

Topography by Harris Surveying, Inc., March, 1997

BENCHMARK: ACS 7-G12, located on the southwest corner of the intersection of Rio Grande Boulevard and Campbell Road, NW. Elevation: 4964.79

LEGAL DESCRIPTION
LOTS 3A-1 THROUGH 3A-9, ALVARADO GARDENS, SECTION 1, T. 10 N., R. 3 E., NMPM BERNALILLO COUNTY, NEW MEXICO

Table B Maximum impervious areas on each lot

Lot number	Impervious area (square feet)
3A-2	4000
3A-3	4400
3A-4	6910
3A-5	3960
3A-6	4140
3A-7	3540
3A-8	4550
3A-9	5360

NOTES

A Driveways and garage aprons may be surfaced with gravel or with impervious surface. Runoff estimates are based on impervious surfaces.

B House dimensions and locations as shown are general. The maximum area of the house and other impervious areas on each lot are shown on Table B. See Architectural Plans for details on house locations.

C Finished floor elevations are based on slab on grade housing. Building pad elevations as constructed (Finished Floor Elevations) may be higher than shown. Auxiliary impervious areas, such as patios, garden paths, gazebos, etc. may be placed at elevations which will be flooded during heavy precipitation, thus not decreasing the ponding capacity.

D Quantitative earthwork estimates should be based on more detailed topographic cross sections of the work area.

