HYDROLOGY B14/D1 13 PLANS

B14/D1

13 Plans

BOHANNAN–HUSTON INC.

4125 Carlisle Blvd. Albuquerque, New Mexico 87107
(505) 881-2000 NE

B14-01

To: City Engineering
Hydrology Section
4th Floor City Hall

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JUL 29 1983
ENGINEERING

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- ☐ Bus
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- ☐ RR Express
- ☐ Air Freight

Attention: Fred Aguirre

Transmittal

Date: 7/29/83 Our job number: 21070
Your job number:
Job: Alameda West Shopping Center Drainage Report

We are enclosing:	For:
___ Prints	___ Your Use
___ Sepias	✓ Your Approval
___ Tracings	___ Your Records
✓ Specs	✓ Review & Comments
✓ Studies Report	___ Revisions
___ Xerox	___ Response to Your Request
___ Plan Sets	

Comments: 3 copies Alameda West Drainage Report

By: R.P. Bohannan thank you

Rec'd by: David W. Hogin Date: 7/29/83
Please return signed receipt.

BOHANNAN-HUSTON INC.

4125 Carlisle Blvd. Albuquerque, New Mexico 87107
(505) 881-2000 NE

B14-D1

To: City Engineering
4th Floor City Hall

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Attention: Fred Aguirre

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Transmittal

Date: 10/19/83 Our job number: 21074, 21075
Your job number:
Job: Alameda West Shopping Center Offsite Improvements

We are enclosing:	For:
✓ Prints (See Comments)	Your Use
Sepias	Your Approval
Tracings	✓ Your Records
Specs	Review & Comments
Studies Report	Revisions
Xerox	Response to Your Request
Plan Sets	
✓ Transmittal Letter	
(cc. of AMAFCA	
transmittal letter)	

Comments: Onsite Sheets C-1 thru C-6
Offsite Sheets 1 thru 8
Offsite AMBA Sheets 1 thru 4

By: Ron Paul Bohannan thank you

Rec'd by: Marie Romero Date: 10-19-83
Please return receipt

MIDDLE RIO GRANDE CONSERVANCY DISTRICT LICENSE

1. The Middle Rio Grande Conservancy District, with the approval of the Bureau of Reclamation, whose approval is noted heron, hereby licenses and permits the undersigned Licensee, who hereby accepts this license and agrees to be bound by its terms and conditions to construct an outlet to the Corrales Main Canal for the purpose of evacuating stormwater from the proposed detention pond located on the east side of Coors Road in the mouth of the old Calabacillas Arroyo. Stormwater shall be released to the Corrales Main Canal at a flow rate not to exceed 1 cfs.

at the west bank of the Corrales Main Canal at approximate MRGCD Station 524+42.

2. Licensee shall at its own expense, locate, construct, maintain and repair any structures or accessories permitted by this License and shall, at its own expense, bear all costs incurred by reason of the exercise of the privilege conferred by this License.

3. In the exercise of the privilege conferred by this license and the erection of any permitted structures or accessories, the following specifications and conditions must be complied with:

a. Installation shall be in accordance with attached drawing and shall be subject to inspection and acceptance by the Middle Rio Grande Conservancy District.

b. Any permitted installation must be completed within six months.

c. Two signed copies of the license must be returned to Middle Rio Grande Conservancy District

4. The Licensee shall be liable for any and all damages to the property of the Middle Rio Grande Conservancy District, United States or any third party or parties by reason of the construction, maintenance or repair of any structures or accessories authorized by this license or by the exercise of the privilege conferred by this License. In addition, the Licensee agrees to indemnify and hold harmless the Middle Rio Grande Conservancy District and/or the United States, their agents and employees from any and all claims, demands, actions, or suits of any nature which arise as a result of this License including, but not limited to those which result from the construction, maintenance, use, state of repair, presence of any structures, accessories or exercise of the privilege conferred by this license.

5. This License shall continue so long as in the opinion of the Middle Rio Grande Conservancy District, it is considered to be expedient or not detrimental to the public interest or the interest of the Middle Rio Grande Conservancy District. This license shall be revocable by the Middle Rio Grande Conservancy District for any reason upon ten days written notice to the Licensee. Upon such revocation all structures and accessories shall be removed by the Licensee without delay at the expense of the Licensee and any rights which Licensee may have under this License are revoked. Revocation shall not release Licensee from any liability or obligation, whether of indemnity or otherwise, which may have attached, accrued, or was accruing at the time of such revocation. Notice of revocation shall be sufficient if mailed to Licensee at

Alameda West Ltd.
3615 Rio Rancho Blvd., NW, Suite 203-B
Albuquerque, NM 87048

6. The privilege granted by this License shall not be exercised, nor shall any structure or accessory be constructed or maintained so as to obstruct in any manner the flow of water in the canals, laterals, ditches, or drains of the Middle Rio Grande Conservancy District or to interfere in any manner whatsoever with the construction, operation, maintenance and functions of the Middle Rio Grande Conservancy District. Removal, relocation, or protection of this installation (structure) necessitated by operation and maintenance of District works by the District shall be the responsibility of Licensee."

7. In order to allow the Middle Rio Grande Conservancy District to inspect the installation of any structures provided for in this License, the Licensee shall contact John Black, Managing Partner, Alameda West Ltd. or Mike Emery, Bohannan–Huston, Inc. at the time construction is begun.

8. The Licensee hereby releases the Middle Rio Grande Conservancy District and the United States, their agents and employees from any and all claims for damage to property, personal injury, or death that may arise as a result of the location, erection, maintenance, repair, use, or presence of the structures or accessories provided for herein or as a result of the exercise of the privilege conferred by this license.

9. If, at any time, the Licensee shall in the judgment of the Middle Rio Grande Conservancy District, fail to properly perform any of its obligations or covenants under this agreement, the Middle Rio Grande Conservancy District may, at its option, perform or have performed such work as it deems necessary for the safe operation of the works of the Middle Rio Grande Conservancy District or to protect the property of the Middle Rio Grande Conservancy District, the United States, any third party, or the public, in such event, licensee agrees to pay the cost incurred plus the cost of supervision and handling within thirty (30) days after a bill is rendered. The failure of the Middle Rio Grande Conservancy District to elect to perform the obligations of the Licensee shall not release the Licensee from liability for any loss or damage occasioned thereby. By giving the Middle Rio Grande Conservancy District the right to perform any of the obligations or covenants of Licensee under this License, it is not the intent of the parties to confer any rights on the Licensee or any third party or to create any additional liability on the Middle Rio Grande Conservancy District.

LICENSE VOID IF 2 COPIES NOT RETURNED TO MIDDLE RIO GRANDE CONSERVANCY DISTRICT

10. If the Middle Rio Grande Conservancy District is required to bring suit in any court for the purposes of enforcing this agreement or any provisions or portions thereof, the Licensee shall be liable for all costs incurred and for reasonable attorney's fees.

11. The Licensee upon completion of the work, shall advise the Middle Rio Grande Conservancy District and the license issued to him shall be signed and approved by the District signifying final construction approved.

MIDDLE RIO GRANDE CONSERVANCY DISTRICT

BY: _____
General Manager

DATE: _____

BY: _____
Licensee

DATE: _____

APPROVED:

BUREAU OF RECLAMATION

BY: _____

DATE: _____

FINAL CONSTRUCTION APPROVED:

BY: _____

DATE: _____

BOHANNAN-HUSTON INC.
4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 (505) 881-2000
6713 VISCOUNT BLVD., EL PASO, TEXAS 79925 (915) 778-4491
330 GARFIELD SANTA FE, NEW MEXICO 87501 (505) 988-7671

July 29, 1983

Mr. Subhas R. Shah
Middle Rio Grande Conservancy District
P.O. Box 581
Albuquerque, NM 87103

Re: Drainage Report for Alameda West Shopping Center
MRGCD License to Construct Stormwater Outlet to the Corrales Main Canal

Dear Mr. Shah:

The purpose of this letter is to transmit the enclosed Drainage Report for the Alameda West Shopping Center and to request MRGCD and BUREC approval of the attached license. Copies of the report have been submitted for City of Albuquerque and AMAFCA review.

The concepts presented in the report are essentially the same as those discussed in our meeting on July 7, 1983. The proposed improvements offer the Conservancy District several benefits as described in the report. Perhaps the most important benefit is the immediate stormwater protection afforded the Corrales Main Canal from upland basins outlined in the report. Flow from these basins is cut from approximately 78 cfs to 1 cfs. The reduction will help protect the canal from breaching and will also lessen maintenance requirements for sediment removal.

If you should have any questions or comments concerning the Drainage Report or the request for approval of the MRGCD License, please contact me or Ron Paul Bohannan of this office.

Sincerely,

Michial M. Emery, P.E.
Vice President

Enclosures

cc: Mr. Fred Aguirre ✓
Mr. Richard E. Leonard
Mr. John Black
Mr. Andrew Bol

RPB/sim
Job No. 21070

PRINCIPALS
JERRY R. BOHANNAN, P.E. & L.S.
LARRY W. HUSTON
DONALD T. CREMANS, P.E.
C. J. ISKIPI MEAD, P.E.
MICHIAL M. EMERY, P.E.

ASSOCIATES
ANDRES ARAGON VIAMONTE, P.E.
JACK EICHORN
ROBERT H. GREENLEE, P.E.
G. LEE TRUSSELL
ISAAC J. PINO, P.E.
RAMON LARA, P.E.
DARRELL L. WADE, P.E.
PATRICK L. STIEHR, P.E.
DAVID M.Y. MILLIKAN, P.E.

BOHANNAN-HUSTON INC.
ENGINEERS PLANNERS PHOTOGRAMMETRISTS
4125 CARLISLE BLVD., N. E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
6713 VISCOUNT BLVD., EL PASO, TEXAS 79925 915 778-4491
330 GARFIELD, SANTA FE, NEW MEXICO 87501 505 988-7671

July 29, 1983

Mr. Fred Aguirre
Civil Engineer – Hydrology
Civil Engineer's Office
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RECEIVED
JUL 29 1983
ENGINEERING

Re: Drainage Report for Alameda West Shopping Center

Dear Mr. Aguirre:

The purpose of this letter is to submit the enclosed Drainage Report for Alameda West Shopping Center for your review and approval. By copy of this letter, the report is also being submitted for review and approval by Rich Leonard, Executive Engineer AMAFCA.

