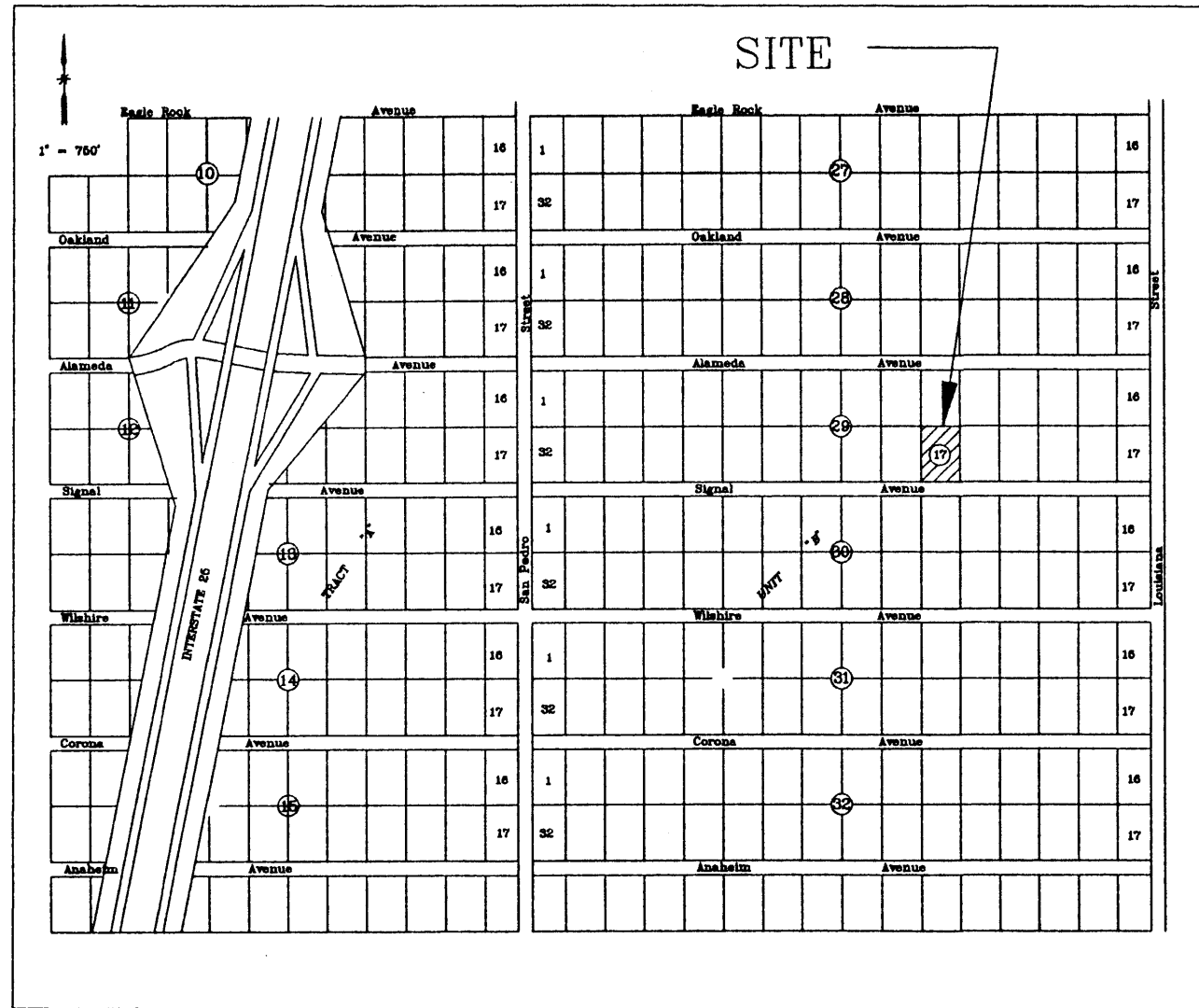




VICINITY MAP

ZONE ATLAS NO. C-18

ON-SITE DRAINAGE CALCULATIONS

EXISTING CONDITIONS:

The site is located on the north side of Signal Avenue, N.E., the sixth lot west of Louisiana Blvd. The site is presently undeveloped. Lot 23 to the west is undeveloped. Lot 21 to the east is developed. Lot 11 to the north is also developed. The lot slopes from east to west at an average slope of approximately 3 percent. Signal Avenue is paved in front of the site but only the south half of the street is permanent pavement with curb and gutter. The north half is temporary pavement. The same situation is applicable to the next two lots to the west.

