HYDROLOGY G19/D9 1 of 2 5 PLANS

G19/D9

5 PLANS

Gardner, Mason & Associates, Inc.
ENGINEERS, PLANNERS & LAND SURVEYORS
2127 Menaul Blvd. NE Albuquerque, N.M. 87107 (505) 881-3846

Gilbert D. Gardner, P.E.L.S.
Richard Mason, P.E.
Thomas N. Burkson, L.S.

May 7, 1982

Mr. Fred Aguirre
Municipal Development Dept.
City Engineer's Office
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Subject: Penn-Mont Plaza Site Improvements

Dear Fred:

This letter is to notify you that the developer, John Melton, has completed all of the grading and drainage improvements in accordance with the drainage plan as approved by your office, with the exception of the driveway modifications on Montgomery and on Pennsylvania. Two of these driveways are located on property owned by the First Interstate Bank, and as such are beyond the limits of Mr. Melton's responsibilities. The third driveway was inspected and approved by the City Engineer's office as explained in the attached letter.

I therefore certify that the site improvements have been completed and are in accordance with City policies and standards.

Sincerely,

Gilbert D. Gardner

Gilbert D. Gardner, P.E.L.S.

GDG:cg

cc: Mr. John Melton

MELTON
DEVELOPMENT
& CONSTRUCTION, INC.

LIC #17539

HOME OFFICE
Rinconada del Bosque P.O. Box 637
Algodones, New Mexico 87001
(505) 867-2257

BRANCH OFFICE
7520 Montgomery Blvd. N.E.
Albuquerque, New Mexico 87111

May 5, 1982

GARDNER & MASON & ASSOCIATES, INC.
2127 Menaul Blvd., N. E.
Albuquerque, New Mexico 87110

SUBJECT: Driveways located at 7520 Montgomery N. E.

Dear Sirs:

This is to inform you of the driveways on the southwest corner of Pennsylvania and Montgomery (7520 Montgomery, N.E.).

The south driveway on Pennsylvania is the only one installed and owned by Penn Mont, Ltd. It was installed under the supervision of the City of Albuquerque Engineering Department. One of their engineers came to the job site when construction was being performed and actually supervised the construction.

The north driveway on Pennsylvania and the driveway on Montgomery are owned by First Interstate Bank and Harold Albert. The engineer who designed and supervised the construction was hired by Bank of New Mexico. If any problems arise from these two driveways you should contact the Real Estate Division of the First Interstate Bank.

I hope that this information will help in solving the problems of this development. If I can be of further assistance to you please notify me.

Sincerely,

John J. Melton

JJM:rp

ENGINEER FOR FIRST INTERSTATE BANK

W. R. UNDERWOOD
4200 SILVER S.E.
PH. 265-7370

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT

Gardner, Mason & Associates, Inc.
ENGINEERS, PLANNERS & LAND SURVEYORS
2127 Menaul Blvd. NE Albuquerque, N.M. 87107 (505) 881-3846

Gilbert D. Gardner, P.E.L.S.
Richard Mason, P.E.
Thomas N. Burkson, L.S.

February 22, 1982

Mr. Fred Aguirre
Municipal Development Dept.
City Engineer's Office
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

RECEIVED
FEB 23 1982

Subject: Penn Mont Plaza
Site Improvements

Dear Fred:

I hereby certify that the drainage structures have been installed and that the site improvements completed to date are in substantial compliance with the site grading and drainage plan approved by your office.

Sincerely,

Gilbert D. Gardner

Gilbert D. Gardner, N.M.P.E.L.S. 5653

GDG:cg

cc: Mr. John Melton

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

MAYOR
David Rusk

G19-D9

August 19, 1981

Gilbert Gardner, P.E.
Gardner, Mason & Associates
2127 Menaul Boulevard N.E.
Albuquerque, New Mexico 87107

RE: PENN MONT PLAZA DRAINAGE REPORT DATED JULY 21, 1981

Dear Gilbert:

The revised Drainage Report referenced above is approved. Upon completion of the project, submit the Letter of Certification with as-built drawings (if applicable) to this office.

If I can be of further help, please call.

Sincerely

Fred Aguirre

Fred Aguirre, P.E.
Civil Engineer/Hydrology

FA:gc
7824A
cc Drainage Files
f/Reading

Gardner, Mason & Associates, Inc.
ENGINEERS, PLANNERS & LAND SURVEYORS
2127 Menaul Blvd. NE Albuquerque, N.M. 87107 (505) 881-3846

Gilbert D. Gardner, P.E.L.S.
Richard Mason, P.E.
Thomas N. Burkson, L.S.

August 7, 1981

RECEIVED
AUG 07 1981
CITY ENGINEER

Mr. Fred Aguirre
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Subject: Penn-Mont Plaza

Dear Fred:

For your review/approval we are transmitting herewith three copies of the revised detail channel connection and three copies of the site sketch for Penn-Mont Plaza.

If you have any questions, please call.

Sincerely,

Richard Mason

Richard Mason, P.E.

RM:cg

cc: Mr. John Melton

Gardner, Mason & Associates, Inc.
ENGINEERS, PLANNERS & LAND SURVEYORS
2127 Menaul Blvd. NE Albuquerque, N.M. 87107 (505) 881-3846

Gilbert D. Gardner, P.E.L.S.
Richard Mason, P.E.
Thomas N. Burkson, L.S.

August 5, 1981

Mr. Fred Aguirre
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Dear Fred:

For your review/approval we are transmitting herewith four sets of drainage plans, grading plans, site sketch, and supplemental drainage calculations for Penn-Mont Plaza.

If you have any questions, please call.

Sincerely,

Richard Mason

Richard Mason, P.E.

RM:cg

cc: Mr. John Melton

MELTON
DEVELOPMENT
& CONSTRUCTION, INC.
LIC #17539

HOME OFFICE
Rinconada del Bosque P.O. Box 637
Algodones, New Mexico 87001
(505) 867-2257

BRANCH OFFICE
7520 Montgomery Blvd. N.E.
Albuquerque, New Mexico 87111

July 31, 1981

City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Attention: Mr. Charles Easterling

Dear Mr. Easterling:

Please find attached a copy of the construction agreement with Kent Nowlin Construction Co. for the Discharge Structures required for Penn-Mont Plaza in the amount of $3,372.00 and a certified check in the amount of $4,215.00 which is the contract amount plus 25%. This certified check is to insure that these drainage requirements will be constructed in a reasonable time. If the developer has not completed his requirements in a reasonable time period you have complete authority to use all or any portion of this certified check to construct the discharge structures.

Sincerely,

John J. Melton
President

JJM:cg

APPROVED FOR DRAINAGE
7-31-81
DATE
SIGNATURE
TITLE
CONTINGENCIES OK. to RELEASE of CO's FOR 7520 MONTGOMERY N.E (PENN MONT PLAZA)

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

G19-D9

July 23, 1981

Gilbert D. Gardner, P.E.
Gardner Mason & Associates
2127 Menaul Blvd. N.E.
Albuquerque, N.M. 87107

RE: PENNMONT PLAZA GRADING & DRAINAGE PLAN DATED 7/21/81

Dear Gilbert:

The grading and drainage plan referenced above is approved. Also, we will accept your certification of the site for the purpose of obtaining the Certificates of Occupancy.

For the record, this grading & drainage plan was verbally approved by me in our telephone conversation on April 9, 1981.

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

Sincerely,

Fred J. Aguirre, P.E.
Civil Engineer/Hydrology

FJA/tsl

cc: Dr. Files

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

July 21, 1981

Mr. John J. Melton
General Partner
P. O. Box 637
Algodones, N.M. 87110

RE: PENN-MONT PLAZA

Gentlemen:

The Certificates of Occupancy will not be released until the referenced site is constructed in accordance with the approved plans submitted to this office on April 1, 1981 by Gil Gardner and Associates.

Very truly yours,

Fred J. Aguirre, P.E.
Civil Engineer/Hydrology

FJA/fs

MUNICIPAL DEVELOPMENT DEPARTMENT
Richard S. Heller, P.E., City Engineer ENGINEERING DIVISION Telephone (505) 766-7467

Gardner, Mason & Associates, Inc.
ENGINEERS, PLANNERS & LAND SURVEYORS
2127 Menaul Blvd. NE Albuquerque, N.M. 87107 (505) 881-3846

Gilbert D. Gardner, P.E.L.S.
Richard Mason, P.E.
Thomas N. Burkson, L.S.

RECEIVED
JUL 2
CITY EN

RECEIVED
JUL 2 1981
CITY ENGINEER

July 21, 1981

Mr. Fred Aguirre
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Subject: Penn Mont Plaza

Dear Mr. Aguirre:

Per your request we are transmitting herewith two sets of plans (Sheets 1 and 2) and copies of letters of April 1, 1981 and June 18, 1981.

On Plan Sheets 1 and 2 we have added revision dates and when these revision notes were added. These notes are necessary to avoid any confusion with other previous plans before the revisions. Also enclosed is a sheet of approved amendments.

Should you have any questions, please call.

Sincerely,

Richard Mason

Richard Mason, P.E.

RM:cg

Attachments

Gardner, Mason & Associates
7833 LOMAS BLVD. N.E., SUITE 17/ALBUQUERQUE, N.M. 87110/ (505) 266-5868
- Engineers -

June 18, 1981

Mr. Fred Aguirre
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Subject: Penn-Mont Plaza

Dear Fred:

This letter is to notify you that our office has been retained by John Melton to inspect and certify the site work for the subject project upon completion.

Sincerely,

Gilbert D. Gardner

GDG:cg

cc: Mr. John Melton

Gardner, Mason & Associates
7833 LOMAS BLVD. N.E., SUITE 17/ALBUQUERQUE, N.M. 87110/ (505) ~~266-5868~~ 881-3841
- Engineers -

June 15, 1981

Mr. Fred Aguirre
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Subject: Penn-mont Plaza

Gentlemen:

I have reviewed the attached plans for Penn-mont Plaza prepared by our office and hereby certify that these plans are in conformance with the drainage policy of the City of Albuquerque and further that there are no encroachments shown on the plans.

Sincerely,

Gilbert D. Gardner

Gilbert D. Gardner

cc: Mr. John Melton

April 20, 1981

Albuquerque City Building
Inspection Department
123 Central, NW
Albuquerque, New Mexico 87102

Re: Pennmont Plaza Medical Office Complex
7580 Montgomery, NW, Albuquerque, NM
7520

Gentlemen:

We would like to have an extension of our temporary Certificate of Occupancy of the above building. Units 3-E, 5-E and 18-E have not been completed. Also the drainage is now under construction and will be completed within the next two to three weeks.

Your prompt action on this would be appreciated.

PENNMONT PLAZA

By: John J. Melton
General Partner
P.O. Box 637
Algodones, NM 87001

APPROVED:

CITY OF ALBUQUERQUE

Fred D. Arguin, P.E. 30 Day 4-20-81 Temporary is acceptable
Drainage Department

Michael J. Ellis, P.E. 30 Day Temporary 4/20/81 is acceptable
Building Inspection Department

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

MAYOR
David Rusk

April 16, 1981

New York Life Insurance Company
51 Madison Avenue
New York, New York 10010

Attention: Ms. Susan Kaufman

Re: Penmont Plaza Office Complex - Buildings D & E

This letter is to advise you that the attached revised plan dated February 12, 1981, has been amended April 16, 1981.

Upon completion of this work the final Certificate of Occupancy will be issued in accordance with the codes of the City of Albuquerque.

Sincerely,

Charles W. Volz

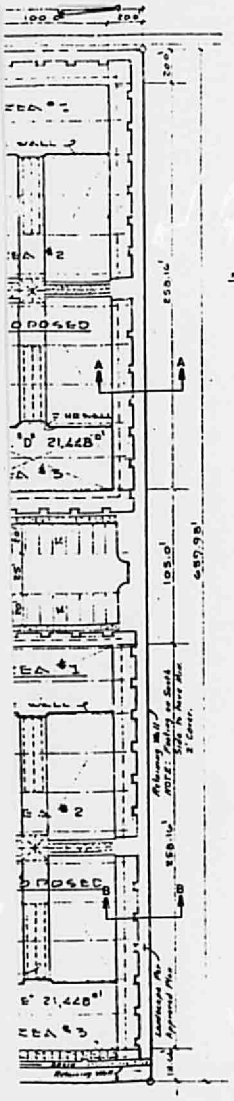
Charles W. Volz, AIA
Chief Building Official

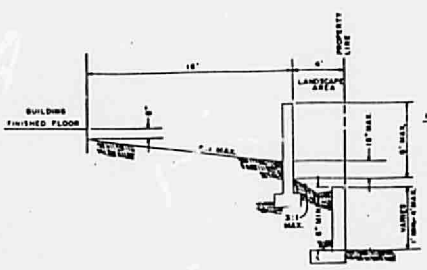
CWV:pp

xc: Ed Ordonez, Chief Building Inspector
Code Administration Division
Fred J. Aguirre, Hydrology Section
Engineering Division

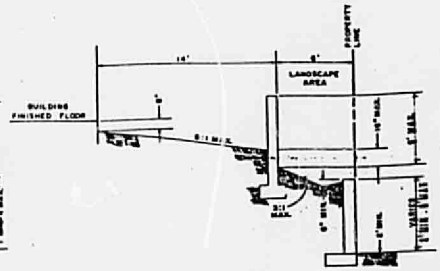
AMENDMENTS TO APPROVED SITE PLAN Z - 74 - 23

1. Add retaining wall adjacent to south property line.
2. Remove sidewalk adjacent to south property line.
3. Add sidewalk and privacy wall adjacent to west end Bldg. "E".
4. Add retaining walls adjacent to west property line
5. Remove 15 parking spaces (480 - 15 = 465/451 required).
6. Add retaining wall at northwest corner.

