HYDROLOGY G10/D3 SIX PLAN

G10-D3

6 PLANS

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION
WASHINGTON, D. C. 20410

IN REPLY REFER TO:
IFE (216):
FLO-1

July 28, 1978

Mr. Bruno Conegliano
Asst. City Engineer - Hydrology
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Dear Mr. Conegliano:

This is in response to your letter of July 6, 1978 indicating that the Flood Hazard Boundary Map for Bernalillo County, New Mexico may not accurately reflect the Special Flood Hazard Area in the community.

Our consulting engineers will be contacting you to discuss the flooding problem. Please make available any technical flood or topographic information these engineers might find useful to make a determination, including but not limited to those data discussed in the enclosed memorandum. Upon completion of our review, the map will be amended, if required.

If we can be of further assistance, please let us know.

Sincerely,

Gloria M. Jimenez

Gloria M. Jimenez
Federal Insurance Administrator

Enclosure

RICHARD E. LEONARD
EXECUTIVE ENGINEER

B. H. SWINBURNE, CHAIRMAN
WILLIAM V. HEREFORD, VICE-CHAIRMAN
FRANCES MCCOY, SECRETARY-TREASURER
VERNON DOAK, DIRECTOR
RICHARD H. CLOUGH, DIRECTOR

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority
2600 PROSPECT AVE. N.E.
P. O. BOX 25651 - ALBUQUERQUE, N. M. 87125
TELEPHONE 344-3816

August 31, 1978

Mr. David Weir
Vice President
Security Federal
Savings & Loan Association
P.O. Box 3747
Albuquerque, New Mexico 87110

Subject: El Rancho Atrisco, Units 1 and 3.

Dear Sir:

This is to inform you that I have reviewed the location of subject development and compared it with the Flood Hazard Boundary Map. The development was not in the floodplain even before construction of our Ladera Facility.

Please call me if you have questions.

Sincerely,

Richard E. Leonard

Richard E. Leonard
Executive Engineer

REL:sls

SEP 6 1978

WESTERN DEVELOPMENT COMPANY

September 1, 1978

Mr. Jake Bordenave
T. T. Burnett Engineering, Inc.
120 Morningside Drive, N.E.
Albuquerque, NM 87108

Subject: El Rancho Atrisco, Unit I

Dear Jake;

Please find enclosed a letter from Albuquerque Metropolitan Arroyo Flood Control Authority (A.M.A.F.C.A.) concerning the floodplain in El Rancho Atrisco. A copy of the Flood Hazard Boundary Map, with our Units I and II included, is also enclosed.

If you have any questions please call.

Very truly yours,

WESTERN DEVELOPMENT COMPANY

Andre Houle

Andre Houle
Engineering Manager

AH/pd

Enclosures

619 truman, n.e. albuquerque, new mexico 87110 phone (505) 268-4395

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

September 5, 1978

Jake Bordenave
T.T. Burnett Engineering, Inc.
120 Morningside Dr.N.E.
Albuquerque, New Mexico 87108

RE: EL RANCHO ATRISCO UNIT 2

Dear Mr. Bordenave:

As a result of our discussion held last Friday, Sept. 1, 1978 in the office of Mr. Dwayne Sheppard, Acting City Engineer regarding the referenced Subdivision, please be advised of the following:

1. For the two channel crossings under Ouray St., one hundred years storm design is required due to the lack of other routes of access to this development.

2. The channel along the South end of the parcel will have to be designed in a manner that will insure channel stability over time. (The U.S. Department of Agriculture Tech. Paper #25 can supply an acceptable design method.) An adequate energy dissipator will have to be supplied at the outfall point into the Ladera Golf Course.

3. When the channel designs are finished, a water surface profile will have to be supplied as an addendum to the drainage report to demonstrate the adequacy of the proposed design.

4. The developer will supply a letter of agreement with the Public Service Co. for the construction of the diversionary dikes (which will have to be shown on the site grading plans and be initialized by Public Service Co.) to be built within the Public Service Co. easement. These dikes will effectively divert the flows from the West to the channel and appropriate erosion protection facilities will have to be provided at the outfall.

5. An additional dike will have to be constructed within the Western Development lands to prevent uncontrolled water and sediment conveyance to Ouray West of Unit 2.

Very Truly Yours,

Bruno Conegliano
Asst. City Engineer-Hydrology

BC/tl

T. T. Burnett Engineering, Inc.
Consulting Engineers
120 MORNINGSIDE N. E.
ALBUQUERQUE, NEW MEXICO 87108

TELEPHONE
(505) 255-7545

October 17, 1978

Mr. Bruno Conegliano, ACE Hydrology
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87102

Dear Mr. Conegliano:

Construction plans for El Rancho Atrisco, Unit 2, have been submitted for signatures. Included in this submittal is a sheet detailing a ditch and dike section which is located within the PNM easement and parallels the west boundary of El Rancho Atrisco, Tract 2, from the PNM substation on the south to the north boundary of Tract 2. The total length of this ditch and dike is approximately 4,100 feet. In addition,there is a sheet detailing a ditch and dike section paralleling the west boundary of Unit 2.

It is requested that the plans be processed as submitted, but that permission be given to construct the first mentioned ditch and dike section at a later date, as Unit 2 is protected with the second mentioned ditch and dike.

Very truly yours,

Jean J. Bordenave

Jean J. Bordenave
President

ms

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

November 13, 1978

Mr. Bo Johnson
Western Development Co.
619 Truman N.E.
Albuquerque, N.M. 87110

SUBJECT: OURAY RD. CROSSING FOR EL RANCHO ATRISCO DEVELOPMENT

Dear Mr. Johnson:

This letter is written to summarize the results of the conversation held this morning, November 13, 1978, in the office of Mr. Rip Orr, Acting Director, Public Works Department.

The City accepts as an interim solution the construction of a culvert structure under Ouray Rd. with a design discharge of 10 years frequency of recurrence.

The Western Development Co. will be allowed to proceed with the construction on and the sale of the first seventy-five lots. No further development of the remaining lots will be allowed without the completion of the culvert crossing under Ouray Rd. with the standard 100 year frequency design.

The second phase of construction will have to include the outlet structures for the pipe culverts constructed during the first phase. The Western Development Corp. will maintain the crossing structure and temporary roadway until final acceptance by the City is received. The Department of Public Works in turn will recommend the inclusion of the construction of the full section of Ouray Rd. (and pertinent culvert extension) in the next cycle of capital improvement program.

If this letter presents clearly your understanding of the agreement, please sign and return a copy to the office of the City Engineer.

Very truly yours,

Bruno Conegliano
Assistant City Engineer - Hydrology

BC/fs

cc - Rip Orr
Dick Heller
Richard Leonard
Orlando Sedillo
Drainage File

Western Development Company
Bo Johnson

November 20, 1978

Bruno Conegliano
Assistant City Engineer-Hydrology
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Dear Mr. Conegliano:

OURAY ROAD CROSSING
FOR EL RANCHO ATRISCO

This letter is to provide a clarification to your November 13, 1978 letter concerning the culvert structure construction phasing on Ouray Road. Western Development Company is in agreement with your proposition in the November 13, 1978 letter. The limits of the flood protection provided by Western Development Company will be as per the approved construction drawings.

We would also like to add that Western Development will also provide temporary paving in that area crossing City property. The future arterial section will be provided completely by the City under the Capital Improvement Program, as per our understanding in the meeting held November 13, 1978 in Mr. Rip Orr's office.

This letter will provide an agreement with the City of Albuquerque and Western Development Company for both this letter and you November 13, 1978 letter.

Very truly yours,

WESTERN DEVELOPMENT COMPANY

Bo Johnson

Bo K. Johnson, P.E.
Vice President

pd

CITY OF ALBUQUERQUE

Bruno Conegliano
City Engineer-Hydrology

cc: Rip Orr
Dick Heller
Paul Bechr

619 truman, n.e. albuquerque, new mexico 87110 phone (505) 268-4395

608

TRINITY ENTERPRISES, INC.