The concepts presented in the report are essentially the same as those discussed in our meeting at AMAFCA on July 6, 1983. It is important to note the extremely low discharge proposed for the temporary detention pond east of Coors Road. A maximum controlled discharge rate of 1 cfs is presented in an attempt to minimize the impact on the Corrales Main Canal and to gain MRGCD approval of the Drainage Plan. Given the 100-year volume of 4.63 ac. ft., the temporary detention pond east of Coors Road will require approximately 56 hours to drain. An additional 40 hours will then be required to pass the 3.30 ac. ft. volume ponded west of Coors Road through the east pond. We realize the time required to drain the ponds exceeds the 24 hour requirement established in Section 6F. of the City of Albuquerque Drainage Ordinance. We request that you allow a variance from the 24 hour requirement to accomodate the development in this delicate matter.

If you should have any questions or comments concerning the Drainage Report or the request for variance, please contact me or Ron Paul Bohannan of this office.

Sincerely,

Michial M. Emery

Michial M. Emery, P.E.
Vice President

Enclosures: 3 Copies of Drainage Report

cc: Mr. Richard E. Leonard w/2 copies of Drainage Report
Mr. John Black
Mr. Andrew Bol
Mr. Subhas R. Shah

RPB/blm
Job No. 21070

PRINCIPALS
JERRY R. BOHANNAN, P. E. & L. S.
LARRY W. HUSTON
DONALD T. CREMANS, P. E.
C.J. (SKIP) MEAD, P. E.
MICHIAL M. EMERY, P. E.

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DAVID M.Y. MILLIKAN, P. E.

BOHANNAN-HUSTON INC.
4125 Carlisle Blvd. N.E. Albuquerque, N.M. 87107
(505) 881-2000

TELEPHONE CONFERENCE NOTES

JOB No. 21070

PROJECT TITLE: Alameda West Shopping Center

RECEIVED SEP 27 1983 CITY ENGINEER

DATE: 9/21/83 TIME: 3:30 pm

CONVERSATION: Mr. Shah OF MRGCD

AND: Ron Paul Bohannan OF Bohannan-Huston Inc.

SUBJECT: MRGCD and Bureau of Reclamation Review of License Request to Discharge Runoff Water into the Corrales Main Canal.

CONTENT:

Mr. Shah returned my call from this morning. I asked Mr. Shah if action had been taken on the review of the request for a MRGCD License to discharge 1 cfs of Alameda West runoff directly to the Corrales Main Canal. Mr. Shah explained that the request had been reviewed and that the MRGCD has decided not to grant any license applications for discharge into the ditch until problems at Oxbow downstream are corrected. A study of the problem is expected to be complete in 3 to 4 months. Mr. Shah asked about the construction schedule for Alameda West and proposed drainage improvements. I explained that site grading was expected to begin within 3 weeks, that the proposed drainage improvements would be complete in 3 to 4 months. Mr. Shah asked what would be done with runoff water. I explained that runoff from the proposed improvements would be discharged to flow overland to the Corrales Main Canal, as existing drainage does, but that the flow rate would be cut from 76 cfs to 1 cfs as outlined in the drainage report. Mr. Shah had no immediate response.

June 1980

BOHANNAN-HUSTON INC.
4125 Carlisle Blvd. N.E. Albuquerque, N.M. 87107
(505) 881-2000

TELEPHONE CONFERENCE NOTES

JOB No. 21070

PROJECT TITLE: Alameda West Shopping Center

DATE: 9/21/83 TIME: 3:30 pm

CONVERSATION
Mr. Shah OF MRGCD
AND Ron Paul Bohannan OF Bohannan-Huston, Inc.

SUBJECT: Cont. from page 1 of 2

CONTENT: I requested that Mr. Shah contact Bohannan-Huston in the event that any future meetings or reviews are scheduled to discuss the Alameda West MRGCD License request. I explained to Mr. Shah that we would like to work cooperatively to resolve this matter.

Ronald P. Bohannan

cc: Mr. Subhas R. Shah, MRGCD
John Black, Los Colinas
Dan Sabo, AMAFCA
Fred Aguire, City of Albq.

June 1980

BOHANNAN-HUSTON INC.

4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
6773 VISCOUNT BLVD., EL PASO, TEXAS 79925 915 778-4491
330 GARFIELD, SANTA FE, NEW MEXICO 87501 505 988-7871

October 19, 1983

Mr. Dan Sabo
Albuquerque Metropolitan Arroyo
Flood Control Authority
2600 Prospect Ave., N.E.
Albuquerque, NM 87125

Re: Alameda West Shopping Center

Dear Dan:

The purpose of this letter is to transmit the attached working drawings for Alameda West Shopping Center. The following are transmitted:

Alameda West Plat (2 sheets)
Alameda West Sitework Drawings Sheets C-1 thru C-6
Alameda West Offsite A.H.B.A. Improvements Sheets 1 thru 4
Alameda West Offsite Imrpovements Sheets 1 thru 8

Onsite work is described in sheets C-1 thru C-6, which were included in the Alameda West Shopping Center project main plan set. Offsite improvements have been broken into two plan sets, primarily for review purposes. Work within the City of Albuquerque right-of-way (Coors Road R/W and State Highway 528 R/W) is described in the Alameda West Shopping Center Offsite A.H.B.A. Improvements plan set. Work outside City of Albuquerque right-of-way is detailed in the Alameda West Shopping Center Offsite Improvements plan set. All three plan sets will be submitted to the Highway Department for NMSHD review along with the utility permit application. The two offsite plan sets will be submitted to the Bernalillo County Building Inspection Department for their review. The Offsite A.H.B.A. Improvements plan set will be submitted for review by the City of Albuquerque.

Please note that we have deleted the fence around the onsite detention pond shown on sheet C-3. The fence was deleted due to the mild 5:1 sideslopes now detailed for the pond, and to enhance the landscaping proposed for this area. If deletion of the fence is not acceptable to AMAFCA, please advise.

RECEIVED
OCT 19 1983
ENGINEERING

PRINCIPALS
JERRY R. BOHANNAN, P.E. & L.S.
LARRY W. HUSTON
MICHIAL M. EMERY, P.E.

If you should have any questions or comments regarding the project, please contact Ron Paul Bohannan of this office.

Sincerely,

Michial M. Emery, P.E.
Vice President

Enclosures

cc: Fred Aguirre, City of Albuquerque w/Enclosures
John Black, Las Colinas Realty & Development w/Enclosures

RPB/cas
Job No. 21074

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

November 16, 1983

Mr. Dan Sabo
AMAFCA
2600 Prospect Avenue NE
Albuquerque, NM 87125

REF: ALAMEDA WEST SHOPPING CENTER (B14-D1)

Dear Mr. Sabo:

I have reviewed the above referenced drainage plan and forward the following comments:

1. Conceptually, I have no adverse comments regarding this plan.

2. In order to become a workable plan, I have some concerns that need to be addressed or clarified.

   a. The City ordinance does not allow ponding over 18 inches without fencing for safety reasons. Would this be a viable requirement for the County?

   b. What will be the impact of ponding adjacent to Coors Road? The report states that Basins J, K and L will not be drained.

   c. The plan indicates that water will exceed the capacity of the street between Basins G and I and spreads into Basin G. Will this remain the case when Basin G is developed?

   d. Since the site is accepting flows from off-site from the west and southwest, how will they be handled? Will there be any provisions for controlling erosion?

MUNICIPAL DEVELOPMENT DEPARTMENT

C. Dwayne Sheppard, P.E., City Engineer ENGINEERING DIVISION Telephone (505) 766-7467

AN EQUAL OPPORTUNITY EMPLOYER

If I can be of further assistance, please do not hesitate to contact me at 766-7644.

Sincerely,

Billy J. Goolsby

Billy J. Goolsby, PE
Civil Engineer/Hydrology

BJG:mrk

cc: Michial Emery, Bohannan-Huston, Inc.

RICHARD E. LEONARD
EXECUTIVE ENGINEER

B. H. SWINBURNE, CHAIRMAN
WILLIAM V. HEREFORD, VICE-CHAIRMAN
FRANCES McCOY, SECRETARY-TREASURER
R. WARD HUNNICUTT, DIRECTOR
KLESTON LAWS, DIRECTOR

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority

2600 PROSPECT AVE., N.E.
P. O. BOX 25851 - ALBUQUERQUE, N. M. 87125
TELEPHONE 884-2215

RECEIVED
DEC 21 1983
CITY ENGINEER

B14-D1

December 19, 1983

Mr. Ronald P. Bohannan
Bohannan-Huston, Inc.
4125 Carlisle, NE
Albuquerque, NM 87107

SUBJECT: Alameda West Shopping Center
Drainage Report

Dear Ron:

I have reviewed the drainage report and the licenses from the State Highway Department and have the following comments:

1. The City hydrologist's comments should be addressed.

2. On page 5 the west pond requires manual operation of a valve. Please advise who will be responsible for the operation.

3. Is this tract included in the recent annexation by the City?

During our phone conversation of December 15, you advised that you would reply directly to Mr. Goolsby on item 5.

Your report is approved subject to reply to items 2 and 3 of this letter.

Sincerely,

Dan Sabo

Dan Sabo
Drainage Engineer

ic
cc: Billy J. Goolsby, City Hydrology
Clyde Vigil - w/attachment

1314-D1

FILE COPY

BOARD OF COUNTY COMMISSIONERS
LENTON MALRY, CHAIRMAN
DISTRICT 3
ORLANDO VIGIL, MEMBER
DISTRICT 2
PATRICK J. PADILLA, MEMBER
DISTRICT 1
MARION M. COTTRELL, MEMBER
DISTRICT 5
WRAY L. SIMMONS, MEMBER
DISTRICT 4
ALEX ABEYTA, JR., COUNTY MANAGER

County of Bernalillo

State of New Mexico

620 LOMAS, N.W.
ALBUQUERQUE, NEW MEXICO 87102

BOB V. STOVER, SHERIFF
JAMES B. LEWIS, TREASURER
DOLORES C. WALLER, COUNTY CLERK
EDWARD M. MURPHY, ASSESSOR
GERARD W. THOMSON,
PROBATE JUDGE

January 10, 1984

TO: Mr. Clyde Vigil, Assistant Building Official

FROM: Billy J. Goolsby, City/County Flood Plain Administrator

SUBJECT: ALAMEDA WEST SHOPPING CENTER DRAINAGE REPORT

I have reviewed the drainage plan for the above referenced site and forward my comments to Mr. Dan Sabo of AMAFCA since the site is within AMAFCA's and the City's jurisdiction because the site is involving both City and County Development. As representative for both the City and County as Flood Ordinance Administrator, these plans were forward to me by Bohannan-Huston, Inc. for review with regard to drainage requirements and approval.

