HYDROLOGY G16/D20 ONE PLAN

G 16 / D 20

1 PLAN

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

March 9, 1976

Michial M. Emery
Bohannon, Westman, Huston & Assoc., Inc.
4125 Carlisle Blvd. N.E.
Albuquerque, New Mexico 87107

RE: DRAINAGE REPORT FOR U.P.S. AT COMMANCHE AND I-25

Dear Mr. Emery:

The concept of the subject drainage report is approved. Building or development plans shall include a grading plan. Detailed construction plans signed by the City Engineer are required prior to work in public easements or rights-of-way.

Very Truly Yours,

Kleston H. Laws

Kleston H. Laws
Asst. City Engineer-Hydrology

KHL/tl

cc: John Robert

Public Works Department

Director — Erwin F. Hensch, P. E. 766-7467
Engineering 766-7441 — V. M. Kimmick, P. E.
Street Maint. 766-7755 — G. E. Paul, P. E.
Ass't. Director — Harold R. Orr, Jr. P. E.
Liquid Waste 766-7535 — R. P. Lowe, P. E.
Water 766-7437 — W. H. Otto, P. E.

ENGINEERS & PHOTOGRAMMETRISTS

BOHANNAN WESTMAN HUSTON & ASSOCIATES INC.

4125 CARLISLE BLVD. N.E.
ALBUQUERQUE, NEW MEXICO 87107
PHONE 505 881-2000

February 23, 1976

Mr. Kleston H. Laws
Assistant City Engineer, Hydrology
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Re: Drainage Report - Northeast Corner Parcel of Comanche/ I-25 Intersection

Dear Mr. Laws:

Enclosed for your review and approval are three copies of the drainage report on the subject parcel. If you should have any questions concerning this report, please feel free to contact this office; and we will be happy to answer your questions.

We will be anxious to receive your comments.

Sincerely yours,

Michial M. Emery

Michial M. Emery
Chief Design Engineer

Enclosures

cc: Mr. Dave DeCook, Mexalb Corporation

MME/sh
Job Number E76-027

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE January 19, 1981 REF. NO. C16-020 file

TO: Mr. Vern Hagen, Planning Department

FROM: Bruno Conegliano, Assistant Hydrology Engineer B. C.

SUBJECT: Tract of Land North of Comanche Rd. between Interstate Highway 25 and the North Diversion Channel

Substantial pressure for development is being experienced on the tract of land described above. Yet, there are a number of problems that need to be resolved in a comprehensive manner to insure the orderly growth. Two problems in particular are object of concern; one pertains to the future traffic pattern; the other to the provision of satisfactory drainage facilities. To some extent these two problems are interwoven as is reviewed below.

Mr. Bob Fosnaugh of the Traffic Department has indicated that the northerly extension of Vassar Dr. is highly desirable and should be planned for, in anticipation of the expected change to a 'one-way' street of the feeder road east of the Pan-American Freeway. This northerly extension of Vassar Dr., should also allow the connection, south of Montgomery, of Bryn Mawr Dr. which presently ends in a cul-de-sac. I can see how this proposal would benefit the community, but it also could affect adversely the existing drainage facilities. To the north of the so called Hahn Parcel, a drainage easement must be provided in order to supply an outfall, both to these proposed public streets and to all the properties within this tract of land. Unfortunately, west of the Freeway, we are outside the municipal limits and the City cannot perform or recommend improvements on County property. If adequate outfall facilities existed, or could be provided, this condition would represent no more than an inconvenience, because of the need to interface with other agencies; but the problem is complicated because at the present time, no easements are available, and the runoff is just discharged onto the sand and gravel pits north of Carmony Lane. Other problems may exist impacting other departments, but surely what I have described cannot be properly addressed by a single developer concerned with a couple of acres; these problems require a comprehensive approach.

I am, therefore, calling this issue to your attention so that a staff meeting may be called, to review all the problems which may affect the referenced tract of land. The purpose of the meeting would be to obtain the input from all the departments and agencies that would or could be affected. Then we could come up with some recommendation for a possible plan of action. A master plan may have to be requested, so that we will not find ourselves in the position either of not knowing what reply to give to zoning and subdivision requests, or to have to consent to piecemeal development.

