

Offices & Warehouse Facility for  
 Royal Plumbing & Heating  
 6401 SIGNAL AVENUE NE, ALBUQUERQUE, NEW MEXICO

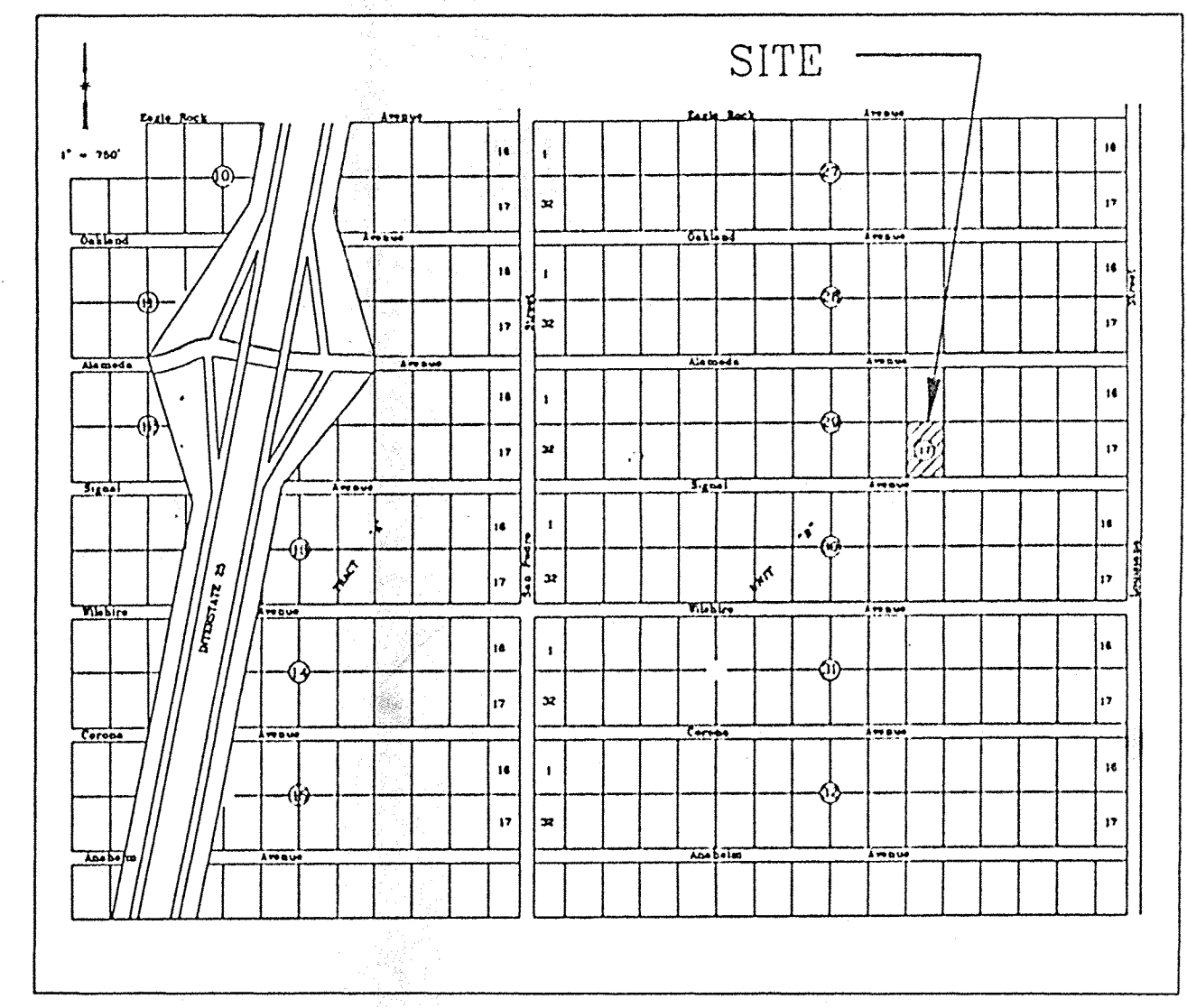
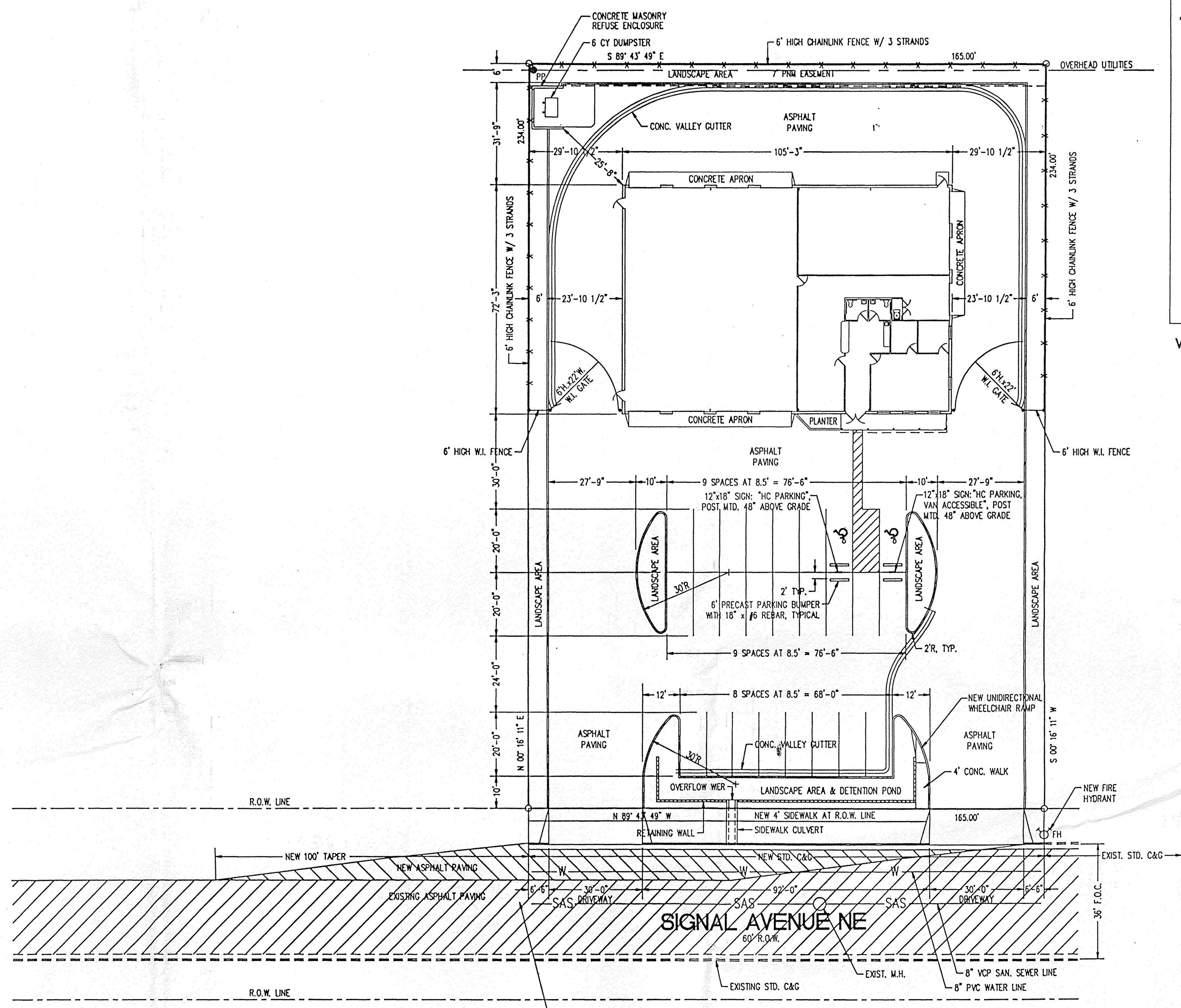
**KEN HOVEY, ARCHITECT**  
 1521 241-0033 • FAX (505) 254-8574 • 1803 SIMS AVE. SE • ALBUQUERQUE, NM • 87103

JOB NO.	9736
DATE	26 JUNE 1997
REVISIONS	
	14 JANUARY 1998

SHEET NO.  
**C-1a**

DRB-97-357

DRB-97-357



VICINITY MAP ZONE ATLAS NO. C-18

Case Number: DRB-97-357

This plan is consistent with the specific site plan amendment approved by the Development Review Board (DRB) on Feb. 17, 1998 and that findings of the official notice have been complied with.

<i>Mark Dwan</i>	2-17-98
Traffic Engineer, Transportation Division	Date
<i>Robert J. ...</i>	2-17-98
Design and Development Department / CIP	Date
<i>Roger A. ...</i>	2-17-98
Public Works, Water Utilities Division	Date
<i>John H. ...</i>	2-17-98
City Engineer, Engineering Division / AMNFA	Date
<i>Kevin ...</i>	2/10/98
City Planner, Albuquerque Planning Division	Date

**SECTOR DEVELOPMENT PLAN:**  
 THIS SITE FALLS WITHIN THE BOUNDARY OF THE NORTH I-25 SECTOR DEVELOPMENT PLAN AND MUST ADHERE TO THE REQUIREMENTS OF THAT PLAN AS WELL AS THE REQUIREMENTS OF THE ZONING CODE.

**BUILDING USE:**  
 THIS FACILITY WILL PROVIDE OFFICES FOR ROYAL PLUMBING AND HEATING, AS WELL AS A PARTS WAREHOUSE, ASSEMBLY AREA AND INDOOR PARKING FOR SERVICE VEHICLES. THERE WILL BE NO OUTSIDE STORAGE.

**DESIGN CRITERIA:**

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

**ZONE ATLAS MAP:** C-18

**ZONING:** SU-2 FOR IP USE

**OCCUPANCY CLASSIFICATION:** B-2, B-1

**TYPE OF CONSTRUCTION:** II-N

**GROSS FLOOR AREA:** 7,560 SQUARE FEET

**NET LEASABLE FLOOR AREA:**

OFFICE AREA:	1,066 SQUARE FEET
ASSEMBLY AREA:	1,325 SQUARE FEET
SERVICE VEHICLE PARKING:	3,887 SQUARE FEET
PARTS WAREHOUSE:	996 SQUARE FEET

**OFF-STREET PARKING REQUIRED:**

1,066	+ 1,325	+ 3,887+996	= 9.09	= 10 SPACES
200	1,000	2,000		

**OFF-STREET PARKING PROVIDED:**

PARKING ON-SITE:	25 SPACES
PARKING IN BUILDING:	8 SPACES
TOTAL PROVIDED:	33 SPACES

**MAXIMUM HEIGHT PERMITTED (BY ZONING CODE):**  
 BASED ON 45-DEGREE-ANGLE PLANES DRAWN FROM THE HORIZONTAL AT THE MEAN GRADE ALONG EACH BOUNDARY OF THE PREMISES, THE STRUCTURE HEIGHT WILL BE RESTRICTED TO 29'-10 1/2".

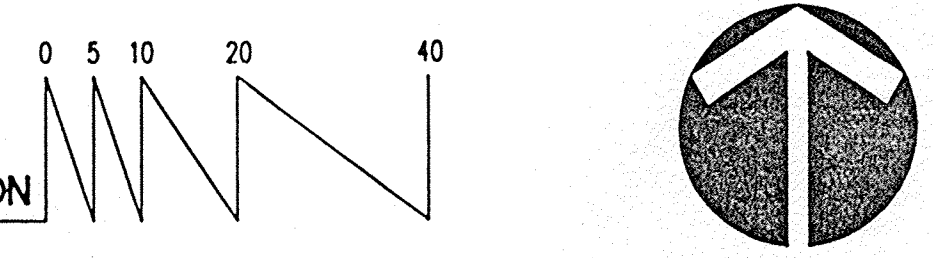
**ACTUAL STRUCTURE HEIGHT:** 19'-6"

**SITE PLAN ULTIMATE CONDITION**  
 SCALE: 1-20.0'

**NOTE:**  
 THIS SITE PLAN ILLUSTRATES THE "ULTIMATE CONDITION" WITH A DETENTION POND WITH RESTRICTED DISCHARGE.

AN "INTERIM CONDITION" INVOLVING A RETENTION POND IS REQUIRED BECAUSE SIGNAL DOES NOT HAVE CURB & GUTTER OR PAVING BETWEEN THIS SITE AND EXISTING STORM SEWER FACILITIES TO THE WEST.

