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State of New Mexico

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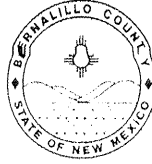
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2400 BROADWAY, S.E.
ALBUQUERQUE, NEW MEXICO 87102
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February 28, 1997

Marvin R. Kortum, P.E.
1605 Speakman Drive SE
Albuquerque, New Mexico 87123

**RE: Engineer's Certification For Lot 201A Big Horn Ridge Dr., Sandia Heights South,
Unit 2, (C23/D49)(PWD 95-107), Engineer's Stamp Dated 2/20/97.**

Dear Mr. Kortum:

Based on the information provided in the submittal of February 25, 1997, the above referenced Engineer's Certification is adequate for Certificate of Occupancy release.

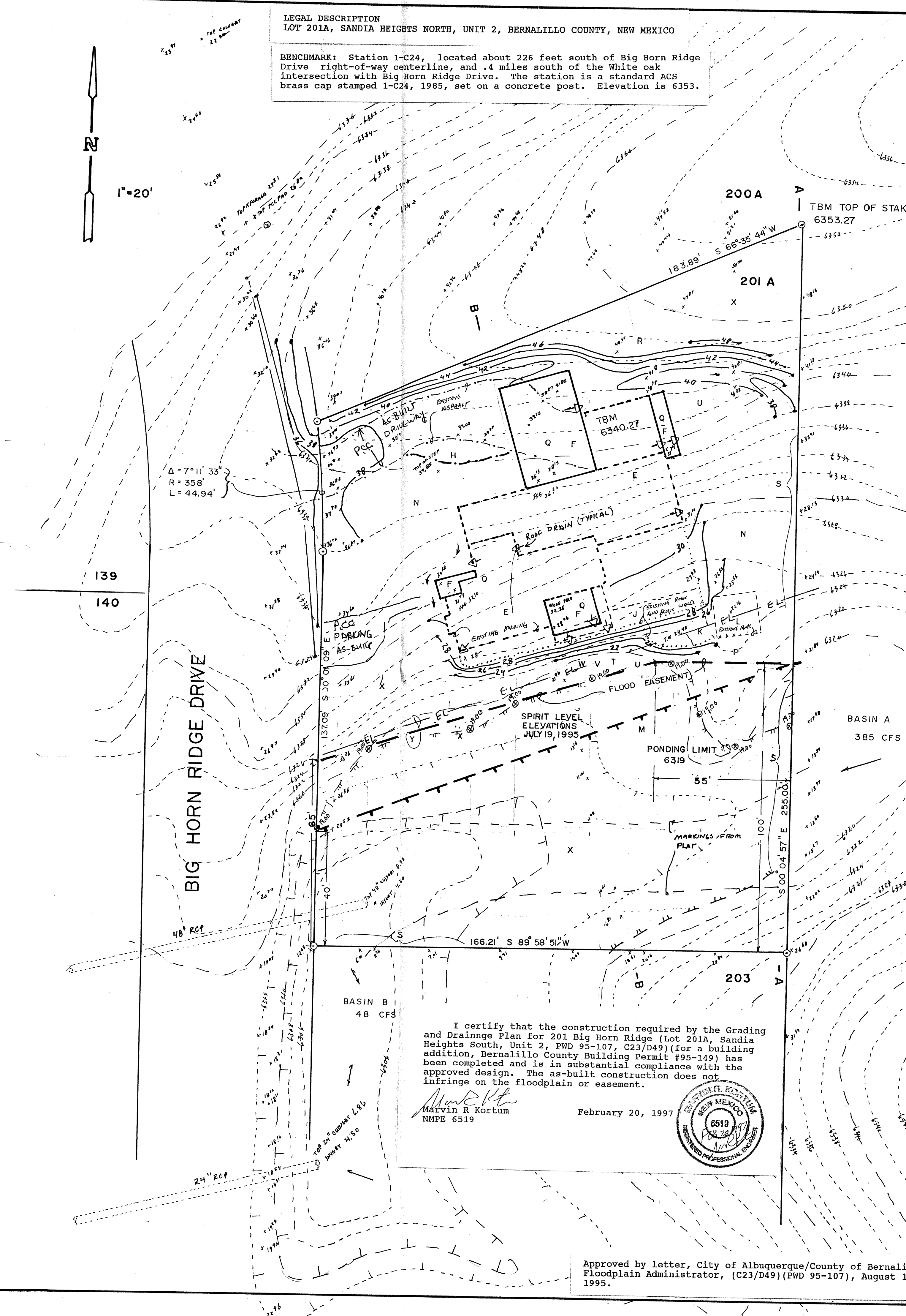
If you should have any questions, or if I may be of further assistance to you, please do not hesitate to call me at 924-3982.