BC/fs

[illegible] Hahn
[illegible] Fosnaugh
[illegible]

file

DRAINAGE REPORT FOR
NORTHEAST CORNER PARCEL
COMANCHE/I-25 INTERSECTION
ZONE ATLAS SHEET G-16

FEBRUARY, 1976

BOHANNAN WESTMAN HUSTON

DRAINAGE REPORT FOR

NORTHEAST CORNER PARCEL

COMANCHE/I-25 INTERSECTION

ZONE ATLAS SHEET G-16

FEBRUARY, 1976

BOHANNAN WESTMAN HUSTON & ASSOCIATES INC.

4125 Carlisle Boulevard/NE Albuquerque, New Mexico 87107 Phone 881-2000

DRAINAGE REPORT FOR

NORTHEAST CORNER PARCEL

COMANCHE/I-25 INTERSECTION

ZONE ATLAS SHEET G-16

FEBRUARY, 1976

PREPARED FOR

MEXALB CORPORATION
United Parcel Service
Southwest Region
4255 LBJ Freeway, Suite 292
Dallas, Texas 75234

PREPARED BY

BOHANNAN WESTMAN HUSTON & ASSOCIATES, INC.
4125 Carlisle Blvd., N.E.
Albuquerque, New Mexico 87107

STATE OF NEW MEXICO
MICHIAL M. EMERY
No. 5194
REGISTERED PROFESSIONAL ENGINEER

Michial M. Emery

MICHIAL M. EMERY
N.M.P.E. NO. 5194

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PLATE II - POND LOCATION AND DETAILS

DRAINAGE REPORT FOR

NORTHEAST CORNER PARCEL

COMANCHE/I-25 INTERSECTION

NARRATIVE

Located in a portion of the area bounded by Comanche, I-25, and the North Diversion Channel is a parcel of land that once was the site of the Hahn Flood Control Dam. Recently, the dam site was regraded to reclaim the area for commercial development. The United Parcel Service now desires to develop approximately 12.5 acres of ground at the northeast intersection of Comanche and the I-25 Frontage Road. The purpose of this report is to demonstrate how such a development can be accomplished without aggravating the downstream flooding potential and to insure no upland drainage problems will affect the site.

UPLAND DRAINAGE

Shown on Plate II is the parcel location and the existing contours which were established at the time the site was regraded. In the northwest corner of the parcel, a 10' x 5' box culvert is constructed under I-25. When the site was regraded, a concrete wall was constructed across the front of this culvert and a large metal inlet grate was provided to allow flows to pass into the box culvert between this wall and the existing parapet wall. Backfill was then placed around the culvert until the finished grade was established at the height of the grate.

An analysis was performed to determine to what depth water would pond above this grate before it could pass the peak flow that could be experienced during the 100 year storm. Shown in these computations are the dimensions of this grate and its capacity curve at various depths of water above the grate.

To determine what the peak flow rate that could be experienced by the grate might be, the rational formula was used. Shown on Plate I is the outline of the area that could contribute flow to the grate. An additional box culvert to the north of the one in question could intercept flow from a substantial portion of this area. However, it was assumed that due to poor maintenance and trash accumulation, the grate over this culvert would be totally clogged. In addition, it was assumed that flows from the contributing basins will be permanently held to their existing levels and that any flows from the parcel in question would enter the culvert through a pipe to be constructed through the front wall of the culvert below the grate inlet.

With the above assumptions, it was determined that 170 cfs would be experienced at the grate. Referring to the grate discharge curve, it can be seen that the maximum water depth above the grate would be approximately 1/2 foot. Constructing all finished grades on the site at least 3 feet above this elevation will insure that adequate protection against flooding from upland flows will be provided.

DOWNSTREAM FLOODING POTENTIAL

To determine what the downstream flooding potential might be, the path of the arroyo below the box culvert was traced in the field. Immediately downstream of the box culvert, the flows will pass through an enclosed commercial yard littered with junk cars and scrap metal. Farther downstream, the arroyo has been partially filled and constricted. Crossings of a dirt road, a fill site, a railroad spur, and another commercial site have been accomplished with concrete culvert pipes. After passing under Edith through a large concrete box culvert, the arroyo dies in an open field

presently being used as a borrow site.

