6' bike lane all water, sewer, storm drainage required	Tower road	2630' West of Coors	3440' West of Coors	/	/	/
		8"	Sanitary Sewer	Tower Road	Jaconita	Amole Del Norte	/	/	/
		24"	RCP storm drain and appurtanances	Public Drainage Eas.	Jaconita	San Ygnacio	/	/	/
		24"	RCP storm drain and appurtanances	Public Drainage Eas.	Taos Place	San Ygnacio	/	/	/
		24"	RCP storm drain and appurtanances	Tower Road	2000' West of Coors	3440' West of Coors	/	/	/
		24"	RCP storm drain and appurtanances	Stinson	San Jon Ct.	San Ygnacio	/	/	/
		NA	Approved. Letter of Map Revision required for release of SIA	Onsite	N/A	N/A	/	/	/
		NA	Drainage pond with easement and Covenant	Lot 25	N/A	N/A	/	/	/

NAME OF PLAT AND/OR SITE PLAN STINSON PARK

ORIGINAL

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To
761381	761381	24'	Temporary Paving	Stinson St.	3. Property Line	San Ygnacio
		24'	Temporary Paving	San Ygnacio	E. Property Line	Stinson St.
		24' F-E	Residential Paving, C&G	Stinson	Tower	Lt 53
		24' F-E	6' Sidewalk	San Ygnacio	W. PL	Lot 64
769181	769181	8"	Sewer Line	Amole Del Norte	San Ygnacio	Tower Rd.
		Varies	Temporary Paving	Stinson St.	Tower Rd.	Sombrilla Rd.

Private Inspector	City Inspector	City Cnst Engineer
1	1	1
1	1	1
1	1	1
1	1	1

1 Engineers Certification of Grading required for release of SIA and Financial Guarantee

2 site lighting shall be installed per DPM Standards.

3

AGENT / OWNER

David Sorle

NAME (print)

Rio Grande Engineering

FIRM

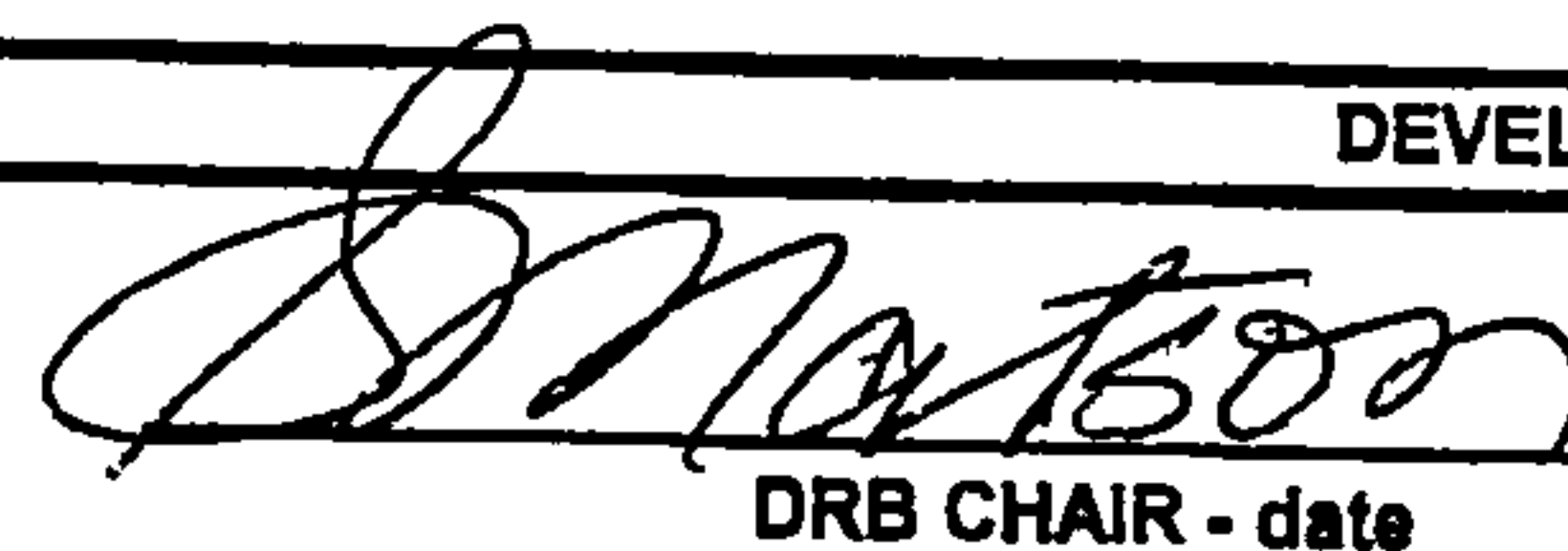
JMM 1/25/05

SIGNATURE - date

MAXIMUM TIME ALLOWED TO CONSTRUCT
THE IMPROVEMENTS WITHOUT A DRB

EXTENSION:

DEVELOPMENT REVIEW BOARD MEMBER APPROVALS



DRB CHAIR - date



TRANSPORTATION DEVELOPMENT - date



UTILITY DEVELOPMENT - date



CITY ENGINEER - date



PARKS & GENERAL SERVICES - date

AMAFCA - date

- date

- date

DESIGN REVIEW COMMITTEE REVISIONS

REVISION	DATE	DRB CHAIR	USER DEPARTMENT	AGENT / OWNER
1	2-1-06			K. Kline
2	3-6-06		Bradley L. Bingham	Dee Krueger
3	5-18-06		William G. Bales, MD, B&B	Dee D. Krueger

PAGE 3 OF 3

CITY OF ALBUQUERQUE



May 24, 2006

Ron Bohannon, PE
Tierra West LLC
8509 Jefferson St NE
Albuquerque, NM 87113

Re: Stinson Park Subdivision Drainage Report
Engineer's Stamp dated 4-11-06 (L10/D26)

Dear Mr. Bohannon,

P.O. Box 1293

Based upon the information provided in your submittal dated 4-11-06, the above referenced report is approved for Work Order and Final Plat action by the DRB. This is now the plan that must be certified for release of SIA and Financial Guarantees.

