HYDROLOGY H16/D17 3 PLANS

H16/D17

3 PLANS

H16/D17

3 PLANS

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

January 24, 1978

Thomas T. Mann, Jr., P.E.
Goldberg-Mann & Associates
2329 Wisconsin N.E., Suite E
Albuquerque, New Mexico 87110

RE: McGuire Townhouse Project

Dear Tom:

I have reviewed the drainage report for the McGuire Townhouse Project and I find it in agreement with our prior discussion. The report is therefore hereby approved.

Very truly yours,

Bruno Conegliano
Asst. City Engineer-Hydrology

BC/gm

cc; V.M. Kimmick
Jim Smith
Drainage file

Goldberg · Mann & Associates
Engineers · Planners
2329 Wisconsin N.E., Suite E Albuquerque, New Mexico 87110 (505) 292-1092

January 23, 1978

Mr. Bruno Conigliano
Public Works Department
P. O. Box 1293
Albuquerque, New Mexico

Re: Drainage Study, McGuire Townhouse Project

Transmitted herewith are two (2) copies of the Drainage Study for the McGuire Townhouse Project.

If you have any further questions please feel free to call.

Thomas T. Mann Jr.
THOMAS T. MANN, JR., P.E.
President

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

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

November 10, 1975

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

RE: DRAINAGE STUDY MAGUIRE TOWNHOUSES
NETHERWOOD PARK SUBDIVISION

Dear Mr. Emery:

The subject drainage report is approved and I will sign the development plat. I would suggest the front yard holding areas be reduced to a maximum depth of 6 inches.

Very truly yours,

Kleston H Laws

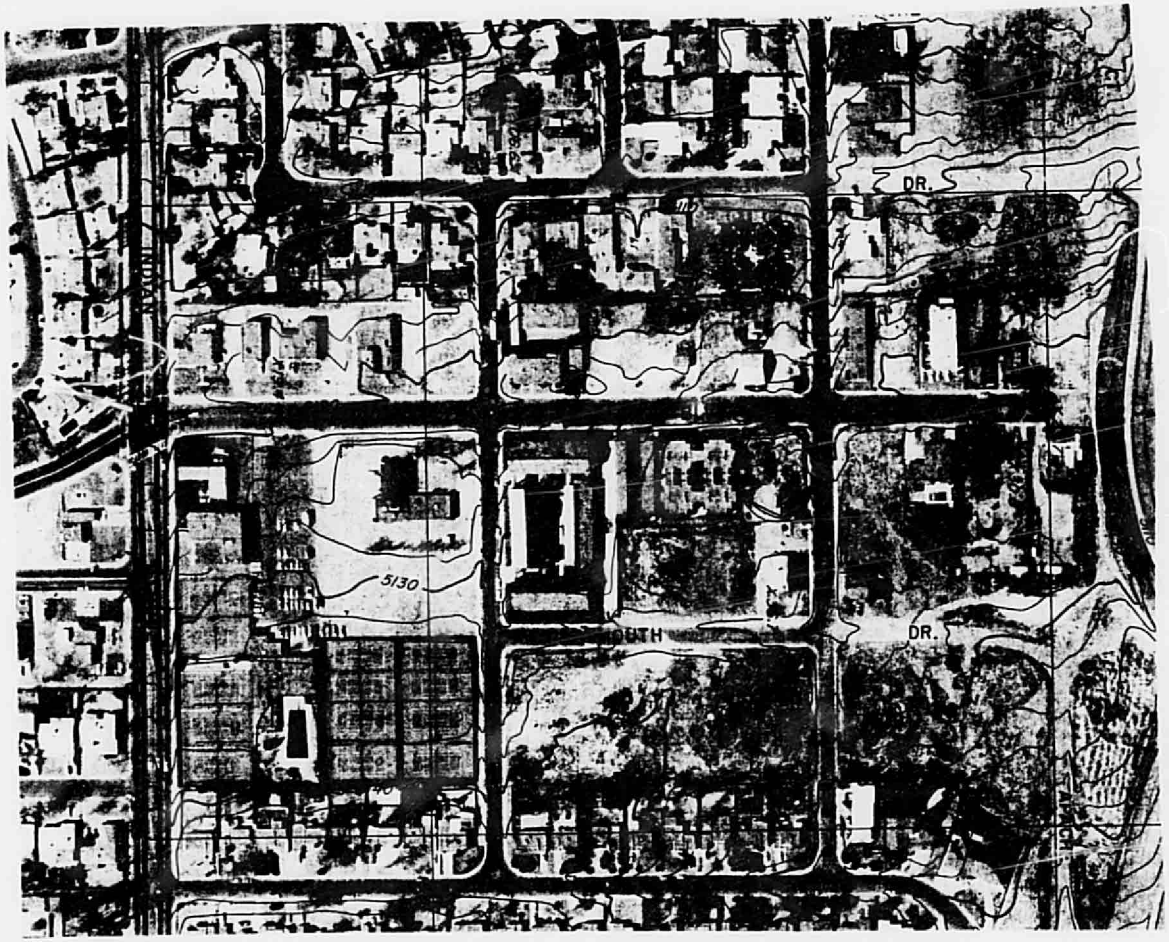
Kleston H. Laws
Assistant City Engineer-Hydrology