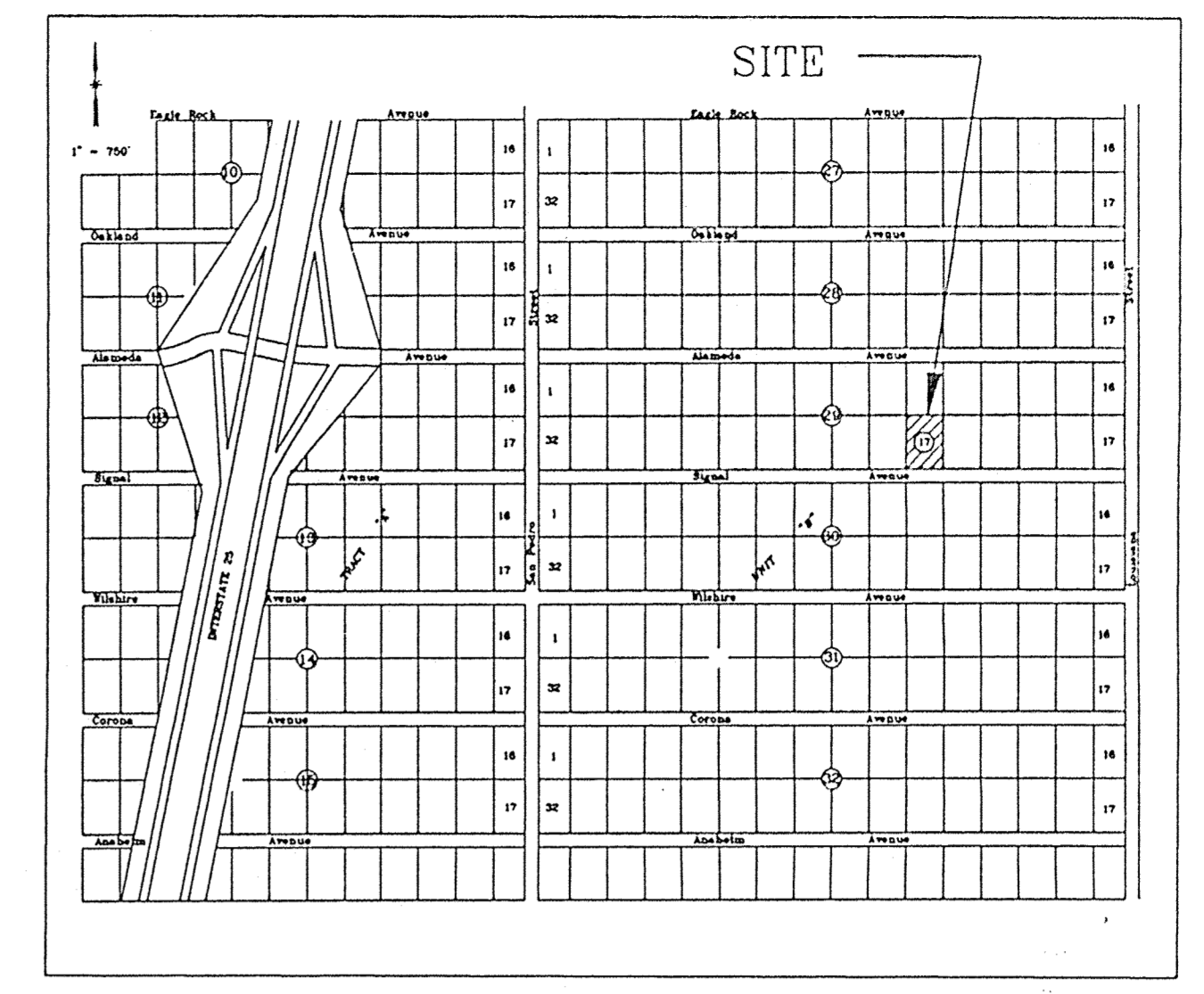
AT SUCH TIME AS THE CURB & GUTTER AND PAVING IS INSTALLED, THE RETENTION POND WILL BE REPLACED WITH A DETENTION POND WITH RESTRICTED DISCHARGE AS SHOWN HEREON.



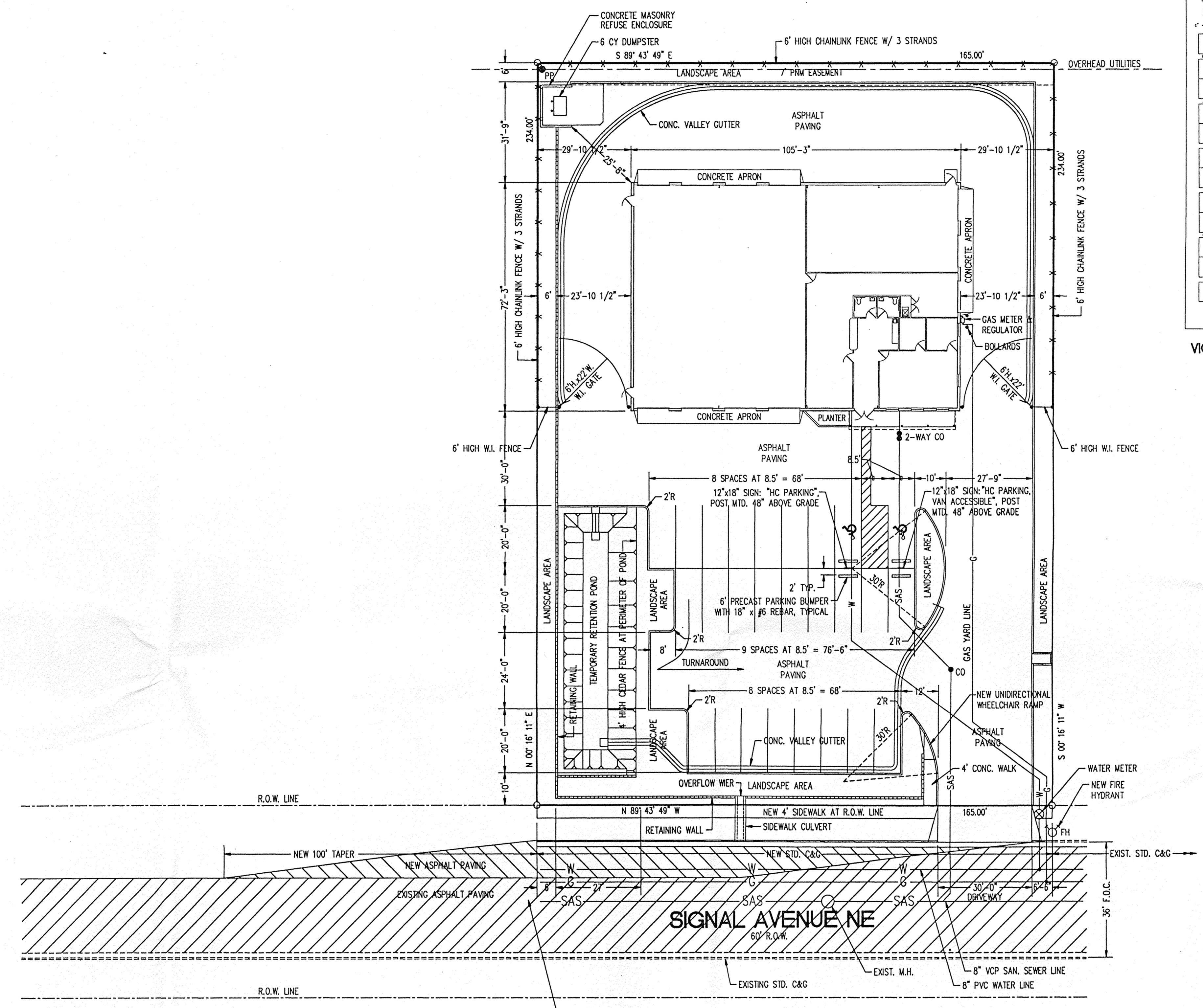


Offices & Warehouse Facility for  
**Royal Plumbing & Heating**  
 6401 SIGNAL AVENUE NE, ALBUQUERQUE, NEW MEXICO

**KEN HOVEY, ARCHITECT**  
 6501 254-0083 • FAX 505/744-8091 • 3008 SIMMS AVE. SE • ALBUQUERQUE, NM • 87103



VICINITY MAP ZONE ATLAS NO. C-18



**DESIGN CRITERIA:**

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

ZONE ATLAS MAP: C-18  
 ZONING: SU-2 FOR IP USE  
 ZONING HISTORY: DRB-97-357  
 OCCUPANCY CLASSIFICATION: B-2, B-1  
 TYPE OF CONSTRUCTION: II-N  
 GROSS FLOOR AREA: 7,560 SQUARE FEET  
 NET LEASABLE FLOOR AREA:  
 OFFICE AREA: 1,066 SQUARE FEET  
 ASSEMBLAGE AREA: 1,325 SQUARE FEET  
 SERVICE VEHICLE PARKING: 3,887 SQUARE FEET  
 PARTS WAREHOUSE: 996 SQUARE FEET

OFF-STREET PARKING REQUIRED:  
 $\frac{1,066}{200} + \frac{1,325}{1,000} + \frac{3,887+996}{2,000} = 9.09 \rightarrow 10$  SPACES

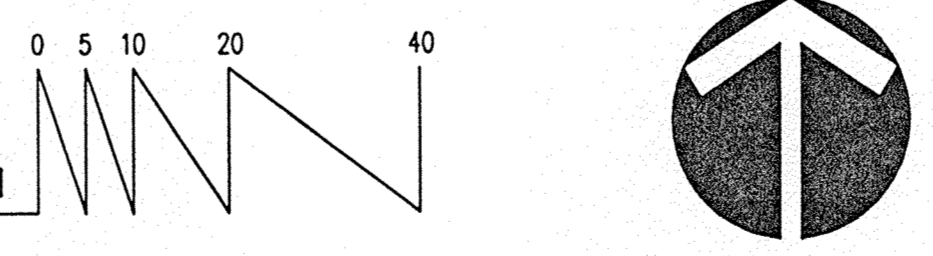
OFF-STREET PARKING PROVIDED:  
 PARKING ON-SITE: 26 SPACES  
 PARKING IN BUILDING: 8 SPACES  
 TOTAL PROVIDED: 34 SPACES

MAXIMUM HEIGHT PERMITTED (BY ZONING CODE):  
 BASED ON 45-DEGREE-ANGLE PLANES DRAWN FROM THE HORIZONTAL  
 AT THE MEAN GRADE ALONG EACH BOUNDARY OF THE PREMISES, THE  
 STRUCTURE HEIGHT WILL BE RESTRICTED TO 29'-10 1/2'.

ACTUAL STRUCTURE HEIGHT: 19'-6"

DESIGN LOADS:  
 APPLICABLE CODE: UNIFORM BUILDING CODE, 1991 EDITION  
 SEISMIC ZONE: 2B  
 DESIGN WIND SPEED: 75 MPH  
 EXPOSURE: C  
 IMPORTANCE FACTOR: 1.0  
 SNOW LOAD: 20 PSF, NO REDUCTIONS

**SITE PLAN INTERIM CONDITION**  
 SCALE: 1=20.0'

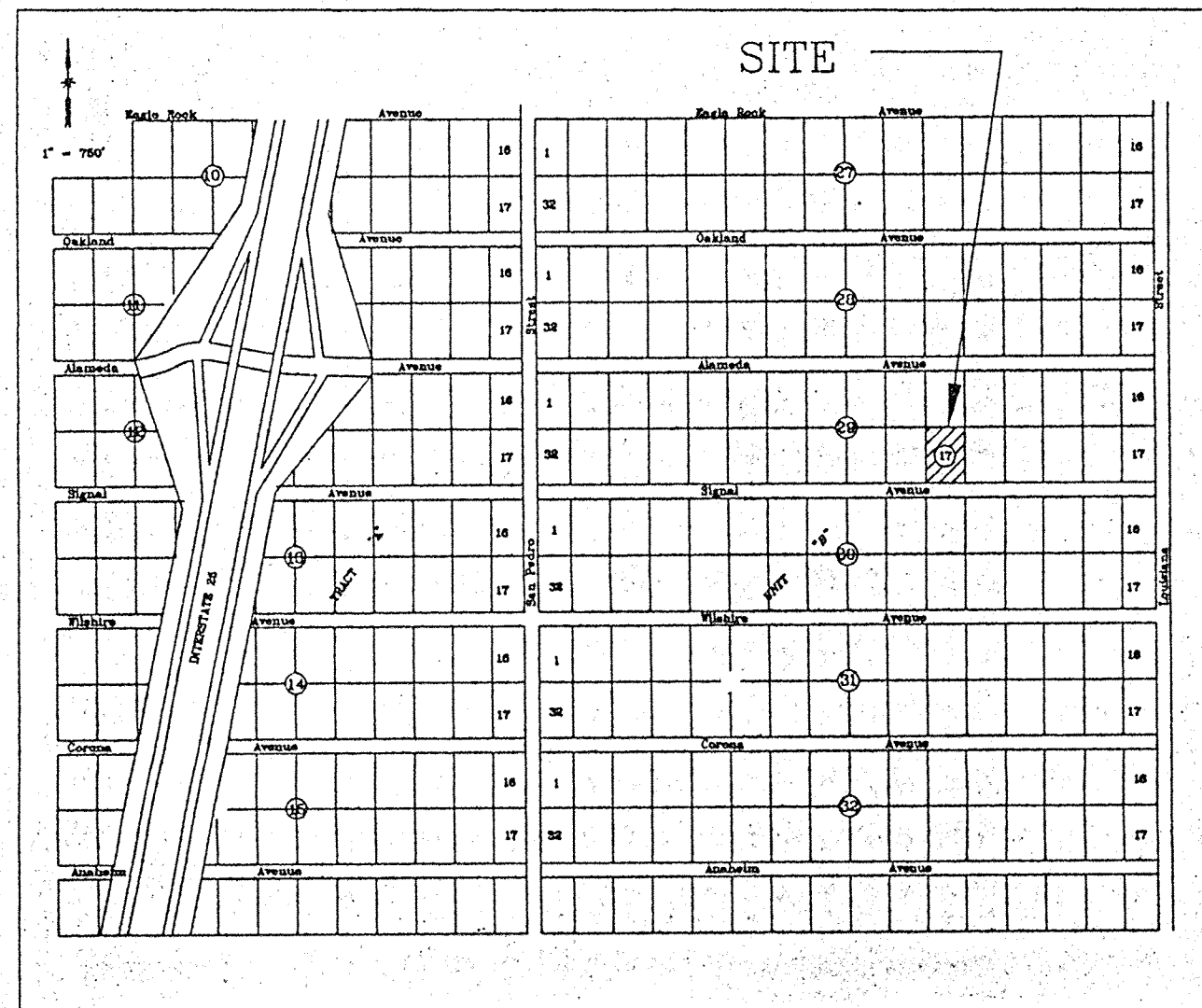


NOTE:  
 THE INTERIM CONDITION FOR THIS SITE PLAN INVOLVES A TEMPORARY  
 RETENTION POND. THE POND IS REQUIRED BECAUSE SIGNAL DOES  
 NOT HAVE CURB & GUTTER OR PAVING BETWEEN THIS SITE AND  
 EXISTING STORM SEWER FACILITIES TO THE WEST.