Albuquerque

This project requires a National Pollutant Discharge Elimination System (NPDES) permit. Refer to the attachment that is provided with this letter for details. If you have any questions please feel free to call the Municipal Development Department, Hydrology section at 768-3654 (Charles Caruso).

New Mexico 87103

If you have any questions, you can contact me at 924-3986.

www.cabq.gov

Sincerely,

Bradley L. Bingham, PE
Principal Engineer, Planning Dept.
Development and Building Services

C: Chuck Caruso, DMD
file

**DEVELOPMENT & BUILDING SERVICE CENTER
ONE STOP SHOP
600 SECOND ST. N.W.**

ATTENTION: MESA Reprographics
505-924-3900

Records Withdrawal Form

Project No. L-10/D26

Date: 11/9/05

Project Title: STINSON Park Sub'd

a. File

b. Mylars

c. Redlines/Comments

d. Other _____

Requested by: Marcella Jaramillo Tierra West **Phone No.:** 858-3100
Name and Company

Comments:

Anticipated Return Date: 11/10/05

I hereby accept full responsibility for the security of the above noted records/plans until return receipt acknowledgement is completed. Records/plans will be returned to the Development and Building Services Center on or before the indicated anticipated return date.

Delivery Picked Up By:

Name: Jonathan Edgar
Print

Organization: Mesa Repro

Signed: [Signature]

Date: 11-9-05
Andrew 16:26

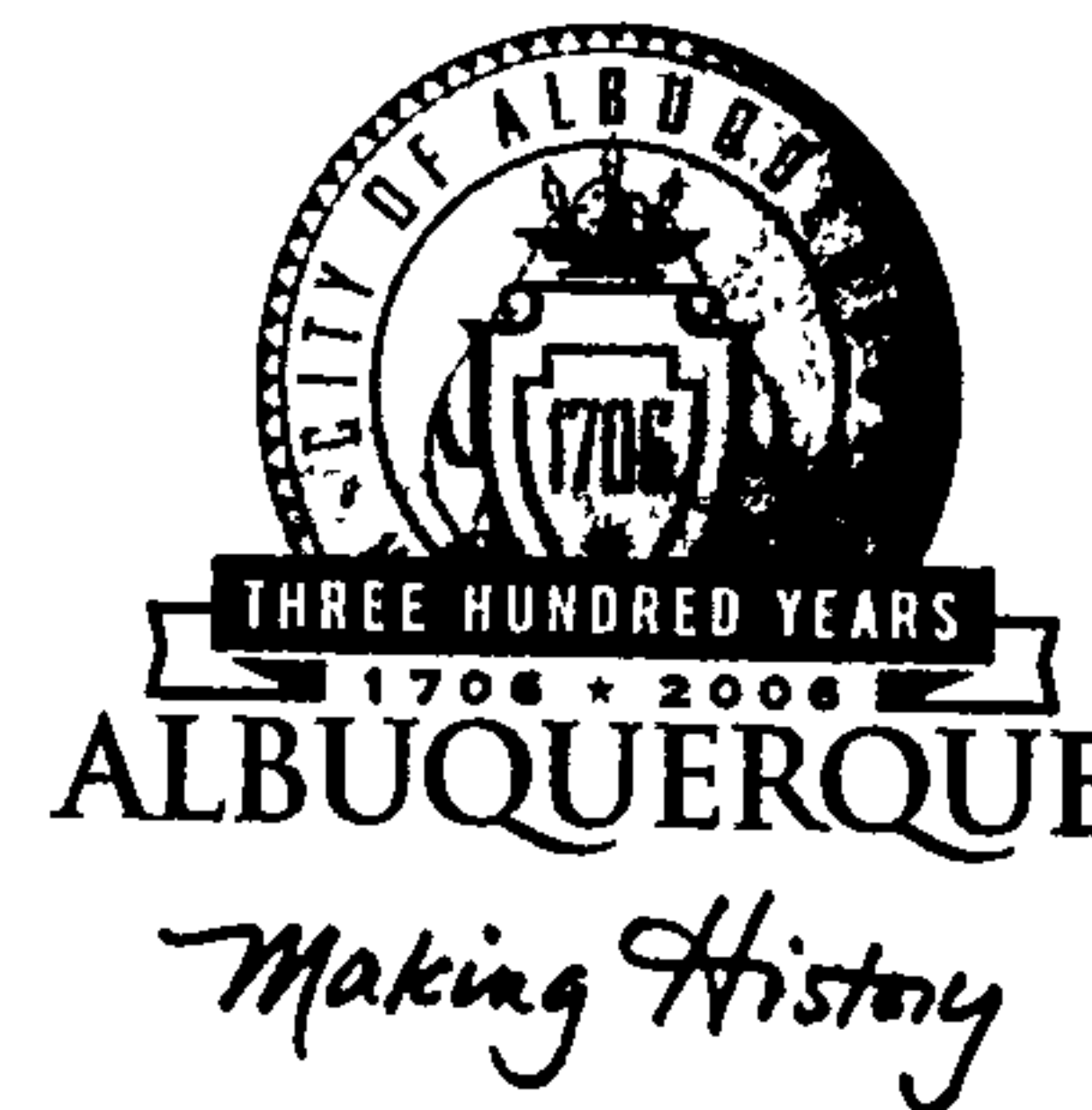
Office Use Only

Return Acknowledged:

Received By: Andrew Pauer
Print

Date: 11/10/05

CITY OF ALBUQUERQUE



January 25, 2005

David Soule, PE
Rio Grande Engineering
3500 Comanche NE, Bldg E, Ste 5
Albuquerque, NM 87107

Re: Stinson Park Subdivision Drainage Report
Engineer's Stamp dated 12-15-04 (L10/D26)

Dear Mr. Soule,

Based upon the information provided in your submittal dated 12-17-04, the above referenced report is approved for Preliminary Plat action by the DRB. Once that board has approved the plan, please provide a mylar copy for my signature in order to obtain a Rough Grading permit.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit. Refer to the attachment that is provided with this letter for details. If you have any questions please feel free to call the Municipal Development Department, Hydrology section at 768-3654 (Charles Caruso) or 768-3645 (Bryan Wolfe).