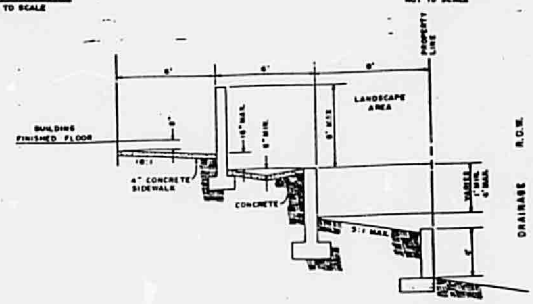




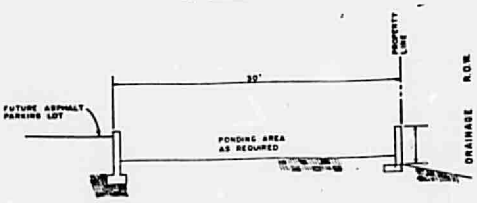
SECTION A-A
NOT TO SCALE



SECTION B-B
NOT TO SCALE



SECTION C-C
NOT TO SCALE



SECTION D-D
NOT TO SCALE

AMENDMENTS APPROVED BY:

3/19/81
PLANNING DIRECTOR

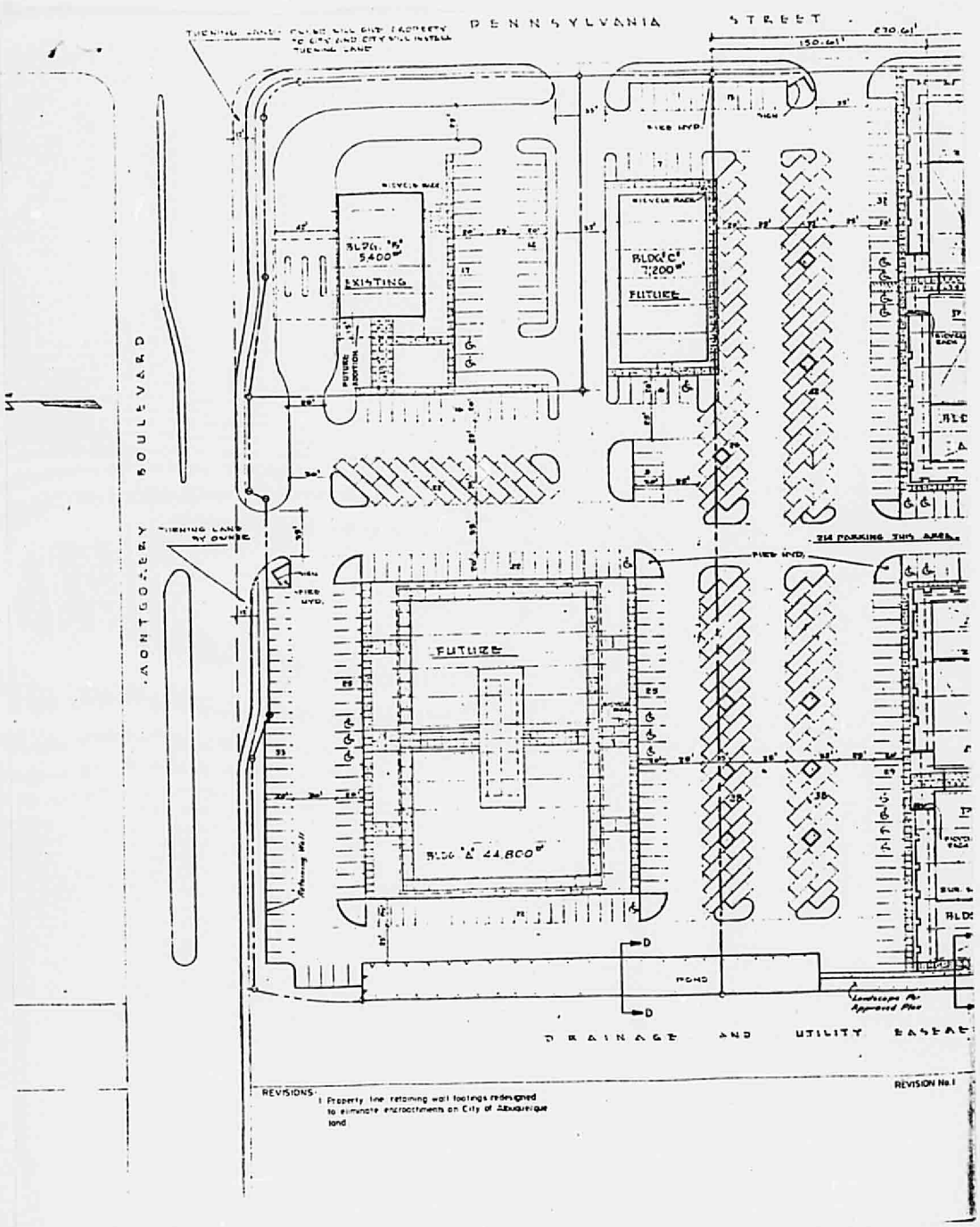
Robert L. Stallings by C.A. Hymes 4/1/81
CITY ENGINEER

DIRECTOR OF PARKS & RECREATION

DEVELOPER

NOTE: PLANNING DIRECTOR 16 April 81

PENN-MONT PLAZA	SHEET 2 OF 2
AMENDENTS TO APPROVED SITE PLAN Z-74-23	
GARDNER, MASON & ASSOC. INC. ALBUQUERQUE, NEW MEXICO	
PROJECT NO. / DRAWN / CHECKED / DATE 2/12/81 / SCALE	



REVISIONS:
1 Property line retaining wall footings redesigned to eliminate encroachments on City of Albuquerque land

Gardner, Mason & Associates
7833 LOMAS BLVD. N.E., SUITE 17/ALBUQUERQUE, N.M. 87110/ (505) 266-5868
- Engineers -

April 1, 1981

Mr. Fred Aguirre
City of Albuquerque
PO Box 1293
Albuquerque, NM 87103

Subject: Penn Mont Plaza

Dear Fred:

I have reviewed your comments of March 17, 1981 and am in concurrence with them. Our changes and/or additions are as follows:

1. We have prepared an additional plate (plate for inclusion in your drainage report showing the contributioning area of the swales). This sheet shows the approximate location of the existing roof drains.

2. We have revised some elevations on the grading plan and have shown the drains through the patio walls into the swale.

3. We have added a detail of the swale inlet into the pond, called for a 6" concrete collar around the orifice pipes and added a disclaimer note to the grading plan.

4. We have checked all of the elevations on the grading plan and corrected drafting errors.

5. We ran the driveway revisions through Dwayne. He made no negative comment. The driveway entrances can be checked for compliance during your final inspection.

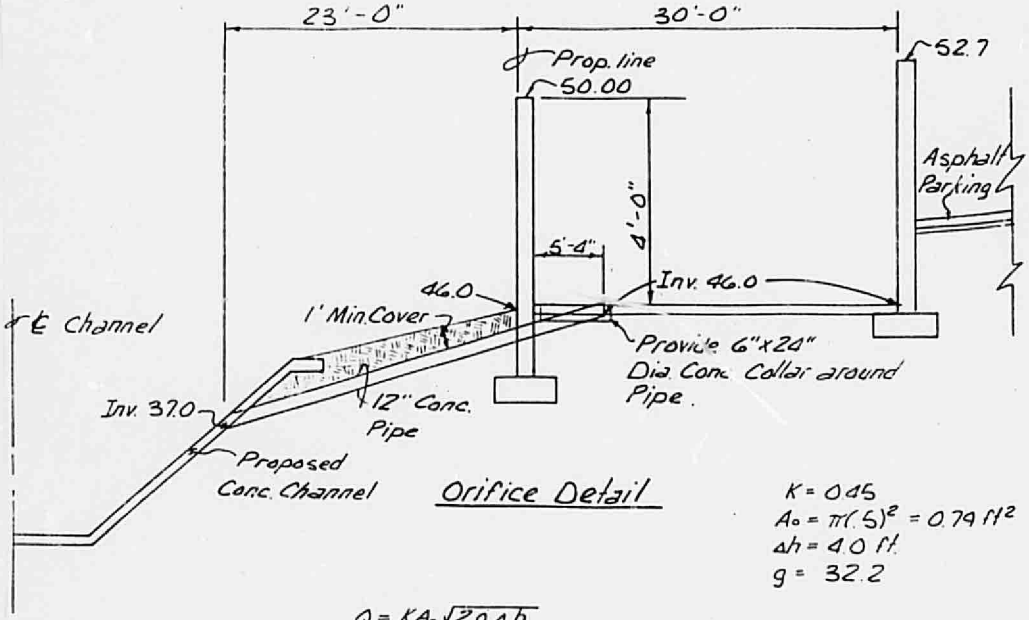
Thank you for your patience and cooperation on the project. Please notify Robert Romero about the completion of this project.

Sincerely,

Gilbert D. Gardner

Gilbert D. Gardner

cc: John Melton
Dwayne Sheppard



Orifice Detail

$K = 0.45$

$A_o = \pi(.5)^2 = 0.79\ ft^2$

$\Delta h = 4.0\ ft.$

$g = 32.2$

$Q = KA_o\sqrt{2g\Delta h}$

$Q = (0.45)(0.79)[(64.4)(4.0)]^{1/2}$

$Q = 5.7$ CFS Max. flow thru one Pipe

: for $\Delta h = 2.0$ feet

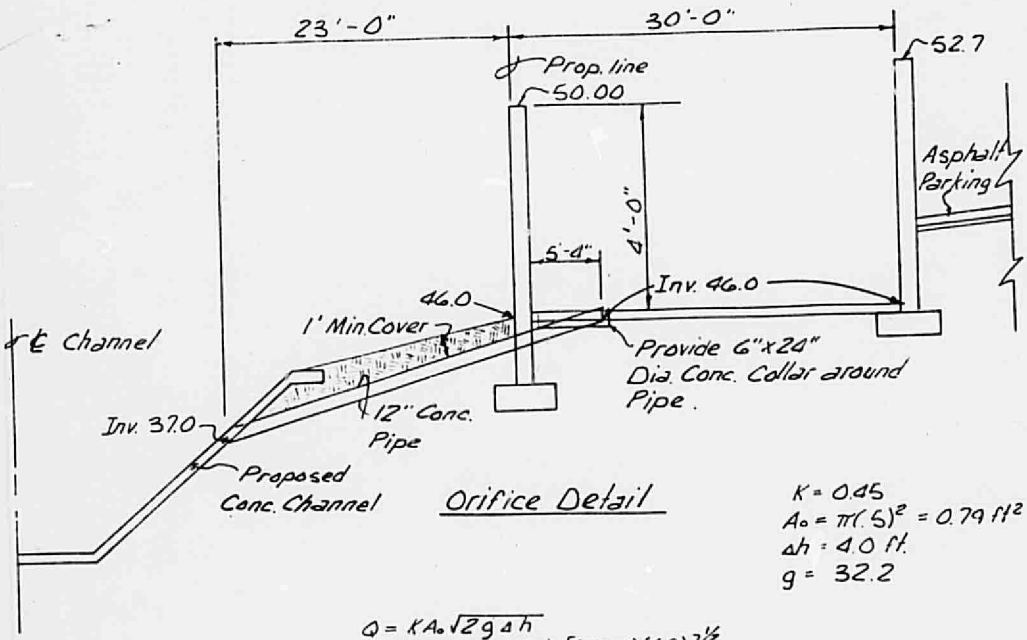
$Q = 4.00$ CFS

: for $\Delta h = 1.0$ feet

$Q = 2.8$ CFS

Plate A

GARDNER, MASON & ASSOCIATES, INC.
ALBUQUERQUE, NEW MEXICO



Orifice Detail

$K = 0.45$
$A_o = \pi(.5)^2 = 0.79\ ft^2$
$\Delta h = 4.0\ ft.$
$g = 32.2$

$Q = KA_o\sqrt{2g\Delta h}$
$Q = (0.45)(0.79)[(64.4)(4.0)]^{1/2}$
$Q = 5.7$ CFS Max. flow thru one Pipe
: for $\Delta h = 2.0$ feet
$Q = 4.00$ CFS
: for $\Delta h = 1.0$ feet
$Q = 2.8$ CFS

Plate

GARDNER, MASON & ASSOCIATES, INC.
ALBUQUERQUE, NEW MEXICO

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

MAYOR
David Rusk

March 20, 1981

New York Life Insurance Company
Colorado National Building
950 17th Street, Suite 1705
Denver, Colorado 80202

Attn: Mr. Steve Currit

Ref: Pennmont Plaza Office Complex
Buildings D and E

Dear Mr. Currit:

This letter is to advise you that the temporary Certificate of Occupancies issued for the above referenced buildings permits legal occupancies of those suites indicated during the period of time prior to the issuance of the permanent Certificate of Occupancies.

