HYDROLOGY

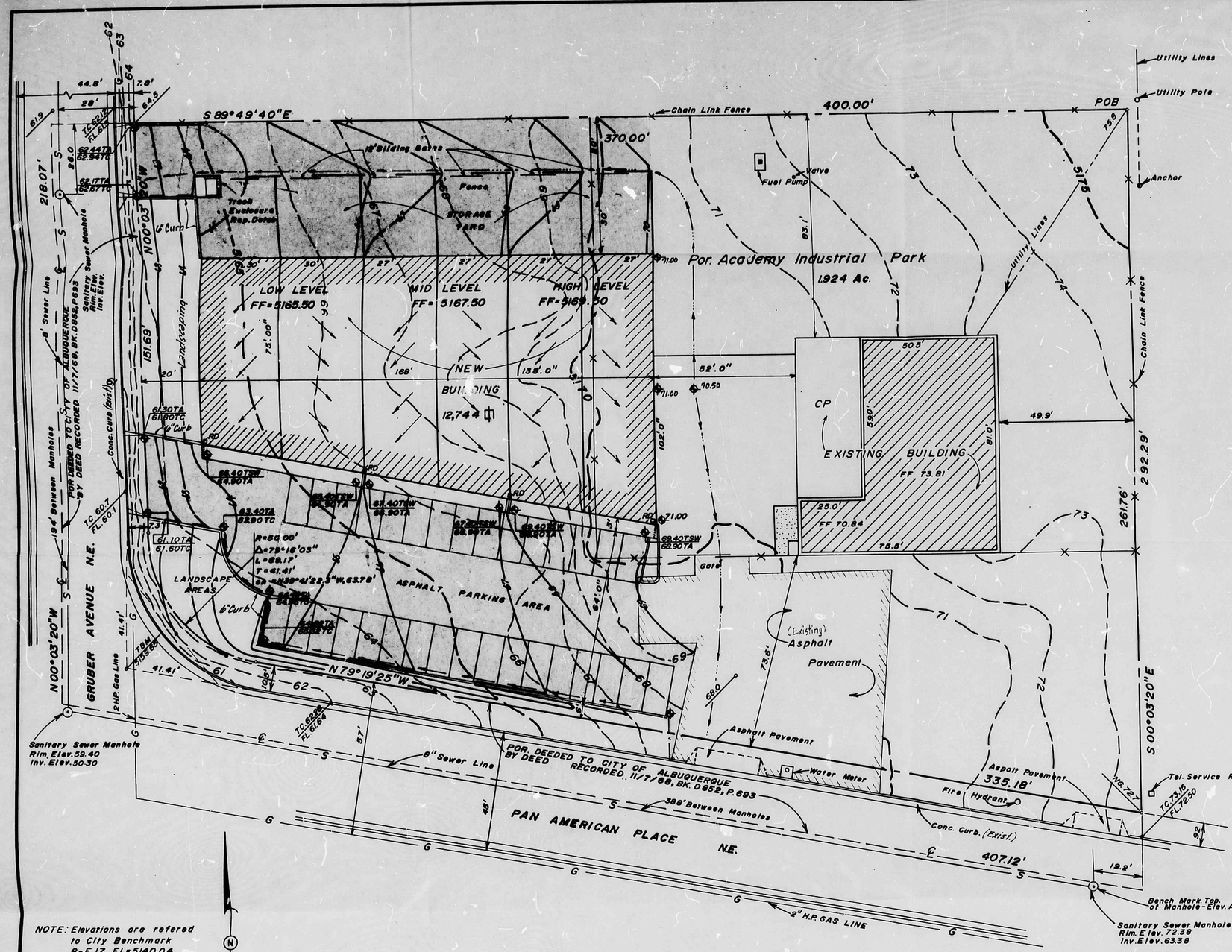
E17/D2.8

ONE PLAN

1 PLAN
FOR

HUGO BERNADETTE
PLBG. + HTG. ADD

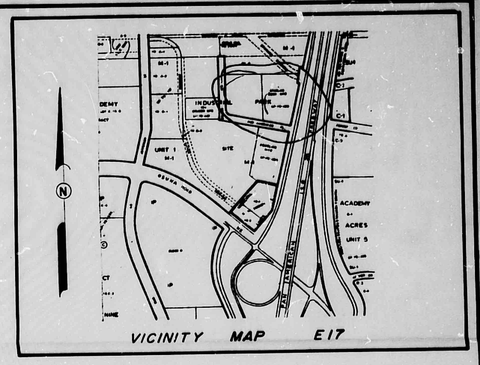
E-17-D59



LEGEND:

DESCRIPTION	EXISTING	NEW
FLOW DIRECTION		
CONTOUR		70
SPOT ELEVATION		
PROPERTY LINE		
ROOF DRAIN		RD

TC = TOP CURB
TA = TOP ASPHALT
FL = FLOW LINE



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 No. 16 of 50, Effective October 14, 1983, prepared by the Fereral Emergency Management Agency.

