HYDROLOGY H16/D34 1 PLAN

H16/D34

1 PLAN

MEMORANDUM
FORM 3919N

LOCATION | DEPT. | NAME | DATE

TO MR FRED AGUIRRE 7/14/82

SUBJECT STORM DRAINAGE CONNECTION - 3333 LOS ARBOLES N.E.

ATTACHED IS A COPY OF MY LETTER TO SCANLAN + ASSOCIATES WHICH HOPEFULLY WILL BRING ABOUT SOME ACTION IN GETTING FINAL APPROVAL OF OUR DRAINAGE SYSTEM. PLEASE ADVISE IF THERE IS ANYTHING ELSE I CAN DO SO THAT WE MAY OBTAIN OUR CERTIFICATE OF OCCUPANCY.

SINCERELY,
RAWUSER

LOCATION | DEPT. | NAME

Westinghouse
Electric Supply Company

3333 Los Arboles
Box 26505
Albuquerque, NM 87125
505 883.5666

W E S C O

July 14, 1982

Mr. Gene W. Myers, P.E.
Scanlan & Associates, Inc.
1570 Pacheco Street
Suite A-7
Santa Fe, NM 87501

RE: Storm Drain Connection

Dear Mr. Myers:

I recently received information from the City of Albuquerque stating that we have not received a Certificate of Occupancy for our building because we had not received final approval of our drainage system at 3332 Los Arboles, NE.

On May 5, 1982 I contacted Mr. C.T. Murphy of Daves & Associates regarding this problem. At this time he informed me that your firm was in the process of obtaining the final approval.

As of today, this apparently has still not been resolved. As a result, we are facing legal action from the City. I am enclosing copies of the correspondence I have received from the City of Albuquerque for your information.

Because I am totally unfamiliar with the details involved in the approval process, I would appreciate your help in clearing up this matter as quickly as possible.

Sincerely,

R.M. Wiser
Branch Administrative Manager

cc: Bill Kearney - City of Albuquerque
Fred J. Aguirre - P.E. City of Albuquerque
C.T. Murphy - Daves & Associates

RMW/cs

RECEIVED
JUL 16 1982
CITY ENGINEER

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

July 12, 1982

WESCO
C/O B. M. Wiser
Branch Admin. Mgr.
3333 Los Arboles NE
Box 26505
Albuquerque, New Mexico 87125

RE: 3333 LOS ARBOLES NE

Dear Mr. Wiser:

Attached is a copy of a letter sent to Scanlon and Associates regarding the approval of the unauthorized storm drain connection within the City's rights-of-way. Included with this letter is a sample format of the details required for such approval.

If you have any questions regarding the above, please feel free to call me at 766-7644.

Sincerely,

Fred J. Aguirre

Fred J. Aguirre, PE
Civil Engineer/Hydrology

FJA/el

Enclosure

cc: Drainage File
Reading File

Westinghouse
Electric Supply Company

3333 Los Arboles
Box 26505
Albuquerque, NM 87125
505 883.5666

W E S C O

July 6, 1982

City of Albuquerque
Mr. Fred J. Aguirre, P.E.
P.O. Box 2193
Albuquerque, NM 87103

Dear Mr. Aguirre:

On May 3, 1982 I talked to you regarding your April 20, 1982 letter pertaining to a final drainage approval so that we could obtain a Certificate of Occupancy. At that time I contacted Davis and Associates of Santa Fe and was told that drainage approval was pending subject to approval of the engineer's final plans.

Apparently this approval was never obtained as I received a letter dated July 1, 1982 stating that we had still not received a Certificate of Occupancy. I need to remedy this situation, however I'm not sure what steps I need to take as my interpretation of the problem was that the general contractor and the engineer were working on the approvals.

Please advise what I might do to remedy this situation, thus eliminating any legal problems we might incur with the City of Albuquerque. Your help in this matter is appreciated.

Sincerely,

RMWiser

R.M. Wiser
Branch Administrative Manager

RMW/cs

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

April 20, 1982

Westinghouse Electric Supply Company
3333 Los Arboles N.E.
Albuquerque, New Mexico 87107

A review of our records indicates that this office has never given a final drainage approval at 3333 Los Arboles N.E. Further, I have noted that the building is being occupied without a Certificate of Occupancy which is contrary to Section 306 of the City Building Code.

In order to provide fair, effective enforcement of drainage policy, it is imperative that I, or one of my staff, make a final inspection of all buildings prior to occupancy. Please make immediate arrangements with me to allow for an inspection of the above mentioned property.

If arrangements for an inspection and approval of your site are not completed within 30 days from the above date, this office will take the necessary legal steps to envoke one or more of the penalties listed under Section 205 of the City Building Code.

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

Sincerely,

Fred J. Aguirre

Fred J. Aguirre, P.E.
Civil Engineer

FJA/tsl

cc: Barbara Stephenson,
City Attorneys Office

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

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

July 1, 1982

TO: Owner or Manager
3333 Los Arboles N.E
Albuquerque, New Mexico
87109

According to our records, you have failed to obtain a Certificate of Occupancy for your project located at 3333 Los Arboles N.E. (Warehouse) .

"Failure to request a Certificate of Occupancy prior to occupancy . . . shall constitute a continuing violation of this Code and subject the offender to penalty under Section 205".

Uniform Administrative Code
City of Albuquerque

/cc

MUNICIPAL DEVELOPMENT DEPARTMENT

Charles W. Volz, A.I.A.
Chief Building Official

CODE ADMINISTRATION DIVISION

123 Central Avenue N.W.
Albuquerque, New Mexico 87102
Telephone (505) 766-7529

AN EQUAL OPPORTUNITY EMPLOYER

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

January 8, 1982

Mr. C. T. Murphy
Davis & Assocates, Inc.
P. O. Box 2184
Santa Fe, New Mexico 87501

SUBJECT: DRAINAGE FACILITIES WITHIN RIGHT-OF-WAY, 3333 LOS ARBOLES N.E.

Dear Mr. Murphy:

Your letter to Mr. Fred Aguirre was referred to my office for review and approval. The drawings as submitted are not acceptable based on the following comments:

a. Sheet 1:

1. Require a location map to show property in relation to streets in the vicinity.

2. Require engineer's seal and signature.

3. Require name and address of property owner.

4. Fill in the blanks under "Notice to Contractor".

5. Put in Map No.

b. Sheet 2:

1. This sheet lacks many of the details required for construction.

2. There are no plan and profile views, ties to center-line of streets or property lines, size of storm sewer line in street, locations of property lines parallel to street, etc.

3. Recommended use of concrete pipe within right-of-way.

Enclosed for your information are copies of the requirements for submittal and sample of a typical submittal.

If you have any questions, please contact me at my office in City Hall 4th. Floor, Room 402 or by telephone (505) 766-7441.

Yours truly,

Quentin R. Kielich
Assistant City Engineer/Design

QRK/fs
Enclosures
cc: Fred Aguirre w/o encl.
Design File w/o encl.
Division File w/o encl.
9626A

CITY OF ALBUQUERQUE
CITY ENGINEER'S OFFICE

SPECIAL ORDER NO. 19 (REVISION 1)

SUBJECT: PROCEDURES FOR CONSTRUCTION OF PRIVATE STORM DRAIN IMPROVEMENTS WITHIN CITY RIGHT-OF-WAY

1. This revision supersedes Special Order No. 19, effective date July 1, 1981.

2. In order to expedite the approval process of Building Plans and to improve maintenance of records, the following procedure is required for approval of Building Plans, proposing subject improvements. Single or duplex residential dwellings are exempt.

a. An original drawing and three copies of the proposed drainage installation within the City right-of-way will be submitted to the Assistant City Engineer, Design for review and approval. The design must be prepared by a Registered Professional Engineer in the State of New Mexico.

b. The drawings shall include but not be limited to the following items:

(1) Key location map. Suggested scale 1:500 or 1:1000.

(2) Property address and legal description (Lot, Block and Name of Subdivision)

(3) Notice to Contractor.

(4) Location for improvement (tie should be to property corner, center-line of an intersecting street, or other adequate reference points).

(5) Name of street(s).

(6) Size and invert elevation of existing storm sewer line in right-of-way, if applicable.

(7) Invert elevations, slope, type and size of pipe. Rim and floor elevations of catch basin, elevation of gutter flow-line, and elevation of adjacent top of curb and sidewalk.

(8) All elevations must be referenced to City of Albuquerque Mean Sea Level Datum.

(9) Applicable City Standards drawing(s), referenced to Standard Drawing Number, to be used for the proposed installation.

(10) Engineer's Seal & signature.

c. The original approved set of drawings will be retained in the Design Section. One approved set of prints will be attached to each set of Building Plans. No site drainage approval will be approved if these copies are not attached to the Building Plans.

d. Prior to construction of the drainage facility, the contractor must obtain the necessary permit for excavation and construction from the City Engineer's Office. The third copy of the approved drawings will be submitted by the contractor at time of application for permit. This copy will be attached to the Field Section's copy of the permit. Prior to forwarding the permit to the Field Section, the number of the permit will be recorded as the project number on the original set and permit print set.

e. After Field acceptance of the installation by the Field Section Inspector, the Field Section set will be marked up for as-built conditions, and submitted to Design Section to annotate the originals to reflect the as-built conditions.

f. Revised originals will be submitted to Assistant City Engineer, Field and Field Inspector for signatures. The originals will be returned to the Design Section for filing. A copy will be forwarded to the Hydrology Section.

3. The contractor's work within the right-of-way must be approved before the Hydrology Section can approve the release of the Certificate of Occupancy.

4. Maintenance of the drainage facilities described herein shall be the responsibility of the owner, as outlined in the drainage covenant.