KHL/fs

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.


DR.
5130
DR.

3/81

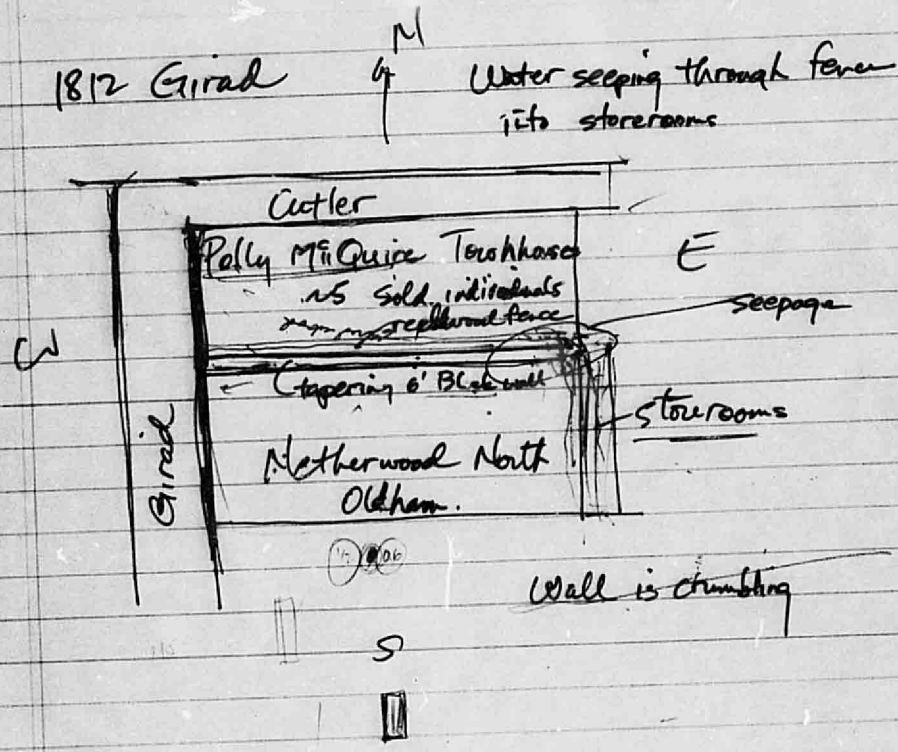
Party: Aubry Oldham
884-9069 work
268-9343 home

Inquire: Stated that water was seeping through adjacent properties back yard and damaging concrete fence on his property.

An inspection by me showed that the wall was being damaged. However, it was difficult to determine whether flow from the property was actually doing any harm.

Told Mr. Oldham that we would be in touch if further problems arose.

1812 Girad


N
Water seeping through fence into storerooms
Cutler
Polly McQuire Torchhouse
.25 Sold individuals
seepage
W
E
Tapering 6' Block wall
storerooms
Girad
Netherwood North
Oldham.
Wall is crumbling
S

received 29 Oct 75

DRAINAGE STUDY

TOWNHOUSING FOR MS. PAULINE P. MAGUIRE

NETHERWOOD PARK SUBDIVISION

ALBUQUERQUE, NEW MEXICO

OCTOBER 1975

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
NEW MEXICO P.E. NO. 5194

received 29 Oct 75

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OCTOBER 1975

PREPARED BY

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Albuquerque, New Mexico 87107

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

Michial M. Emery

MICHIAL M. EMERY
NEW MEXICO P.E. NO. 5194

DRAINAGE STUDY

TOWNHOUSING FOR MS. PAULINE P. MAGUIRE

PURPOSE

The objective of this report is to present a drainage scheme that allows development of the Townhousing for Ms. Pauline P. Maguire without increasing rainfall runoff, compared to runoff under existing conditions.

