HYDROLOGY G20/D10 1 PLAN

G 20/D 10

1 Plan

Goldberg - Mann & Associates, Inc.
Engineers - Planners
811 Dallas St., N.E. Albuquerque, New Mexico 87110 (505) 265-5611

September 5, 1980 0-48 & 0-49

Mr. Fred Aquirre
City of Albuquerque
Flood Control/Engineer Division
P.O. Box 1293
Albuquerque, New Mexico 87103

Re: Eubank Office Complex Drainage Plan

Dear Fred:

Transmitted herewith are two (2) copies of the revised drainage plan for the Eubank Office Complex. In accordance with your request, we have outlined the pond areas where they extend into the paved areas. This should facilitate you in checking our volumes. Secondly, we have drawn sections through the pond to show what that looks like. Third, I have noted that my reference for my orifice calculations is Cameron's Handbook. As I stated, the one pond is two feet deep which exceeds your 18-inch requirement, but I feel that if this is acceptable the pond would only reach the two foot depth during the major storms. The pond is away from public areas, sidewalks, and things of that nature; it is tucked as far back in our lot as we can get it. Therefore, I think the occasional depth is acceptable since the pond does have a drain that will lower the depth very rapidly.

Therefore, I request that you approve the drawings as soon as possible. If you have any questions or comments, please do not hesitate to call. Thank you.

Yours truly,

GOLDBERG-MANN & ASSOCIATES, INC.

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

TTM:pe
Enc.

Copies of the revised drainage plan have been inserted on plans

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

MAYOR
David Rusk

April 9, 1979

Mr. Thomas T. Mann, Jr., P.E.
President
Goldberg-Mann & Associates
911 Pennsylvania St. N.E.
Albuquerque, New Mexico 87110

Re: Eubank Heights Office Complex

Dear Tom:

The revisions to the drainage report submitted with your letter dated April 5, 1979 are consistent with the AMAFCA Resolution 72-2. The drainage report as amended is therefore hereby approved.

The site grading plan to be submitted with the construction plan will have to include sufficient details to allow verification of the ponding volumes provided. The design of Weimer Court will have to include a water block consistent with your recommendations (such a water block is not indicated on the drawing supplied with the letter mentioned above).

Very truly yours,

Bruno Conegliano
Assistant City Engineer-Hydrology

BC/fs

cc - Dick Heller
Rich Leonard
Drainage File

Goldberg · Mann & Associates
Engineers·Planners
911 Pennsylvania St. Albuquerque, New Mexico 87110 (505) 265-3521

April 5, 1979 8-106

Mr. Bruno Conegliano
Assistant City Engineer/
Hydrology
Division of Engineering
P.O. Box 1293
Albuquerque, New Mexico 87103

RECEIVED
APR 6, 1979

Re: Lot A-1 Block A Eubank Heights

Dear Bruno:

This letter is in response to your letter dated March 26, 1979.

Transmitted herewith is a revised "calculation" page and Drainage Plan for our drainage report submitted on February 21, 1979.

The calculations indicate a total pond volume of 11,369 cubic feet will be required. The required ponding has been apportioned to each lot in accordance with the size of the lot. The drainage plan has been revised to reflect the new pond volumes.

A field inspection revealed a waterblock in Inca Street that was not evident from the aerial photography. Therefore, I concur with your calculations. The building pads and the water block in Weimer Court will be set 0.3 feet above the top of curb. A note stating such has been added to the drainage plans.

If you have any further comments, do not hesitate to call.

Yours truly,

GOLDBERG-MANN & ASSOCIATES

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

TTM:jj
Enc.

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

MAYOR
David Rusk

March 26, 1979

Mr. Thomas T. Mann, Jr., P.E.
President
Goldberg-Mann & Associates
911 Pennsylvania St. N.E.
Albuquerque, New Mexico 87110

Re: Eubank Heights Office Complex

Dear Tom:

It gives me little pleasure to disapprove drainage reports particularly those prepared by engineers whose competency I respect. I am therefore disappointed to have to comment further on the amendments to the drainage report for the captioned project. From my reading of the report I gather that you recommend the uncontrolled discharge from 1.23 Ac (42.4% of the total area) and for the remaining 1.67Ac you would provide a ponding volume equivalent to 0.1 times 1.67Ac.