II. GENERAL INFORMATION:

A. Soil Type (Ref.B., Sheet No. 21) Soil type is EmB, Embudo gravelly fine sandy loam, 0 to 5 percent slopes. The Hydrologic Soil Group is "B".

B. Imperviousness:

Type of Surface	Existing Area Sq.Ft.	Existing Area Acres	Proposed Area Sq.Ft.	Proposed Area Acres
Building roof	6000	0.1377	18213	0.4181
Concrete Surfaces	-	-	710	0.0163
Asphalt Surfaces	18000	.4132	36917	0.8475
Landscaping & Undeveloped surface	59766	1.3721	27926	0.6411
Site total	83766	1.9230	83766	1.9230
Percent impervious	29%		67%	

C. "C" Factor (See Ref. A., Plate 22.2 C-1)
1. Undeveloped "C" Factor = 0.47
2. Developed "C" Factor = 0.67

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; By the Kirpich Equation:

$T_c = 0.0078\ (L^{0.77}/S^{0.385})$ L = 400 ft.

Delta Elev. = 14 ft. S = 14 / 400 = 0.035 = 2.9 min.
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} = 0.47 x 4.65 x 1.92 = 4.20 cfs
Q_{10} = 0.657 x 4.20 = 2.76 cfs

B. Developed Conditions.
Q_{100} = 0.67 x 4.65 x 1.92 = 5.98 cfs
Q_{10} = 0.657 x 5.98 = 3.92 cfs

IV. DOWNSTREAM CAPACITY:

There is an existing ditch connecting the Pan American Place/Gruber Avenue intersection with the existing channel known as "Beta" channel. This existing ditch must carry all runoff from the site and adjacent property, approximately 6.4 acres. Assume minimum time of concentration of 10 minutes. Assume C = 0.70
Q = CIA = 0.7 x 4.65 x 6.4 = 20.8 cfs

Boundaries of the drainage area are as follows:
On the north by an existing drainage channel.
On the east by I-25 Frontage Road.
On the South by Pan American Place.
On the west by Gruber Avenue.

The actual ditch cross section varies but appears to be an average of 3 feet wide with 1:1 side slopes and could easily accomodate a depth of 1.5 feet. The slope is approximately 2%. By Mannings Equation, the Capacity is as follows:
A = 6.75' P = 7.24 feet R = 6.75/7.24 = 0.93'

$Q = A(1.486/n)R^{2/3}S^{1/2}$ Assume n = 0.035

$Q = 6.75(1.486/0.05)0.93^{0.667} \times 0.02^{0.5}$ = 38.61 cfs
38.61 cfs > 20.8 cfs The channel has adequate capacity.

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.

EROSION CONTROL MEASURES:

THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR MANAGEMENT OF STORM RUNOFF DURING CONSTRUCTION. HE SHALL INSURE THAT THE FOLLOWING MEASURES ARE TAKEN:

1. ADJACENT PROPERTY SHALL BE PROTECTED AT ALL TIMES BY THE CONSTRUCTION OF BERMS, DIKES, SWALES, PONDS AND OTHER TEMPORARY GRADING AS REQUIRED TO PREVENT STORM RUNOFF FROM LEAVING THE SITE AND ENTERING SAID PROPERTY.

2. ADJACENT PUBLIC RIGHTS-OF-WAY SHALL BE PROTECTED AT ALL TIMES FROM STORM WATER RUNOFF FROM THE SITE. NO SEDIMENT BEARING WATER SHALL BE PERMITTED TO ENTER PUBLIC STREETS.

3. THE CONTRACTOR SHALL IMMEDIATELY AND THOROUGHLY REMOVE ANY AND ALL SEDIMENT WITHIN PUBLIC STREETS THAT HAS BEEN ERODED FROM THE SITE AND DEPOSITED BY STORM RUNOFF.

DRAINAGE COMMENTS:

1. There is no off-site flow entering the site from adjacent private property, nor does any flow generated on this site cross lot lines into any ajoining property.

2. Per the pre-design conference, discharge from the site is dependent upon an easement to "Beta" channel. A copy of the easement has been provided with this plan.

3. Per pre-design conference, discharge from the site is also dependent on there being an adequate rundown from the easement channel into the "Beta" channel. The rundown is gunite and is in good condition.

4. Because of items 2 and 3 above, free discharge is justified.

HERMAN D. LOVELACE
NEW MEXICO
6512
REGISTERED PROFESSIONAL ENGINEER

June 15, 1985

RECEIVED
JUL 17 1985
HYDROLOGY SECTION

GRADING AND DRAINAGE PLAN
FOR
ADDITION TO BERNADETTE PLUMBING AND HEATING
4915 Pan American Place, N.E.
ALBUQUERQUE, NEW MEXICO

EM/D 59