LOCATION AND PROJECT DESCRIPTION

The Townhousing for Ms. Pauline P. Maguire is a parcel along the north edge of Cutler Avenue between Dartmouth Drive and Girard Boulevard. The property covers .7067 acres, all of which is undeveloped land except for an existing single-family residence on the east edge of the property.

Development will be complete with eight townhouses; each with a combination of pitched and flat roofs, back yards and front yards, two-car garages, and drive pads. Lot size will be 34.5' wide and 100' deep. The property is zoned R-3. (Reference Site Data, Page 1 of Calculations.)

DESIGN CONCEPT

The following design procedures were used:

A. For the purpose of retaining and infiltrating water, a six hour, 100 year storm condition was used.

1. The back yard is graded 11" below finish floor elevation to collect and infiltrate rainfall on the back yard and patio roof.

2. The front yard area as shown on Sheet 1 of the drawings will collect and infiltrate water from pitched roofs, side yards, and front yards.

3. Computations for back yards, pitched roofs, and front yard areas are shown on Page 2 of Calculations.

B. The area affecting runoff into Cutler Avenue was analyzed using the rational method and a 100 year storm, as shown on Page 2 of Calculations.

1. Rain falling on drive pads is discharged directly onto Cutler Avenue.

2. Rain falling on flat roofs will be discharged onto drive pads at a controlled rate of 22 gallons per minute by the use of roof drains. One roof drain per roof is required (total of 16 for the development) - "flo-set" Type No. 4514, or approved equal, Josam Manufacturing Company, Michigan City, Indiana. Reference: Practices in Detention of Urban Stormwater Runoff, APWA-SR-43, Page 39 (see Appendix, Page 3).

3. Computations for the total area undeveloped and for the areas affecting runoff after development are shown on Page 2 of Calculations.

C. A minimum 2 percent grade is proposed for the area from the pitched roof to the depressed area in the front yard. Roof drains, flow patterns, and front yard depressed areas are shown on Sheet 1 of the drawings.

CONCLUSIONS

Townhousing for Ms. Pauline P. Maguire will rely on back yards, front yard depressed areas, and flat building roofs to reduce the runoff discharge. Flat roofs serve as a temporary retention area.

The peak discharge from the entire property in its natural and developed condition for a 100 year storm is 1.34 cfs.

APPENDIX

SITE DATA

AREA OF SITE = 104' X 296' = 30,784 FT² = 0.7067 Ac.

AFFECTIVE AREAS

FLAT ROOFS TOTAL AREA	= 8920 FT²
DRIVE PADS TOTAL AREA	= 3680 FT²
YARDS ADJACENT TO GIRARD AVE & DARTMOUTH DR.	= 2698 FT²
TOTAL AREAS (TO DRAIN ONTO STREETS)	= 15,298 FT² = 0.3512 AC.
BACK, SIDE, AND FRONT YARDS, AND PITCHED ROOFS (TO DRAIN TO DEPRESSED AREA)	= 15,486 FT² = 0.3555 AC
TOTAL AREAS	= 30,784 FT² = 0.7067 AC

AREA, UNDEVELOPED

LENGTH OF BASIN = 104 FT.
SLOPE = 1.18%
AREA, ACRES = 0.7067
C (GROUND CHAR) = 0.35
t_c (MINUTES) ≤ 10.0
I (INTENSITY) = 5.4 (CURVES FOR ALBUQUERQUE AREA, 100 YR. STORM)
Q max (CFS) = (C)(I)(ACRES) = 1.34 CFS

AREA, FULLY DEVELOPED

CALCULATIONS FOR FLAT ROOFS, DRIVE PADS, AND ADJACENT YARDS

LENGTH OF BASIN = 85'
SLOPE = 2.00%
AREA (ACRES) = 0.3512
C (GROUND CHAR.) = 0.84
t_c (MINUTES) ≤ 10.0
I (INTENSITY) = 5.4 (CURVES FOR ALBUQ. AREA, 100 YEAR STORM)
Q max (CFS) = (C)(I)(ACRES) = 1.59 CFS
SINCE 1.59 CFS IS GREATER THAN EXISTING CONDITIONS (1.34 CFS, ABOVE) BY .25 CFS, RAINFALL DISCHARGE FROM FLAT ROOFS WILL BE CONTROLLED:

CALCULATIONS FOR DRIVE PADS:

LENGTH = 28'
SLOPE = 1.15 ÷ 28 = 4.11%
AREA = 0.0845 AC.
C = .95
t_c ≤ 10
I = 5.4
Q max = (C)(I)(A) = 0.43 CFS

PROJECT NAME TOWNHOUSING FOR MS. MAGUIRE SHEET 1 OF 3
PROJECT NO. 75-229 BY RAB DATE 10/28/75
SUBJECT RAINFALL RUNOFF CALCULATIONS CH'D _____ DATE _____

SITE DATA (CONTINUED)

CALCULATIONS FOR ADJACENT YARDS

LENGTH = 16'
SLOPE = 2.00%
AREA = 0.0619 Ac.
C = .35
t_c ≤ 10
I = 5.4
Q_{max} (C)(I)(A) = 0.12 CFS

.43 CFS (DRIVE PADS) + .12 CFS (ADJACENT YARDS) = 0.55 CFS

ALLOWABLE DISCHARGE RATE FROM FLAT ROOFS IS EQUAL TO CFS OF UNDEVELOPED AREAS MINUS CFS OF DRIVE PADS AND ADJACENT YARDS:

(AREA, UNDEVELOPED) 1.34 CFS MINUS (AREA, DRIVE PADS & ADJACENT YARDS) 0.55 CFS = 0.79 CFS

0.79 CFS (ALLOWED FROM TOTAL AREA OF FLAT ROOFS) DIVIDED BY 16 ROOFS = 0.049 CFS PER ROOF

(0.049, CFS PER ROOF)(60 SEC.)(7.48 GAL PER FT³) = 22 GPM

THUS, ROOF DRAINS CALIBRATED AT 22 GALLONS PER MINUTE PER ROOF ARE REQUIRED.

CALCULATIONS FOR DEPRESSED COLLECTING AREAS

PER UNIT: BACK YARD AREA: 510 FT² + PATIO ROOF 80 FT² = 590 FT² (RAINFALL AREA)

100 YR., 6 HR STORM = 3.0 IN. = .25 FT

INFILTRATION RATE = .25 IN PER HOUR

(590 FT²)(.25 FT) = 148 FT³ (VOLUME OF RAINFALL)

(510 FT²)(.25 IN/HR)(6 HR) = 18 FT³ (VOLUME OF INFILTRATION)

148 FT³ − 18 FT³ = 130 FT³ (VOLUME TO BE COLLECTED)

(130 FT³) ÷ (510 FT²) = 0.25 FT = 3 INCHES (MAX. DEPTH OF WATER)

THUS: BACK YARD IS TO BE GRADED TO FINISHED FLOOR ELEVATION MINUS 8" STANDARD PLUS 3" MAXIMUM WATER DEPTH = 11 INCHES.

PER UNIT: FRONT YARD AREA: 805 FT² (FRONT & SIDE YARD) + 541 FT² (PITCHED ROOF) = 1346 FT² (RAINFALL AREA)

(1346 FT²)(.25 FT) = 337 FT³ (VOLUME OF RAINFALL)

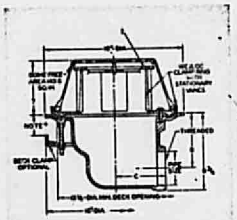
FRONT YARD DEPRESSED AREA = 16' × 15' = 240 FT² (FOR RAINFALL COLLECTION)

(240 FT²)(.25 IN/HR)(6 HR) = 30 FT³ (VOLUME INFILTRATED)

337 FT³ − 30 FT³ = 307 FT³ (STORAGE REQUIRED)

307 FT³ ÷ 240 FT² = 1.28 FT (DEPTH OF FRONT YARD DEPRESSION REQUIRED)

4300



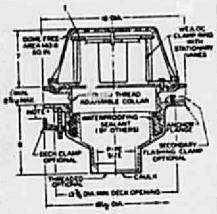
SIDE OUTLET

SPECIFICATION: Cast iron roof drain with large sump and flange, side outlet, large dome, adjusted calibrated vane collar, WEJLOC non-puncturing clamp ring with stationary vanes and integral gravel stop.