Using the approximate procedure indicated in the check list provided by the City, the ponding volume required is 0.1x2.9x43560 o. 12622 cu ft. If greater approximation is desired, using the C factors of the report and given the total precipitation at Montgomery and Eubank, of 2.6", the required ponding volume would be (C dev - C undev)xAxP or $0.4\% \times 2.9 \times 43560 \times \frac{2.6}{12}$ or 13138 cu ft. Both values are considerably at variance with the recommendations of the report.

In regard to the offsite-flow, the drainage area estimated by your office is considerably smaller than the area considered to be contributing to the intersection of Pitt St. & Eubank Blvd (see the attached map). Given the difference in elevation of 79ft for a length of run of 3450 ft the enclosed nomograph indicates a Time of Concentration of 17 minutes to which corresponds an intensity of 4.5"/hr. Engineers in the community have rather consistently used a value of 0.65 for C in developed residential areas and given the

area of 58.2 Ac the 100 years flow would amount to 170cfs. Without field data I cannot evaluage what would be the likely distribution of the flow at Pitt St. and Pitt Place, but I note that the other plot map shows steeper grades at the N.W. corner of this intersection. A very rough and conservative estimate evaluates in 90cfs and the flow moving west down Pitt Place at 2 velocity of approximately 11.0fps. Given the momentum of this flow I would venture to guess that most of this flow would reach the western lane of Eubank Blvd. It is therefore my recommendation that the pad elevations and the water block at Weimer Ct. be set at a height of no less than 0.3ft above the adjacent top of curb elevations. If you wish to review this matter further please feel free to contact my office.

Very truly yours,

Bruno Conegliano
Assistant City Engineer-Hydrology

BC/ms

Enc: map

cc - Dick Heller
Rich Leonard
Drainage File

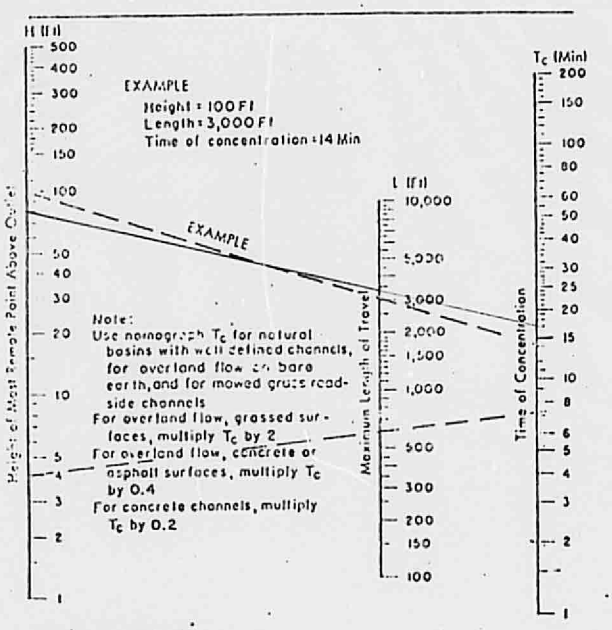
PLATE 11

NOMOGRAPH

for determination of

TIMES OF CONCENTRATION

$\Delta H = 79'$
$L = 3450$
$t_c = 17'$



Based on study by P. Z. Kirpich,
Civil Engineering, Vol 10, No 6, June 1940, p. 362

Goldberg · Mann & Associates
Engineers·Planners
811 Pennsylvania St. Albuquerque, New Mexico 87110 (505) 265-3521

March 19, 1979 8-106

Mr. Bruno Conegliano
Assistant City Engineer/Hydrology
Department of Public Works
P.O. Box 1293
Albuquerque, New Mexico 87103

Re: Eubank Heights Office Complex

Dear Bruno:

In response to your letter on March 5, 1979, we are making the following amendments and additions to the drainage report for the Eubank Heights Office Complex:

1. 100% of the increased runoff will be retained - this is supported by the calculations as submitted previously.

2. The proposed buildings pads should be set as high as the existing top of curb elevation that occurs adjacent to them on Eubank.

3. The water block need not be any higher than the existing top of curb elevations.

The preceding amendments are based on the following:

Enclosed you will find a topographic map of the watershed upstream from the proposed Weimer Court. Also enclosed is a hydrological computation for the area shaded in brown. A normal depth calculation was done based on the resulting flow. The flow in the east half of Eubank at the intersection of Pitt and Eubank would be about 30 c.f.s. At this flow the normal depth in the half street would be 0.56' measured at the low point of the gutter. It is unlikely that any of this flow would cross over into the south bound lanes as there is 0.3' to 0.4' freeboard between this water surface and the centerline of Eubank.