The only requirements remaining in order to issue permanent Certificate of Occupancies on the above referenced office buildings is the completion of the approved drainage plan and the completion of Suites E-3, 5, and 17. When these items have been completed as per plans, the City will issue the permanent Certificate of Occupancies for the entire above referenced office buildings.

Sincerely,

Charles W. Volz
Chief Building Official
Code Administration Division

CWV/cc

xc: Ed Ordonez, Chief Building Inspector/Code Admin. Div.
Fred J. Aguirre, Hydrology Sec., Engineering Div.

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

March 17, 1981

Mr. Gilbert Gardner, P.E.
Gardner, Mason and Associates
7833 Lomas Boulevard, N.E. Suite 17
Albuquerque, New Mexico 87110

RE: REVISED DRAINAGE REPORT AND GRADING PLAN FOR PENN-MONT PLAZA, REC'D 3/13/81

Dear Mr. Gardner:

Per our last meeting regarding the drainage criteria to be followed for the above referenced site, I find the revised drainage report in substantial compliance with our meeting. However, before I can give final approval for this site the following items must also be included or addressed in the report.

1. Provide supporting data for the adequacy of the proposed swale with respect to the design storm runoff.

2. Indicate the location of the roof drains on the plans.

3. Supply grades and/or a typical detail of the scheme for routing the roof runoff through the patios.
   NOTE: NO PONDING ALLOWED IN CLOSE PROXIMITY OF ANY STRUCTURE WITHOUT THE CONCURRENCE OF A SOILS INVESTIGATION REPORT.

4. Provide an inlet detail to the pond.

5. Provide erosion protection for the unlined portion of the swale.

6. Address the possibility of piping with respect to the 3-12" concrete pipes located in the pond, also provide the inlet detail.

MUNICIPAL DEVELOPMENT DEPARTMENT
Richard S. Heller, P.E., City Engineer ENGINEERING DIVISION Telephone (505) 766-7467

✓ 7. Address in more detail the adequacy of the proposed swale transition at the S.W. corner for the conveyance of the design storm runoff.

8. Include a detail of the swale connection to the pond.

9. Obtain approval for the drive-pad modifications on Pennsylvania from the A.C.E.-Design.

10. Correct the discrepancy between the grades on Detail A, Section EE and the south west corner of the grading plans. I also would suggest a re-check of all figures provided on the plan.

11. Where is plate 5?

12. The statement below will be stamped on the approved construction plans because of the potential hazard of the pond:

> "The Detention pond is of such nature that it may constitute an attractive nuisance and/or otherwise be a hazard. The City disclaims any liability by virtue of the approval given herein."

If you have any questions concerning the above, please do not hesitate to call me.

Very Truly Yours,

Fred J. Aguirre

Fred J. Aguirre, P.E.

FJA/kdb
cc: Dwayne Sheppard
Richard S. Heller
File

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

March 16, 1981

Gardner, Mason & Associates
7833 Lomas Blvd., N.E.
Suite 17
Albuquerque, New Mexico 87110

Attention: Mr. Gilbert Gardner, P.E.

Reference: Penn-Mont Plaza Modifications, Plans Submitted 3/10/81

Dear Gill:

A review of your proposed amendments indicates to me that the concept is feasible and would be acceptable from the City Engineer's office. Concurrence will, of course, be necessary from at least three other areas. These are:

1. Fred Aguirre's review of the actual drainage management scheme.

2. The Director of Parks & Recreations must concur for the area to the south of the property.

3. The Zoning Department must, of course, concur with wall heights, etc.

There are some details that need to be amplified on the plans. They are as follows:

1. The plan provides that wall footings encroach upon public property. As I indicated to you in our conversation during the preliminary review of these plans, it will be necessary for the developer to secure an encroachment contract from the City before this plan can be finally approved. I believe that at the last meeting, I gave you a copy of the required encroachment form. If the developer chooses not to seek approval of encroachment, then the walls will have to be moved back on the site sufficiently to clear the property line, with all appurtenances.

2. With respect to the footings, I find that the details provided for the footings, do not give sufficient dimensions to indicate how they are to be built. Specifically, the stem is not located with respect to the footing. Although both footing and stem dimensions are given, their relationship to each other is not clear.

3. A third item concerns the note "construct 12" orifice" from the ponding area on the west side of the property. It could be implied that the developers are only to provide the orifice from the ponds. It is intended that the developers supply the entire 12" line complete to its connection with the channel.

4. I find numerous inconsistencies in elevations given for tops of footings and walls. These occur at locations like the southwest corner, where detail A, Section EE, and the actual plan at the southwest corner do not agree. For instance, the top of the wall is given in one place as 54.2 and the identical point , 54.5, in another view. In one case, the top of the wall is given as 49.0, while in another view, it is given as 48.6. All of which seems to vary from that given in the Section Drawing CC, where elevations are indicated to vary from 48.6 to 50.23. I believe a careful check of all these figures and reconciliation is required.

5. I question the desirability of an earthen swale, as shown in Section BB, above the top of a retaining wall which has no relief holes. Suggest you study this and see what your conclusions are.

Asside from the preceeding items, the concept itself appears reasonable and workable, given the constraints with in which you have to work on this project. I will recommend approval as soon as the details I mentioned are resolved and when we have concurrence from the other entities mentioned.

Sincerely yours,

C. D. Sheppard

C. Dwayne Sheppard
Principle Assistant City Eng.

CDS/et

cc: Fred Aguirre
Richard S. Heller
File

KELEHER & McLEOD, P. A.
ATTORNEYS AND COUNSELORS AT LAW
PUBLIC SERVICE BUILDING
P. O. DRAWER AA
ALBUQUERQUE, NEW MEXICO 87103

JOHN B. TITTMANN
RUSSELL MOORE
WILLIAM B. KELEHER
MICHAEL L. KELEHER
PATRICK W. HURLEY
CHARLES A. PHARRIS
RICHARD B. COLE
ARTHUR D. BEACH
JOHN M. KULIKOWSKI
THOMAS F. KELEHER
PETER H. JOHNSTONE
HENRY F. NARVAEZ
CHARLES L. MOORE
ROBERT H. CLARK
BRIAN J. O'ROURKE
JOHN J. POTTS
RONALD F. HORN
CLYDE F. WORTHEN
SPENCER REID
MICHAEL WILE
PHIL KRECHBIEL
ROBERT C. CONKLIN
DONALD W. CODDING
REBECCA A. HOUSTON

W. A. KELEHER
1886-1972
A. H. McLEOD
1902-1976

TELEPHONE 842-6262
AREA CODE 505

March 12, 1981

Albuquerque City Building
Inspection Department
123 Central, N.W.
Albuquerque, New Mexico 87102

Attention: Charles Voltz

Re: Pennmont Plaza Medical Office Complex
7250 Montgomery, N.W., Albuquerque,
New Mexico

Gentlemen:

This letter will confirm our telephone conversation of March 12, 1981, in which I explained to Mr. Voltz the need we have to obtain a temporary Certificate of Occupancy for the above-referenced office complex. We have received the following inspections: building inspection, plumbing, gas, electrical, zoning, fire, environmental, and refuse. There is, however, a problem with the drainage system on the property and Melton Construction Company has submitted a plan that is being reviewed by the drainage department. In order to close on our permanent financing, we need a temporary Certificate of Occupancy from the City of Albuquerque.

If you are in need of further information in order to issue this Certificate, would you please feel free to contact either John Melton or myself.

Very truly yours,

KELEHER & McLEOD, P. A.

By Clyde F. Worthen
Clyde F. Worthen

CFW:lcb

cc: John J. Melton

Gardner, Mason & Associates
7833 LOMAS BLVD. N.E., SUITE 17/ALBUQUERQUE, N.M. 87110/ (505) 266-5868
- Engineers -

March 10, 1981

Mr. Dwayne Sheppard
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

SUBJECT: Penn-Mont Plaza Modifications

Dear Dwayne:

Transmitted herewith are two sets of the modifications on Penn-Mont Plaza as prepared by our office. We have incorporated the items discussed in our last meeting with you and Fred Aguire. Please review and comment on these plans so that we may obtain the necessary approvals.

We have submitted copies of these drawings to James Hewitt of Espey, Houston for his use.

If you have any questions do not hesitate to call this office.

Sincerely,

Gilbert D. Gardner, P.E.

GDG/mg

c.c. Mr. John Melton

Mr. Bill Algire/ with attachments.

RECEIVED
1981
CITY ENGINEER

Gardner, Mason & Garnand Engineers, Inc.

7833 LOMAS BLVD. N.E., SUITE 17/ALBUQUERQUE, N.M. 87110/ (505) 266-5868

November 21, 1980

Mr. John J. Melton
Melton Development & Construction, Inc.
P.O. Box 637
Algodones, New Mexico 87001

RECEIVED
NOV 24 1980
CITY ENGINEER

SUBJECT: Penn-Mont Plaza

Dear John:

Richard Mason and I met with Dwayne Sheppard and Fred Aguirre of the City Engineers office Thursday afternoon regarding Penn-Mont Plaza.

We discussed the concerns that the City Engineers office had. These concerns are as follow:

I. Encroachments on the channel right-of-way and the adjacent park.

II. Drainage from the site.

Dwayne Sheppard stated that his concern was that fill from Penn-Mont Plaza did not encroach upon either the channel right-of-way or the park land and that no runoff from the buildings or parking areas drained onto the park. He would accept retaining walls similar to what we have proposed to accomplish this.

We discussed the ponding requirements and the use of controlled runoff. Controlled runoff would be allowed as long as it met the City's Interim Drainage Guidelines. These guidelines state that the developer may detain the difference in runoff between "undeveloped" and "developed" conditions and release it at a rate not greater than the peak undeveloped runoff rate for a five year storm. In other words approximately 5 cubic feet per seconds. In order to do this the water has to be ponded temporarily. The amount that has to be ponded is approximately 32,000 cubic feet. The detention pond we proposed was sized to do this. Because of the depth, a fence will be required. There is no way we can eliminate this pond unless we use the parking lot as a ponding area. If we used the parking lot, the area required would be 64,000 sq. feet at a depth of six (6) inches.

Dwayne emphasized that his concern was encroachments and drainage and that he was not involved with asthetics. He will accept any type of wall that is sound engineering and acceptable to Zoning and Parks. In other words, if you construct retaining walls that eliminate the fill encroachment along the channel and the park, he will be satisfied.

PENN - MONT PLAZA

Drainage & Site Improvements
November 20, 1980

To File:

An informal meeting was held in Mr. Dwayne Sheppard's office this afternoon at 1:30 p.m., November 20, 1980. In attendance were Mr. Dwayne Sheppard, City Engineers, Mr. Fred Aguirre, City Engineer with Building and Inspection, Mr. Gilbert Gardner and Mr. Richard Mason with Gardner, Mason and Garnand Engineers, Inc.

The main topic discussed was the approach and the methods of ponding and controlling the outflows for storm runoff from the property, and site grading with main concerns of encroachment onto adjacent properties.

Mr. Sheppard asked what the total discharge was and it was found in the original drainage report to be 15 cfs. The size of the discharge pipe from the pond was also discussed, since we had shown it to be 18" diameter. Mr. Sheppard indicated that a minimum discharge pipe within right-of-way should be 12" or 18" diameter. The capacity of the pond was indicated to be 32,400 ft^3 as shown in the supplement with an 18" diameter discharge pipe. The discharge capacity of the drain pipe was asked, however, no work sheets were available. It was roughly said to be about 4 to 6 cfs.

Mr. Aguirre indicated that the required ponding volume should be the difference between developed site runoff and undeveloped site runoff, with a five year rate discharge pipe and overflow sized for a developed site discharge.