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE
Principal Engineer, Planning Dept.
Development and Building Services

C: Chuck Caruso, DMD
file

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 01/28/2003rd)

PROJECT TITLE: Stinson Park Subd
DRB #: _____ EPC #: _____

ZONE MAP/DRG. FILE #: L-10-1726
WORK ORDER #: _____

LEGAL DESCRIPTION: Tracts 414, 415 C & D, 416, Lands of Atrisco Grant unit 3
CITY ADDRESS: _____

ENGINEERING FIRM: Rio Grande Engineering
ADDRESS: 1606 Central NW Suite 201
CITY, STATE: ALBUQUERQUE, NM

CONTACT: David Soule, PE
PHONE: (505)321-9099
ZIP CODE: 87106

OWNER: Albuquerque Excavators
ADDRESS: 7201 Isleta Blvd. SW
CITY, STATE: Albuquerque, NM

CONTACT: Ed Demarry
PHONE: 489-1503
ZIP CODE: 87105

ARCHITECT: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

SURVEYOR: Terrametrics
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

CONTRACTOR: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

CHECK TYPE OF APPROVAL SOUGHT:

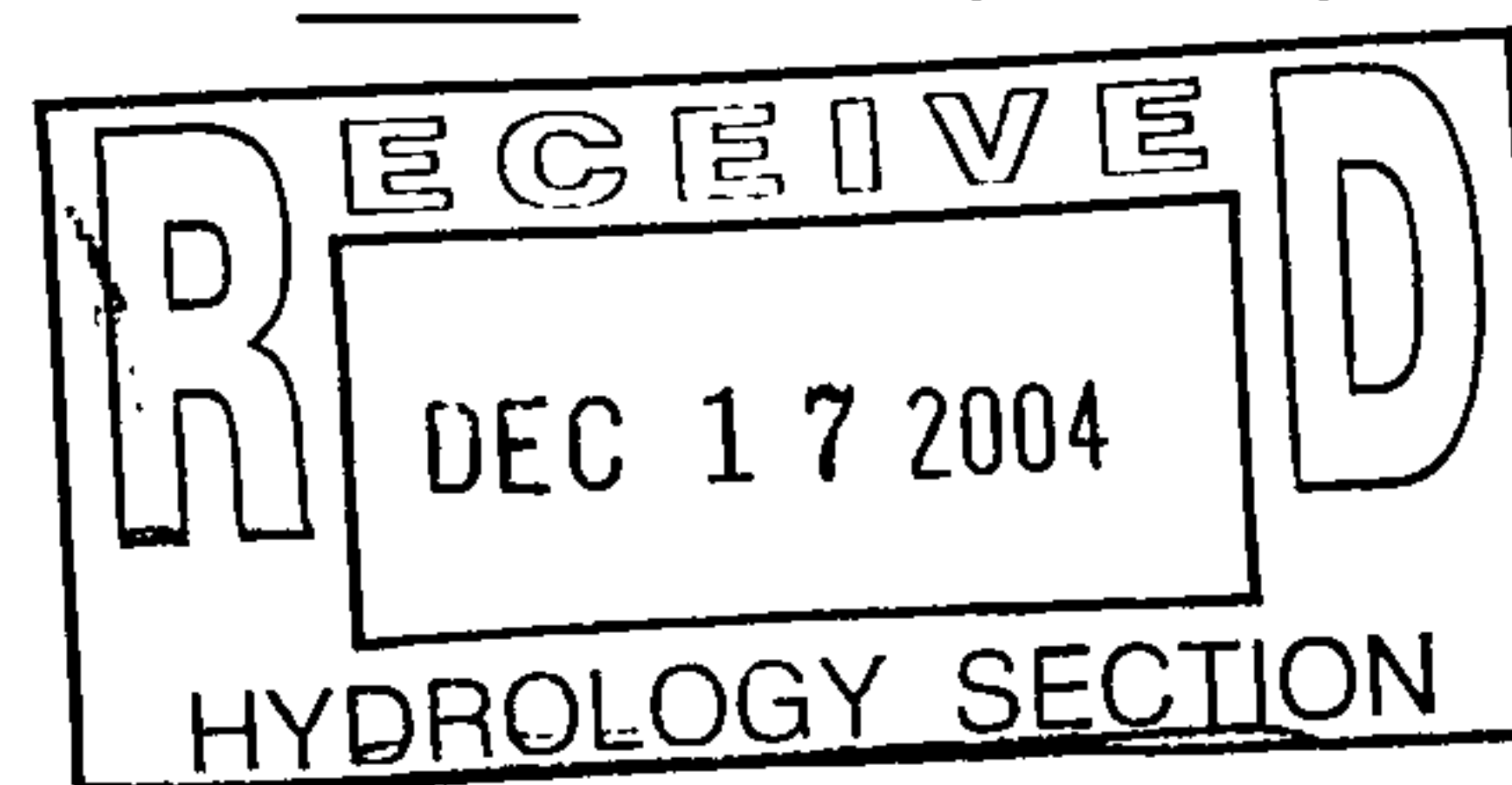
- ☒ DRAINAGE REPORT
☐ DRAINAGE PLAN 1st SUBMITTAL, *REQUIRES TCL or equal*
☐ DRAINAGE PLAN RESUBMITTAL
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☒ GRADING PLAN
☐ EROSION CONTROL PLAN
☐ ENGINEER'S CERTIFICATION (HYDROLOGY)
☐ CLOMR/LOMR
☐ TRAFFIC CIRCULATION LAYOUT (TCL)
☐ ENGINEERS CERTIFICATION (TCL)
☐ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
☐ OTHER

- ☐ 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) *Concurrence for Bern. Co*

\$950.00 \$10.00/lot
Need to pay

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☐ YES
☐ NO
☐ COPY PROVIDED



DATE SUBMITTED: 12/17/2004 BY: David Soule

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.