The flow accumulating from the west side of Eubank would be insignificant as can be seen by the small contributing area shown on the topo (area shaded in orange).

If you have any questions concerning this matter, please contact me immediately.

Yours truly,

GOLDBERG-MANN & ASSOCIATES

Richard Ingram

Richard Ingram
Project Engineer

RI:jj
Enc.

Calculations

Undeveloped Flows

Area = 2.90 acres
Length = 480 feet
Slope = 3.3%
Tc = 10 min.

$$\text{Intensity} = \frac{189}{25 + 10} = 5.4 \text{ in/hr}$$

Flow = 0.40 (5.4) 2.90 = 6.3 cfs

Composite 'C' Factor

Assume 15% pervious area.
(.85) .90 = (.15) .40 = 0.83

Area to Pond
6.3 = 0.83 (5.4) A
A = 1.40 acres
2.90 - 1.40 = 1.50 acres to pond

Required Pond Volume

$$(0.4 - 0.9)\ \frac{2.4}{12}\ (2.90 \times 43{,}560 \times 0.9)^{*} = 11{,}369 \text{ cf}$$

Ponding Areas

Lot 1	0.61 acres = 21%	Volume =	2,388 cf
Lot 2	1.48 acres = 51%	Volume =	5,798 cf
Lot 3	0.81 acres = 28%	Volume =	3,183 cf
	2.90 acres = 100 %		11,369 cf

*10% of lot area must be pervious to allow percolation

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

MAYOR
David Rusk

March 5, 1979

Mr. Thomas T. Mann, Jr., P.E.
President
Goldberg- 'ann & Associates
911 Pennsylvania St. N.E.
Albuquerque, New Mexico 87110

Re: Eubank Heights Office Complex

Dear Mr. Mann:

The draiage report submitted for the referenced project has been reviewed and has been found not in compliance with the AMAFCA Resolution 72-2. The site must retain in the ponding areas 100% of the increased runoff resulting from the development rather than the stated 50%. The figure included and labelled grading plan does not indicate the change in topography resulting from the development and as such it is not a grading plan acceptable for review by my office or the Planning Department. Finally, safe finished floor elevations with regard to flooding, need to be established on the basis of the 100 years frequency flow in Eubank. This determination is also necessary to evaluate the height of the water block at the entrance of Weimer Court which may be such as to prevent the flow in Eubank Blvd. from entering this parcel.

Please note that for maintenance purposes the City does not accept drainage channels in City easements not constructed according to the standard drawing K-1 (i.e. typical Section 2 is not acceptable.)

If you want to discuss this matter further, please feel free to contact my office.

Very truly yours,

Bruno Conegliano
Assistant City Engineer-Hydrology

BC/fs
cc - Dick Heller
Rich Leonard
Drainage File

Goldberg · Mann & Associates
Engineers·Planners
911 Pennsylvania St. Albuquerque, New Mexico 87110 (505) 265-3321

March 1, 1979

8-106

Mr. Bruno Conegliano
Assistant City Engineer/
Hydrology
Department of Public Works
P.O. Box 1293
Albuquerque, New Mexico 87103

RECEIVED
MAR 02 1979
CITY ENGINEERS

Re: Eubanks Heights Office Complex

Dear Bruno:

Please find enclosed two (2) copies of a drainage report for the above referenced project. This report will be supplemented with separate formal drainage reports for each of the three parcels. We are currently working with the architects for each of the buildings and will submit the respective drainage reports with the construction plans.

If there are any questions, please call.

Yours truly,

GOLDBERG-MANN & ASSOCIATES

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

TTM:jj
Enc. 2
cc:John M. Henderson III w/enc.

ESTIMATED RET[illegible] PERIODS FOR SHORT-DURATION PRE[illegible]ITATION (Inches)

Station: ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO (CITY).
Latitude, 35° 05' N.; Longitude, 106° 39' W.; Elevation 4960 ft.