Enlarging the discharge pipe, storing water in buried culverts, covering the pond with metal grating or storing water in paved parking areas were mentioned, however, they were considered inconvenient and expensive.

Mr. Aguirre mentioned ponding areas are attractive to children, even though they are enclosed in chain link fences; however, he considers that fencing is a requirement when ponding is over two feet deep. It was noted that the Penn-Mont Plaza proposed ponding was 5 to 6 feet deep.

Mr. Sheppard asked if infiltration was considered for ponding design and it was indicated that it was not considered. It was also mentioned that the pond bottom can be concrete lined.

I talked with Robert Romero of Zoning Friday morning. His concerns were the fact that the grading and drainage did not conform to the development plan as previously approved by the Environmental Planning Commission. He also stated that he and the Neighborhood Association were against fourteen (14) foot high retaining wall. He was unaware that our office had proposed stepped retaining walls along the channel and along the park for a short distance. It seems that the proposed stepped retaining walls and drainage improvements we submitted are acceptable to the City in principle. However, they have been led to believe that these will not be installed. Because of this, the City Engineer's office has not reviewed our plans and have made no comment on them.

The City will require the following items in order to review any proposed changes in the original development plans:

1) An "As Built" grading and drainage plan of the whole site showing what has been constructed and what is proposed to complete the project. This plan must be certified by a surveyor or engineer.

2) A new development plan to be submitted to Planning and the Environmental Planning Commission.

3) Design plans for the proposed modifications prepared by a registered engineer. The improvement plans prepared by our office may be used with a few additions or you may wish to have new ones prepared.

4) A new drainage report prepared by a registered engineer analysing the developed site and showing that the site conforms to the drainage guidelines.

In my conversation with Robert Romero, he stated you need to get with him Monday or Tuesday so that he won't have to "Red Tag" the project. If you wish for us to prepare the above materials, we will do so. Please let us know if you want us to complete the project and if so, what method of retaining the fill you wish to use. I should like to point out that even with controlled discharge some type of ponding will be required.

Sincerely,

Gilbert D. Gardner, P.E.

c.c. Mr. Dwayne Sheppard
Mr. Fred Aguirre
Mr. Robert Romero

Mr. Sheppard indicated that assuming all engineering aspects were met or satisfied, the City does not have any problems to the approach as shown on the plans that were submitted.

Mr. Sheppard recommended that an integrated, updated, comprehensive report of the drainage area, grading, ponding areas, and discharges be made along with solutions. This report is to include relationships to the drainage channel and to adjacent properties. The new boundary fill slopes should be stable and not encroaching onto adjacent properties. In some cases the slopes may be trimmed back where the finished ground grade and the old original ground grade do not differ more than 6 inches. The main point is to stay off adjacent properties and not to let any site runoff drain onto these properties.

Other related minor topics discussed included the following:

Mr. Sheppard indicated there is nothing official regarding local residents disliking retaining walls.

Mr. Aguirre recommended a good survey of the entire area. He is concerned about the entrance driveway along Montgomery Blvd. draining into the street. He also indicated there may be a depression in front of the existing building at the northwast corner of the site.

Mr. Sheppard cautioned there might be problems with the pervious bottom of the pond, and he said the loading of the proposed ponding retaining walls under these conditions should be checked. He also emphasized that City Zoning and Parks Department have their concerns and roles that are to be met. Also the City has not reviewed the submitted plans and it was understood they will not review them until additional integrated, comprehensive reports and drawings are submitted.

In conclusion, it was understood that the City has indicated to the developer that the developed site runoff is to be let into the drainage channel at a controlled rate. This is not eliminating a detention pond. A letter is to be written to the developer with a copy to the City Engineer's office regarding the concerns and recommendations of the City of Albuquerque, City Zoning Department, and City Parks Department along with our recommendations and some of the additional work to fulfill these requirements.

Meeting was adjourned.

Richard Mason

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE October 20, 1980 REF. NO._____

TO: Barbara Stevenson, City Attorneys Office

FROM: Bruno Conegliano, Assistant Hydrology Engineer

SUBJECT: CONCERNS THAT NEED TO BE COVERED BY THE AGREEMENT BETWEEN THE CITY AND PENMONT PLAZA LIMITED

In consideration of obtaining from the City a temporary certificate of occupancy, with a six months expiration term for the development known as Penmont Plaze, Penmont Plaza Limited will provide a bond to the amount of $100,000.00 to cover the cost of construction of the required retaining walls, grading and drainage facilities, along the west side and the south side of this development. If the work is not completed within 6 months from the date of this agreement, the City will act against this bond and construct the necessary facilities. The work will be performed to the satisfaction of the City Engineer's Office and not affect adversely the City Parks Property.

BC/ tsl

cc: R. S. Heller, City Engineer
C. D. Sheppard, Principal Asst./City Engineer
Jim Milton, Developer
F. Aguirre, Asst. Hydrology Engineer

GARDNER ENGINEERS, INC.

September 12, 1980

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

SUBJECT: Penn-Mont Plaza

Gentlemen:

Transmitted herewith are one set of plans on detention ponding and other related works along with a brief supplement to the original drainage report for the subject project.

We would appreciate it if you would expedite your reviewal/ or approval. Should you have any questions, please call.

Sincerely,

Richard Mason

Richard Mason, PE

c.c.: Mr. Fred J. Aguirre, Albuquerque Building and Inspection
Mr. John Melton
Mr. James L. Hewitt; Espey, Huston & Associates, Inc.

Rm/mg

7833 LOMAS BLVD. N.E., SUITE 23/ ALBUQUERQUE, N.M. 87110/ [505] 266-5868

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

June 27, 1980

Melton Development and
Construction Inc.
4808 Jefferson NE
Albuquerque, New Mexico 87106

Reference: Penmont Plaza

Dear Mr. Melton:

On June 24, 1980 a field inspection was made because of a complaint of encroachment on the channel that was filed with our office. The City survey section sent a survey crew out on June 25, 1980 and the east right-of-way line of the channel was restaked and was verified that there was definite fill dirt enroachment into the channel right-of-way. This has prompted us to require that you take immediate action on these three concerns:

1. Before any work is done on the channel lining, all fill dirt that is encroaching on channel right-of-way will have to be removed by your company (lining construction to begin within two months.)

2. The proposed pond adjacent to the channel shown on your construction plans is inadequate and has never been approved by our office; a new design of the pond will have to be made and reviewed by our office.

3. A new design of work to be done on the west property line adjacent to the channel is required for review at this time.

I would recommend that you coordinate the design on the west property line adjacent to the channel with Mr. James L. Hewitt Jr., of Espey, Huston & Associates, Inc., since they are responsible for the design of the channel lining.

MUNICIPAL DEVELOPMENT DEPARTMENT
Richa d S. Heller, P.E., City Engineer ENGINEERING DIVISION Telephone (505) 766-7467

If you have any questions regarding these matters, please feel free to contact our office at your earliest convenience.

Very truly yours,

Bernie J. Montoya
Hydrologic Engineering Technician

BJM/lc

xc: James Hewitt Jr., Espey,Huston,& Assoc.
Rip Orr, Principal Assistant City Engineer

4200-C Silver Ave. S.E.

Phone 265-7370

W. R. UNDERWOOD, JR.
Consulting Engineer
ALBUQUERQUE, NEW MEXICO 87108

January 18, 1980

RECEIVED
JAN 23 1980
CITY ENGINEER

City of Albuquerque
Public Works Department
401 Marquette Avenue, NW
Albuquerque, New Mexico 87101

Att: Mr. Fred Aguirre

Subject: Bank of New Mexico, Montgomery Branch
Pennsylvania & Montgomery, NE
Albuquerque, New Mexico
Pavement

Gentlemen:

It is understood that you have some questions regarding the completion of the pavement on subject project.

As Construction Manager of this project for the Bank of New Mexico, I am writing this letter to advise you that the present pavement has not been accepted, and the paving contractor has agreed to return after the weather has warmed, probably the latter part of May, and correct the deficiencies. The contractor believes, and I agree, that under present weather conditions it is inadvisable to do corrective work now. The Owner is with-holding money to cover this work, and I assure you the Owner is very much interested in obtaining a satisfactory job.

Very truly yours,

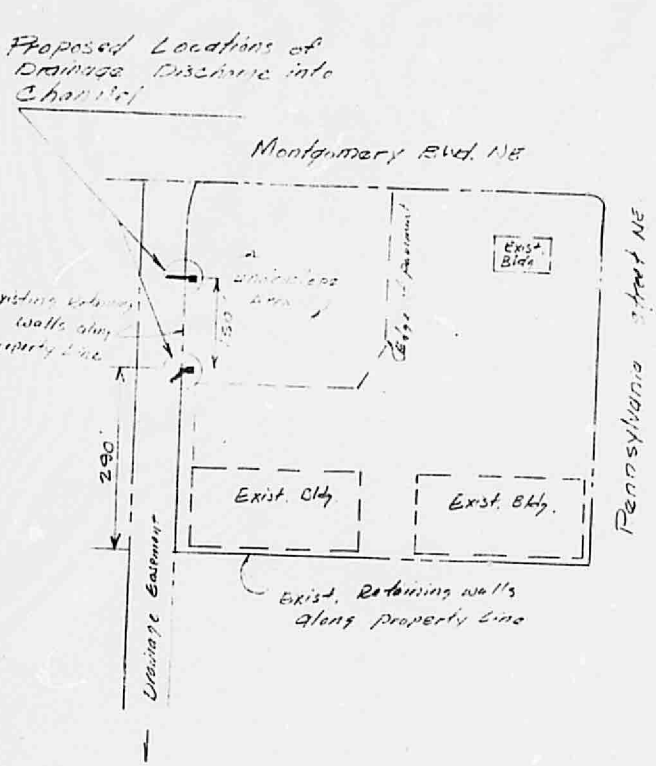
W. R. Underwood, Jr.

W. R. Underwood, Jr. ACEC

WRU/su

cc - Bank of New Mexico
Att: Newton W. Gillihan

INFORMED MR UNDERWOOD BY TELEPHONE OF THE WATER POOLING IMMEDIATELY BEHIND THE DRIVE THRU TELLERS. MR UNDERWOOD INFORMED ME THAT THIS SITUATION WILL BE CORRECTED WHEN THE PAVING IS COMPLETED
1-23-80



SCALE: 1" = 1'-0"

SITE PLAN

PENN-MONT PLAZA

7530 Montgomery Blvd. NE.

Richard Mason

RICHARD MASON
NEW MEXICO
6000
REGISTERED PROFESSIONAL ENGINEER

CITY OF ALBUQUERQUE				
APPROVALS	ENGINEER	DATE	TITLE:	
A.C.E. DESIGN	J Kelich	11 Aug 81	PENN-MONT PLAZA	
WATER RESOURCES				
CITY ENGINEER			PROJECT NO.	MAP NO. 6-19-Z

STORM DRAINAGE STUDY
PENMONT PLAZA
ALBUQUERQUE, NEW MEXICO

GARDNER ENGINEERS, INC.
ALBUQUERQUE, NEW MEXICO

JANUARY, 1979

JOHN J. MELTON
4808 JEFFERSON. N.E.
ALBUQ.
PH. 883-9100

STORM DRAINAGE STUDY
PENNONT PLAZA
ALBUQUERQUE, NEW MEXICO

JANUARY, 1979

GARDNER ENGINEERS, INC.
Consulting Engineers
Albuquerque, New Mexico

STORM DRAINAGE STUDY
PENMONT PLAZA
ALBUQUERQUE, NEW MEXICO

PURPOSE

The purpose of this report is to ascertain the design criteria and conceptual approach necessary to satisfy drainage requirements for the proposed development.

SCOPE

The scope of this report includes an investigation of both existing and future conditions both on and off (adjacent to) the Project site with respect to the design storm runoff, requirements and recommendations as to fulfilling those requirements.

LOCATION AND DESCRIPTION

The Penmont Plaza Shopping Center consisting of Tracts "A-1-A", "A-1-B" and "A-2" of Block 15, Unit No. 4, Stardust Skies, an addition to the City of Albuquerque, New Mexico; is the 9-acre area located at the southwest corner of Montgomery Blvd., N. E. and Pennsylvania Street, N. E. The site is presently undeveloped, however existing contours show the site to be undisturbed.

EXISTING DRAINAGE

At present, none of the adjacent areas have runoff on to the site. The site itself contributes flow to all the adjacent areas. Approximately .02 Ac. drains easterly to Pennsylvania Street (and can be reasonably neglected); approximately .74 Ac. drain northerly to Montgomery Blvd.; approximately 2.52 Ac. drains southerly to the Park area and approximately 5.72 Ac. drain westerly to the Flood Control Channel. This Flood Control Channel is a segment of the North Helm Flood Control System. Existing design storm flows in Pennsylvania, Montgomery Blvd. and the flood control channel presents no flooding hazards to the site (see Appendix for existing condition hydrology both on and off site).