Sincerely,

A handwritten signature in cursive script, reading "Susan Calongne".

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Roger Paul, County Public Works
Kurt Browning, AMAFCA
File



LEGAL DESCRIPTION
LOT 201A, SANDIA HEIGHTS NORTH, UNIT 2, BERNALILLO COUNTY, NEW MEXICO

BENCHMARK: Station 1-C24, located about 226 feet south of Big Horn Ridge Drive right-of-way centerline, and 4 miles south of the White Oak intersection with Big Horn Ridge Drive. The station is a standard ACS brass cap stamped 1-C24, 1985, set on a concrete post. Elevation is 6353.

I certify that I have personally inspected the Lot 201A, Sandia Heights South, Unit 2, site and the surrounding terrain. The representation of the land and the contours are as presented on these drawings and the accompanying text as of June 1995.

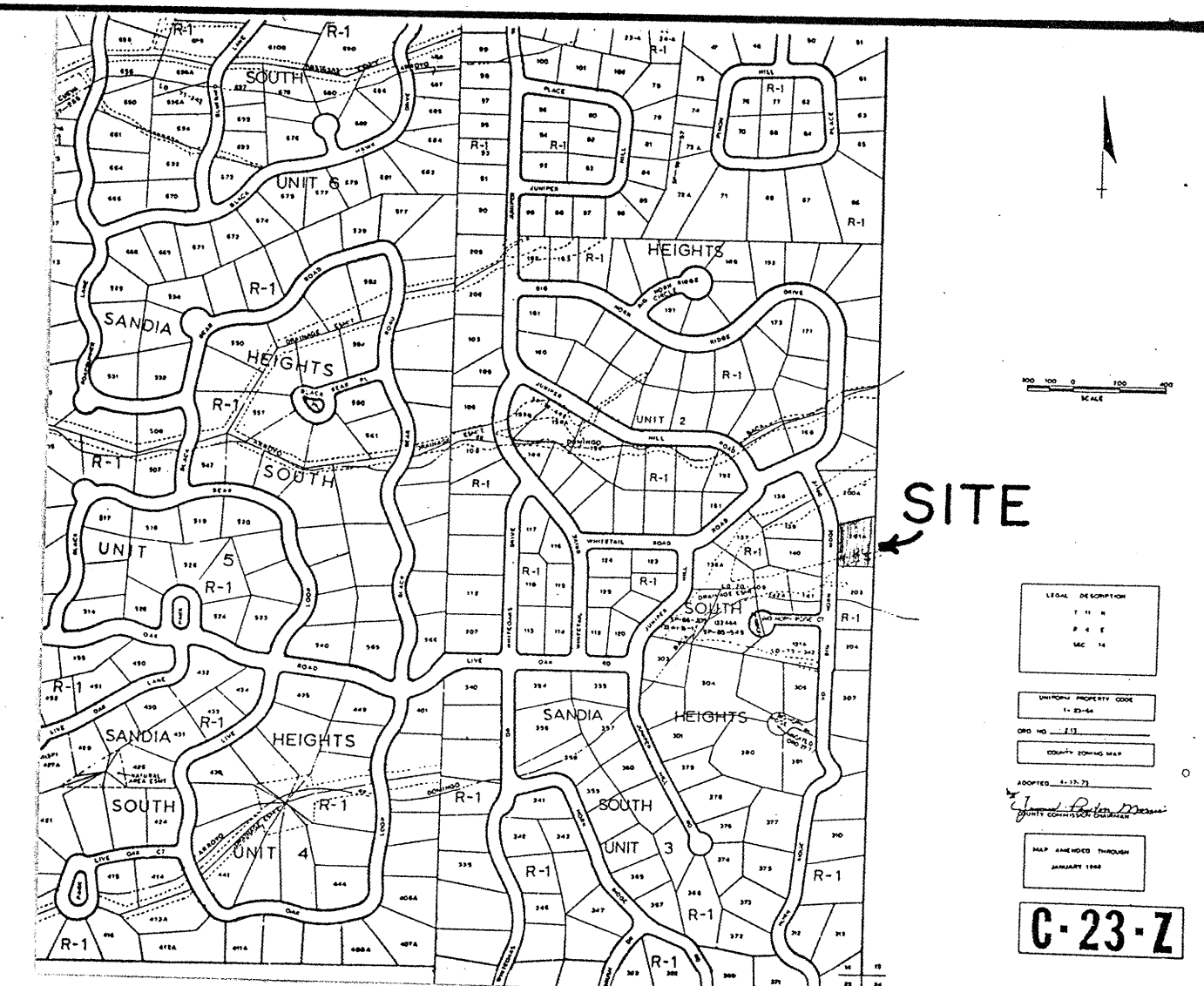
Marvin R Kortum *M. Kortum* June 7 1995
Spirit Level Topography by Marvin R Kortum

