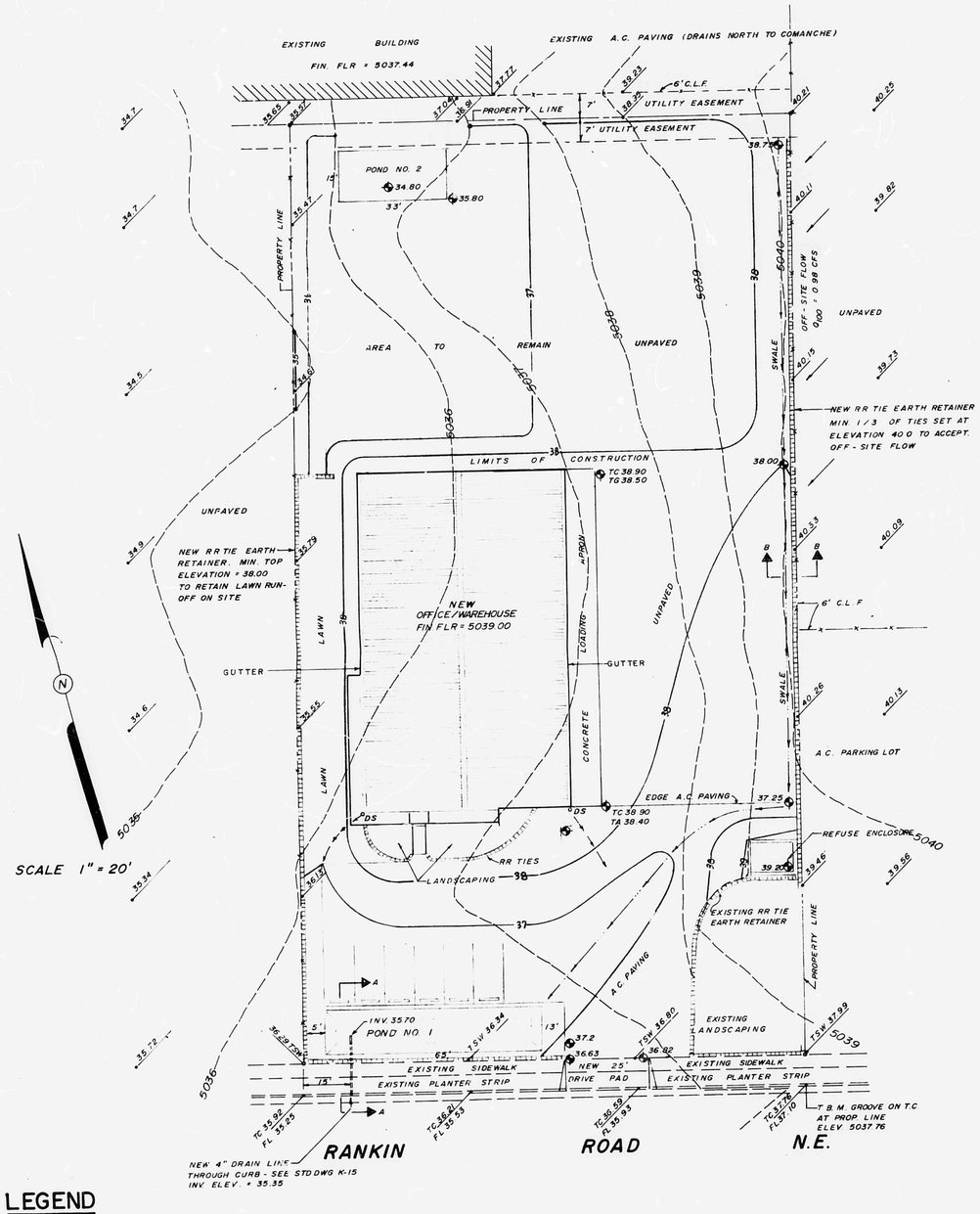
HYDROLOGY

G15/D27
ONE PLAN

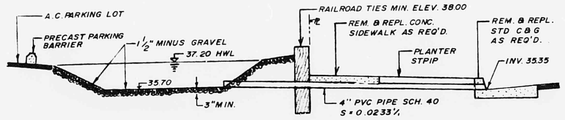
G 15/D27

1 PLAN



LEGEND

EXISTING	NEW	DESCRIPTION
		PROPERTY LINE
		SPOT ELEVATION
		SWALE
		CURB & GUTTER
		DOWNSPOUT



SECTION A-A
1/4" = 1'-0"

DRAINAGE CALCULATIONS

I. REFERENCES:

A. City of Albuquerque Development Process Manual (DPM) Volume 2, Design Criteria, Chapter 22, Drainage, Flood Control and Erosion Control.

B. Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico, United States Department of Agriculture, Soil Conservation Service.

C. Floodway Map, Panel 23 of 50, Federal Emergency Management Agency, October 14, 1983.

II. GENERAL INFORMATION:

A. Soil Type (Ref.B., Sheet No. 21) Soil type is BkD, Bluepoint-Kokan association. The Hydrologic Soil Group is "A".

B. Imperviousness:

Type of Surface	Existing Area Sq.Ft.	Existing Area Acres	Proposed Area Sq.Ft.	Proposed Area Acres
Building roof			6540	0.1501
Concrete Surfaces			900	0.0207
Asphalt Surfaces			6940	0.1593
Landscaping Undeveloped surface	42000	0.9642	27620	0.6341
Site total	42000	0.9642	42000	0.9642
Percent impervious	0%		34%	

C. "C" Factor (See Ref. A., Plate 22.2 C-1)
1. Unieveloped "C" Factor = 0.17
2. Developed "C" Factor = 0.33

D. Rainfall, 100-year, 6-hour, R_6: (See Ref.A., Plate 22.2 D-1) R_6 = 2.2 inches.

E. Time of Concentration, T_c: Use 10 minutes.

F. Rainfall Intensity, I; (See Ref. A, Plate 22.2 D-2)

$I = R_6 \times 6.84 \times T_c^{-0.51} = 2.2 \times 6.84 \times (10)^{-0.51}$

$I = 4.65$ In/Hr

III. PEAK DISCHARGE:

A. Existing Conditions. Use Rational Equation)
$Q_{100} = 0.17 \times 4.65 \times 0.96 = 0.76$ cfs
$Q_{10} = 0.657 \times 0.76 = 0.5$ cfs

B. Developed Conditions.
$Q_{100} = 0.33 \times 4.65 \times 0.96 = 1.47$ cfs
$Q_{10} = 0.657 \times 1.47 = 0.96$ cfs

IV. PEAK VOLUME:

A. Existing Conditions.
$V_{100} = 0.17 \times (2.2/12)\ 42{,}000 = 1309$ cf

$V_{10} = 0.657 \times 1309 = 860$ cf

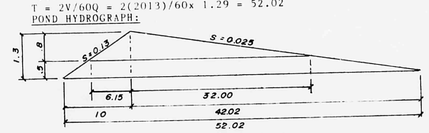
B. Developed Conditions:
$V_{100} = 0.33 \times (2.2/12)(42000) = 2541$ cf
$V_{10} = 0.657 \times 2541 = 1669$ cf

V. POND NO. 1 CALCULATIONS:

Building Roof	6540SF
Concrete	900
A.C. Paving	6940
Landscaping, Pond, etc.	11870
Total	26250 = 0.6026 acres

Percent Impervious 55% C = 0.46
$Q_{100} = 0.46 \times 4.65 \times 0.6026 = 1.29$ cfs
$V_{100} = (2/12)26250 = 2013$ cf
$T = 2V/60Q = 2(2013)/60x\ 1.29 = 52.02$

POND HYDROGRAPH:



V = 0.8(6.15 +32.0) 0.5 x 60 = 916 cf
Actual Pond Volume = 62' x 10' x 1.5' = 930 cf

VI. POND NO. 2 CALCULATIONS:

Area = 42,000 - 26,250 = 15,750 sf = 0.36 acres
$Q_{100} = 0.17 \times 4.65 \times 0.36 = 0.28$ cfs
$V_{100} = 0.17(2.2/12)15{,}750 = 490$ cf
Assume 1' Deep x 15' Wide pond.
Width = 490/15 = 32.7' Use 33'

VII. POND NO. 1 POSITIVE DISCHARGE:

Invert of 4" pipe = 37.70 . Elev. of overflow through driveway = 37.20. Use Orifice Equation $Q = CA(2gh)^{\frac{1}{2}}$ C=0.6
$Q = 0.6 \times 0.0873\ (2 \times 32.2 \times 1.33)^{0.5} = 0.48$ or approx. 0.5 as used in the hydrograph.