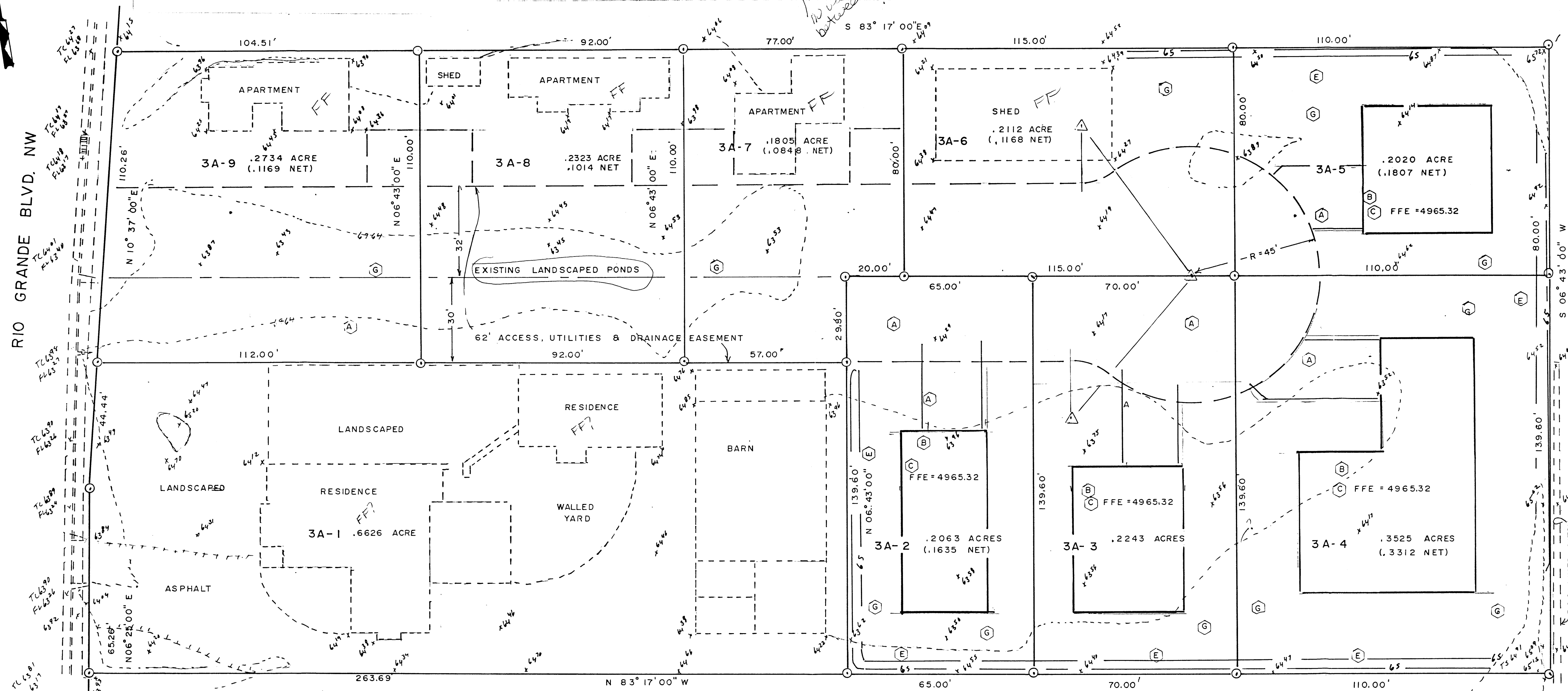
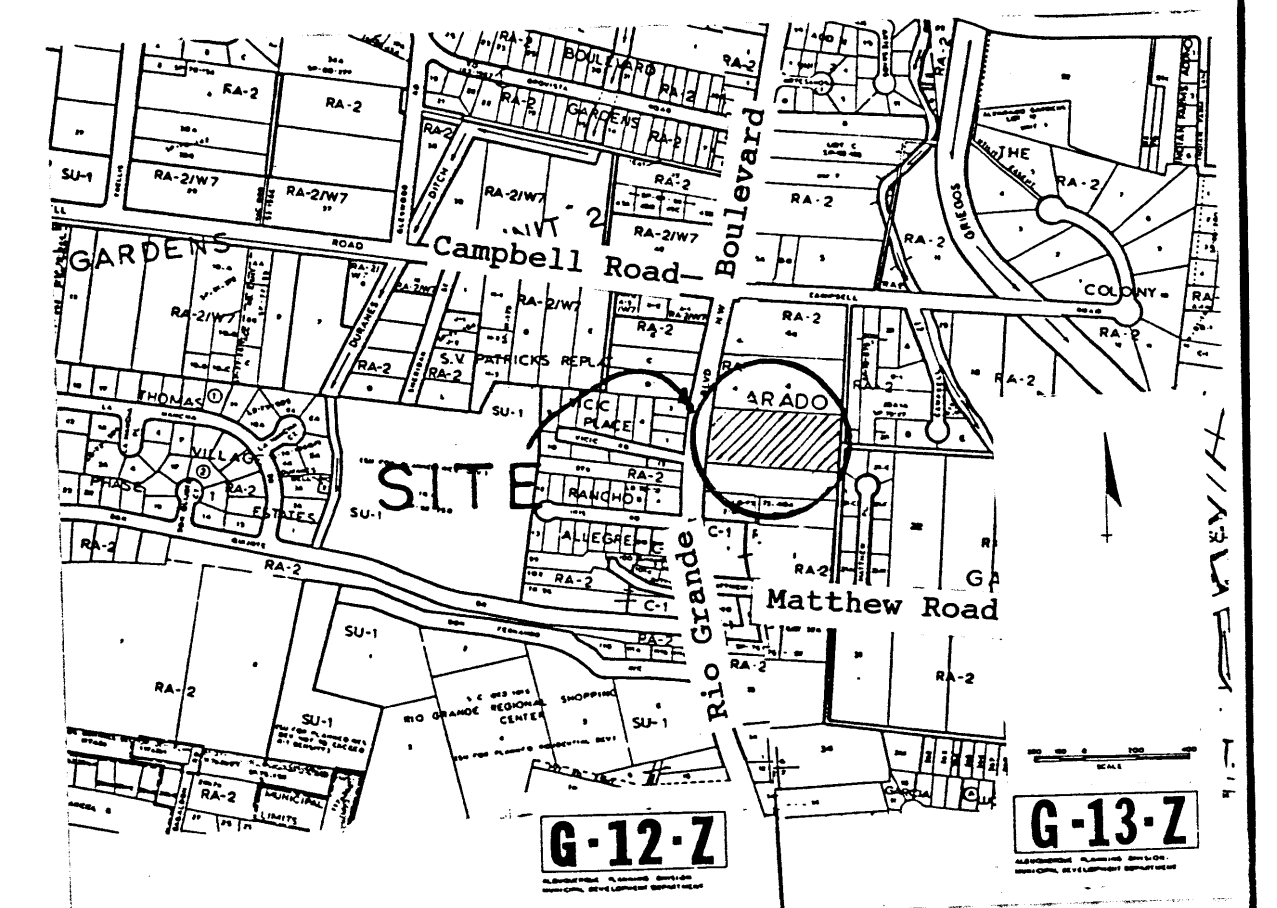
E Construct a low berm along the north, east and south subdivision property lines. Privacy fences or walls may also be constructed on the north, east, and south subdivision property lines. Fences or walls between lots within the subdivision shall not prevent cross flow runoff from the adjacent lots.