- NOTES
- A. Items marked existing are as found on-site in June 1995. Items marked proposed are additions proposed for construction after June 1995.
 - B. Existing topography ---6342--- is topography copied from reference H. The aerial photography was made prior to any building development, but after some earthwork on the roads.
 - C. Proposed grading ---42--- includes that which has been done for existing structures, as well as that required for the proposed construction.
 - D. Differences in elevations on undisturbed areas between the spirit elevations and the aerial photography are due to differences in registration of the topographic data.
 - E. Existing buildings to remain.
 - F. Proposed building additions.
 - G. Existing asphalt surface to remain.
 - H. Additional asphalt surface to be placed.
 - J. Existing patio and ground surface to remain.
 - K. Existing garden terrace to remain.
 - L. Existing portland cement concrete tank (16" deep) to remain.
 - M. 100 year flood plan boundary and proposed drainage easement, as required.
 - N. Landscaped, garden or orchard area.
 - P. General location of septic tank drain field. Size and depth as required by County of Bernalillo permit.
 - Q. For detailed house dimensions see architectural drawings.
 - R. Quantitative earthwork estimates should be based on more detailed topographic cross sections of the work area.
 - S. No solid walls or other structures, berms or swales shall be constructed on the lot property lines which will obstruct cross flow of sheet flow runoff from the adjacent property to the east. Buildings and partial yard fencing and walls as shown on this plan are permitted. Future buildings, landscaping, or other treatment interior to the lot must provide for cross flow of runoff from adjacent property.
 - T. All berms and earthwork supporting structures must be compacted to 95% of maximum dry density (Modified Proctor Test).
 - U. 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 is for protection and ease of maintenance. To prevent damage to downstream property, erosion control must be placed within six months of completion of the building, or one year from the issuing of the building permit. Erosion control may be provided by seeding with a native grass mixture as follows:
- | Common name | Genus-species | Pounds/Acre |
|---------------------------|------------------------|-------------|
| "Palma" | Oryzopsis | |
| Indian rice grass | Hymenoides | 2.0 |
| "Viva" Galileia grass | Hilaria Jasmessii | 2.0 |
| "Miner" 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.
- V. Additional fill may be placed around the perimeter foundation wall. All wall materials below the finished exterior grade shall be approved for direct contact with the earth. All fill so placed shall have a minimum slope of 5% away from the building.
 - W. Footings for foundation walls may be stepped. See architectural drawings for details on footings.
 - X. Undisturbed area.
 - Y. Erosion limit for 100 year flood plain based on 385 CFS peak flow for a 6 hour storm (reference E).

PURPOSE: The purpose of this grading and drainage plan is to obtain approval for a building permit for an addition to a residential house on lot 201A.

SOILS: Soils on lot are 30 identified by reference C as Tesajo-Millet sandy loams. The Millet soil is on ridges of alluvial fans. The Tesajo soil is in swales adjacent to and parallel to the intermittent streams and is subject to flooding. Included in this mapping unit are arroyo channels and Rock outcrop, which makes up about 20 percent of the unit. About 20 percent of the surface is covered with granite stones and boulders 1 foot to 15 feet in diameter. On all soils, runoff is medium and the hazard of water erosion is moderate. The soil is suited for residential buildings and septic drain fields, except where flooding may occur. Soils may be taken to direct runoff and landscape watering away from building foundations.

DISCUSSION: A. The proposed construction is to be located on an existing natural ridge adjacent to and north of a tributary to the South Domingo de Baca Arroyo (SDB arroyo). The .836 acre site (lot 201A) is to be developed with a single family residence. The increase in runoff due to the development is shown in Table A. The runoff after development will follow the same flow pattern that presently exists, with all of the runoff flowing into the SDB tributary arroyo and 100 year floodplain that crosses the south portion of the lot. Some of the runoff will flow out the driveway, then along the street, then flowing then along the arroyo. No flows from the development are directed to other drainage basins, nor are any increased flows a hazard to downstream property.



B. The lot is partially within the flood plain of the South Domingo de Baca Arroyo. The floodway insurance map shows a zone AO for the adjacent floodplain, with a depth of 1 foot. Due to the present road embankment and the 24" and 48" culverts which cross through the embankment, a possibility exists for a greater depth of flooding if the culverts were to clog. On sheet 2, the cross section of the embankment shows that overflow would start over the road at an elevation of about 6318.2. At an elevation of one foot, the width of the overflow would be greater than 100 feet, with a capacity that greatly exceeds the storm runoff. A maximum depth of ponding would be about 12 feet, to an elevation of 6319. The lowest natural elevation around the house is about 6324, and lowest elevation of the building pad is 6328. Ponding within the entrapment area will not be a hazard to the existing or proposed structures.

