HYDROLOGY K21/D1A 3 PLANS

K21/D1A

3 Plans

DENNEY-GROSS & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0696

July 17, 1981

Mr. Fred Aguirie
Civil Engineer
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Bio-Med Dialysis Facility
Albuquerque, New Mexico
F.D. Job No. 522.32

Dear Fred:

Enclosed herewith for your review is a copy of the modified site plan for subject project.

The only change that has occured is the addition of an 8" PVC drain line from the roof to the pond.

Fred, the overall scheme is not affected by this addition. Therefore, we would appreciate your expeditious review and approval.

Very truly yours,

Ron Taylor

Ron Taylor

RT/am
Enclosure

FRED DENNEY & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0696

June 26, 1981

RECEIVED
JUN 29 1981
CITY ENGINEER

Mr. Fred J. Aguirre, P.E.
Hydrology Department
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: National Medical Care, Inc.
Bio-Medical Applications of
Northeast Albuquerque, NM
F.D. Job No. 522.32

Dear Mr. Aguirre:

In accordance with the requirements of your letter of June 4, 1981, for Drainage Report K-21-D1b, on subject property, transmitted herewith is one original Agreement executed by the owner accepting the offsite flows.

One original of this Agreement will be filed in the Office of the County Clerk this date. We trust this meets all requirements and that the Certificate of Occupancy can now be issued when appropriate.

Very truly yours,

Anita Moya

Anita Moya

AM/
Enclosure
cc: National Medical Care, Inc.,
Francis F. LaPlante, V.Pres.

AGREEMENT

We the undersigned, being the owners of Tract 2, Block A, "Corrected, Amended Summary Plat, Block A, Land Division Map" filed for record April 14, 1981, agree to the following stipulations relating to the drainage plan for said tract.

1. That the drainage facilities and grading will be constructed in accordance with the plans approved by the City of Albuquerque.
2. That the off-site drainage, which is accounted for in our drainage plan, will be managed by our drainage facilities. No changes in our drainage facilities will be made that will preclude the handling of the off-site flows as planned.

Bio-Medical Applications of
Northeast Albuquerque, Inc.

Francis F. LaPlante
Vice President

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

June 4, 1981

Mr. Ron Taylor
Fred Denney & Associates, Inc.
Consulting Engineers
2400 Comanche Road N.E.
Albuquerque, N.M. 87107

RE: NATIONAL MEDICARE REVISED DRAINAGE REPORT K-21-D1b

Dear Mr. Taylor:

The drainage report for the referenced site is approved. However, the Certificate of Occupancy will be withheld until this office receives the letter from the owner accepting the offsite flows discussed in your report.

If you have any questions concerning the above, please feel free to call me.

Very truly yours,

Fred J. Aguirre

Fred J. Aguirre, PE
Civil Engineer

FJA/tsl

FRED DENNEY & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0696

RECEIVED
JUN 02 1981
CITY ENGINEER

May 27, 1981

Mr. Joe Micalizzi
National Medical Care, Inc.
Real Estate & Construction Dept.
1055 Commonwealth Avenue
Boston, MA 02215

Re: National Medical Care
Dialysis Facility
F.D. Job No. 522.32

Dear Joe:

Changes to the site plan are as follows:

1. The water service connection has been changed from the connection on Hotel Circle onto the 20" water main on Lomas Boulevard.

2. Grading has changed to accommodate a larger pond.

3. Overflow channel was added to drainage facilities.

4. Drain pipe changed from a 12" PVC to 8" Ductile Iron pipe.

5. The cobbled pad has been enlarged from a 6" x 10' x 27' pad with 6" cobbles to a 1' x 10' x 27' pad with 3" cobbles.

6. A railroad tie fence has been added.

7. Outlet for drain pipe has been specified per City Standards. Also, you will note in Mr. Denney's letter to Bill Pervidi dated April 24, 1981, it was stated that the City of Albuquerque will allow us to tie the drain line from the pond onto the Lomas Boulevard storm sewer. In a subsequent meeting Lou Gross and myself had with Chuck Easterling and Fred Aguirre, both with the City of Albuquerque, it was decided

by them at that time to drain the pond onto Hotel Circle. (See attachment)

8. Per the City of Albuquerque, Water Resources Department, a manhole was added to the 6" connection to the existing 8" sewer line.

9. 4 CY lift bin to serve dialysis facility. Rolloff bin required at later date for entire development.

10. Plant Sizes. Three 1.5" caliper or 10' - 20' in length. Shrubs to be 5 gallon minimum.

Enclosed is a mylar sepia of the approved drainage plan per your request. To expedite the acquisition of the building permit, the site plan was not placed on National Medical Care's standard size sheets.

Joe, as of this date the building permit is in the Contractor's possession.

If you have any questions concerning this, please do not hesitate to call.

Very truly yours,

Ron Taylor

Ron Taylor

RT/lm

Enclosures

cc: Fred Aguirre

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

HYDROLOGY SECTION PROJ. NO. K-21-D/6 DATE: 5/5/81

PLANNING DIVISION NO. _____

CONFERENCE RECAP

SUBJECT: NATIONAL MEDICAL CARE

	WHO	REPRESENTING
ATTENDANCE:	LOU GROSS	FRED DEWNEY & ASSOC
	RON TAYLOR	" " "
	FRED AGUIRRE	CITY
	CM EASTERLING	CITY

FINDINGS:

~~4. DISCHARGE UNDEVELOPED~~

1. DISCHARGE Qs UNDEVELOPED FOR BOTH HEWLETT-PACKARD AND DEVELOPMENT SITE TO HOTEL CIRCLE
2. CONSTRUCT 1' DEEP GRAVEL BED BELOW ~~[illegible]~~ OUTLET DISCHARGE POINT TO HOLD IRRIGATION OVER-SPRAY.
3. PROVIDE CITY WITH COPY OF FILED DRAINAGE EASEMENT.
4. PROVIDE AGREEMENT TO ACCEPT WATER FROM H-P.

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED: [illegible] SIGNED: [illegible]

TITLE: Vice Pres. Fred Dewney & Assoc. TITLE: PRINC. ASSIST. CITY ENGR/HYDR

DATE: 5/5/81 DATE: 5/5/81

522.11
G.C.

FRED DENNEY & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0696

May 8, 1981

RECEIVED
MAY 08 1981
CITY ENGINEER

Mr. Fred Aguirre
Engineering Department
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: National Medicare Revised
Drainage Report
F.D. Job No. 522.11

Dear Fred:

Per our discussion on May 4, 1981 regarding referenced project, your comments and the action taken are listed below.

1. COMMENT: In calculating Q_5 undeveloped for the positive discharge system, a composite runoff factor of 0.69 was used.

ANSWER: The runoff factor has been changed to 0.40. Quantities are as follows:

Page 6 and 7 of Revised Drainage Report:

RECEIVED
MAY 12 1981

Q = AIR
A = 2.80
I = 2.72 in/hr
R = 0.4 (undeveloped)

Q = (2.8)(2.72)(.4) = 3.05 cfs

Pond #1

$Q = .6A\sqrt{2gh}$

Use 4 - 2" x 6" slots arranged as shown on construction drawings. This results in the following discharge:

DEPTH (ft)	AREA (sf)	CAPACITY (cfs)
3.00	.17	1.42
1.95	.17	1.14
		2.56

2.56 cfs < 3.05 cfs O.K.

Drain Pipe Sizing (Using Mannings Equation)

Try 8" Diameter Pipe

P = 1.05 ft n = 0.012

A = .35 SF S = 0.016

R = .33 ft

$Q = (1.486/.012)(.33)^{2/3}(.016)^{1/2}(.35) = 2.69$ cfs

2.69 cfs > 2.56 cfs O.K.

2. COMMENT: A small cobbled pad to hold irrigation overspary. No design information is available to size the pad.

   ANSWER: A 27' x 10' x 1' deep pad with 3" cobbles has been provided.

3. COMMENT: A copy of the re-filed plat showing the drainage easement is needed.

   ANSWER: Attached.

4. COMMENT: The railroad tie fence must be a minimum of 3 feet high.

   ANSWER: Done.

5. COMMENT: For construction purposes, cross sections of pond and swale lines are needed.

   ANSWER: Cross sections have been provided. These cross sections are drawn to scale.

6. COMMENT: Spot elevations on curb next to pond needed to insure the water will flow into the pond as indicated.

ANSWER: Grades have been slightly changed and spot elevations provided.

7. COMMENT: Details for storm drain and outlet onto Hotel Circle.

ANSWER: Because the curb on Hotel Circle is a 6" curb, the City Standard Drawing K-16 has been modified for a 6" curb.

8. COMMENT: Details for inlet and outlet channels needed.

ANSWER: Done.

Fred, all of the above have been incorporated into a construction drawing. Also, the Agreement from National Medical Care, Inc. concerning the runoff from the Hewlett-Packard lot is in the process of being signed by National Medical Care, Inc.

We believe that the above information should suffice in supplying the required information for final approval of the drainage report.

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

Very truly yours,

Ron Taylor

Ron Taylor

RT/lm

Enclosures

cc: National Medical Care, Inc.

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

HYDROLOGY SECTION PROJ. NO. K-21 - ~~DA~~ DATE: 5/5/81

PLANNING DIVISION NO. _____

K21-D1B

CONFERENCE RECAP

SUBJECT: NATIONAL MEDICAL CARE

ATTENDANCE: WHO	REPRESENTING
LOU GROSS	FRED DEWNEY & ASSOC
RON TAYLOR	" " "
FRED AGUIRRE	CITY
CM EASTERLING	CITY

FINDINGS:

4. ~~[illegible]~~
1. DISCHARGE Qs UNDEVELOPED FOR BOTH HEWLETT-PACKARD AND DEVELOPMENT SITE TO HOTEL CIRCLE
2. CONSTRUCT 1' DEEP GRAVEL BED BELOW ~~[illegible]~~ OUTLET DISCHARGE POINT TO HOLD IRRIGATION OVER-SPRAY.
3. PROVIDE CITY WITH COPY OF FILED DRAINAGE EASEMENT.
4. PROVIDE AGREEMENT TO ACCEPT WATER FROM H-P.

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED: [illegible] SIGNED: [illegible]

TITLE: Vice Pres. Fred Dewney & Assoc. TITLE: PRINC ASSIST. CITY ENGR/HYDRO

DATE: 5/5/81 DATE: 5/5/81

FRED DENNEY & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0696

April 16, 1981

RECEIVED
APR 17 1981
CITY ENGINEER

Mr. Chuck Easterling
Engineering Division
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Drainage Plan
Tract 2, Block A,
C.C. & F. Properties
Dialysis Facility
F.D. Job No. 522.21

Dear Chuck:

Ron Taylor of our office received comments from F. J. Aguirre concerning the referenced drainage plan. We have considered each comment and are listing below both Mr. Aguirre's Comments and our answers.