	DIMENSIONS IN INCHES			
Type No.	Pipe Size	B	C	Wgt. Lbs.
4303	3	6½	5½	66
4304	4	6	5½	66
4305	5	5½	5⅝	68
4306	6	5	5⅝	70

♦ (GG) — All Galvanized (D) — Deck Clamp
(E) — Extension Collar (N) — Drain Receiver

4500



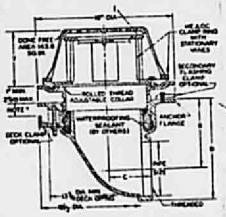
LEVELEZE

SPECIFICATION: Cast iron LEVELEZE roof drain with large sump and anchor flange, roof flange and top adjustable for insulation, bottom outlet, large dome, adjusted calibrated vane collar, WEJLOC non-puncturing clamp ring with stationary vanes and integral gravel stop.

Type No.	Pipe Size In.	Wgt. Lbs.
4503	3	108
4504	4	110
4505	5	112
4506	6	114

♦ (GG) — All Galvanized (C) — Secondary Flashing Clamp
(D) — Deck Clamp (E) — Extension Collar (N) — Drain Receiver

4510



LEVELEZE SIDE OUTLET

SPECIFICATION: Cast iron LEVELEZE roof drain with large sump and anchor flange, roof flange and top adjustable for insulation, side outlet, large dome, adjusted calibrated vane collar, WEJLOC non-puncturing clamp ring with stationary vanes and integral gravel stop.

	DIMENSIONS IN INCHES				
Type No.	Pipe Size	B	C	D	Wgt. Lbs.
4513	3	6⅝	4¾	8¾	112
4514	4	7¼	4¾	9⅞	113
4515	5	7¾	4⅞	11	115
4516	6	8¼	4⅞	12½	117

♦ (C) — Secondary Flashing Clamp (D) — Deck Clamp
(E) — Extension Collar (N) — Drain Receiver
(GG) — All galvanized

† Calibrated vane collar provides flows ranging from 15 G.P.M. to 420 G.P.M. at a 6" head. Specify desired flow rate and head. Drain will be furnished pre-set to these specifications.

*NOTE: ⅜ min. 4½ max. with 6" studs std. Longer studs for deeper deck available at extra cost. (On Series 4300, min. is ½", max. is 4¾")

(♦ Add suffix to Type No. for optional at extra cost)

c. "flo-set" roof drains

Source: Josam Manufacturing Co.
Michigan City, Indiana

FIGURE 1 RAINFALL DETENTION PONDING RING FOR FLAT ROOFS

SHEET 3 OF 3

DRAINAGE REPORT
for
McGUIRE TOWNHOUSE
project

Goldberg · Mann & Associates
Engineers · Planners
2329 Wisconsin N.E., Albuquerque, New Mexico 87110

DRAINAGE REPORT
for

McGUIRE TOWNHOUSE
project

Goldberg · Mann & Associates
Engineers · Planners
2329 Wisconsin N.E., Albuquerque, New Mexico 87110

Goldberg · Mann & Associates
Engineers · Planners
2329 Wisconsin N.E., Suite E Albuquerque, New Mexico 87110 (505) 292-1092

January 23, 1978

Mr. H. William Fanning
4100 F Silver S.E.
Albuquerque, NM 87108

Re: McGuire Townhouse Project

We are herewith transmitting two (2) copies of the drainage plan for the McGuire Townhouse Project.

This plan is in accordance with the requirements of the City of Albuquerque and Resolution 1972-2, Albuquerque Metropolitan Arroyo Flood Control Authority.

We have enjoyed working with you on this project and look forward to future opportunities to assist you.

Yours sincerely,

Thomas T. Mann, Jr., P.E.
President

sc

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PURPOSE AND SCOPE

LOCATION AND DESCRIPTION OF PROJECT

DESIGN CRITERA

EXISTING DRAINAGE CONDITIONS

PROPOSED DRAINAGE CONDITIONS

CONCLUSIONS

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FIGURE 2. INTENSITY DURATION FREQUENCY CURVES

FIGURE 3. TYPICAL LOT DRAINAGE

FIGURE 4. EXISTING TOPOGRAPHY AND GRADING PLAN

Purpose and Scope

The purpose of this drainage plan is to establish the criteria for controlling surface runoff from a particular development in a manner that is acceptable to the City of Albuquerque and to the Albuquerque Metropolitan Arroyo Flood Control Authority.