C. The floodplain and drainage basin as presently exists shows little change from the shown on the 1973 aerial topography. The drainage basins are shown on sheet 2, and consist of basin A, 95 acres, with the channel crossing the south part of lot 201A, and basin B, 12 acres, from which the runoff will feed into the same pond as basin A.

D. The estimated flow in the SDB tributary arroyo is obtained from reference D as follows:

- 1. For adjacent drainage basins on the North Domingo de Baca Arroyo, unit runoff of between 1136 (for NB 14) to 2586 (for NB15) CFS/square mile (SM) are estimated. Using the largest of these factors on basins A and B results in the following:

Basin A: 95 acres/640 acres/SM x 2586 = 385 CFS.
Basin B: 12 acres/640 acres/SM x 2586 = 48 CFS

E. From the above references, it is concluded that the runoff flow due to the 100 year hour storm is less than 400 CFS.

F. Reference F states that an erosion limit of 6 feet per 100 CFS, or an alternative erosion protection be provided. The 24 feet of erosion limit would not impinge on proposed structures. If necessary, the erosion limit can be reduced, based on the following observations:

- 1. The floodplain in this vicinity is poorly mapped. The floodplain depth is designated as 1 foot, but the map is outlined to a depth of about 5 feet.
- 2. The flood plain mapping does not exclude the boulder and earth mound that projects into the channel in the vicinity of the tank.
- 3. Erosion is severely limited by the natural armoring of the channel which occurs due to the presence of very large boulders and stones.
- 4. Channel flow is limited to the capacity of the culverts downstream, about 125 CFS. Greater flows will result in detention, and a stilling of the velocity of flow, at least until such time that the road embankment washes away, which is a remote event.

CONCLUSIONS:

- A. The proposed construction is not within a designated 100 year floodplain.
- B. Construction as proposed will not increase the hazard from flooding to downstream properties.
- C. The proposed grading and construction will protect the property from reasonable changes in the flood plain as designated on the current floodway map.
- D. This Grading and Drainage Plan does not propose changes to the FLOODWAY or FIRM maps.

REVISIONS: PRELIMINARY APPROVALS, REVISIONS

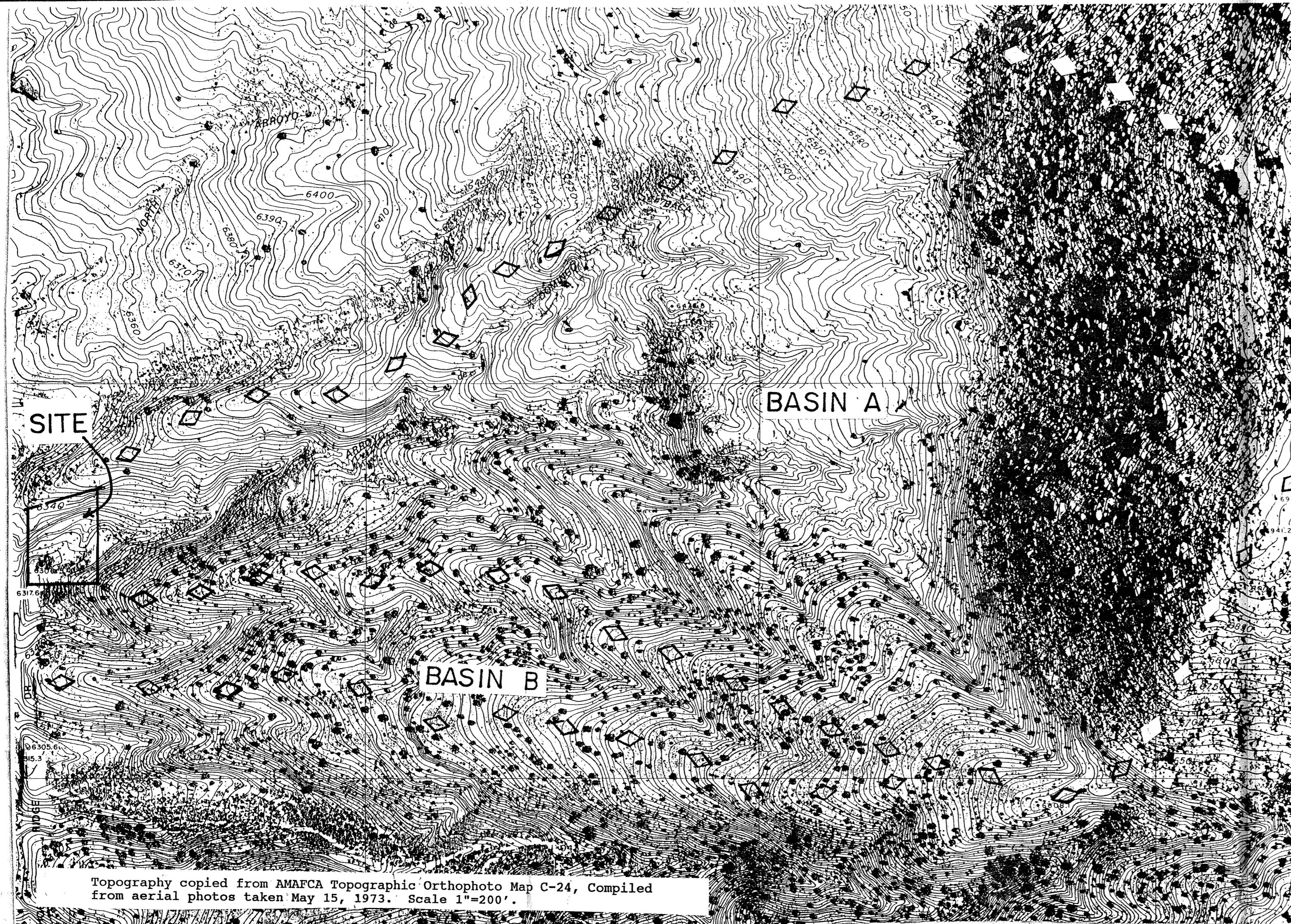
REVISION	DATE	BY
1	JULY 19 1995	MRK
2	JUN 27 1995	MRK
3	JUN 7 1995	BY