The fact that Mr. Sabo referred to me as a City Hydrologist is due to the fact that I have more dealings with him on a City basis and that this particular project involves City jurisdiction due to the proposed storm sewer on Coors Boulevard. If there is a problem associated with my title in any area, it can be established for all to know as City/County Flood Ordinance Administrator such that there will no longer be problems associated with correspondence.

BJG:mrk

Response to Initial Design Review Comments
Project 1970

Alameda West Shopping Center
Off Site AHBA Improvements

January 16, 1984

- **Response to Comments from Dave Harmon, Traffic Engineering, 11/18/83**

  1. General Note 5 has been added to require the contractor to submit a traffic control plan and receive a barricade permit prior to roadway construction.

  2. Curb return radii, tangent lengths and transition lengths for all right turn lanes were previously discussed and approved by Mr. Bob Fosnaugh in preliminary design.

- **No Comments from Survey Section per Response 10/23/83**

- **No Comments from Water Resources Department per Bill Zimmerman Response 10/31/83**

- **Response to Comments from Fred Aguirre, Hydrology Department, 11/16/83**

  1. The New Mexico State Highway Department has reviewed the plan set and has granted a permit to construct the proposed facilities.

- **Response to Comments from Billy Goolsby, Hydrology Department (comments made in letter dated 11/16/83 to Dan Sabo of AMAFCA)**

  2a. The pond fence was considered but eliminated. The mild (5:1) pond side slopes do not present a hazard and the pond fence would detract from the park-like appearance of the pond area.

  2b. As indicated in the approved Drainage Report, ponding is expected west of Coors Road at the northeast corner of the Alameda West Site. Ponding in this area is an existing condition which will be decreased by the proposed improvements. Under existing conditions, a runoff volume of 0.60 ac. ft. is accumulated during the 100-year storm. Under proposed development conditions, the volume will be reduced to approximately 0.49 ac. ft. Ponding in this area will continue to be of relatively short duration due to the high permeability associated with the soil. Ponding in this area has had little or no impact in the past and is not expected to present a problem in the future.

2c. The water carried in the street along the east side of Basin G originates in Basin G. If the peak flow rate is generated, runoff will overflow the west curb and spill over into adjacent parking areas to the west. This condition will remain upon complete development of Basin G.

2d. Two off site desilting basins are proposed to intercept off site flows. Off site areas will also be contour graded to minimize erosion.

- **Comments written on project plan sheets were answered on project plan sheets.**

End of Response to Comments

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JAN 27 1984
HYDROLOGY SECTION

ENGINEERS PLANNERS PHOTOGRAMMETRISTS

BOHANNAN-HUSTON INC.

4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 (505) 881-2000
6713 VISCOUNT BLVD., EL PASO, TEXAS 79925 (915) 778-4491
330 GARFIELD SANTA FE, NEW MEXICO 87501 (505) 988-7671

January 26, 1984

Mr. Dan Sabo
AMAFCA
2600 Prospect Avenue, NE
Albuquerque, NM 87107

Re: Alameda West Shopping Center – Off Site AHBA Improvements

Dear Dan:

We are currently submitting Final Design Plans and Response to Initial Review Comments for the referenced project to the City of Albuquerque. Copies of the plans and responses are enclosed for your review and records.

In response to comments in your letter of December 19, 1983, we offer the following:

1. We have addressed comments made by Billy J. Goolsby, Civil Engineer/Hydrology, City of Albuquerque, in our Response to Comments (enclosed).

2. Alameda West, Ltd. will be responsible for manual operation of the canal gate on the drain line of the west off site pond.

3. An area of approximately 130 acres on the west side of Coors Road has been recommended for annexation, but final annexation is not anticipated in the near future. The area would include the west off site pond but would not include the Alameda West site or the east off site pond.

If you should have any additional comments or questions regarding the project, please contact Ron Paul Bohannan of this office.

Sincerely yours,

Michial M. Emery

Michial M. Emery, P.E.
Vice President

Enclosures

cc: Mr. Billy J. Goolsby
Mr. John Black

RPB/mw
Job No. 2 107 4

RECEIVED
JAN 27 1984
HYDROLOGY SECTION

PRINCIPALS
JERRY R. BOHANNAN, P.E. & L.S.
LARRY W. HUSTON
MICHIAL M. EMERY, P.E.

BOHANNAN-HUSTON INC.

4125 Carlisle Blvd. Albuquerque, New Mexico 87107
(505) 881-2000 NE

To: City Hydrology
4TH Floor City Hall

Attention: Billy Goolsby

- [ ] Parcel Post
- [ ] First Class
- [ ] Air Mail
- [ ] Special Delivery
- [ ] Bus
- [x] Messenger
- [ ] UPS
- [ ] RR Express
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Transmittal

Date: 1/27/84 Our job number: 21074
Your job number: 21075

Job: Alameda West Shopping Center
Offsite AHBA Improvements

We are enclosing:	For:
___ Prints	___ Your Use
___ Sepias	___ Your Approval
___ Tracings	✓ Your Records
___ Specs	___ Review & Comments
___ Studies Report	___ Revisions
___ Xerox	✓ Response to Your Request
___ Plan Sets	
✓ CC Don Sabo Letter	
___ dated 1/26/84	
✓ Response to Comments	

RECEIVED JAN 27 1984 HYDROLOGY SECTION

Comments:

By: thank you

Rec'd by: Cynthia Underwood Date: 1/27/84

BOHANNAN-HUSTON

DRAINAGE REPORT FOR ALAMEDA WEST SHOPPING CENTER

JULY, 1985

ENGINEERING INC.

RECEIVED
JUL 29 1986

DRAINAGE REPORT
FOR
ALAMEDA WEST SHOPPING CENTER

JULY, 1983

PREPARED FOR

SEVEN BAR LAND AND CATTLE COMPANY
3615 RIO RANCHO BOULEVARD, N.W.
SUITE 203B
ALBUQUERQUE, NEW MEXICO 87048

PREPARED BY

BOHANNAN–HUSTON, INC.
4125 CARLISLE BOULEVARD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
505/881-2000

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

MICHIAL M. EMERY, P.E.
N.M.P.E. NO. 5194

DRAINAGE REPORT
FOR
ALAMEDA WEST SHOPPING CENTER

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2. Existing D[illegible]age
3. Interim Drainage Improvements
4. Developed Drainage and Grading Plan

PURPOSE AND SCOPE

The purpose of this Drainage Report is to present the existing drainage and the proposed developed drainage characteristics of the Alameda West Shopping Center Site. The report has been prepared in conformance with the guidelines of the City of Albuquerque Development Process Manual (DPM), Chapter 22, entitled "Drainage and Flood Control".

A few of the drainage concepts and assumptions presented in this report differ significantly from concepts previously approved in the Drainage Master Plan for the Seven Bar Ranch Development. After a brief description of the Alameda West Shopping Center Site and drainage history of the area, these new concepts and assumptions will be delineated in the Conceptual Regional Drainage Plan section of this report. Existing drainage and proposed interim drainage improvements will then be presented and followed by a description of developed on-site drainage. Finally, the drainage benefits associated with the development of the Alameda West Site will be discussed in the report summary.

SITE LOCATION AND DESCRIPTION

The Alameda West Shopping Center will occupy a 21.43 acre site located on the west side of Coors Road approximately ½ mile south of State Road 528. The site is bounded on the east by Coors Road, on the south by the proposed Seven Bar Loop Road, and by undeveloped land on the north and west (see Vicinity Map, Figure 1).

The site was zoned C-1 by the Bernalillo County Commission and will be developed as an initial step in the development of the Seven Bar Ranch Property. The Sector Development Plan for the Seven Bar Ranch was prepared by Bohannan—Huston, Inc. and approved in December, 1982.

The Alameda West site slopes generally from west to east. Existing ground slopes vary from 0.5% to 4.0%. Some natural ponding occurs on-site, especially at the northeast corner of the parcel, which is lower than the adjacent Coors Road.

On-site soils and soils throughout the areas analyzed in this report consist of Bluepoint loamy fine sand, 1 to 9 percent slopes (BCC), as indicated by Sheet 10 of the Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, N.M., prepared by the Soil Conservation Service (see Figure 2). In accordance with the Soil Survey, these soils were assumed to have a hydrologic soil group classification of "A".

Vegetation in the area consists of native grasses, cacti, sagebrush and desert annuals. The site and surrounding areas were classified as range land in fair condition for undeveloped drainage analysis purposes.

METHOD OF ANALYSIS

The peak flow rates for the developed and undeveloped basins were determined by application of the Rational Method. The total runoff volumes were calculated by the SCS Composite Runoff Curve Number Method or by the Rational Formula, depending on which method was deemed more applicable for the basins being considered. The specific details of runoff and volume determinations are noted by reference in the computation tables.

It is important to note that a hydrologic soils group classification of "A" was used in flow rate and runoff computations in this report in contrast to the more conservative group "B" classification used in the Drainage Master Plan. The group "B" classification is appropriate for the general analysis of the entire area presented in the Master Plan. The group "A" classification is appropriate for the detailed analysis of the specific areas addressed by this report.

Flow depths and velocities in parking areas and swales were computed using a Manning's "n" of 0.017. All storm drains were sized for gravity flow conditions.

DRAINAGE HISTORY

The accepted Drainage Master Plan for the area was approved as part of the Seven Bar Ranch Sector Development Plan. The Master Plan made several proposals for drainage management for the area, all of which can be classified into three catagories, as outlined below.

1. Convey drainage to the proposed Cabezon Channel.
2. Convey drainage to the Calabacillas Arroyo.
3. Retain runoff on-site or establish detention ponding with controlled discharge to the Corrales Main Canal.

The Drainage Master Plan also recommended that detailed drainage reports be prepared for each parcel as each parcel is developed.