Civil Engineers
Land Planners
Developers

3107 Eubank, N.E.
Suite 3
Albuquerque, New Mexico 87111
(505) 292-7666

February 18, 1981

RECEIVED
FEB 20 1981
CITY ENGINEER

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

Re: Storm Drainage Report
Addendum Letter dated December 30, 1980

Dear Mr. Heller,

Please consider this a request for your comments or approval on the Drainage Report for El Rancho Atrisco: A Review of the Drainage Criteria For the Lands of Westland Development Corporation, Inc.

I am at your disposal for a meeting to finalize this report.

Sincerely,

Bo K. Johnson
President

BKJ/dd

RSH		ADM	
HRO		SUR	
CBS		COUN	
DES		SEC	
INSP		FILE	
HYDRO		RETURN	

Action

FILE:
1 RANCHO ATRISCO
2 ATRISCO BUSINESS PARK
3 LADERA SYSTEM

RICHARD E. LEONARD
EXECUTIVE ENGINEER

B. H. SWINBURNE, CHAIRMAN
R. WARD HUNNICUTT, VICE-CHAIRMAN
FRANCES MCCOY, SECRETARY-TREASURER
VERNON DOAK, 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
JUN 1 1981
ENGINEER

June 16, 1981

Mr. Wiley Smith
Environmental Planning Committee
Albuquerque, NM

Dear Mr. Smith:

Reference your questions regarding drainage of the El Rancho Atrisco area between Interstate 40 and our Ladera system of dams and channels.

AMAFCA originally envisioned that most of this area would drain into the Ladera System, and Ladera is designed to accommodate flows from this area. (Ref. "Design Report for the Ladera Storm Drainage Diversion and Detention System," Boyle Engineers, 1979.)

Subsequently the City formulated plans to construct an interceptor channel immediately north of Interstate 40. This would make it easier to develop and drain the area between I-40 and Ladera. The El Rancho Atrisco drainage concept assumes this channel will be built.

It is my understanding that the City has reasonably firm plans to construct the I-40 channel. If not, the drainage concept for El Rancho Atrisco is probably inappropriate.

Sincerely,

Rich Leonard

Richard E. Leonard
Executive Engineer

ic
cc: V. Hagen
R. Heller
H. Orr
C. Easterling ✓
F. Denney

G10/D35 3 -

dtm & associates, inc

Denney-Tibljas-McLean & Associates, Inc.
Consulting Engineers ■ Planners ■ Surveyors

RECEIVED
OCT 14 1985
DH0426
HYDROLOGY SECTION

October 10, 1985

HAND DELIVERED

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

Re: El Rancho Atrisco
Unit 2 Replat
DRB No. 85-699-1
DTM Job No. 794.22

Dear Fred:

Per your instructions at the October 8, 1985 DRB Meeting, we submit the Contract between Western Development Company, Inc., and Inter West, Ltd., for the installation of cut off walls and sidewalks adjacent to Units 3 & 6 (along the north side of Ouray Road), of El Rancho Atrisco. As you can see, these items have been made a part of the Ouray Road widening project.

The $28,000.00 Bid will cover the following work:

Sidewalks:
Unit 6 from Luna Nuestro to Flor Silvestre
Unit 3 from Flor Silvestre to Sol de Vida

Cut Off Walls:
Unit 3 from Llano Encantado to Sol de Vida

Mr. Gerhard Mueller, President of Western Development Company, Inc., has talked with Mr. Dwayne Sheppard regarding the above matter and has presented the same information to him.

The construction of these items adjacent to Units 3 & 6 will satisfy requirements as outlined by the Agreement between the City and Western Development Company, Inc., (A copy is attached).

If you have any questions, please call.

Very truly yours,

Gary W. Tibljas, P.E.

GWT/klb
Attachment

2400 COMANCHE ROAD, NE ■ ALBUQUERQUE, NM 87107
TELEPHONE [505] 884-0696

Exhibit "A"

Inter-West, Ltd.
Contractors / Engineers / Construction Managers

October 3, 1985

Denney-Tibljas & McLean
2400 Comanche, NE
Albuquerque, N.M. 87110

Attn: Gary Tibljas

Re: Ouray Road from S.E. Corner of Unit 9 to NW Corner of Unit 8

SUMMARY OF WORK PHASES

1.	EARTHWORK	Per Unit Price Schedule	$27,320.00
2.	STORM SEER WORK	Per Unit Price Schedule	8,425.00
3.	PAVING WORK (INCL. CONC.)	Per Unit Price Schedule	193,099.60
4.	Additional Sidewalk & walls on Ouray Road		28,000.00
		TOTAL	$256,844.60

We exclude the cost of engineering, surveying, testing, tax, bonds, and permits.

Yours very truly,

INTER-WEST, LTD.

P. K. Elliott

P. K. Elliott
Vice President

Encl.
PKE/mg

Ouray Road From S.E. Corner of Unit 9 to N.W. Corner of Unit 8

Item No.	Description	Quantity	U.Price	Total
STORM SEWER				
K-5	24" RCP	76 LF	25.00	1,900.00
K-34	"D" Inlet	2 EA	3,000.00	6,000.00
K-50	PCC Conc.	1.5 CY	350.00	525.00
	SUBTOTAL STORM SEWER			$8,425.00
PAVING				
M-28	Art Pv R&R	36 SY	25.00	900.00
P-4	Grade Less than 2'	13,991 SY	1.50	20,986.50
P-9	Rem & Disp. A.C.	270 SY	1.50	405.00
P-10	Rem. & Disp A.C.,Saw Cut	295 SY	3.50	1,032.50
P-12	Rem.& Disp. A.C.Curb	2,332 LF	3.00	6,996.00
P-17	Process Exist.4" Subbase	5,036 SY	0.90	4,532.40
P-18	Process Exist 6" Subbase	5,036 SY	1.00	5,036.00
P-23	4" AC Base 1000 Lb	5,036 SY	7.50	37,770.00
P-27	2 1/2" AC Base 1500 Lb	5,036 SY	5.00	25,180.00
P-30	Tack	5,036 SY	0.20	1,007.20
P-35	1½" A.C. Surface 1800 Lb	5,036 SY	3.00	15,108.00
P-42	4" Sidewalk	15,044 SF	1.50	22,566.00
P-46	Std C & G	2,075 LF	8.00	16,600.00
P-47	Med. C & G	4,664 LF	7.50	34,980.00
	SUBTOTAL PAVING			$193,099.60

Additional Sidewalk & Walls on Ouray Rd..Lump Sum $28,000.00

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document A101

Standard Form of Agreement Between Owner and Contractor

where the basis of payment is a

STIPULATED SUM

1977 EDITION

THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES; CONSULTATION WITH AN ATTORNEY IS ENCOURAGED WITH RESPECT TO ITS COMPLETION OR MODIFICATION

Use only with the 1976 Edition of AIA Document A201, General Conditions of the Contract for Construction.

This document has been approved and endorsed by The Associated General Contractors of America.

AGREEMENT

made as of the Third day of October in the year of Nineteen Hundred and Eight-Five

BETWEEN the Owner:

Western Development Co., Inc.
601 Hidden Valley, S.E
Albuquerque, New Mexico 87123

and the Contractor:

Inter-West, Ltd.
4004 Carlisle NE, Suite "N"
Albuquerque, N.M. 87107

The Project:

Project #2476, Ouray Road

The Architect:

Denney-Tibljas-McLean

The Owner and the Contractor agree as set forth below.

Copyright 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, © 1977 by the American Institute of Architects, 1735 New York Avenue, N.W., Washington, D. C. 20006. Reproduction of the material herein or substantial quotation of its provisions without permission of the AIA violates the copyright laws of the United States and will be subject to legal prosecution.

ARTICLE 1

THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, the Conditions of the Contract (General, Supplementary and other Conditions), the Drawings, the Specifications, all Addenda issued prior to and all Modifications issued after execution of this Agreement. These form the Contract, and all are as fully a part of the Contract as if attached to this Agreement or repeated herein. An enumeration of the Contract Documents appears in Article 7.