CERTIFICATION Feb 20 1997

MARVIN R. KORTUM, P.E.
Civil Engineering
NM PE 6519

1805 Speakman Drive, S.E.
Albuquerque, New Mexico 87123
(505) 299-0774

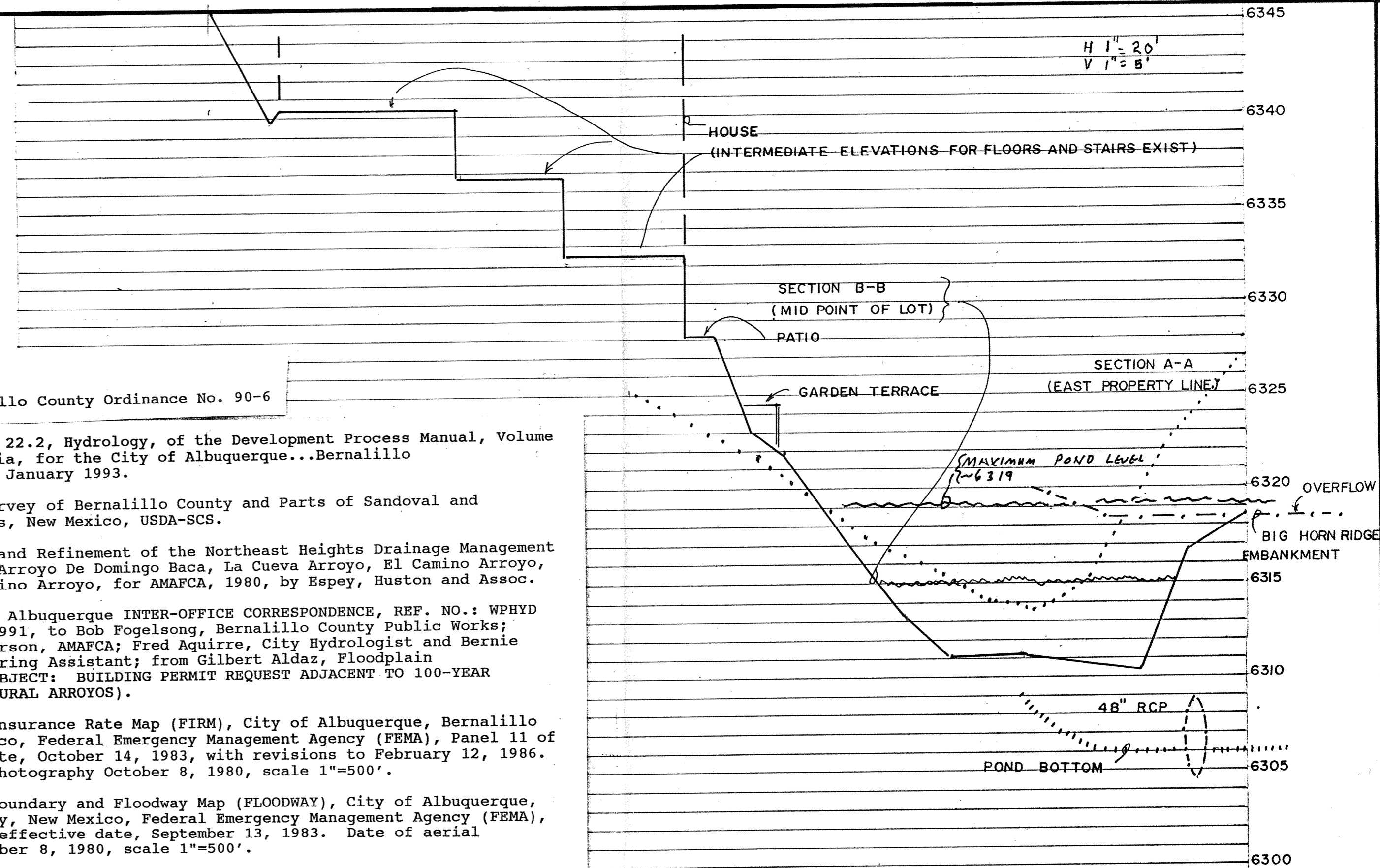
GRADING AND DRAINAGE PLAN
LOT 201A, SANDIA HEIGHTS SOUTH, UNIT 2
201 BIG HORN RIDGE DRIVE