Since the time of the Master Plan, two details have been acknowledged which are likely to alter and clarify drainage management in the area. First, the by-pass road through the Seven Bar Ranch Development has been more precisely located to the west as shown on Plate 1. This revision was made so that development within the area

could better accomodate the possibility of an additional Rio Grande river crossing at El Pueblo. This relocated alignment will redefine drainage basin boundaries adjacent to the Calabacillos Arroyo as shown on Plate 1. Second, permanent runoff retention facilities within prime property along Coors Road are now recognized as undesirable. In order to eliminate retention ponding, it is recommended that the option of improving the Corrales Main Canal to carry control discharge storm runoff be pursued.

CONCEPTUAL REGIONAL DRAINAGE PLAN

For the reasons outlined in the Drainage History portion of this report, a conceptual Regional Drainage Plan to serve as an extension of the Drainage Master Plan has been developed. The main thrust of the conceptual plan is to provide a means for draining areas west of the Corrales Main Canal which will not drain to the proposed Cabezon Channel or to the Calabacillas Arroyo west of Coors Road.

In brief, the plan involves the improvement of the Corrales Main Canal to function as a storm drainage channel as well as an irrigation canal. With moderate improvement, the canal can be upgraded to convey controlled discharge runoff in the amount of 0.8 cfs per acre from contributing basins, as shown on Plate 1, in addition to the maximum 40 cfs irrigation flow anticipated in the canal. A pump station, similar in concept to those existing along the AMAFCA North Division Channel, is proposed at the point where the Corrales Main Canal crosses under the Calabacillas Arroyo. The purpose of the pump station is to lift and discharge the drainage runoff portion of the flow over the levy to the Rio Grande or into the Calabacillas Arroyo, while allowing the 40 cfs irrigation flow to pass downstream throught the existing siphon. To provide sufficient ponded volume for prolonged pumping, it will be desirable to allow the runoff flow in the canal to spill into the Corrales Riverside Drain. This spill-over proposal has the added attraction of possibly allowing the MRGCD to use the pump station as a facility that will alleviate existing problems downstream of the Calabacillas.

Improvement of the Corrales Riverside Drain south of the Calabacillas Arroyo, and the construction of a new outfall to the Rio Grande are currently being considered by AMAFCA to better manage storm drainage in that area. These improvements may provide an alternative to the Calabacillas pump station if a culvert is built to convey Riverside Drain flow beneath the Calabacillas to the improved channel to the south. Pursuit of this option would require extensive planning and coordination between developing areas north and south of the Calabacillas and may delay development in both areas.

With additional analysis, the design of a workable system can be detailed. The allowable controlled discharge rate of 0.8 cfs per acre is a reasonable discharge approximately equal to the undeveloped flow rate per acre for the area, as presented in Table1. A typical channel section to convey a maximum peak flow of 300 cfs is presented in Figure 4. This section is adequate for the low velocities anticipated in the channel. The total current construction costs for improvement of 7600 LF of the Corrales Main Canal and the construction of the pump station is roughly estimated at $1,300,000.00.

It is not anticipated that the high cost of these improvements could be financed by any single development. Construction would probably occur in stages as the demand for incremental portions of the system increases.

EXISTING DRAINAGE CONDITIONS

Existing drainage basins which impact the development of the Alameda West Site were defined as shown on Plate 2. Peak runoff flow rates and volumes generated by these basins are presented in Table 3.

A combined runoff flow rate of 78 cfs from Basins 1 and 2 is currently passed under Coors Road by the existing 60" Dia RCP culvert at the old Calabacillos Arroyo crossing. A small portion of the Basin 4 runoff (approximately 3 cfs) is passed under Coors Road by the existing 24" Dia RCP culvert near the Gas Company Border Station. These flows continue overland to the east and eventually enter the Corrales Main Canal. The remaining runoff from Basin 4 ponds along the west side of Coors Road in the low point at the northeast corner of the proposed Alameda West Site. Runoff from Basin 3 and areas to the north flows away from the Alameda West Site toward the north and east.

INTERIM DRAINAGE IMPROVEMENTS

The magnitude of the Alameda West Shopping Center Development is not sufficient to finance improvement of the Corrales Main Canal or the pump station outlined in the Conceptual Regional Drainage Plan portion of this report. However, several interim drainage improvements are proposed which will allow development of Alameda West in accordance with the goals of the Conceptual Plan. In addition, these interim improvements offer immediate storm protection for the Corrales Main Canal and areas to the east. Interim improvements are shown on Plate 3 and described as follows:

- Limit controlled discharge from the Alameda West Shopping Center to 0.8 cfs per acre.

- Utilize the existing 24" Dia RCP culvert to convey developed site controlled discharge to the east side of Coors Road.
- Construct a 27" Dia RCP storm drain line from the 24" culvert south along the east side of Coors Road to the proposed detention pond in the mouth of the old Calabacillas Arroyo.
- Construct approx 4.63 ac. ft. detention pond on east side of Coors Road to accept discharge from basins 4A, 4M, 4H and 4O in addition to the controlled discharge from the Alameda West Site. Provide 8" Dia DIP drain line to discharge the detention pond to the Corrales Main Canal at a maximum rate of 1.0 cfs.
- Improve drainage ditch along west side of Coors Road to conduct runoff from basins 4A and 4M to the existing, 60" Dia RCP culvert, across Coors Road to the 4.63 ac. ft. detention pond described above.
- Construct an approximate 3.30 ac. ft. retention pond on the west side of Coors Road to intercept drainage from Basins 1 and 2. Provide a drain line with a manually controlled gate valve to discharge ponded runoff through the existing 60" RCP culvert to the detention pond east of Coors Road. Discharge from the west pond will be allowed only when downstream facilities are able to accept flow.
- Construct a diversion swale/dike to direct runoff from basin 1 to the 3.30 ac. ft. retention pond described above.

Computations for the sizing of these interim improvements are contained in the Computations Section of this report.

DEVELOPED ON–SITE DRAINAGE

Developed on-site drainage improvements are shown on Plate 4. Controlled discharge for the developed site is limited to 0.8 cfs per acre and is directed, either overland or by storm drain, to the existing 24" Dia culvert south of the main entrance to the Shopping Center. Off-site flows from basins 4B and 4C are accepted and passed through the site. For the purposes of this report basins 4B and 4C were assumed to be developed with controlled discharge limited to 2.74 cfs (0.8 cfs per acre). The developed peak flow rates and volumes assumed are greater than the existing undeveloped peak flow rates and volumes.

Basins 4B, 4E and 4G all drain to the landscaped detention pond in the southeast corner of the site. Peak volume of this detention pond is approximately 1.47 ac. ft. Given the controlled discharge of 2.0 cts, the pond drains in about 8.9 hours.

Basins 4C, 4F and 4H drain to the parking area detention pond north of the shopping center main entrance. Peak volume of this pond is approximately 0.70 ac. ft. Discharge is limited to 20.0 cfs and the pond drains in about 25 minutes.

Runoff from Basin 4I is ponded within that Basin and is allowed to discharge to the storm drain system at a rate of 0.25 cfs. Due to site grading restrictions, Basins 4J, 4K and 4L cannot be directed to detention ponds. Runoff from these basins will pond within the Coors Road right-of-way and be absorbed by the ground as is the case now under existing conditions.

DRAINAGE IMPROVEMENTS DESIGN

Actual design of proposed interim and on-site drainage improvements will be detailed with the site construction drawings for the Alameda West Shopping Center project. As the design of the Fast Foods Park progresses, minor modifications to the site grading may be anticipated in this area. Final earthwork balancing of the site may also require grading adjustments, however, all the critical features of this drainage plan will be preserved.

EROSION CONTROL

Desilting areas shall be provided within Basins 4B and 4C to prevent sediment from entering the Alameda West site. In addition, storm drain facilities on-site will be sealed until the site is paved to prevent sediment from entering the system during construction.

SUMMARY

This Drainage Report is an extension and modification of the Drainage Master Plan approved for this area in December 1982. The report proposes a Conceptual Regional Drainage Plan for areas not drained by the proposed Cabezon Channel or the Calabacillas Arroyo. Specific interim off-site improvements and permanent on-site improvements are proposed to allow for development of the Alameda West Shopping Center in accordance with the Conceptual Plan.

There are many long term advantages associated with the proposed Conceptual Regional Drainage Plan. The plan offers a permanent workable system for storm drainage control in the area. Concrete channel lining improvement of the Corrales

Main Canal would provide storm runoff protection for property to the east and reduced maintenance costs. The construction of a storm drainage pump station at the Calabacillas Arroyo would offer a means for discharging excess Riverside Drain water directly to the Rio Grande.

The short term advantages of the interim improvements are equally attractive. Construction of the two off-site ponding areas and related storm drains will provide a temporary system for control of developed site drainage from Alameda West as well as control of existing drainage in the area. A storm water runoff flow rate of 78 cfs now reaching the Corrales Main Canal from Basins 1 and 2 will be reduced to 1.0 cfs. These improvements offer immediate storm runoff protection to the canal and areas to the east. Ponding along the west side of Coors Road will be reduced from 0.79 ac. ft. to 0.49 ac. ft.

In closing, it is important to consider the continuity of proposed interim and conceptual improvements. Although the area is relatively undeveloped at this time, the potential for immediate development is great. Comprehensive drainage management in the area is essential. Fortunately, the developer has sufficient control over much of the area to insure cooperation in the establishment of permanent as well as interim improvements.