ARTICLE 2

THE WORK

The Contractor shall perform all the Work required by the Contract Documents for
(Here insert the caption descriptive of the Work as used on other Contract Documents.)

Installation of strm sewer, curb & gutter, paving, earthwork .. more fully described on Exhibit "A" (Engineers plans, quantity estimates and unit prices) attached hereto and which is incorporated into this Contract.

ARTICLE 3

TIME OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

The Work to be performed under this Contract shall be commenced

and, subject to authorized adjustments, Substantial Completion shall be achieved not later than

(Here insert any special provisions for liquidated damages relating to failure to complete on time.)

See Exhibit "B"

ARTICLE 4

CONTRACT SUM

The Owner shall pay the Contractor in current funds for the performance of the Work, subject to additions and deductions by Change Order as provided in the Contract Documents, the Contract Sum of See Attached Exhibit "A".

The Contract Sum is determined as follows:
(State here the base bid or other lump sum amount, accepted alternates, and unit prices, as applicable.)

See Exhibit "A"

ARTICLE 5

PROGRESS PAYMENTS

Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided in the Contract Documents for the period ending the 25th day of the month as follows:

Not later than ten days following the end of the period covered by the Application for Payment One Hundred percent (100 %) of the portion of the Contract Sum properly allocable to labor, materials and equipment incorporated in the Work and one hundred percent (100 %) of the portion of the Contract Sum properly allocable to materials and equipment suitably stored at the site or at some other location agreed upon in writing, for the period covered by the Application for Payment, less the aggregate of previous payments made by the Owner; and upon Substantial Completion of the entire Work, a sum sufficient to increase the total payments to one hundred percent (100 %) of the Contract Sum, less such amounts as the Architect shall determine for all incomplete Work and unsettled claims as provided in the Contract Documents.

(If not covered elsewhere in the Contract Documents, here insert any provision for limiting or reducing the amount retained after the Work reaches a certain stage of completion.)

Owner to retain last 5% as retainage until contract is complete.

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate entered below, or in the absence thereof, at the legal rate prevailing at the place of the Project.
(Here insert any rate of interest agreed upon.)

(Truth in lending laws and requirements under the Federal Truth in Lending Act, similar state and local consumer credit laws and other regulations at the Owner's and Contractor's principal places of business, the location of the Project and elsewhere may affect the validity of this provision. Specific legal advice should be obtained with respect to deletion, modification, or other requirements such as written disclosures or waivers.)

ARTICLE 6

FINAL PAYMENT

Final payment, constituting the entire unpaid balance of the Contract Sum, shall be paid by the Owner to the Contractor when the Work has been completed, the Contract fully performed, and a final Certificate for Payment has been issued by the Architect.

ARTICLE 7

MISCELLANEOUS PROVISIONS

7.1 Terms used in this Agreement which are defined in the Conditions of the Contract shall have the meanings designated in those Conditions.

7.2 The Contract Documents, which constitute the entire agreement between the Owner and the Contractor, are listed in Article 1 and, except for Modifications issued after execution of this Agreement, are enumerated as follows:

(List below the Agreement, the Conditions of the Contract (General, Supplementary, and other Conditions), the Drawings, the Specifications, and any Addenda and accepted alternates, showing page or sheet numbers in all cases and dates where applicable.)

Note: Contract bid is based on a unit price estimate and all quantities to be verified by Denney-Tibljas-McLean.

Contractor to furnish to owner Performance Bond for the amount of this contract and Liability Insurance in the amount of $1,000,000.00

This Agreement entered into as of the day and year first written above.

OWNER	CONTRACTOR
Western Diff-Co-	Inter-West Ltd
[illegible]	J. K. Elliot VP

AGREEMENT

THIS AGREEMENT, made and entered into this 10th day of February, 1982, by and between Western Holding Company, 3700 Coors Blvd., N.W. Albuquerque, New Mexico, 87120, a New Mexico Corporation, (hereinafter referred to as the "Developer"), and the City of Albuquerque, New Mexico, a municipal corporation (hereinafter referred to as the "City").

WITNESSETH:

WHEREAS, the Developer is developing the area known as El Rancho Atrisco, consisting of Units 1, 2 Phase I, 2 Phase II, 2 Phase III, 2a, and 3 through 13, all as more specifically shown on the El Rancho Atrisco Master Plan, which is attached hereto as Exhibit A, and by this reference made a part of this Agreement; and

WHEREAS, the City requires the Developer, as part of the development, to construct certain public facilities at the Developer's expense; and

WHEREAS, THE Developer is desirous of developing Unit 8 prior to the completion of construction of certain public facilities consisting of certain offsite improvements; and

WHEREAS, the City is willing to grant permission to the Developer to develop Unit 8 only upon the terms and conditions provided herein.

NOW, THEREFORE, in consideration of the premises and mutual obligations herein, the parties hereto do mutually agree as follows:

1. Offsite Improvements. The Developer specifically acknowledges that the following public facilities relative to the development of El Rancho Atrisco have not been completed as required by the City:

A. Westerly portion of Ouray Road adjacent to Unit 8, consisting of approximately 1345 lineal feet of 24 foot arterial pavement including curt and gutter;

Contacted Gerhardt Muller 6/10/82 BMA

B. Drainage channel lying south of Units 2 and 10 and north of Units 8 and 9;

"No progress till late fall"

C. Drainage culverts under Ouray Road between detention pond #14 and debris basin discharging into Ladera Golf Course, consisting of the installation of five (5) 100 foot corrugated metal culverts and the extension of four (4) existing culverts from 62 feet to 100 feet; and

Out of town till 1/18/83 per Rus Gutzert — will call

Called 1/25. not available

Mr Muller called 1/25. will respond in 2/1/83

D. Sidewalks and necessary retaining walls along Ouray Road adjacent to Units 3, 6 and 8, consisting of approximately 3050 lineal feet of 4 foot sidewalks, $28,000

which are shown on Exhibit A as A, B, C and D respectively and which are hereinafter referred to as the "Offsite Improvements".

2. Unit 8. The City hereby grants permission to the Developer to develop Unit 8 of El Rancho Atrisco without first

completing the construction of the Offsite Improvements; provided, however, that such permission is contingent upon the Developer's complying with the terms and conditions set forth herein and upon the Developer's complying with all of the City's requirements relative to the development of Unit 8.

3. Future Development. The Developer expressly acknowledges that in order to receive permission from the City to develop other portions of El Rancho Atrisco, including Unit 9, the Offsite Improvements shall have been fully constructed within one (1) year of the date of execution of this Agreement or a Letter of Credit furnished to the City as provided herein.

In lieu of fully constructing the Offsite Improvements within one (1) year of the date of execution of this Agreement or the furnishing of a Letter of Credit as provided herein, the Developer may, within such one (1) year period, provide evidence to the City of a binding contract with a contractor satisfactory to the City for the completion of the construction of the Offsite Improvements within a specified time, which time is subject to the approval of the City, and furnish to the City a performance bond, naming the City as obligee, in the amount of one hundred ten percent (110%) of the estimated cost of the completion of the construction of the Offsite Improvements, based on the contract documents for City-Wide Utilities and Cash Paving No. 30, and which bond ensures the completion of the construction of the Offsite Improvements within the specified time. The Developer expressly agrees that if it elects to utilize this method in lieu of completing the construction of the Offsite Improvements within the one (1) year period or furnishing the Letter of Credit, the City is under no obligation to nor is it required to approve the development of other portions of El Rancho Atrisco, including Unit 9, prior to the completion of construction of the Offsite Improvements.

4. Letter of Credit. In lieu of completing the construction of the Offsite Improvements within one (1) year of the date of execution of this Agreement, the Developer may furnish the City with an irrevocable Letter of Credit, within one (1) year of the date of execution of this Agreement, to ensure the construction of the Offsite Improvements. The Letter of Credit shall be in a form and issued by a financial institution satisfactory to the City and in the amount of one hundred fifty percent (150%) of the estimated cost of construction of the Offsite Improvements, based on the Contract Documents for City-Wide Utilities and Cash Paving No. 30.