F All cut and fill slopes and constructed drainage swales are to be provided with an erosion control surface by developer/owner. Coverings may be turf, rock, terraced with garden walls or timbers or similar according to the landscape plan. Erosion control may be provided by seeding with a native grass mixture as follows:

Common name	Genius-species	Pounds/Acre
"Palma"	Oryzopsis	
Indian rice grass	Hymenoides	2.0
"Viva" Galleta grass	Hilaria Jasmessii	2.0
"Niner" Sideoates Gramma	Bouteloua curti Pedula	2.0
"Hatchita" Blue Gramma	Bouteloua Gracilis	3.0
Sand dropseed (NM Region)	Sporobolus Cryptandrus	1.0
Four-wing Saltbrush	Atriplex Canescens	1.0

The seed will be spread on loose surface soil, raked or worked into the soil about one-half inch, and a straw mulch or a mulch mat placed over the seed to prevent erosion. The seeded area is to be watered daily until a turf is established.

G Landscaped, garden or orchard area.



LEGEND	Existing	Proposed
Spot Elevation	64.25	64.25
Top of Curb	TC	TC
Flow Line Invert	FL	FL
Finished Floor Elevation	FFE	FFE
Contour Line	49.62	64
Property Line		
Lot Number		5
Structure		
Curb and Gutter		
Driveway		