REFERENCES:

- Bernalillo County Ordinance No. 90-6
- Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria, for the City of Albuquerque...Bernalillo County...AMAFCA, January 1993.
- Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico, USDA-SCS.
- Review and Refinement of the Northeast Heights Drainage Management Plan, for North Arroyo De Domingo Baca, La Cueva Arroyo, El Camino Arroyo, and North El Camino Arroyo, for AMAFCA, 1980, by Espey, Huston and Assoc.
- City of Albuquerque INTER-OFFICE CORRESPONDENCE, REF. NO.: WPHYD 0157, March 4, 1991, to Bob Fogelson, Bernalillo County Public Works; Clifford E. Anderson, AMAFCA; Fred Aquirre, City Hydrologist and Bernie Montoya, Engineering Assistant; from Gilbert Aldaz, Floodplain Administrator, SUBJECT: BUILDING PERMIT REQUEST ADJACENT TO 100-YEAR FLOODPLAINS (NATURAL ARROYOS).
- Flood Insurance Rate Map (FIRM), City of Albuquerque, Bernalillo County, New Mexico, Federal Emergency Management Agency (FEMA), Panel 11 of 50, effective date, October 14, 1983, with revisions to February 12, 1986. Date of aerial photography October 8, 1980, scale 1"=500'.
- Flood Boundary and Floodway Map (FLOODWAY), City of Albuquerque, Bernalillo County, New Mexico, Federal Emergency Management Agency (FEMA), Panel 11 of 50, effective date, September 13, 1983. Date of aerial photography October 8, 1980, scale 1"=500'.
- Topographic Orthophoto Map, Albuquerque Metropolitan Arroyo Flood Control Authority, Bernalillo County, New Mexico, Sheet C-23, Aerial Photography dated May 15, 1973. Scale 1"=200'.
- Topographic Orthophoto Map, Albuquerque Metropolitan Arroyo Flood Control Authority, Bernalillo County, New Mexico, Sheet C-24, Aerial Photography dated May 15, 1973. Scale 1"=200'.

BENCHMARK: Station 1-C24, located about 226 feet south of Big Horn Ridge Drive right-of-way centerline, and .4 miles south of the White oak intersection with Big Horn Ridge Drive. The station is a standard ACS brass cap stamped 1-C24, 1985, set on a concrete post. Elevation is 6353.



June 7, 1995
RUNOFF FOR LOT 201A, SANDIA HEIGHTS SOUTH, UNIT 2

TABLE A
Runoff Estimate: For On-site Basin of .836 acres, (LOT 201A).

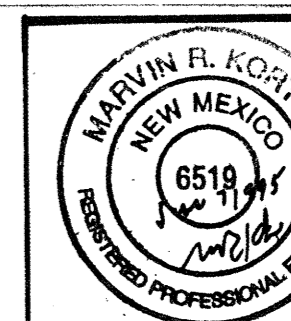
Land use	Runoff Factors		CURRENT USE		PROPOSED USE		PROPOSED USE	
	Peak	Total	Area	Percent	Peak	Total	Area	Percent
	CFS/acre	inches	SF		CFS	CF	SF	
A	2.26	0.66	36430	1.000	1.9	2003.6	18230	0.500
B	3.05	0.85	0	0.000	0.0	0.0	4000	0.110
C	3.94	1.13	0	0.000	0.0	0.0	7500	0.206
D	5.74	2.57	0	0.000	0.0	0.0	6700	0.184
TOTALS			36430	1.000	1.9	2003.6	36430	1.000
			0.836 acre			0.836 acre	0.836 acre	