PROPOSED CONDITIONS:

It is proposed to construct an office and warehouse facility. All runoff will be directed to an interim retention pond in the front parking lot where it will be ponded to a depth of 1.25 feet maximum in the parking lot. The overflow spillway for the pond will be the westerly driveway. The positive discharge pipe will be extended through the face of the retaining wall but will be plugged and covered with fill until such time that downstream drainage improvements are constructed. New curb and gutter and permanent pavement will be provided for under the Subdivision Agreement Process.

DRAINAGE CRITERIA:

The calculations shown on this plan were prepared in accordance with Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria, for the City of Albuquerque, in cooperation with Bernalillo County, New Mexico and the Albuquerque Metropolitan Arroyo Flood Control Authority, January, 1993.

PRECIPITATION ZONE:

The site is east of San Mateo Boulevard and is, therefore, in Precipitation Zone 3.

LAND TREATMENT AREAS, EXCESS PRECIPITATION AND UNIT PEAK DISCHARGE:

The peak discharge per acre and excess precipitation are shown for the four land treatments in Zone 3 in the table below, and the values shown are from the City of Albuquerque D.P.M. Also shown are the existing and proposed land treatment areas.

LAND TREATMENT	q(cfs/acre)	E (in)	Existing Site Areas %	Sq.Ft.	Acres	Developed Site Areas %	Sq.Ft.	Acres
100-yr. 10-yr.	100-yr. 10-yr.	100-yr. 10-yr.						
A	1.87	0.58	0.66	0.19	100.0	38,610	0.8864	0.0
B	2.60	1.19	0.92	0.36	0.0	0.0000	12.0	4,623
C	3.45	2.00	1.29	0.62	0.0	0.0000	6.8	2,610
D	5.02	3.39	2.36	1.50	0.0	0.0000	81.2	31,377
Totals					100.0	38,610	0.8864	100.0

PEAK DISCHARGE:

EXISTING CONDITIONS:

$$Q_{100} = 0.8864 \times 1.87 = 1.66 \text{ cfs} \quad Q_{10} = 0.8864 \times 0.58 = 0.51 \text{ cfs}$$

DEVELOPED CONDITIONS:

$$Q_{100} = 2.60 \times 0.1061 + 3.45 \times 0.0600 + 5.02 \times 0.7203 = 4.10 \text{ cfs}$$

$$Q_{10} = 1.19 \times 0.1061 + 2.00 \times 0.0600 + 2.39 \times 0.7203 = 2.69 \text{ cfs}$$

VOLUME, 100-YEAR, 6-HOUR:

$$V_{100} = (0.66 \times 38,610)/12 = 2,124 \text{ cf} \quad V_{10} = (0.19 \times 38,610)/12 = 611 \text{ cf}$$

EXISTING CONDITIONS:

$$V_{100} = (0.92 \times 4,623 + 1.29 \times 2,610 + 1.50 \times 31,377)/12 = 6,805 \text{ cf}$$

$$V_{10} = (0.36 \times 4,623 + 0.62 \times 2,610 + 1.50 \times 31,377)/12 = 4,196 \text{ cf}$$

DEVELOPED CONDITIONS:

$$V_{100} = (0.92 \times 4,623 + 1.29 \times 2,610 + 1.50 \times 31,377)/12 = 6,805 \text{ cf}$$

$$V_{10} = (0.36 \times 4,623 + 0.62 \times 2,610 + 1.50 \times 31,377)/12 = 4,196 \text{ cf}$$

SUMMARY OF ON-SITE VOLUMES AND PEAK DISCHARGE RATES:

	V100(CF)	V10(CF)	Q100(CFS)	Q10(CFS)
EXISTING	2,140	611	1.66	0.51
DEVELOPED	6,805	4,196	4.10	2.69
DECREASE	4,665	3,585	2.44	2.18

OFF-SITE DRAINAGE CALCULATIONS

DESCRIPTION OF OFF-SITE BASIN:

The off-site area is shown on the floodway map inset (Sht. C-3). The area is roughly triangular, extending 300 feet to the east and the base of the triangle being the east property line of the site. The off-site area is as follows: A = $(300 \times 2.34)/2 = 35,100 \text{ sf}$ or 0.8058 Ac.