PROPOSED DRAINAGE

A. Criteria:

1. General - Resolution No. 1972-2, Albuquerque Metropolitan Arroyo Flood Control Authority.

2. Design Storm - 100-year fregency; Intensity Duration as shown on Chart I, "1963 Master Plan of Drainage for the City of Albuquerque and Environs" (See Fig. 1, this report) prepared by Gordon Werkenhoff and Associates, Inc., Consulting Engineers.

B. Flood Protection:

Off-site drainage calculations reveal no flooding hazards to site (see Appendix for Off-site Drainage Calculations).

C. Site Drainage:

Development of the site results in a significant increase in runoff. The principle means of controlling this increased runoff are: 1) Isolate, where possible, areas of the site such that all flow is retained and allowed to evaporate and/or percolate off the site thus yielding an effective runoff coefficient of zero (c=0) for those areas; 2) Site grading is performed so as to prevent any direct runoff and convey all remaining flow through a retention basin effectively reducing the peak flow off the site (see Appendix for on-site drainage calculations).

CONCLUSIONS AND RECOMMENDATIONS

Off-site drainage does not present any significant problems in the site plan design so long as City Standard drivepad details are used at entrance ways. On-site drainage is complicated by a lack of suitable ponding area. By using the available area in the southwest corner of the site as a routing basin as well as ponding, results in an optimum storage-outflow configuration that can meet 72-2 requirements.

In conclusion, if the site drainage plan, as shown in the enclosure, is adhered to conceptually, the basin configurations and flow paths need not be identical to those shown, the project development will 1) Not be in any hazard from off-site, 100-year runoff and; 2) Would meet or exceed AMAFCA 72-2 requirements, as well as present no flood hazard to downstream properties.

BY A. G DATE 12-26-78 SUBJECT PENNANT PLAZA SHEET NO. 1 OF
CHKD. BY DATE ON SITE DRAINAGE JOB NO. 101

I. EXISTING CONDITIONS

$Q = C \times A \times I$ Q = PEAK RUNOFF (CFS)

C = RUNOFF COEF. = .35 (ESTIMATED. BARE SOIL w/ SPARSE GRASS COVER)

A = AREA = 9 (ACRES.)

I = INTENSITY = 189/(Tc+25) (IN/HR.) SEE FIG. 1

Tc = Tc (OVERLAND) + Tc (SWALE)

Tc (OVERLAND) = 8.2 MIN NOMOGRAPH 100' BARE SOIL @ 2.5% SEE FIG. 2

Tc (SWALE) = 6.2 MIN (ESTIMATED)

SWALE HYDRAULICS

$Q = \frac{1.486}{n} a R^{2/3} S^{1/2}$ $a = \delta^2 Z$ $R = \left(\frac{\delta Z}{2\sqrt{1+Z^2}}\right)$

APPROXIMATE MEAN SECTION
Z = 28 FROM TOPO (SEE ENCLOSURE)
CHANNEL LENGTH = 600' (SEE ENCLOSURE)
MANNING'S n = .030 (ESTIMATED)
MEAN SLOPE = S = 2.3% (SEE ENCLOSURE)

$Q = \frac{1.486}{.030} \times 28\delta^2 \times \delta^{2/3} \times \left(\frac{28}{2\sqrt{1+28^2}}\right)^{2/3} \times .023^{1/2}$

$Q = 132.45\ \delta^{8/3}$

$V = Q^{1/4} / \left(28 \times \left(\sqrt{132.45}\right)^{3/4}\right)$
$= 1.39437\ Q^{1/4}$

BY A. G. DATE 12-26-78 SUBJECT PENMONT PLAZA SHEET NO. 2 OF
CHKD. BY DATE ON SITE DRAINAGE (CONT.) JOB NO. 101

$I = 189/(8.2+6.2+2.5) = \underline{4.797}$ In/hr

$Q_{(PT.\,"A")} = .35 \times .29 \times 4.797 = .4869$ CFS

$Q_{(PT.\,"B")} = .35 \times (.29+2.51) \times 4.797 = 4.7010$ CFS

$V_{(PT.\,"A")} = 1.39437\,(.4869)^{1/4} = \underline{1.165}$ FPS

$V_{(PT.\,"B")} = 1.39437\,(4.7010)^{1/4} = \underline{2.053}$ FPS

$V_{AVG.} = (1.165+2.053)/2 = \underline{1.609}$ FPS

$T_c = \frac{L}{V} = 600^{FT} \times \frac{1}{1.609}\,FPS \times \frac{1}{60}\,SEC/MIN = \underline{6.215}$ MIN.

ESTIMATED 6.2 ≈ 6.215 OK

∴ PEAK RUNOFF = $.35 \times 9 \times 4.797$

= $\underline{15.11}$ CFS

II. DEVELOPED CONDITIONS

ASSUMING THAT FINISHED GRADES ARE ESTABLISHED SO AS TO MOST CLOSELY CONFORM TO THE NATURAL CONTOUR OF THE SITE, WHILE MAINTAINING SWALE SLOPES > .5% AND < 6% W/ SIDE SLOPES VARYING FROM 1% TO 4% AND DISALLOWING ANY PERMANENT PONDING WITHIN 10' OF FOUNDATION WALLS, AS WELL AS DUE TO ARCHITECTURAL RESTRICTIONS, PREVENTING ANY DIRECT RUNOFF FROM THE SITE.

BY A.G. DATE _____ SUBJECT Pennoni Plaza SHEET NO. 3 OF _____
CHKD. BY _____ DATE _____ On Site Drainage (cont.) JOB NO. 101

$$Q = \sum_{1}^{n}(A \times C) \times I$$

WHERE: THE FOLLOWING COEFICIENTS ARE USED

C	DISCUSSION
1.0	CONCRETE SURFACE (SIDEWALKS)
.95	ASPHALT SURFACE (PARKING & DRIVEWAYS)
.9	BUILT UP ROOF
.35	BARE SOIL (USED FOR EXISTING)
.2	LAND SCAPED (ASSUMES GOOD GRASS COVER)
0	CLOSED BASIN (BASIN W/ LOCAL PONDING SO AS TO PREVENT RUNOFF)

SEE SITE PLAN ENCLOSURE FOR BASIN CONFIGURATIONS, FLOW PATHS AND RECOMMENDED PONDING & DETENTION LOCATIONS AND CONFIGURATIONS.

$I = 189/(25 + T_c)$ SEE FIG. 1

$T_c = T_c(\text{OVERLAND}) + T_c(\text{SWALE})$

$T_c(\text{OVERLAND})$ 26' @ 1% (PAVED) → 1.5 min
(SEE FIG. 2)

$T_c(\text{STREET})$ (ESTIMATED) ≒ 10.1 min

$I = 189/(25 + 1.5 + 10.1) = 5.16393$

BY A.G. DATE _____ SUBJECT Pomona Zone
CHKD. BY _____ DATE _____ On Site Drainage (Cont.) SHEET NO. 4 OF _____
JOB NO. _____

BASIN "A"

$\Sigma AC = (1.0 \times .115 + .25 \times .116 + .5 \times .052 + .25 \times .045)$
$= .262$

$\Sigma A = .315$

$Q = .262 \times 5.6293$
$= \underline{1.352}$ CFS

Assuming road side ditch (Z) 10:1 (0.5%)
n = .015 (Natural Channel) & grass
SLOPE = 1% LENGTH OF REACH = 252'

$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$

$= \frac{1.486}{n} \delta^2 Z \left(\frac{\delta^2 Z}{\delta 2\sqrt{1+Z^2}}\right)^{2/3} S^{1/2}$

$= \frac{1.486}{n} Z \left(\frac{Z}{2\sqrt{1+Z^2}}\right)^{2/3} S^{1/2} \delta^{8/3}$

$Q = 249.58\, \delta^{8/3}$

$\delta = (Q/249.58)^{3/8} = .1413'$

$V = Q/A = 1.693$ FPS

t_c (SWALE) $= V_{AVG}/L = \left(\frac{1.693}{2} + 0\right)^{-1} \times 252' \times \frac{1}{60}$

$= \underline{4.96}$ min.

BASIN "B"

$\Sigma AC = (1.0 \times .055 + .25 \times .002 + .5 \times .633 + .25 \times .214)$
$= 1.513$
$+ .262$
$Q = 1.775 \times I$
$= 9.166$ CFS

$\Sigma A = 1.701$

Z = 10, n = .015, Mean Slope swale Parallel

BY A.G. DATE _____ SUBJECT Hammett Place SHEET NO. 5 OF _____
CHKD. BY _____ DATE _____ On Site Drainage Comp. JOB NO. _____

MONTGOMERY BLVD. = 3.3% (PARALLEL & BELOW GRADE OF STREAMLE PROPOSED PREVENT RUNOFF)
LENGTH OF REACH = 407'

SAME HYDRAULICS AS FOR BASIN "A"

$Q = 453.39\ d^{8/3}$

$d = (Q/453.39)^{3/8} = .2315'$

$V = 4.274$ FPS.

$t_c(\text{SWALE}) = \left(\frac{4.274 + 1.633}{2}\right)^{-1} \times 407' \times \frac{1}{60}$

$= \underline{2.24}$ MIN

BASIN "C"

$\Sigma A_{nc} = (1.0 \times .034 + .25 \times .335 + .2 \times .046)$
$= .351$
$+1.775$ $\Sigma A = .405$
$Q = 2.126 \times I$
$= 10.979$ CFS

Z = 40, n = .015, MEAN SLOPE = .5% (ON AS TO MINISTRICT FINISH WORK, WATER)
LENGTH OF REACH = 259'

SAME HYDRAULICS

$Q = 176.48\ d^{8/3}$

$d = (Q/176.48)^{3/8} = .3529'$

$V = 2.203$ FPS

BY A.G. DATE _____ SUBJECT Pomona Plaza
CHKD. BY _____ DATE _____ On Site Drainage Calc. SHEET NO. 6 OF _____ JOB NO. _____

t_c (SWALE) $= \left(\frac{4.274 + 2.213}{2}\right)^{-1} \times 259 \times \frac{1}{60}$

$= \underline{1.33}$ min

BASIN "D"

$\Sigma A \times C = (1.0 \times .052 + .95 \times 1.251 + .5 \times .274 + .2 \times .201)$
$= 1.778$
$+ 2.126$
$Q = 3.904 \times I$
$= 20.160$ CFS

$\Sigma A = 2.257$

$Z = 40,\ n = .015,\ S = .5\%,\ L = 118'$

Same Hydraulics

$Q = 176.48\ \delta^{8/3}$

$\delta_m = .4432'$

$V = 2.565$ FPS.

t_c(SWALE) $= \left(\frac{2.213 + 2.565}{2}\right)^{-1} \times 118 \times \frac{1}{60}$

$= \underline{.82}$ min

BASIN "E"

$\Sigma A \cdot C = (1.0 \times .668 + .95 \times 1.935 + .5 \times .530 + .2 \times .513)$
$= 2.314$
$+ 3.904$
$Q = 6.218 \times I$
$= 32.109$ CFS

$\Sigma A = 2.865$

$Z = 40,\ n = .015,\ S = .5\%$ (minimum), $L = 115'$

BY A.G. DATE ____ SUBJECT PEDMONT PLAZA SHEET NO. 7 OF ____
CHKD. BY ____ DATE ____ ON SITE DRAINAGE (CONT.) JOB NO. ____

SAME AS ABOVE

$Q = 176.48\ \delta^{8/3}$

$\delta_{av} = .5248'$

$V = 3.882$ F.P.S.

$t_c\,(\text{SURFACE}) = \left(\frac{2.565(.5248)^{2/3}}{2}\right)^{-1} \times 115 \times \frac{1}{60}$

$= \underline{.70}$ min

BASINS F, & F2

GROUPED BASINS, TAKING INVENTORY OF ADJACENT AREAS SUITABLE FOR PONDING & THUS MINIMIZING INPUT TO DETENTION BASIN.

$\Sigma A = 1.563$ Ac.

AREA CHECK $= \sum_A^F A_n = .319 + 1.791 + .405 + .057 + 2.861 + .563)$
$= \underline{9.000}$ Ac. ✓

Tc CHECK $= \sum_A^B T_{c_n} = (4.96 + 2.27 + 1.23 + .82 + .70)$
$= \underline{10.08}$

≈ 10.1 ESTIMATE OK ✓

DETENTION BASIN

UTILIZING THE SOUTH WEST CORNER OF THE SITE, A RECTANGULAR AREA 144' x .52' CAN BE UTILIZED AS A DETENTION BASIN. USING SODDED EMBANKMENTS SLOPPING AT 3:1 AN 8½' DEPRESSION OF TRIANGULAR CROSS SECTION RESULTS WHOSE VOLUME = f (DEPTH) = f(d)

BY A. G. DATE ____ SUBJECT PENMONT PLAZA ON SITE DRAINAGE (CONT.) SHEET NO. 8 OF ____
CHKD. BY ____ DATE ____ JOB NO. ____

$$Vol = 12\,d^3 + 276\,d^2$$

OUTLET WORKS SHOULD CONSIST OF AN OVER FLOW TYPE STRUCTURE TO PRECLUDE A BACK UP OF FLOW FROM THE DRAINAGE CHANNEL.