DRAINAGE REPORT

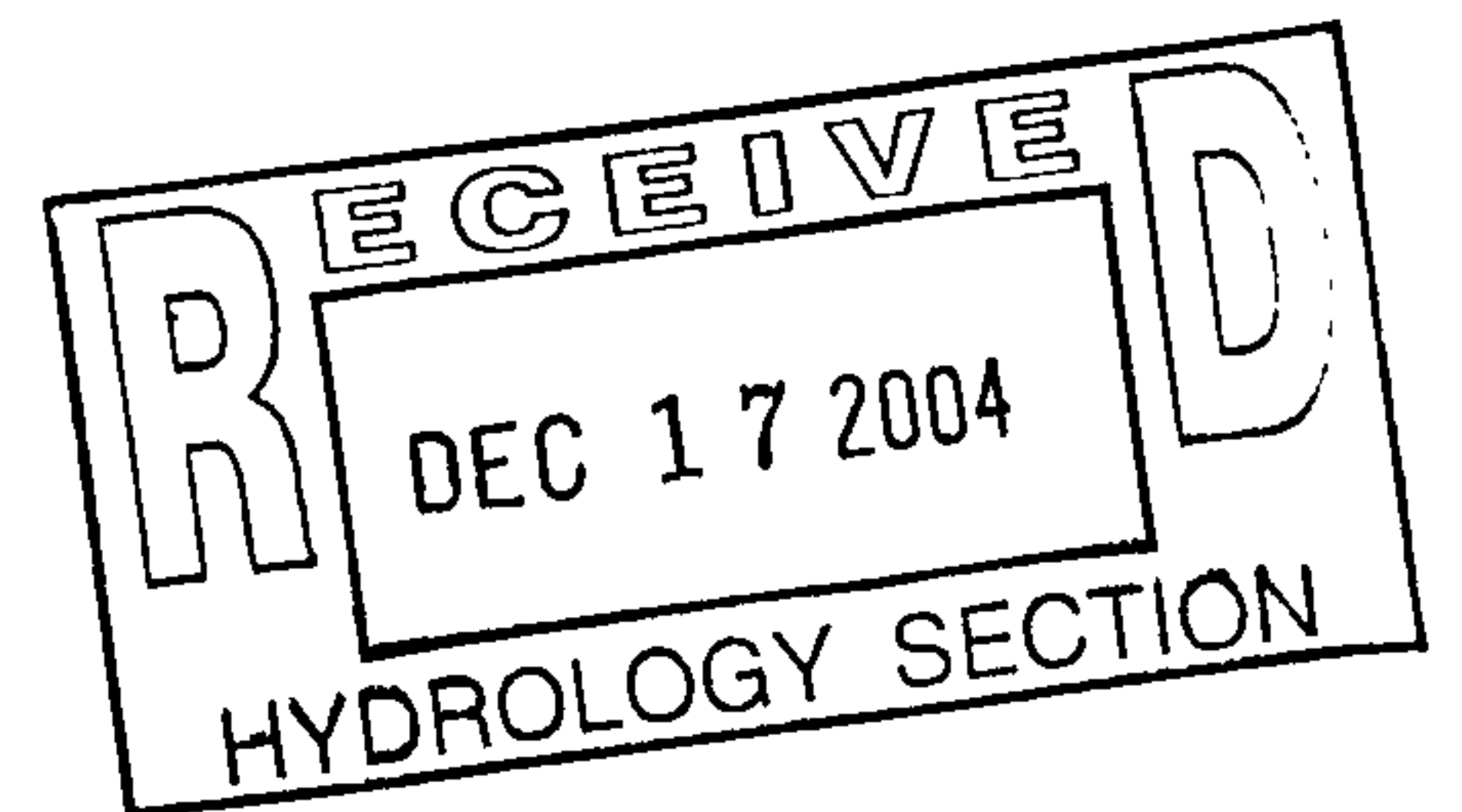
For

**STINSON PARK
SUBDIVISION
Albuquerque, New Mexico**

Prepared by

Rio Grande Engineering
3500 Comanche Blvd. NE
Albuquerque, New Mexico 87107

December 2004



David Soule P.E. No. 14522

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Introduction 3

Vicinity Map 4

Existing Conditions 5

Proposed Conditions 5

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Appendix

Site Hydrology A

Hydraulic Calculations B

Map Pocket

Drainage Basin Map A

Site Grading and Drainage Plan B

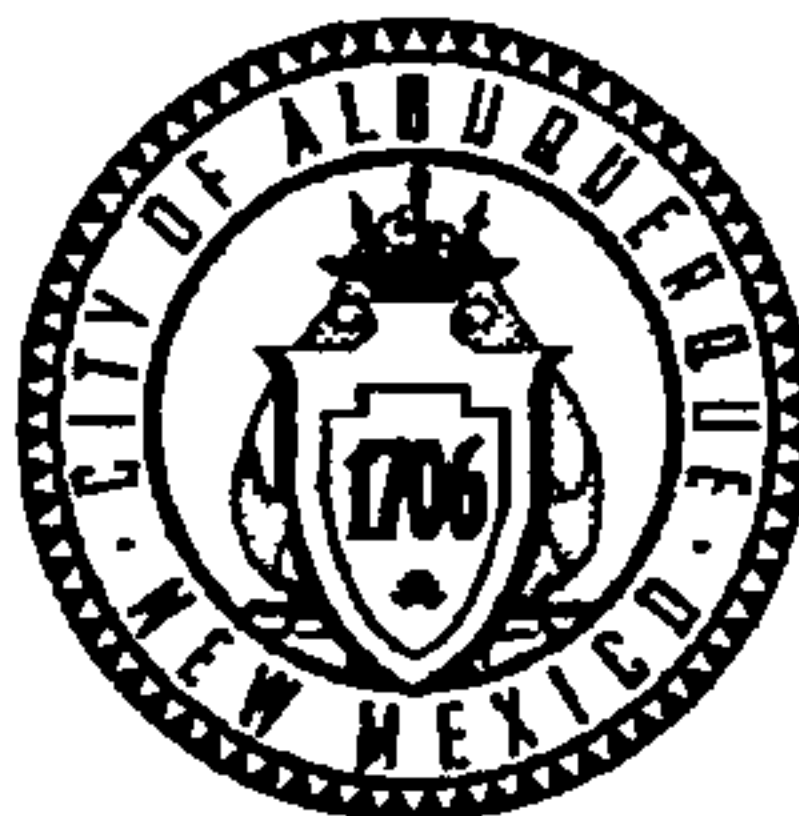
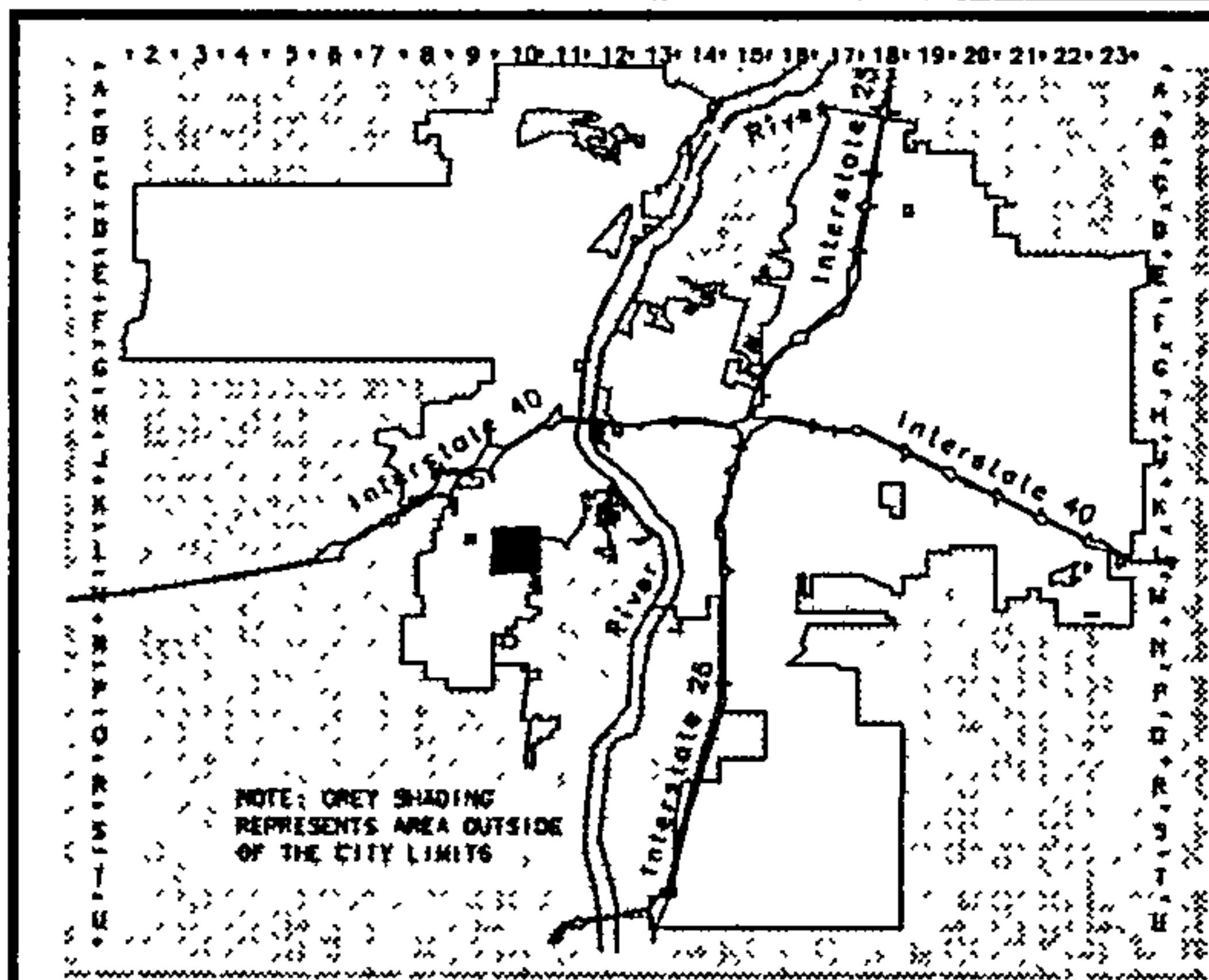
PURPOSE

The purpose of this report is to provide the Drainage Management Plan for the development of the Stinson Park Subdivision. This plan will be utilized for the development of the subject property as a 90-lot single family residential subdivision. This plan was prepared in accordance with the City of Albuquerque's Development Process Manual. This report will demonstrate that the proposed improvements do not adversely affect the surrounding properties, nor the upstream or downstream facilities.

INTRODUCTION

The subject of this report, as shown on the Exhibit A, is a 14.7-acre parcel of land located on the west side of Stinson Street between San Ygnacio Street and Tower Road. The site is located in the Southwest Mesa area of Albuquerque. The legal description of this site is Lots 414 through 416 Town of Atrisco Grant Unit 3. As shown on FIRM map 35001C0329E, the site is located entirely within Flood Zone AH. The site is currently partially developed.