Comment No. 1: Common easement required between Block B and Tract 2, Block A, for the proposed storm runoff across their common property line.

Answer: Our drainage plan accounts for the portion of storm water generaged on Block B which enters Tract 2. The grading plan provides for leading the water from Block B to the pond proposed on Tract 2. The pond is sized to store the 100 year storm water from the portion of Block B and all of Tract 2. We cannot obtain an easement or an agreement from the owner of Block B. We suggest that if the owner of Tract B requests a building permit in the future the City would be in a position to obtain an agreement.

Comment No. 2: Concurrence from the utility companies for the proposed 12" PVC storm drain pipe within their right-of-way. Assuming approval by the utility companies, the easement must be modified to reflect the drainage easement. We should also address the responsibility of maintenance for this storm drain system.

Answer: See attached re-filed Summary Plat.

Comment No. 3: Standard City curb cuts for the outlet should be used or approval obtained for the new design from the ACE-Design.

Answer: Plans changed accordingly.

Comment No. 4: The existing pond indicated in the report is not reflected in the grading plan provided. Please include the approved drainage plan for the Hewlett-Packard Lot and any proposed modifications to said plan with this report.

Answer: The existing pond is shown on the grading plan. The approved plan for the Hewlett-Packard Lot (Block B) will be included. The only change in the approved plan is the obliteration of what is called Pond No. 5 (Temporary). This is shown on the grading plan.

Comment No. 5: The drainage report must address the entire developed runoff and not just the increased runoff.

Answer: The plan was changed to pond all the developed runoff.

Comment No. 6: Also see brief comments in the report.

Answer: Done.

Comment No. 7: Check to see if the street you are proposing to drain into is not private, and if it is, check to see if you will be allowed to discharge into it.

Answer: The pond evacuation pipe is proposed to drain to Hotel Circle, which is a private street. We cannot obtain permission to discharge to the street. However, the natural drainage was picked up by this street before development. The proposed drainage plan would allow a lesser peak flow to enter the street, but would allow a larger volume over a longer period of time. Also, less sediment would be transported to Hotel Circle.

We first proposed to drain the ponding to the storm sewer in Lomas Boulevard but were told that the line was overloaded. We were directed by the Office of City Hydrology to drain the pond to Hotel Circle. It seems apparent that if continued public interest in Hotel Circle is evidenced, it is the City's obligation to acquire it.

Very truly yours,

Louis W. Gross

LWG/am

4/13/81

Planning history requires!
Hotel circle is private dr.
We do not have any idea of adequacy
of dr. facilities provided

S.U. 1 zoning granted subject to
~~[illegible]~~ supplying single dr. plan for area!

B.C.

4-1-81

To: Chuck Easterling
From: F.J. Aguirre
Subject: Dialysis Facility Drainage Report dated Feb, 1981

1) Common easement required between Block B and Tract 2 Block A for the proposed storm runoff across their common property line

2) Concurrence from the utilitic companies for the proposed 12" PVC storm drain pipe within their right-of-way. Assuming approval by the utility companies, the easement must be modified to reflect the drainage easement. We should also address the responsibility of maintenance for this storm drain system.

3) Standard City curb cuts for the outlet should be used or approval obtained for the new design from the ACE-Design.

4) The existing pond indicated in the report is not reflected in the grading plan provided. Please include the approved drainage plan for the Hewlett-Packard Lot and any proposed modifications to said plan with this report.

5) The drainage report must address the entire developed runoff and not just the increased runoff.

6) Also see brief comments in the report.

7) Check to see if the street you are proposing to drain into is private, and if it is, check to see if you will be allowed to discharge into it.

over

FRED DENNEY & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0896

February 23, 1981

Mr. Richard Heller
City Engineer
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Drainage Report
National Medical Care's
Dialysis Facility
F.D. Job No. 522.21

Dear Mr. Heller:

Enclosed herewith are three copies of the drainage report for your review and approval.

Your expeditious handling of this matter would be greatly appreciated. Also, if you have any questions or require additional information, please do not hesitate to give me a call.

Very truly yours,

Ron Taylor

Ron Taylor

RT/lm

Enclosures

cc: National Medical Care, Inc/w. Encl.

See pg 7 & Exhibit F
Tony comments

RECEIVED
FEB 23 1981
CITY ENGINEER

11320 Prospect N.E.

7-15-80
disapproved

① no plat exists showing property as presented in construction plans

② if approved as a subdivision, it will require a soils report & a drainage report

CONDITIONAL
revised grading plan

1-5-80

REVISED DRAINAGE REPORT
DIALYSIS FACILITY
TRACT 2, BLOCK A
CC&F PROPERTIES

Prepared For

NATIONAL MEDICAL CARE, INC.

APRIL, 1981

F.D. Job No. 522.21

RECEIVED
APR 17 1981
CITY ENGINEER

Prepared By

Fred Denney & Associates, Inc.

2400 Comanche Road, N.E.

Albuquerque New Mexico 87107

REVISED DRAINAGE REPORT

DIALYSIS FACILITY

TRACT 2, BLOCK A

CC&F PROPERTIES

Prepared For

NATIONAL MEDICAL CARE, INC.

APRIL, 1981

F.D. Job No. 522.21

Prepared By

Fred Denney & Associates, Inc.

2400 Comanche Road, N.E.

Albuquerque, New Mexico 87107

I, Louis W. Gross, hereby certify that the enclosed documents and drawings were prepared under my supervision and are true and correct to the best of my knowledge and belief.

Louis W. Gross

New Mexico Registered Professional
Engineer and Land Surveyor No. 4100

LOUIS W. GROSS
NEW MEXICO
4100
AND LAND SURVEYOR
REGISTERED PROFESSIONAL ENGINEER

REVISED DRAINAGE REPORT
DIALYSIS FACILITY
TRACT 2, BLOCK A, CC&F PROPERTIES

1. DESCRIPTION OF SITE:

This undeveloped tract is bounded on the North by Lomas Boulevard, on the West by Block B of Tract 1 (vacant), on the South by S1, 2, Tract 3 of Horne Development and on the East by Block A, Tract 1 occupied by Hewlett-Packard. The site slopes to the west at approximately 2.7% and contains 1.17312 acres more or less. The site is not located within a designated flood hazard area.

2. GENERAL:

There is an existing pond on the West side of Tract 2 which acts as a temporary pond for the Hewlett-Packard lot. (Attached is a copy of the previously approved drainage plan.) Water is presently discharged from the north and south end of this pond into Block B of Tract 1. After leaving Block B of Tract 1 the runoff is discharged onto Hotel Circle.

The construction on the proposed site will eliminate the temporary pond; therefore, runoff calculations will include the effected area of the Hewlett-Packard lot. After development runoff water will be retained in Pond #1 and discharged from Pond #1 onto Hotel Circle via drain pipe at a rate not to exceed the runoff produced from a 5-year storm.

3. RUNOFF CRITERIA:

Runoff volumes are determined using the City of Albuquerque Precipitation Map for a 6-hour, 100-year storm. Rainfall of 2.5 inches is used. A runoff factor of 0.9 is used for paving and roofs and 0.4 for landscaped and undeveloped areas.

4. OFF-SITE RUNOFF:

The source of off-site runoff is the Hewlett-Packard lot east of the site. This volume of runoff is computed using a 100-year, 6-hour storm.

35,748 x 0.9 x (2.5/12) = 6,703.0 CF

35,331 x 0.4 x (2.5/12) = 2,944.0 CF

Total Volume = 9,647.0 CF

5. ON-SITE RUNOFF:

Developed:

Paving & Roofing = (35,509)(0.9)(2.5/12) = 6,657 CF

Landscaped = (15,592)(0.4)(2.5/12) = 1,299 CF

Total Volume = 7,956 CF

Total Ponding Required for Hewlett-Packard and Bio-Med Lots = (9,647.0 SF + 7,956.0 CF) = 17,603.0 CF

6. PONDING:

Pond #1:

Top Area = 10,639.5 SF

Bottom Area = 2,325 SF

Average Area = 6,482.3 SF

Depth = 2.9 ft.

Volume = 18,798.53 SF

Total Capacity of Pond #1 = 18,798.5 CF

This capacity is greater than 17,603.0 CF required by development.

The purpose of the cobbled pad is to retain sediment from the parking lots which will allow the remainder of the pond to be landscaped. Details of this and the concrete channel connecting the pad and the parking lots are shown in Exhibit "B".

7. CHANNEL INTO POND #1:

Runoff Areas: (Bio-Med Lots & Hewlett-Packard Lot)

Paved & Roofed	=	71,257.0 SF
Landscaped	=	50,923.0 SF
		122,180.0 SF (2.80 Acres)

Runoff Factors:

Natural Soil	=	0.40
Landscaped	=	0.40
Paving & Roofed	=	0.90

Composite Runoff Factors:

Paving & Roofed	=	(71,257)(0.9)	=	64,131.0
Landscaped	=	(50,923)(0.4) / 122,180	=	20,369.0
				84,500.0

Composite Runoff Coefficient:

(84,500/122,180) = .69

CRITERIA: The Rational Method (Q=AIR) will be used to compute the peak flow for a 100-year frequency storm. (Intensities may be obtained from Exhibit "C".) A "composite" runoff coefficient has been computed based on the runoff factors for each of three types of surfaces receiving rainfall: roofed area, landscaped area, and paved area.

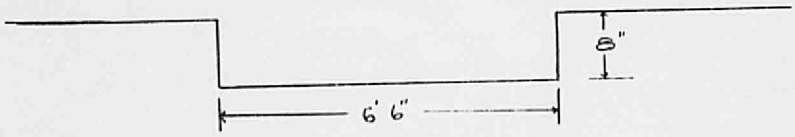
Time of Concentration:

$Tc = 189/(t+25) = (189/35) = 5.4$ @ $t = 10$ minutes

Peak Flow:

$Q = (5.4)(.69)(2.80) = \underline{10.43 \text{ cfs}}$

TRY:



Channel Control:

$Q = (1.486/.013)(R^{2/3})(S^{1/2})(A)$

$A = 4.333$ SF

$R = (A/P) = .5532$

$S = .046$

$Q = (1.486/.013)(.5532)^{2/3}(.046)^{1/2}(4.333)$

$Q = 71.59$ cfs > 10.43 cfs O.K. Check inlet control

Channel Inlet Control:

$H = (Q/(CR))^{2/3}$

R = Width of Channel

Q = Flow (cfs)

C = 3.46

$H = (10.43/(3.46 \times 6.5))^{2/3} = .599 < .6667$ O.K.