DURATION	RETURN PERIOD (YEARS) 1	2	5	10	25	50	100	I_1
5 min.	0.18	0.23	0.30	0.35	0.44	0.49	0.55	2.17
10 min.	0.27	0.35	0.47	0.55	0.68	0.77	0.86	1.62 ← $I_{10\ min.}$
15 min.	0.35	0.44	0.59	0.70	0.86	0.97	1.08	1.40
30 min.	0.48	0.62	0.82	0.96	1.19	1.34	1.50	0.96
1 hr.	0.61	0.78	1.04	1.22	1.50	1.70	1.90	
2 hr.	0.63	0.81	1.09	1.28	1.57	1.78	1.99	
3 hr.	0.64	0.83	1.13	1.33	1.63	1.86	2.08	
6 hr.	0.68	0.90	1.25	1.47	1.80	2.05	2.30	
12 hr.	0.71	0.96	1.35	1.59	1.95	2.22	2.50	
24 hr.	0.75	1.02	1.46	1.72	2.10	2.40	2.70	

POND CAPACITY

POND Nº 1

@ $d = 0$ AREA = 0

@ $d = 0.75$ AREA = 9775 FT^2 VOL = 3666 FT^3

W.S. = 99.5 @ $d = d$ AREA = $13033\,d$

VOL = $6517\,d^2$

$$d = \sqrt{\frac{\text{Volume}}{6517}}$$

POND Nº 2

572 FT^3 MAX. VOLUME (SEE GRADING PLAN)

@ $d = 0$ AREA = 0

@ $d = 1.3$ AREA = 880 FT^2

@ d AREA = $677\,d$ ⟶ VOL = $339\,d^2$ $d = \sqrt{\frac{VOL}{339}}$

POND Nº 3

915 FT^3 MAX. VOLUME

$$d = \sqrt{\frac{VOL}{542}}$$

VOL = $(64)(22)(1.3)(\frac{1}{2}) = 915$

@ $d = 0$ AREA = 0

@ $d = 1.3$ AREA = 1408

@ d AREA = $1083\,d$

VOL = $542\,d^2$

$$d = \sqrt{\frac{VOL}{542}}$$

POND Nº 1

EFFECTIVE AREA = 10,800 (.90) = 9720 FT.^{2}

STORM TIME	ACCUM. RAINFALL	RUNOFF VOLUME	AVE. POND DEPTH	INCREM. FLOW RATE	ACCUM. RUNOFF VOLUME	STORAGE VOLUME	
MIN.	INCHES	FT.^{3}	FT.	C.F.S.	FT.^{3}	FT.^{3}	
0	0	0				0	
5	0.59	478	0.13 0.27	0.04	11.53 11.53	467	
10	0.92	745	0.30 0.33	0.06	17.25 28.78	717	
15	1.17	948	0.35 0.37	0.06	18.69 47.47	901	
20	1.36	1102	0.39 0.40	0.07	19.56 67.03	1035	
25	1.50	1215	0.41 0.42	0.07	20.11 87.14	1128	
30	1.62	1312	0.42 0.43	0.07	20.50 107.64	1205	
35	1.73	1401	0.44 0.44	0.07	20.81 128.45	1273	
40	1.82	1474	0.45 0.45	0.07	21.06 149.50	1325	
45	1.90	1539	0.45 0.46	0.07	21.25 170.70	1369	
50	1.96	1588	0.46 0.46	0.07	21.39 192.14	1396	
55	2.02	1636	0.47 0.47	0.07	21.49 213.63	1423	
60	2.05	1661	0.47 0.47	$\boxed{0.07}$	21.55 235.18	$\boxed{1426}$	
70	2.08	1685	0.47 0.46	0.07	43.09 278.27	1406	
80	2.10						
90	2.12						

1. 1426 FT.^{3} < 3666 FT.^{3}
2. MAXIMUM DISCHARGE = 0.07 C.F.S. w/ 2" DRAINAGE ORIFICE

POND Nº 2

EFFECTIVE AREA = 4420(.9) = 3978

V_{MAX} = 576

STORM TIME	ACCUM. RAINFALL	RUN-OFF VOLUME	AVE. POND DEPTH	INCREM. FLOW RATE	ACC. RUN-OFF VOL.	STORAGE VOLUME
MIN.	INCHES	$FT.^3$	FT.	C.F.S.	$FT.^3$	$FT.^3$
0	0	0				0
5	0.59	196	0.36 0.72	0.06	18.97 18.97	178
10	0.92	305	0.80 0.87	0.09	28.16 47.13	258
15	1.17	388	0.92 0.96	0.10	30.15 77.28	311
20	1.36	451	0.98 1.01	0.10	31.23 108.50	343
25	1.50	497	1.02 1.02	0.11	31.75 140.26	356
30	1.62	537	1.03 1.04	0.11	31.99 172.25	364
35	1.73	573	1.04 1.04	0.11	32.12 204.37	$\boxed{368}$
40	1.82	603	1.04 1.04	$\boxed{0.11}$	32.15 236.52	366
45	1.90	630	1.04 1.03	0.11	32.07 268.59	361
50	1.96	650	1.02 1.01	0.11	31.88 300.46	349
55	2.02	670				
60	2.05	680				