Allowable Discharge from Alameda West Site

Basin	Area
4B	3.43
4C	3.43
4E	0.65
4F	3.54
4G	8.03
4H	7.92
4I	0.84
Total	27.84 ac

Allowable Discharge = 27.84 × 0.8 cfs/ac = 22.27 cfs

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100 yr. Storm Offsite Pond Volumes

- Required Pond Area West of Coors

  Retention with Manual Control Gate

Basin 1	1.96	ac ft
Basin 2	1.34	ac ft
Total	3.30	ac ft

- Required Pond Area East of Coors

  Detention Pond with 1 cfs controlled discharge
  (assume Retention for sizing)

Basin 4A	0.25	ac ft
Basin 4B	0.44	ac ft
Basin 4C	0.44	ac ft
Basin 4E	0.10	ac ft
Basin 4F	0.55	ac ft
Basin 4G	1.24	ac ft
Basin 4H	1.22	ac ft
Basin 4I	0.02	ac ft
Basin 4M	0.13	ac ft
Basin 4N	0.13	ac ft
Basin 4O	0.11	ac ft
Total	4.63	ac. ft

- Basins Ponding West of Coors (Uncontrolled)

Basin 4D	0.18	ac ft
Basin 4J	0.11	ac ft
Basin 4K	0.05	ac ft
Basin 4L	0.15	ac ft.
Total	0.49	ac ft

BASIN 4G DETENTION POND REQUIRED VOLUME
(Assume 2.00 cfs outflow)

Pond at maximum required volume when Basin 4-B only discharge at T= 116.58 min, because discharge rate from pond is less than discharge rate from contributing Basin 4-B

Total Volume from contributing basins:

Basin 4B	0.44 ac ft
Basin 4E	0.10 ac ft
Basin 4G	1.24 ac ft
Total	1.78 ac ft

Volume Discharged to T= 116.58 min:

116.58 − 4.00 × 60 × 2 = 13,510 cu ft = 0.31 ac ft

Required Volume for Basin 4G Detention Pond:

1.78 ac ft − 0.31 ac ft = 1.47 ac ft = 64,033 cu ft

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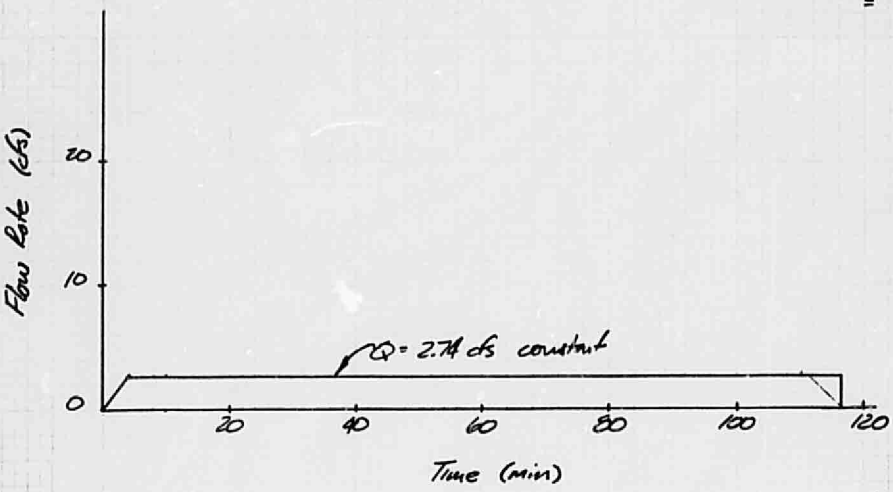
BASIN 4-C RUNOFF HYDROGRAPH

Assume Developed Basin with controlled discharge of 0.8 cfs / acre.

Qp = 3.43 × 0.8 = 2.74 cfs (controlled discharge)

Vol = 0.44 ac ft = 19,166.4 cu.ft.

T = 19,166.4 ÷ 2.74 = 6,995 sec = 116.58 min



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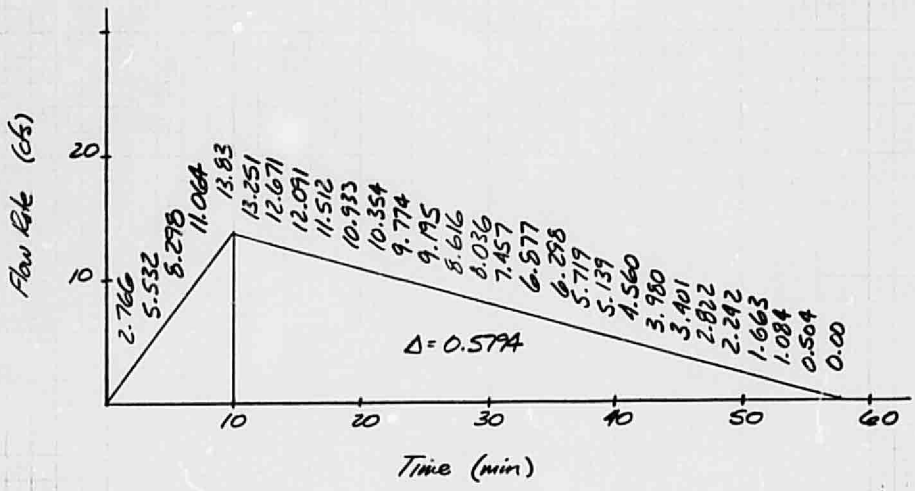
BASIN 4-F RUNOFF HYDROGRAPH

Q_p = 13.83 cfs
Vol = 0.55 ac ft = 23,958 cu. ft.

$$T = \frac{23{,}958\ (2)}{(60)\ 13.83} = 57.74 \text{ min}$$



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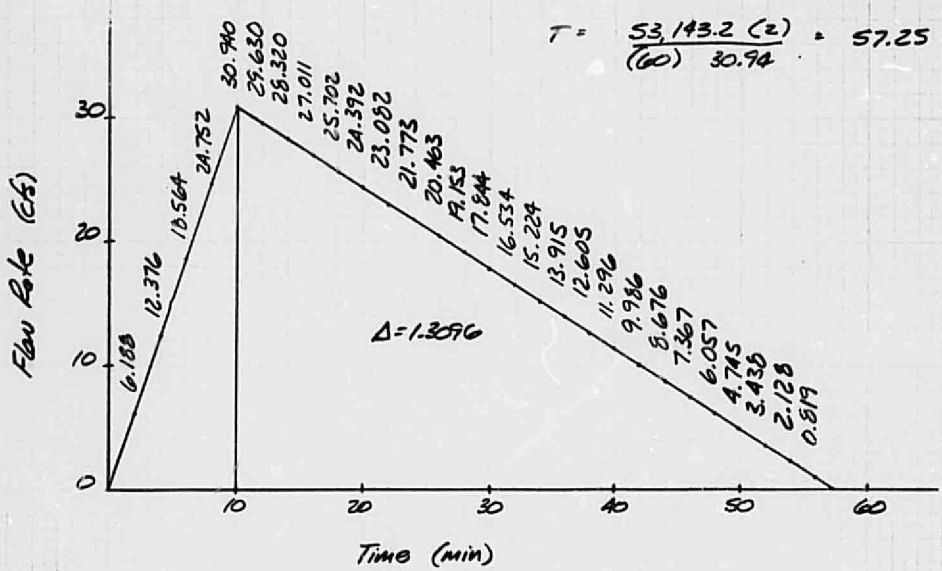
BASIN 4-H RUNOFF HYDROGRAPH

$Q_p = 30.94$ cfs
$Vol = 1.22$ ac ft $= 53{,}143.2$ cu. ft.

$$T = \frac{53{,}143.2\ (2)}{(60)\ 30.94} = 57.25 \text{ min}$$



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COMBINED HYDROGRAPH FOR BASINS 4-C, 4-F, 4-H

Time	BASIN 4H	BASIN 4-F	BASIN 4-C	COMBINED 4H 4F 4C
0	0	0	0	0
2	6.19	0	0	6.19
4	12.38	2.77	0	15.15
6	18.56	5.53	2.74	26.83
8	24.75	8.30		35.79
10	30.94	11.06		44.74
12	29.63	13.83		46.20
14	28.32	13.25		44.31
16	27.01	12.67		42.42
18	25.70	12.09		40.53
20	24.39	11.51		38.64
22	23.08	10.93		36.75
24	21.77	10.35		34.87
26	20.46	9.77		32.98
28	19.15	9.20		31.09
30	17.84	8.62		29.20
32	16.53	8.04		27.31
34	15.22	7.46		25.42
36	13.92	6.88		23.53
38	12.61	6.30		21.64
40	11.30	5.72		19.76
42	9.99	5.14		17.86
44	8.68	4.56		15.98
46	7.37	3.98		14.09
48	6.06	3.40		12.20
50	4.75	2.82		10.31
52	3.44	2.24		8.42
54	2.13	1.66		6.53
56	0.82	1.08		4.64
58	0	0.50		3.24
60		0		2.74
62			2.74	2.74
116			2.74	2.74
118	0	0	0	0

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~~BASIN~~ 4-H DETENTION POND REQUIRED VOLUME
(Assume outflow @ 20.00 cfs)

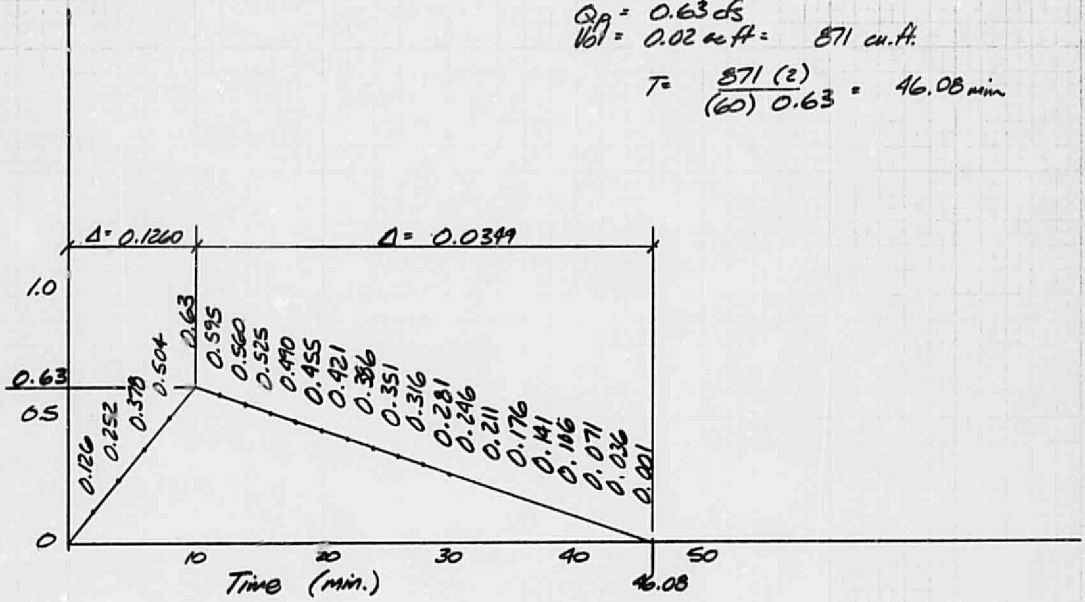
Time (min.)	Q In (cfs)	Incremental Volume In (cu. ft)	Cumulative Volume In (cu ft)	Q Out (cfs)	Incremental Volume Out (cu ft.)	Cumulative Volume Out (cu ft.)	Detained Volume (cu. ft.)
0	0	0	0	0	0	0	
2	6.19	743	743	0	0	0	
4	15.15	1818	2561	10	1200	1200	
6	26.83	3220	5781	20	2400	3600	
8	35.79	4295	10,076			6000	
10	44.74	5369	15,445			8400	
12	46.20	5544	20989			10,800	
14	44.31	5317	23306			13,200	
16	42.42	5090	31,396			15,600	
18	40.53	4864	36,260			18,000	
20	38.64	4637	40,897			20,400	
22	36.75	4410	45,307			22,800	
24	34.87	4184	49491			25,200	24,291
26	32.98	3958	53449			27,600	25,849
28	31.09	3731	57180			30,000	27,180
30	29.20	3504	60684			32,400	28,284
32	27.31	3277	63961			34,800	29,161
34	25.42	3050	67011			37,200	29,811
36	23.53	2824	68,835			39,600	29,235
38	21.64	2597	72,432			42,000	30,432 ← MAX
40	19.76	2371	74,803			44,400	30,403
42	17.86	2143	76,946			46,800	30,146
44	15.98	1918	78,864			49,200	29,664
46	14.09	1691	80,555			51,600	28,955
48	12.20	1464	82,019			54,000	28,019
50	10.31	1237	83256	20	2400	56,400	26,856

30,432 ÷ 43560 = 0.699 ac ft.