5. Attached for your information are copies of the format for drawing submittals with illustrative design.

6. Blank format sheets are available in the Design Section

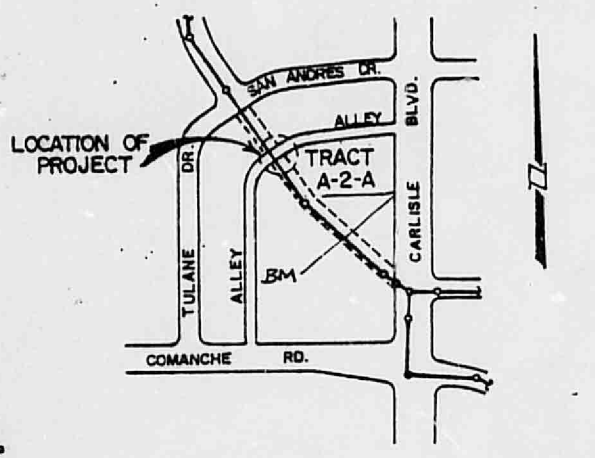
EFFECTIVE DATE: SEPTEMBER 9, 1981.

Richard S. Heller

City Engineer

CITY OF ALBUQUERQUE

DRAINAGE FACILITIES WITHIN CITY RIGHT-OF-WAY



VICINITY MAP

200 100 0 200 400

SAMPLE

Engineer's Seal & Signature

Owner's Name & Address

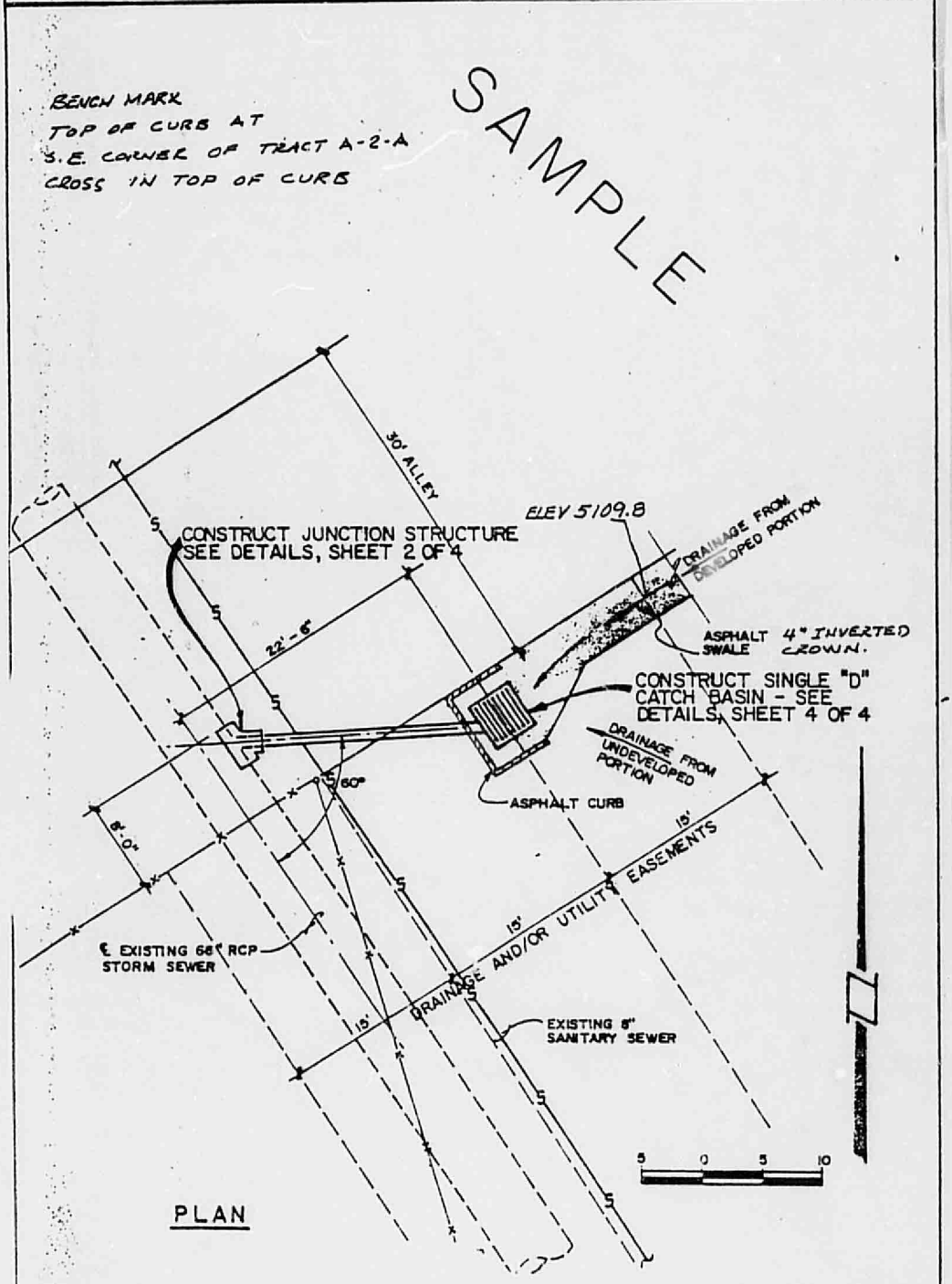
NOTICE TO CONTRACTOR

1. An excavation/construction permit will be required before beginning any work within City right-of-way. An approved copy of these plans must be submitted at the time of application for this permit.
2. All work detailed on these plans to be performed, except as otherwise stated or provided hereon, shall be constructed in accordance with "Contract Documents for City-Wide Utilities and Cash Paving No. 30 "
3. Two working days prior to any excavation, contractor must contact Line Locating Service, 765-1234, for location of existing utilities.
4. Prior to construction, the contractor shall excavate and verify the horizontal and vertical locations of all obstructions. Should a conflict exist, the contractor shall notify the engineer so that the conflict can be resolved with a minimum amount of delay.
5. Backfill compaction shall be according to Residential street use.

APPROVALS	NAME	DATE	TITLE: MONTGOMERY HEIGHTS ADDITION TRACT A-2-A CATCH BASIN & JUNCTION STRUCTURE
A.C.E./DESIGN			
INSPECTOR A.C.E./FIELD			PERMIT NO. SHEET 1 OF 4 — MAP NO. G-16

CITY OF ALBUQUERQUE

DRAINAGE FACILITIES WITHIN CITY RIGHT-OF-WAY



APPROVALS	NAME	DATE
A.C.E./DESIGN		
INSPECTOR		
A.C.E./FIELD		

TITLE: MONTGOMERY HEIGHTS ADDITION
TRACT A-2-A
CATCH BASIN & JUNCTION STRUCTURE

PERMIT NO.
SHEET 2 OF 4

MAP NO. G-16

CITY OF ALBUQUERQUE

DRAINAGE FACILITIES WITHIN CITY RIGHT-OF-WAY

NOTES:

1. Rectangular opening in main line pipe shall be cut within the limits shown normal to pipe surface without damaging steel.
2. Transverse reinforcement in pipe shall be cut in center of opening and bent to uniform distance from top and bottom of junction structure.
3. Main line pipe, beneath and to each side of rectangular opening, shall be cradled in concrete as shown on the plan. Bottom of cradle shall be poured against undisturbed soil.
4. Concrete shall be 3000 psi.
5. Reinforcing steel shall be round, deformed, straight bars 1½" clear from face of concrete unless otherwise shown.
6. Design is based on City of Los Angeles, Department of Public Works Standard Plan Number B-1529, Junction Structure B.

SAMPLE

APPROVALS	NAME	DATE
A.C.E./DESIGN		
INSPECTOR		
A.C.E./FIELD		

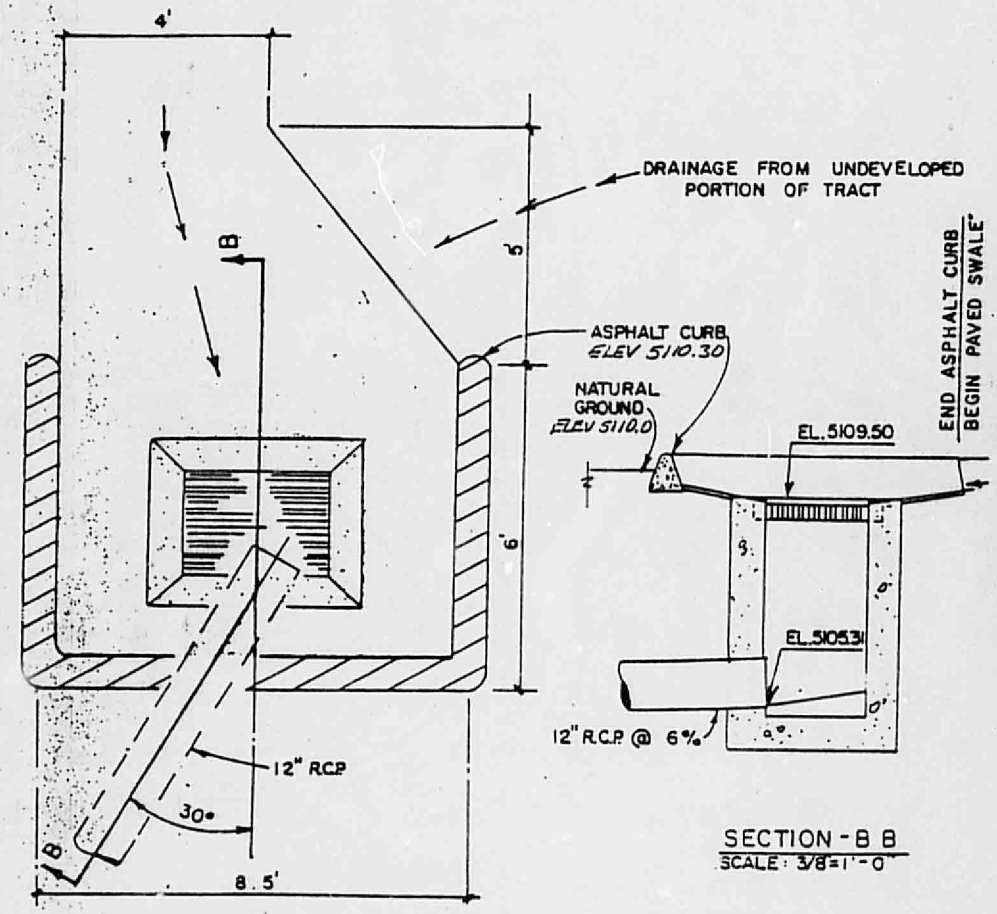
TITLE: MONTGOMERY HEIGHTS ADDITION TRACT A-2-A
CONSTRUCTION NOTES - JUNCT'N STRUCTURE

PERMIT NO.
SHEET 3 OF 4

MAP NO. G-16

CITY OF ALBUQUERQUE

DRAINAGE FACILITIES WITHIN CITY RIGHT-OF-WAY



PLAN
SCALE: 3/8" = 1'-0"

SECTION - B B
SCALE: 3/8" = 1'-0"

SAMPLE

NOTES:

1. For catch basin details, see City of Albuquerque Standard Drawing K-6-1 catch basin, double "D".
2. For asphalt curb see City of Albuquerque Standard Drawing P-8-2 Paving Curb and Gutter.

