HYDROLOGY

K17/D24

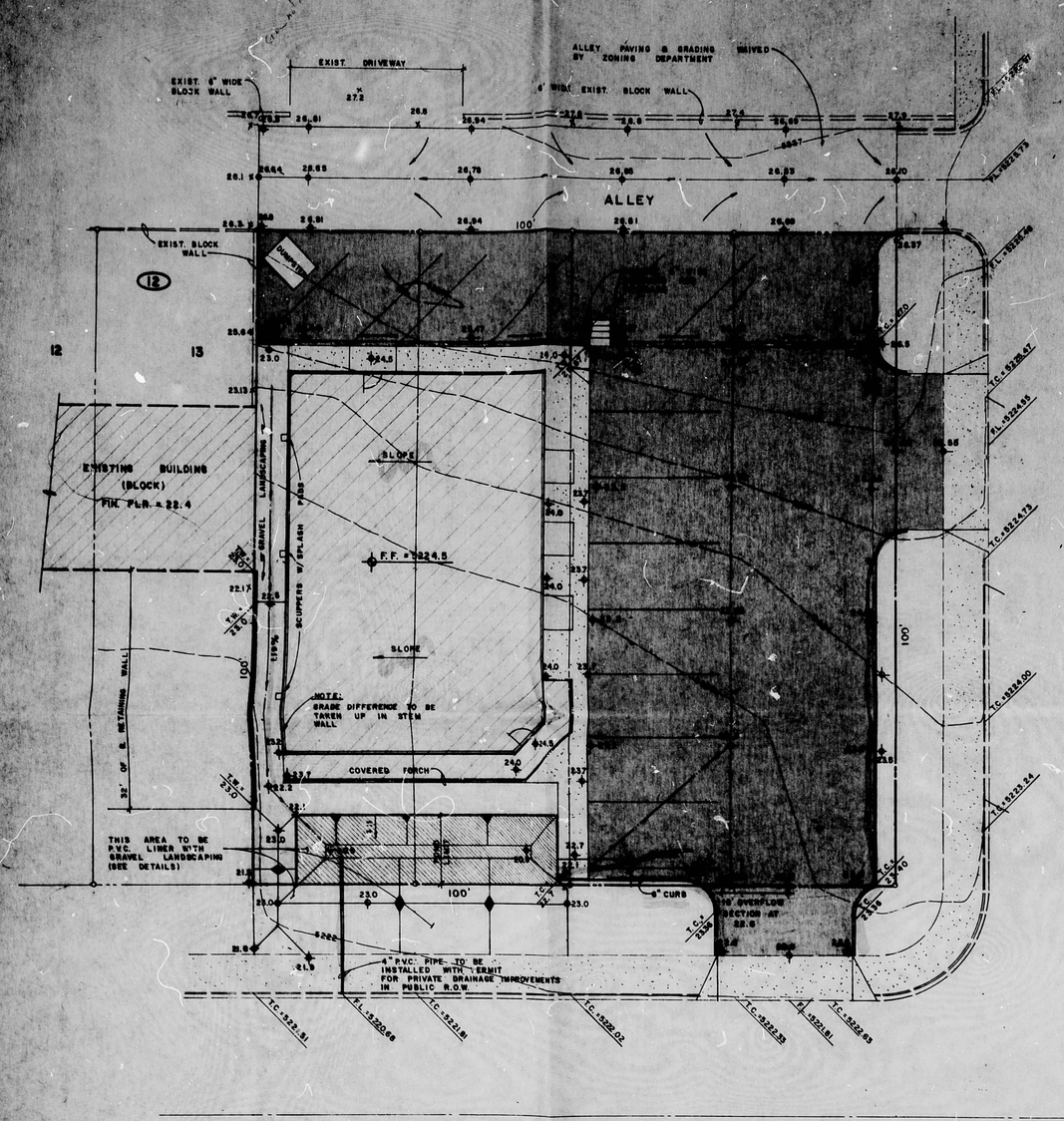
ONE PLAN

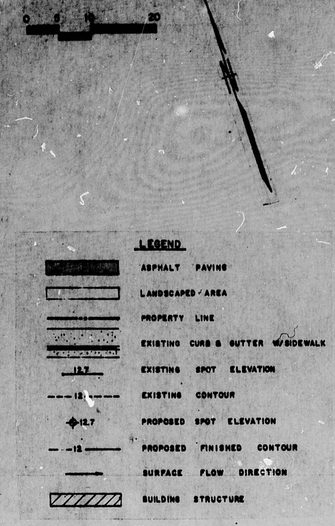
1 PLAN FOR

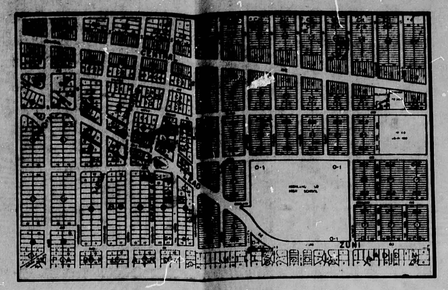
OFFICE BIDG.