BASIN 4-I RUNOFF HYDROGRAPH

$Q_p = 0.63$ cfs
Vol = 0.02 ac-ft = 871 cu.ft.

$T = \frac{871\,(2)}{(60)\,0.63} = 46.08$ min



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BASIN 4-I DETENTION POND
(Assume outflow @ 0.25 cfs)

Time (min)	Q In (cfs)	Incremental Volume In (cu.ft.)	Cumulative Volume In (cu.ft.)	Q out (cfs)	Incremental Volume Out (cu.ft.)	Cumulative Volume Out (cu.ft.)	Detained Volume (cu.ft.)	
0	0	0	0	0	0	0	0	
2	0.13	15.6	15.6	0	0	0	15.6	
4	0.25	30.0	45.6	0.25	30.0	30.0	15.6	
6	0.38	45.6	91.2			60.0	31.2	
8	0.50	60.0	151.2			90.0	61.2	
10	0.63	75.6	226.8			120.0	106.8	
12	0.60	72.0	298.8			150.0	148.8	
14	0.56	67.2	366.0			180.0	186.0	
16	0.53	63.6	429.6			210.0	219.6	
18	0.49	58.8	488.4			240.0	248.4	
20	0.46	55.2	543.6			270.0	273.6	
22	0.42	50.4	594.0			300.0	294.0	
24	0.39	46.8	640.8			330.0	310.8	
26	0.35	42.0	682.8			360.0	322.8	
28	0.32	38.4	721.2			390.0	331.2	
30	0.28	33.6	754.8			420.0	334.8	Max
32	0.25	30.0	784.8			450.0	334.8	
34	0.21	25.2	810.0			480.0	330.0	
36	0.18	21.6	831.6			510.0	321.6	
38	0.14	16.8	848.4			540.0		
40	0.11	13.2	861.6			570.0		
42	0.07	8.4	870.0			600.0		
44	0.04	4.8	874.8			630.0		
46	0.00	0	874.8	0.25	30.0	660.0		
48								
50								

Required Pond Volume 335 cu.ft.

Basin 4G Pond Volume

Outlet invert @ 5024.30

Contour	Area (sq.ft)	Depth (ft)	Incremental Volume (cu ft)	Cumulative Volume (cu.ft)
24.30	0			
		0.70 (x 1/3)	2,215	
25.0	9492			2215
		1.00	11,576	
26	13,659			13791
		1.00	14,435	
27	15,210			28,226
		1.00	16,022	
28	16,833			44,248
		1.00	17,681	
29	18,528			61,929
		1.00	19,412	
30	20,295			81,341
		1.00	21,215	
31	22,134			102,556

Required Volume$_{100}$ = 64,033 cu

Water Surface Elevation: $\frac{64,033 - 61,929}{81,314 - 61,929} = \frac{2104}{19,385} = 0.11$

$\boxed{\text{Elev} = 5029.11}$

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Basin 4-H Pond Volume

Outlet Grate @ 28.00

Contour	Area (sq.ft)	Average Area (sq.ft)	Depth (ft)	Incremental Volume (cu.ft)	Cumulative Volume (cu ft)
28.0	0				
		18,819	0.50 (1/3)	3,137	3137
28.50	18,819				
		31,495	0.50	15,748	18,885
29.0	44,171				
		53,162	0.50	26,581	45,466
29.50	62,152				

Required Volume$_{100}$ = 30,432

Water Surface Elev 100yr Vol

$$\frac{30,432 - 18,885}{45,466 - 18,885} \quad \frac{11,547}{26,581} = 0.43$$

$$(0.43 \times 0.50) = 0.22'$$

$$\boxed{\text{Elev} = 5029.22}$$

PROJECT NAME Alameda West SHEET 19 OF 26

PROJECT NO. 21070 BY RPB DATE 7/85

SUBJECT Drainage Report Computations CH'D ____ DATE ____

Existing Culvert Capacities
(Assume clean culvert maintained, gravity flow)

60" RCP @ .0351 → 487.9 cfs
24" RCP @ .0275 → 37.5 cfs

PROJECT NAME Alameda West SHEET 20 OF 26
PROJECT NO. 21070 BY EPB DATE 7/83
SUBJECT Damage Report Computations CH'D _____ DATE _____

Peak Flow Rate to be conveyed by storm drain line from Basin 4-F Inlet

Basin 4C	2.74 cfs
Basin 4F	13.83 cfs
Total	16.57 cfs

24" RCP @	.005	→	16.0 cfs	(Gravity Flow)
27" RCP @	.005	→	21.9 cfs	" ← use
30" RCP @	.005	→	29.0 cfs	"
36" RCP @	.005	→	47.2 cfs	

Required Head, Pipe Invert to Water Surface to fill 27" RCP with 16.57 cfs = 1.87 ft

Required Head, Pipe Invert to Water Surface to fill 27" RCP with (16.57+5.27=) 21.84 cfs = 2.42 ft

Peak Flow Rate to be conveyed by storm drain line from Basin 4-E inlet

Basin 4 B	2.74
Basin 4 E	2.53
Total	5.27 cfs

15" RCPC .005 → 4.6 cfs
18" RCPC .005 → 7.4 cfs ← use

Required Head, Pipe Invert to Water Surface to fill 18" RCP with 5.27 cfs = 1.13 ft.

PROJECT NAME Alameda West SHEET 22 OF 26
PROJECT NO. 21070 BY RPB DATE 7/83
SUBJECT Drainage Report Computations CHKD ____ DATE ____

Storm Drain for Basin 4-I Discharge 8" Dia DIP
8" Dia DIPE .005 → 0.85 cfs

Storm Drain for Basin 4G Pad Discharge to 24" Culvert
12" Dia RCP S = .0050 Q = 2.52 cfs

PROJECT NAME Alameda West SHEET 23 OF 26
PROJECT NO. 21070 BY RPB DATE 7/83
SUBJECT Drainage Report Computations CH'D. DATE

Peak Flow Rate to be conveyed by storm drain line from 24" RCP culvert to Pond east of Cors

22.25 cfs

Slope to Pond $\frac{20.61 - 16.00}{750.00}$ S = .0062

24" RCP @ .005 → 16.0 cfs
27" RCP @ .005 → 21.9 cfs
30" RCP @ .005 — 29.0 cfs

27" RCP @ .006 → 24.0 cfs ← use

PROJECT NAME Alameda West SHEET 24 OF 26
PROJECT NO. 21070 BY RPB DATE 7/83
SUBJECT Drainage Report Computations CHD DATE

Ditch Improvement along West Side of Lot 3

Basin 4A	6.22 cfs
Basin 4M	3.36 cfs
Total	9.58 cfs

Existing Slope = .0080

Q = 10 cfs
BW = 0.10 ft
SS = 5:1
S = .008
n = .035

Depth = 0.93'
Velocity = 2.26 fps

Ditch/Dike Construction for cutoff of Basin 2

Upland Basin Area

140 x 220 ÷ 2	15,400'
310 x 235	72,850'
155 x 260	40,300'
100 x 240 ÷ 2	12,000'
	140,550' = 3.23 ac

Q = 0.16 x 4.65 x 3.23 = 2.40 cfs

Slope 2 ÷ 240 = .006

Q = 2.4 cfs
BW = 0.10 ft
SS = 3:1
S = .006
n = .035

Depth = 0.67'
Vel = 1.57 fps

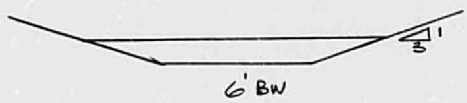
Swale improvement to divert Basin 1 flow

Q = 61.7 cfs

Slope = .0050

Q = 52
BW = 6.00
SS = 3:1
S = .0050
n = .017

Depth = 1.08'
Vel = 5.22 fps



PROJ: Alameda West — 26 — 26
PROJ: 21070 — RPB — 7/83
SUBJ: Drainage Report Computations

TABLE 1.
CONCEPTUAL REGIONAL DRAINAGE PLAN - BASINS
RATIONAL FORMULA HYDROLOGY (See Plate 1)

Basin	Area (acres)	Percent Impervious	Runoff Coefficient 2.	Basin Length (Ft.)	Basin Slope (Ft/Ft.)	Time of Concentration (Min.) 3.	Intensity 100 yr 4.	Peak Flow Rate 100 yr (cfs) 1.	Intensity 10 yr 4.	Peak Flow Rate 10 yr (cfs) 1.
A	133.6	25	0.45	3100	.014	76.4	1.65	99.1	1.08	65.1
B	41.2	0	0.34	1300	.024	48.8	2.07	29.0	1.36	19.1
C	6.5	0	0.34	900	.011	25.0	2.91	6.5	1.91	4.3
D	44.1	10	0.38	2500	.008	84.9	1.56	26.2	1.02	17.2
E	13.8	0	0.34	1600	.004	76.2	1.65	7.8	1.08	5.1
F	13.3	10	0.38	1800	.013	25.4	2.89	14.6	1.90	9.6
G	10.7	0	0.34	750	.027	15.8	3.69	13.4	2.42	8.8
H	7.4	0	0.34	800	.037	10.8	4.48	11.3	2.94	7.4
I	28.1	0	0.34	2650	.011	24.9	2.92	27.9	1.92	18.3
J	20.5	0	0.34	2200	.025	36.9	2.39	16.7	1.57	11.0

Notes:
1. Runoff Peak Flow Rates were computed by use of the Rational Formula as outlined in the DPM.
2. Runoff Coefficients were determined by use of DPM Plate 22.2 C-1 (Figure 7) and SCS Soils group B.
3. Times of Concentration were computed by use of DPM Plate 22.2 B-1 (Figure 5) and breakdown of runoff flow into segments.
4. Rainfall intensities for 100 yr and 10 yr storms were determined from Plate 22.2 D-1 (Figure 11) and Plate 22.2 D-2 (Figure 12).