APPROVALS	NAME	DATE
A.C.E./DESIGN		
INSPECTOR		
A.C.E./FIELD		

TITLE:
MONTGOMERY HEIGHTS ADDITION
TRACT A-2-A
CATCH BASIN AND PAVING DETAILS

PERMIT NO.
SHEET 4 OF 4

MAP NO. G-16

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

December 8, 1981

Scanlon & Associates, Inc.
c/o Gene W. Myers, P.E.
1570 Pacheco Street, Suite A-7
Santa Fe, New Mexico 87501

RE: STORM DRAIN CONNECTION AT 3333 LOS ARBOLES, NE

Dear Mr. Myers:

All construction within City right-of-way requires the approval of the Assistant City Engineer-Design and the Assistant City Engineer-Field. Attached is a sample of the required format for obtaining such approval.

Please submit the required construction detail on the forms provided for the referenced storm drain connection to the A.C.E.-Design for review and approval.

The Certificate of Occupancy can not be released until approval of the storm drain connection is obtained.

If you have any questions regarding the format, please contact Bob Kielich, A.C.E.-Design at 766-7441.

Sincerely,

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

FJA/el

cc: Bob Kielich, Assistant City Engineer
Bill Kearney, Inspections, City Engineers
C. T. Murphy, Davis & Associates Inc.

DAVIS & ASSOCIATES INC.
GENERAL CONTRACTORS

P O Box 2184
Santa Fe
New Mexico
87501

(505)
988-2894

SF-6169

November 17, 1981

Re: 3333 Los Arboles, N. E.
Albuquerque, NM

RECEIVED
NOV 20 1981
CITY ENGINEER

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

Attention: Mr. Fred Aguirre, P.E.

Gentlemen:

In reply to your letter dated 16 November 1981, we are waiting for a reply from your office in regards to Scanlon & Associates letter dated 29 October 1981 in regards to a drainage problem that your office feels exists and needs correction.

All other aspects of the above project have been ~~finished~~ FINALED with the exception of the drainage.

Your prompt reply will be appreciated.

Very truly yours,

DAVIS & ASSOCIATES, INC.

C. T. Murphy
Project Manager

CTM:nh
cc: Barbara Stephenson,
City Attorney's Office

SCANLON & ASSOCIATES INC.

CONSULTING ENGINEERS

RECEIVED

NOV 04 1981

CITY ENGINEER

October 29, 1981

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

Re: Westinghouse Electric Supply Company,
Corner of Wellesley Dr., NE and Los Arboles Ave., NE

Dear Mr. Aguirre:

We have reviewed the storm sewer design of the referenced project. At question is whether or not a flap gate should be installed to prevent backflow from the storm sewer in Wellesley into the ponding area. Our as-builts survey grades on the storm sewer indicate a top of pipe elevation for the 36" storm sewer in Wellesley of 26.49. The overflow level of the ponding area is designed at 26.0. Therefore when the pipe is flowing full, about 6" of water can be expected to overflow the pond into Matthew Avenue. We suggest two possible remedies to the situation. A flap gate could be installed in a new manhole to be constructed at the point where the 12" RCP changes to 12" CMP on the Westinghouse property. Alternatively, the overflow elevation of the pond could be raised to 26.5 and contain the storm water. Please consider these options and express a preference to us.

Very truly yours,

SCANLON & ASSOCIATES, INC.

Gene Myers

Gene W. Myers, P. E.
Vice President

GWM:mmcs

xc: Davis & Associates

KEARNEY: NOV 11 to
What about increased
capacity? DISCUSS
THIS MATTER WITH
YOU AND KIELICH
Pickatine

PLEASE REPLY TO:
- ☐ ALBUQUERQUE, NEW MEXICO 87110 — 8008 PENNSYLVANIA CIRCLE NE — TELEPHONE: (505) 265-6941
- ☐ ARTESIA, NEW MEXICO 88210 — 510 WEST TEXAS AVENUE — TELEPHONE: (505) 748-1010
- ☐ FARMINGTON, NEW MEXICO 87401 — 1405 SCHOFIELD LANE — TELEPHONE: (505) 327-1023
- ☑ SANTA FE, NEW MEXICO 87501 — 1570 PACHECO STREET, SUITE A-7 — TELEPHONE: (505) 983-3323

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

MAYOR
David Rusk

March 10, 1981

Scanlon & Associates, Inc.
8008 Pennsylvania Circle N.E.
Albuquerque, New Mexico 87110

Re: PRELIMINARY DRAINAGE REPORT FOR WESTINGHOUSE ELECTRICAL SUPPLY COMPANY

Dear Sir:

Before I can give the referenced drainage report a thorough review, I must also have the grading plan showing the proposed and existing topography for the subject site. Affixed to these two documents must be the professional stamp of the engineer who is responsible for the design.

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

Very truly yours,

Fred J. Aguirre

Fred J. Aguirre, P.E.
Civil Engineer

FJA:pp

CAUTION

I UNDERSTAND THAT IS

Murphy for Davis & Assoc

DATE 13 Feb 81

Conditional
APPROVED FOR DRAINAGE

3-26-81
DATE

SIGNATURE TITLE

ADVISE DRAINAGE INSPECTOR
WHEN GRADING EXECUTED

pending receipt of revised plan [redacted] addressing elevation symbols and change in grade at the property line. (SW corner)

APPROVED
Date 2/26/81
By
DEPT. TRAFFIC ENGINEERING
Albuquerque, New Mexico

ENVIRONMENTAL HEALTH

Rejected By _____ Date _____

Approved By _____ Date _____

Top Soil Disturbance Permit: Required ☐ Not Required ☐

Top Soil Permit Issued By _____ Date _____

Comments: _____

DRAINAGE REPORT

FOR

WESTINGHOUSE ELECTRICAL SUPPLY COMPANY

PREPARED FOR

DAVIS and ASSOCIATES

MARCH 16,1981

SCANLON & ASSOCIATES INC.
ENGINEERS
& PLANNERS

I. Introduction

Westinghouse Electric Supply Company (WESCO) is a commercial facility which is being developed by Davis and Associates. The site is bounded on three sides by Wellesley Drive, Matthew Avenue, and Los Arboles Avenue on Albuquerque's northeast side (see vicinity map Appendix A-1). The facility will include a warehouse, office building, and parking lot encompassing approximately 1.84 acres.

II. Existing Conditions

The site of the proposed WESCO facility currently has no major structures on it. The terrain primarily consists of low grasses, with the majority of runoff being directed either into a swale which runs east to west across the southern end of the property, or towards the northwest corner, due to a low ridge running through the center of the site. Sidewalks and curb and gutter, corresponding to the three streets previously mentioned which define the site, were existing at the time the site was purchased. Consequently, little or no runoff from off site is conveyed across the property. A topographic map showing how the WESCO site relates to the surrounding topography is included in Appendix A, page A-1. In estimating the peak runoff rates for existing and proposed conditions, the Rational Method was used in conjunction with the Albuquerque Metropolitan Flood Control Authority (AMAFCA) criteria and the Interim Drainage Guidelines, November 1979, for the City of Albuquerque. Details of the runoff calculations are provided in Appendix B. The total peak runoff from the site for existing conditions is estimated to be 5.30 cubic feet per second.

III. Effects of Development:

The proposed development will consist of parking lot, building, and landscaped areas. Landscaped areas as shown will consist of 1 1/2 inch gravel underlaid with a plastic film and, for runoff calculation purposes, will be considered impervious. A weighted runoff coefficient is estimated to be 0.89, with 0.9 used for impervious surfaces and 0.4 for existing or permeable areas such as planters. From Appendix B the peak runoff rate for post development conditions is estimated to be 11.8 cubic feet per second.

IV. Ponding Requirements

The volume of on site ponding necessary to detain the increased runoff caused by development is estimated by taking the difference in runoff volume before and after development:

0.40 = runoff coefficient prior to development
0.89 = runoff coefficient after development
2.44" = 100 year, 6 hour rainfall depth
80 000 sq. ft. = total area of site

Volume retained = (0.89 -0.40) x $\frac{2.44"}{12'/ft.}$ x 80,000 sq. ft.

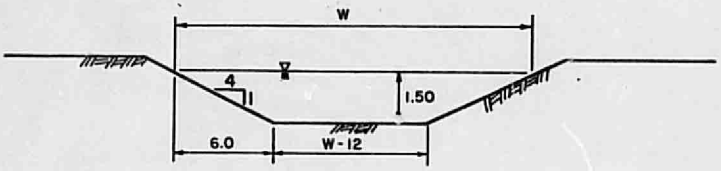
= 7970 cubic feet
= 0.183 acre feet

Pond Size:

L - Length = 175'
Z - Side slopes = 4 hor. to 1 vert.
D - Average depth 1.50 ft.
T - Top area = 175' x W (width)
B - bottom area = (175 - 12)(W - 12) = 163 W - 1956

Vol. = 1/2 (T + B) x D
7970 = 1/2 (175W + 163W - 1956)(1.50)
7970 = 1/2 (338W - 1956)(1.50)
W = 37.25'

FIGURE 1: CROSS SECTION OF POND



V. Conclusions

In the Interim Drainage Guidelines for the City of Albuquerque, November 1979, it is stated that the allowable positive discharge from pond to street or storm drain is equal to the five year-10 minute peak runoff rate from the undeveloped site. From Figure B-3, for a 10 minute storm duration and a 5 year return period, the total rainfall depth is approximately equal to 0.60 inches, or a rainfall intensity of 3.60 inches per hour. Therefore, the peak runoff $Q = CiA = (0.40)(3.60)(1.84) \approx 3.00$ cfs. It is proposed that the detention pond be constructed along the north property line within the landscaped area assshown on the site plan.