5. Indemnity. The Developer agrees to defend, indemnify, hold harmless the City and its officers, agents and employees from and against all suits, actions or claims or any character brought because of any injury or damage received or sustained in any way by any persons, person or property resulting from or arising out of the City's granting permission to the Developer to develop Unit 8 without first completing the construction of the Offsite Improvements or the Developer's failure to have constructed the Offsite Improvements or by reason of any act or omission, neglect or misconduct of the Developer or its agents or employees.

The indemnity required hereunder shall not be limited by reason of the specification of any particular insurance coverage in this Agreement. Nothing herein is intended to impair any right of indemnity under the laws of the State of New Mexico.

6. Insurance.

A. General Conditions: The Developer shall procure and maintain in full force and effect until

completion of the construction of the Offsite Improvements, such insurance as is required herein. Policies of insurance shall be written by companies authorized to write such insurance in New Mexico, and shall be in a form satisfactory to the City and properly filed and approved by the Superintendent of Insurance, State of New Mexico.

The Developer shall furnish the City two (2) copies of certificates of required insurance (or copies of insurance policies if the City calls for them). All certificates of insurance (or policies) shall provide that thirty (30) days' written notice be given to the Risk Manager, City of Albuquerque, Box 1293, Albuquerque, New Mexico, 87103 before a policy is cancelled, materially changed or not renewed. Various types of required insurance may be written in one or more policies.

B. Approval of Insurance: The Developer shall, within thirty (30) days of the date of execution of this Agreement, obtain the insurance required herein and shall file the proper certificates (or policies) with the City.

C. Comprehensive General Liability Insurance Including Automobile: The Developer shall procure and maintain, until completion of the construction of the Offsite Improvements, a comprehensive general liability and automobile insurance policy with liability limits in amounts not less than $1,000,000 single limit of liability for bodily injury, including death, and property damage in any one occurrence.

Said policy of insurance shall include coverage for all operations, coverage for the use of all owned, non-owned, hired automobiles, vehicles and other equipment both on and off work, and contractual liability coverage shall specifically insure the hold harmless provision of this Agreement.

D. Workmen's Compensation Insurance: The Developer shall comply with the provisions of the Workmen's Compensation Act, the Subsequent Injury Act, and the New Mexico Occupational Disease Disablement Law. The Developer shall procure and maintain until completion of the construction of the Offsite Improvements, complete Workmen's Compensation and Employer's Liability Insurance in accordance with New Mexico law and regulations. Such insurance shall include coverage permitted under Section 52-1-10 NMSA 1978, for safety devices. The City, its officers or employees, will not be responsible for any claims or actions occasioned by failure of the Developer to comply with the provisions of this subparagraph.

E. Increased Limits: If, during the life of this Agreement, the Legislature of the State of New Mexico increases the maximum limits of liability under the Tort Claims Act (Sections 41-4-1 through 41-4-25 NMSA 1978) the City may require

the Developer to increase the maximum limits of any Insurance required herein.

7. Failure to Procure and Maintain Insurance. It is expressly agreed by the Developer that the City's granting of permission to the Developer to develop Unit 8 of El Rancho Atrisco as provided herein is contingent upon the Developer's procuring, within thirty (30) days of the date of execution of this Agreement, the insurance specified in Section 6 hereof and maintaining such insurance as provided in Section 6. In the event that the Developer fails to procure or maintain such insurance, the City may, in its sole discretion, terminate this Agreement upon the giving of three (3) days' written notice of such termination to the Developer and upon such termination, the City's granting of permission to the Developer, as specified in Section 2, shall be deemed to have been rescinded.

8. Entire Agreement. This Agreement embodies the whole agreement of the parties. There are no promises, terms, conditions, or obligations other than those contained herein; and this Agreement shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties hereto.

9. This Agreement shall inure to the benefit of and be binding upon the heirs, executors, administrators, assignees, and successors of the respective parties.

IN WITNESS WHEREOF, the City and the Developer have executed this Agreement as of the date first above written.

CITY OF ALBUQUERQUE, NEW MEXICO

By: Frank C. Kleinkuss
Chief Administrative Officer

ATTEST:

City Clerk

DEVELOPER: WESTERN HOLDING

By:

Its: PRESIDENT

REVIEWED BY THE LEGAL DEPARTMENT:

Assistant City Attorney

RECOMMENDED:

2/9/82
City Engineer

RECOMMENDED:

2-9-82
Director, Municipal Development Department

DRAINAGE REPORT

FOR

EL RANCHO ATRISCO, TRACT 2

LADERA DRIVE, OURAY ROAD

SEPTEMBER 1978

Prepared by:

T. T. Burnett Engineering, Inc.
120 Morningside Dr. NE
Albuquerque, New Mexico 87108

Prepared For:

Western Development Co.
619 Truman
Albuquerque, New Mexico 87110

Jean J. Bordenave, N.M.P.E & L.S. #5510

TABLE OF CONTENTS

	PAGE
PURPOSE	1
LOCATION AND TERRAIN	1
PROPOSED DEVELOPMENT	2
UPLAND DRAINAGE	3
INTERNAL DRAINAGE	4
CONCLUSIONS	4

APPENDIX A

INTENSITY DURATION CURVE DEVELOPMENT

APPENDIX B

TRACT 2
INTERNAL DRAINAGE
UPLAND DRAINAGE

LADERA DRIVE

OURAY ROAD

PLATES

I LOCATION MAP

II-A SOILS REPORT INFORMATION

II-B

III INFILTRATION INFORMATION,
ASCE Manual of Engineering Practice No.28 "Hydrology Handbook"

IV EL RANCHO ATRISCO MASTER PLAN

V UPLAND DRAINAGE TOPOGRAPHY

DRAINAGE REPORT

FOR

EL RANCHO ATRISCO, TRACT 2

LADERA DRIVE, OURAY ROAD

PURPOSE

This report is prepared for presentation to governing agencies and the developer of the described tract as a guide in preparation of drainage facilities and grading plans for the proposed development. Implementation of the recommendations of this report will provide stormwater runoff protection for the proposed development as well as downstream developments for the 100 year frequency storm.

LOCATION AND TERRAIN

Tract 2

The tract is located approximately 3/4 mile west of Coors Road and is bounded on the south by Ouray Road and on the north by a drainage channel in the Ladera system, and on the west by the Public Service Company of New Mexico easement from the West Mesa Substation and on the east by the City of Albuquerque Ladera Basin Golf Course. (See Plate I for exact location.)

The entire tract slopes easterly toward the basin at grades of approximately two percent. The northern portion of the tract, due to blowing sand, has no definite drainage pattern. Vegetation is quite sparse, composed of prairie grasses and mesquite. Soils are slightly silty sands and have a high infiltration rate. (See Plates II-A, II-B & III.)

Ladera Drive

Ladera Drive extends from Redlands Road on the north to Ouray Road on the south, and parallels the common boundaries of Tracts 1 and 3 of El Rancho Atrisco. (See Plate 1 for exact location.)

The ground is quite flat through this reach with a variation of no more than one foot in elevation. Vegetation is relatively dense and is composed of prairie grasses. Soils are slightly silty to very silty sands and have a high infiltration rate upon breaking soil surface.

Ouray Road

For the purpose of this report the bounds of Ouray Road are from Ladera Drive on the east to Tract 2 on the west, with the Ladera System Sedimentation Basin to the south.

The grades are quite flat following a contour elevation of 5110. Vegetation is relatively dense and composed of prairie grasses. Soils are very silty sands and have a medium to high infiltration rate.

PROPOSED DEVELOPMENT

Tract 2

The area will be developed for an R-1 subdivision with a density of approximately 3.7 dwelling units per acre. Lots will vary in width from 65 to 80 feet and in depth from 110 to 120 feet. Dwellings will vary from 1700 to 2200 square feet in area. Streets will be 32 feet face to face of curb with 4 foot sidewalks. All rear yards will be ponded.