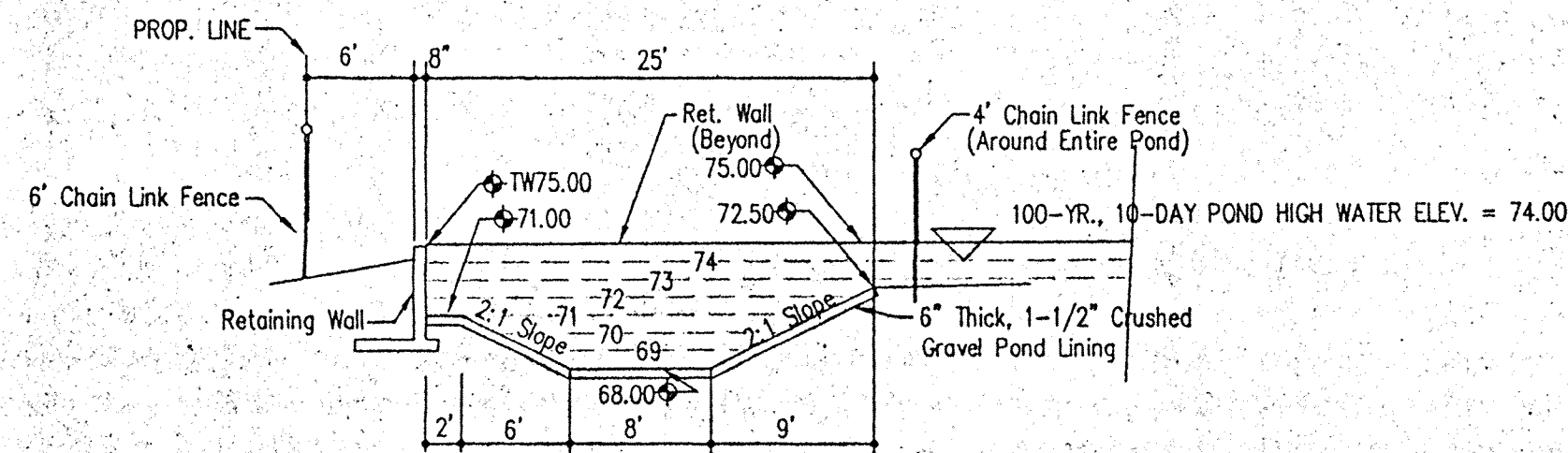
AT SUCH TIME AS THE CURB & GUTTER AND PAVING IS INSTALLED  
 THE RETENTION POND WILL BE REPLACED WITH A DETENTION POND  
 WITH RESTRICTED DISCHARGE. THIS IS DESCRIBED ON THE SITE  
 PLAN LABELED "ULTIMATE CONDITION".

DB NO.	9736
DATE	26 JUNE 1997
REVISIONS	
	14 JANUARY 1998

SHEET NO.  
**C-1**



VICINITY MAP ZONE ATLAS NO. C-18



SECTION E - E  
1" = 10' (Horiz. & Vert.)

**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 SW corner of the site. The pond will be supplemented by ponding in the parking lot to a maximum depth of 1.18 ft. The overflow spillway for the pond will be a sidewalk culvert. A positive discharge pipe will be placed through the curb and extended one foot into the property for future use when Signal Avenue is constructed fully to the west. New curb and gutter and permanent pavement will be provided for the north half of Signal Ave. under C.O.A. Project No. 582381.

**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:**

LAND TREATMENT	q (cfs/ac)		E (in)		Existing Site Areas		Developed Site Areas	
	100-yr	10-yr	100-yr	10-yr	%	Sq. Ft.	%	Sq. Ft.
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:**  
Q100 = 0.8864 \* 1.87 = 1.66 cfs Q10 = 0.8864 \* 0.58 = 0.51 cfs

**DEVELOPED CONDITIONS:**  
Q100 = 2.60 \* 0.1061 + 3.45 \* 0.0600 + 5.02 \* 0.7203 = 4.10 cfs  
Q10 = 1.19 \* 0.1061 + 2.00 \* 0.0600 + 2.39 \* 0.7203 = 2.69 cfs

**VOLUME, 100-YEAR, 6-HOUR:**

**EXISTING CONDITIONS:**  
V100 = (0.66 \* 38,610) / 12 = 2,124 cf V10 = (0.19 \* 38,610) / 12 = 611 cf

**DEVELOPED CONDITIONS:**  
V100 = (0.92 \* 4,623 + 1.29 \* 2,610 + 1.50 \* 31,377) / 12 = 6,805 cf  
V10 = (0.36 \* 4,623 + 0.62 \* 2,610 + 1.50 \* 31,377) / 12 = 4,196 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 X 234) / 2 = 35,100 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 X 0.92 + 0.9 X 2.36 = 2.21 inches

q(w) = 0.1 X 2.60 + 0.9 X 5.02 = 4.78 cfs/acre

Q100 = 0.8058 X 4.78 = 3.85 cfs V360 = (35,100 X 2.21) / 12 = 6,464 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 rundowns are proposed, 6" deep at inlet. Use Weir Equation, Q = CLH<sup>3/2</sup> C = 3.0 L = 3.0 H = 0.5'  
Q = 3.0 X 3.0 X 0.5<sup>3/2</sup> = 3.18 cfs > 3.85/2 (3' wide rundown is adequate).  
Off-site flows will flow out through the westerly driveway.

**ON-SITE DRAINAGE CALCULATIONS**

**CALCULATION OF 100-YEAR, 10-DAY VOLUME:**

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

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

$V_{360} = (A_A + A_B + A_C)(E_w / 12)$

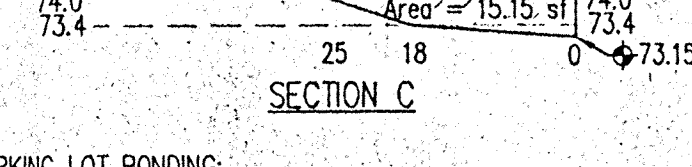
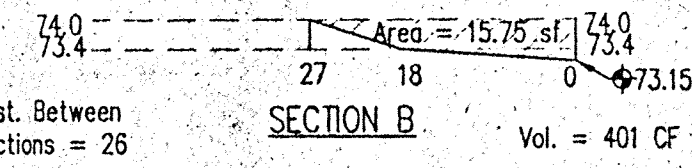
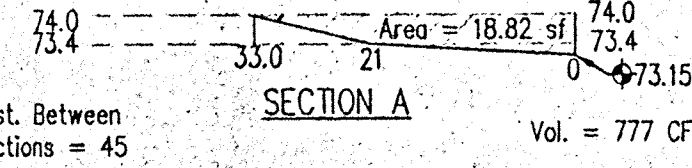
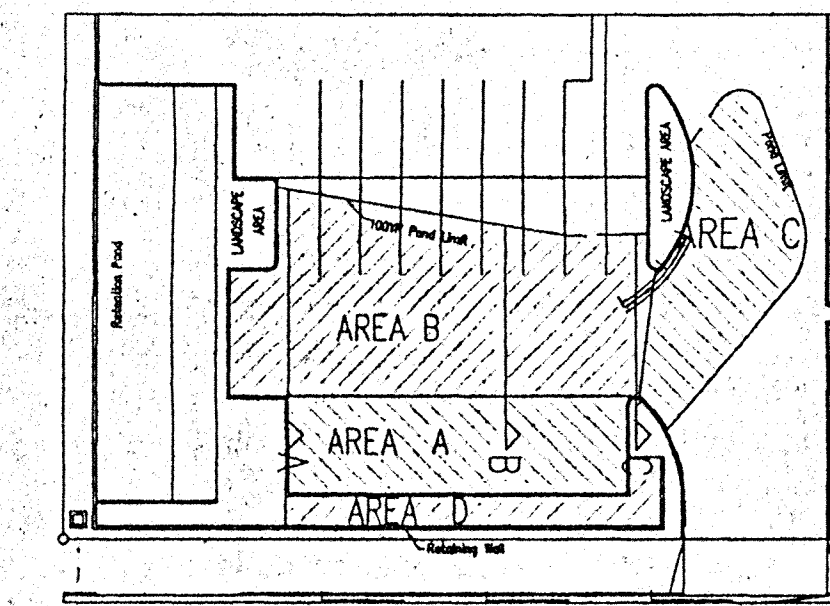
$E_w = (E_{gA} + E_{gB} + E_{gC} + E_{gD}) A_T$   $A_T = 38,610$  sf  $A_B = 4,623$  sf  $A_C = 2,610$  sf  $A_D = 31,377$  sf

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

$E = (0.92 X 4,623) + (1.29 X 2,610) + (2.36 X 31,377) / 38,610 = 2.115$  in.

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

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



**MISCELLANEOUS PONDING:**

Area A = 20' x 68' x 0.97 (ave.) = 1,319 cf  
Area B (See cross sections above)  
Vol = 777 + 401 = 1,178 cf  
Area C = 1238 sf. Use Pyramid Eq. V = BH<sup>3</sup> / 3  
Vol = (650 x 0.85) / 3 = 184 cf  
TOTAL PARKING LOT PONDING  
TOTAL VOLUME = 1,319 + 1,178 + 184 = 2,681 CF

**RETENTION POND:**  
Required Volume = 12,819 cf - (2,681 + 4,039) = 6,099 cf  
Total Vol. of Pond w/o side slopes 25' x 85' x 4.5' = 9,562.5 cf  
Vol. fill = 15 (85 + 16) + 20.25(85) = 3,236 cf  
Plus 4 Corners: [1/3(1/2 x 6 x 6)] x 4 = 72 cf (Pyramid Eq.)  
Ret. Pond Vol. = 9,562.5 - (3,232 + 72) = 6,254.5 cf > 6,099 cf

**TOTAL MISC. PONDING:** 342 + 510 + 3,187 = 4,039 cf

Also on N. & S. Ends of Pond

**LEGEND**

- AG=ALLEY GUTTER
- S C&G=STD. CURB & GUTTER
- TC=TOP CONC. CURB
- FL=FLOW LINE CONC. CURB
- TAC = TOP ASPHALT CURB
- FLA = FLOW LINE ASPHALT CURB
- SANITARY SEWER MANHOLE
- EXIST. SPOT ELEVATION
- EXISTING CONTOUR
- NEW SPOT ELEVATION
- NEW CONTOUR

**RUNDOWN CALCULATIONS:**

AREA = 5 X 165 X 18 = 14,850 SF

AREA = 0.34 ACRE

Land Treatment = D q100 = 5.02 cfs/acre.

Q100 = 0.34 x 5.02 cfs/acre = 1.71 cfs

Exist. Roadside Swale

15' X 15' X 6" Thick Crushed Rock Rundown Use 2-1/2" Crushed Rock

NEW 100' TAPER Edge Temp. Asp. Pmnt New Temp. Asp. Curb

NEW TEMPORARY ASPHALT PAVING

EXISTING TEMPORARY ASPHALT PAVING

20' EXISTING PERMANENT ASPHALT PAVING

R.O.W. LINE

**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)

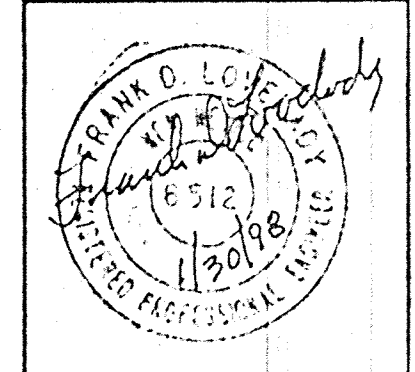
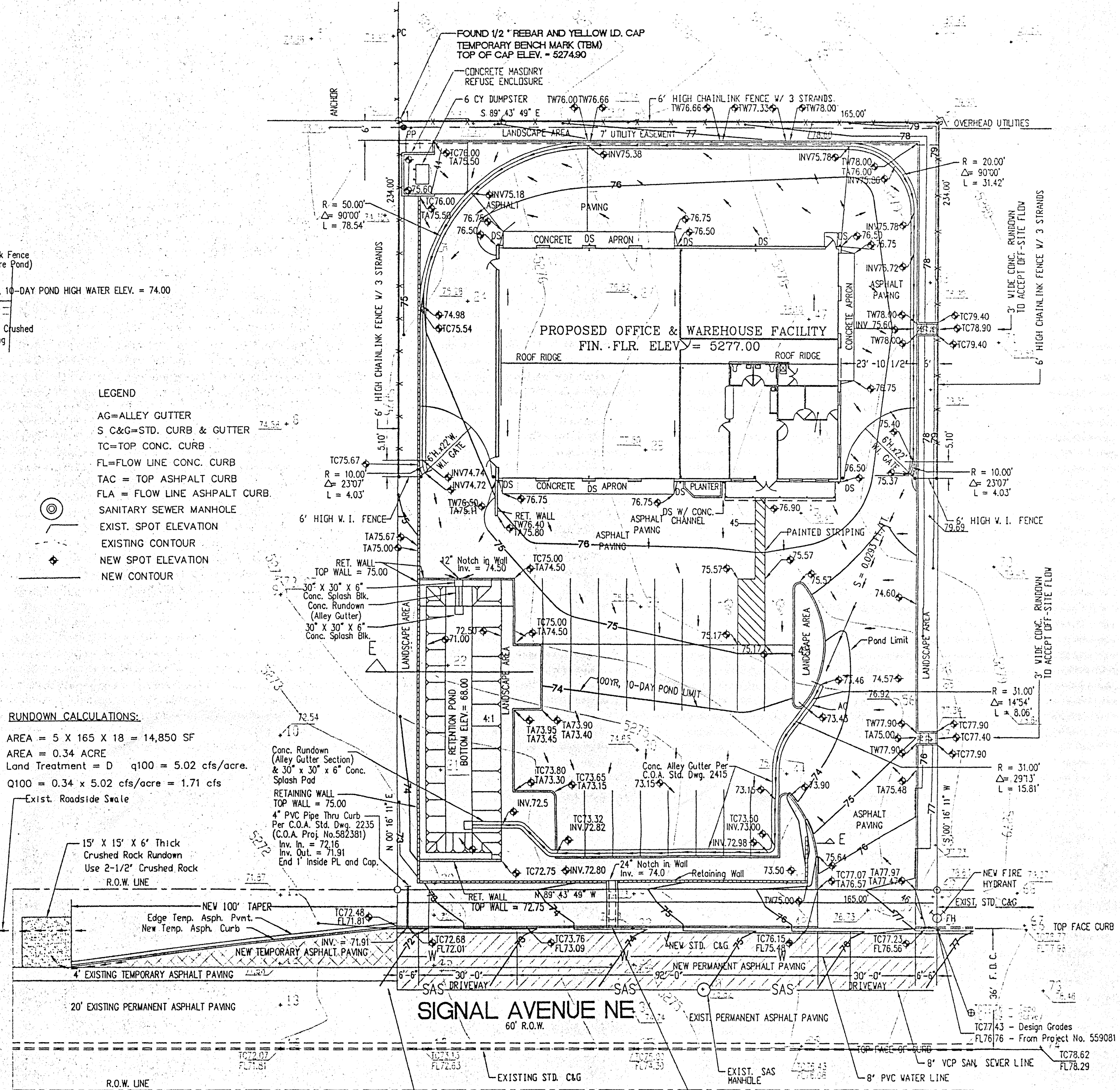
**LEGAL DESCRIPTION:**