8. POSITIVE DRAINAGE SYSTEM FOR POND #1:

Pond #1 must have a positive drainage system which will not discharge a total runoff greater than Q_5 undeveloped. The time of concentration for the entire area under consideration equals 10 minutes. The method outlined within the NOAA (National Oceanic and Atmospheric Administration) Atlas, Volume IV for New Mexico was used to determine rainfall intensities for the 5-year storm as follows:

Y_2 = 2-year, 1-hour estimated value

X_1 = 2-year, 6-hour value from precipitation frequency maps

X_2 = 2-year, 24-hour value from precipitation frequency maps

$Y_{100} = 0.494 + (X_3(X_3/X_4))$

WHERE:

Y_{100} = 100-year, 1-hour estimated value

X_3 = 100-year, 6-hour value from precipitation frequency maps

X_4 = 100-year, 24-hour value from precipitation frequency maps

THEREFORE:

$Y_2 = -0.011 + 0.942 \times 1.0(1.0/1.2) = .7740$ or 0.80

$Y_{100} = 0.440 + 0.755 \times 2.3(2.3/2.7) = 1.919$ or 2.00

From Exhibit "E", the 5-year, 1-hour storm precipitation is approximately 1.01 inches/hour. Therefore, using adjustment factors to obtain N-minute estimates from 1-hour values results in:

5-year, 5-minutes 0.29 x 1.01 = .30 in. = 3.60 in/hr

5-year, 10-minutes 0.45 x 1.01 = .45 in. = 2.72 in/hr

5-year, 15-minutes 0.57 x 1.01 = .58 in. = 2.30 in/hr

5-year, 30-minutes 0.79 x 1.01 = .80 in. = 1.59 in/hr

5-year, 60-minutes 1.00 x 1.01 = 1.01 in. = 1.01 in/hr

Positive discharge from Pond #1 will be accomplished by a slotted standpipe (detail on Exhibit "A"). Therefore, using the Rational Method results in the following:

Q = AIR

A = 2.80 (Bio-Med & Hewlett-Packard Lots)

I = 2.72 in/hr

R = Runoff Coefficient: Use .69 as previously computed

R = .69

Q = (2.80)(2.72)(.69) = 5.26 cfs

Required Discharge must be no greater than 5.26 cfs

<u>Pond #1</u>:

$Q = .6A\sqrt{2gH}$

Use 6, 2" x 6" slots arranged as shown in Exhibit "A". This results in the following discharge:

DEPTH	AREA	CAPACITY
3.00'	.25	2.08 cfs
1.95	.25	1.66 cfs
		3.74 cfs

3.74 cfs < 5.26 cfs Q_5 Required Discharge

Drain Pipe Sizing:

Using Mannings Equation:

N = 0.011

S = .021

R = (A/P) (Assume pipe flowing full)

Try 12" Diameter Pipe:

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

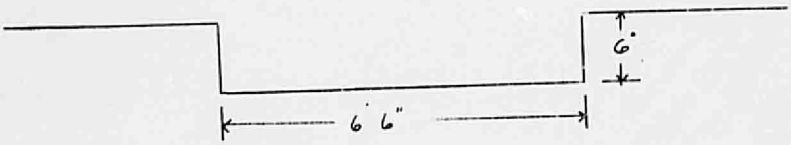
$Q = (1.486/.011)(.25)^{2/3}(.021)^{1/2}(.7854)$

Q = 6.10 cfs > 3.74 cfs that will discharge into it.

The flow is restricted by the orifice such that it will never be greater than the 12" pipe can handle.

9. OVER FLOW CHANNEL:

Using the 100-year storm value obtained for sizing the channel into Pond #1 minus 3.74 cfs through the positive discharge system we obtain a value of 7.71 cfs (10.43 cfs - 3.74 cfs = 6.69 cfs)



$Q = (1.486/.013)(R^{2/3})(S^{1/2})(A)$

$A = 3.33$ SF

$R = (A/P) = (3.33/7.5) = .4400$

$S = .333$

$Q = (1.486/.013)(.4400)^{2/3}(.333)^{1/2}(3.33)$

$Q = 127.07$ cfs > 6.69 cfs O.K. Check inlet control

Inlet Control:

$H = (Q/(CR))^{2/3}$

R = Width of Channel

Q = Flow (cfs)

C = 3.46

$H = (6.69/(3.46 \times 6.5))^{2/3} = .4456 < .5$ O.K.

10. CONCLUSIONS & RECOMMENDATIONS:

Based on the preceeding calculations, all runoff created by development will be retained on site. The pond retaining this runoff will exhibit a positive discharge drainage system that will drain Pond #1 in accordance with the City of Albuquerque Drainage Guidelines.

Therefore, we recommend that the drainage plan herein should be accepted as presented.

POND # 1

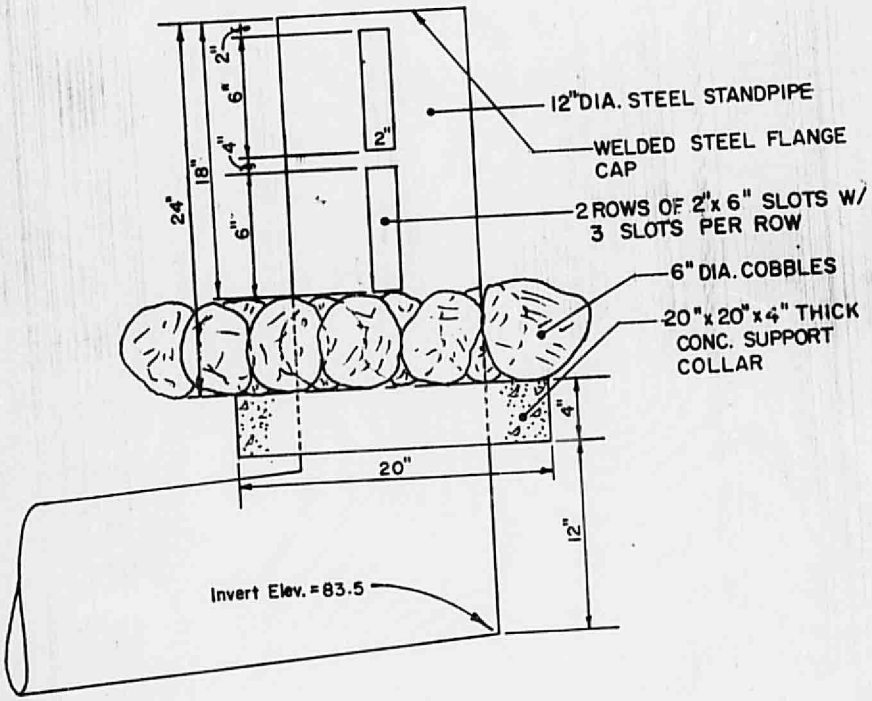
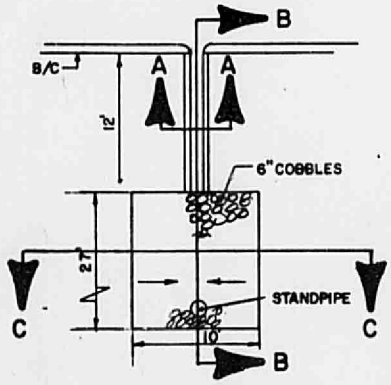
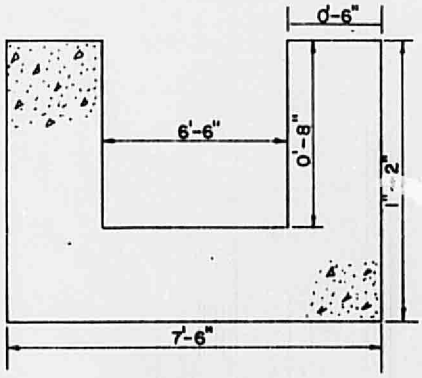


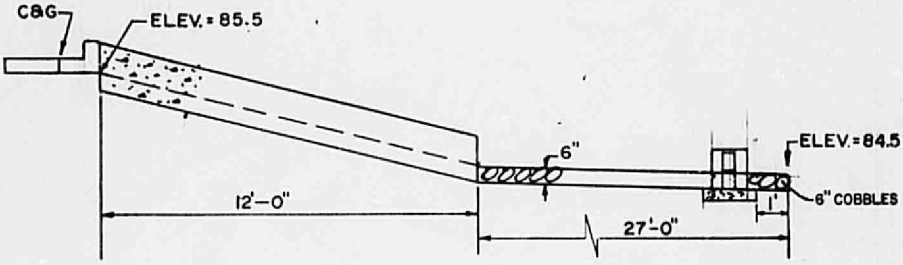
EXHIBIT "A"



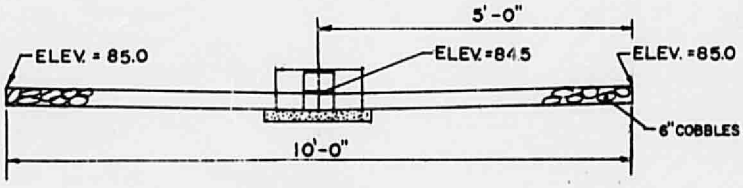
PLAN VIEW



SECTION A-A



SECTION B-B



SECTION C-C

EXHIBIT "B"

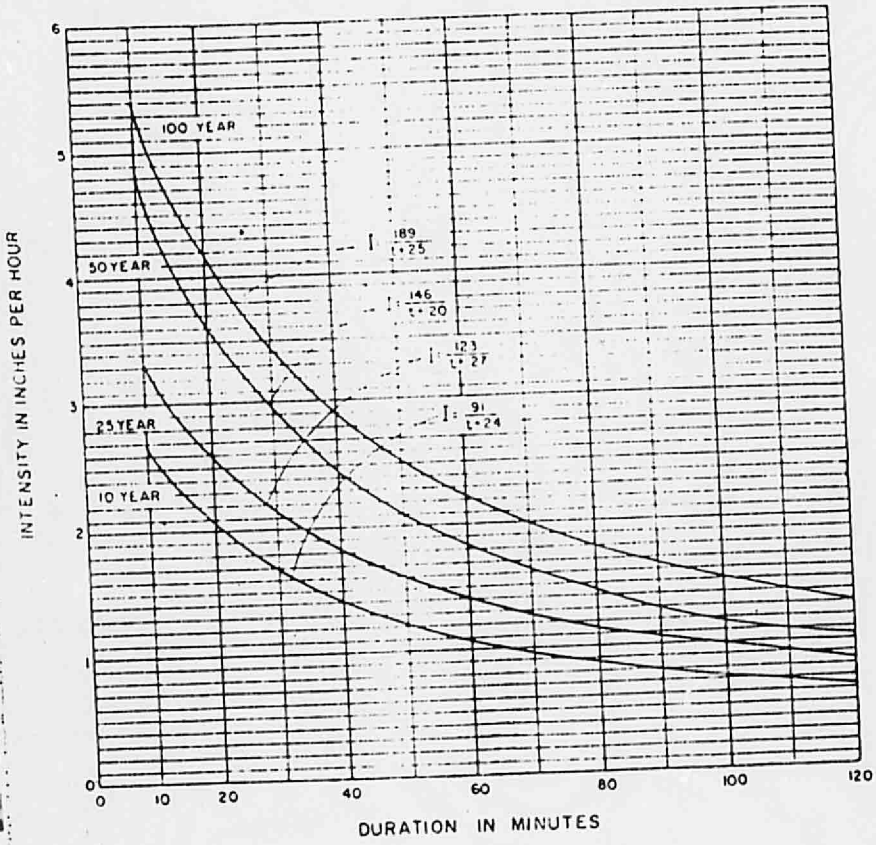
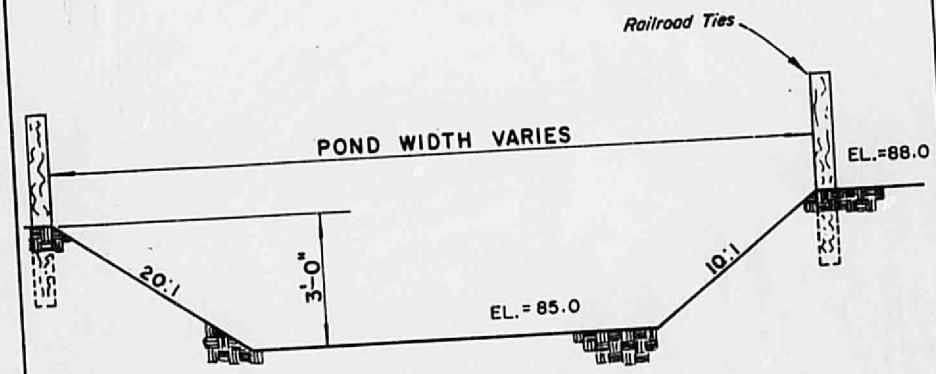