For the above reasons, it was determined that the development of the subject parcel should be restricted to not increasing the rate or volume of storm water flows to downstream sites.

CONTROL OF STORM WATER DISCHARGE

To insure the rate or volume of storm water discharge from the site will not be increased, it is proposed that a combination infiltration/evaporation and controlled discharge basin be constructed in the northwest corner of the parcel. It was determined that an increased volumetric flow of 59,827 $ft.^3$ would be experienced from the parcel. It is proposed that the lower portion of the basin below the discharge be provided with this permanent storage volume.

Assuming an antecedent storm has occurred that has filled the above pool, an additional volume of storage above the outfall should be provided to control the discharge to the existing 18 cfs that leaves the parcel now. It was determined that an additional 37,200 $ft.^3$ of volume would be required.

The discharge could be controlled with a broad-crested weir 4.9 feet long. The weir would be the front edge of a concrete box set at the elevation of the water surface in the permanent storage pool. The width of the weir would be 8 inches. The weir discharge coefficient was selected as the average of those over the range of depths at which it would be operating.

The above computations are based on a basin with a bottom area of 28,000 $ft.^2$ and 3:1 side slopes. The depth of the permanent pool would be 2.13 feet, and the maximum depth of the discharge pool would be approximately 1.4 feet. Total depth of the basin would be 4.5 feet to provide freeboard.

An 18-inch reinforced concrete pipe could function as the outlet and

would be run from the bottom of the outlet box through the wall poured in front of the box culvert. The invert of the outlet pipe should be set 4.5 feet below the elevation of the broad-crested weir.

See Plate II for details concerning the pond and its outlet. The bottom of the pond should be scarified annually to a depth of 6 inches to insure its infiltration characteristics are maintained.

RECOMMENDATIONS

1. Construct the pond as detailed on Plate II.
2. Grade the site so that all runoff enters the pond.
3. Provide a routine maintenance program as follows:
   a. Scarify the pond bottom annually to a depth of 6 inches.
   b. Inspect the large grate over the box culvert at the northwest corner of the site monthly to insure it does not become clogged.
4. Develop the site so that all finished grades are 3 feet above the box culvert grate elevation.

CONCLUSION

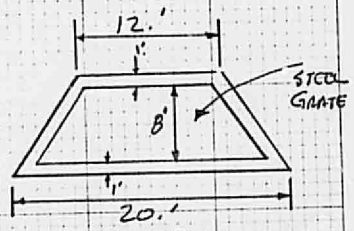
If the above recommendations are followed, the site will be protected from flooding by upland flows; and the potential downstream flooding situation will not be aggravated.

APPENDIX

COMPUTATIONS

CAPACITY OF DROP INLET GRATE

GRATE AREA = $\left(\frac{10+18}{2}\right) 8 = 112 \text{ FT}^2$

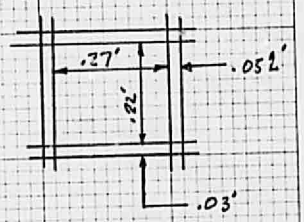


GRATE DIMENSIONS

% OPEN AREA = $\frac{(.27')(.22')}{(.322')(.25')}(100)$

$= \frac{.0594}{.0805}(100)$

$= 73$



TYPICAL GRATE OPENING

$Q = CA\sqrt{2gh} \times \xi$

C = .6 (SQUARE EDGED)