4205 LEAD

K17—D24







VICINITY MAP - K-17

BM.: CITY OF ALBUQUERQUE
BENCH MARK 5K17
ELEV. = 5233.23

T.B.M.: TOP OF FLANGE ON F. HYDRANT ON THE NNW RETURN
ELEV. = 5225.65

DRAINAGE NOTES AND CALCULATIONS

1. **Legal Description:** Lots numbered 9 thru 12 in Block 12 of the Mesa Grande Addition.
2. **Zoning:** C-1
3. **Soil Type:** As per the USDA Soil Conservation Report on Soils in Bernalillo County, this soil is defined as gravelley fine sandy loam of the Hydrologic Soil Group B.
4. **Off-site Flows:** This site is defined as "infill" and only the alley contributed an off-site flows to it. Coal Avenue is defined as a flood plain therefore the building finish floor is elevated approximately 2.5' above the top of curb on Coal Avenue, so the building is effectively flood proof.
5. **Undeveloped Condition:** The site is currently 100% pervious, therefore using Plate 22.2C-1, DRM, Vol. 2, C = 0.34. Plate 22.D-1, DRM, Vol. 2 generates a rainfall amount of 2.3 inches using a time of concentration t_c equal to 10 minutes the rainfall intensity (I) equal $P(6.84)t_c^{-0.51} = (2.3)(6.84)(10)^{-.51} = 4.9$ inches/hour. $Q = CIA = 0.34(4.9)(\frac{10,000}{43,560}) = 0.4$ c.f.s. for the 100 year storm; 10 year flow rate = 0.657(.4) = 0.25 c.f.s.
6. **Developed Drainage Management Plan:** The drainage shall all be routed thru a detention pond and released thru a 4" diameter pipe to Lead Avenue, SE.

$C_{developed}$ equal 1

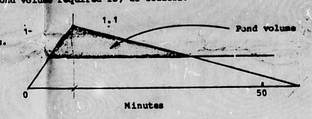
Q_{100} Developed = CIA = (1.0)(4.9)(10,000/43,560) = 1.1 c.f.s.

Volume = (2.3)(10,000 sq. ft.)(1/12) = 1,917 cubic feet

$$t_b = \frac{2\ \text{Volume}}{(q_p)} = \frac{2(1917)}{(1.1)(.6)} = 58 \text{ minutes}$$

Allowable head on 4" pipe = $22^3 - 20^9 = 1.4'$ - $Q = Ca\sqrt{2gh} = 0.5$ c.f.s.

Min Pond volume required is, as follows:



Pond volume required = 1/2(1.1-0.5)(58-26)(60) = 576 cubic feet.

Actual Pond Volume Provided:

Elevation	Area	Average Area	Depth	Volume
20^9	49			
		253	1.2'	304
22	456			

Pond will overflow at 0.93 c.f.s. or 0.5 c.f.s. thru pipe & 0.43 thru the driveway.

Check Parking Lot Outflow Capacity

$Q = CLH^{3/2} = Q = CIA = (1.0)(4.9)(5575/43560) = 0.63$ c.f.s.

$H_{allowable} = 23 - 22.6 = 0.4$

C = 3.0

$L = \frac{Q}{CH^{3/2}} = \frac{1.1}{(3)(.4)^{3/2}} = 1.45'$ Provide 10' O.K.

Check West Swale Capacity

Q = CIA = (1.0)(4.9)(4425/43560) = 0.5 c.f.s.

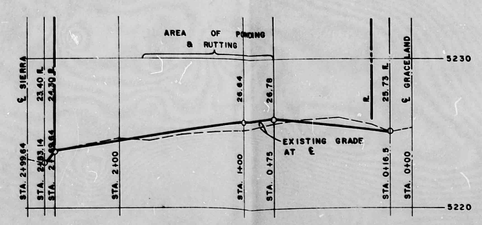
Use ditch at slope = $\frac{23^2 - 22^2}{70} = 0.0119$ ft./ft.

D	Q
.5	1.6
.4	.9
.3	.4

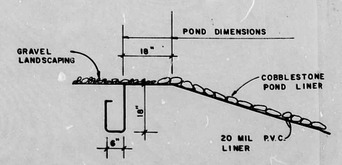
d = 0.3' O.K.; velocity = 1.85 f.p.s. O.K.

NOTE

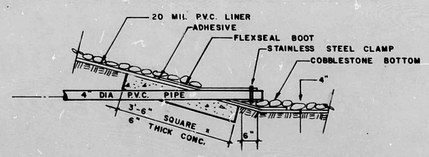
THIS IS TO CERTIFY THAT THE OWNER OF THE OFFICE BUILDING AT 4205 LEAD S.E. HEREBY RECOGNIZES & ACCEPTS THE POND WITHIN 15 FEET OF THIS BUILDING



ALLEY GRADES



P.V.C. ANCHOR TRENCH DETAIL



PIPE DETAIL
1" = 2'

K17/D24

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REVISIONS	DATE
7-15-83	10/14/83
7-15-83	12-5-83
DESIGNED A.W.	9-83
DRAWN A.W.	9-83
CHECKED A.K.	9-83

REVISED 7-15-83
DRAINAGE / GRADING PLAN
OFFICE BUILDING AT 4205 LEAD S.E.

ANDRE HOULE NEW MEXICO 7876 REGISTERED PROFESSIONAL ENGINEER

SHEET 1 OF 1