In order to collect and convey the runoff from the parking lot and loading area on the south side of the building to the detention pond, it is proposed that an 18 inch diameter CMP storm drain be provided within the 5 foot wide area along the west property line. In addition, all roof drainage will be routed into the CMP via drain pipes on the building's west side (see detail on site plan). The paved parking/storage area on the north end of the warehouse will be graded so as to direct runoff in a sheet flow manner to the pond area.

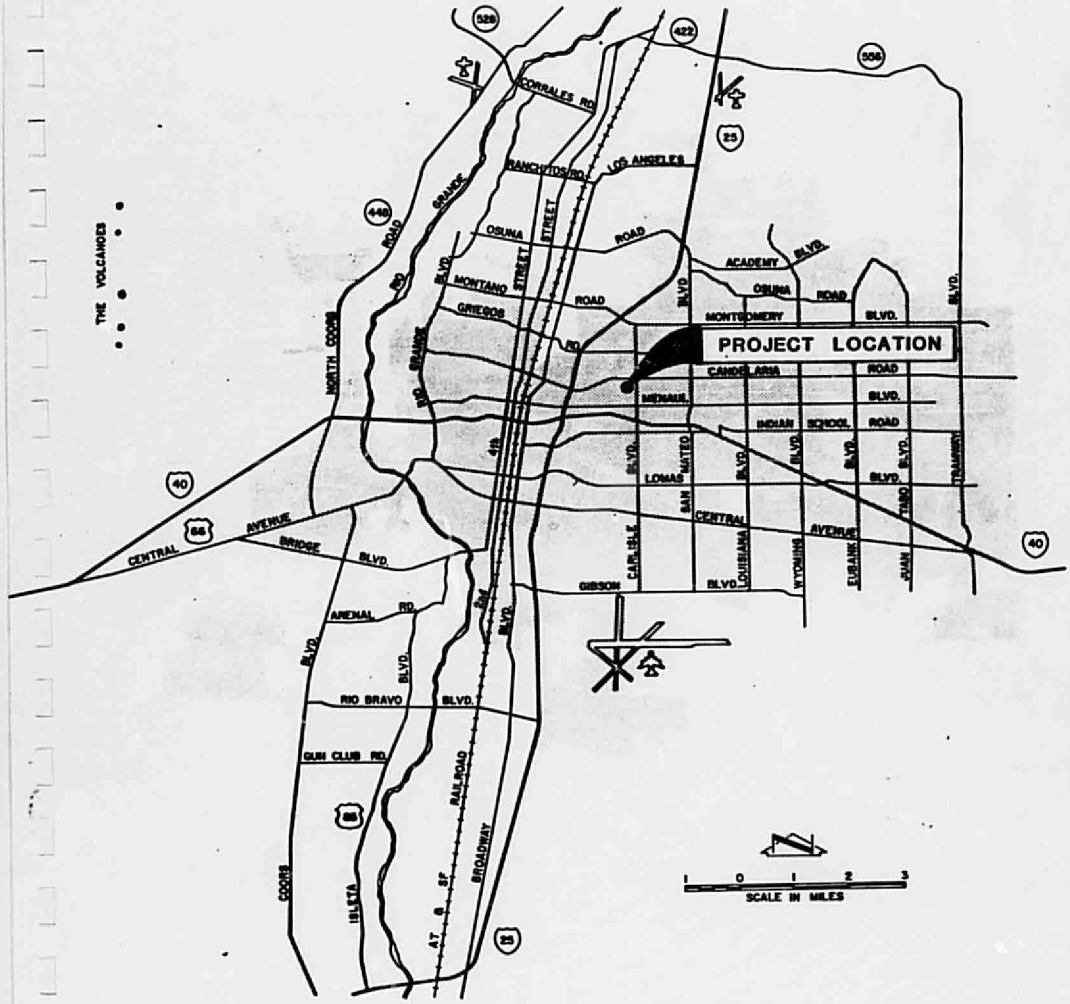
A 12 inch diameter discharge pipe is proposed to allow for the release of approximately 3 cfs of positive discharge from the detention pond into the 30 inch storm sewer via the manhole as shown under Wellesley Drive. Twelve inch RCP discharge piping is called for from the manhole under the street to 5 feet inside the property line to provide adequate surface loading protection, with the remainder being 12 inch CMP with a flared end section conforming to the pond side slope.

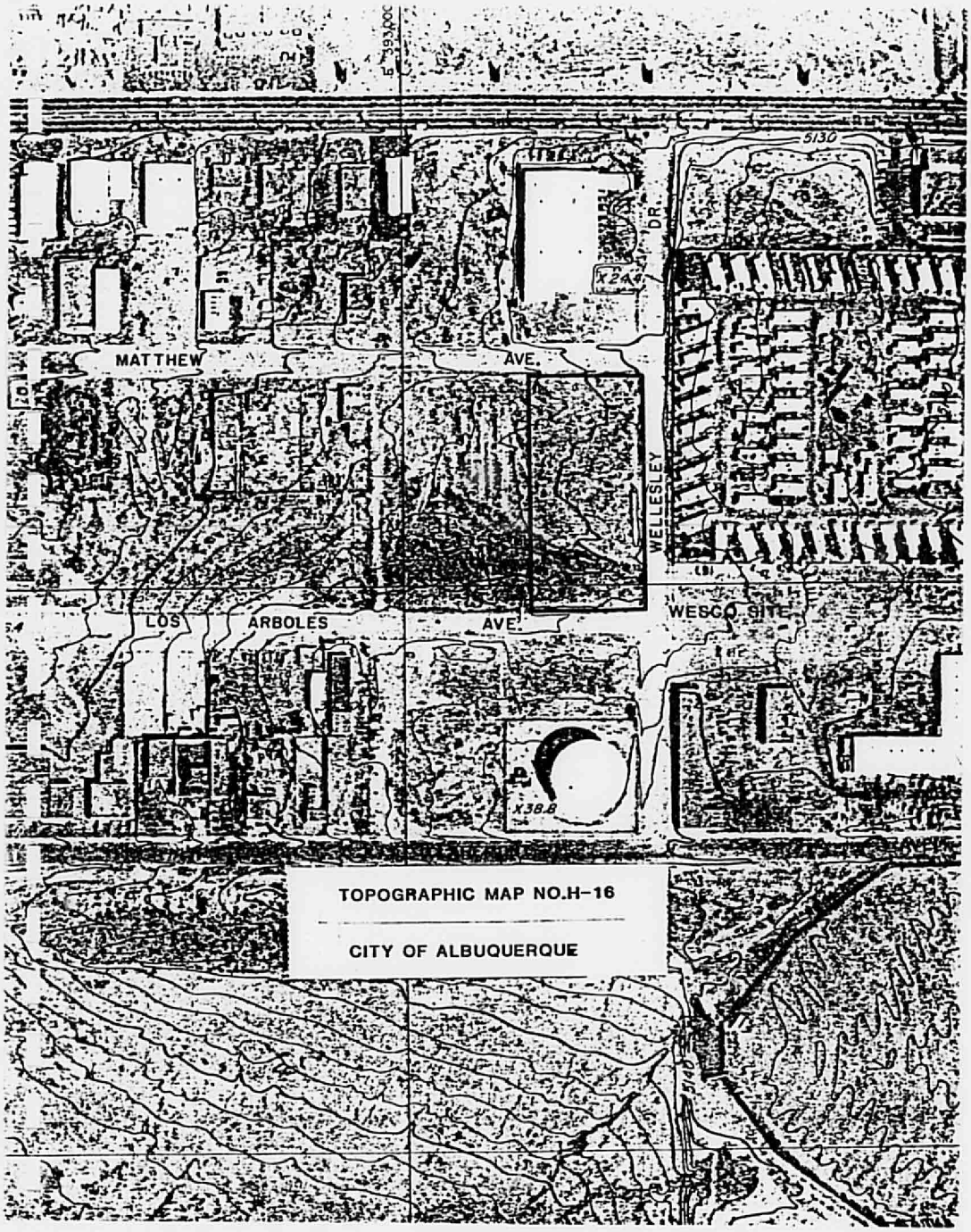
Assuming that entrance control will occur in the case where the 30 inch storm sewer is flowing at a minimum depth, the 12 inch CMP will discharge approximately 3 cfs. In the case where the 30 inch storm sewer is flowing full which is more likely in a major rainfall event, the pipe will discharge approximately 2 cfs which is less than the allowable maximum (see calculations Appendix D).

Any future development of the facilities which would encroach on the capacity of the detention pond or increase the amount of impervious surface on the site would necessitate additional runoff detention facilities. These would most likely be some form of underground gravel pits due to the limited amount of available space.

Off site drainage is currently contained within the streets bordering the property, and it is assumed that it will be similarly contained in the future. Therefore, no off site runoff was considered in the calculations.