A = (112)(.73) = 82 FT²

ξ = CLOGGING FACTOR = .67

$Q = 264.5\sqrt{h}$

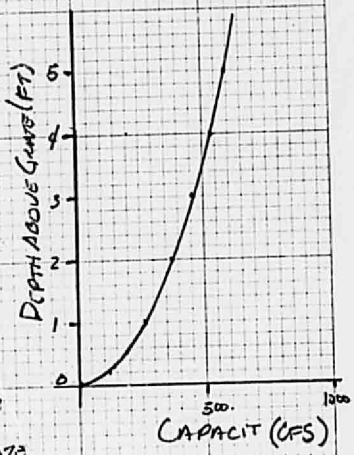
Q = 264.5 CFS @ 1' ABOVE GRATE

Q = 374. CFS @ 2' ABOVE GRATE

Q = 458. CFS @ 3' ABOVE GRATE

Q = 529. CFS @ 4' ABOVE GRATE

Q = 591 CFS @ 5' ABOVE GRATE



PROJECT NAME	UNITED PARCEL SERVICE	SHEET 1	OF 5
PROJECT NO.	76-027	BY MMS	DATE 2-76
SUBJECT	DRAINAGE REPORT	CH'D	DATE

UPLAND DRAINAGE AREA = 9.6 cm^2 (from USGS map)

9.6 cm^2 × 620,000 (conv. factor cm^2 to ft^2) = 5,952,000 ft^2 = 136.64 acres

LENGTH OF DRAINAGE AREA = 2300 FT.

SLOPE = 1.60%

GROUND FACTOR (used Bare Soil) = 1.52

T_c (Time of Concentration) = 28.0 min.

I (intensity in/hr) $I = \frac{189}{t+25}$ = 3.56 in/hr

Q = AIC (RATIONAL FORMULA)

Q = (136.64)(3.56)(.35) = 170 cfs

EXISTING FLOW and VOLUME COMPUTATIONS (used 100 yr, 6 hr. storm = 2.4")

DEVELOPED AREA = 543,886 ft^2 = 12.49 acres

EXISTING

C = .35

$V = \frac{(.35)(2.4)}{(12)}(543,886)$

= 38,072 ft^3

DEVELOPED

C = .90

$V = \frac{(.90)(2.4)}{(12)}(543,886)$

= 97,899 ft^3

PERMANENT STORAGE VOLUME = 97,899 ft^3 − 38,072 ft^3 = 59,827 ft^3

Q = CIA

Q = (.35)(4.2)(12.49)

Q = 18 cfs

Q = CIA

Q = (.90)(5.4)(12.49)