This plan will determine the runoff resulting from a 100-year frequency storm falling on the site of the McGuire Townhouse Project under existing and developed conditions.

The scope of this plan is to insure that the proposed project will be protected from storm runoff and that the construction of this project will not increase the flooding potential of the adjacent properties.

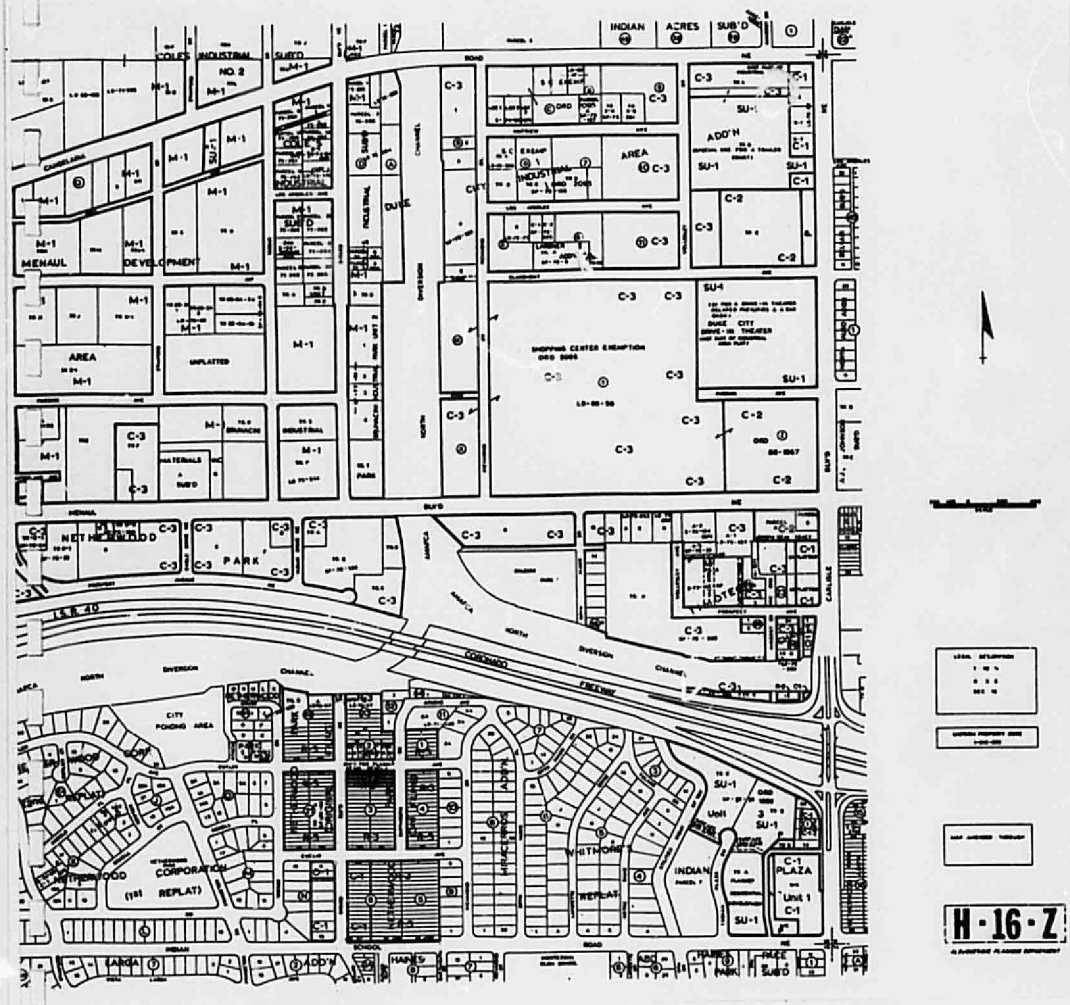
Location and Description of Project

The McGuire Townhouse Project is located within the corporate limits of the City of Albuquerque in the Northeast quadrant. The project is bounded by Girard Boulevard on the west, Cutler Avenue on the north and Dartmouth Drive on the east. The legal description is Township 10 north, Range 3 Section 10.

This parcel is 0.68 acres in size and will be developed as an eight unit townhouse project. The natural topography of the area slopes from the east to west at approximately 3 percent.