RECOMMEND NARROW BROAD CRESTED RECTANGULAR WEIR.

$$Q = K\,H^{3/2}$$

WHERE $K = 2.90792$
AND H = BASIN DEPTH IN EXCESS OF $5\frac{2}{3}'$
(OUT FLOW @ FULL CAPACITY $d = 8\frac{2}{3}$, $H = 3$ + 15.11 CFS) OK

IN FLOW HYDROGRAPH:

FOR ROUTING PURPOSES A TRIANGULAR HYDROGRAPH W/ A PEAK = 32.11 CFS @ t = 11.6 min. (t_c) IS ADEQUATE

HYDROGRAPH BASE = T = TIME FOR $\int_0^T Q$ = VOL OF RUNOFF FOR 1 HR.
WHERE MEAN INTENSITY = (1.09/(25+60))
= 2.22353 IN/HR

$$Vol = ACI \times \frac{SEC}{HR}$$
$$= 6.218\ Ac \times 43560\ \frac{SQ\ FT}{AC} \times \frac{2.22353''}{12''}$$
$$= 50{,}188.04\ CU.\ FT.$$

$$T = Vol / Q_p \times 2 = 50{,}188.04 / 32.11 \times 2 \times \frac{1}{60}\ \frac{HR}{MIN}$$
$$= 52.1\ MIN$$

(SEE TABULATED HYDROGRAPH IN BASIN ROUTING PAGE 9)

BY A.G. DATE _____ SUBJECT On Site Drainage SHEET NO. 2 OF 2
CHKD. BY _____ DATE _____ Detention Pond JOB NO. _____

Pul's Routing for Retention Basin
52' x 144' x 8½' w/ weir flow @ 5½
Rated @ 15.11 cfs w/ 3' of head. Δt = 116 sec.

Σ Δt (min)	I (cfs)	$\frac{(I_1+I_2-O)\Delta t}{2}$ (cu. ft.)	O (cfs)	$S_2 + \frac{O_2 \Delta t}{2}$ (cu. ft.)	S (cu. ft.)	d (ft)	H (ft)
0	0	–	0	–	0		
1.93	5.352	310.4			310.4	<5½	
3.87	10.703	931.2			1241.6		
5.8	16.055	1552.0			2793.6		
7.73	21.407	2172.8			4966.4		
9.67	26.758	2793.6	0		7759.9	<5½	–
* 11.6	32.110	3414.3	.015	11,174.3	11,173.4	5.696	0.02960
13.53	30.577	3635.0	2.008	14,808.4	14,691.9	6.448	0.78128
15.47	22.044	3341.6	4.591	18,033.5	17,767.2	7.023	1.35589
17.4	27.512	3014.0	7.015	20,781.2	20,374.3	7.465	1.79865
19.33	25.979	2695.6	9.115	23,069.9	22,541.2	7.808	2.14176
21.27	24.446	2396.0	10.860	24,937.2	24,307.3	8.074	2.40718
23.2	22.913	2116.9	12.264	26,424.8	25,713.0	8.277	2.61034
25.13	21.380	1857.7	13.351	27,570.7	26,796.3	8.429	2.76243
27.07	19.847	1616.8	14.152	28,413.1	27,592.3	8.539	2.87185
29.0	18.315	1392.6	14.697	28,984.8	28,132.5	8.612	2.94504
30.93	16.782	1183.2	15.012	29,315.7	28,445.0	8.654	2.98700
** 32.87	15.249	987.1	15.123	29,432.1	28,555.0	8.668	3.0017
34.8	13.716	802.8	15.092	29,357.8	28,484.7	8.659	2.99232
36.73	12.183						
38.67	10.651						
40.6	9.118		*	PEAK	INFLOW		
42.53	7.585		**	PEAK	OUTFLOW		
44.47	6.052						
46.4	4.519	PEAK OUTFLOW		>	DESIGN RUNOFF		
48.33	2.986	BY .013	CFS		(NEGLIGEABLE)		OK
50.27	1.454						
52.2	–						

BY A. G. DATE 1-8-79 SUBJECT FUNKONY PLAZA SHEET NO. 1 OF
CHKD. BY DATE OFF SITE DRAINAGE JOB NO. 101

THE 100 YR. RUNOFF FROM ADJACENT PROPERTIES DOES NOT FLOW THRU THE SITE.

TO THE EAST, PENNSYLVANIA ST. HAS A HIGH POINT PREVENTING FLOW FROM SPILLING INTO PENNSYLVANIA FROM MONTGOMERY BLVD. DEVELOPEMENT ALONG THE EAST SIDE OF THE STREET EFFECTIVELY TERMINATES THE CONTRIBUTING AREA IN THE IMMEDIATE VICINITY OF THE PROJECT SITE PRECLUDING ANY POSSIBLE FLOOD HAZARD FROM FLOWS IN PENNSYLVANIA ST. TO THE SITE.

TO THE SOUTH, A CITY PARK LIES BELOW AND SLOPING AWAY FROM THE PROJECT LOCATION. AS SUCH, IT IS NOT A FACTOR IN THE OFFSITE DRAINAGE.

MONTGOMERY BLVD. AN AREA OF 30.3 AC. IS ESTIMATED TO CONTRIBUTE TO FLOW IN MONTGOMERY ALONG THE NORTH BOUNDRY OF THE PROJECT LOCATION (SEE FIG. 3). BASED ON THE ASSUMPTION THAT 40% OF THE AREA, INCLUDING THE MONTGOMERY R.O.W. COULD HAVE A RUNOFF COEFICIENT AS HIGH AS .8 AND THAT THE REMAINING 60%, CONSISTING OF RESIDENTIAL DEVELOPEMENT, HAS A RUNOFF COEFICIENT OF .4, A REASONABLE WEIGTED COEFICIENT IS EQUAL TO $.8 \times .4 + .4 \times .6 = .56$.

$Q = ACI$

$I = 180/(25 + T_c)$ SEE FIG 1.

$T_c = T_c$ (OVERLAND) + T_c (GUTTER)

T_c (OVERLAND): 35' AVG. GRASS @ 2% → 8.5 min (TYPICAL RESIDENTIAL, SEE FIG. 2)

T_c (GUTTER) = 16.9 min (ESTIMATED)

BY A. G. DATE 1-8-10 SUBJECT PENNANT PLAZA SHEET NO. 2 OF
CHKD. BY DATE OFF SITE DRAINAGE (CONT.) JOB NO. 101

$I = 189/(25 + 8.5 + 16.5)$
$= \underline{3.75}$ in/hr

BASIN I: $A = 15.6$ Ac. $Q = ACI = 15.6 \times .56 \times 3.75$
(SEE FIG. 3) $= \underline{32.76}$ cfs

HYDRAULICS:

$z = 50$ (2% SIDE SLOPE) MANNING'S $n = .015$
LENGTH OF GUTTER $\approx 1550'$ SLOPE $= 2.25\% = S$

$Q = \frac{1.486}{n} a\, r^{2/3} S^{1/2}$

$a = d^2 z$
$p = a/d(2\sqrt{1+z^2} + 2)$

$Q = \frac{1.486}{n} d^2 z \left(d \cdot \frac{z}{(2\sqrt{1+z^2} + 2)}\right)^{2/3} S^{1/2}$

$d = \left(\frac{Qn}{1.486\, z\, S^{1/2}} \left(\frac{2\sqrt{1+z^2}}{z} + 2\right)^{2/3}\right)^{3/8}$
$= \underline{.371'}$
$V = Q/a = \underline{4.76}$ F.P.S.

T_c (GUTTER) $= L/V_{AVG.} = 1550/(4.76/2 + 0) \times \frac{1}{60}$
$= \underline{10.84}$ min

BASIN II: $A = 10.4$ Ac. $Q = \Sigma ACI = 10.4 \times .56 \times 3.75 + 32.76$
(SEE FIG. 3) $= \underline{54.60}$ cfs

SAME HYDRAULICS: $z = 50$, $n = .015$, LENGTH $= 1300'$
$S = 2.3\%$

$d = \underline{.447'}$
$V = \underline{5.461}$ F.P.S

BY A. G. DATE 1-8-92 SUBJECT PENNANT PLAZA SHEET NO. 3 OF
CHKD. BY DATE OFF SITE DRAINAGE (CONT) JOB NO. 101

BASIN II: (CONT.)

T_c (GUTTER) = $1300 / (\frac{5.46'}{2} + 4.46') \times \frac{1}{60}$

= 4.24 min

BASIN III: $A = 4.3$ ac. $Q = \Sigma ACI = 4.3 \times .56 \times 2.75 = 54.6$

(SEE FIG. 3) = 63.63 CFS

SAME HYDRAULICS: $Z = 50$, $n = .015$, LENGTH = 650'

$S = 2.3\%$

$d = .443'$

$V = 6.497$ F.P.S.

T_c (GUTTER) = $650 / (\frac{6.497}{2} + 5.46') \times \frac{1}{60}$

= 1.81 min

ΣT_c (GUTTER) = 10.84 + 4.24 + 1.81

= 16.89 min ≈ 16.9 (ESTIMATE) OK

100 YR. RUNOFF IN MONTGOMERY BLVD. IS WELL WITHIN STREET FLOW CAPACITY AND PRESENTS NO HAZARD SO LONG AS DRIVEWAY ENTRANCE ELEVATIONS ARE GREATER THAN .443' ABOVE GUTTER ℄.

DIVERSION CHANNEL: A FLOOD CONTROL DIVERSION CHANNEL LOCATED ALONG THE WEST BOUNDRY OF THE SITE IS TO BE CONCRETE LINED BY THE DEVELOPER. SHOULD THE CITY REQUIRE, THE SAME SECTION WILL BE USED, IN THE VICINITY OF THE SITE, AS WAS USED IN THE RECENTLY COMPLETED PORTION OF THE CHANNEL IMMEDIATLY DOWN STREAM.

BY A. G. DATE 1-8-72 SUBJECT PENNANT PLAZA SHEET NO. 4 OF 4
CHKD. BY ____ DATE ____ OFF SITE DRAINAGE (cont) JOB NO. 101

CHANNEL SECTION:*

$S^* = 1\%$

* TAKEN FROM "AS BUILTS" ON FILE W/ W. I. MATTSON.

STUDYS PERFORMED FOR THE CITY INDICATE A PEAK 100 YR FLOW OF 366 CFS IMMEDIATELY NORTH OF MONTGOMERY BLVD. (DATA PROVIDED BY CITY DRAINAGE ENGINEER, MR. BRUNO CARIGLIANO) ASSUMING THE WORST; A COMBINATION OF PEAK FLOWS FROM THE CHANNEL, MONTGOMERY BLVD. (RUNDOWNS & DROP INLETS INDICATE ALL MONTGOMERY FLOW SPILLS INTO THE CHANNEL) AND THE PROJECT YIELD A 100 YR PEAK FLOW FOR THE CHANNEL = 366 + 63.6 + 15.1 = **444.7** CFS