The site is located within the Tower/Sage Master Drainage Plan boundaries. The development of this property will be in conformance to the Tower/Sage Master Drainage Plan. The upstream and downstream storm drainage facilities are in place within San Ygnacio Road which connect the regional detention pond constructed with SAD 222 to the Amole Channel. The existing flood zone is caused by 'low spots' and a large upland drainage basin. With the construction of this project, the 'low spots' will be filled in and the flows from the upland basin, which has been significantly restricted with recent developments, will be captured by inlets within San Ygnacio. The existing storm drain located within San Ygnacio was sized to accommodate the developed flow from this site.



GRAPHIC SCALE IN FEET



Zone Atlas Page

L-10-Z

Map Amended through February 03, 2004

Albuquerque **G**eographic **I**nformation **S**ystem
PLANNING DEPARTMENT

© Copyright 2004

EXHIBIT A

EXISTING CONDITIONS

The site is currently partially developed. The site has been denuded of native grasses; there are signs of current and previous impact from human activities, including stock piles of earthen material and burrow pits from previous adobe manufacturing. The site slopes from the northwest to the south east at a typical 2% slope. Historically the site included depressed areas that created large ponding, as evident from the existing flood zones encompassing the majority of the site. The site currently is impacted by offsite flows entering the site from the southwest. Due to the existing topography to the east, a sump condition exists for portions of this site. Recent upland improvements have reduced the upland basin, yet a recent LOMR left portions of the flood zone impacting the site. Adjacent to the site, within San Ygnacio, there is an existing storm drain. This storm drain connects the Tower Pond to the Amole del Norte Channel. The storm drainage system was constructed with SAD 222 and the system was designed to accommodate the fully developed conditions of the contributing basin of which this site is contained in.