Q = 60.7 cfs

PROJECT NAME UNITED PARCEL SERVICE SHEET 2 OF 5

PROJECT NO. 76-027 BY JAJ DATE 2-76

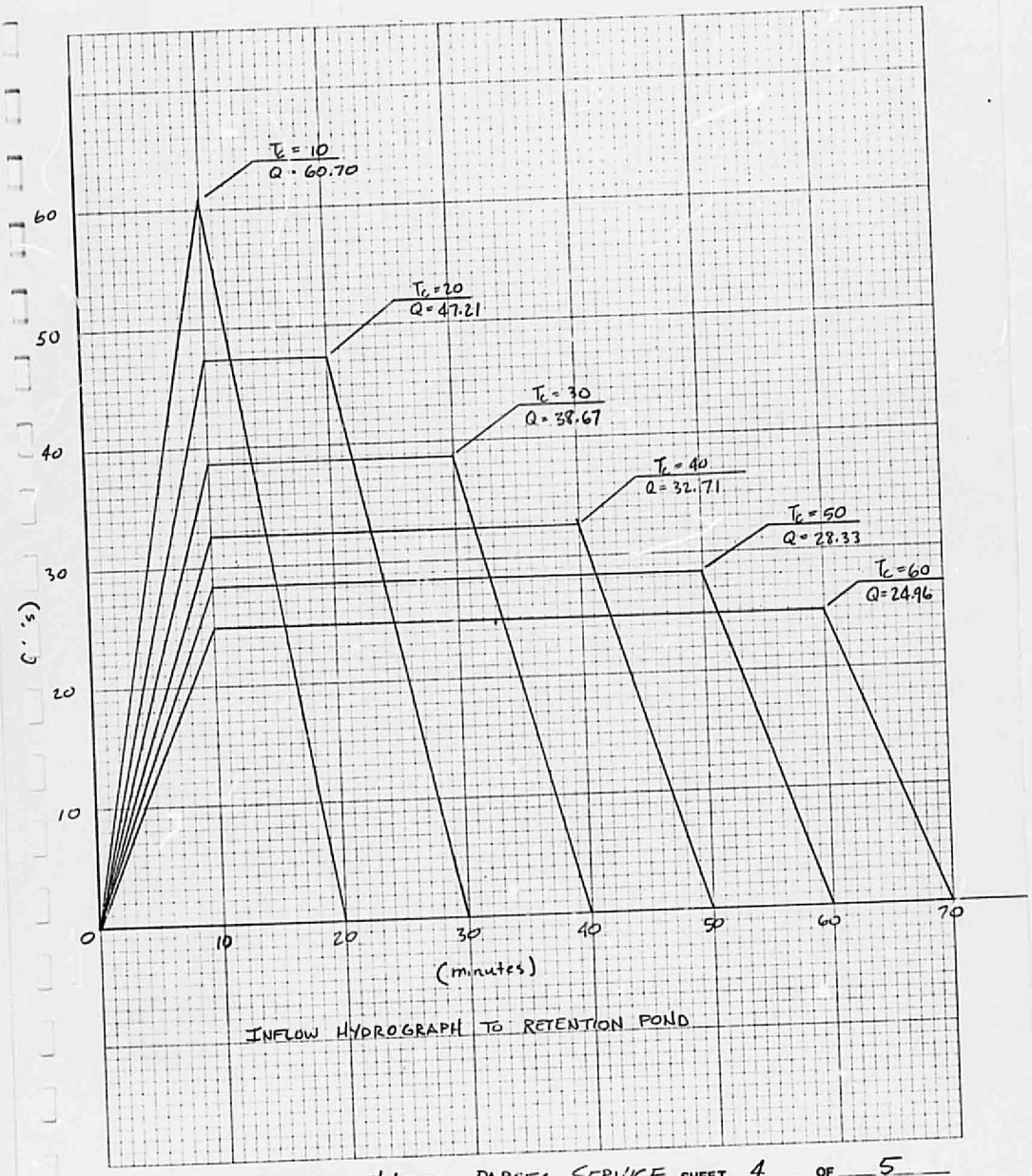
SUBJECT FLOWS and VOLUME CH'D _____ DATE _____

POND VOLUME REQUIREMENTS

100 YR. STORM (min)	INTENSITY (in/hr)	PEAK FLOW RATE (cfs)	STORM RUNOFF VOLUME (ft^3)	RELEASE FLOW (ft^3)	REQUIRED STORAGE VOLUME (ft^3)
10	5.40	60.70	36,420	10,800	25,620
20	4.20	47.21	56,652	21,600	35,052
* 30	3.44	38.67	69,606	32,400	37,206
40	2.91	32.71	78,504	43,200	35,304
50	2.52	28.33	84,990	54,000	30,990
60	2.22	24.96	89,856	64,800	25,056

* CRITICAL STORM DURATION, PROVIDE 37,200 ft^3 OF STORAGE VOLUME TO CONTROL DISCHARGE

PROJECT NAME UNITED PARCEL SERVICE SHEET 3 OF 5
PROJECT NO. 76-027 BY JDJ DATE 2-76
SUBJECT POND VOLUME CH'D _____ DATE _____



INFLOW HYDROGRAPH TO RETENTION POND

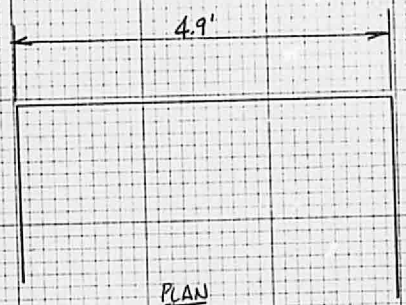
PROJECT NAME UNITED PARCEL SERVICE SHEET 4 OF 5