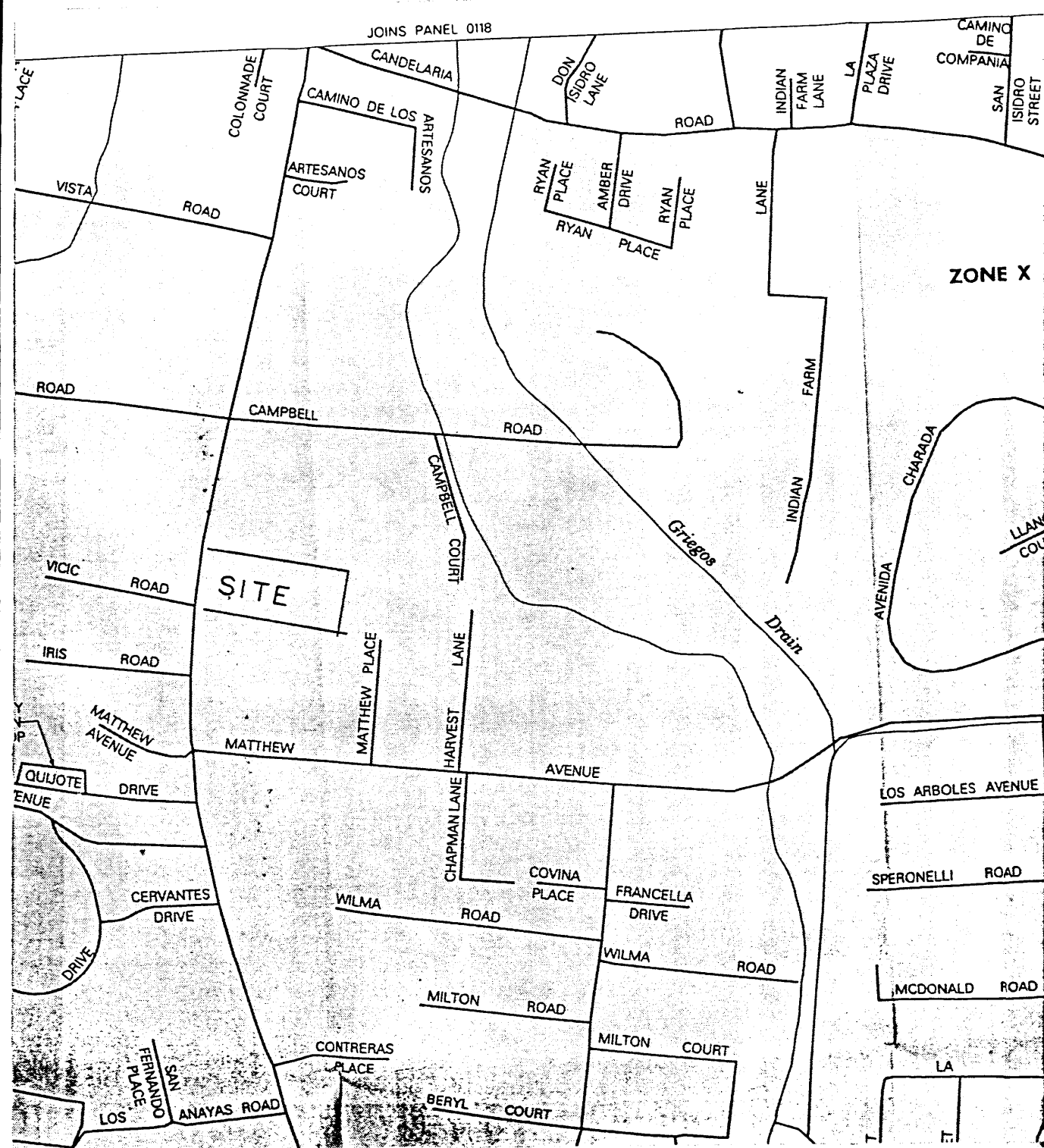
H Additional fill may be placed around the perimeter foundation wall up to a height of 8 inches below the sill plate. All fill so placed shall have a minimum slope of 5% away from the building, and a maximum slope of 1 vertical to 3 horizontal (1:3). Berms may be placed higher on walls if walls are designed with appropriate water proofing and as retaining walls. All foundation footings will be designed to permit ponding adjacent to foundations as may occur during heavy precipitation.

I All cut and fill slopes shall be 3 horizontal to 1 vertical, except that slopes no more than 3 feet in elevation difference may be 2 horizontal to 1 vertical if the surface is covered with 2" to 6" angular cobbles or other erosion protection.

J Each lot shall grant an easement for the collection and passage of runoff flows (see plat).

PRELIMINARY	M.R.K.	AUG 12, 1997
APPROVALS, CHANGES	BY	DATE
	MARVIN R. KORTUM, P.E.	
	Civil Engineering	
	NM PE 6519	
	1605 Speakman Drive, S.E.	
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GRADING AND DRAINAGE PLAN
LOTS 3A-2 TO 3A-9
ALVARADO GARDENS



NATIONAL FLOOD INSURANCE PROGRAM

FIRM FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY,
NEW MEXICO AND
INCORPORATED AREAS

PANEL 331 OF 825
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
ALBUQUERQUE CITY OF BERNALILLO COUNTY 350002 0331 0
UNINCORPORATED AREAS 350001 0331 0