PROPOSED CONDITIONS

The proposed improvements consist of a 90-lot single family residential lot subdivision with approximately 3000 lineal feet of 28' wide public roads. The onsite lot grading shall consist of a building pad and rear and side yard swales with typical grades of 1%. Each lot will drain directly to the adjacent roadway. The proposed roadway will consist of a 2% crowned roadway section with mountable and standard curb and gutters. As shown in Appendix A the site contains 14.7 acres. The developed storm water generation rates were calculated using the simplified procedure for 40 acre and smaller basins as shown in chapter 23-part A of the Development Process Manual. As shown in Appendix A, the total developed flow developed on the site is predicted to be 53.7 cfs. The streets storm water conveyance capacity was calculated using the Manning's Equation and an Excel spreadsheet. As shown in appendix B, the 100-year peak discharge rate will stay within the roadway, and the energy grade line will be contained within the

right of way. As shown on the grading plan the mountable curb transitions to standard prior to the capacity of the mountable curb being exceeded.

As shown in the Tower/Sage Master Drainage Study, this site is located within Basin B7-D. Therefore the site is allowed to discharge 52.9 cfs to San Ygnacio based upon the land treatment types specified. Since the site is predicted to discharge 52.5 cfs, the downstream conveyance system will not be adversely impacted.

SUMMARY AND RECOMMENDATIONS

This site is an undeveloped portion of land located within the boundaries of the Tower/Sage Master Drainage Plan. As regulated by this plan the site is allowed to discharge 52.9 cfs to the San Ygnacio right-of-way. The mainline storm drainage facilities were completed with Special Assessment District 222. The onsite developed storm water discharge will be conveyed via surface flow by each individual lot to the adjacent Roadway. The public street has capacity to convey the predicted flow. San Ygnacio and the downstream storm drainage facilities were designed to convey the developed flow leaving this site. Since this site is impacted by a flood zone, a LOMR must be completed with this development. This LOMR will be completed separate from this report. Based upon annexation requirements, the developer of this tract will be constructing Tower Road from The Amole Del Norte Channel to Unser Boulevard. The construction of this road shall include the required storm drain and utilities. This 'Tower' project will be included in a separate report.

The proposed site development does not adversely affect the upstream or downstream facilities. The site was designed in conformance to City of Albuquerque Drainage Policy. Therefore, we request approval of the site-grading plan. Since public improvements will be constructed a work order and Subdivision Improvement Agreement will be required. Since this site encompasses more than 1 acre, a NPDES permit will be required prior to any construction activity.

APPENDIX A
SITE HYDROLOGY

Weighted E Method

Existing Basins

											100-Year		
Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
			%	(acres)	%	(acres)	%	(acres)	%	(acres)			
ONSITE	640824.23	14.711	69%	10.150797	15%	2.207	6%	0.88268	10%	1.471	0.661	0.810	26.54
Total	640824.23	14.711		10.150797		2.207		0.88268		1.471		0.810	26.54

Proposed Developed Basins

											100-Year, 6-hr.			10-day
Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)
			%	(acres)	%	(acres)	%	(acres)	%	(acres)				
BASIN A	277799.54	6.377	8%	0.510192	16%	1.020	12%	0.76529	64%	4.082	1.522	0.809	22.76	1.353
BASIN B	363024.68	8.334	8%	0.666712	16%	1.333	12%	1.00007	64%	5.334	1.522	1.057	29.75	1.768
Total	640824.23	14.711		1.176904		2.353808		1.76536		9.415232		1.865883217	52.507572	3.1212475

Discharge allowed within Tower/Sage DMP

											100-Year, 6-hr.			10-day
Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)
			%	(acres)	%	(acres)	%	(acres)	%	(acres)				
Entire site	640824.23	14.711	0%	0	33%	4.855	0%	0	67%	9.857	1.541	1.889	52.93	3.203

Equations:

Weighted E = $E_a \cdot A_a + E_b \cdot A_b + E_c \cdot A_c + E_d \cdot A_d$ / (Total Area)