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

**BENCH MARK INFORMATION:**

BASIS OF ELEVATION: ACS 9-118

TOPOGRAPHIC SURVEY BY E. MAXWELL DOAK-SURVEYORS



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

**KEI HOVEY, ARCHITECT**  
601 241-0083 • FAX 601 241-8001 • 3808 SIMMS AVE SE • ALBUQUERQUE, NM • 81106

JOB NO: 4736

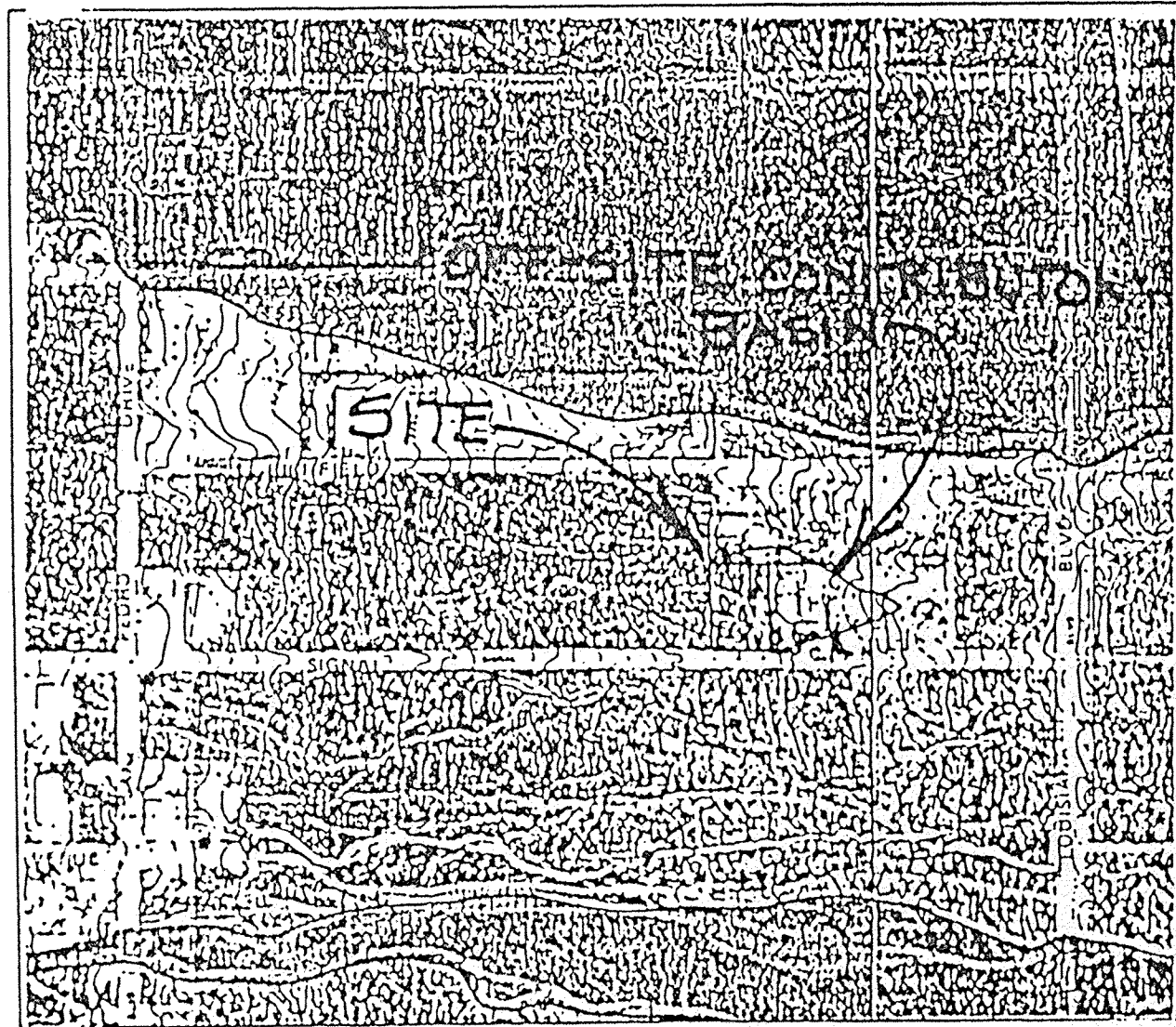
DATE: 21 JULY 1997

REVISIONS

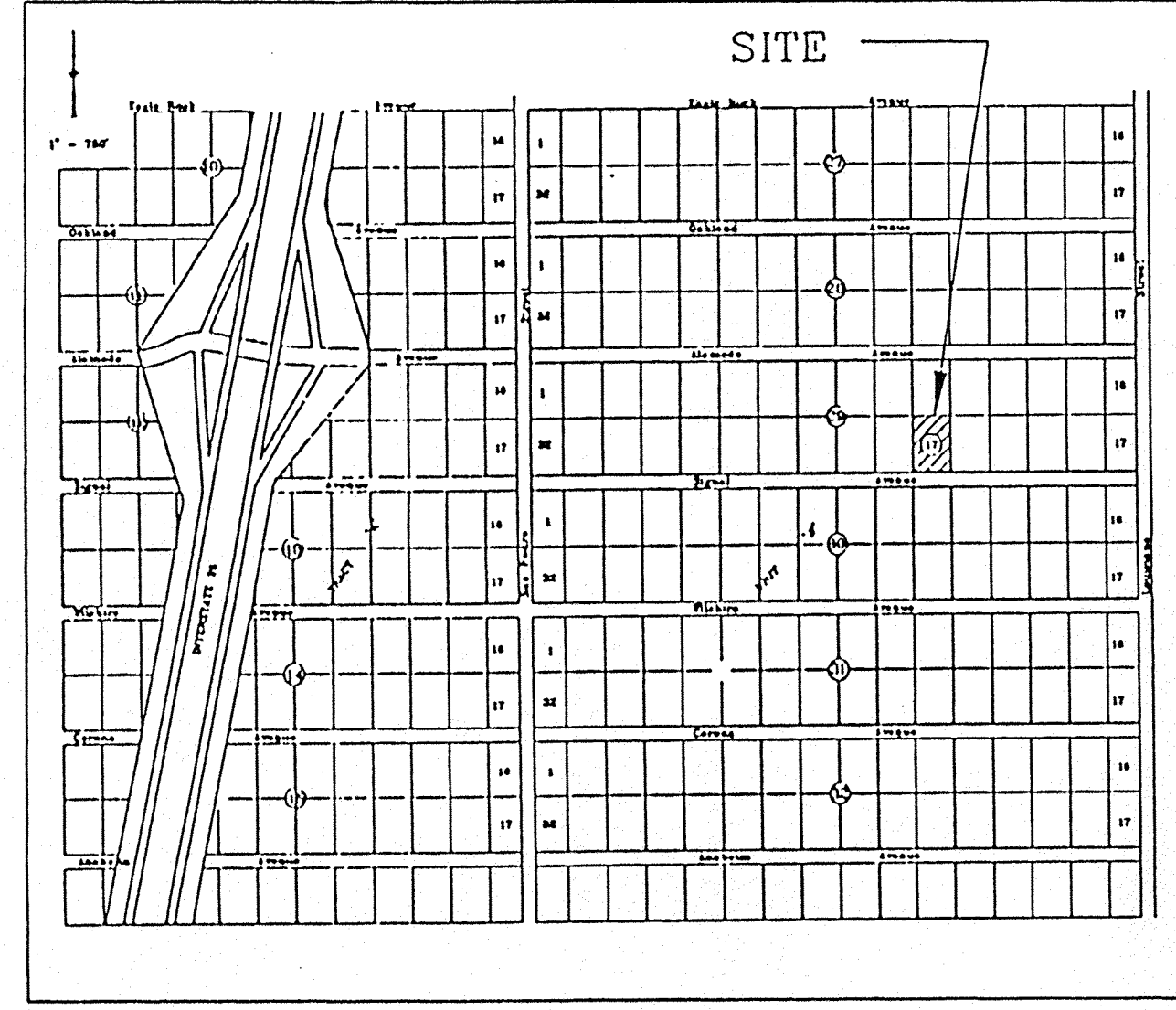
SHEET NO.

C-2

SIGNAL-IDWG (JANUARY 30, 1996)



FLOODWAY MAP



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.

PROPOSED CONDITIONS:

It is proposed to construct an office and warehouse facility. All runoff will be directed to a detention pond in the front parking lot and landscaping area where it will be ponded to a depth of 18 inches. The overflow spillway for the pond will be the westerly driveway. The positive discharge pipe will be extended through the face of the new curb and gutter proposed to be constructed with this project. New curb and gutter and permanent pavement will be constructed as infrastructure improvements.

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	100-yr. 10-yr.		100-yr. 10-yr.		%	SoFl.	Acres	Developed Site Areas	%	SoFl.	Acres
	Q (cfs/acre)	E (in)	Q (cfs/acre)	E (in)							
A	1.87	0.58	0.66	0.19	100.0	38,610	0.8864	0.0	0	0.0000	0.0000
B	2.60	1.19	0.92	0.36	0.0	0.0000	13.1	5,050	0.1160	0.0000	0.1160
C	3.45	2.00	1.29	0.62	0.0	0.0000	0.0	0.0	0.0000	0.0	0.0000
D	5.02	3.39	2.36	1.50	0.0	0.0000	86.9	33,560	0.7704	0.0000	0.7704
Totals					100.0	38,610	0.8864	100.0	38,610	0.8864	0.8864

PEAK DISCHARGE:

EXISTING CONDITIONS:  
 $Q_{100} = 0.8864 \cdot 1.87 = 1.66$  cfs  $Q_{10} = 0.8864 \cdot 0.58 = 0.51$  cfs

DEVELOPED CONDITIONS:  
 $Q_{100} = 2.60 \cdot 0.1160 + 5.02 \cdot 0.7704 = 4.17$  cfs  
 $Q_{10} = 1.19 \cdot 0.1160 + 3.39 \cdot 0.7704 = 2.75$  cfs

VOLUME 100-YEAR 6-HOUR:

EXISTING CONDITIONS:  
 $V_{100} = (0.66 \cdot 38,610) / 12 = 2,124$  cf  $V_{10} = (0.19 \cdot 38,610) / 12 = 611$  cf

DEVELOPED CONDITIONS:  
 $V_{100} = (0.92 \cdot 5,050 + 2.36 \cdot 33,560) / 12 = 6,987$  cf  
 $V_{10} = (0.36 \cdot 5,050 + 1.50 \cdot 33,560) / 12 = 4,347$  cf

SUMMARY OF ON-SITE VOLUMES AND PEAK DISCHARGE RATES:

	V100(CF)	V10(CF)	Q100(CFS)	Q10(CFS)
EXISTING	2,124	611	1.66	0.51
DEVELOPED	6,987	4,347	4.17	2.75
DECREASE	4,863	3,736	2.51	2.24

OFF-SITE DRAINAGE CALCULATIONS

DESCRIPTION OF OFF-SITE BASIN:

The off-site area is shown on the floodway map inset. The area is roughly triangular, extending 200 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:  $A = (300 \times 234) / 2 = 35,100$  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.

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

$q(w) = 0.1 \times 2.60 + 0.9 \times 5.02 = 4.78$  cfs/acre

$Q_{100} = 0.8058 \times 4.78 = 3.85$  cfs  $V_{100} = (35,100 \times 2.21) / 12 = 6,464$  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 runoffs are proposed, 6" deep at inlet. Use Weir Equation,  $Q = CWH^{3/2}$   $C = 3.0$   $L = 3.0$   $H = 0.5'$   
 $Q = 3.0 \times 3.0 \times 0.5^{3/2} = 3.18$  cfs  $> 3.85/2$  (3' wide runoff is adequate).  
 Off-site flows will flow out through the westerly driveway.

DETENTION POND CALCULATIONS:

$T_p = (2.107 \cdot E + A_1 / Q_p) - (0.25 A_0 / A_1)$   $A_1 = 0.8864$   $A_0 = 0.7704$   $Q_p = 4.17$  cfs

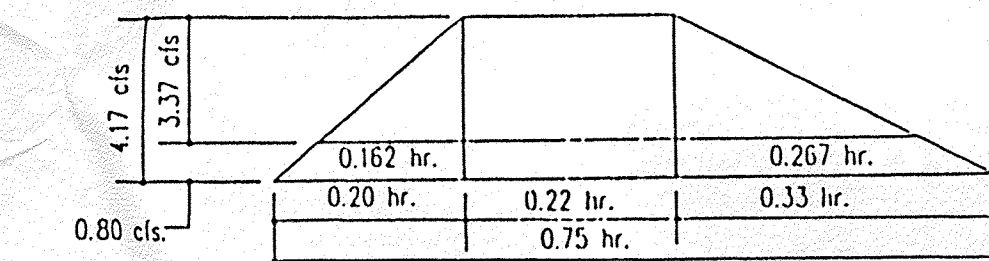
$E = (0.1160 \cdot 0.92 + 0.7704 \cdot 2.36) / 0.8864 = 2.17$  in.

$T_p = (2.107 \cdot 2.17 + 0.8864/4.17) - (0.25(0.7704/0.8864)) = 0.75$  hr.

DETENTION POND CALCULATIONS, CONTINUED:

$T_p = (0.7 + 0.2) + ((1.6 - (0.7704 / 0.8864)) / 12) = 0.20$  hr.

Continue the Peak for 0.25 (0.7704/0.8864) = 0.22 hr.



Ponded Volume =  $[1/2(0.162 + 3.37) + (0.22 + 3.37) + 1/2(0.267 + 3.37)]3600 = 5271$  cf

ACTUAL VOLUME:

See Sheet C-3 for calculations of ponding volume in asphalt parking lot.

Volume ponded in parking lot = 3,501 cf.

Ponding in area where detention pond is located.  $A = 1/2(67 + 84)27 = 2038$  sf.

The depth is at least 1.25' over the entire area.