1. 368 < 576 FT^3 ∴ POND WILL NOT OVERFLOW
2. MAXIMUM Discharge RATE = 0.11 c.f.s. w/ 2" DIA. DRAINAGE ORIFICE

POND Nº 3

EFFECTIVE AREA = 7500(.90) = 6750 FT.^{2}

V_{MAX} = 915 FT.^{3}

STORM TIME	ACCUM. RAINFALL	RUN-OFF VOLUME	AVE. POND DEPTH	INCREM. FLOW RATE	ACCUM. RUN OFF VOL.	STORAGE VOLUME
MIN.	INCH	FT.^{3}	FT.	C.F.S.	FT.^{3}	FT.^{3}
0	0	0				0
5	0.59	332	0.38 0.76	0.06	19.43 19.43	313
10	0.92	518	0.85 0.93	0.10	28.98 48.40	470
15	1.17	658	0.98 1.03	0.10	31.24 79.64	579
20	1.36	765	1.07 1.10	0.11	32.52 112.16	652
25	1.50	844	1.12 1.13	0.11	33.29 145.45	698
30	1.62	911	1.15 1.16	0.11	33.77 179.22	731
35	1.73	973	1.17 1.18	0.11	34.12 213.34	759
40	1.82	1024	1.19 1.20	0.11	34.38 247.72	776
45	1.90	1069	1.20 1.20	0.12	34.53 282.25	786
50	1.96	1103	1.20 1.20	$\boxed{0.12}$	34.58 316.83	$\boxed{786}$
55	2.02	1136	1.20 1.20	0.12	34.57 351.40	784
60	2.05	1153	1.20 1.19	0.11	34.47 385.87	767
70	2.08	1170	1.15 1.17	0.11	68.15 454.01	715

786 FT^3 < 915 FT^3 ∴ STORAGE VOLUME WILL NOT OVERFLOW

PEAK DISCHARGE RATE = 0.12 c.f.s. w/ 2" dia. DISCHARGE ORIFICE

DRAINAGE REPORT for the EUBANK HEIGHTS OFFICE COMPLEX

Goldberg · Mann & Associates
Engineers-Planners
911 Pennsylvania N.E. Albuquerque, New Mexico 87110

Goldberg · Mann & Associates
Engineers·Planners
911 Pennsylvania St. Albuquerque, New Mexico 87110 (505) 265-3521

8-106

February 21, 1979

Mr. John M. Henderson III
Executive Vice President
Pickard and Associates, P.A.
2625 Pennsylvania N.E.
Albuquerque, New Mexico 87110

Re: Block A-1 Eubank Heights Drainage Report

Dear Mr. Henderson:

We are herewith transmitting three (3) copies of the drainage plan for Block A-1 Eubank Heights.

The drainage plan is in accordance with the requirements of the City of Albuquerque and the 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 truly,

GOLDBERG-MANN & ASSOCIATES, INC.

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

TTM:pe
Enc.

TABLE OF CONTENTS

PURPOSE AND SCOPE

LOCATION AND DESCRIPTION OF PROJECT SITE

DESIGN CRITERIA

EXISTING DRAINAGE CONDITIONS

PROPOSED DRAINAGE CONDITIONS

CONCLUSIONS

CALCULATIONS

LIST OF FIGURES

FIGURE 1. LOCATION MAP

FIGURE 2. FLOOD HAZARD MAP

FIGURE 3. INTENSITY DURATION FREQUENCY CURVES

FIGURE 4. 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 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.