WEIGHTED VALUES FOR EXCESS PRECIPITATION AND PEAK DISCHARGE:

From DPM, Table A-5, the percent Treatment D for Commercial is 90%. Assume the remainder is landscaping.

$$E(w) = 0.1 \times 0.92 + 0.9 \times 2.36 = 2.21 \text{ inches}$$

$$q(w) = 0.1 \times 2.60 + 0.90 \times 5.02 = 4.78 \text{ cfs/acre}$$

$$Q_{100} = 0.8058 \times 4.78 = 3.85 \text{ cfs} \quad V_{360} = (35,100 \times 2.21) / 12 = 6,464 \text{ cf}$$

ACCEPTING OFF-SITE FLOW:

According to the existing contours, off-site flow will enter the site at two locations, each taking approximately half of the flow. Three-foot-wide concrete roundouts are proposed,

$$6'' \text{ deep at inlet. Use Weir Equation, } Q = CLH^{3/2} \quad C = 3.0 \quad L = 3.0 \quad H = 0.5'$$

$$Q = 3.0 \times 3.0 \times 0.5^{3/2} = 3.18 \text{ cfs} > 3.85/2 \quad (3' \text{ wide roundout is adequate}).$$

Off-site flows will flow out through the westerly driveway.

CALCULATION OF 100-YEAR, 10-DAY VOLUME:

$$V_{100\text{-year, 10-day}} = V_{360} + A (P_{10\text{-day}} - P_{360})/12 \quad P_{10\text{-day}} = 4.90'' \quad P_{360} = 2.60''$$

$$(See Table A-2, City DPM) (P_{10\text{-day}} - P_{360}) = 4.90'' - 2.60'' = 2.30 \text{ in}$$

$$V_{360} = (AA + AB + AC)E_w/12$$

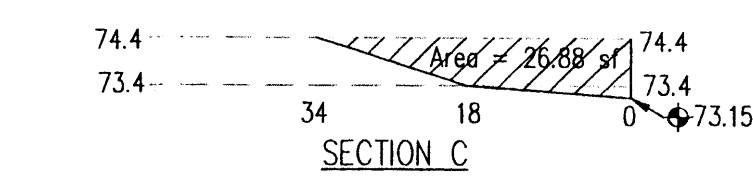
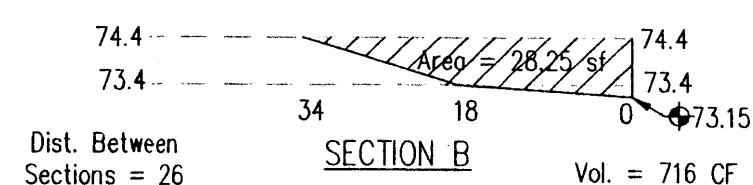
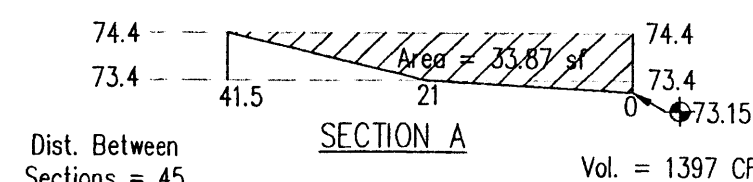
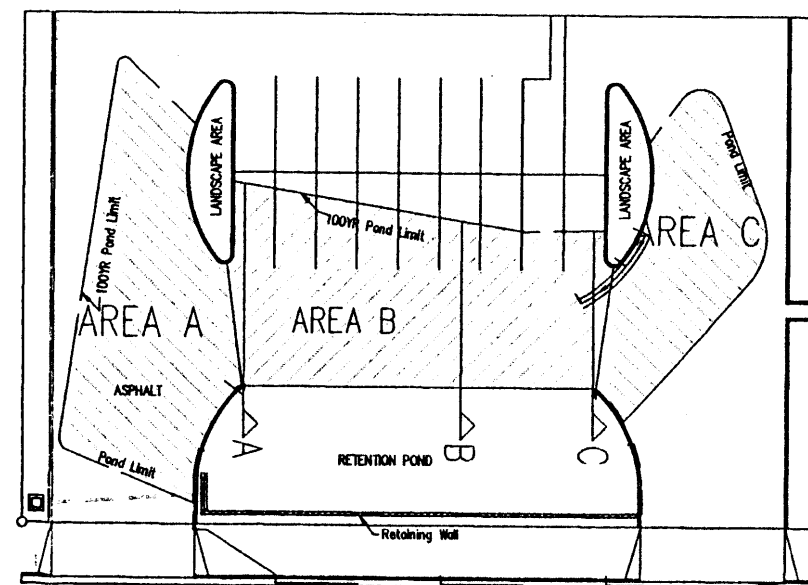
$$E_w = (E_A A_B + E_C A_C + E_D A_D) A_T \quad A_T = 38,610 \text{ sf} \quad A_B = 4,623 \text{ sf} \quad A_C = 2,610 \text{ sf} \quad A_D = 31,377 \text{ sf}$$