Volume =  $2,038 \cdot 1.25 = 2,547$  cf

Total Volume =  $3,501 + 2,547 = 6,048$  cf.  $> 5,271$  cf

POSITIVE DISCHARGE PIPE W/O RISE PLATE:

Use Orifice Equation. Water Surface = 42.30 Invert = 40.83 O.H. = 1.47'

$H = 1.47' - 1/2$  Dia. of Orifice Plate  $(1/2 \cdot 5 \cdot 3/16) = 2.5938' = 0.22'$

$H = 1.47' - 0.22 = 1.25'$   $A = (2.5938 \cdot (PI)) / 144 = 0.1468$  sf

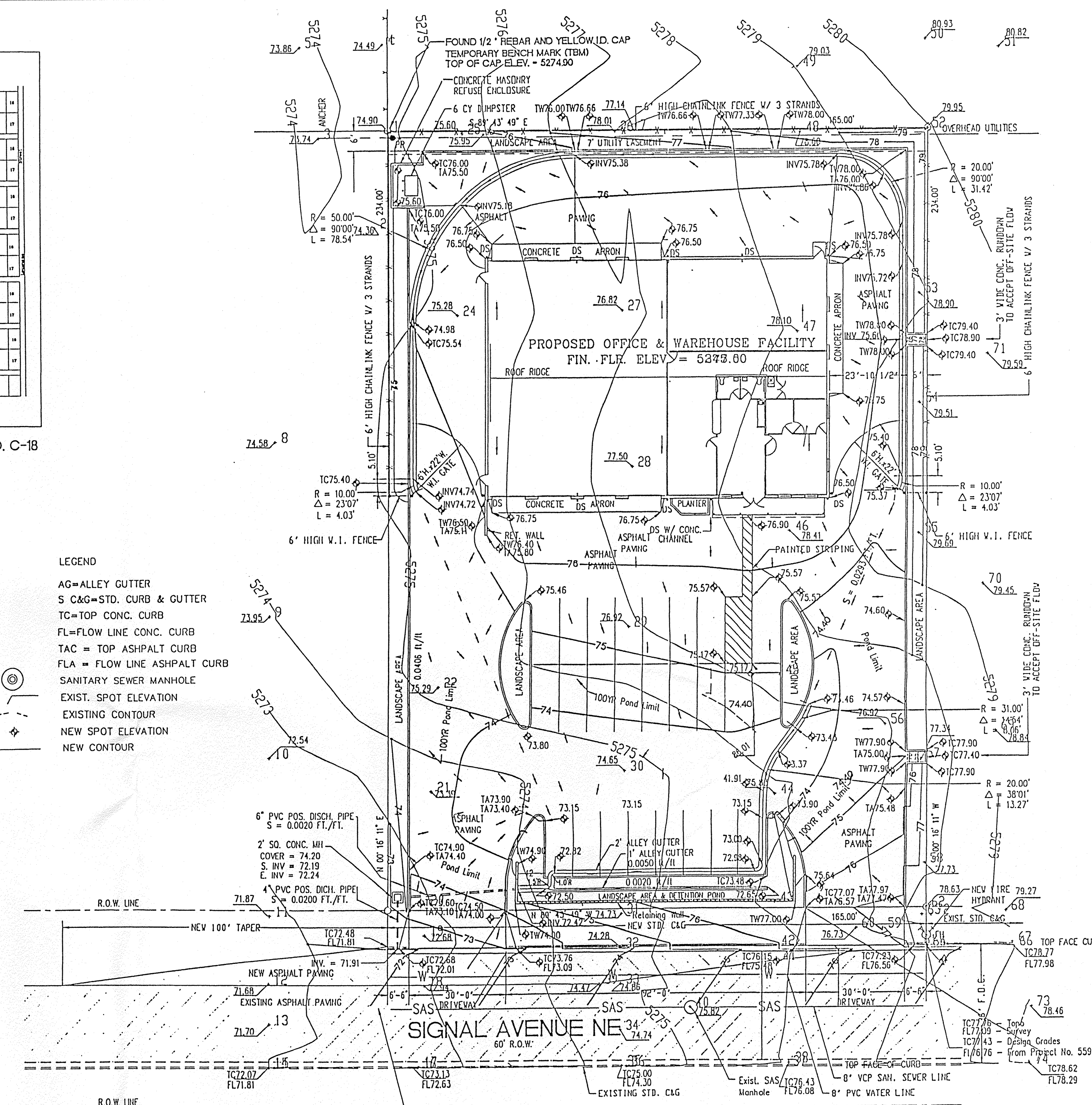
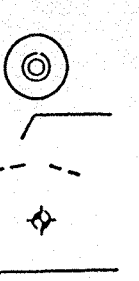
$Q = 0.6 \cdot 0.1468 \cdot (2 \cdot 32.2 + 1.25)^{3/2} = 0.79$  cfs  $< 0.80$  cfs (OK)

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 detained such that the 100-year developed flow will not exceed the capacity of the existing storm drain located in San Pedro. The allowable discharge rate for developing properties in the contributing basin has been established by Avid Engineering in the design of Sonora West and further related with the Signal Hill Subdivision Drainage Report. The allowable discharge rate from the latter is 0.8 cfs/acre based on the capacity of the storm drain in San Pedro and the total acreage of drainage basins draining to that point. There is a 30' storm drain line in Signal Avenue from San Pedro as far as the west end of Lot 24, two lots west of the site, or approximately 350 feet. The storm drain in San Pedro is 48" diameter. Since the storm drain in Signal Avenue does not extend to the site, it will be necessary to discharge the detention pond positive discharge pipe through the curb into Signal Avenue. The overflow spillway will be through the westerly driveway. The above referenced study for Signal Hill Subdivision shows that for ultimate conditions, the storm sewer in Signal Street will extend no further than it presently does. It also shows a storm drain in Louisiana Blvd. and Corona Ave. intercepting all flows to the east. A total Q100 of 52.6 cfs enters the storm drain where it now ends, according to the drawing showing "Ultimate Conditions". However, the AHJNO INPUT summary shows 42.1 cfs from Sonora Subdivision, and 6.2 cfs from subbasin 07-6 (Signal between the end of the storm drain and Louisiana Blvd.), or 48.3 cfs. There is no mention made in the report of the need to extend the storm drain further east on Signal Avenue. There are no inlets on Signal Ave. where the storm drain now ends, or rather, turns south into Sonora Subdivision. Water and sanitary sewer were extended east on Signal to Louisiana and then to a development on Oakland with a project designed by Terra West. C&G and street paving, Lots 17 thru 21, was done at the request of the Owners.
- The new street curb and gutter will be constructed under work order along with the positive discharge pipe so that no Special Order 19 is required.

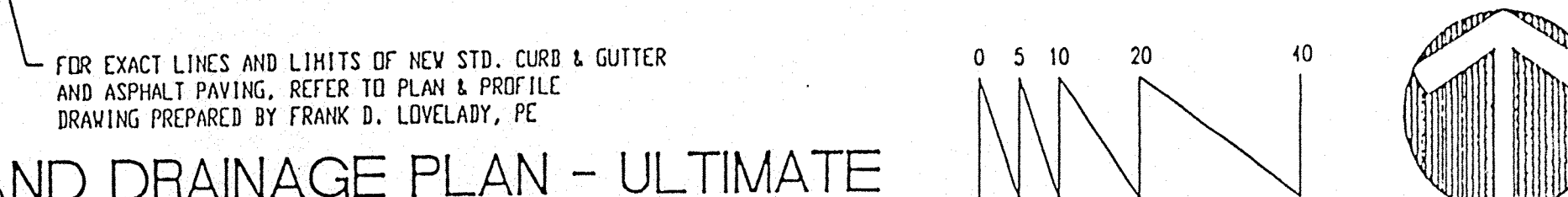
LEGEND

- AG=ALLEY GUTTER
- S C&G=STD. CURB & GUTTER
- TC=TOP CONC. CURB
- FL=FLOW LINE CONC. CURB
- TAC = TOP ASPHALT CURB
- FLA = FLOW LINE ASPHALT CURB
- SANITARY SEWER MANHOLE
- EXIST. SPOT ELEVATION
- EXISTING CONTOUR
- NEW SPOT ELEVATION
- NEW CONTOUR



GRADING AND DRAINAGE PLAN - ULTIMATE

SCALE: 1"=20.0'

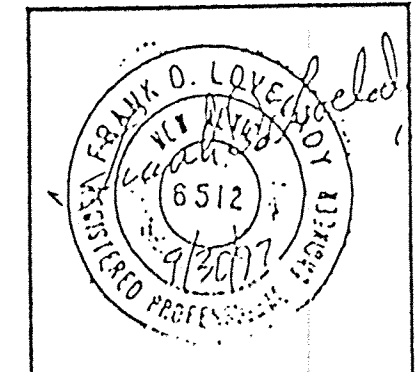


**LEGAL DESCRIPTION:**  
 LOT 22 IN BLOCK 29, TRACT "A", UNIT "B", NORTH ALBUQUERQUE ACRES, BERNALILLO COUNTY, ALBUQUERQUE, NEW MEXICO.

**BENCH MARK INFORMATION:**  
 BASIS OF ELEVATION: ACS 9-C18  
 TOPOGRAPHIC SURVEY BY E. MAXWELL DOAK-SURVEYORS

**ATTENTION:**  
 THIS PLAN, WHICH INCLUDES A DETENTION POND AND POSITIVE DISCHARGE PIPE, IS NOT TO BE IMPLEMENTED UNTIL AFTER STREET IMPROVEMENTS, INCLUDING CURB AND GUTTER, HAVE BEEN COMPLETED FROM THE SITE TO THE STORM DRAIN MANHOLE ADJACENT TO LOT 24 AND A STORM DRAINAGE INLET HAS BEEN CONSTRUCTED AND CONNECTED TO THAT MANHOLE TO INTERCEPT THE NORTH GUTTER FLOW. UNTIL THESE DOWNSTREAM INFRASTRUCTURE IMPROVEMENTS ARE IN PLACE, ALL STORM DRAINAGE RUNOFF WILL BE RETAINED ON SITE AND CONSTRUCTION OF ON-SITE DRAINAGE FACILITIES WILL BE IN ACCORDANCE WITH SHEET C-2, GRADING AND DRAINAGE PLAN - INTERIM CONDITIONS.

SIGNAL-C-DWG (SEPTEMBER 30, 1997)

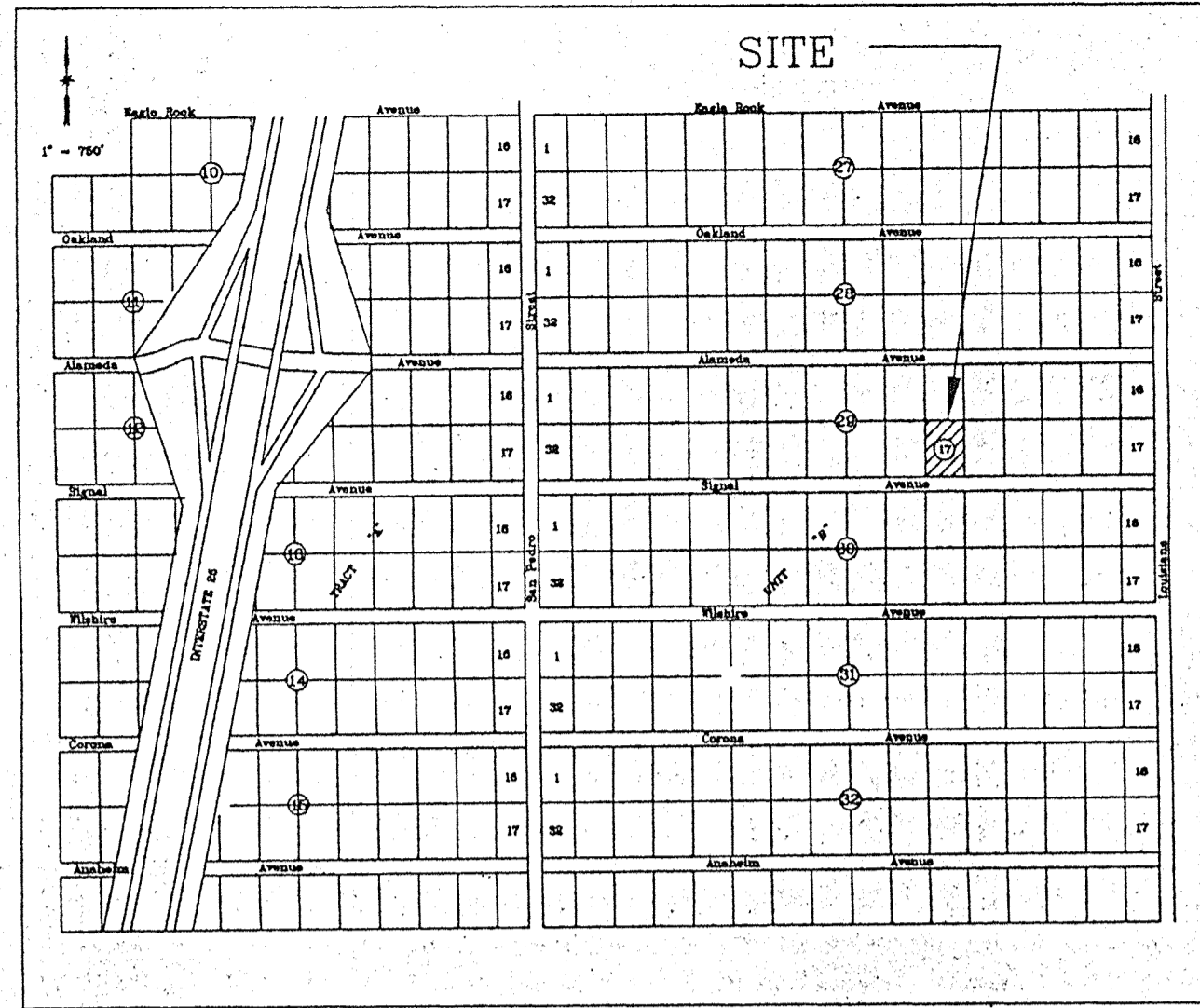


Offices & Warehouse Facility for  
**Royal Plumbing & Heating**  
 LOCATED ON SIGNAL AVENUE NE, ALBUQUERQUE, NEW MEXICO