Ladera Drive

A partial section 25 feet in width is to be constructed immediately with a proposed ultimate section 86 feet in width. Ponding will be adjacent to the street for its full length.

Ouray Road

Ouray Road will be a temporary asphalt section 22 feet in width. The proposed ultimate section for this street is 66 foot four lane divided street. Since the street crosses the proposed detention basin, no ponding will be provided.

UPLAND DRAINAGE

Tract 2 (See Plate IV)

Though extensive storm water channels have been constructed in the area, they are not effective so far as this tract is concerned. Approximately 600 acres drain through the proposed tract from a basin approximately three miles in length with a very narrow width. Approximately one-third of the area being below the escarpment, one-sixth of the area on the escarpment and the remainder of the area atop the mesa. Due to the length to width ratio of this basin, less than one-half the area contributes to the 100 year peak flow.

A ditch and dike section shall be constructed along the western boundary of the property to divert offsite flow to a permanent channel across the subdivision to Ladera Golf Course. Both the ditch and dike section and the main channel shall be designed for velocity less than 2 1/2 feet per second. Drop structures, if required, shall be constructed of derrick stone rip rap. The street crossing of the main channel shall be designed to carry the 100 year flow through culverts.

Ladera Drive

Ladera drive is constructed as a ridge line and is therefore not affected by upland flows.

Ouray Road

Flows were obtained from MacCornack and Burns, Consulting Engineers, for the 100 year and S.P.F. storms. Culverts shall be constructed to carry the 100 year storm.

INTERNAL DRAINAGE

Tract 2 (See Plate V.)

The area shall be designed as a typical R-1 subdivision with a portion of the flows being retained in rear yard ponds and the remainder drained through streets to the Ladera Golf Course. The tract is divided into seven sub-basins.

CONCLUSIONS

Tract 2

Internally developed flows will be of the same magnitude now experienced. Basins have been sized and street grades set such that flows will not reach the top of curb, and flows will exit the tract at points coordinated with the golf course architect.

Ladera Drive

This street has been designed with its own retention system and all flows generated within its right-of-way will be retained onsite. It is recommended that the ultimate roadway section be designed without median curbs due to the very flat grades.

Ouray Road

Ouray Road is designed to carry the 100 year flow of the Ladera System through culverts. It is recommended that that area west of the culverts be backfilled to the roadway elevation when the ultimate section is constructed, thereby allowing the S.P.F. to cross without meeting a dike.

APPENDIX A

INTENSITY DURATION CURVE DEVELOPMENT

JJB 10/77
Sheet 1

El Rancho Atrisco

100YR. PID. CURVE

from NOAA Atlas 2
Volume IV New Mexico

Duration	min, hr	5	10	15	30	1	2	3	6	12	24
Rainfall	in.	0.55	0.86	1.08	1.50	1.90	2.00	2.07	2.2	2.4	2.6
Intensity	in/hr	6.6	5.2	4.3	3.0	1.9	1.0	0.7	0.4	0.2	0.1

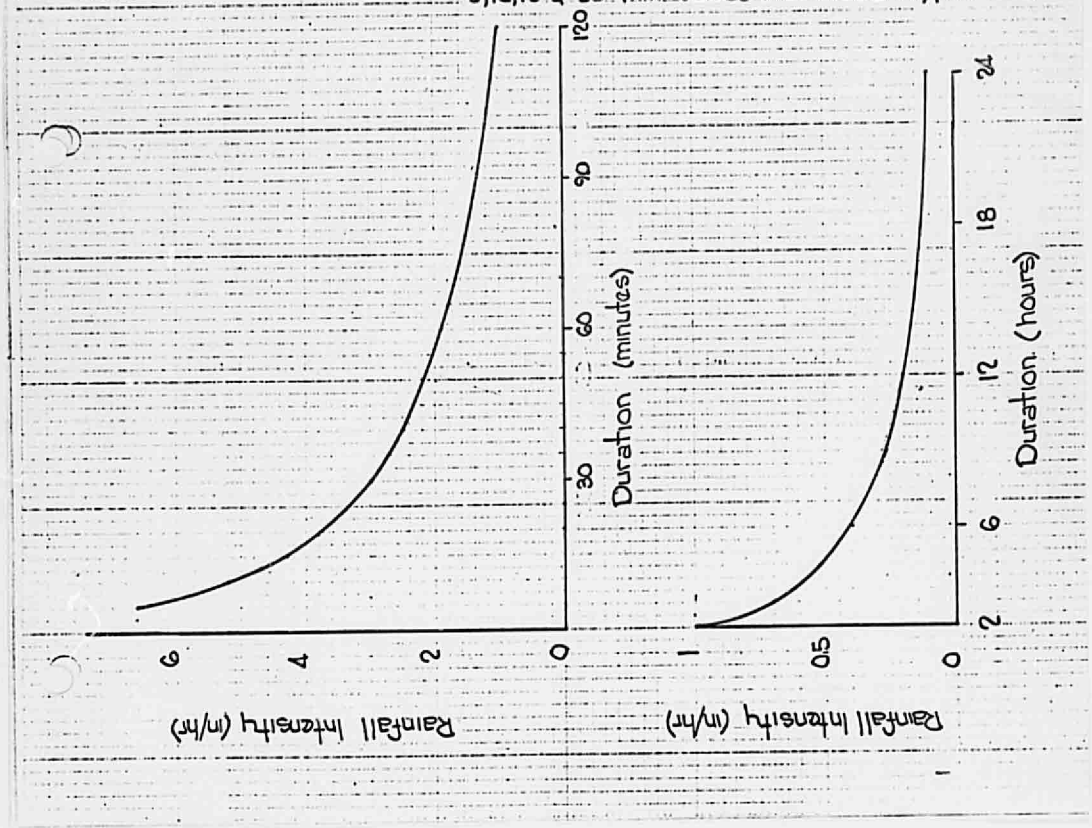
1 hour rainfall = $0.494 + 0.755(2.2)^2/2.6$

Region 2 — 2 hr = $(.341)(2.2) + (.659)(1.9)$

3 hr = $(.569)(2.2) + (.431)(1.9)$

12 hr = from plot fig 16, p.16 NOAA Atlas 2

5, 10, 15 & 30 min. values from table 12, p.16 NOAA Atl



APPENDIX B

TRACT 2

INTERNAL DRAINAGE

UPLAND DRAINAGE

LADERA DRIVE, OURAY ROAD

DRAINAGE REPORT
EL RANCHO ATRISCO - TRACT 2

LOT DRAINAGE SCHEME ~ 75' LOT

assuming approximately equal times of concentration between existing and developed conditions.

Typical lot 75'x115' w/ 50' ROW for street

Existing Condition

Area (SQ.FT.)		C	Effective Area
(75) (115 + 50/2) =	10,500	0.40	4200

Developed Condition (street drainage)

Area (SQ. FT.)				
Street (17)(75)	=	1,275	0.95	1211
Sidewalk (4)(75)	=	300	0.95	285
Drivepad (4)(24)	=	96	0.95	91
Earth (4)(51)	=	204	0.40	82
Front Yard (31)(55)	=	1705	0.30	512
Driveway (25)(20)	=	500	0.95	475
		4080		2656

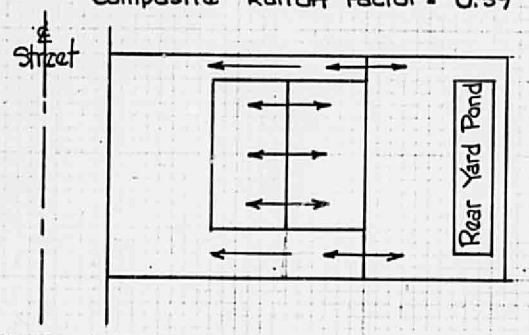
(4200 - 2656)/0.95 = 1625 sq.ft

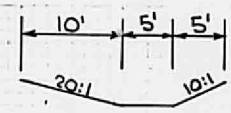
Approx. total House Area = 2400 sq ft.