TABLE 2
CONCEPTUAL REGIONAL DRAINAGE MANAGEMENT PLAN
CUMULATIVE PEAK FLOW RATES AT ANALYSIS POINTS 1, 2. (See Plate 1.)

Analysis Point	Contributing Basins	Peak Flow Rate 100yr	Peak Flow Rate 10yr
AP 1	E	47.8	45.1
AP 2	C, D	32.7 3.	21.5 3.
AP 3	C, D, E, F	95.1	76.2
AP 4	B, C, D E F G	137.5	104.1
AP 5	A, B, C, D, E, F, G, H	247.9	176.6
AP 6	A, B, C, D, E, F, G, H, I	275.8	194.9
AP 7	A, B, C, D, E, F, G, H, I, J	292.5	205.7

Notes:
1. Peak Flow Rates include 40 cfs irrigation flows in Corrales Main Canal (east fork) except as noted.
2. Peak Flow Rates were determined by summation of individual flows from contributing basins. These cumulative flows were not routed.
3. The Peak Flow Rates for Analysis Point 2 do not include irrigation water in the west fork of the Corrales Main Canal. The combined irrigation flow of the east and west forks of the Corrales Main Canal from the siphon at the Calabacillos Arroyo to the canal confluence is 40 cfs. No attempt was made to split out the flow for the west fork. The 40 cfs flow rate was conservatively assumed to be carried in the east fork of the Corrales Main Canal.

Alameda West
21070 RPS 7/95
Drainage Report TABLE 2

TABLE 3
EXISTING DRAINAGE CONDITIONS (See Plate 2.)

Basin	Area (ac.)	Percent Impervious	Runoff Coefficient 2.	Basin Length (ft.)	Basin Slope (ft/ft.)	Time of Concentration (Min.) 3.	Intensity 100 yr 4.	Intensity 10 yr 4.	Peak Flow Rate 100 yr (cfs)	Peak Flow Rate 10 yr (cfs)	Composite Runoff CN	Volume 100 yr (ac.ft.) 1.	Volume 10 yr (ac.ft.) 1.
1	117.6	21	0.26	4800	.012	72.5	1.69	1.11	51.7	34.0	64	1.96	1.29
2	80.2	15	0.24	5100	.017	113.6	1.35	0.89	26.0	17.1	62	1.34	0.88
3	38.3	18	0.25	3200	.010	88.9	1.53	1.01	14.6	9.7	63	0.64	0.42
4	43.3	8	0.20	2000	.015	47.6	2.10	1.38	18.2	12.0	59	0.72	0.47

Notes:

1. Runoff Peak Flow Rates were computed by use of the Rational Formula as outlined in the DPM.
2. Runoff Volumes were determined by the Soil Conservation Service Composite Runoff Curve Number method by using DPM Plate 22.2 C-2 (Figure 8), DPM Plate 22.2 C-3 (Figure 9), Plate 22.2 C-4 (Figure 10) and DPM Plate 22.2 D-1 (Figure 11).
3. Runoff Coefficients were determined by use of DPM Plate 22.2 C-1 (Figure 7) and SCS soils group "A".
4. Times of Concentration were computed by use of DPM Plate 22.2 B-1 (Figure 5) and DPM Plate 22.2 B-2 (Figure 6) and breakdown of runoff into flow segments.
5. Rainfall Intensities for 100 yr and 10 yr storms were determined from DPM Plate 22.2 D-1 (Figure 11) and DPM Plate 22.2 D-2 (Figure 12)

TABLE 4
INTERIM DRAINAGE - DEVELOPED ONSITE DRAINAGE
(See Plates 3 and 4)

Basin	Area (ac)	Percent Impervious	Runoff Coefficient 1.	Basin Length (ft)	Basin Slope (ft/ft)	Time of Concentration (Min) 2.	Intensity 100 yr. 3.	Peak Flow Rate 100 yr. (cfs) 4.	Volume 100 yr. (ac.ft.) 4.	Intensity 10 yr. 3.	Peak Flow Rate 10 yr. (cfs) 4.	Volume 10 yr. (ac.ft.) 4.
4-A	6.37	10	0.21	1360	.017	10	4.65	6.22	0.25	3.06	4.09	0.16
4-B/5.	3.43	85	0.70	750	.015	10	4.65	2.74	0.44	3.06	2.74	0.29
4-C/5.	3.43	85	0.70	950	.013	10	4.65	2.74	0.44	3.06	2.74	0.29
4-D	6.04	0	0.16	500	.014	10	4.65	4.49	0.18	3.06	2.95	0.12
4-E	0.65	95	0.84	385	.028	10	4.65	2.53	0.10	3.06	1.66	0.07
4-F	3.54	95	0.84	1070	.007	10	4.65	13.83	0.55	3.06	9.09	0.36
4-G	8.03	95	0.84	1220	.016	10	4.65	31.37	1.24	3.06	20.61	0.81
4-H	7.92	95	0.84	980	.012	10	4.65	30.94	1.22	3.06	20.33	0.80
4-I	0.34	0	0.16	250	.024	10	4.65	0.63	0.02	3.06	0.41	0.01
4-J	0.57	84	0.69	340	.032	10	4.65	2.79	0.11	3.06	1.95	0.07
4-K	0.60	54	0.45	320	.015	10	4.65	1.26	0.05	3.06	0.83	0.03
4-L	1.85	54	0.45	360	.014	10	4.65	3.87	0.15	3.06	2.54	0.10
4-M	2.41	32	0.30	500	.032	10	4.65	3.36	0.13	3.06	2.21	0.09
4-N	1.55	54	0.45	500	.028	10	4.65	3.24	0.13	3.06	2.13	0.09
4-O	3.71	0	0.16	600	.040	10	4.65	2.76	0.11	3.06	1.81	0.07

See Notes following page.

TABLE 4
INTERIM DRAINAGE - DEVELOPED ONSITE DRAINAGE (cont.)
(See Plates 3 and 4)

Notes:

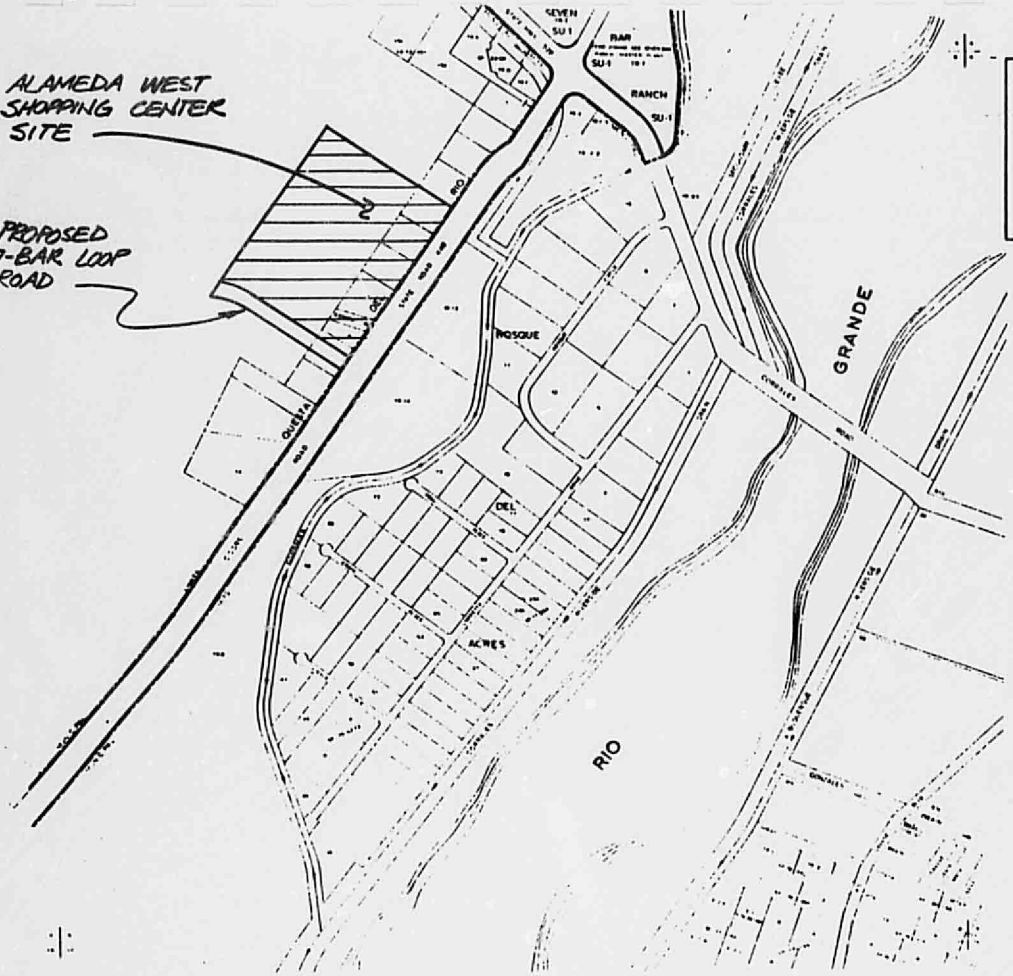
1. Runoff Coefficients were determined by use of DPM Plate 22.2 C-1 (Figure 7) and SCS soils group A.