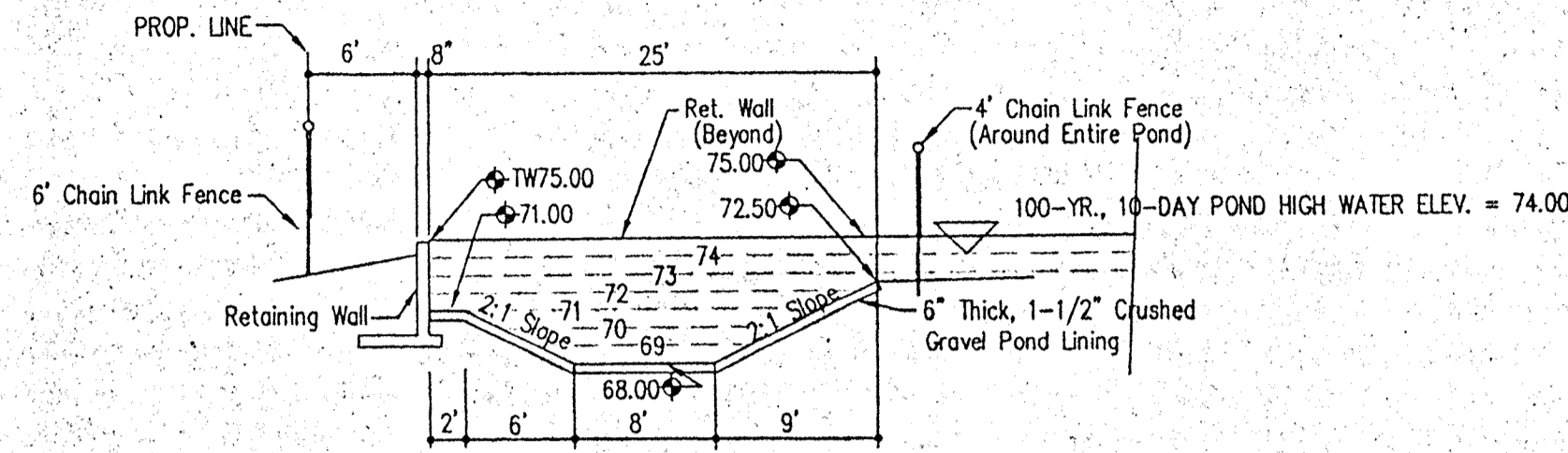
**KEN HOVEY, ARCHITECT**  
 BOB 251-0053 • FAX 254-8001 • 3003 SHINE AVE. SE • ALBUQUERQUE, NM • 87109

JOB NO.	4736
DATE	21 JULY 1997
REVISIONS	

SHEET NO.  
**C-3**



VICINITY MAP ZONE ATLAS NO. C-18



SECTION E - E  
1" = 10' (Horiz. & Vert.)

**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 SW corner of the site. The pond will be supplemented by ponding in the parking lot to a maximum depth of 1.18 ft. The overflow spillway for the pond will be a sidewalk culvert. A positive discharge pipe will be placed through the curb and extended one foot into the property for future use when Signal Avenue is constructed fully to the west. New curb and gutter and permanent pavement will be provided for the north half of Signal Ave. under C.O.A. Project No. 582381.

**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	E (in)				Existing Site Areas		Developed Site Areas			
	100-yr. 10-yr.	100-yr. 10-yr.	%	Sq.Ft.	%	Sq.Ft.	%	Sq.Ft.		
A	1.87	0.58	0.66	0.19	100.0	38,610	0.8864	0.0	0.0000	
B	2.60	1.19	0.92	0.36	0.0	0.0000	12.0	4,623	0.1061	
C	3.45	2.00	1.29	0.82	0.0	0.0000	6.8	2,610	0.0600	
D	5.02	3.39	2.36	1.50	0.0	0.0000	81.2	31,377	0.7203	
Totals					100.0	38,610	0.8864	100.0	38,610	0.8864

**PEAK DISCHARGE:**  
EXISTING CONDITIONS:  
 $Q_{100} = 0.8864 \times 1.87 = 1.66$  cfs  $Q_{10} = 0.8864 \times 0.58 = 0.51$  cfs

DEVELOPED CONDITIONS:  
 $Q_{100} = 2.60 \times 0.1061 + 3.45 \times 0.0600 + 5.02 \times 0.7203 = 4.10$  cfs  
 $Q_{10} = 1.19 \times 0.1061 + 2.00 \times 0.0600 + 2.39 \times 0.7203 = 2.69$  cfs

**VOLUME, 100-YEAR, 6-HOUR:**  
EXISTING CONDITIONS:  
 $V_{100} = (0.66 \times 38,610)/12 = 2,124$  cf  $V_{10} = (0.19 \times 38,610)/12 = 611$  cf  
DEVELOPED CONDITIONS:  
 $V_{100} = (0.92 \times 4,623 + 1.29 \times 2,610 + 1.50 \times 31,377)/12 = 6,805$  cf  
 $V_{10} = (0.36 \times 4,623 + 0.82 \times 2,610 + 1.50 \times 31,377)/12 = 4,196$  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:  $A = (300 \times 234)/2 = 35,100$  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.

$E(w) = 0.1 \times 0.92 + 0.9 \times 2.36 = 2.21$  inches  
 $q(w) = 0.1 \times 2.60 + 0.9 \times 5.02 = 4.78$  cfs/acre  
 $Q_{100} = 0.8058 \times 4.78 = 3.85$  cfs  $V_{360} = (35,100 \times 2.21)/12 = 6,464$  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 rundowns are proposed, 6" deep at inlet. Use Weir Equation,  $Q = C L H^{3/2}$   $C = 3.0$   $L = 3.0$   $H = 0.5'$   
 $Q = 3.0 \times 3.0 \times 0.5^{3/2} = 3.18$  cfs  $> 3.85/2$  (3' wide rundown is adequate).  
Off-site flows will flow out through the westerly driveway.

**CALCULATION OF 100-YEAR, 10-DAY VOLUME:**

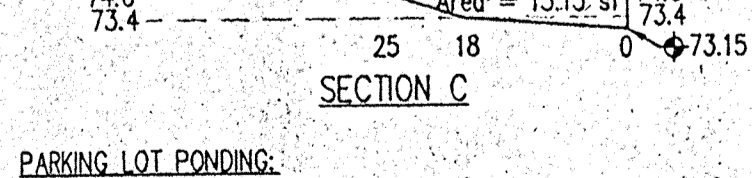
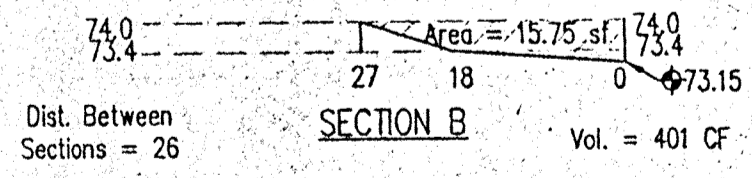
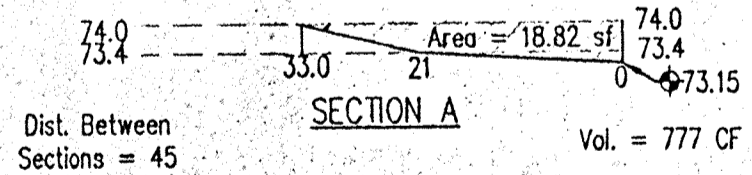
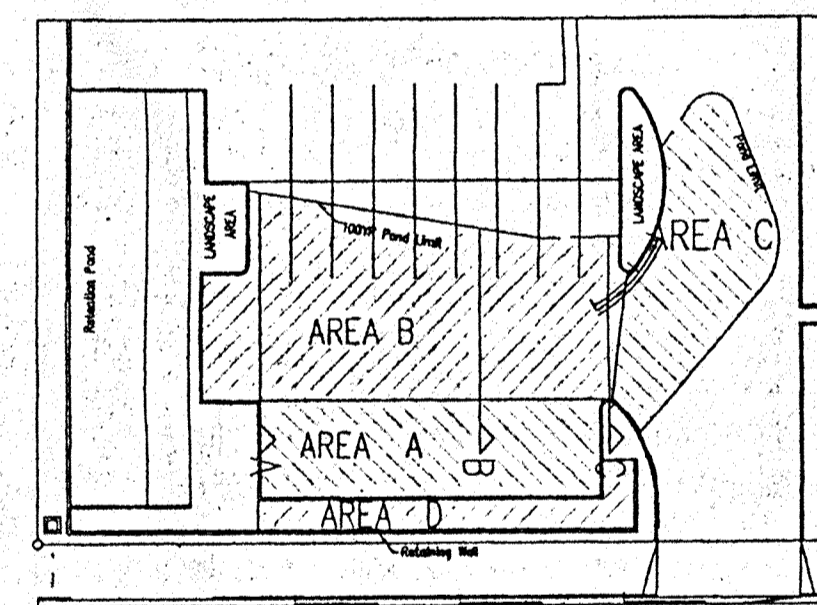
$V_{100-year, 10-day} = V_{360} + A (P_{10-day} - P_{360})/12$   $P_{10-day} = 4.90''$   $P_{360} = 2.60''$

(See Table A-2, City DPM)  $(P_{10-day} - P_{360}) = 4.90'' - 2.60'' = 2.30$  in  
 $V_{360} = (A_A + A_B + A_C)(E_w/12)$   
 $E_w = (E_{D,A} + E_{D,B} + E_{D,C}) A_T$   $A_T = 38,610$  sf  $A_B = 4,623$  sf  $A_C = 2,610$  sf  $A_D = 31,377$  sf

$E_B = 0.92$   $E_C = 1.29$   $E_D = 2.36$  cfs Zone 3. (See Table A-8, City D.P.M.)  
 $E = (0.92 \times 4,623) + (1.29 \times 2,610) + (2.36 \times 31,377)/38,610 = 2.115$  in.

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

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



**PARKING LOT PONDING:**

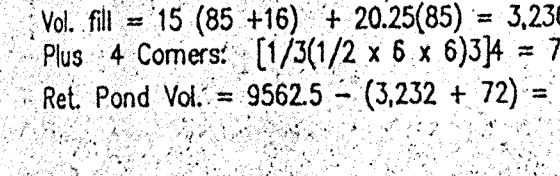
Area A =  $20' \times 68' \times 0.97$  (ave.) = 1,319 cf  
Area B (See cross sections above)  
Vol =  $777 + 401 = 1,178$  cf

Area C =  $1236$  sf. Use Pyramid Eq.  $V = BH/3$   
Vol =  $(650 \times 0.85)/3 = 184$  cf  
Area Above Retention Pond (74.0 to 72.5)  
Vol =  $25 \times 85 \times 1.5 = 3,187$  cf

TOTAL PARKING LOT PONDING  
TOTAL VOLUME =  $1,319 + 1,178 + 184 = 2,681$  CF

**RETENTION POND:**

Required Volume =  $12,819$  cf -  $(2,681 + 4,039) = 6,099$  cf  
Total Vol. of Pond w/o side slopes  $25' \times 85' \times 4.5' = 9,562.5$  cf  
Vol. fill =  $15$  (85 + 16) +  $20.25$ (85) =  $3,236$  cf  
Plus 4 Corners:  $[1/3(1/2 \times 6 \times 6)]H = 72$  cf (Pyramid Eq.)  
Ret. Pond Vol. =  $9,562.5 - (3,232 + 72) = 6,254.5$  cf  $> 6,099$  cf



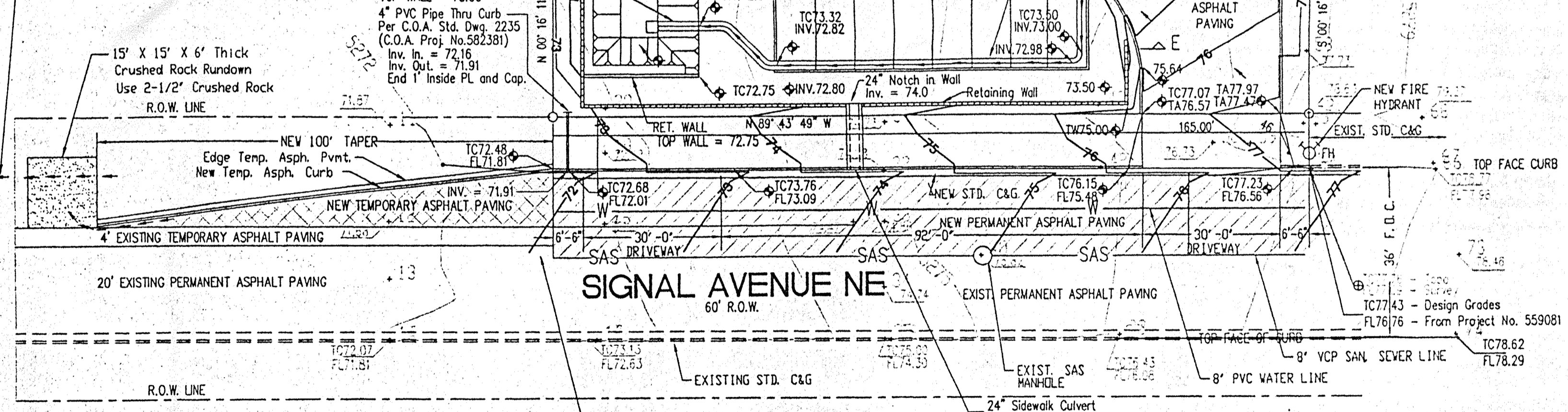
**MISCELLANEOUS PONDING:**

Area D = Area South of Parking Lot.  
 $(70 \times 6 + 6 \times 6) 0.75 = 342$  cf  
Area Around Retention Pond (Slopes to Pond)  
Use Pyramid Equation,  $V = (Area \times depth)/3$   
Vol. =  $(1,021 \times 1.5)/3 = 510$  cf  
Area Above Retention Pond (74.0 to 72.5)  
Vol. =  $25 \times 85 \times 1.5 = 3,187$  cf

TOTAL MISC. PONDING:  
TOTAL MISC. VOL. =  $342 + 510 + 3,187 = 4,039$  cf

- LEGEND**  
AG=ALLEY GUTTER  
S C&G=STD. CURB & GUTTER  
TC=TOP CONC. CURB  
FL=FLOW LINE CONC. CURB  
TAC = TOP ASPHALT CURB  
FLA = FLOW LINE ASPHALT CURB  
SANITARY SEWER MANHOLE  
EXIST. SPOT ELEVATION  
EXISTING CONTOUR  
NEW SPOT ELEVATION  
NEW CONTOUR

**RUNDOWN CALCULATIONS:**  
AREA =  $5 \times 165 \times 18 = 14,850$  SF  
AREA = 0.34 ACRE  
Land Treatment = D  $q_{100} = 5.02$  cfs/acre.  
 $Q_{100} = 0.34 \times 5.02$  cfs/acre = 1.71 cfs  
Exist. Roadside Slope



**GRADING AND DRAINAGE PLAN - INTERIM CONDITIONS**

SCALE: 1"=20.0'

**DRAINAGE NOTES:**

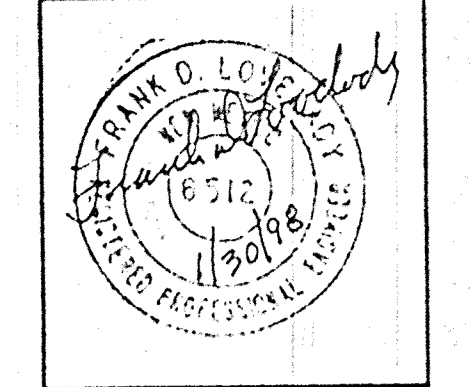
- The site is located in a partially developed area where some of the streets are still unpaved and underground infrastructure is incomplete. The lot is located on a relatively high portion of an area that is predominantly flat and ribboned with numerous braided arroyo channels. There are no historic 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.