Volume = Weighted D * Total Area

Flow = $Q_a \cdot A_a + Q_b \cdot A_b + Q_c \cdot A_c + Q_d \cdot A_d$

Where for 100-year, 6-hour storm

Ea= 0.44	Qa= 1.29
Eb= 0.67	Qb= 2.03
Ec= 0.99	Qc= 2.87
Ed= 1.97	Qd= 4.37



**CITY OF ALBUQUERQUE
NEW MEXICO**

**AMOLE DEL NORTE
STORM DRAINAGE FACILITIES**

**TOWER/SAGE
DRAINAGE MASTER PLAN**

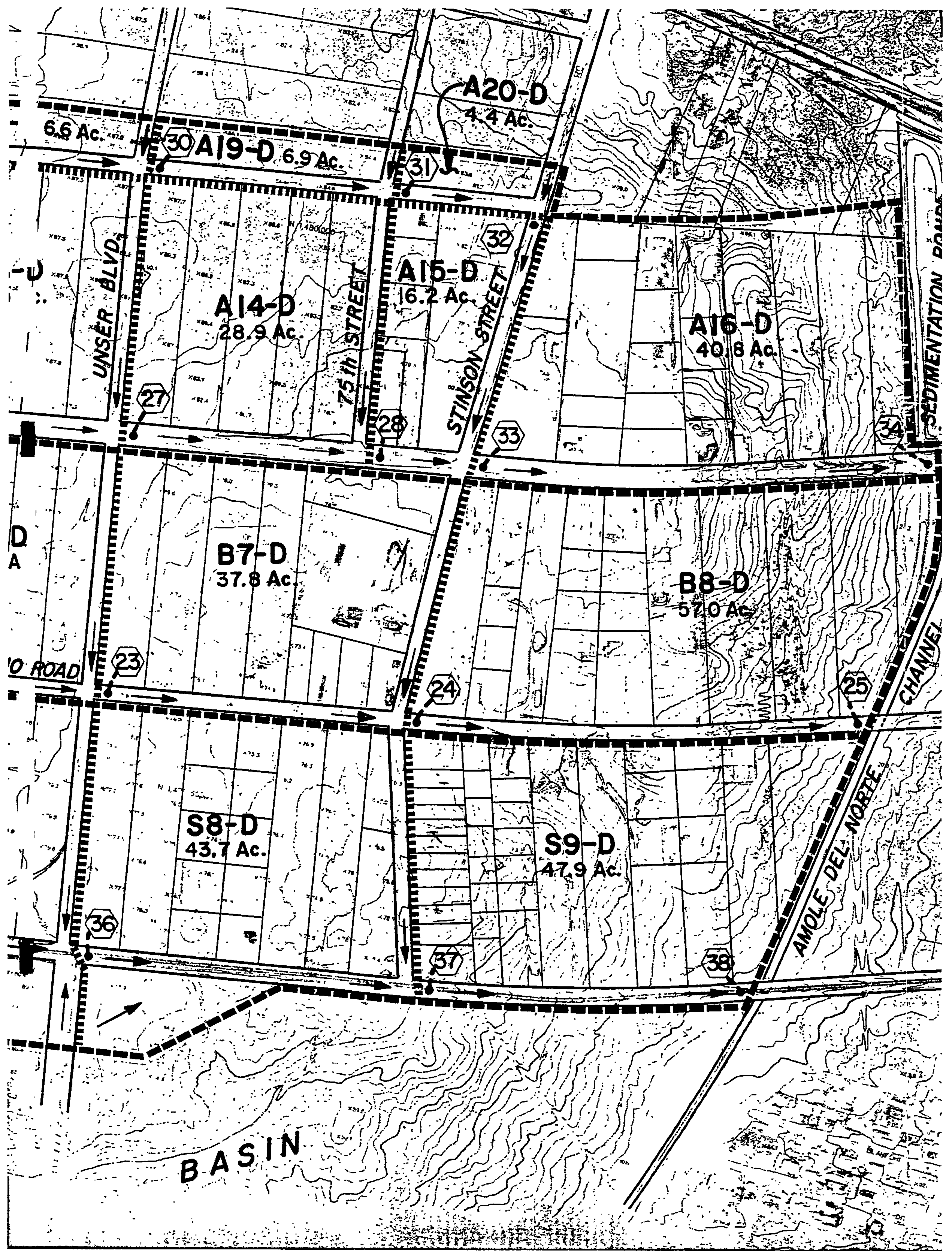
**ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
ALBUQUERQUE, NEW MEXICO**

TABLE 2
TOWER/SAGE DRAINAGE MASTER PLAN
AHYMO BASIN PARAMETER WORKSHEET
PEAK BASIN FLOWS AND VOLUMES

(ALL FLOWS & VOLUMES INCLUDE A 5% BULKING FACTOR)

														10 YEAR		100 YEAR	
BASIN	AREA		LENGTH (ft.)	ELEV. DIFF. (ft.)	SLOPE (%)	K	VEL (fps)	T(c) (hr.)	T(p) (hr.)	LAND TREATMENT (%)				PEAK FLOW (6hr.) (cfs)	RUNOFF VOLUME (24hr.) (ac.ft.)	PEAK FLOW (6hr.) (cfs)	RUNOFF VOLUME (24hr.) (ac.ft.)
	(ac.)	(sq.mi.)								A	B	C	D				
B4-D	14.7	0.0230	200	5.0	2.50	0.7	1.11	0.05	0.03								
			450	6.0	1.33	3.0	3.46	0.04	0.02								
			1050	12.0	1.14	3.0	3.21	<u>0.09</u>	<u>0.06</u>								
			TOTAL =									50		50	29	1.1	51
B5-D TOWER POND	25.0	0.0391						0.20	0.13	30	50	15	5	21	0.6	55	1.6
B6-D	29.4	0.0459	200	1.0	0.50	0.7	0.49	0.11	0.07								
			950	1.0	0.11	3.0	0.97	0.27	0.18								
			850	5.0	0.59	3.0	2.30	<u>0.10</u>	<u>0.07</u>								
			TOTAL =									35		65	41	2.8	68
B7-D	37.8	0.0591	400	3.0	0.75	1.0	0.87	0.13	0.09								
			1000	3.0	0.30	3.0	1.64	0.17	0.11								
			950	5.0	0.53	3.0	2.18	<u>0.12</u>	<u>0.08</u>								
			TOTAL =									33		67	58	3.7	97
B8-D	57.0	0.0891	200	1.0	0.50	0.7	0.49	0.11	0.07								
			1000	1.0	0.10	3.0	0.95	0.29	0.20								
			800	1.0	0.13	3.0	1.06	0.21	0.14								
			950	5.0	0.53	3.0	2.18	<u>0.12</u>	<u>0.08</u>								
			TOTAL =										50		50	49	4.4

SEE MAP NO. 2 FOR BASIN IDENTIFICATION





CITY OF ALBUQUERQUE, NEW MEXICO
AMOLE DEL NORTE STORM DRAINAGE FACILITIES
**TOWER/SAGE DRAINAGE
MASTER PLAN**
DRAINAGE AREA MAP

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS

ALBUQUERQUE

NEW MEXICO

SCALE: 1" = 500'

FILE No.
90-572

DRAWN
TL

CHECKED
DA, JA

DATE
MAR. 1995

MAP No. 2

APPENDIX B

HYDRAULIC CALCULATIONS

0.847	9.60	23.68	0.41	35.63	71.26	3.71	3.14	0.71	0.5270333
-------	------	-------	------	-------	-------	------	------	------	-----------

MAP POCKET A
DRAINAGE BASIN MAP

11
11
11
11
11

MAP POCKET B
GRADING PLAN

1

Street Capacity Calculations

JACONITA PLACE AND TAOS PLACE

28' F-F Street Section with 8" curb

Slope= 0.006

For water depths less than 0.125 feet

$Y =$ Water depth
 $Area = 8 \cdot Y^2$
 $P = \sqrt{257 \cdot Y^2} + Y$
 $n = 0.017$