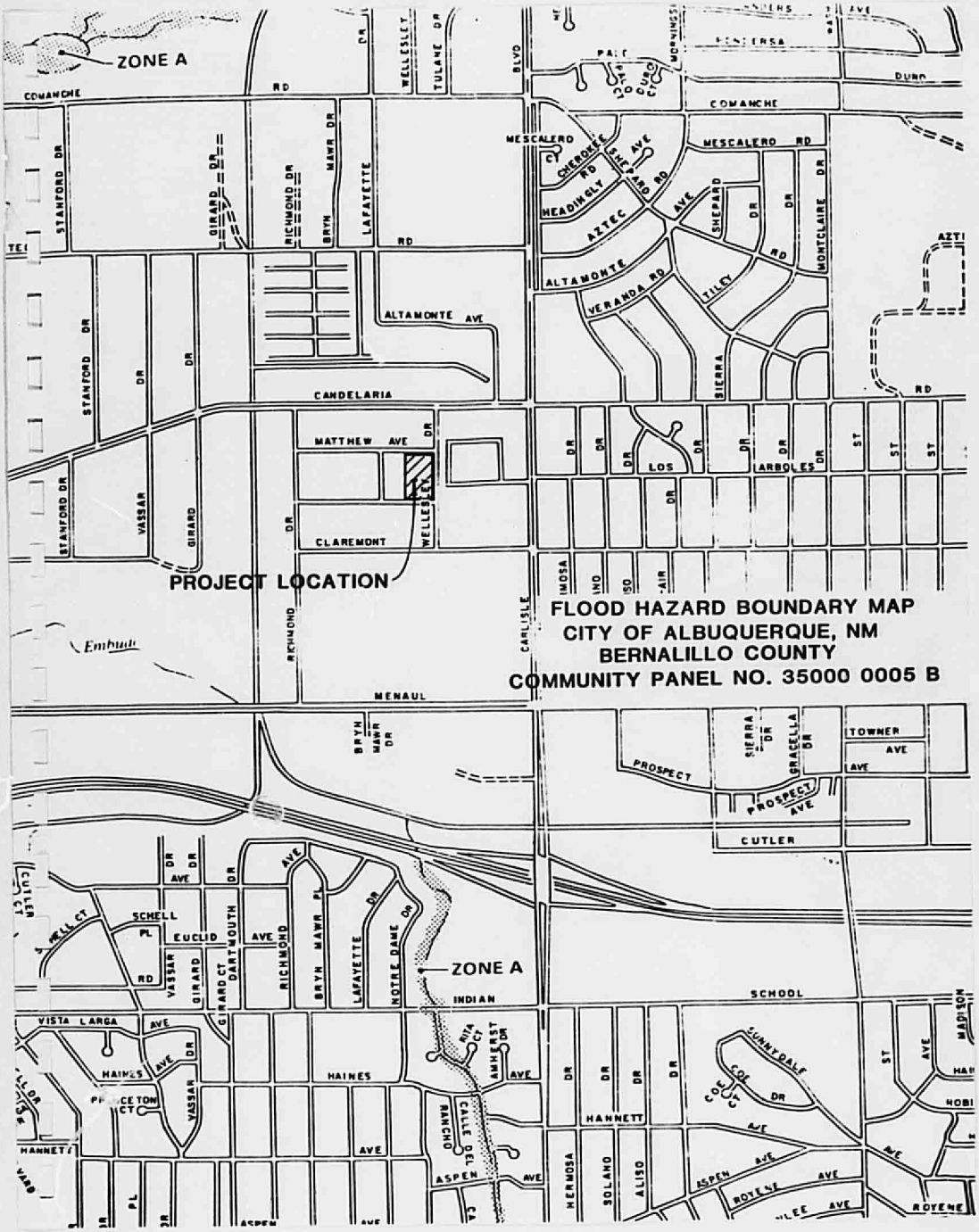
APPENDIX A


PROJECT LOCATION
THE VOLCANOES
CORRALES RD.
RANCHITOS RD.
LOS ANGELES
OSUNA ROAD
ACADEMY BLVD.
MONTANO BLVD.
GRIEGOS RD.
MONTGOMERY BLVD.
CANDELARIA ROAD
MENAUL BLVD.
INDIAN SCHOOL ROAD
LOMAS BLVD.
CENTRAL AVENUE
GIBSON BLVD
ARENAL RD.
RIO BRAVO BLVD.
GUN CLUB RD.
NORTH COORS ROAD
RIO GRANDE BLVD.
4th
2nd
BRIDGE BLVD.
CENTRAL AVENUE
COORS BLVD.
ISLETA BLVD.
A.T. & S.F. RAILROAD
BROADWAY
SAN MATEO BLVD.
CARLISLE BLVD.
LOUISIANA BLVD.
WYOMING BLVD.
EUBANK BLVD.
JUAN TABO BLVD.
TRAMWAY BLVD.
SCALE IN MILES



TOPOGRAPHIC MAP NO.H-16

CITY OF ALBUQUERQUE


ZONE A
COMANCHE RD
WELLESLEY DR
TULANE DR
BLVD
COMANCHE
MESCALERO
MESCALERO RD
CHEROKEE RD
SHEARD RD
HEADINGLY AVE
AZTEC AVE
ALTAMONTE
VERANDA RD
TILCY RD
SHEPARD DR
MONTCLAIRE DR
STANFORD DR
GIRARD DR
RICHMOND DR
BRYN MAWR DR
LAFAYETTE RD
ALTAMONTE AVE
CANDELARIA
MATTHEW AVE
CLAREMONT
WELLESLEY
PROJECT LOCATION
VASSAR
SIERRA
LOS ARBOLES
IMOSA
CARLISLE
MENAUL
FLOOD HAZARD BOUNDARY MAP
CITY OF ALBUQUERQUE, NM
BERNALILLO COUNTY
COMMUNITY PANEL NO. 35000 0005 B
PROSPECT
SIERRA DR
GRACELLA DR
TOWNER AVE
PROSPECT AVE
CUTLER
SCHELL PL
EUCLID AVE
DARTMOUTH
NOTRE DAME DR
ZONE A
INDIAN
SCHOOL
VISTA LARGA AVE
HAINES AVE
HAINES
PRINCETON CT
AMHERST DR
CALLE DEL OCHO
ASPEN AVE
HANNETT
SUNNYDALE
COE DR
HERMOSA
SOLANO
ALISO
ROVENE AVE
MADISON

APPENDIX B: DRAINAGE CALCULATIONS

I. Estimation of Rainfall Depths:

Rainfall depth values for 2, 5, and 100 year recurrence intervals for both 6 and 24 hour storm durations were estimated from isopluvial maps found in the NOAA Atlas 2, Volume IV, for New Mexico, 1973, and are given in Table B-1.

Copies of the applicable NOAA Atlas maps showing the estimated values are found in Appendix C.

One hour values for 2 and 100 year storms were calculated from the equations given in the NOAA Atlas 2, Volume IV, for Western New Mexico. The values were plotted on Figure B-2 to determine the 5 year, 1 hour rainfall value.

Total Rainfall Depth versus Storm Duration is plotted as Figure B-3 in order that rainfall depth values as well as rainfall intensity can be determined for any time of concentration.

II. Existing Conditions

A. Areas as separated by low ridge (A)

Area 1; south of ridge line	1.04 acres
Area 2; north of ridge line	0.80
total	1.84 acres

B. Time of concentration (t), Rainfall Intensity (i)

$$\text{Area 1; } t = \left[\frac{(11.9)(.053)^3}{3.30}\right]^{0.385*} = 3.30 \text{ min.}$$

$$\text{Area 2; } t = \left[\frac{(11.9)(0.056)^3}{4.80}\right]^{0.385} = 3.05 \text{ min.}$$

Use t = 5.0 min.

From Figure B-3; for t = 5.00 min.

Rainfall Depth = 0.60 inches

$$\text{Rainfall Intensity} = \frac{0.60 \text{ inches}}{5 \text{ min}} \times \left(60 \frac{\text{min}}{\text{hr}}\right) = 7.20 \text{ in/hr}$$

* Equation is from California Culverts Practice, California Highways and Public Works, September 1942, and is of the form:

$$T = \left(\frac{11.9\ L^3}{H}\right)^{0.385}$$

where:

T = time of concentration in hours
L = length of longest watercourse in miles
H = elevation difference in feet

C. Runoff Coefficient (C)

Assume C = 0.4 for entire site

D. Peak Runoff Rate: Q = CiA

1. Area 1:

Q = (0.4)(7.20 in/hr.)(1.04 acres) = 3.00 cubic feet

2. Area 2:

Q = (0.4)(7.20)(0.80 acres) = 2.30 cfs

3. Total Peak Runoff

Q_T = 3.00 + 2.30 = 5.30 cfs

III. After Development

A. Areas as determined by land use (A)

Impervious Area
(Parking, Building, Landscaping, etc.) = 1.791 acres

Permeable Area
(Planters, etc.) = 0.046 acres

total = 1.84 acres

B. Time of Concentration (t), Rainfall Intensity (i)

L - southeast corner to pond discharge = 680 L.F.
= 0.129 miles

H - 31.5 - 25.0 = 6.5 ft.

$T = 11.9(0.129)^3 \quad 0.385 = 0.119$ hours = 7.1 min.

From Figure B-3; for T = 7.1 min.

Rainfall Depth = 0.85 in.

Rainfall Intensity = $\frac{0.85}{7.1}$ (60) = 7.2 in/hr

C. Runoff Coefficient (C)

Impervious Areas = 0.90
Permeable Areas = 0.40

Weighted C Factor - 0.89

D. Peak Runoff Rate: Q = CiA

Q = (0.80)(7.2 in/hr)(1.84 ac) = 11.8 cfs

APPENDIX C : RAINFALL DATA

FIGURE 19, NOAA ATLAS 2, VOL IV
2 YR. - 6 HOUR = 1.05"