EXHIBIT 'C'

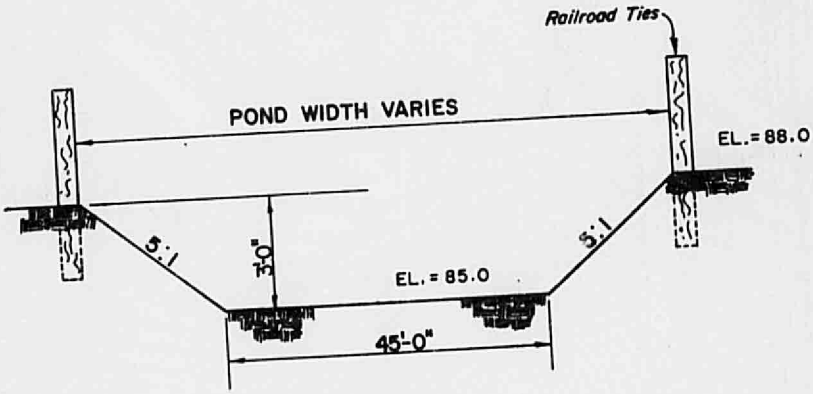
MASTER PLAN OF DRAINAGE
CITY OF ALBUQUERQUE - NEW MEXICO
AND ENVIRONS

INTENSITY DURATION
FREQUENCY CURVES

(ALBUQUERQUE AREA - 1961)



SECTION B-B



SECTION A-A

POND NO. 1

EXHIBIT D

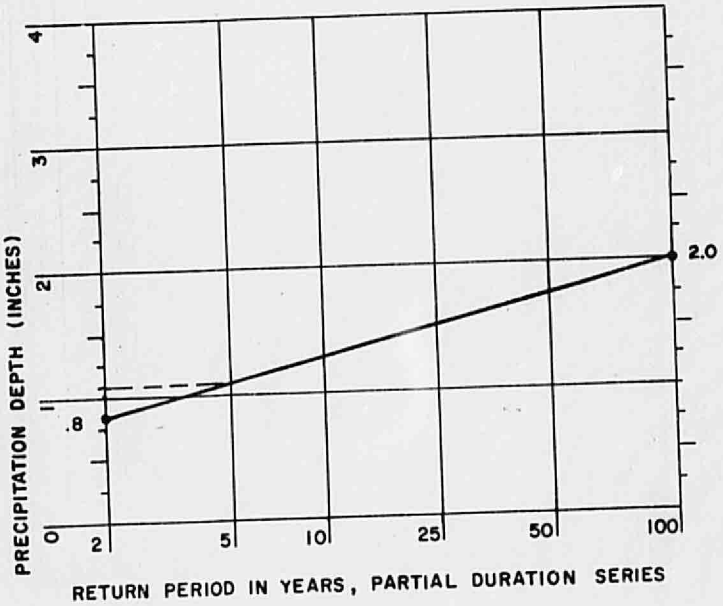
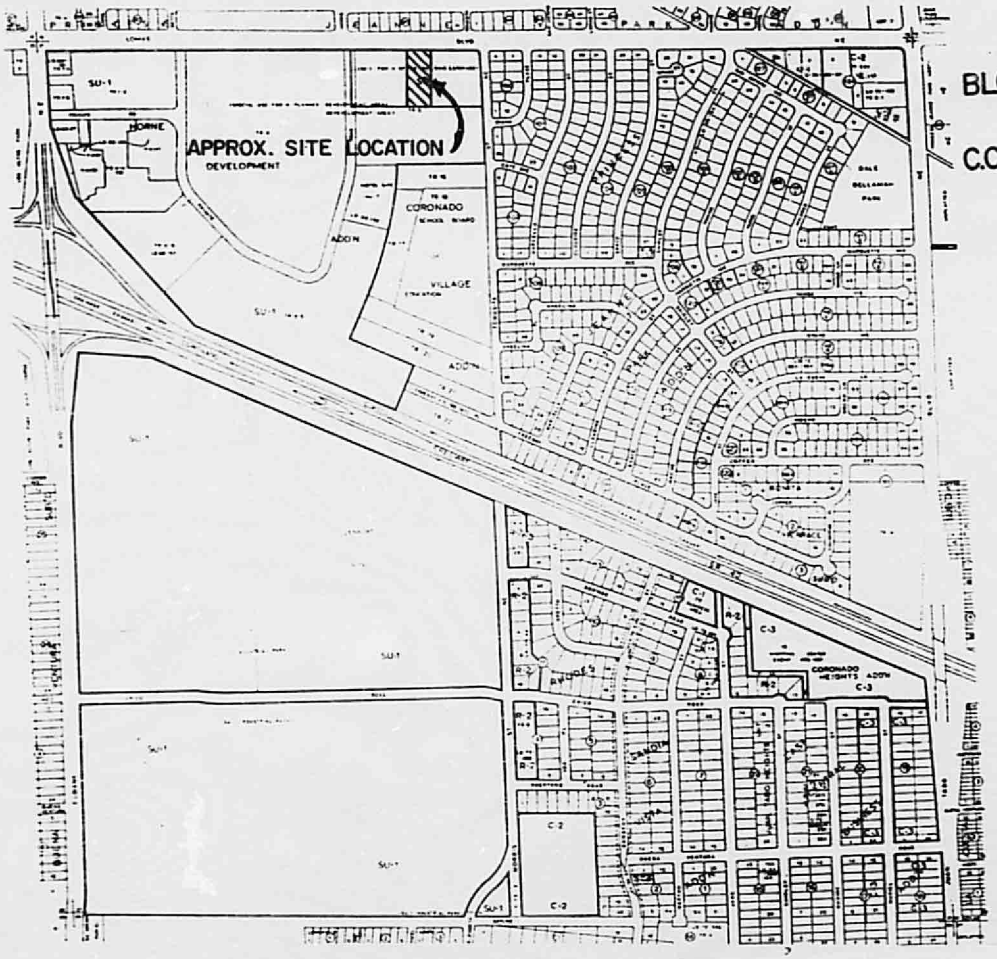

PRECIPITATION DEPTH (INCHES)
0
1
2
3
4
.8
2.0
2
5
10
25
50
100
RETURN PERIOD IN YEARS, PARTIAL DURATION SERIES

EXHIBIT "E"



BLOCK A TRACT 2
OF
C.C.& F. PROPERTIES

EXHIBIT F

K-21-Z

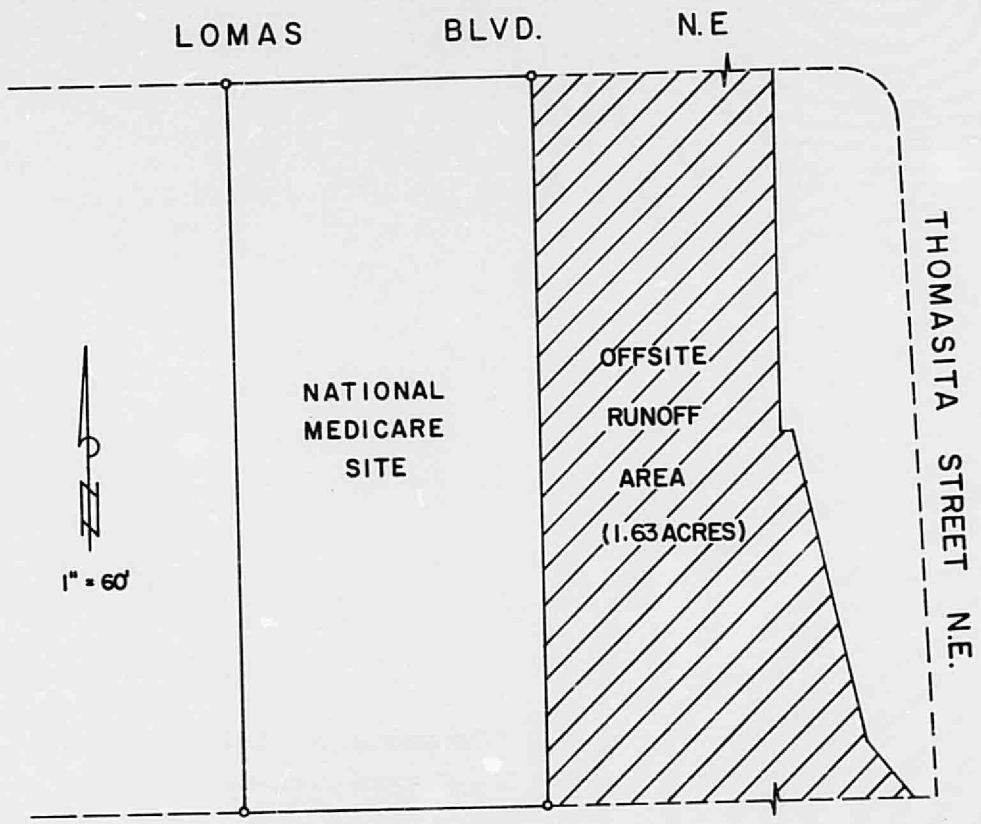

LOMAS BLVD. N.E
THOMASITA STREET N.E.
NATIONAL MEDICARE SITE
OFFSITE RUNOFF AREA (1.63 ACRES)
1" = 60'

EXHIBIT G

0 9 1 3

HYDROLOGY K21/D1A 3 PLANS

K21/D1A

3 Plans

DENNEY-GROSS & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0696

July 17, 1981

Mr. Fred Aguirie
Civil Engineer
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Bio-Med Dialysis Facility
Albuquerque, New Mexico
F.D. Job No. 522.32

Dear Fred:

Enclosed herewith for your review is a copy of the modified site plan for subject project.