PROJECT NO. 76-027 BY JDJ DATE 2-76

SUBJECT INFLOW HYDROGRAPH TO RETENTION POND CH'D _____ DATE _____

BOWMAN-HESTNAN HUSTON

WIER DETAILS



PLAN

$$L = \frac{Q}{CH^{2/3}}$$

$$L = \frac{18}{(3)(1.37^{2/3})} = 4.9'$$

PROJECT NAME UNITED PARCEL SERVICE SHEET 5 OF 5

PROJECT NO. 76-027 BY JDJ DATE 2-76

SUBJECT WIER CH'D DATE

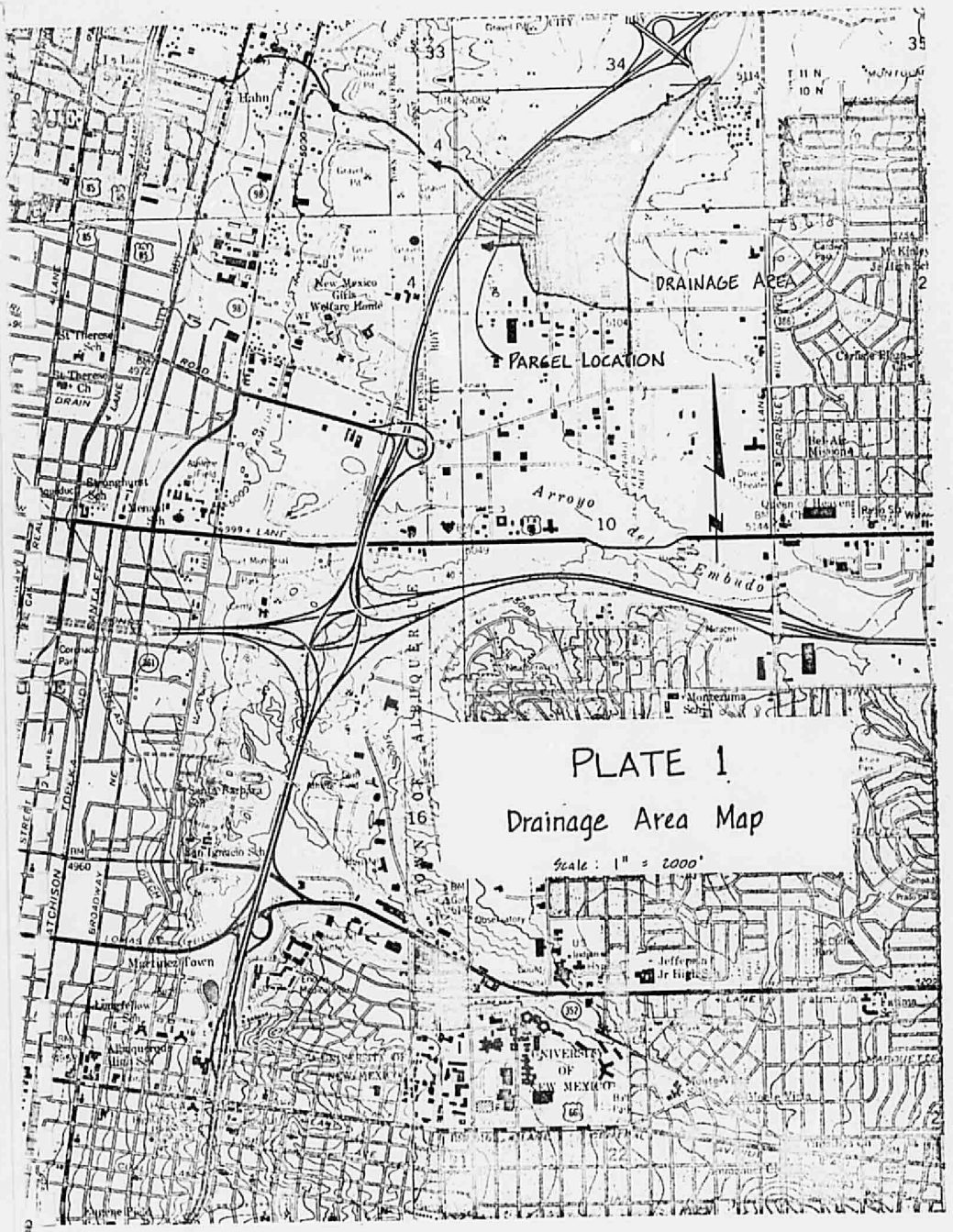


PLATE 1

Drainage Area Map

Scale: 1" = 2000'

BOHANNAN WESTMAN HUSTON & ASSOCIATES, INC.