$$E_B = 0.92 \quad E_C = 1.29 \quad E_D = 2.36 \text{ cfs} \quad \text{Zone 3. (See Table A-8, City D.P.M.)}$$

$$E = (0.92 \times 4,623 + (1.29 \times 2,610) + (2.36 \times 31,377) / 38,610 = 2.115 \text{ in.}$$

$$V_{360} = (38,610)(2.115 / 12) = 6,805 \text{ cf}$$

$$V_{10\text{-day}} = 6,805 + 31,377 (2.30 / 12) = 6,821 + 6014 = 12,819 \text{ cf}$$



ACTUAL RETENTION POND

CONTOUR	AREA	AVE. AREA	DIST.	VOL.
67.4	327	408	0.6	245 CF
68	489	635	1.0	635 CF
69	781	939	1.0	939 CF
70	1,098	1,268	1.0	1,268 CF
71	1,437	1,617	1.0	1,617 CF
72	1,798	1,896	1.0	1,896 CF
73	1,993	2,093	1.4	2,930 CF
74.4	2,193			

$$\text{Area A} = 2094 \text{ sf. Use Pyramid Eq. } V = BH/3$$

$$\text{Vol} = (2094 \times 1.25)/3 = 873 \text{ cf}$$

$$\text{Area B (See cross sections above)}$$

$$\text{Vol} = 1397 + 716 = 2113 \text{ cf}$$

$$\text{Area C} = 1238 \text{ sf. Use Pyramid Eq. } V = BH/3$$

$$\text{Vol} = (1238 \times 1.25)/3 = 515 \text{ cf}$$

$$\text{TOTAL PARKING LOT PONDING}$$

$$\text{TOTAL VOLUME} = 873 + 2,113 + 515 = 3,501 \text{ CF}$$

$$\text{TOTAL VOLUME RETAINED:}$$

$$\text{TOTAL VOLUME} = 3,501 + 9,530 = 13,031 \text{ CF} > 12,819 \text{ (OK)}$$