The only change that has occured is the addition of an 8" PVC drain line from the roof to the pond.

Fred, the overall scheme is not affected by this addition. Therefore, we would appreciate your expeditious review and approval.

Very truly yours,

Ron Taylor

Ron Taylor

RT/am
Enclosure

FRED DENNEY & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0696

June 26, 1981

RECEIVED
JUN 29 1981
CITY ENGINEER

Mr. Fred J. Aguirre, P.E.
Hydrology Department
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: National Medical Care, Inc.
Bio-Medical Applications of
Northeast Albuquerque, NM
F.D. Job No. 522.32

Dear Mr. Aguirre:

In accordance with the requirements of your letter of June 4, 1981, for Drainage Report K-21-D1b, on subject property, transmitted herewith is one original Agreement executed by the owner accepting the offsite flows.

One original of this Agreement will be filed in the Office of the County Clerk this date. We trust this meets all requirements and that the Certificate of Occupancy can now be issued. when appropriate.

Very truly yours,

Anita Moya

Anita Moya

AM/
Enclosure
cc: National Medical Care, Inc.,
Francis F. LaPlante, V.Pres.

AGREEMENT

We the undersigned, being the owners of Tract 2, Block A, "Corrected, Amended Summary Plat, Block A, Land Division Map" filed for record April 14, 1981, agree to the following stipulations relating to the drainage plan for said tract.

1. That the drainage facilities and grading will be constructed in accordance with the plans approved by the City of Albuquerque.
2. That the off-site drainage, which is accounted for in our drainage plan, will be managed by our drainage facilities. No changes in our drainage facilities will be made that will preclude the handling of the off-site flows as planned.

Bio-Medical Applications of
Northeast Albuquerque, Inc.

Francis F. LaPlante
Vice President

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

June 4, 1981

Mr. Ron Taylor
Fred Denney & Associates, Inc.
Consulting Engineers
2400 Comanche Road N.E.
Albuquerque, N.M. 87107

RE: NATIONAL MEDICARE REVISED DRAINAGE REPORT K-21-D1b

Dear Mr. Taylor:

The drainage report for the referenced site is approved. However, the Certificate of Occupancy will be withheld until this office receives the letter from the owner accepting the offsite flows discussed in your report.

If you have any questions concerning the above, please feel free to call me.

Very truly yours,

Fred J. Aguirre

Fred J. Aguirre, PE
Civil Engineer

FJA/tsl

FRED DENNEY & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0696

RECEIVED
JUN 02 1981
CITY ENGINEER

May 27, 1981

Mr. Joe Micalizzi
National Medical Care, Inc.
Real Estate & Construction Dept.
1055 Commonwealth Avenue
Boston, MA 02215

Re: National Medical Care
Dialysis Facility
F.D. Job No. 522.32

Dear Joe:

Changes to the site plan are as follows:

1. The water service connection has been changed from the connection on Hotel Circle onto the 20" water main on Lomas Boulevard.

2. Grading has changed to accommodate a larger pond.

3. Overflow channel was added to drainage facilities.

4. Drain pipe changed from a 12" PVC to 8" Ductile Iron pipe.

5. The cobbled pad has been enlarged from a 6" x 10' x 27' pad with 6" cobbles to a 1' x 10' x 27' pad with 3" cobbles.

6. A railroad tie fence has been added.

7. Outlet for drain pipe has been specified per City Standards. Also, you will note in Mr. Denney's letter to Bill Pervidi dated April 24, 1981, it was stated that the City of Albuquerque will allow us to tie the drain line from the pond onto the Lomas Boulevard storm sewer. In a subsequent meeting Lou Gross and myself had with Chuck Easterling and Fred Aguirre, both with the City of Albuquerque, it was decided

by them at that time to drain the pond onto Hotel Circle. (See attachment)

8. Per the City of Albuquerque, Water Resources Department, a manhole was added to the 6" connection to the existing 8" sewer line.

9. 4 CY lift bin to serve dialysis facility. Rolloff bin required at later date for entire development.

10. Plant Sizes. Three 1.5" caliper or 10' - 20' in length. Shrubs to be 5 gallon minimum.

Enclosed is a mylar sepia of the approved drainage plan per your request. To expedite the acquisition of the building permit, the site plan was not placed on National Medical Care's standard size sheets.

Joe, as of this date the building permit is in the Contractor's possession.

If you have any questions concerning this, please do not hesitate to call.

Very truly yours,

Ron Taylor

Ron Taylor

RT/lm

Enclosures

cc: Fred Aguirre

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

HYDROLOGY SECTION PROJ. NO. K-21-D16 DATE: 5/5/81

PLANNING DIVISION NO. _____

CONFERENCE RECAP

SUBJECT: NATIONAL MEDICAL CARE

ATTENDANCE: WHO	REPRESENTING
LOU GROSS	FRED DENNEY & ASSOC
RON TAYLOR	" " "
FRED AGUIRRE	CITY
CM EASTERLING	CITY

FINDINGS:

4. ~~DISCHARGE [illegible] UNDEVELOPED~~
1. DISCHARGE IS UNDEVELOPED FOR BOTH HEWLETT-PACKARD AND DEVELOPMENT SITE TO HOTEL CIRCLE
2. CONSTRUCT 1' DEEP GRAVEL BED BELOW ~~INLET~~ OUTLET DISCHARGE POINT TO HOLD IRRIGATION OVER-SPRAY.
3. PROVIDE CITY WITH COPY OF FILED DRAINAGE EASEMENT.
4. PROVIDE AGREEMENT TO ACCEPT WATER FROM H-P.

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED: [illegible] SIGNED: [illegible]

TITLE: Vice Pres. Fred Denney & Assoc. TITLE: PRINC. ASSIST. CITY ENGR / HYD

DATE: 5/5/81 DATE: 5/5/81

522.11
C.C.

FRED DENNEY & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0696

May 8, 1981

RECEIVED
MAY 08 1981
CITY ENGINEER

Mr. Fred Aguirre
Engineering Department
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: National Medicare Revised
Drainage Report
F.D. Job No. 522.11

Dear Fred:

Per our discussion on May 4, 1981 regarding referenced project, your comments and the action taken are listed below.

1. COMMENT: In calculating Q_5 undeveloped for the positive discharge system, a composite runoff factor of 0.69 was used.

ANSWER: The runoff factor has been changed to 0.40. Quantities are as follows:

Page 6 and 7 of Revised Drainage Report:

RECEIVED
MAY 12 1981

Q = AIR
A = 2.80
I = 2.72 in/hr
R = 0.4 (undeveloped)

Q = (2.8)(2.72)(.4) = 3.05 cfs

Pond #1

$Q = .6A\sqrt{2gh}$

Use 4 - 2" x 6" slots arranged as shown on construction drawings. This results in the following discharge:

DEPTH (ft)	AREA (sf)	CAPACITY (cfs)
3.00	.17	1.42
1.95	.17	1.14
		2.56

2.56 cfs < 3.05 cfs O.K.

Drain Pipe Sizing (Using Mannings Equation)

Try 8" Diameter Pipe

P = 1.05 ft n = 0.012

A = .35 SF S = 0.016

R = .33 ft

$$Q = (1.486/.012)(.33)^{2/3}(.016)^{1/2}(.35) = 2.69 \text{ cfs}$$

2.69 cfs > 2.56 cfs O.K.

2. COMMENT: A small cobbled pad to hold irrigation overspary. No design information is available to size the pad.

   ANSWER: A 27' x 10' x 1' deep pad with 3" cobbles has been provided.

3. COMMENT: A copy of the re-filed plat showing the drainage easement is needed.

   ANSWER: Attached.

4. COMMENT: The railroad tie fence must be a minimum of 3 feet high.

   ANSWER: Done.

5. COMMENT: For construction purposes, cross sections of pond and swale lines are needed.

   ANSWER: Cross sections have been provided. These cross sections are drawn to scale.

6. COMMENT: Spot elevations on curb next to pond needed to insure the water will flow into the pond as indicated.

ANSWER: Grades have been slightly changed and spot elevations provided.

7. COMMENT: Details for storm drain and outlet onto Hotel Circle.

ANSWER: Because the curb on Hotel Circle is a 6" curb, the City Standard Drawing K-16 has been modified for a 6" curb.

8. COMMENT: Details for inlet and outlet channels needed.

ANSWER: Done.

Fred, all of the above have been incorporated into a construction drawing. Also, the Agreement from National Medical Care, Inc. concerning the runoff from the Hewlett-Packard lot is in the process of being signed by National Medical Care, Inc.

We believe that the above information should suffice in supplying the required information for final approval of the drainage report.

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

Very truly yours,

Ron Taylor

Ron Taylor

RT/lm

Enclosures

cc: National Medical Care, Inc.

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

HYDROLOGY SECTION PROJ. NO. K-21 - ~~[illegible]~~ DATE: 5/5/81

PLANNING DIVISION NO. _____

K 21-D1B

CONFERENCE RECAP

SUBJECT: NATIONAL MEDICAL CARE

	WHO	REPRESENTING
ATTENDANCE:	LOU GROSS	FRED DEWNEY & ASSOC
	RON TAYLOR	" " "
	FRED AGUIRRE	CITY
	CM EASTERLING	CITY

FINDINGS:

~~4. DISCHARGE [illegible] UNDEVELOPED~~

1. DISCHARGE Q's UNDEVELOPED FOR BOTH HEWLETT-PACKARD AND DEVELOPMENT SITE TO HOTEL CIRCLE
2. CONSTRUCT 1' DEEP GRAVEL BED BELOW ~~[illegible]~~ OUTLET DISCHARGE POINT TO HOLD IRRIGATION OVER-SPRAY.
3. PROVIDE CITY WITH COPY OF FILED DRAINAGE EASEMENT.
4. PROVIDE AGREEMENT TO ACCEPT WATER FROM H-P.

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED: Louis M. Gross

TITLE: ~~Vice Pres. Fred Dewney & Assoc.~~

DATE: 5/5/81

SIGNED: Carl M. Easterling

TITLE: PRINC ASSIST. CITY ENGR/HYDRO

DATE: 5/5/81

FRED DENNEY & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0696

April 16, 1981

RECEIVED
APR 17 1981
CITY ENGINEER

Mr. Chuck Easterling
Engineering Division
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Drainage Plan
Tract 2, Block A,
C.C. & F. Properties
Dialysis Facility
F.D. Job No. 522.21

Dear Chuck:

Ron Taylor of our office received comments from F. J. Aguirre concerning the referenced drainage plan. We have considered each comment and are listing below both Mr. Aguirre's Comments and our answers.