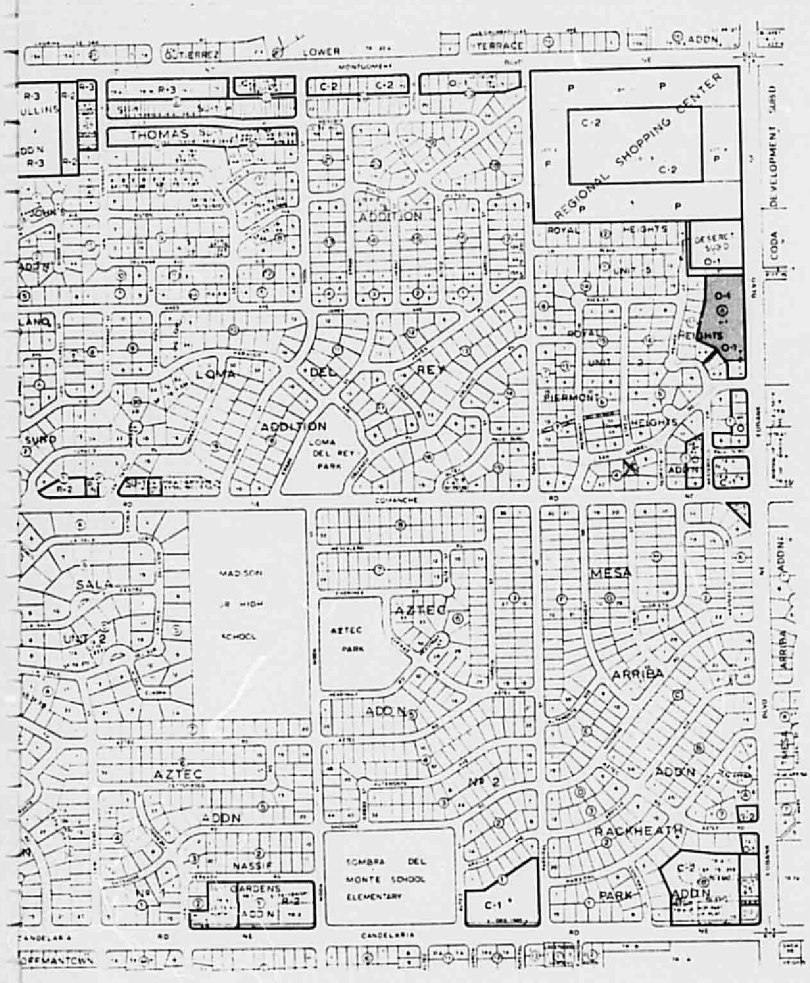
LOCATION AND DESCRIPTION OF PROJECT

Block A-1 Eubank Heights is located within the corporate limits of the City of Albuquerque in the northeast quadrant. The site is located on the west side of Eubank Boulevard N.E. between Comanche Road N.E. and Montgomery Boulevard N.E., just north of San Gabrial Road, as shown on Figure 1.

The parcel is approximately 2.9 acres in size and will be developed with three office complexes. There will be a cul-de-sac off of Eubank Boulevard to service the office complexes. The natural topography slopes from north to south at approximately 3.3 percent.

FIGURE 1.
LOCATION MAP

DATE
RECEIVED_____



APPLICANT

NAME: H. G. Pickard & Assocs.
ADDRESS: 2526 Pennsylvania N.E.
Albuquerque, N.M. 87110
PHONE: 293-9220
SIGNATURE: _____

LOCATION OF PARCEL

LOT NO: A BLOCK NO: 17
SUBDIVISION: Royal Hts. Unit 2
STREET ADDRESS: Eubank Blvd. N.E.

CURRENT ZONING: 0-1

EXISTING DRAINAGE CONDITIONS

The Flood Hazard Map for the proposed project is shown in Figur 3. The existing contours are shown on Figure 4, Gra ing Plan. The natural slope of the land is from north to south, southwest at approximately 3.3 percent. The site is bounded by Eubank Boulevard N.E. on the east, a church on the north, single family residences on the west and undeveloped land on the south. The site generally lies above Eubank Boulevard and the land to the south and west. A block wall along the west property line will prevent runoff from leaving the site in that direction. The church constructed a curb along the north property line that will prevent runoff from entering the site. Therefore, off-site runoff for this project is neglible.

The property is not 1) located in a flood plain or, 2) adjacent to a natural or artificial water course. A drainage easement has been dedicated to allow runoff to reach San Gabriel Road. Erosion will not result from the construction activity or from the off-site runoff. The proposed development does not block any drainage from adjacent properties.