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.00	0.17	0.00	0.00	0.00	0.19	0.00	0.33	0.0018848
0.02	0.00	0.34	0.01	0.00	0.00	0.30	0.01	0.38	0.0045908
0.04	0.01	0.68	0.02	0.01	0.01	0.48	0.02	0.42	0.0111278
0.06	0.03	1.02	0.03	0.02	0.04	0.63	0.04	0.45	0.0186349
0.08	0.05	1.36	0.04	0.04	0.08	0.76	0.06	0.47	0.0268376
0.1	0.08	1.70	0.05	0.07	0.14	0.88	0.09	0.49	0.0355923
0.12	0.12	2.04	0.06	0.11	0.23	1.00	0.12	0.51	0.0448091
0.125	0.13	2.13	0.06	0.13	0.26	1.02	0.13	0.51	0.0471777

For water depths greater than 0.125 ft but less than 0.365 ft

$Y1 = Y - 0.125$
 $A2 = A1 + 2 \cdot Y1 + 25 \cdot Y1^2$
 $P2 = P1 + \sqrt{2501 \cdot Y1^2} + Y1$

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.13	0.14	2.38	0.06	0.14	0.27	1.00	0.13	0.49	0.0460163
0.16	0.23	3.91	0.06	0.23	0.46	1.01	0.16	0.45	0.0486259
0.2	0.42	5.95	0.07	0.48	0.95	1.15	0.23	0.45	0.0623776
0.24	0.69	8.00	0.09	0.90	1.81	1.32	0.32	0.47	0.0806096
0.2846	1.08	10.27	0.11	1.63	3.26	1.51	0.43	0.50	0.1037171
0.32	1.47	12.08	0.12	2.43	4.87	1.66	0.53	0.52	0.1234692
0.3551	1.91	13.87	0.14	3.45	6.89	1.81	0.64	0.53	0.1440036
0.365	2.05	14.37	0.14	3.77	7.55	1.85	0.67	0.54	0.1499436

For water depths greater than 0.365 ft but less than 0.667 ft

$Y2 = Y - 0.365$
 $A3 = A2 + Y2^2 \cdot 14$
 $P3 = P2 + Y2$

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.37	2.12	14.38	0.15	3.99	7.98	1.89	0.70	0.55	0.1556607
0.4556	3.31	14.46	0.23	8.40	16.80	2.54	1.16	0.66	0.2556985
0.4848	3.72	14.49	0.26	10.18	20.37	2.74	1.33	0.69	0.2906669
0.5	3.94	14.51	0.27	11.16	22.33	2.84	1.42	0.71	0.3090234
0.54	4.50	14.55	0.31	13.91	27.82	3.09	1.67	0.74	0.357805
0.5584	4.75	14.56	0.33	15.25	30.50	3.21	1.79	0.76	0.3804643
0.63	5.76	14.64	0.39	20.91	41.83	3.63	2.29	0.81	0.4698487
0.667	6.27	14.67	0.43	24.10	48.21	3.84	2.56	0.83	0.5167338

For water depths greater than 0.667 ft but less than 0.847 ft

$Y3 = Y - 0.667$
 $A4 = A3 + 14 \cdot Y3 + 25 \cdot Y3^2$
 $P4 = P3 + \sqrt{2501 \cdot Y3^2}$

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.7	6.76	16.32	0.41	25.44	50.89	3.76	2.63	0.79	0.5090958
0.72	7.09	17.32	0.41	26.43	52.87	3.73	2.69	0.77	0.5071856
0.74	7.43	18.32	0.41	27.55	55.10	3.71	2.74	0.76	0.5069788
0.76	7.79	19.32	0.40	28.79	57.58	3.70	2.81	0.75	0.508251
0.78	8.17	20.32	0.40	30.16	60.31	3.69	2.88	0.74	0.5108175
0.8	8.58	21.32	0.40	31.64	63.29	3.69	2.95	0.73	0.5145251
0.847	9.60	23.68	0.41	35.63	71.26	3.71	3.14	0.71	0.5270333

Pipe Capacity

Pipe	D	Slope	Area	R	Q Provided	Q Required	Velocity
	(in)	(%)	(ft^2)		(cfs)	(cfs)	(ft/s)
A	24	8.91	3.14	0.5	67.71	22.76	7.24
B	24	9.88	3.14	0.5	71.30	29.75	9.47

Manning's Equation:

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

A = Area

R = D/4

S = Slope

n = 0.013

STORM DROP INLET-EFFECTIVE AREA

Double 'A'

Area at the grate:

$$\begin{aligned} L &= 88 \frac{3}{4}'' - 2(6'' \text{ ends}) - 6'' \text{ center piece} - 14(\frac{1}{2}'' \text{ middle bars}) \\ &= 63 \frac{3}{4}'' \\ &= 5.3125' \end{aligned}$$

$$\begin{aligned} W &= 25 \frac{1}{2}'' - 13(\frac{1}{2}'' \text{ middle bars}) \\ &= 19'' \\ &= 1.5833' \end{aligned}$$

$$\begin{aligned} \text{Area} &= 5.3125' \times 1.5833' \\ &= 8.41 \text{ ft}^2 \end{aligned}$$

$$\begin{aligned} \text{Effective Area} &= 8.41 - 8.41 (0.5 \text{ clogging factor}) \\ &= 4.21 \text{ ft}^2 \text{ at the grate} \end{aligned}$$

Area at the throat:

$$L = 13.50''$$

$$\begin{aligned} H &= 10 \frac{3}{4}'' - 4 \frac{1}{2}'' \\ &= 6 \frac{1}{4}'' \\ &= 0.5208' \end{aligned}$$

$$\begin{aligned} \text{Area} &= 13.50' \times 0.5208' \\ &= 7.03 \text{ ft}^2 \text{ at the throat} \end{aligned}$$

Total Area:

$$\begin{aligned} \text{Area} &= 4.21_{\text{grate}} + 7.03_{\text{throat}} \\ &= 11.24 \text{ ft}^2 \end{aligned}$$

DROP INLET CALCULATIONS

INLET	TYPE OF INLET	AREA (SF)	Q (CFS)	H (FT)	H ALLOW (FT)
A	Double 'A'	11.24	22.76	0.1769	0.67
B	DOUBLE 'A'	11.24	29.75	0.3022	0.67

ORIFICE EQUATION

$Q = CA \sqrt{2gH}$

$C = 0.6$

$g = 32.2$