∴ Drain from back of House toward street and assume half of house drains to street

Area			C	Effective Area
from above		4,080		2,656
Sideyard (20')(55')	=	1,100	0.30	330
1/2 House	=	1,200	0.95	1,140
Rear Yard	=	2,920	0.00	0
1/2 House	=	1,200	0.00	0
		10,500		4,126

Composite Runoff Factor = 0.39





Pond Section

Volume = L (15d² + 5d)

Area = L (5 + 30d) + 100

JJB 8/78

DRAINAGE REPORT
EL RANCHO-ATRISCO ~ TRACT 2

REAR YARD POND ~ 75' Lot

Runoff Source

Area	(SQ. FT.)	Runoff Factor	Effective Area
1/2 House	1200	0.95	1140
Pond (20×75)	1500	1.00	1500
Rear Yard	1420	0.30	426
	4120		3066

Pond Requirement

Runoff Volume = (3066/12) Rainfall = 256 × Rainfall

Infiltration - use 2 in/hr

Storm Duration	Rainfall	Runoff Volume	Ave. Pond Surface		Increm. Infiltration	Accum. Infiltration	Storage Volume
min.	in.	ft^3	ft^2		ft^3	ft^3	ft^3
10	0.86	220	300 940	620	17.22	17	203
20	1.27	325	1089	1015	28.19	45.41 45	280
30	1.50	384	1139	1114	30.95	76.36 76	308
35	1.59	407	1161	1145	15.90	92.26 92	315
40	1.67	428	1160	1156	16.05	108.31 108	320
45	1.75	448	1166	1163	16.16	124.47 124	324
50	1.82	465	1166	1166	16.16	140.63 141	324

Pond Volume = $900\,d^2 + 300\,d$, ft^3; $d = \left[-1 + \sqrt{1 + 0.04\,vol.}\right]/6$, ft.

Surface Area = $300 + 1900\,d$, ft^2

POND STORAGE CAPACITY

@ d = 0.5' Vol = 420 ft^3, % excess = 29%

@ d = 0.7' Vol = 712 ft^3, % excess = 120%

JB 8/78

DRAINAGE REPORT
EL RANCHO ATRISCO ~ TRACT 2

LOT DRAINAGE SCHEME ~ 60' LOT

assuming approximately equal times of concentration between existing and developed conditions.

Typical lot 60' x 105' w/ 50' ROW for street

Existing Condition

Area (SQ FT)		C	Effective Area
(60)(105 + 50/2)	= 7800	0.40	3120

Developed Condition (Street drainage)

Area (SQ. FT.)			C	Effective Area
Street	(17) (60)	= 1020	0.95	969
Sidewalk	(4) (60)	= 240	0.95	228
Drivepad	(4) (24)	= 96	0.95	91
Earth	(4) (36)	= 144	0.40	58
Front Yard	(28) (40)	= 1120	0.30	336
Driveway	(25) (20)	= 500	0.95	475
		3120		2167

(3120 - 2167)/0.95 = 1003 sq. ft.

Approx. total House Area = 1700 ☐

∴ drain from back of house toward street and assume half of house drains to street.

Area		C	Effective Area
from above	3120		2167
Sideyard (1.5)(40)	600	0.30	180
1/2 House	850	0.95	808
Rear yard	2380	0.00	0
1/2 House	850	0.00	0
	7800		3155

Composite Runoff Factor = 3155/7800 = 0.40

JJB 8/78

DRAINAGE REPORT
EL RANCHO ATRISCO ~ TRACT 2

REAR YARD POND ~ 60' LOT

Runoff Source

	Area #	Runoff Coeff.	Effective Area
1/2 House	700	0.95	665
Pond 20×60	1200	1.00	1200
Rear Yard 20×60	1200	0.30	360
			2,225

Pond Requirement

Runoff Volume = (2225/12) Rainfall = 185 Rainfall

Infiltration ~ use 2"/hr

Storm Duration	Rainfall	Runoff Volume	Ave. Pond Surface		Increm. Infiltration	Accum. Infiltration	Storage Volume
min.	in.	ft^3	ft^2		ft^3	ft^3	ft^3
10	0.86	159	225 / 699	462	12.83	13	146
20	1.27	235	810	755	20.96	34	201
30	1.50	278	847	829	23.02	57	221
35	1.59	294	854	851	11.82	69	225
40	1.67	309	860	857	11.90	81	228
45	1.75	324	865	863	11.98	93	231
50	1.82	337	867	866	12.03	105	232

Pond Volume = $675d^2 + 225d$, ft^3; $d = \left[-1 + \sqrt{1 + 0.0533\,Vol.}\right]/6$, ft.

Surface Area = $225 + 1450d$, ft^2

POND STORAGE CAPACITY

@ d = 0.5', Vol = 325 ft^3, % excess = 40%

@ d = 0.7', Vol = 550 ft^3, % excess = 137%

STREET	FROM	TO	No. of Lots Area symbol	A acres	C	AC	ΣAC	T min.	I in./hr.	Q c.f.s.	Slope %	Length ft.	Vel. ft/sec	ΔT min.	Allow. Q	NOTES
A	Ouray Rd										2.5	300	1.7	2.9		Provide 0.3' Water Block @ Ouray
		Road B	10	3.2	0.40	1.28	1.28	8	5.6	7					196	
B	Road A										0.6	250	2.2	1.9		
		Road C	4	1.3	0.40	0.52	1.80	10	5.2	9					96	
B	Road C										0.6	200	2.5	1.3		
		Ouray Rd	11	3.5	0.40	1.40	3.20	11	5.0	16					96	

STORM DRAINAGE COMPUTATIONS

BASIN A
0.32 Acres/lot Ave

BASED ON RATIONAL METHOD Q = CIA

Q = Design peak runoff rate in c.f.s.
C = Runoff coefficient
I = Rainfall intensity in in./hr. for 100

STREET	FROM	TO	No. of Lots	A acres	C	AC	ΣAC	T min.	I in./hr.	Q c.f.s.	Slope %	Length ft.	Vel. ft/sec	ΔT min.	Allow. Q	NOTES
A	Cul de Sac										1.8	300	2.2	2.3		
		Ouray	13	3.9	0.40	1.56	1.56	7	5.8	9					166	Use 5 min. + street travel time
Ouray	Road A										0.8	300	2.1	2.4		
		Road B	13	3.9	0.40	1.56	3.12	10	5.2	16					140	
Ouray	Road B										0.8	500	3.0	2.8		
		Channel	14	4.2	0.40	1.68	4.80	12	4.7	23					140	23 cfs Peak Flow from Basin in Developed Condition

BASED ON RATIONAL METHOD Q = CIA

STORM DRAINAGE COMPUTATIONS

BASIN B
0.30 Acres/Lot Ave.
EL RANCHO ATRISCO ~ TRACT 2

Q = Peak runoff [illegible]
C = Runoff coefficient
A = Watershed area in acres

I = Rainfall intensity in in./hr. for 100 [illegible] storm [illegible] relationships [illegible] Appendix [illegible]

STREET	FROM	TO	No. of Lots	A acres	C	AC	ΣAC	T min.	I in./hr.	Q c.f.s.	Slope %	Length ft.	Vel. ft./sec	ΔT min.	Allow. Q	NOTES
A	Ouray										2.2	450	2.7	2.8		Provide 0.3' water block @ Ouray
		B	13	3.0	0.40	1.2	1.2	8	5.6	7					184	
B	A										0.6	250	2.0	2.1		
		C	18	4.1	0.40	1.7	2.9	10	5.2	15					96	
B	C										0.5	300	2.0	2.5		
		Channel	21	4.8	0.40	1.9	4.8	12	4.8	23					84	
																Opening to channel - Use broad crested weir w/ C = 2.6 and due to probable turbulence from flow confluence use velocity of approach = 0
																$Q = CL\,H^{3/2}$
																$23 = 2.6\,L\,(0.67)^{3/2}$
																Min L = 12'
TOTAL	RUNOFF	BASIN B & C														
DEVELOPED																
From this sheet										23						
From previous sheet										23						
										46						
NATURAL				24	0.40	9.6	9.6	23	3.4	33	2	1000	–	23		