**BENCHMARK INFORMATION:**

BASIS OF ELEVATION: ACS 9-C18  
TOPOGRAPHIC SURVEY BY E. MAXWELL DOAK-SURVEYORS



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

**KEN HOVEY, ARCHITECT**  
601 251-0003 • FAX 601 251-3007 • 3605 SHAW AVE. SE • ALBUQUERQUE, NM • 87105

JOB NO: 9736  
DATE: 21 JULY 1997  
REVISIONS

SHEET NO:  
**C-2**

SIGNAL-IDWG (JANUARY 30, 1998)



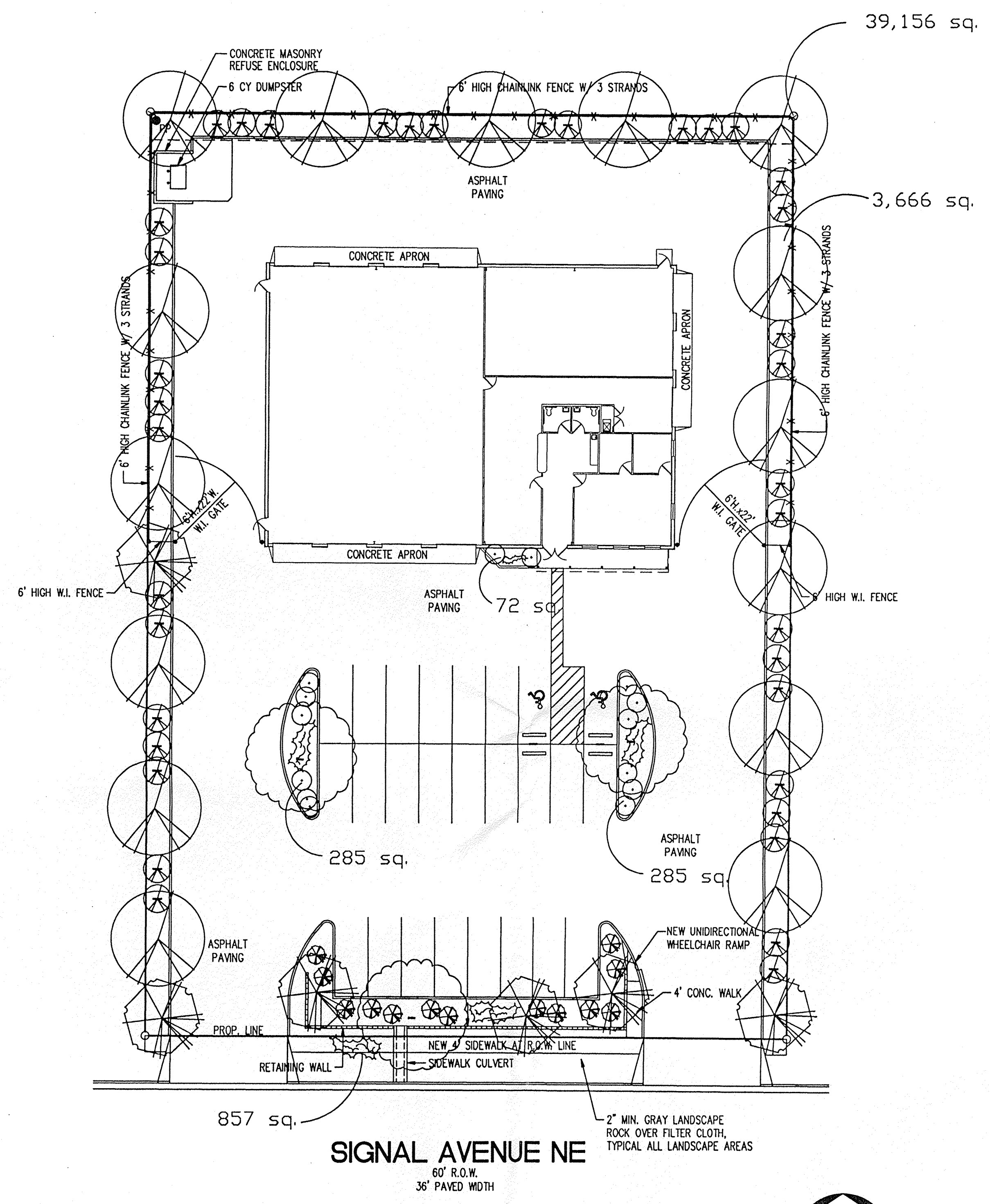
Offices & Warehouse Facility for  
**Royal Plumbing & Heating**  
 6401 SIGNAL AVENUE NE, ALBUQUERQUE, NEW MEXICO

**KEN HOVEY, ARCHITECT**  
 8001 294-0033 • FAX 850 251-8071 • 3808 SIMS AVE. SE • ALBUQUERQUE, NM • 87108

JOB NO:	9736
DATE:	26 JUNE 1997
REVISIONS	
	14 JANUARY 1998

SHEET NO.  
**C-3a**

- 2" CAL ASH(H)(3)  
Fraxinus pennsylvanica
- 15 GAL HONEY LOCUST(H)(15)  
Gleditsia triacanthos
- 15 GAL FLOWERING PEAR(H)(5)  
Pyrus calleryana
- 5 GAL CHAMISA(L)(37)  
Chrysothamnus nauseosus
- 5 GAL INDIAN HAWTHORN(M)(13)  
Raphiolepis indica
- 5 GAL SILVERBERRY(M)(14)  
Elaeagnus pungens
- 5 GAL TAM JUNIPER(M)(26)  
Juniperus squamata



**LANDSCAPE NOTES:**

All landscaping shall be watered by a complete underground irrigation system operated by automatic timer. Pop Up spray heads to sod lawn. Bubblers to trees and drip irrigation to shrub areas. Irrigation system maintenance shall be the responsibility of the Property Owner.

Landscape maintenance shall be the responsibility of the Property Owner.

It is the intent of this plan to comply with the City of Albuquerque, water conservation landscaping and waste water ordinance, planting restriction approach.

Approval of this plan does not constitute or imply exemption from water waste provisions of the water conservation landscaping and water waste ordinance. Water management is the sole responsibility of the Property Owner.

**IRRIGATION NOTES:**

Pop Up heads to SOD lawn  
 Trees to receive (5) 1.0 GPM Drip Emitters  
 Shrubs to receive (1) 1.0 GPM Drip Emitters  
 Drip and bubbler systems to be tied to 1/2" poly pipe with flush caps at each end

Run time per each drip valve will be approximately 15 minutes per week, to be adjusted according

Point of connection for irrigation system is unknown at current time and will be coordinated in the field.

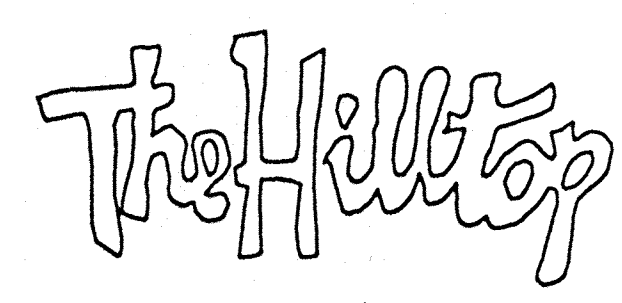
Irrigation will be operated by automatic controller. Location of controller to be field determined and power source for controller to be provided by others.

**LANDSCAPE PLAN** ULTIMATE CONDITION  
 SCALE: 1"=20.0'

**LANDSCAPE CALCULATIONS**

NET LANDSCAPE AREA	
TOTAL LOT AREA	39,156 square feet
TOTAL BUILDINGS AREA	8,420 square feet
TOTAL OFFSITE AREA	0 square feet
NET LOT AREA	30,736 square feet
LANDSCAPE REQUIREMENT	4,611 square feet
TOTAL LANDSCAPE REQUIREMENT	4,611 square feet
TOTAL LANDSCAPE PROVIDED	5,533 square feet
TOTAL BED PROVIDED	5,533 square feet

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Offices & Warehouse Facility for  
**Royal Plumbing & Heating**  
 6401 SIGNAL AVENUE NE, ALBUQUERQUE, NEW MEXICO

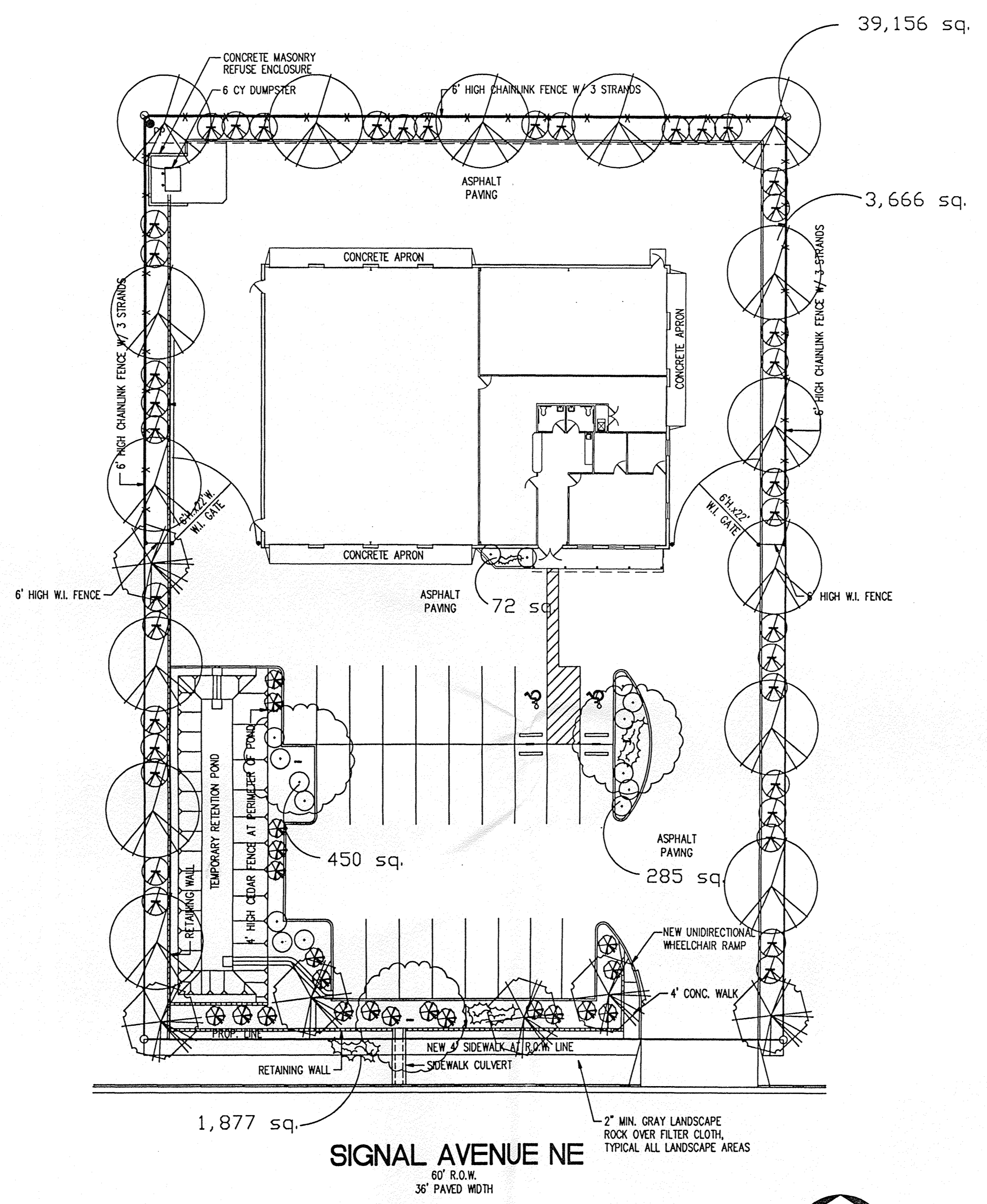
**KEN HOVEY, ARCHITECT**  
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JOB NO:	9736
DATE:	26 JUNE 1997
REVISIONS	
	14 JANUARY 1998

SHEET NO.

C-3

- 2" CAL ASH(H)<3>  
Fraxinus pennsylvanica
- 15 GAL HONEY LOCUST(H)<15>  
Gleditsia triacanthos
- 15 GAL FLOWERING PEAR(H)<5>  
Pyrus calleryana
- 5 GAL CHAMISA(L)<37>  
Chrysothamnus nauseosus
- 5 GAL INDIAN HAWTHORN(M)<21>  
Raphiolepis indica
- 5 GAL SILVERBERRY(M)<15>  
Elaeagnus pungens
- 5 GAL TAM JUNIPER(M)<24>  
Juniperus squamata



**LANDSCAPE NOTES:**

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Landscape maintenance shall be the responsibility of the Property Owner.

It is the intent of this plan to comply with the City Of Albuquerque, water conservation landscaping and waste water ordinance, planting restriction approach.

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Point of connection for Irrigation system is unknown at current time and will be coordinated in the field.

Irrigation will be operated by automatic controller. Location of controller to be field determined and power source for controller to be provided by others.