FIGURE 1.
LOCATION MAP

DATE
RECEIVED_____



APPLICANT

NAME: H. William Fanning, Arch.
ADDRESS: 4100 F Silver S.E.
Albuquerque, NM 87108
PHONE: 266-5874
SIGNATURE: H. William Fanning Jr.

LOCATION OF PARCEL

1,2,3,4,35
LOT NO: 36,37 & 38 BLOCK NO: 3
SUBDIVISION: Netherwood Pk. Add.
STREET ADDRESS: 2900 Cutler Av. N.E.

CURRENT ZONING: R-3

Design Criteria

In analyzing the storm runoff, the Rational Formula, $Q = CIA\ C_f$ is used.

Where:

Q = Runoff quantity in cubic feet/second.

A = Contributing area in acres.

C_f = Frequency factor for Rational Formula.

I = Intensity in inches/hour for a duration equal to the time of accumulation (duration) measured in minutes and obtained from Figure 2, Intensity Duration Frequency Curves, Albuquerque Area 1961. (Note: Where a Time of Concentration Tc is less than ten minutes, the intensity value derived from a Tc of ten minutes is employed.)

C = Runoff Coefficient (No Units). This coefficient represents the integrated effects of infiltration, detention storage, evaporation, retention, flow routing, and interception which all affect the time distribution and peak rate of runoff.

Existing Drainage Conditions

The existing contours and proposed drainage basins are shown in Figure 4. The property which slopes from east to west is bounded on the west, the north and the east by paved streets and on the south by apartments. Dartmouth Drive prevents offsite flows on the east from entering the property and grading of the apartment complex to the south prevents flows in that area from entering the property.

Proposed Drainage Conditions

The grading plan for the proposed development is shown in Figure 4. The drainage plan provides for the retention on site of fifty (50) percent of the rainfall from the 100 year storm. The common areas between and in the front of each pair of units and the rear yards of each unit will be utilized for ponding. All roof drains and grading will direct the flow into the ponding areas.

The required ponding volume is 2960 square feet. The proposed ponding areas contain approximately 2965 cubic feet of storage.

Conclusions

1. Provide front and rear yard ponding.
2. Direct all flows from roofs and landscaped areas into ponds.
3. Provide storage in excess of 2960 cubic feet.