HYDRAULICS: $n = .015$

$$Q = \frac{1.486}{n} a R^{2/3} S^{1/2} \qquad a = d^2 Z + dB$$

$$R = a/(\sqrt{1+Z^2}\,d + B)$$

$d \approx 2.75'$ @ 1%
$\approx 3.25'$ @ .5%

100 YR RUNOFF DOES NOT APPROACH THE CHANNEL CAPACITY NOR DOES IT PRESENT ANY HAZARD TO THE SITE.

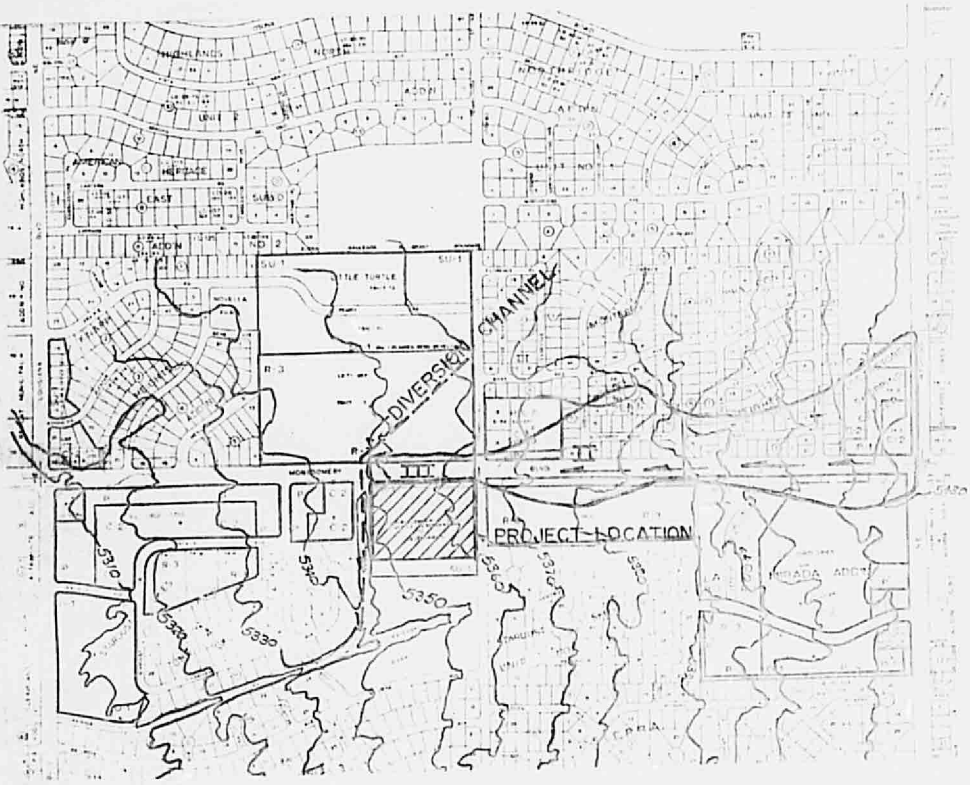


FIG. 2
OFFSITE DRAINAGE

REVISED DRAINAGE

DESCRIPTION	SQ FT.	%
TOTAL LAND 9 AC	392,040	100.0
PAVEMENT	203,050	51.8
BUILDINGS	93,400	23.8
SIDEWALKS	15,095	3.9
PONDS & LANDSCAPING	80,495	20.5

EXISTING CONDITIONS

IMPERVIOUS AREAS 0 VOLUME OF RUNOFF = AREA [2.4] ÷ 12 (.9) 0 cu ft.
PERVIOUS AREA 392,040 sq ft " " " = " (2.4) ÷ 12 (.9) 31,363 cu ft.
TOTAL 31,363 cu ft.

DEVELOPED CONDITIONS

IMPERVIOUS AREAS 311,545 sq ft VOLUME OF RUNOFF = AREA (2.4) ÷ 12 x .9 = 56,078 cu ft.
PERVIOUS AREA 80,495 sq ft " " " = " (2.4) ÷ 12 x .9 = 6,439 cu ft
TOTAL 62,517 cu ft.

REQ. PONDING : DEVE AREA (62,517) − EXISTING AREA (31,363) = 31,153 cu ft.

AREAS "A" 28,985 cu ft.
"B" 6,300 cu ft.
"C" 2,604 cu ft.
37,914 cu ft.

SEE SITE GRADING PLAN

"C" RUNOFF COEFFICIENT

DESCRIPTION	AREA	%	"C"
TOTAL LAND	392,040	100	0.35
PAVEMENT	203,050	51.8	.90
BUILDING & SIDEWALKS	108,495	27.7	1.0
PONDS & LANDSCAPING	80,495	20.5	.07

"C" (existing) USE 0.35
EXISTING SLOPE AVG. 2.4%
DEVELOPED SLOPE AVG. 1.8%

DEVELOPED "C"

PAVEMENT — BLDG SIDEWALKS — PONDS LANDSCAPING

$.518 \times 0.9 + .277 \times 1.0 + .07 \times .30 =$
$.4662 + .277 + .021 = .7642$
LESS EXISTING "C" = .35
.4142

$T_c = \text{Log}^{-1}[(0.3661 \times B + 0.3354 \text{ Log}(L) - 0.197 \text{ Log}(S) - 0.3613]$

B = GROUND FACTOR 1.25
L = LENGTH OF FLOW 900' ±
S = SLOPE OF FLOW PATH 1.8%
Tc = TIME OF CONCENTRATION

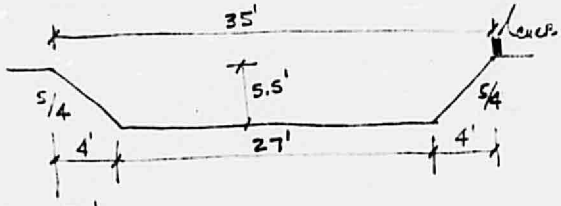
$T_c = \text{Log}^{-1}[(0.3641 \times 1.25 + 0.3354 \text{ Log } 900 - .197 \text{ Log } 1.8 - 0.3613)]$
$= \text{Log}^{-1}[(0.04572 + 1.13856 - 0.05029 - 0.3613)]$
$= \text{Log}^{-1}[0.77209] = 5.92$ min say 6 min

i = INTENSITY $189/6+25 = 6''/HR.$

ASSUME MAXIMUM RAINFALL OCCURS IN 1st 40 min
THEN $40/60 \times 6 = 4''$ RAINFALL

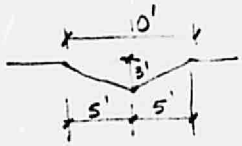
Q = QUANTITY = $.4142 \times 4'' \times 9A \times 2900^{SQ} = 35,787$ CU.FT.
INCREASED RUNOFF = AMOUNT TO BE RETAINED ON SITE = 35,787 CU FT

AREA "A"



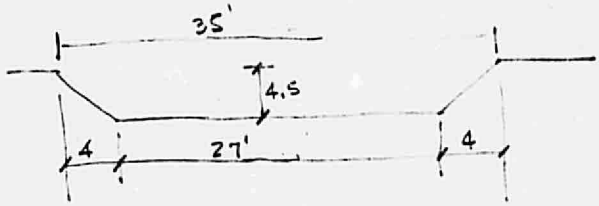
AVG. W = 31'
AVG. D = 5'
L = 170' = 28,985 cu ft.

AREA "B"



AVG W - 5'
D - 3'
L - 315' = 6,300 cu ft.

AREA "C"



AVG. W 35'
D. 4'
L 25' = 2,604 cu ft.

TOTAL "A" 28,985
"B" 6,300
"C" 2,604
37,914 cu ft.

HYDROLOGY G19/D9 2 of 2 5 PLANS

SUPPLEMENT TO
STORM DRAINAGE STUDY
FOR
PENN-MONT PLAZA
ALBUQUERQUE, NEW MEXICO

Gardner, Mason & Associates, Inc.
Albuquerque, New Mexico
February, 1981

PURPOSE

The purpose of this supplement to the original drainage study is to ascertain that the criteria and conceptual approach, approved in the 1979 storm drainage study for Penn-Mont Plaza, can still be satisfied.

LOCATION AND DESCRIPTION

The Penn-Mont Plaza is located on a nine acre site comprised of "A-1-A", "A-1-B" and "A-2" of Block 15, unit No. 4, Stardust Skies, an addition to the City of Albuquerque, New Mexico at the southwest corner of Montgomery Bouldevard, NE and Pennsylvania Street, NE.

EXISTING SITE CONDITIONS

Presently the site is roughly graded and sloping from east to west as original topography. An onsite utility installations and building constructions are in progress. In the southwest corner of tract, "A-2" there is a high fill on which a building is being constructed. The sides of this fill are sloping onto adjacent properties.

DEVELOPED SITE

The site will be developed with other additional commercial buildings with paved driveways, parking lots, concrete curb and gutter, sidewalks and landscaping. The high dirt fills will have retaining walls.

PROPOSED DRAINAGE

The offsite runoff will not present any flood hazards to the site. However, there will be a significant increase in the onsite runoff. These onsite flows are to be controlled by paved and graded driveways, parking lots, and drainage swales such that no overland flows will leave the site except into a detention basin and

through drain pipe (or overflow) and into an existing segment of North Hahn Flood Control Channel located along the western boundary of the site.

DEVELOPED DRAINAGE CHARACTERISTICS

The proposed development plan differs from the conceptual drainage plan in the extent that the pond has been moved from the southwest corner of the site to along the west side of the site.

We have analyzed the composite coefficient of runoff for the approved development plan as compared with the original report. The original report computed a composite coefficient of runoff of 0.691 for developed conditions. The amount of parking and buildings did not change. Drainage areas F and F2 are no longer closed basins, however, which as increased the coefficient of runoff. For this analysis we estimate that the adjusted coefficient of runoff be 0.85.

The peak rate of discharge for undeveloped conditions was 15.1 cfs. The runoff for undeveloped conditions for one hour was 9.0 Ac x 0.35 x 43560 x 2.22353/12 - 23,425 cu. ft. Development of the site has increased the peak discharge and runoff as follows:

Q_{100} = 9.0 x 0.85 x 5.164 = 39.5 cfs

Runoff = 9.0 x 0.85 x 43560 x 2.22/12 = 61,648 cu. ft.

The difference in runoff is 61,648 - 25,425 = 36,223 cu. ft. (Plate 1) The retention pond will have to be sized to hold sufficient water to limit the peak discharge to 15.1 cfs. The required volume to be held is 36,223 cu. ft.

POND SIZE

The proposed retention pond is 30 feet wide by 305 feet long. Assuming a depth of 40 feet, the pond capacity is 36,600 feet.

OUTLET PIPE DESIGN

The outlet pipe could act as a free orifice such that the static head of 4.0 feet and the pipe size would result in an orifice discharge of 5 cfs. Once the pond is full the combination of orifice flows would not exceed 15.1 cfs (undeveloped peak discharge).

PIPE DESIGN (See plate 5 for figure)

Assume a pipe size of 12 inches.

$Q = 4.7$ cfs $\quad H = 3.5 \quad D = 3.5 + 0.5 = 4.0$

This assumes a K of 0.40 which is reasonable.

CONTROLLED OUTFLOW FROM POND

Three 12-inch diameter orifice pipes will be installed in the pond for a controlled outlet flow of 15 cfs peak. Since the rate of flow through the orifice varies as the square root of the height, when the pond is half full, the flow rate would be approximately 4 cfs.

The outlet pipe will be temporarily protected with grouted riprap until the proposed channel is constructed. At that time they can be connected to the channel with overflow sections.

The total pond volume of 36,600 cfs is adequate to handle the discharge from a one-hundred year storm within the City parameters. The total time for the pond to empty completely would be approximately 120 minutes after the start of the storm.

CONCLUSION

The dirt fill side slopes will be retained within the site boundaries by retaining walls. Landscaping on the outside and adjacent to the lower retaining walls will be provided to obliterate the bare walls.

Provided that the site is developed in accordance with the recommendations, plans, drawings and guidelines of the City of Albuquerque, the site will not create any hazards to surrounding properties.

Reference is made to Storm Drainage Study by Gardner Engineers, Inc., January 1979 for Penn-Mont Plaza.

Gilbert D. Gardner, P.E.