HYDROLOGY G16/D20 HYER OFFICE BLDG.

G16 / D20

HYER OFFICE
BLDG.

1 PLAN

INFORMATION SHEET

PROJECT TITLE HYER OFFICE BLDG. TYPE OF SUBMITTAL D/G

ZONE ATLAS PAGE NO. G17 D20 CITY ADDRESS

LEGAL DESCRIPTION Tract A, BK8, North Carlisle Addition

ENGINEERING FIRM CTS, Inc CONTACT Andre Hale

ADDRESS PHONE 266-3444

OWNER CONTACT

ADDRESS PHONE

ARCHITECT Norton & Assoc. CONTACT Mark Grasso

ADDRESS PHONE 265-8333

SURVEYOR CONTACT

ADDRESS PHONE

CONTRACTOR CONTACT

ADDRESS PHONE

DATE SUBMITTED 12-7-93

By

RECEIVED

DEC 07 1993

ENGINEERING

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

FILE COPY

December 29, 1983

Mr. Andre Houle, PE
CTS, Inc.
1100 Alvarado NE, Suite A
Albuquerque, NM 87110

REF: HYER OFFICE BUILDING DRAINAGE PLAN (G17-D20)

Dear Mr. Houle:

The above mentioned plan, dated 12/23/83, is hereby approved. Please see that copies of the approved plan as well as approved copies of "Drainage Facilities Within City Right-of-Way" documents are attached to the permit sets prior to submittal to Hydrology for sign-off.

Thank you,

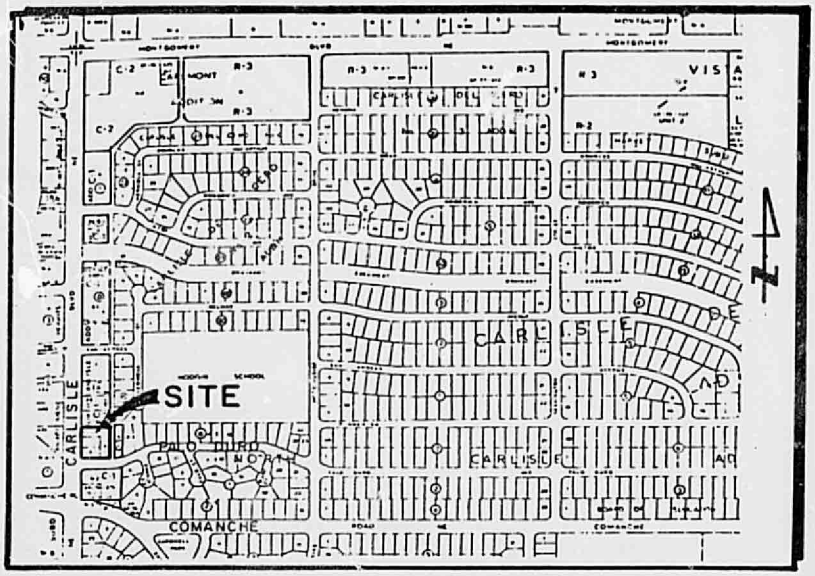
John Armstrong
Civil Engineer/Hydrology

JA:mrk

PERMIT
LOCATION

CITY OF ALBUQUERQUE

DRAINAGE FACILITIES WITHIN CITY RIGHT-OF-WAY



VICINITY MAP - ZONE ATLAS G-17

G17-D20

OWNER: Calvin Hyer Jr.
2920 Carlisle Blvd. N.E.
Albuquerque, N.M.
888-4500

ANDRE HOULE
NEW MEXICO
7876
REGISTERED PROFESSIONAL ENGINEER
12-16-83

NOTICE TO CONTRACTOR

1. An excavation/construction permit will be required before beginning any work within City right-of-way. An approved copy of these plans must be submitted at the time of application for this permit.

2. All work detailed on these plans to be performed, except as otherwise stated or provided hereon, shall be constructed in accordance with "Contract Documents for City-Wide Utilities and Cash Paving No. 31 ".

3. Two working days prior to any excavation, contractor must contact Line Locating Service, 765-1234, for location of existing utilities.