MAP NUMBER
35001C0331 D
EFFECTIVE DATE:
SEPTEMBER 20, 1996

Federal Emergency Management Agency



NATIONAL FLOOD INSURANCE PROGRAM

FLOODWAY FLOOD BOUNDARY AND FLOODWAY MAP

CITY OF
ALBUQUERQUE,
NEW MEXICO
BERNALILLO COUNTY

PANEL 22 OF 50

COMMUNITY-PANEL NUMBER
350002 0022
EFFECTIVE DATE:

Federal Emergency Management Agency

RUNOFF FOR LOT 3 ALVARADO GARDENS
RIO GRANDE BOULEVARD, NW, ALBUQUERQUE, NM
AUGUST 12, 1997

TABLE A-1
Runoff Estimate: For On-site Basin of 0.6626 acres

Land use	CFS/acre	Peak	Total	CURRENT USE		PROPOSED USE	
				Area Percent	Peak Total	Area Percent	Peak Total
	inches			SF	Runoff	SF	Runoff
					CFS		CFS
1 A	1.56	0.53	28863.00	1.000	1.0 1274.8	0.00	0.000 0.0 0.0
2 B	2.28	0.78	0.00	0.000	0.0 0.0	13921.00	0.468 0.7 878.9
3 C	3.14	1.13	0.00	0.000	0.0 0.0	13900.00	0.002 0.1 141.2
4 D	4.70	2.12	0.00	0.000	0.0 0.0	13842.00	0.480 1.5 2445.4
5	1.60						1845.6
TOTALS			28863.00	1.000	1.0 1274.8	28863.00	1.000 2.3 5311.1
			0.6626 acre			0.6626 acre	

DEPTH OF 100 YEAR, 10 DAY STORM ON PERVIOUS AREA 0.35

NOTES:

- Runoff factors from Section 22.2, DPM, January, 1993
- Land use descriptions: A. Uncompacted soil
B. Lawn, shrubs
C. Compacted soil
D. Impervious areas
- Peak runoff = Area (acres) x factor (CFS/acre) = CFS
- Total runoff = Area (SF) x factor (inches/foot) = CF
- Peak and total runoff is based on 6 hour, 100 year frequency storm, lines 1-4
- Line 5: estimate additional contribution for 10 day storm, equation A-9, Section 22.2, DPM [V10 day=V360+ADK(P10 day-P360)/12]; P10 day=3.95", P360=2.35"

TABLE A-2
Runoff Estimate: For On-site Basin of 0.2063 acres

Land use	CFS/acre	Peak	Total	CURRENT USE		PROPOSED USE	
				Area Percent	Peak Total	Area Percent	Peak Total
	inches			SF	Runoff	SF	Runoff
					CFS		CFS
1 A	1.56	0.53	8987.00	1.000	0.3 386.9	0.00	0.000 0.0 0.0
2 B	2.28	0.78	0.00	0.000	0.0 0.0	4487.00	0.499 0.2 291.7
3 C	3.14	1.13	0.00	0.000	0.0 0.0	500.00	0.566 0.0 47.1
4 D	4.70	2.12	0.00	0.000	0.0 0.0	4000.00	0.445 0.4 766.7
5	1.60						533.3
TOTALS			8987.00	1.000	0.3 386.9	8987.00	1.000 0.7 1578.7
			0.2063 acre			0.2063 acre	

DEPTH OF 100 YEAR, 10 DAY STORM ON PERVIOUS AREA 0.32

TABLE A-3
Runoff Estimate: For On-site Basin of 0.2243 acres

Land use	CFS/acre	Peak	Total	CURRENT USE		PROPOSED USE	
				Area Percent	Peak Total	Area Percent	Peak Total
	inches			SF	Runoff	SF	Runoff
					CFS		CFS
1 A	1.56	0.53	9770.00	1.000	0.3 431.5	0.00	0.000 0.0 0.0
2 B	2.28	0.78	0.00	0.000	0.0 0.0	4873.50	0.499 0.3 316.8
3 C	3.14	1.13	0.00	0.000	0.0 0.0	500.00	0.566 0.0 47.1
4 D	4.70	2.12	0.00	0.000	0.0 0.0	4396.50	0.450 0.5 776.7
5	1.60						586.2
TOTALS			9770.00	1.000	0.3 431.5	9770.00	1.000 0.8 1726.8
			0.2243 acre			0.2243 acre	