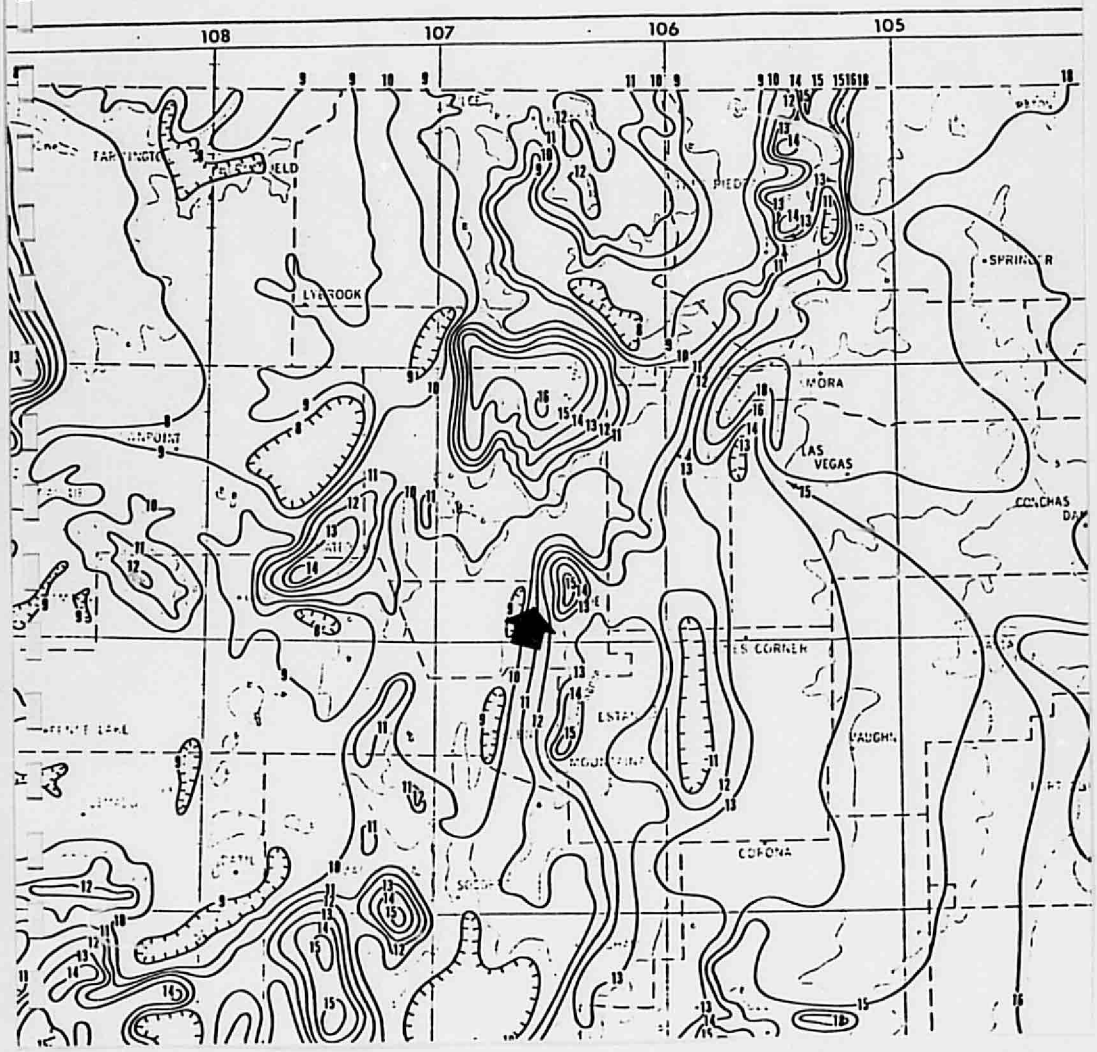
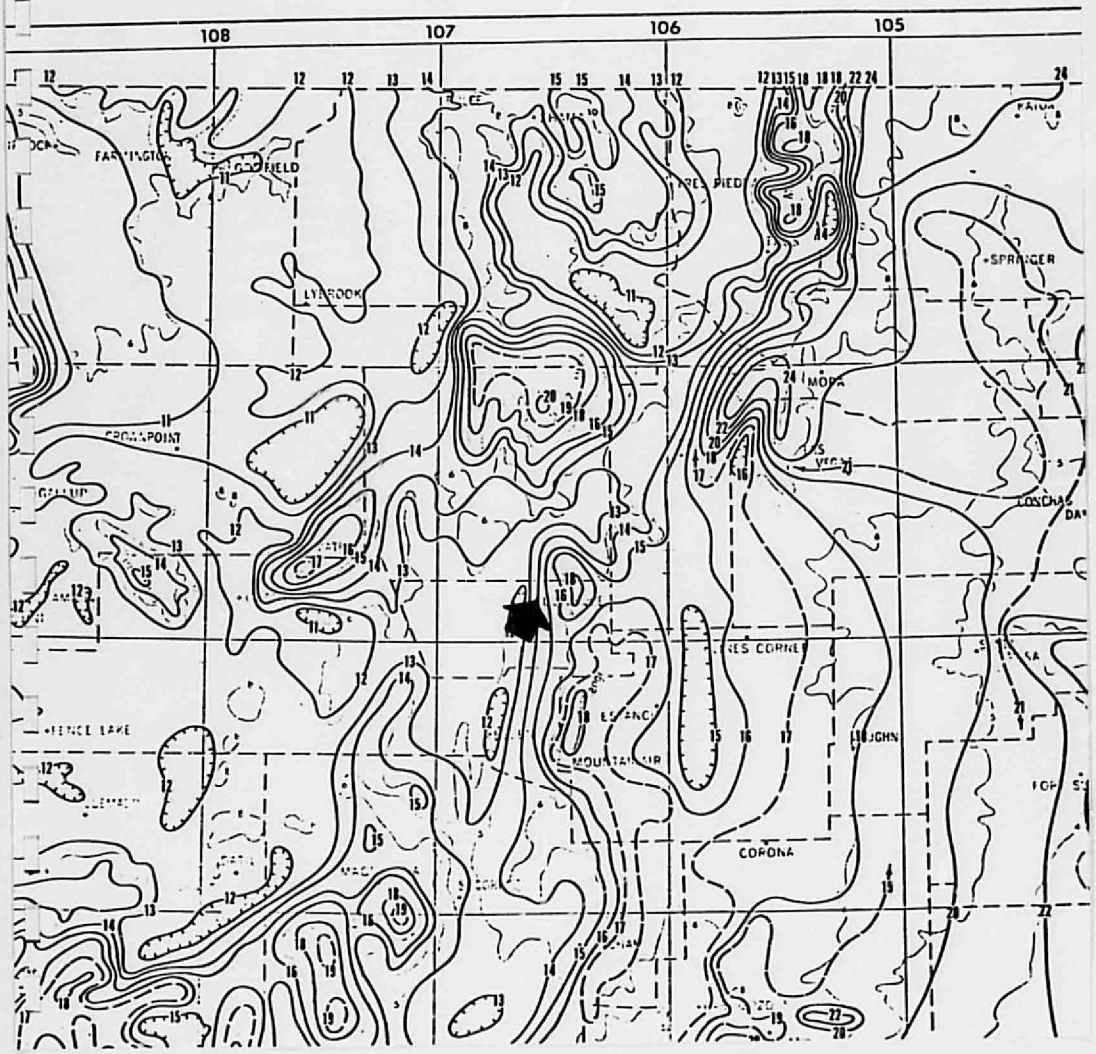


FIGURE 20, NOAA ATLAS 2, VOL IV.
5 YR. - 6 HOUR = 1.58"



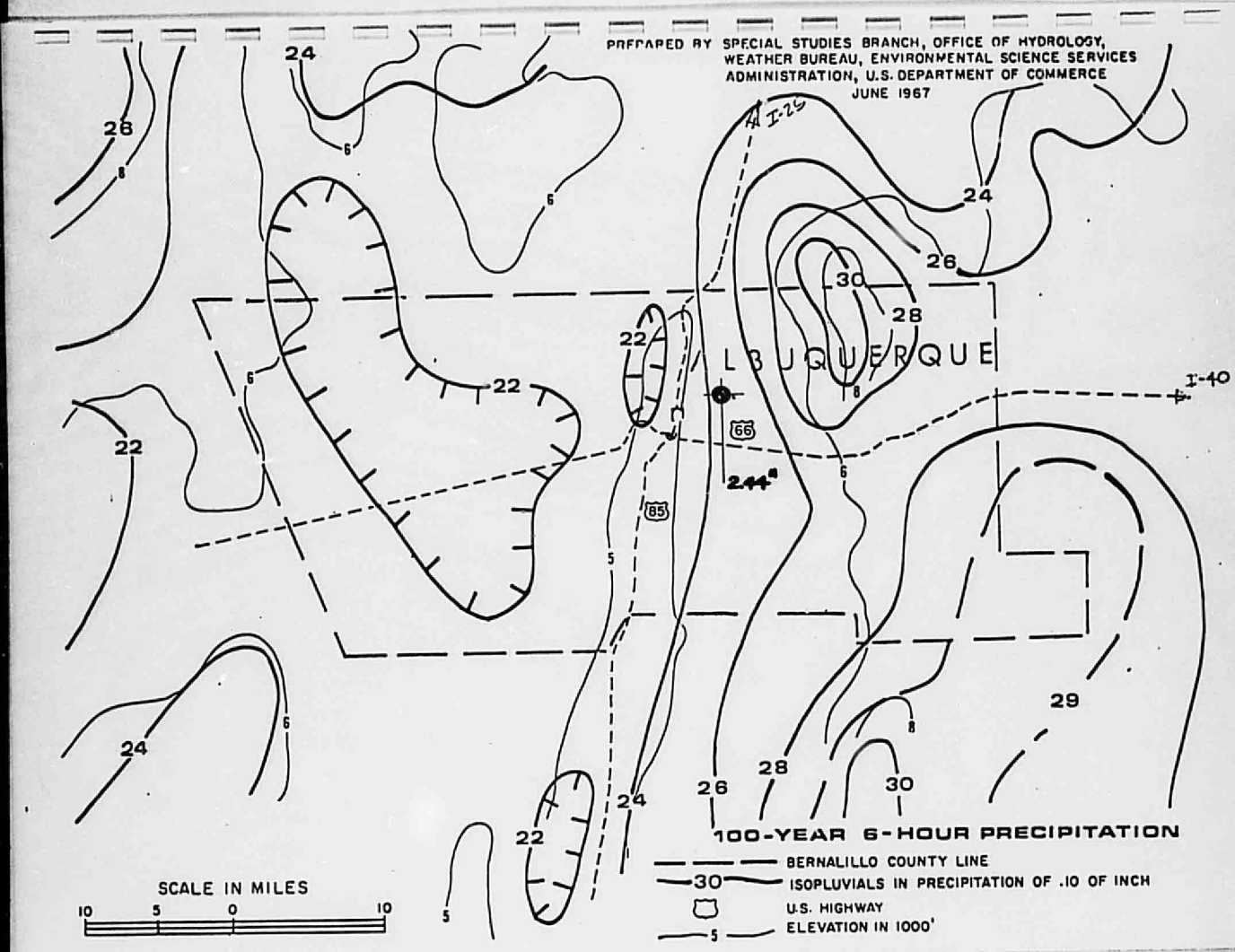

PREPARED BY SPECIAL STUDIES BRANCH, OFFICE OF HYDROLOGY,
WEATHER BUREAU, ENVIRONMENTAL SCIENCE SERVICES
ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE
JUNE 1967
ALBUQUERQUE
I-25
I-40
66
85
244"
100-YEAR 6-HOUR PRECIPITATION
BERNALILLO COUNTY LINE
ISOPLUVIALS IN PRECIPITATION OF .10 OF INCH
U.S. HIGHWAY
ELEVATION IN 1000'
SCALE IN MILES
10 5 0 10