LOCATION Penn-Mont Plaza

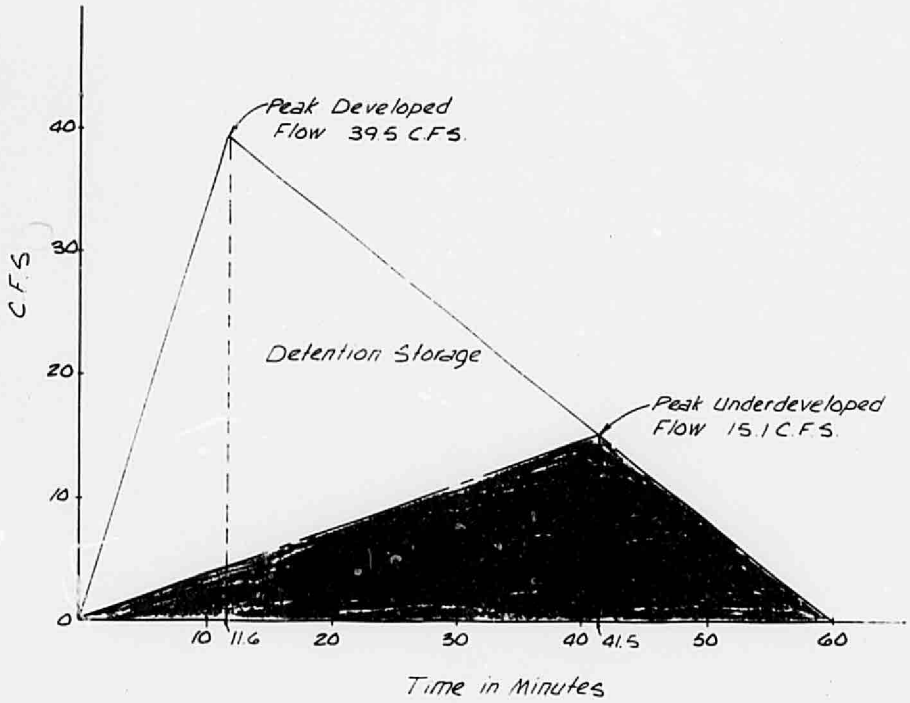
PROJ. NO. 80-1180

DATE 2/26/81

DESIGNER Gardner Engineers Inc

PAGE Plate I

Inflow Hydrograph



LOCATION Penn - Mont Plaza

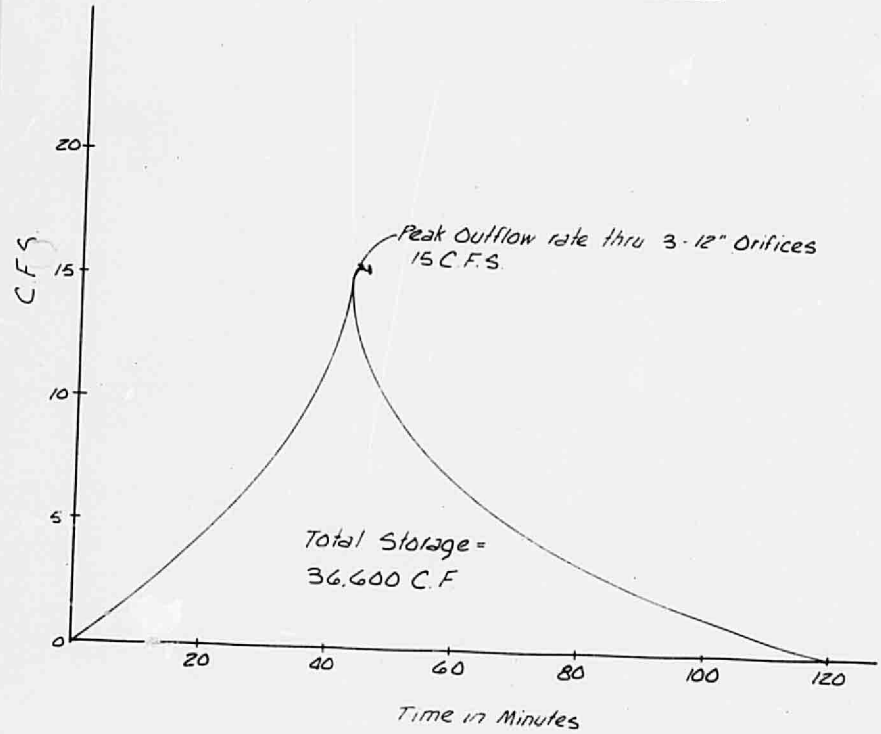
PROJ. NO. 80-1180

DATE 2/26/81

DESIGNER Gardner Engineers Inc.

PAGE Plate II

Outflow Hydrograph



SUPPLEMENT TO
STORM DRAINAGE STUDY
FOR
PENN-MONT PLAZA
ALBUQUERQUE, NEW MEXICO

Gardner Engineers, Inc.
Albuquerque, New Mexico
September, 1980

PURPOSE

The purpose of this supplement to the original drainage study is to ascertain that the criteria and conceptual approach, approved in the 1979 storm drainage study for Penn-Mont Plaza, can still be satisfied.

LOCATION AND DESCRIPTION

The Penn-Mont Plaza is located on a nine acre site comprised of "A-1-A", "A-1-B" and "A-2" of Block 15, unit No. 4, Stardust Skies, an addition to the City of Albuquerque, New Mexico at the southwest corner of Montgomery Bouldevard, NE and Pennsylvania Street, NE.

EXISTING SITE CONDITIONS

Presently the site is roughly graded and sloping from east to west as original topography. An onsite utility installations and building constructions are in progress. In the southwest corner of tract, "A-2" there is a high fill on which a building is being constructed. The sides of this fill are sloping onto adjacent properties.

DEVELOPED SITE

The site will be developed with other additional commercial buildings with paved driveways, parking lots, concrete curb and gutter, sidewalks and landscaping. The high dirt fills will have retaining walls.

PROPOSED DRAINAGE

The offsite runoff will not present any flood hazards to the site. However, there will be a significant increase in the onsite runoff. These onsite flows are to be controlled by paved and graded driveways, parking lots, and drainage swales such that no overland flows will leave the site except into a detention basin and

through a drain pipe (or overflow) and into an existing segment of North Hahn Flood Control Channel located along the western boundary of the site.

The recommended detention pond configuration and location has changed, however, the volume is the same (32,400 ft.^{3}) This pond will be enclosed with a high chain link fence and there will be outlet structures. These outlet structures consist of concrete overflow spillway and a positive 18-inch diameter discharge pipe into an existing flood control channel.

The dirt fill side slopes will be retained within the site boundaries by retaining walls. Landscaping on the outside and adjacent to the lower retaining walls are recommended to obliterate the bare walls.

Provided that the site is developed in accordance with the recommendations, plans, drawings and guidelines of the City of Albuquerque, the site will not create any hazards to surrounding properties.

Reference is made to Storm Drainage Study by Gardner Engineers, Inc., January 1979 for Penn-Mont Plaza.

SUPPLEMENT TO
STORM DRAINAGE STUDY
FOR
PENN-MONT PLAZA
ALBUQUERQUE, NEW MEXICO

Gardner, Mason & Associates, Inc.
Albuquerque, New Mexico
July, 1981

PENN-MONT PLAZA
ALBUQUERQUE, NEW MEXICO
JULY 27, 1981

Peak discharge and runoff for developed site are estimated as follows:

*Total Runoff Q_{100} = 9.0 x 0.85 x 5.164 = 39.5 cfs.

For Area (A_1) Q_{100} = 3.1 x 0.85 x 5.164 = 13.6 cfs.

For Area (A_2) Q_{100} = 5.9 x 0.85 x 5.164 = 25.9 cfs.

Eliminating proposed 4 feet deep retention pond and using concrete drop inlet with pipe outlet which acts as submerged orifice, the following pipe size computations can be made:

For hydraulic head of h = 7', Q_{100} = 39.5 cfs. Coefficient:

C = 0.60
A = area of pipe (ft.^{2})
h = hydraulic head (ft.)
g = 32.2 ft./sec.^{2}
Q = volume rate of flow, cfs.

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

$$A = \frac{Q}{C\sqrt{2gh}} = \frac{39.5}{(.6)\sqrt{2(32.2)7}} = 3.10 \text{ ft.}^2$$

$$A = \pi r^2$$

$$r = \sqrt{\frac{3.10}{\pi}} = 0.99' \approx 1' \text{ or } \underline{24'' \text{ diameter pipe}}$$

Two discharge pipes into the channel will be provided. This is to reduce flooding should one of the structures become obstructed.

For h = 7', 18" diameter pipe:

$$Q = (.6)(1.77)\sqrt{2(32.2)7} = 22.5 \text{ cfs.} > 13.6 \text{ cfs.}$$

*See previous Drainage Report.

For h = 7', 24" diameter pipe:

$$Q = (.6)(3.14)\sqrt{2(32.2)7} = 40.02 \text{ cfs.} > 25.9 \text{ cfs.}$$

Use 18" diameter pipe on north discharge and 24" diameter pipe on south discharge.

Max. Flows Into Concrete Drop Inlet Box

For Rectangular Contracted Weir

$$Q_{Max} = 3.33(L - 0.2H)H^{3/2}$$

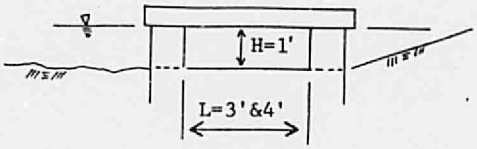
For L = 3'

$$Q_{Max} = 3.33[3 - 0.2(1)]1^{3/2} = 9.32 \text{ cfs.}$$

For L = 4'

$$Q_{Max} = 3.33[4 - 0.2(1)]1^{3/2} = 12.65 \text{ cfs.}$$

$$Q_{Total} = 2(9.32) + 2(12.65) = 43.94 \text{ cfs.}$$



Sketch of Drop Inlet

Energy Equation from water surface to discharge where h = 7', coefficient of loss at pipe entrance is 0.50, and assuming friction factor for pipe to be 0.018 and neglecting acceleration effects in the pipe:

For 18" diameter RCP, and L = 26':

$$h - \left[0.5 + f\left(\frac{L}{D}\right)\right]\frac{V^2}{2g} = \frac{V^2}{2g}$$

$$7 - \left[0.5 + 0.018\left(\frac{26}{1.5}\right)\right]\frac{V^2}{2g} = \frac{V^2}{2g}$$

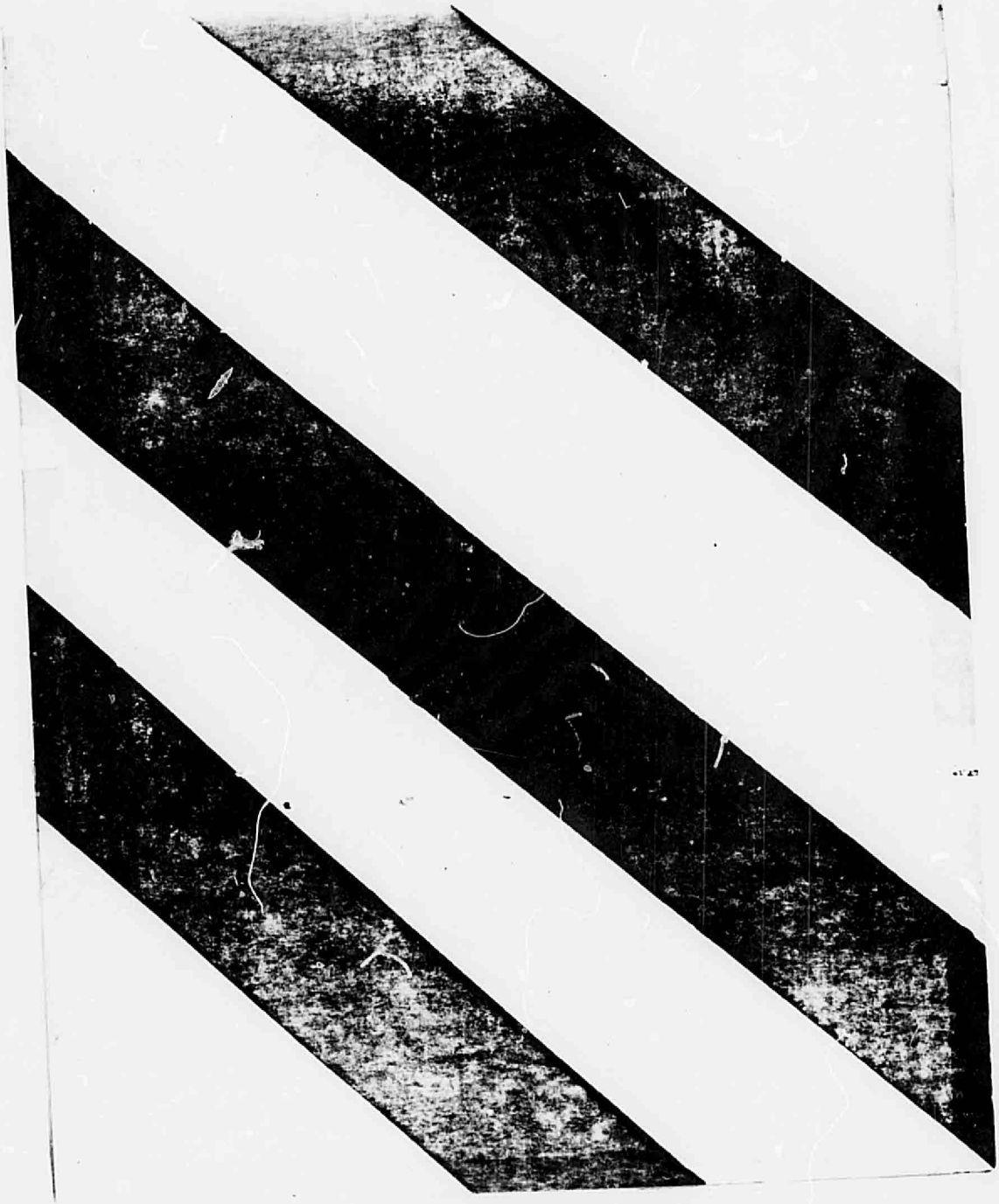
$$7 - 0.8120\,\frac{V^2}{2g} = \frac{V^2}{2g}$$

$$V = 15.77 \text{ fps.}$$

For 24" diameter RCP and L 37':

$$7 - \left[0.5 + 0.018\left(\frac{37}{2}\right)\right]\frac{V^2}{2g} = \frac{V^2}{2g}$$

$$V = 15.68 \text{ fps.}$$

Richard Mason

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