DEPTH OF 100 YEAR, 10 DAY STORM ON PERVIOUS AREA 0.32

TABLE A-4
Runoff Estimate: For On-site Basin of 0.3525 acres

Land use	CFS/acre	Peak	Total	CURRENT USE		PROPOSED USE	
				Area Percent	Peak Total	Area Percent	Peak Total
	inches			SF	Runoff	SF	Runoff
					CFS		CFS
1 A	1.56	0.53	15355.00	1.000	0.5 678.2	0.00	0.000 0.0 0.0
2 B	2.28	0.78	0.00	0.000	0.0 0.0	7945.25	0.517 0.4 516.4
3 C	3.14	1.13	0.00	0.000	0.0 0.0	500.00	0.566 0.0 47.1
4 D	4.70	2.12	0.00	0.000	0.0 0.0	6909.75	0.450 0.7 1230.7
5	1.60						921.3
TOTALS			15355.00	1.000	0.5 678.2	15355.00	1.000 1.2 2705.5
			0.3525 acre			0.3525 acre	

DEPTH OF 100 YEAR, 10 DAY STORM ON PERVIOUS AREA 0.32

TABLE A-5
Runoff Estimate: For On-site Basin of 0.2020 acres

Land use	CFS/acre	Peak	Total	CURRENT USE		PROPOSED USE	
				Area Percent	Peak Total	Area Percent	Peak Total
	inches			SF	Runoff	SF	Runoff
					CFS		CFS
1 A	1.56	0.53	8799.00	1.000	0.3 388.6	0.00	0.000 0.0 0.0
2 B	2.28	0.78	0.00	0.000	0.0 0.0	4339.45	0.493 0.2 282.1
3 C	3.14	1.13	0.00	0.000	0.0 0.0	500.00	0.566 0.0 47.1
4 D	4.70	2.12	0.00	0.000	0.0 0.0	3899.55	0.450 0.4 699.5
5	1.60						527.9
TOTALS			8799.00	1.000	0.3 388.6	8799.00	1.000 0.7 1556.6
			0.2020 acre			0.2020 acre	

DEPTH OF 100 YEAR, 10 DAY STORM ON PERVIOUS AREA 0.32

TABLE A-6
Runoff Estimate: For On-site Basin of 0.2112 acres

Land use	CFS/acre	Peak	Total	CURRENT USE		PROPOSED USE	
				Area Percent	Peak Total	Area Percent	Peak Total
	inches			SF	Runoff	SF	Runoff
					CFS		CFS
1 A	1.56	0.53	9200.00	1.000	0.3 406.3	0.00	0.000 0.0 0.0
2 B	2.28	0.78	0.00	0.000	0.0 0.0	4540.00	0.496 0.2 296.4
3 C	3.14	1.13	0.00	0.000	0.0 0.0	500.00	0.566 0.0 47.1
4 D	4.70	2.12	0.00	0.000	0.0 0.0	4140.00	0.450 0.4 731.4
5	1.60						552.0
TOTALS			9200.00	1.000	0.3 406.3	9200.00	1.000 0.7 1626.9
			0.2112 acre			0.2112 acre	

DEPTH OF 100 YEAR, 10 DAY STORM ON PERVIOUS AREA 0.32

TABLE A-7
Runoff Estimate: For On-site Basin of 0.1805 acres

Land use	CFS/acre	Peak	Total	CURRENT USE		PROPOSED USE	
				Area Percent	Peak Total	Area Percent	Peak Total
	inches			SF	Runoff	SF	Runoff
					CFS		CFS
1 A	1.56	0.53	7862.00	1.000	0.3 347.2	0.00	0.000 0.0 0.0
2 B	2.28	0.78	0.00	0.000	0.0 0.0	3824.10	0.486 0.2 248.6
3 C	3.14	1.13	0.00	0.000	0.0 0.0	500.00	0.566 0.0 47.1
4 D	4.70	2.12	0.00	0.000	0.0 0.0	3537.90	0.450 0.4 625.0
5	1.60						471.7
TOTALS			7862.00	1.000	0.3 347.2	7862.00	1.000 0.6 1392.4
			0.1805 acre			0.1805 acre	