FIGURE 25, NOAA ATLAS 2, VOL IV.
2 YR. - 24 HOUR = 1.20"

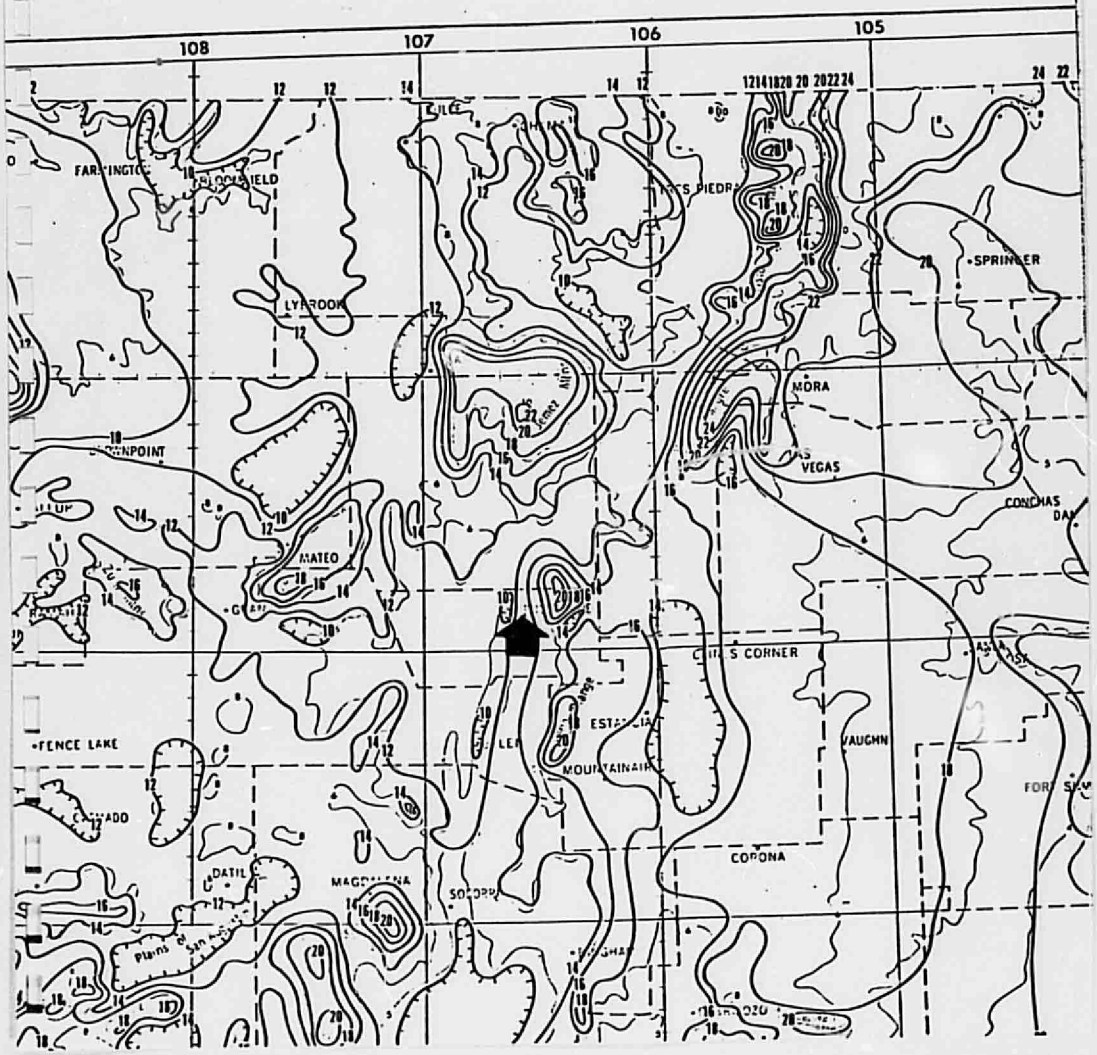


FIGURE 26, NOAA ATLAS 2, VOL. IV
5 YR. - 24 HOUR = 1.70"

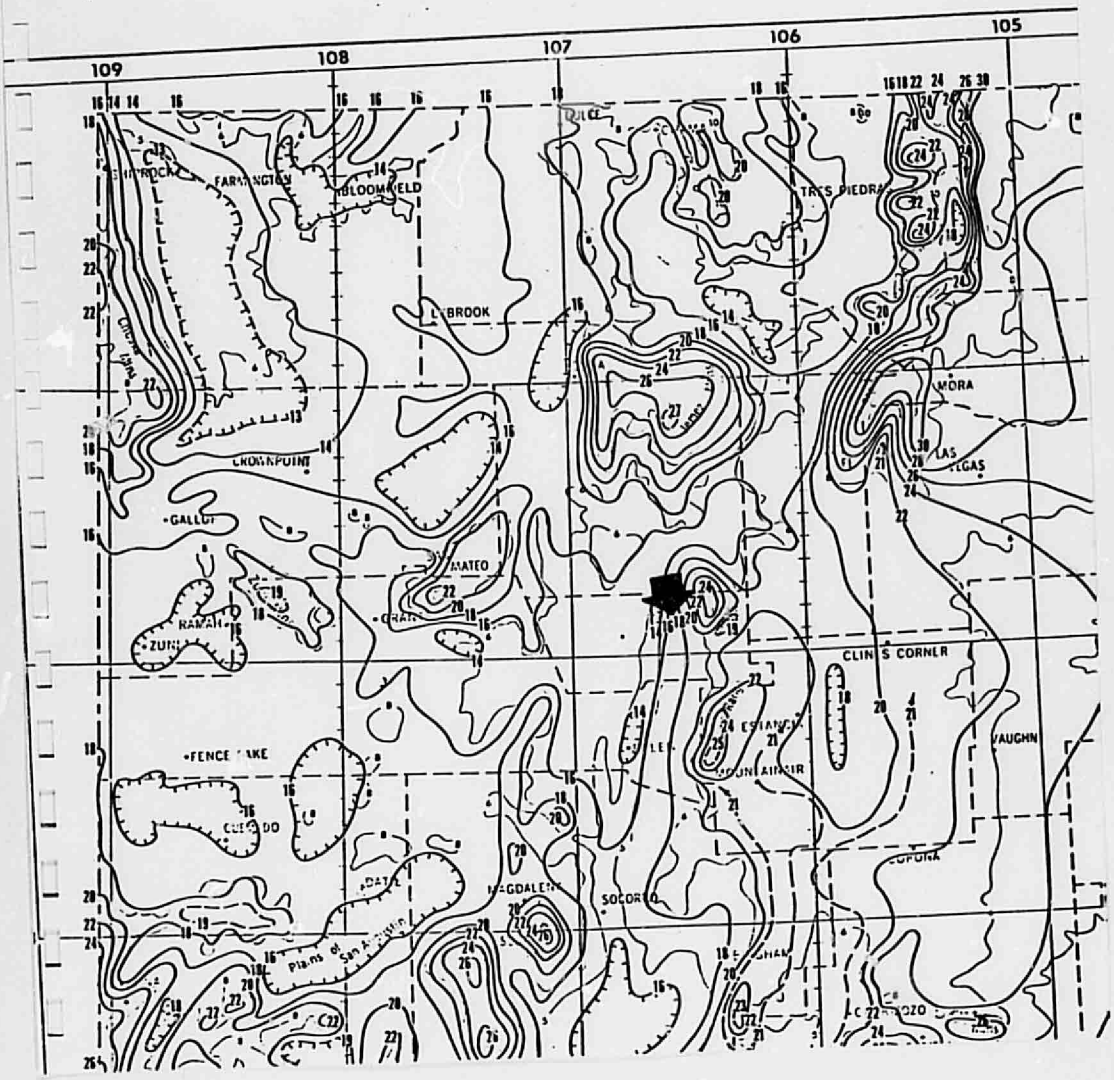
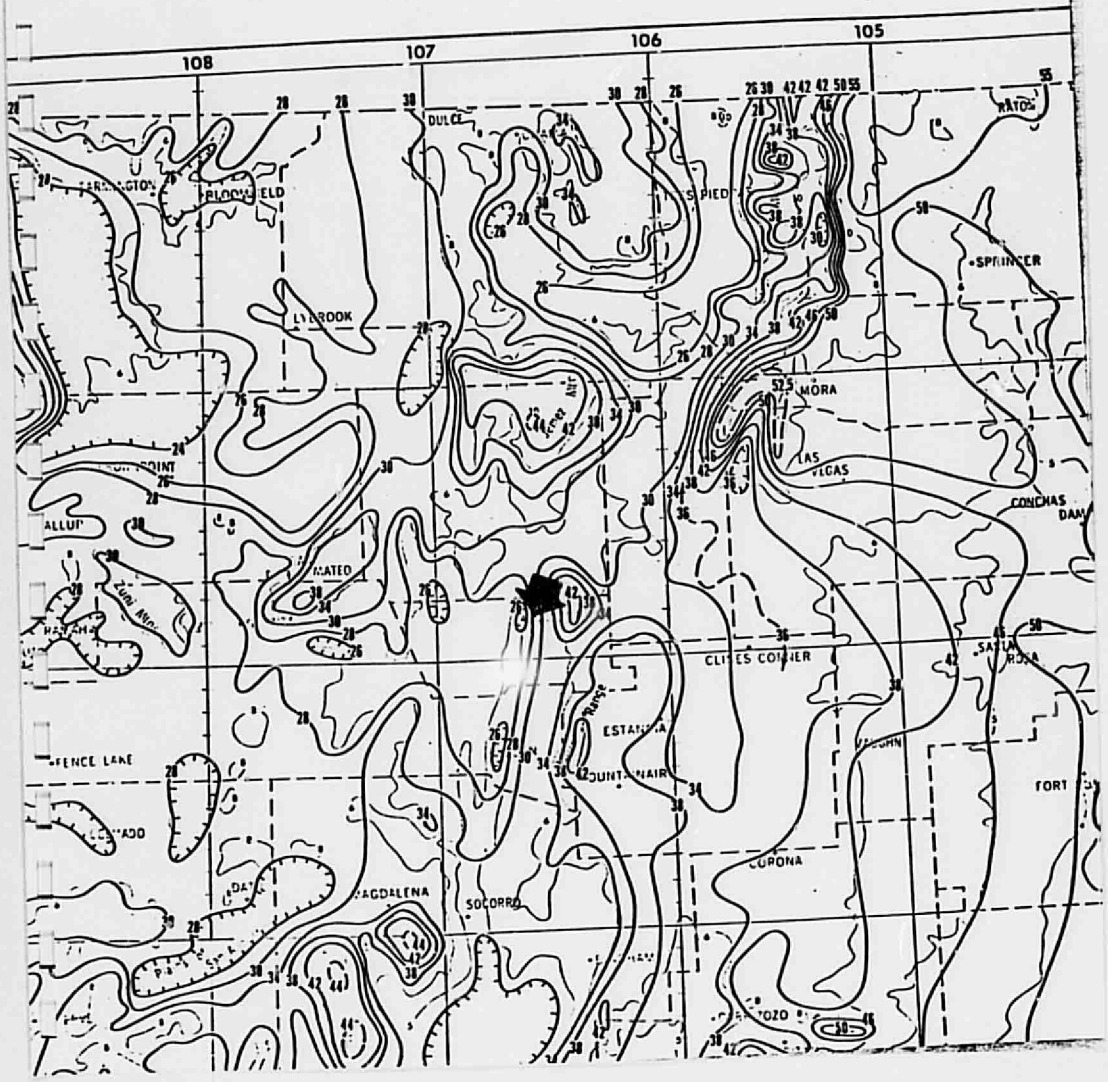