- NOTES:
- Runoff factors from Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria, City of Albuquerque, Bernalillo County and AMAFCA, January, 1993
 - Land use descriptions:
 - Uncompacted soil
 - Lawn, shrubs
 - Compacted soil
 - Impervious areas
 - Peak runoff = Area (acres) x factor (CFS/acre) = CFS
 - Total runoff = Area (SF) x factor (inches) / 12 (inches/foot) = CF
 - Peak and total runoff is based on 6 hour, 100 year frequency storm
 - The current use is for the site in its natural state, or partially developed if off-site. The proposed use is for full development of the basin, under present zoning

CERTIFICATION
NO CHANGE THIS SHEET
REVISION 1
Preliminary
APPROVALS, REVISIONS

MRK
MRK
MRK
BY

DATE
JULY 19, 1995
JUN 27, 1995
JUNE 7, 1995



MARVIN R. KORTUM, P.E.
Civil Engineering
NM PE 6519
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(505) 299-0774

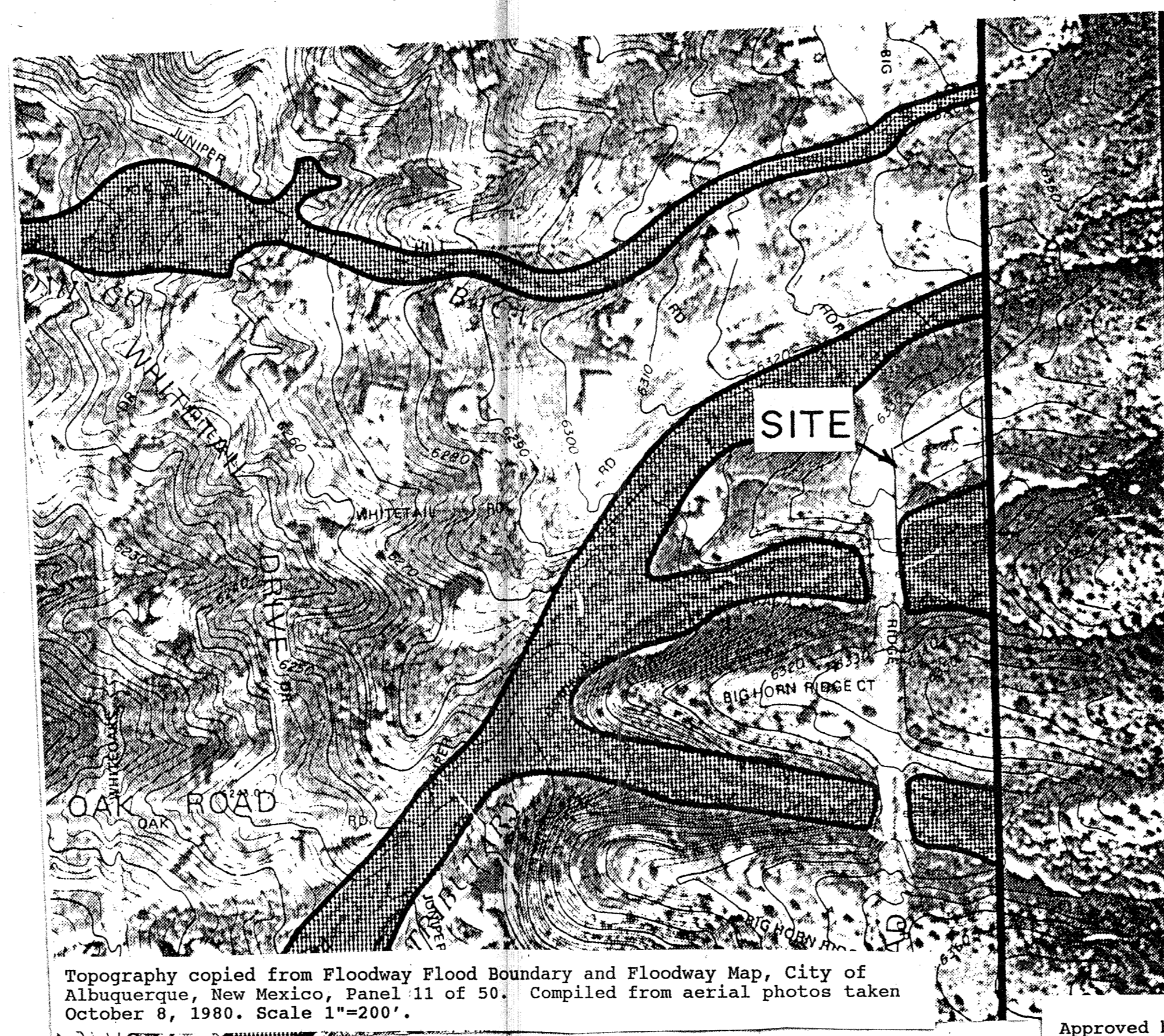
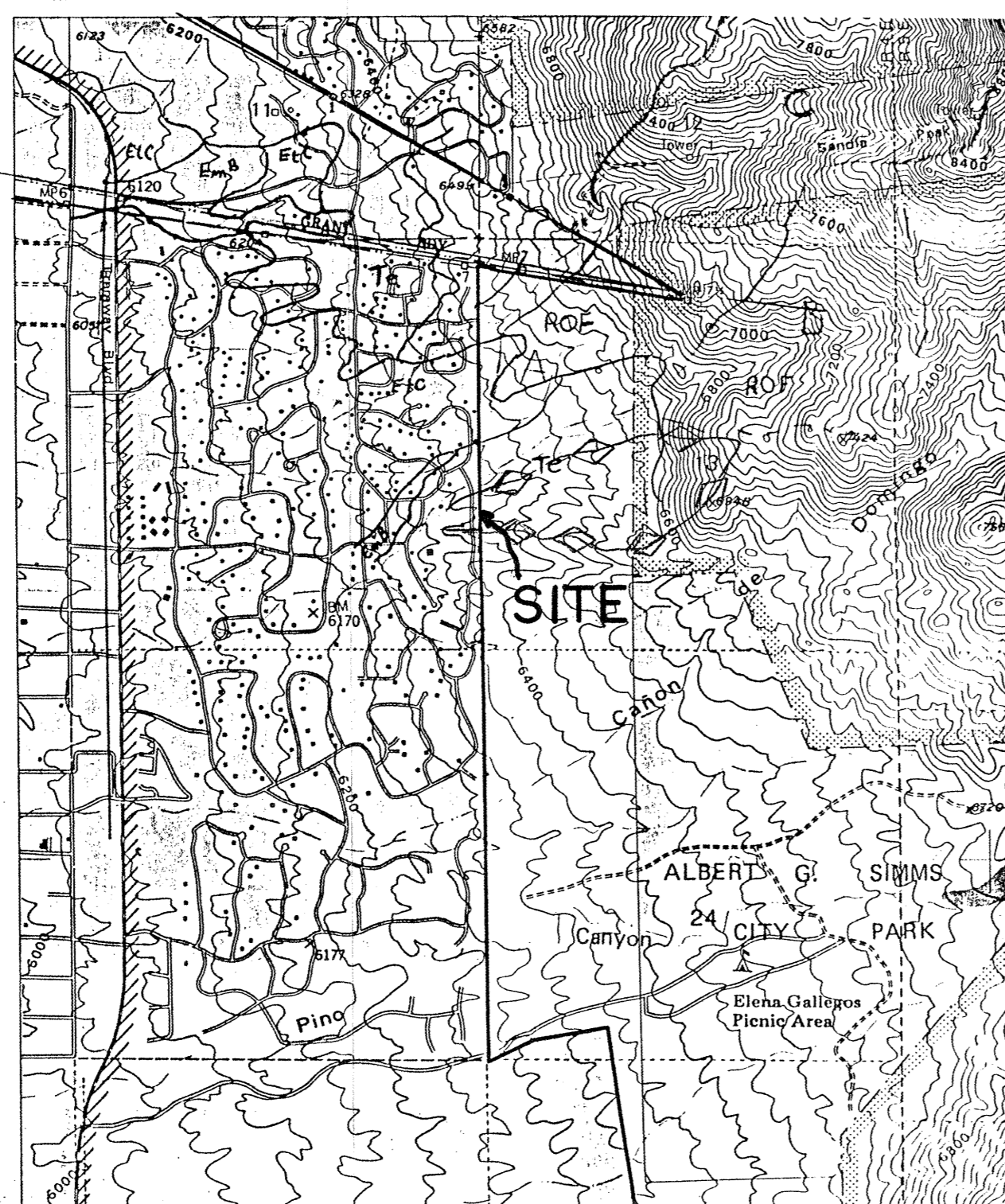
GRADING AND DRAINAGE PLAN
LOT 201A, SANDIA HEIGHTS SOUTH, UNIT 2
201 BIG HORN RIDGE DRIVE

PROJECT NO. C23/D49 MAP NO. C-23 SHEET OF 2 2

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
**SANDIA MOUNTAIN
WILDERNESS**
Cibola National Forest
NEW MEXICO
1985

Scale
0 1000 2000 3000 4000 5000 6000 Feet
Contour Interval = 40 Feet

MAP LEGEND



Topography copied from Floodway Flood Boundary and Floodway Map, City of Albuquerque, New Mexico, Panel 11 of 50. Compiled from aerial photos taken October 8, 1980. Scale 1"=200'.

Approved by letter, City of Albuquerque/County of Bernalillo
Floodplain Administrator, (C23/D49) (PWD 95-107), August 10, 1995.