4. Prior to construction, the contractor shall excavate and verify the horizontal and vertical locations of all obstructions. Should a conflict exist, the contractor shall notify the engineer so that the conflict can be resolved with a minimum amount of delay.

5. Backfill compaction shall be according to Residential street use.

C-164

APPROVALS	NAME	DATE
A.C.E./DESIGN	[illegible]	21 Dec 83
INSPECTOR	[illegible]	7-27-84
A.C.E./FIELD	[illegible]	7-30-84

TITLE: 3820 Carlisle Blvd.
Hyer Office Building
Drainage Outfall

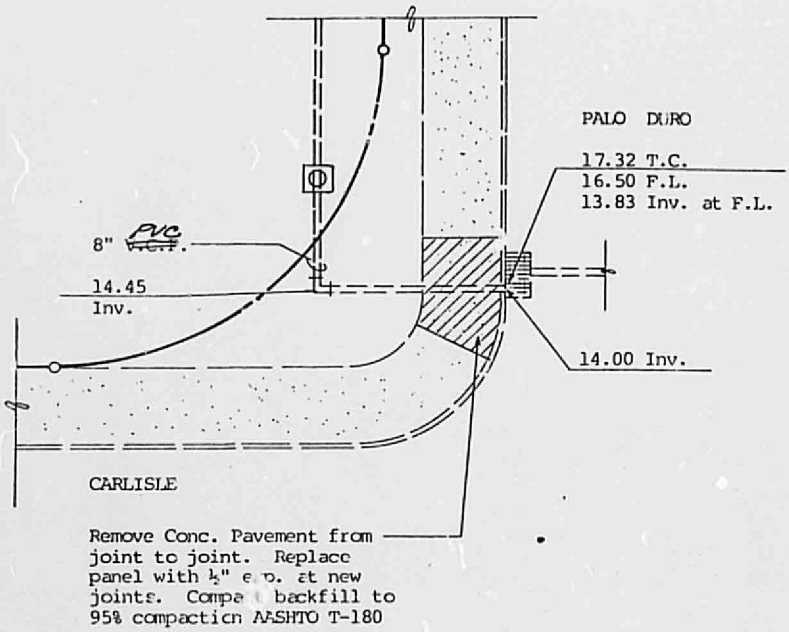
PERMIT NO.

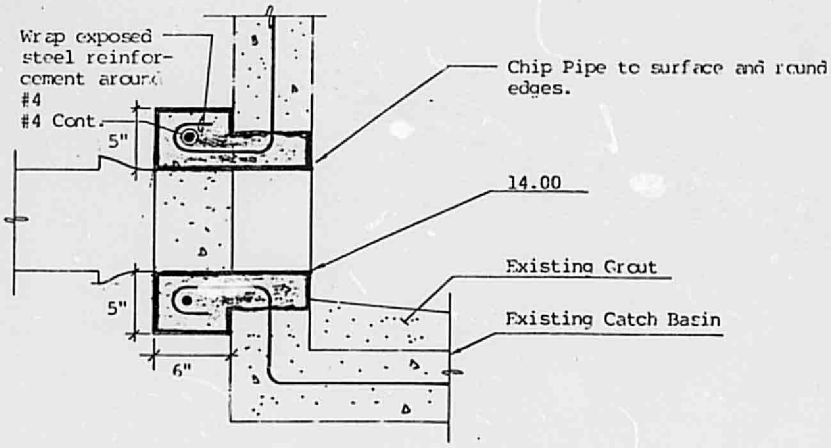
SHEET 1 OF 2

MAP NO. G-17

CITY OF ALBUQUERQUE

DRAINAGE FACILITIES WITHIN CITY RIGHT-OF-WAY





C-164

APPROVALS	NAME	DATE	TITLE: 3820 Carlisle Blvd. Hyer Office Building Drainage Outfall	
A.C.E./DESIGN	[illegible]	21 Dec 83		
INSPECTOR	[illegible]	7-27-84	PERMIT NO.	MAP
A.C.E./FIELD	W. F. McNamara	7-30-84	SHEET 2 OF 2	NO. G-17

1 7 8 2