DEPTH OF 100 YEAR, 10 DAY STORM ON PERVIOUS AREA 0.32

TABLE A-8
Runoff Estimate: For On-site Basin of 0.2323 acres

Land use	CFS/acre	Peak	Total	CURRENT USE		PROPOSED USE	
				Area Percent	Peak Total	Area Percent	Peak Total
	inches			SF	Runoff	SF	Runoff
					CFS		CFS
1 A	1.56	0.53	10119.00	1.000	0.4 446.9	0.00	0.000 0.0 0.0
2 B	2.28	0.78	0.00	0.000	0.0 0.0	5065.45	0.501 0.3 329.3
3 C	3.14	1.13	0.00	0.000	0.0 0.0	500.00	0.566 0.0 47.1
4 D	4.70	2.12	0.00	0.000	0.0 0.0	4553.55	0.450 0.5 804.8
5	1.60						607.1
TOTALS			10119.00	1.000	0.4 446.9	10119.00	1.000 0.8 1787.9
			0.2323 acre			0.2323 acre	

DEPTH OF 100 YEAR, 10 DAY STORM ON PERVIOUS AREA 0.32

TABLE A-9
Runoff Estimate: For On-site Basin of 0.2734 acres

Land use	CFS/acre	Peak	Total	CURRENT USE		PROPOSED USE	
				Area Percent	Peak Total	Area Percent	Peak Total
	inches			SF	Runoff	SF	Runoff
					CFS		CFS
1 A	1.56	0.53	11909.00	1.000	0.4 526.0	0.00	0.000 0.0 0.0
2 B	2.28	0.78	0.00	0.000	0.0 0.0	6049.95	0.508 0.3 393.2
3 C	3.14	1.13	0.00	0.000	0.0 0.0	500.00	0.566 0.0 47.1
4 D	4.70	2.12	0.00	0.000	0.0 0.0	5359.05	0.450 0.6 946.8
5	1.60						714.5
TOTALS			11909.00	1.000	0.4 526.0	11909.00	1.000 0.9 2101.6
			0.2734 acre			0.2734 acre	

DEPTH OF 100 YEAR, 10 DAY STORM ON PERVIOUS AREA 0.32

PURPOSE:

The purpose of this grading and drainage plan is to obtain approval for a subdivision for residential houses on Lots 3A-2 through 3A-9. Lot 3A-1 presently contains a commercial residence (Zoned SU-1, special use for a bed and breakfast), and additions or changes to established drainage patterns on lot 3A-1 are not proposed. Lot 3A-1 presently has a driveway access to Rio Grande Boulevard which is the location where most lot runoff leaves lot 3A-1.

DISCUSSION:

A. The site of the proposed 2.5473 acre subdivision (8 lots and lot 3A-1) is within the historic floodplain of the Rio Grande. Past use of the land has been as an residence with barns and sheds for agriculture and livestock. Recent use has included the placing of small apartment buildings on a portion of the tract, and conversion of the main houses into a bed and breakfast. The sheds and barns remain as usable buildings. The west side of the site is bordered by the Rio Grande Boulevard, a paved street with curbs and gutters. The east side is partially bordered by a local irrigation ditch, and a field that is leveled to permit flood irrigation of the field, presently planted with a hay crop. The area north of the property is partially developed with old residential buildings and unused vacant property. The south side has one substantial residential building adjacent to Rio Grande Boulevard, and the remainder of the lot to the south is undeveloped.