Comment No. 1: Common easement required between Block B and Tract 2, Block A, for the proposed storm runoff across their common property line.

Answer: Our drainage plan accounts for the portion of storm water generaged on Block B which enters Tract 2. The grading plan provides for leading the water from Block B to the pond proposed on Tract 2. The pond is sized to store the 100 year storm water from the portion of Block B and all of Tract 2. We cannot obtain an easement or an agreement from the owner of Block B. We suggest that if the owner of Tract B requests a building permit in the future the City would be in a position to obtain an agreement.

Comment No. 2: Concurrence from the utility companies for the proposed 12" PVC storm drain pipe within their right-of-way. Assuming approval by the utility companies, the easement must be modified to reflect the drainage easement. We should also address the responsibility of maintenance for this storm drain system.

Answer: See attached re-filed Summary Plat.

Comment No. 3: Standard City curb cuts for the outlet should be used or approval obtained for the new design from the ACE-Design.

Answer: Plans changed accordingly.

Comment No. 4: The existing pond indicated in the report is not reflected in the grading plan provided. Please include the approved drainage plan for the Hewlett-Packard Lot and any proposed modifications to said plan with this report.

Answer: The existing pond is shown on the grading plan. The approved plan for the Hewlett-Packard Lot (Block B) will be included. The only change in the approved plan is the obliteration of what is called Pond No. 5 (Temporary). This is shown on the grading plan.

Comment No. 5: The drainage report must address the entire developed runoff and not just the increased runoff.

Answer: The plan was changed to pond all the developed runoff.

Comment No. 6: Also see brief comments in the report.

Answer: Done.

Comment No. 7: Check to see if the street you are proposing to drain into is not private, and if it is, check to see if you will be allowed to discharge into it.

Answer: The pond evacuation pipe is proposed to drain to Hotel Circle, which is a private street. We cannot obtain permission to discharge to the street. However, the natural drainage was picked up by this street before development. The proposed drainage plan would allow a lesser peak flow to enter the street, but would allow a larger volume over a longer period of time. Also, less sediment would be transported to Hotel Circle.

We first proposed to drain the ponding to the storm sewer in Lomas Boulevard but were told that the line was overloaded. We were directed by the Office of City Hydrology to drain the pond to Hotel Circle. It seems apparent that if continued public interest in Hotel Circle is evidenced, it is the City's obligation to acquire it.

Very truly yours,

Louis W. Gross

LWG/am

4/13/81

Planning history requires!
Hotel circle is private dr.
We do not have any idea of adequacy
of dr. facilities provided

S.U. 1 zoning granted subject to
~~[illegible]~~ supplying single dr. plan for area!

B.C.

4-1-81

To: Chuck Easterling
From: F. J. Aguirre
Subject: Dialysis Facility Drainage Report dated Feb, 1981

1) Common easement required between Block B and Tract 2 Block A for the proposed storm runoff across their common property line

2) Concurrence from the utilitic companies for the proposed 12" PVC storm drain pipe within their right-of-way. Assuming approval by the utility companies, the easement must be modified to reflect the drainage easement. We should also address the responsibility of maintenance for this storm drain system.

3) Standard City curb cuts for the outlet should be used or approval obtained for the new design from the ACE-Design.

4) The existing pond indicated in the report is not reflected in the grading plan provided. Please include the approved drainage plan for the Hewlett-Packard Lot and any proposed modifications to said plan with this report.

5) The drainage report must address the entire developed runoff and not just the increased runoff.

6) Also see brief comments in the report.

7) Check to see if the street you are proposing to drain into is private, and if it is, check to see if you will be allowed to discharge into it.

Over

FRED DENNEY & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0696

February 23, 1981

Mr. Richard Heller
City Engineer
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Drainage Report
National Medical Care's
Dialysis Facility
F.D. Job No. 522.21

Dear Mr. Heller:

Enclosed herewith are three copies of the drainage report for your review and approval.

Your expeditious handling of this matter would be greatly appreciated. Also, if you have any questions or require additional information, please do not hesitate to give me a call.

Very truly yours,

Ron Taylor

Ron Taylor

RT/lm

Enclosures

cc: National Medical Care, Inc/w. Encl.

See pg 7 & Exhibit F
my comments

RECEIVED
FEB 23 1981
CITY ENGINEER

11320 Prospect NE. 7-15-80
disapproved

① no plat exists showing property as presented in construction plans

② if approved as a subdivision, it will require a soils report & a drainage report

conditions 1-5-80
revised grading plan

REVISED DRAINAGE REPORT
DIALYSIS FACILITY
TRACT 2, BLOCK A
CC&F PROPERTIES

Prepared For

NATIONAL MEDICAL CARE, INC.

APRIL, 1981

F.D. Job No. 521.21

RECEIVED
APR 17 1981
CITY ENGINEER

Prepared By

Fred Denney & Associates, Inc.

2400 Comanche Road, N.E.

Albuquerque, New Mexico 87107

REVISED DRAINAGE REPORT
DIALYSIS FACILITY
TRACT 2, BLOCK A
CC&F PROPERTIES

Prepared For

NATIONAL MEDICAL CARE, INC.

APRIL, 1981

F.D. Job No. 522.21

Prepared By

Fred Denney & Associates, Inc.

2400 Comanche Road, N.E.

Albuquerque, New Mexico 87107

I, Louis W. Gross, hereby certify that the enclosed documents and drawings were prepared under my supervision and are true and correct to the best of my knowledge and belief.

Louis W. Gross

New Mexico Registered Professional
Engineer and Land Surveyor No. 4100

LOUIS W. GROSS
NEW MEXICO
4100
AND LAND SURVEYOR
REGISTERED PROFESSONAL ENGINEER

REVISED DRAINAGE REPORT
DIALYSIS FACILITY
TRACT 2, BLOCK A, CC&F PROPERTIES

1. DESCRIPTION OF SITE:

This undeveloped tract is bounded on the North by Lomas Boulevard, on the West by Block B of Tract 1 (vacant), on the South by S1, 2, Tract 3 of Horne Development and on the East by Block A, Tract 1 occupied by Hewlett-Packard. The site slopes to the west at approximately 2.7% and contains 1.17312 acres more or less. The site is not located within a designated flood hazard area.

2. GENERAL:

There is an existing pond on the West side of Tract 2 which acts as a temporary pond for the Hewlett-Packard lot. (Attached is a copy of the previously approved drainage plan.) Water is presently discharged from the north and south end of this pond into Block B of Tract 1. After leaving Block B of Tract 1 the runoff is discharged onto Hotel Circle.

The construction on the proposed site will eliminate the temporary pond; therefore, runoff calculations will include the effected area of the Hewlett-Packard lot. After development runoff water will be retained in Pond #1 and discharged from Pond #1 onto Hotel Circle via drain pipe at a rate not to exceed the runoff produced from a 5-year storm.

3. RUNOFF CRITERIA:

Runoff volumes are determined using the City of Albuquerque Precipitation Map for a 6-hour, 100-year storm. Rainfall of 2.5 inches is used. A runoff factor of 0.9 is used for paving and roofs and 0.4 for landscaped and undeveloped areas.

4. OFF-SITE RUNOFF:

The source of off-site runoff is the Hewlett-Packard lot east of the site. This volume of runoff is computed using a 100-year, 6-hour storm.

35,748 x 0.9 x (2.5/12) = 6,703.0 CF

35,331 x 0.4 x (2.5/12) = 2,944.0 CF

Total Volume = 9,647.0 CF

5. ON-SITE RUNOFF:

Developed:

Paving & Roofing = (35,509)(0.9)(2.5/12) = 6,657 CF

Landscaped = (15,592)(0.4)(2.5/12) = 1,299 CF

Total Volume = 7,956 CF

Total Ponding Required for Hewlett-Packard and Bio-Med Lots = (9,647.0 SF + 7,956.0 CF) = 17,603.0 CF

6. PONDING:

Pond #1:

Top Area = 10,639.5 SF

Bottom Area = 2,325 SF

Average Area = 6,482.3 SF

Depth = 2.9 ft.

Volume = 18,798.53 SF

Total Capacity of Pond #1 = 18,798.5 CF

This capacity is greater than 17,603.0 CF required by development.

The purpose of the cobbled pad is to retain sediment from the parking lots which will allow the remainder of the pond to be landscaped. Details of this and the concrete channel connecting the pad and the parking lots are shown in Exhibit "B".

7. CHANNEL INTO POND #1:

Runoff Areas: (Bio-Med Lots & Hewlett-Packard Lot)

Paved & Roofed	=	71,257.0 SF
Landscaped	=	50,923.0 SF
		122,180.0 SF (2.80 Acres)

Runoff Factors:

Natural Soil	= 0.40
Landscaped	= 0.40
Paving & Roofed	= 0.90

Composite Runoff Factors:

Paving & Roofed	= (71,257)(0.9)	=	64,131.0
Landscaped	= (50,923)(0.4)	=	20,369.0
	122,180		84,500.0

Composite Runoff Coefficient:

(84,500/122,180) = .69

CRITERIA: The Rational Method (Q=AIR) will be used to compute the peak flow for a 100-year frequency storm. (Intensities may be obtained from Exhibit "C".) A "composite" runoff coefficient has been computed based on the runoff factors for each of three types of surfaces receiving rainfall: roofed area, landscaped area, and paved area.

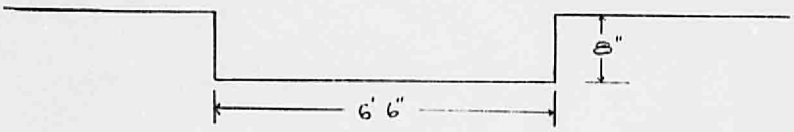
Time of Concentration:

$Tc = 189/(t+25) = (189/35) = 5.4$ @ $t = 10$ minutes

Peak Flow:

$Q = (5.4)(.69)(2.80) = \underline{\underline{10.43 \text{ cfs}}}$

TRY:



Channel Control:

$Q = (1.486/.013)(R^{2/3})(S^{1/2})(A)$

$A = 4.333$ SF

$R = (A/P) = .5532$

$S = .046$

$Q = (1.486/.013)(.5532)^{2/3}(.046)^{1/2}(4.333)$

$Q = 71.59$ cfs > 10.43 cfs O.K. Check inlet control

Channel Inlet Control:

$H = (Q/(CR))^{2/3}$

R = Width of Channel

Q = Flow (cfs)

C = 3.46

$H = (10.43/(3.46 \times 6.5))^{2/3} = .599 < .6667$ O.K.