STORM DRAINAGE COMPUTATIONS

BASIN C
0.23. Acres/lot Ave.
El Rancho Atrisco Tract 2

BASED ON RATIONAL METHOD Q = CIA

Q = Design peak runoff rate in c.f.s.
C = Runoff coefficient

I = Rainfall intensity in in./hr. for 100 year storm. Intensity-duration
See Appendix A

STREET	FROM	TO	Nack Lots ~~Area Symbol~~	A acres	C	AC	ΣAC	T min.	I in./hr.	Q c.f.s.	Slope %	Length ft.	Vel. ft./sec	ΔT min.	Allow. Q	NOTES
A	High Point		Park	3.5	0.20	0.70					1.7	600	2.3	9		
		Road B	27	7.8	0.40	3.12	3.82	9	5.2	20					160	
B	Road A										0.4	280	2.1	2.2		
		Road C	15	4.3	0.40	1.72	5.54	11	5.0	28					87	
B	Road C										0.4	280	2.4	1.9		
		Road D	26	7.5	0.40	3.00	3.54	13	4.5	38					87	
B	Road D										0.4	400	2.7			
		Channel													87	Depth of flow = provide 0.8'± water block @ Road E, BASIN E
																PROVIDE CURB RUNDOWN to Channel

BASIN D

STORM DRAINAGE COMPUTATIONS

0.288 Acres/Lot Ave

El Rancho Atrisco - Tract 2

BASED ON RATIONAL METHOD Q = CIA

Q = Design peak runoff rate in c.f.s.
C = Runoff coefficient
A = Watershed area in acres

I = Rainfall intensity in in./hr. for 100 year storm. Intensity-duration relationship See Appendix A

STREET	FROM	TO	No. of Lots	A acres	C	AC	ΣAC	T min.	I in./hr.	Q c.f.s.	Slope %	Length ft.	Vel. ft./sec	ΔT min.	Allow. Q
A	Cul de Sac	Road B	13	3.8	0.40	1.52	1.52	8	5.6	9	1.1	350	1.8	3.2	130
B	Road A	Road C	16	4.7	0.40	1.88	3.40	11	5.0	17	0.4	280	2.0	2.3	78
B	Road C	Road D	16	4.7	0.40	1.88	5.28	13	4.5	24	0.4	280	1.9	2.5	78
B	Road D	Channel	20	5.8	0.40	2.32	7.60	15	4.3	33	0.4	280	2.3	2.0	78

NOTES

Opening to Channel - Use broad Crested Weir w/ C = 2.6 and due to probable turbulence from flow confluence use velocity of approach = 0

$Q = CLH^{3/2}$

$33 = 2.6\ L\ 0.67^{3/2}$

Min. L = 17'

BASED ON RATIONAL METHOD Q = CIA

STORM DRAINAGE COMPUTATIONS

BASIN E
0.292 Acres/lot Ave.
EL RANCHO ATRISCO TRACT 2
Project

Q = Design peak runoff rate in c.f.s.
C = Runoff coefficient
A = Watershed area in acres

I = Rainfall intensity in in./hr. for 100 year storm. Intensity-duration relationship see Appendix

STREET	FROM	TO	No. of Lots Area Symbol	A acres	C	AC	ΣAC	T min.	I in./hr.	Q c.f.s.	Slope %	Length ft.	Vel. ft./sec	ΔT min.	Allow. Q	NOTES
A	Road B										0.3	300	1.3	3.8		
		Road D	22	6.4	0.40	2.56	2.56	9	5.2	13						
D	Road A										1.3	300	2.4	2.1		
		Road C	24	7.0	0.40	2.80	5.36	11	5.0	27						
D	Road C										1.0	300	3.0	1.7		
		Road E	–				5.36			27						
E	Road D										0.3	300	2.1	2.4		
		Road F	4	1.2	0.40	0.48	5.84	15	4.3	25						Note: Use 27 cfs
F	Road E										1.1	900	3.1	4.8		
		Road H	23	6.7	0.40	2.68	8.52	20	3.8	32						
H	Road F										–	–				
		Channel	30	8.7	0.40	3.48	12.0	20	3.8	46						Opening to Channel - Use broad crested weir w/ C = 2.6 and velocity of approach = 0

$Q = CLH^{3/2}$

$46 = 2.6\,L\,0.87^{3/2}$

MIN. L = 22'

STORM DRAINAGE COMPUTATIONS

BASIN F
0.291 Acres/Lot Ave
EL RANCHO ATRISCO ~ TRACT 2

BASED ON RATIONAL METHOD Q = CIA

Q = Design peak runoff rate in c.f.s.
C = Runoff coefficient
A = Watershed area in acres

I = Rainfall intensity in in./hr. for 100 year storm, intensity-duration relationship: Appendix A

STREET	FROM	TO	No. of Lots ~~Area~~	A acres	C	AC	ΣAC	T min.	I in./hr.	Q c.f.s.	Slope %	Length ft.	Vol. ft./sec	ΔT min.	Allow. Q	NOTES
A	Cul de Sac										1.7	300	2.1	2.4		
		Street B	14	3.9	0.40	1.56	1.56	7	5.8	9						
A	Street B										1.7	300	2.9	1.7		
		Street C	3	0.8	0.40	0.33	1.89	9	5.2	10						
C	Street A										0.8	240	2.0	2.0		
		Street D	9	2.5	0.40	1.00	2.89	11	5.0	14						
D	Street C										1.6	450	2.8	2.7		
		Street E	18	5.0	0.40	2.00	4.89	14	4.4	22						
D	Street E										1.3	300	3.1	1.6		
		Channel	37	10.3	0.40	4.11	9.00	15	4.3	39						

Opening to Channel - Use Broad Crested Weir w/ C = 2.6 and velocity of approach = 0 fps located approximately 6.5' South of street D ℄ to ℄ (see below)

$Q = C L H^{3/2}$

$39 = 2.6\ L\ 0.87^{3/2}$

Min L = 19'

Acres = 5.3
V = 3.1
Q = 22.8 cfs

Acres = 1.1
V = 1.4
Q = 4.7 cfs

Acres = 2.6
V = 1.9
Q = 11.2 cfs

1.00
0.21
Q = 39 cfs, V = use 0 fps

@ T = 15 min, I = 4.3 in/hr

STORM DRAINAGE COMPUTATIONS

BASIN G
0.278 Acres/Lot Ave.
EL RANCHO ATRISCO ~ TRACT 2

BASED ON RATIONAL METHOD Q = CIA

Q = Design peak runoff rate in c.f.s.
C = Runoff coefficient
A = Watershed area in acres

I = Rainfall intensity in in./hr. for 100 year storm. Intensity-duration relationship: See Appendix A

DRAINAGE REPORT
EL RANCHO ATRISCO-TRACT 2

CHANNEL DESIGN

Basin C

concrete lined w/ 10' bottom and max. water depth = 1'0"
Q = 23 cfs, n = 0.013; min. slope = 0.0005% @ d = 1.00'
crit. slope = 0.0034% @ d = 0.55'

Basin E

concrete lined w/ 10' bottom and max. water depth = 1'
Q = 33 cfs, n = 0.013; min. slope = 0.0011% @ d = 1.00'
crit. slope = 0.0033% @ d = 0.70'

Basin F

concrete lined w/ 10' bottom and max. water depth = 1'
Q = 46 cfs, n = 0.013; min. slope = 0.0021% @ d = 1.00'
crit. slope = 0.0034% @ d = 0.59'

Basin G

concrete lined w/ 10' bottom @ max. water depth = 1'
Q = 39 cfs, n = 0.013; min. slope = 0.0015% @ d = 1.00'
crit. slope = 0.0032% @ d = 0.78'

DRAINAGE REPORT
EL RANCHO ATRISCO - TRACT 2

UPLAND DRAINAGE

Reference 1. "Peak rates of Discharge for Small Watersheds" Chapter 2 as revised 10/73 for New Mexico Engineering Field Manual for Conservation Practices, U.S. Soil Conservation Practices,

2. Plate № 3 Drainage Basin Topographic Map

Runoff Source

	Acres	Cover Type	Cover %	Soil Type	Curve No.
Area 1	26	Herb.	50	B	72
Area 2	164	Herb.	50	B	72
Area 3	101	Des. Br.	20	C	88
Area 4A	166	Herb.	50	B	72
4B	130	Herb	50	B	72

Use Distribution Curve No = 75

100 Year Peak Flows (24 hr. rainfall = 2.6 in.)

from Area 1

overland flow Length = 1,400', Slope = 1.4%

from Fig. 2-3 Alluvial Fan, Vel. = 2.0 fps

$T_c = 1400/(2.0)(3600) = 0.19$ hr

Runoff Vol. Fig. 2-4 w/ CN = 72, Q = 0.6 in.