VIII. OFF-SITE FLOW:

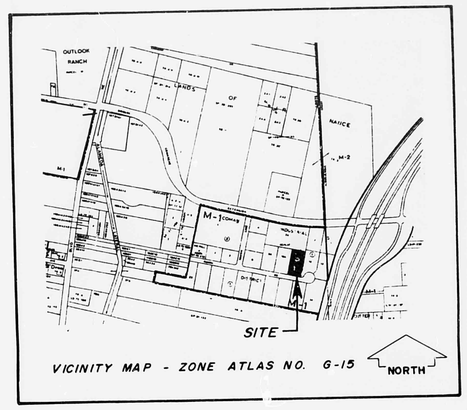
Area is approx. 150 x180 with a 60'x90' building.

Unpaved	21600 x 0.17 = 3672
Building	5400 x 1.00 = 5400
	2700 = 9072

Weighted "C" Factor = 9072/27000 = 0.34
$Q_{100} = 0.34 \times 4.65 \times 27000/43560 = 0.98$ cfs

IX. SWALE TO CONVEY OFF-SITE FLOW:

Section B-B. Use Mannings Equation. For "V" ditch, Depth = 0.4 feet Slope = 5:1 S = 0.0075 A = 0.4 x 2 = 0.8 SF $P = 2(0.4^2 + 2^2)^{0.5} = 4.08$ ft. R = 0.8/4.08 =0.196
$V = (1.486/\ 0.03)(0.196)^{2/3})(0.0075)^{\frac{1}{2}} = 1.45$ fps (non-erosive) $Q = 0.8 \times 1.45 = 1.16$ cfs > 0.98 cfs



VICINITY MAP - ZONE ATLAS NO. G-15

DRAINAGE COMMENTS:

1. LOT 10-A TO THE WEST IS PARTIALLY DEVELOPED AND A NEW BUILDING IS UNDER CONSTRUCTION IS UNDER CONSTRUCTION. NO OFF-SITE FLOW COMES FROM THIS LOT.

2. PROPERTY TO THE NORTH IS FULLY DEVELOPED. DRAINAGE IS TO COMANCHE ROAD.

3. LOT 12 TO THE EAST IS DEVELOPED. THE SOUTH PORTION OF THE LOT IS PAVED AND THE REAR PORTION HAS A BUILDING AND UNPAVED STORAGE YARD. NORTH OF LOT 12, A SMALL AREA ABOUT 30 X 50 GENERATES OFF-SITE FLOW AFFECTING THIS SITE. ALL OFF-SITE FLOW IS ACCEPTED AND IS CONVEYED TO THE STREET VIA THE SWALE TO POND NO. 1 AND OUT THROUGH THE DRIVE PAD WHEN THE POND IS FULL.

4. POND NO. 2 DOES NOT HAVE A POSITIVE DISCHARGE. HOWEVER, THE AREA IS SHOWN BY THE BERNALILLO COUNTY SOILS MAP TO BE AN OLD GRAVEL AND SAND MINING AREA. THIS IS CONFIRMED BY VISUAL INSPECTION. THE SOIL IS CLEAN SAND WITH LITTLE OR NO SILT OR CLAY AND WILL PERMIT RAPID INFILTRATION:

CONSTRUCTION NOTES:

1. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE AT 765-1234 FOR LOCATION OF EXISTING UTILITIES.

2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL POTENTIAL OBSTRUCTIONS; SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.

3. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, RULES, AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.

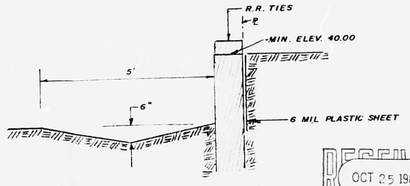
4. ALL CONSTRUCTION WITHIN CITY RIGHT-OF-WAY SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE CITY OF ALBUQUERQUE STANDARDS AND PROCEDURES.

BENCH MARK:

CITY OF ALBUQUERQUE BENCH MARK 3-G15 LOCATED ½ MILE S. OF GRIEGOS OPPOSITE HOUSE NO. 4208 WEST SIDE OF EDITH. 40 PENNY NAIL IN POWER POLE. ELEV. 4979.566 FT./1517.775 M.

LEGAL DESCRIPTION:

LOT 11A, Block 1, COMM INDUSTRIAL DISTRICT.



SECTION B-B
1/2" = 1' - 0"

RECEIVED OCT 25 1985 HYDROLOGY SECTION

REVISIONS	BY

GRADING & DRAINAGE PLAN
OFFICE / WAREHOUSE BUILDING
801 RANKIN ROAD, N.E.

FRANK D. LOVELADY NEW MEXICO 6512 REGISTERED PROFESSIONAL ENGINEER
OCTOBER 16, 1985

DRAWN	
CHECKED	
DATE	
SCALE	
JOB NO.	
SHEET	ONE
OF	ONE SHEETS

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