8. POSITIVE DRAINAGE SYSTEM FOR POND #1:

Pond #1 must have a positive drainage system which will not discharge a total runoff greater than Q_5 undeveloped. The time of concentration for the entire area under consideration equals 10 minutes. The method outlined within the NOAA (National Oceanic and Atmospheric Administration) Atlas, Volume IV for New Mexico was used to determine rainfall intensities for the 5-year storm as follows:

Y_2 = 2-year, 1-hour estimated value

X_1 = 2-year, 6-hour value from precipitation frequency maps

X_2 = 2-year, 24-hour value from precipitation frequency maps

$Y_{100} = 0.494 + (X_3(X_3/X_4))$

WHERE:

Y_{100} = 100-year, 1-hour estimated value

X_3 = 100-year, 6-hour value from precipitation frequency maps

X_4 = 100-year, 24-hour value from precipitation frequency maps

THEREFORE:

Y_2 = -0.011 + 0.942 x 1.0(1.0/1.2) = .7740 or 0.80

Y_{100} = 0.440 + 0.755 x 2.3(2.3/2.7) = 1.919 or 2.00

From Exhibit "E", the 5-year, 1-hour storm precipitation is approximately 1.01 inches/hour. Therefore, using adjustment factors to obtain N-minute estimates from 1-hour values results in:

5-year, 5-minutes 0.29 x 1.01 = .30 in. = 3.60 in/hr

5-year, 10-minutes 0.45 x 1.01 = .45 in. = 2.72 in/hr

5-year, 15-minutes 0.57 x 1.01 = .58 in. = 2.30 in/hr

5-year, 30-minutes 0.79 x 1.01 = .80 in. = 1.59 in/hr

5-year, 60-minutes 1.00 x 1.01 = 1.01 in. = 1.01 in/hr

Positive discharge from Pond #1 will be accomplished by a slotted standpipe (detail on Exhibit "A"). Therefore, using the Rational Method results in the following:

Q = AIR

A = 2.80 (Bio-Med & Hewlett-Packard Lots)

I = 2.72 in/hr

R = Runoff Coefficient: Use .69 as previously computed

R = .69

Q = (2.80)(2.72)(.69) = 5.26 cfs

Required Discharge must be no greater than 5.26 cfs

<u>Pond #1</u>:

$Q = .6A\sqrt{2gH}$

Use 6, 2" x 6" slots arranged as shown in Exhibit "A". This results in the following discharge:

DEPTH	AREA	CAPACITY
3.00'	.25	2.08 cfs
1.95	.25	1.66 cfs
		3.74 cfs

3.74 cfs < 5.26 cfs Q_5 Required Discharge

Drain Pipe Sizing:

Using Mannings Equation:

N = 0.011

S = .021

R = (A/P) (Assume pipe flowing full)

Try 12" Diameter Pipe:

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

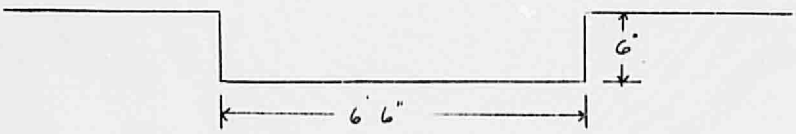
$Q = (1.486/.011)(.25)^{2/3}(.021)^{1/2}(.7854)$

Q = 6.10 cfs > 3.74 cfs that will discharge into it.

The flow is restricted by the orifice such that it will never be greater than the 12" pipe can handle.

9. OVER FLOW CHANNEL:

Using the 100-year storm value obtained for sizing the channel into Pond #1 minus 3.74 cfs through the positive discharge system we obtain a value of 7.71 cfs (10.43 cfs - 3.74 cfs = 6.69 cfs)



$Q = (1.486/.013)(R^{2/3})(S^{1/2})(A)$

$A = 3.33$ SF

$R = (A/P) = (3.33/7.5) = .4400$

$S = .333$

$Q = (1.486/.013)(.4400)^{2/3}(.333)^{1/2}(3.33)$

$Q = 127.07$ cfs > 6.69 cfs O.K. Check inlet control

Inlet Control:

$H = (Q/(CR))^{2/3}$

R = Width of Channel

Q = Flow (cfs)

C = 3.46

$H = (6.69/(3.46 \times 6.5))^{2/3} = .4456 < .5$ O.K.

10. CONCLUSIONS & RECOMMENDATIONS:

Based on the preceeding calculations, all runoff created by development will be retained on site. The pond retaining this runoff will exhibit a positive discharge drainage system that will drain Pond #1 in accordance with the City of Albuquerque Drainage Guidelines.

Therefore, we recommend that the drainage plan herein should be accepted as presented.

POND # 1

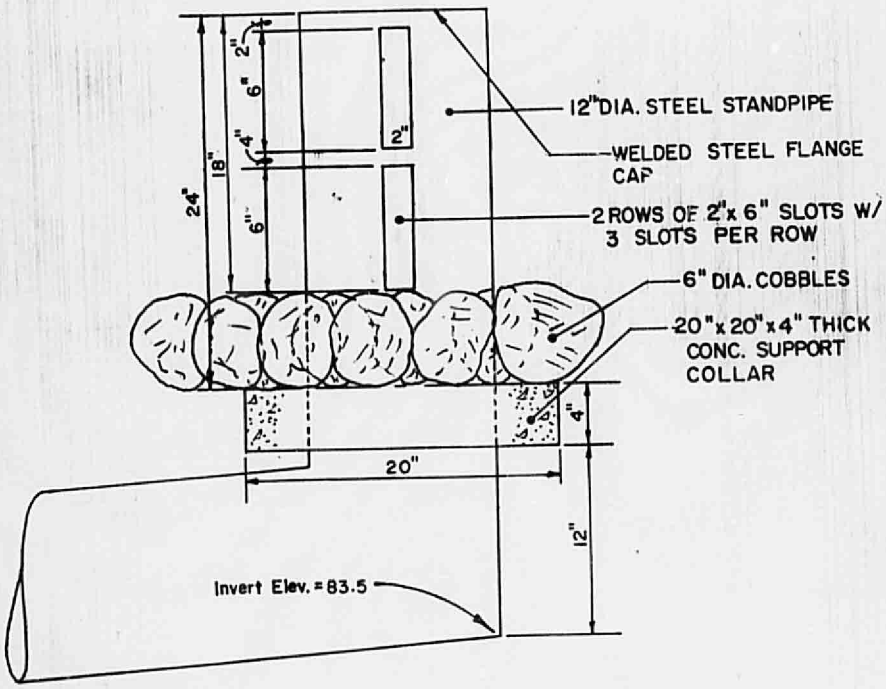
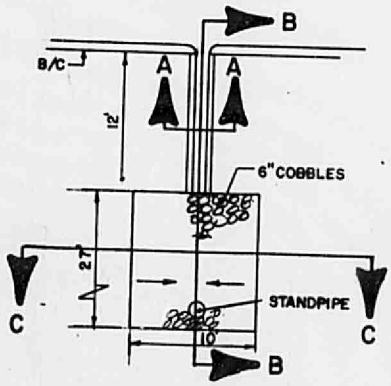
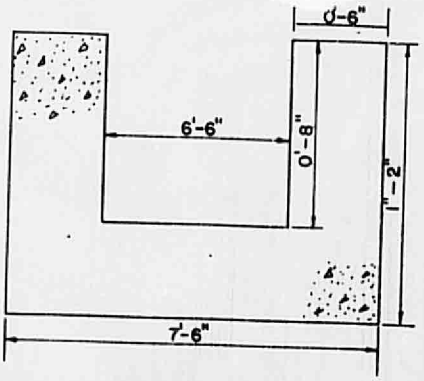


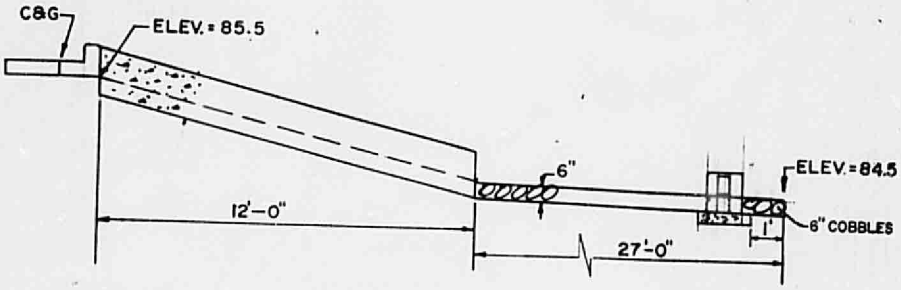
EXHIBIT "A"



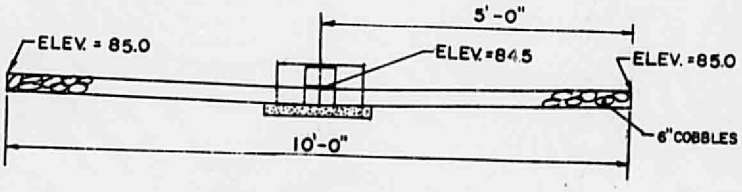
PLAN VIEW



SECTION A-A



SECTION B-B



SECTION C-C

EXHIBIT "B"