B. The site is located along the east side of Rio Grande Boulevard. Surface flow within the paved street surface runs from north to south on Rio Grande Boulevard. The crown of Rio Grande Boulevard provides a diversion for low flows from crossing west to east within the Rio Grande Boulevard right-of-way. Flows along the east side of Rio Grande Boulevard are also collected in a subsurface storm drain system, the storm drain being of relatively small capacity, a 24" pipe. Runoff along Rio Grande Boulevard does not appear to be a hazard to the site for runoff equal to the 100 year storm. The surrounding properties to the north, east and south are vacant or partially developed with residential single family residences, and irrigated fields. All adjacent lands are at the same general elevation as the lots 3A-1 through 3A-9, so significant runoff from these lots is not anticipated. There are also fence and property line berms along the common property lines, remnants of the past use of these lands as irrigated fields. These berms serve to limit runoff from crossing the lot lines. Presently outflow from the site will be generally west, with the flow entering the Rio Grande right-of-way over the existing driveway.

C. The subdivision site is located within Zone B of the Flood Insurance Rate Map (Reference D), which is that area between limits of the 100-year and 500-year flood, or certain areas subject to 100-year flooding with average depths less than one (1) foot, or where the contributing area is less than one square mile, or areas protected by levees from the base flood. In the event of a catastrophic flood, the houses within the proposed subdivision are protected up to a water elevation of about 4965.3.

D. From the above descriptions, it is concluded that there is little danger of large uncontrolled flows into the subdivision area for storms of the 100 year storm magnitude.

E. The proposed development of the subdivision will entail very little change to the surface. Development will generally follow guidelines established by the City of Albuquerque for a flat grading scheme, which are:

- The site must be flat, or can be graded flat,
- No existing off-site flows enter the site,
- The maximum pad size may not be greater than 45% of the lot size, or the sum of all impervious area contributing to the lot (including the street and sidewalk) is not greater than 45% of the contributing area,
- Pad elevation to be one foot above the 100 year 10 day flood elevation,
- The flow between the front yard and the back yard cannot be obstructed,
- A perimeter wall is required to contain the 100 year developed flow,
- The high point of the street would be 4-6 inches above the 100 year 10 day storm water surface elevation.

Tables A-2 through A-9 show the effect of runoff for the 100 year, 10 day storm on the subdivision, with a maximum of 45% of the area with buildings or other impervious areas. The results of the runoff estimates show that the water level would be .32 feet above the ground surface. The present surface is 4964 plus or minus about .4 feet. The existing top of curb elevation at the driveway is about 4964. With no change in grading, the 100 year 10 day storm runoff will be partially retained, with the excess overflowing into the right-of-way of Rio Grande Boulevard. The new house finished floor elevations will be raised to be 1.32 feet or more above the elevation of the driveway overflow, to an elevation of 4965.32 or higher. The existing apartment buildings will remain at their present elevation until such time that they are removed and replaced. There will be no major regrading on each lot. The berms along the perimeter of the subdivision will be improved to provide a full one foot of elevation difference from the average existing surface (4964) to the top of the berm, with the top of the berm at a minimum elevation of 4965.00. The berms will only be required along the presently vacant lots because the existing buildings provide a barrier on the developed lots. Future removal of the existing buildings may necessitate the placing of additional berms. The berm is recommended in place of the wall suggested by the City of Albuquerque scheme as the berms have been used for the past 100 or so years during the period the area was used for agriculture. The low density of the housing will leave room for the berms which will fit into the rural landscaping scheme. Grading as proposed will not alter downstream flow basins.

F. There is no change in grading required or proposed for the buildings and improvements on lot 3A-1. Runoff from this lot will continue to flow into the Rio Grande right-of-way when on-site landscaping and flat grading scheme capabilities are exceeded.

SOILS:

Soils on the subdivision are identified by reference C as Gila clay loam (Ge). The soils are suited for residential buildings and associated infrastructure. The soils have moderate to low strength for streets, so imported material may be required for streets and driveways. Soils may be susceptible to consolidation, particularly when wetted, so care must be taken to direct runoff and landscape watering away from building foundations. The