FIGURE 3D, NOAA ATLAS 2, VOL IV.
100 YR - 24 HOUR = 2.85"



APPENDIX D: DISCHARGE CALCULATION

Assuming outlet control:

(case where 30" storm sewer flowing full)

Total Head Loss HL = He + Hcmp + Hconc

where: He = entrance loss = $1.5\ V^2/2g$

Hcmp = CMP friction loss = $\left[\frac{Vn}{1.49\ R\ 2/3}\right]^2 . L.$

Hconc = Conc friction loss = $\left[\frac{Vn}{1.49\ R\ 2/3}\right]^2 . L$

V - pipe velocity (ft/sec)
g - acceleration due to gravity = 32.2 ft/sec^2
n - Mannings n-value
R - hydraulic radius = $\frac{\text{DIAMETER}}{4}$

L - pipe length = 43 conc pipe
= 32 corregated metal pipe

Available Head = 0.45 ft.

solving for discharge, Q $\approx$ 2.0 cfs

COMPUTE 1 HOUR TOTAL RAINFALL DEPTH

1 EASTERN NEW MEXICO 2 YEARS, 100 YEARS

$Y_2 = 0.218 + 0.709\,[x_1(x_2/x_1)]$

$Y_{100} = 1.897 + 0.439\,[x_3(x_4/x_3)] = 0.0182$

2 WESTERN NEW MEXICO 2 YEARS, 100 YEARS

$Y_2 = -0.011 + 0.942\,[x_1(x_2/x_1)]$

$-0.011+0.942(1.05(1.05/130))$ 0.78"

$Y_{100} = 0.494 + 0.755\,[x_3(x_4/x_3)]$

$0.494+0.755(2.44/(2.44/2.85)) =$ 2.07"

WHERE Y_2 = 2 YR 1 HOUR VALUE

Y_{100} = 100 YR 1 HOUR VALUE

x_1 = 2 YR 6 HOUR VALUE

x_2 = 2 YR 24 HOUR VALUE

x_3 = 100 YR 6 HOUR VALUE

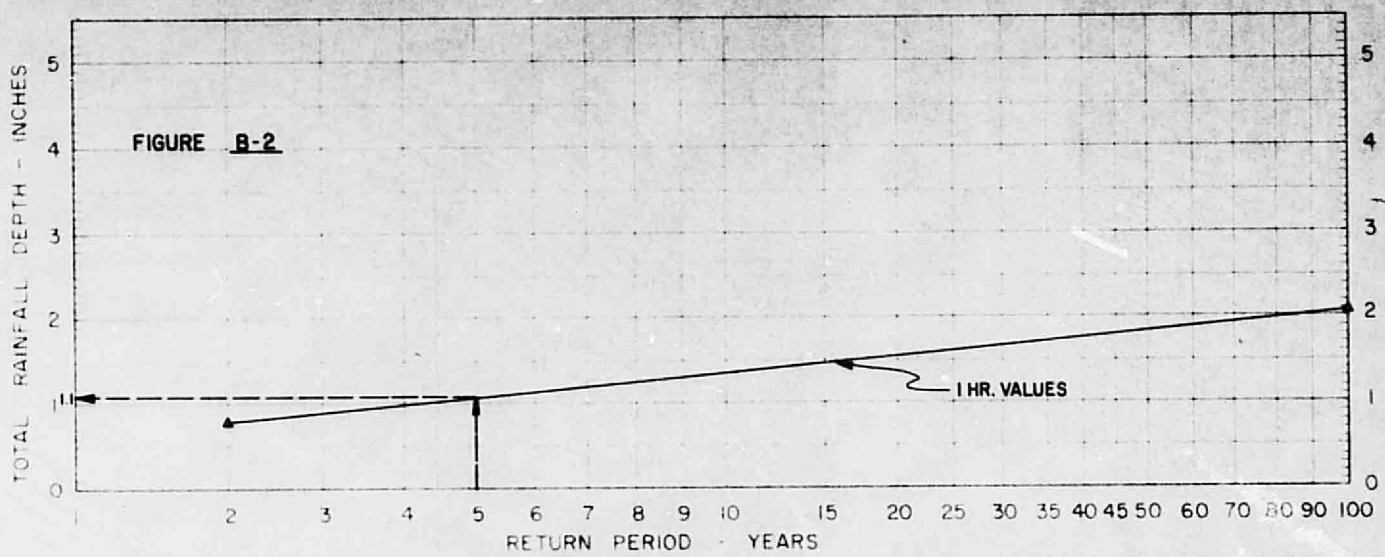
x_4 = 100 YR 24 HOUR VALUE

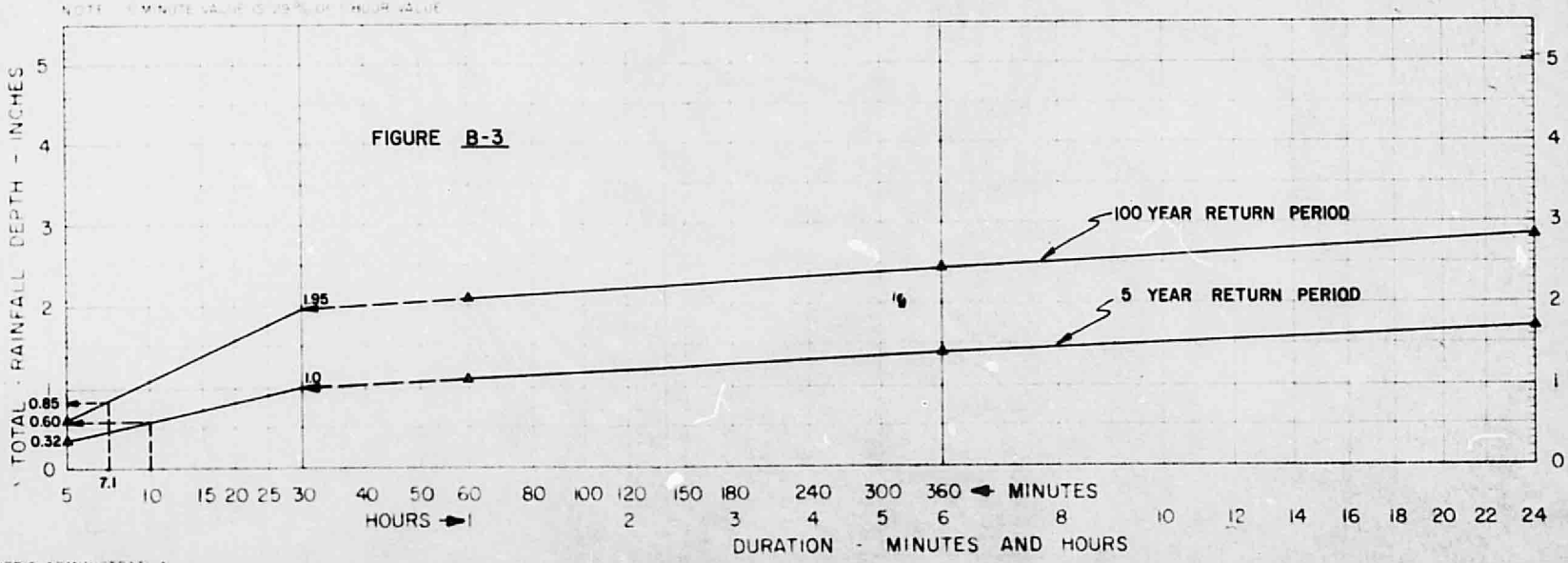
1 = ELEVATION IN HUNDREDS OF FEET

DATA TABLE B-1

YEARS	6 HOURS	24 HOURS
2	x_1 1.05	x_2 1.30
5	1.38	1.70
10		
25		
50		
100	x_3 2.44	x_4 2.85

NOTE 6 MINUTE VALUE IS 29% OF 1 HOUR VALUE





* INFORMATION AND DATA FROM US DEPT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ATLAS 2 PRECIPITATATION FREQUENCY ATLAS OF THE WESTERN UNITED STATES, VOLUME IV - NEW MEXICO, 1973

PROJECT **WESTINGHOUSE SITE DRAINAGE**

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