There is an existing sto ewer system in Eubank Boulevard.

DESIGN CRITERIA

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

Where:

Q = Runoff quantity in cubic feet/second.

A = Contributing area in acres.

I = Intensity in inches/hour for a duration equal in minutes and obtained from Figure 3, 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 (10) 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.

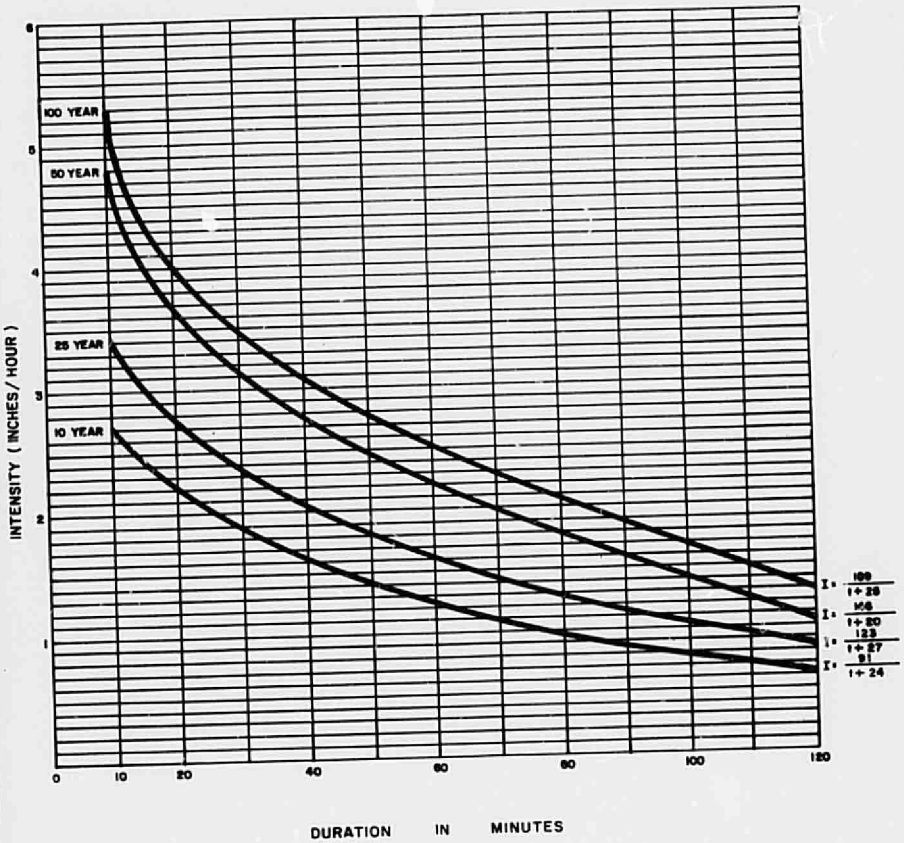
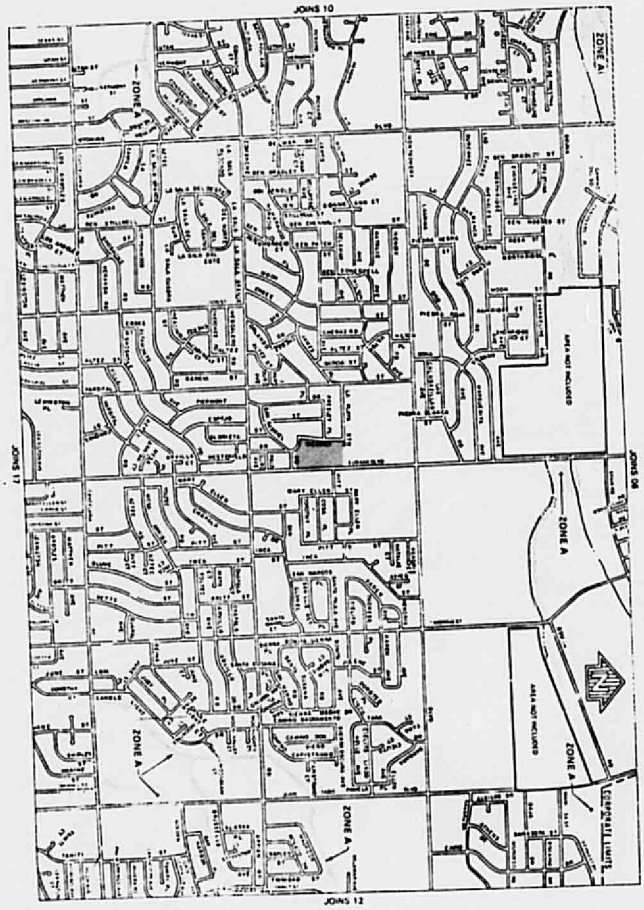


FIGURE 2

INTENSITY DURATION FREQUENCY CURVES



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF ALBUQUERQUE, N.M.
(BERNALILLO CO.)