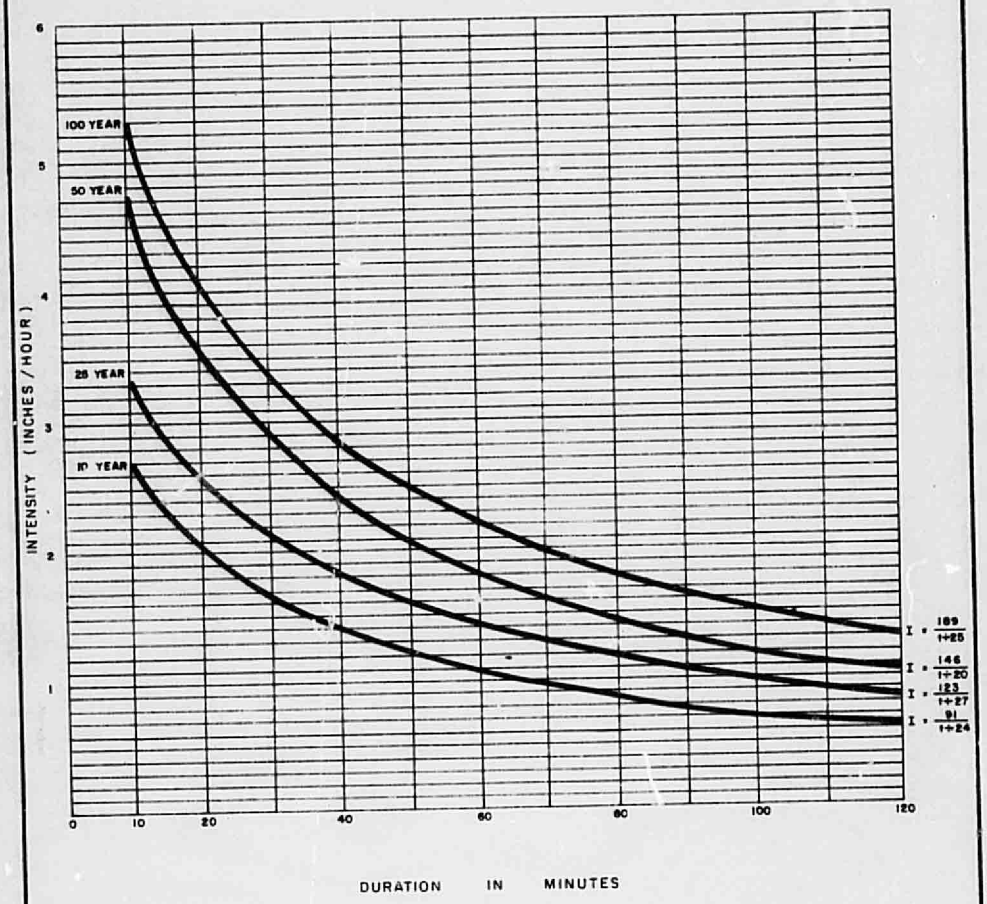


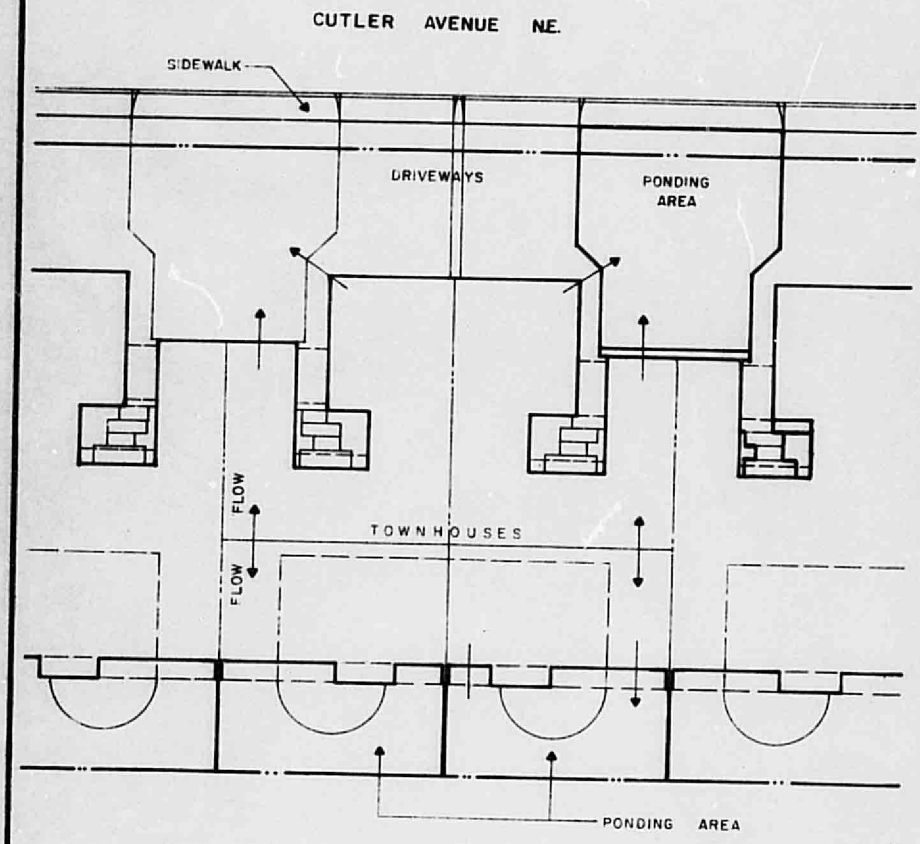
FIGURE 2

CUTLER CASAS
UNIT 2

INTENSITY DURATION
FREQUENCY CURVES

Calculations

Area of Project		100 x 296 = 29,600 sq. ft.
Required Storage Volume		29,600 x 0.1 = 2,960 cubic feet
Storage Area - Front	=	1036 sq. ft. x 3.5 = 3626
Storage Area - Rear	=	480 sq. ft. x 8 = 3840
Total Available Area	=	7466 sq. ft.
Pond Volume - Rear	=	3840 x 0.6 x ½ = 1152 cubic feet
Pond Volume - Front	=	3626 x 1.0 x ½ = 1813 cubic feet
Pond Volume - Total	=	= 2965 > 2960



LEGEND

PROPERTY LINE
STREET CENTERLINE

NOTE:

1 DRAIN ALL ROOFS INTO PONDING AREA

2 SEE FIGURE 4 FOR GRADES

FIGURE 3

CUTLER CASAS UNIT 2

TYPICAL LOT DRAINAGE