$$\text{TOTAL RETENTION POND VOLUME}$$

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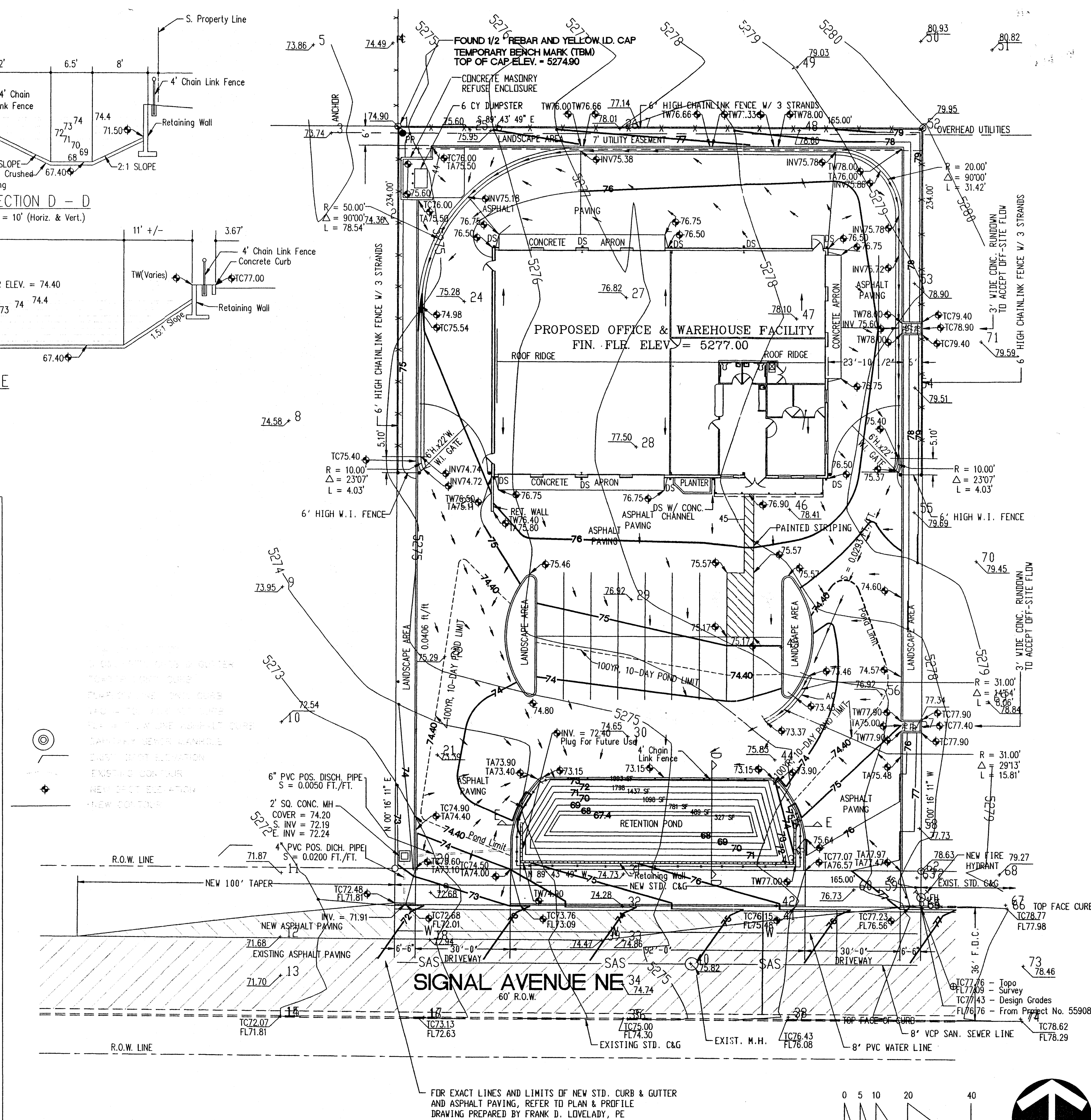
$$\text{TOTAL RETENTION POND VOLUME}$$

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$$\text{TOTAL RETENTION POND VOLUME}$$



GRADING AND DRAINAGE PLAN - INTERIM CONDITIONS

SCALE: 1=20.0'

DRAINAGE NOTES:

- The Site is located in a partially developed area where some of the streets are still unpaved and underground infrastructure is incomplete. The lot is located on a relatively high portion of an area that is predominantly flat and ribboned with numerous braided arroyo channels. There are no historic arroyo channels in the vicinity of the site.
- The site does not lie within or adjacent to a designated flood hazard area as shown on FEMA Floodway Map inset or as indicated by FEMA FIRM Map No. 137 D, effective September 20, 1996.
- Runoff generated by the site will be retained until such time that there are downstream drainage facilities, and then detained as required by downstream capacity. (See Ultimate G&D Plan)

LEGAL DESCRIPTION:

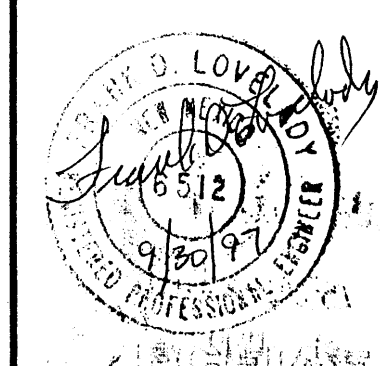
LOT 22 IN BLOCK 29, TRACT "A", UNIT "B", NORTH ALBUQUERQUE ACRES, BERNALILLO COUNTY, ALBUQUERQUE, NEW MEXICO.

BENCH MARK INFORMATION:

BASIS OF ELEVATION: ACS 9-C18

TOPOGRAPHIC SURVEY BY E. MAXWELL DOAK-SURVEYORS

RECEIVED
OCT 27 1997
HYDROLOGY SECTION



Offices & Warehouse Facility for
Royal Plumbing & Heating
LOCATED ON SIGNAL AVENUE NE, ALBUQUERQUE, NEW MEXICO

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JOB NO: 9736
DATE: 21 JULY 1997
REVISIONS

SHEET NO.
C-2