APPROXIMATE SCALE
1000 0 1000 2000 3000 FEET

FLOOD HAZARD BOUNDARY MAP

MAP REVISED
2/14/78

FIGURE 3

PROPOSED DRAINAGE CONDITIONS

The proposed site grading and street improvements including storm drainage transmission facilities are shown on Figure 4, Grading Plan. The conveyance of off-site flows will not be altered.

The development of Block A-1, Eubank Heights will consist of three individual office complexes on three separate lots. Each lot will create new impervious areas that will require retention facilities. The retention volumes will be apportioned according to the lot area and the amount of the lot fronting on Weimer Court. Runoff from the office sites will be retained in landscaped area adjacent to the buildings and parking areas. These retention facilities will combine to produce the retention volume necessary to retain 50 percent of the increased runoff that results from a 100 year frequency storm.

The runoff that is not retained on the northern half of the site will be collected in Weimer Court. Design of Weimer Court will be such that all runoff will be conveyed to a point common to the boundary of lots 1 and 3 at Weimer Court. From this point, the flow will be channelized through a 10 foot easement along the common boundary of lots 1 and 3 to the southern property boundary. The runoff then proceeds off-site in a concrete channel. This channel will be through an existing 10 foot easement between the two single family residential lots. The channel will terminate at the north

curb of San Gabriel Avenue. It will pass under the existing sidewalk and outlet into the existing gutter. A checker plate cover will be used to maintain the sidewalk surface.

The entry of Weimer Court off of Eubank Boulevard will be constructed such that flow will continue down Eubank Boulevard and not be diverted into the proposed Weimer Court. There is an existing inlet on Eubank Boulevard in the area of Weimer Court that will be moved to the north curb return of that court.

Detail drainage/grading plans will be required for each lot as they are developed.

CONCLUSIONS

1. Construct retention ponds adjacent to proposed office buildings.
2. The total pond volume shall be 7,275 cu. ft.
3. The individual lot pond volumes shall be as follows; Lot #1 - 1,500 cu. ft., Lot #2 - 3,750 cu. ft., Lot #3 - 2,025 cu. ft.
4. Construct a concrete swale for drainage along the common boundary of Lots 1 & 3.
5. Reserve 20 percent of each lot for landscaping and ponding.
6. Construct a typical concrete lined channel through an existing 10' easement to convey runoff offsite to San Andres Avenue.
7. Grade Weimer Court such that any runoff entering the court is conveyed to a low point at the common boundary of Lots 1 & 3.
8. Construct a water block at the entry of Weimer Court to prohibit the entry of flows from Eubank Boulevard.
9. Relocate the existing drop inlet that will be in conflict with the proposed Weimer Court entry.

CALCULATIONS

Undeveloped Flows

Area = 2.90 acres

Length = 480 feet

Slope = 3.3%

Tc. = 10 min.

Intensity = $\frac{189}{25+10}$ = 5.4

Flow = (5.4) (.35) (2.90) = 5.5 cfs

Developed Flows

Area to runoff - 1.23 acres

Area to pond - 1.67 acres

Total area - 2.90 acres

Composite "C" Factor - (20% landscaping on area to runoff)

(.8).95 + (.2).35 = .83

Total Developed Flow

(.83) (1.23) (5.4) = 5.5 cfs

Total Undeveloped Flow = 5.5 cfs

Ponding Areas

Total ponding volume required

(1.67) (43,560) (0.1) = 7,275 cf

Area lot 1 - 0.61 acres	21%	Ponding Vol. lot 1	1,500 cf	21%
Area lot 2 - 1.48 acres	51%	Ponding Vol. lot 2	3,750 cf	51%
Area lot 3 - 0.81 acres	28%	Ponding Vol. lot 3	2,025 cf	28%
Totals - 2.90 acres	100%		7,275 cf	100%