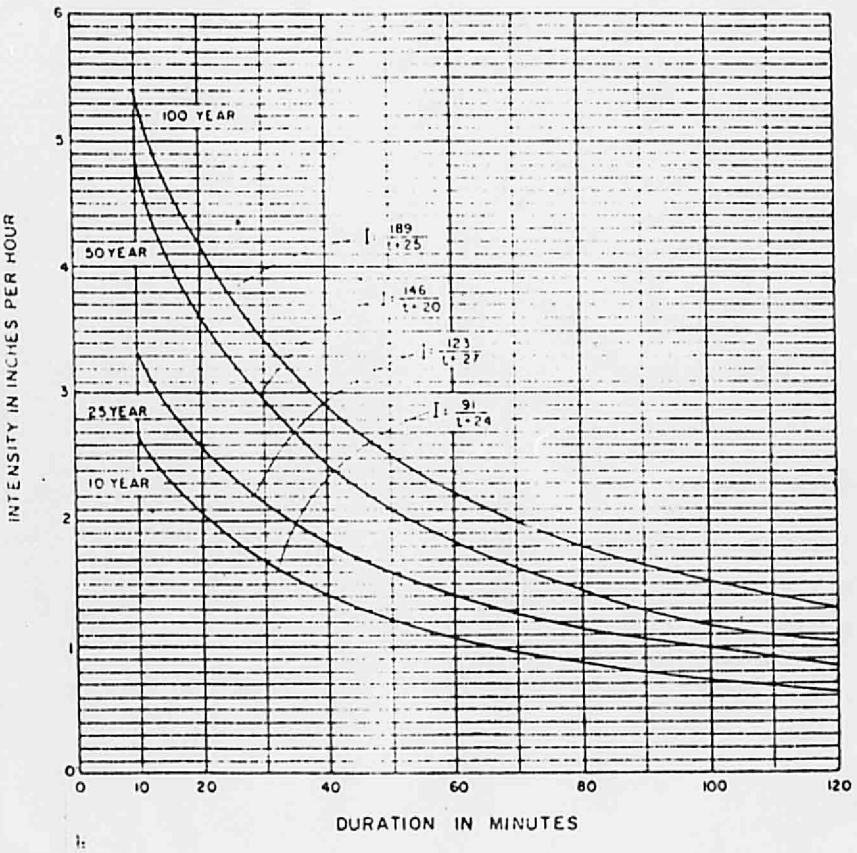
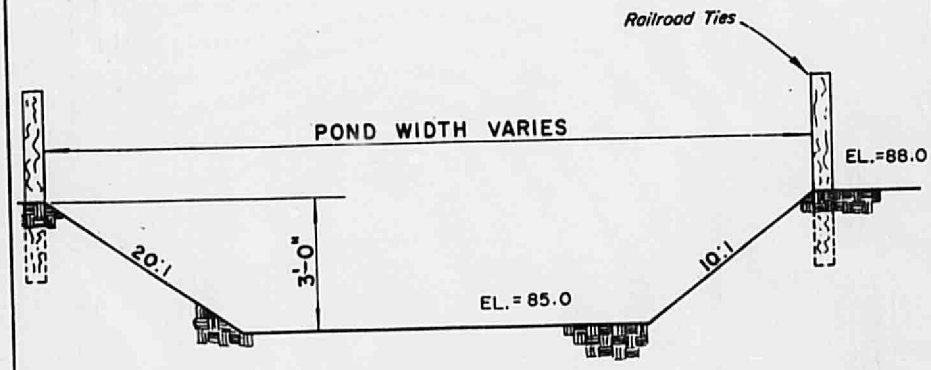


EXHIBIT "C"

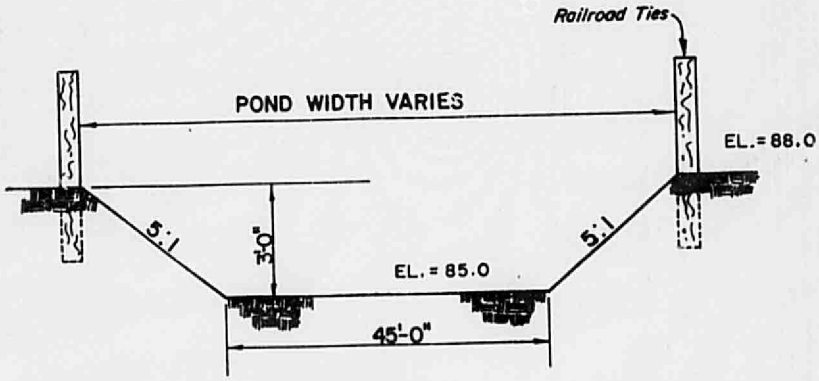
MASTER PLAN OF DRAINAGE
CITY OF ALBUQUERQUE - NEW MEXICO
AND ENVIRONS

INTENSITY DURATION
FREQUENCY CURVES

(ALBUQUERQUE AREA - 1961)



SECTION B-B



SECTION A-A

POND NO. I

EXHIBIT D

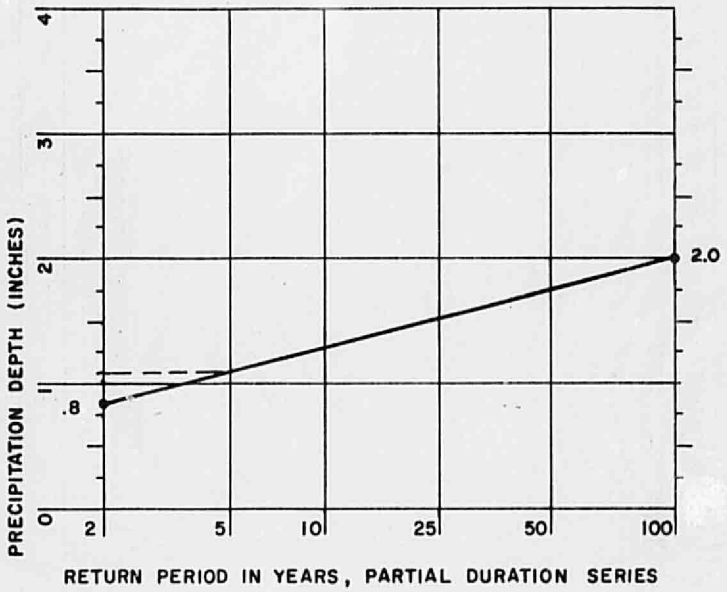
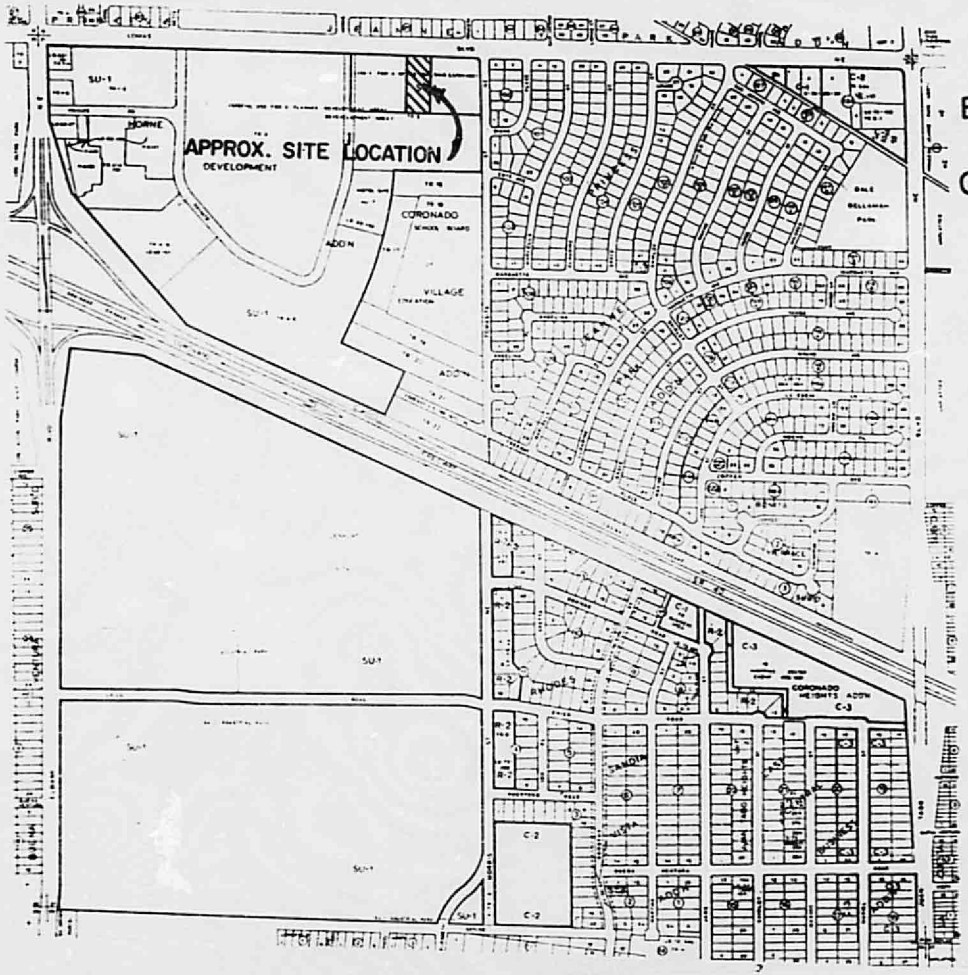

PRECIPITATION DEPTH (INCHES)
0
1
2
3
4
.8
2.0
2
5
10
25
50
100
RETURN PERIOD IN YEARS, PARTIAL DURATION SERIES

EXHIBIT "E"



BLOCK A TRACT 2
OF
C.C.& F. PROPERTIES

EXHIBIT F

K-21-Z

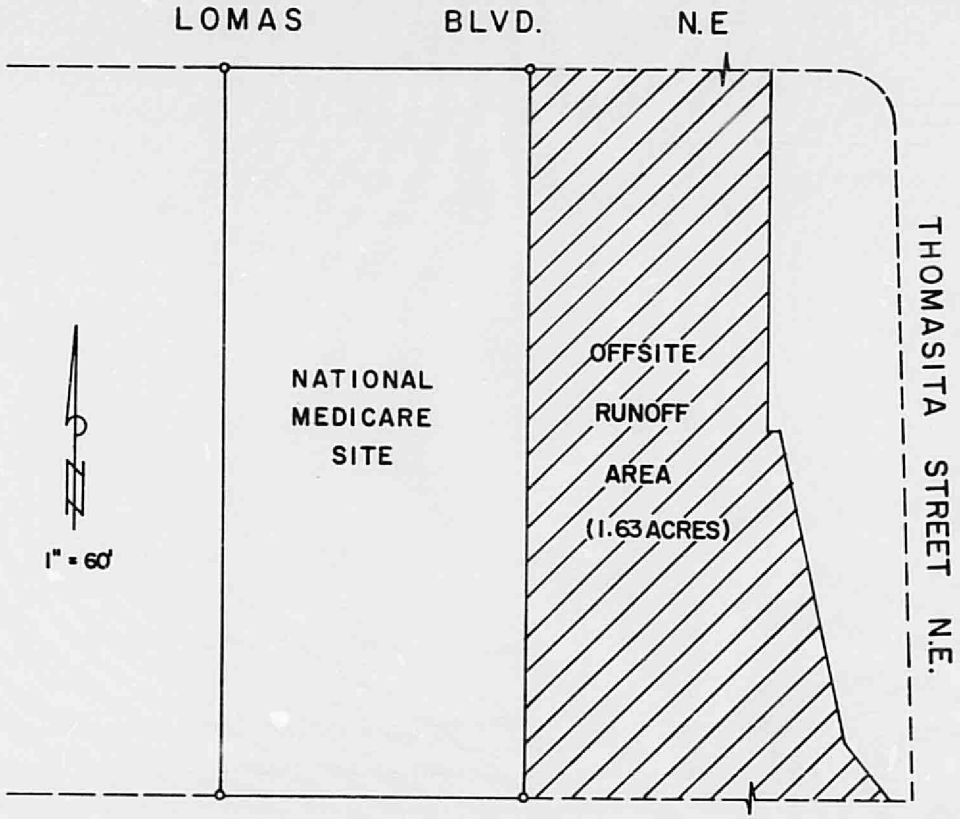

LOMAS
BLVD.
N.E
THOMASITA STREET N.E.
NATIONAL
MEDICARE
SITE
OFFSITE
RUNOFF
AREA
(1.63 ACRES)
N
1" = 60'

EXHIBIT G