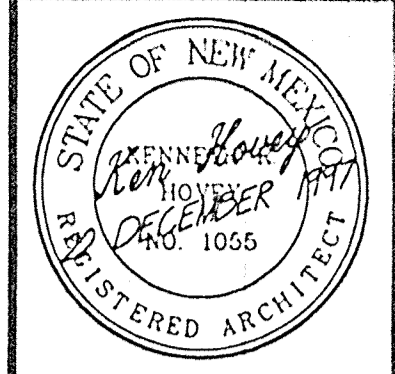
**LANDSCAPE PLAN** INTERIM CONDITION  
 SCALE: 1"=20.0'

**LANDSCAPE CALCULATIONS**

NET LANDSCAPE AREA	
TOTAL LOT AREA	39,156 square feet
TOTAL BUILDINGS AREA	8,420 square feet
TOTAL OFFSITE AREA	0 square feet
NET LOT AREA	30,736 square feet
LANDSCAPE REQUIREMENT	4,611 square feet
TOTAL LANDSCAPE PROVIDED	6,350 square feet
TOTAL LANDSCAPE PROVIDED	6,350 square feet

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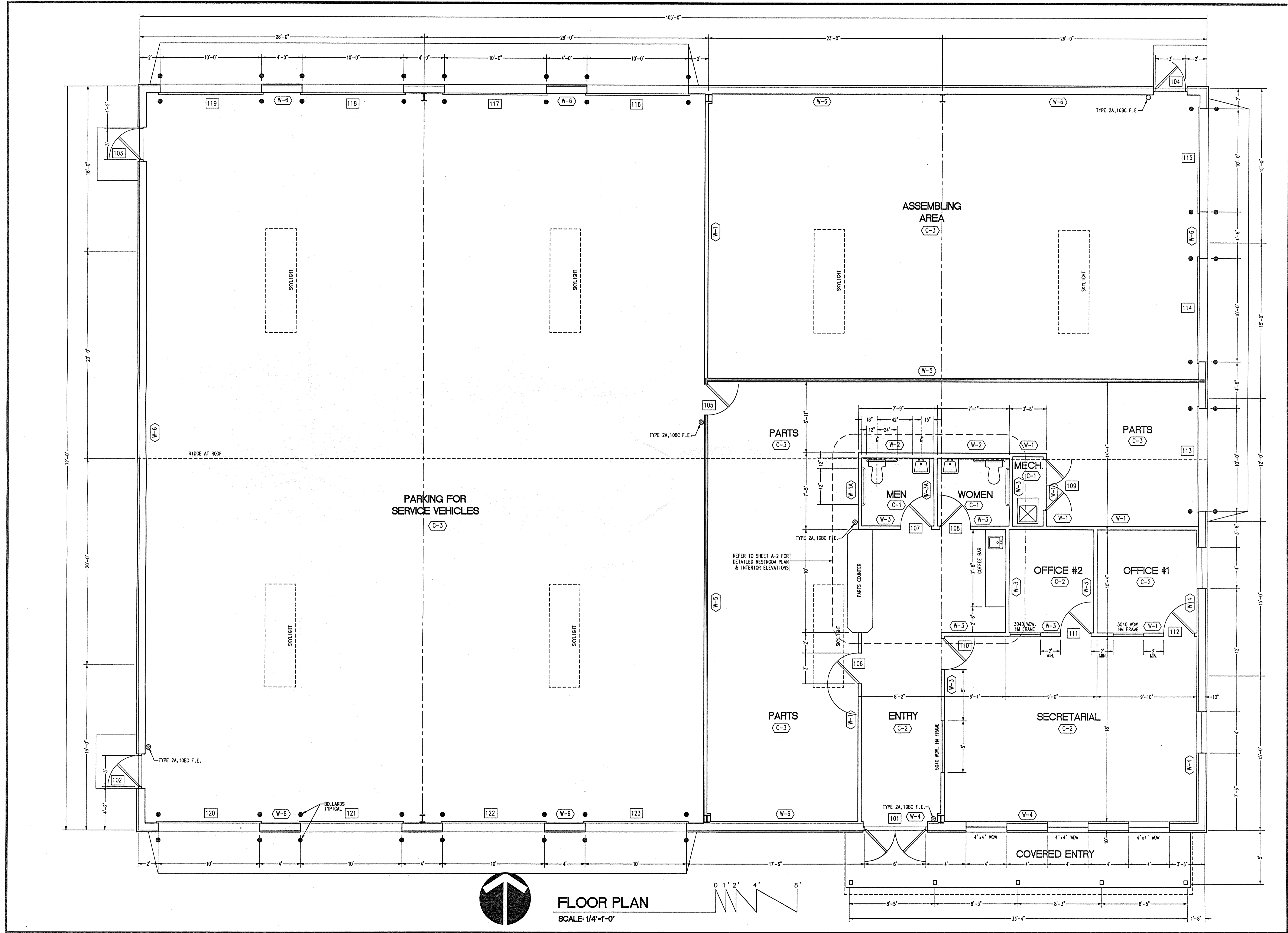


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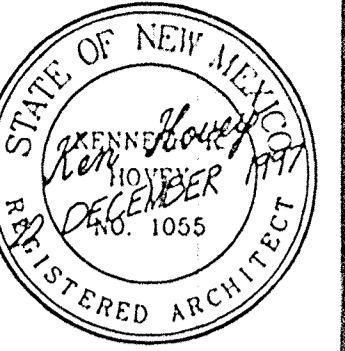
**KEN HOVEY, ARCHITECT**  
 8031 24-0083 • FAX 8031 254-8091 • 3008 54th AVE. SE • ALBUQUERQUE, NM • 87105

JOB NO:	978
DATE:	22 DECEMBER 1997
REVISIONS	
	14 JANUARY 1998

SHEET NO.  
**A-1**







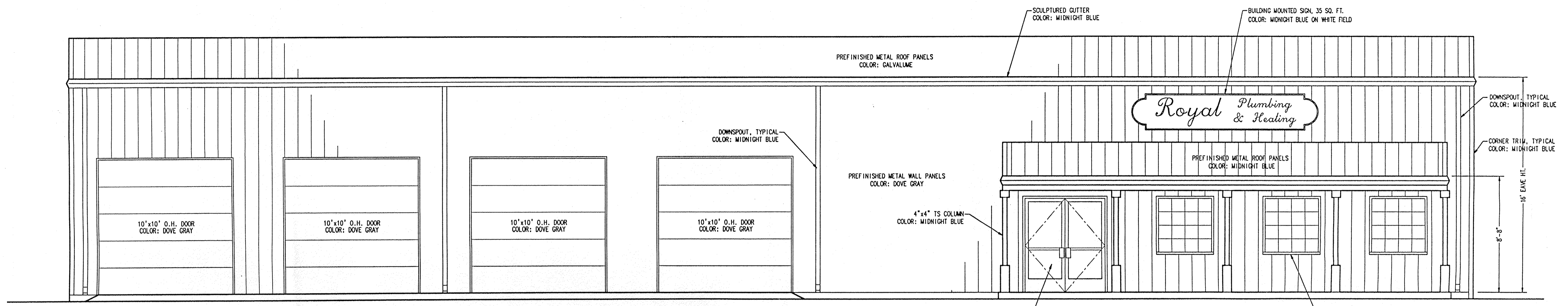
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**Royal Plumbing & Heating**  
 6401 SIGNAL AVENUE NE, ALBUQUERQUE, NEW MEXICO

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 5501 24th Avenue SE • Albuquerque, NM • 87106  
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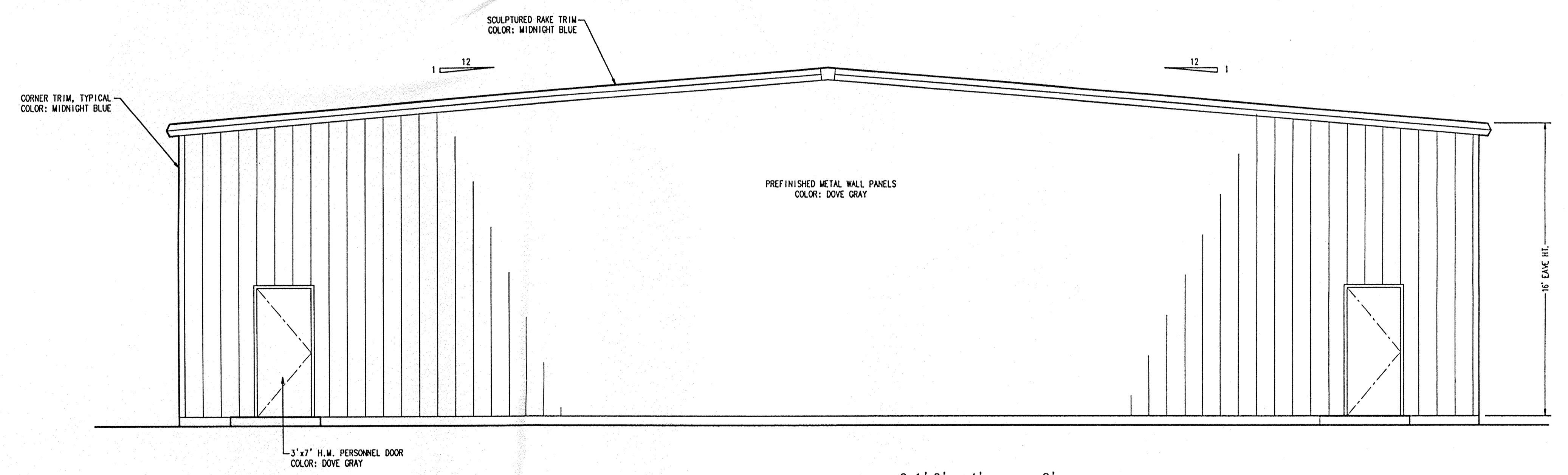
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	14 JANUARY 1998

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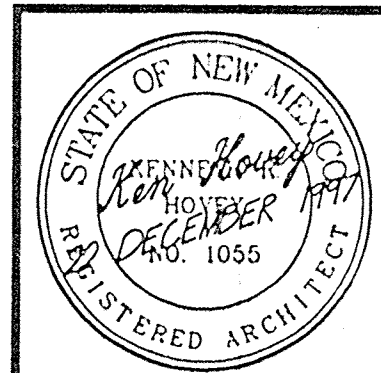
**A-3**



**SOUTH ELEVATION**  
 SCALE: 1/4"=1'-0"



**WEST ELEVATION**  
 SCALE: 1/4"=1'-0"

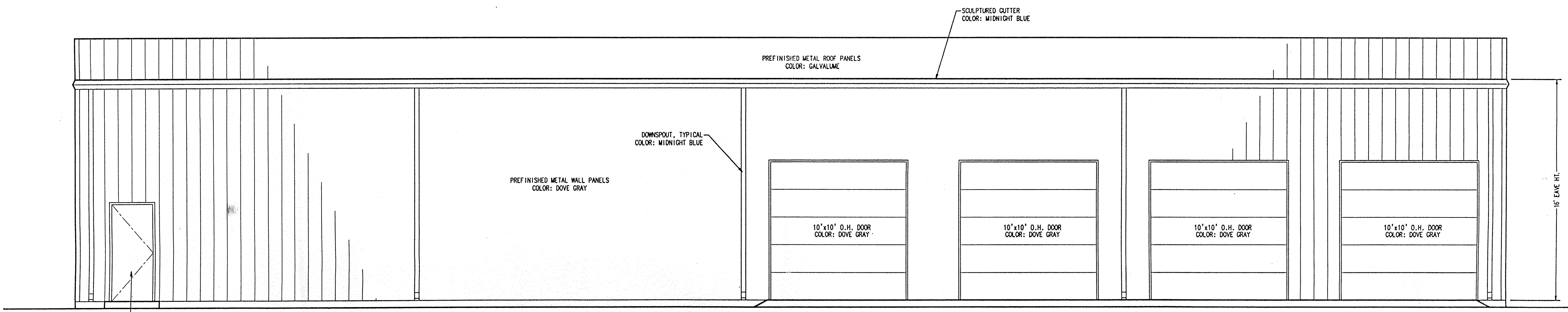


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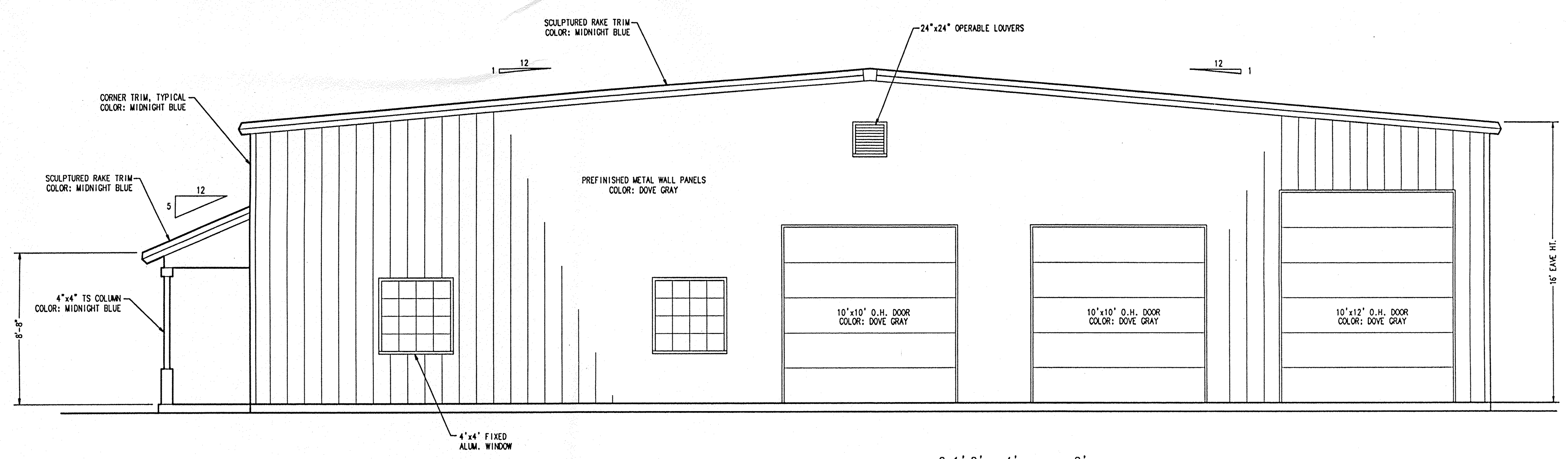
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JOB NO:	4718
DATE:	22 DECEMBER 1997
REVISIONS	

SHEET NO.  
**A-4**



**NORTH ELEVATION**  
SCALE: 1/4"=1'-0"



**EAST ELEVATION**  
SCALE: 1/4"=1'-0"