2. Times of Concentration were determined by use of the Kirpich Formula, by Overland Flow Segments DPM Plate 22.2 B-1 (Figure 5) or by Street Flow Segments DPM Plate 22.2 B-2 (Figure 6)

3. Rainfall Intensities for 100 yr and 10 yr storms were determined from DPM Plate 22.2 D-1 (Figure 11) and DPM Plate 22.2 D-2 (Figure 12)

4. Runoff peak flow rates and volumes for 100 yr and 10 yr storms were determined by use of the rational method.

5. For the purposes of these computations, Basins 4B and 4C were assumed to be developed, and releasing an allowable controled discharge of 0.80 cfs per acre. This assumption is conservative, it results in greater runoff flow rates and volumes for both basins.



ALAMEDA WEST
SHOPPING CENTER
DRAINAGE REPORT

FIGURE 1.
VICINITY MAP

JUNE 1983

B-14-Z

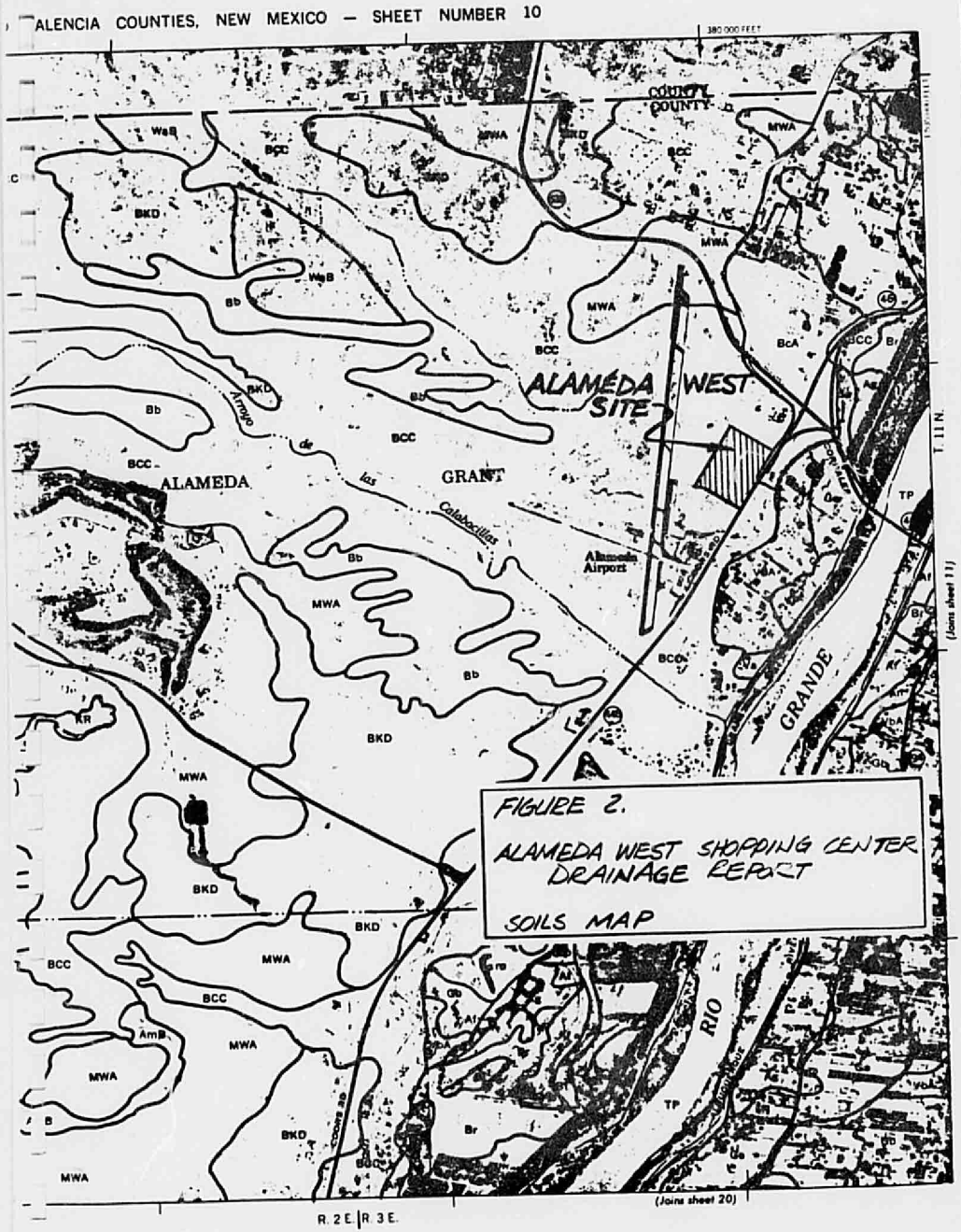


FIGURE 2.

ALAMEDA WEST SHOPPING CENTER DRAINAGE REPORT

SOILS MAP

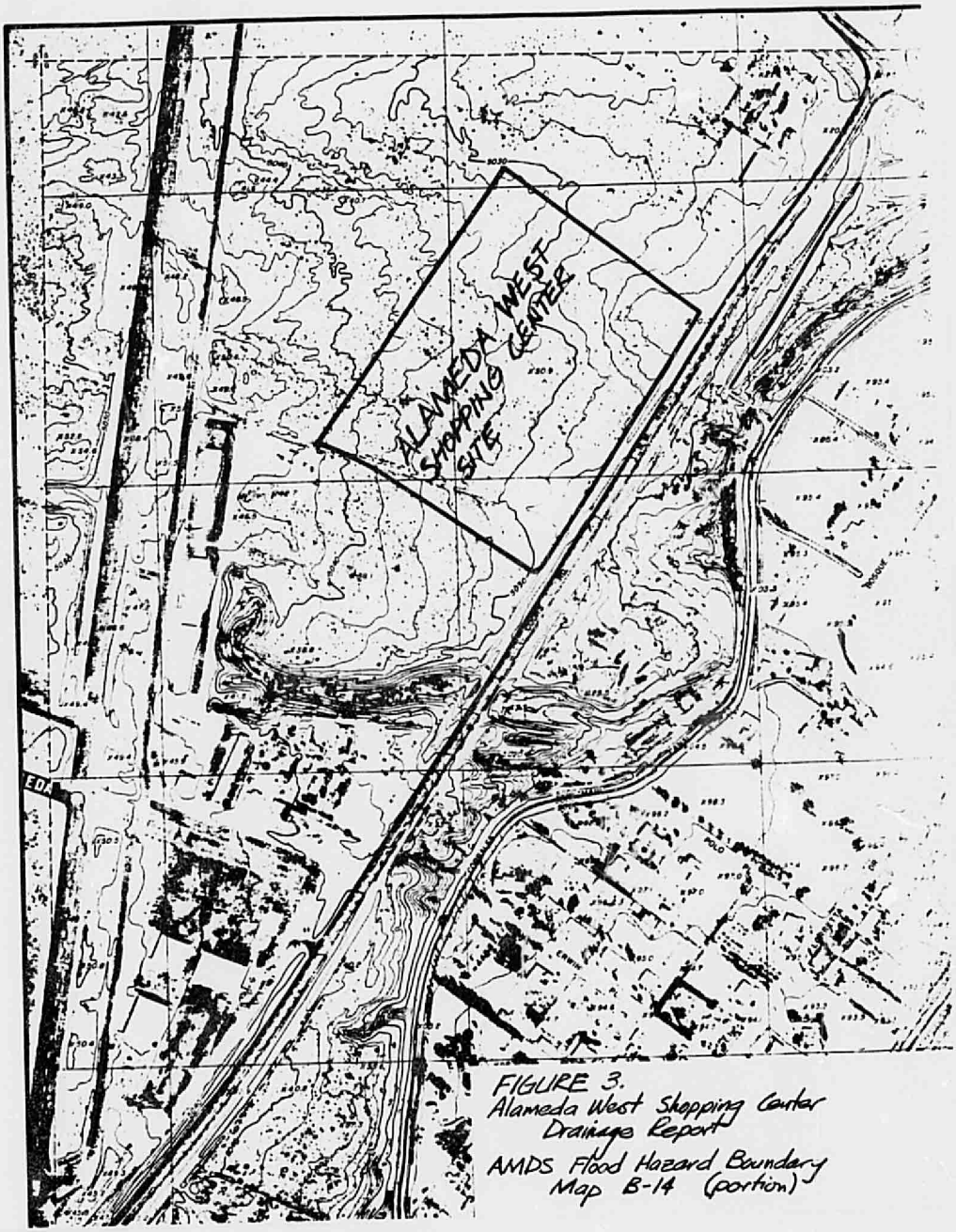
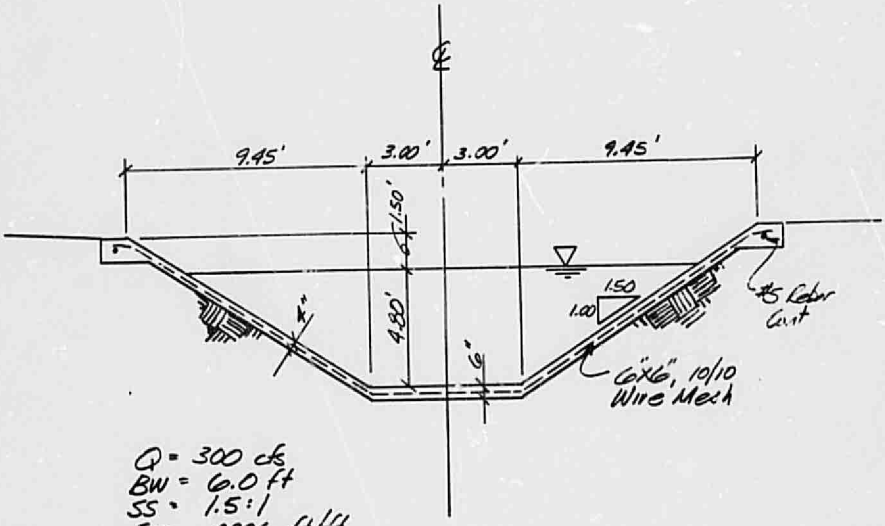


FIGURE 3.
Alameda West Shopping Center
Drainage Report

AMDS Flood Hazard Boundary
Map B-14 (portion)

FIGURE 4
CONCEPTUAL IMPROVED CORRALES MAIN CANAL
CHANNEL SECTION



Q = 300 cfs
BW = 6.0 ft
SS = 1.5:1
S = .0006 ft/ft
n = 0.015

Flow Depth = 4.80 ft.
Velocity = 4.7 ft./sec.

Alameda West
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DRAINAGE REPORT

RPB 7/93