Runoff Rate Fig. 2-5 = 1.5 cfs/acre/inch

= (1.5)(26)(0.6) = 23 cfs

from Areas 1, 2 & 3

overland flow length = 1600', Slope = 12%, upland gullies

= 2700', = 1.7%, grassed waterway

from Fig. 2-3 $V_1 = 7$ fps, $V_2 = 2$ fps

$T_c = (1600/7 + 2700/2)/3600 = 0.44$ hr

DRAINAGE REPORT
EL RANCHO ATRISCO-TRACT 2

UPLAND DRAINAGE

100 Year Peak Flows (cont.)

From Areas 1,2 & 3

Weighted CN

Ac.	CN	Weighted CN
26	72	6.4
164	72	40.6
101	88	30.5
291		77.5

from Fig. 2-4 Runoff Vol = 0.8 in

2-5 Runoff Rate = 1.15 cfs/acre/in

=(1.15)(0.8)(291) = 268 cfs

from Areas 1,2,3 & 4a

overland flow length = 5100, slope = 2.4% grassed waterway

= 1600, = 12%, upland gullies

= 2700, = 1.7%, grassed waterway

from Fig. 2-3 V_1 = 2.4fps, V_2 = 7 fps, V_3 = 2 fps

T_c = (5100/2.4 + 1600/7 + 2700/2)/3600 = 1.03 hr.

Weighted CN

Ac	CN	Weighted CN
26	72	4.1
164	72	25.8
101	88	19.4
166	72	26.2
457		75.5

from Fig. 2-4 Runoff Vol = 0.72 in.

2-5 Runoff Rate = 0.72 cfs/acre/in

=(0.72)(0.72)(457) = 237 cfs

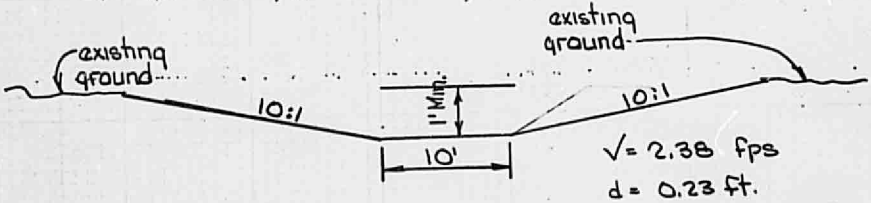
NOTE: due to basin shape Runoff Rate peak beyond area 3 can be expected to drop. Use 300 cfs to allow for portion of Area 4A.

DRAINAGE REPORT
EL RANCHO ATRISCO - TRACT 2

CHANNEL DESIGN

Offsite along Power Line

Use existing road , max. velocity = 2.5 fps
Q = 23 cfs , n = 0.045 ; approx. existing grade = 2%

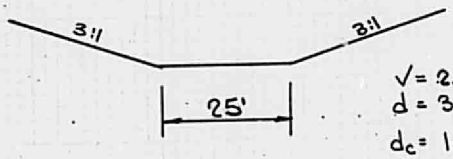


V = 2.38 fps
d = 0.23 ft.
critical depth = 0.21 ft.

Shaped Roadway Section

Onsite Between Basins B & D or C & E

Use Q = 300 cfs , earth channel n = 0.030, s = 0.0005%

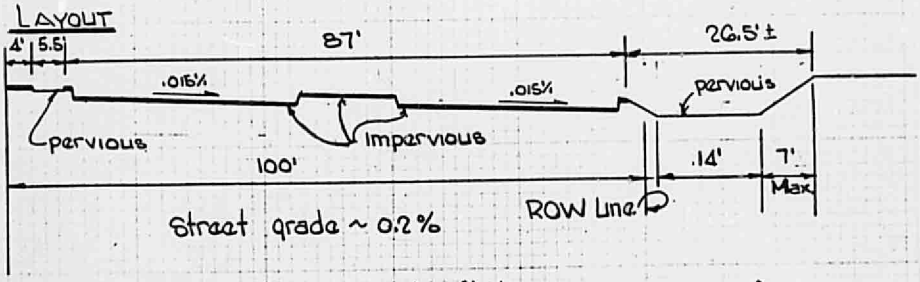


V = 2.20 fps
d = 3.76 ft.
d_c = 1.54 ft.
V_c = 6.56 fps

Culverts (use pipe w/ beveled ends)
w/ inlet control see Plate
300/5 = 60 cfs/pipe , HW/D = 1.2 Headwater = 4.2'
w/ outlet control see Plate
use length = 80' , H = 2' 2 + 3.76 = 5.76'

DRAINAGE REPORT
EL RANCHO ATRISCO - TRACT 3 - LADERA DRIVE

LAYOUT



RUNOFF SOURCE (use 100' length to increase accuracy)

		Area	C
Sidewalk	(100)(4)	400	0.95
Sidewalk to Curb	(100)(5.5)	550	0.40
Out to Out Street	(100)(87)	8700	0.95
Pond	(100)(26.5)	2650	1.00
		12,350	

RUNOFF VOLUME

$$[(400+8700)0.95 + 550(0.40) + 2650(1.00)]/12 = 960 \times \text{Rainfall}$$

POND VOLUME (assume a bottom width of 14', infiltration - 1"/hr)

Storm Duration	Rainfall	Runoff Volume	Ave. Pond Surface		Increm. Infiltration	Accum. Infiltration	Storage Volume
min.	in.	ft^3	ft^2		ft^3	ft^3	ft^3
10	0.86	826	1400 1610	1505	21	21	805
30	1.50	1440	1801	1705	47	68	1372
60	1.90	1824	1810	1805	75	143	1681
70	1.95	1872	1815	1812	25	168	$\boxed{1704}$
75	1.955	1877	1814	1814	13	181	1696

Max. Vol. = $1704 ft^3$ @ 70 min.

Pond Volume = $200d^2 + 1400d$, ft^3 ; $d = [-1 + \sqrt{1 + 0.0004 Vol}]/0.2857$,
Surface Area = $1400 + 400d$, ft^2

DRAINAGE REPORT JJB 8/78

EL RANCHO ATRISCO ~ TRACT 1 ~ OURAY ROAD

LADERA BASIN CROSSING

Outlet Flows from Sedimentation Basin (#15)

from MacCornack & Burns, Consulting Engineers

Q_{100} = 885 cfs

Q_{spf} = 20,209 cfs

Culvert Required

try 9 - 48" ϕ CMP

885/9 = 98 cfs/pipe

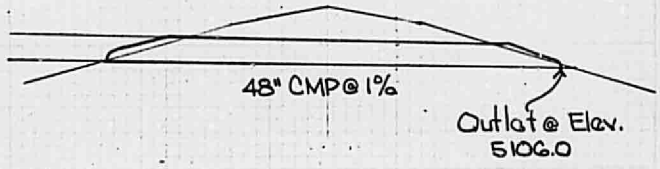
w/inlet control - assume end sections

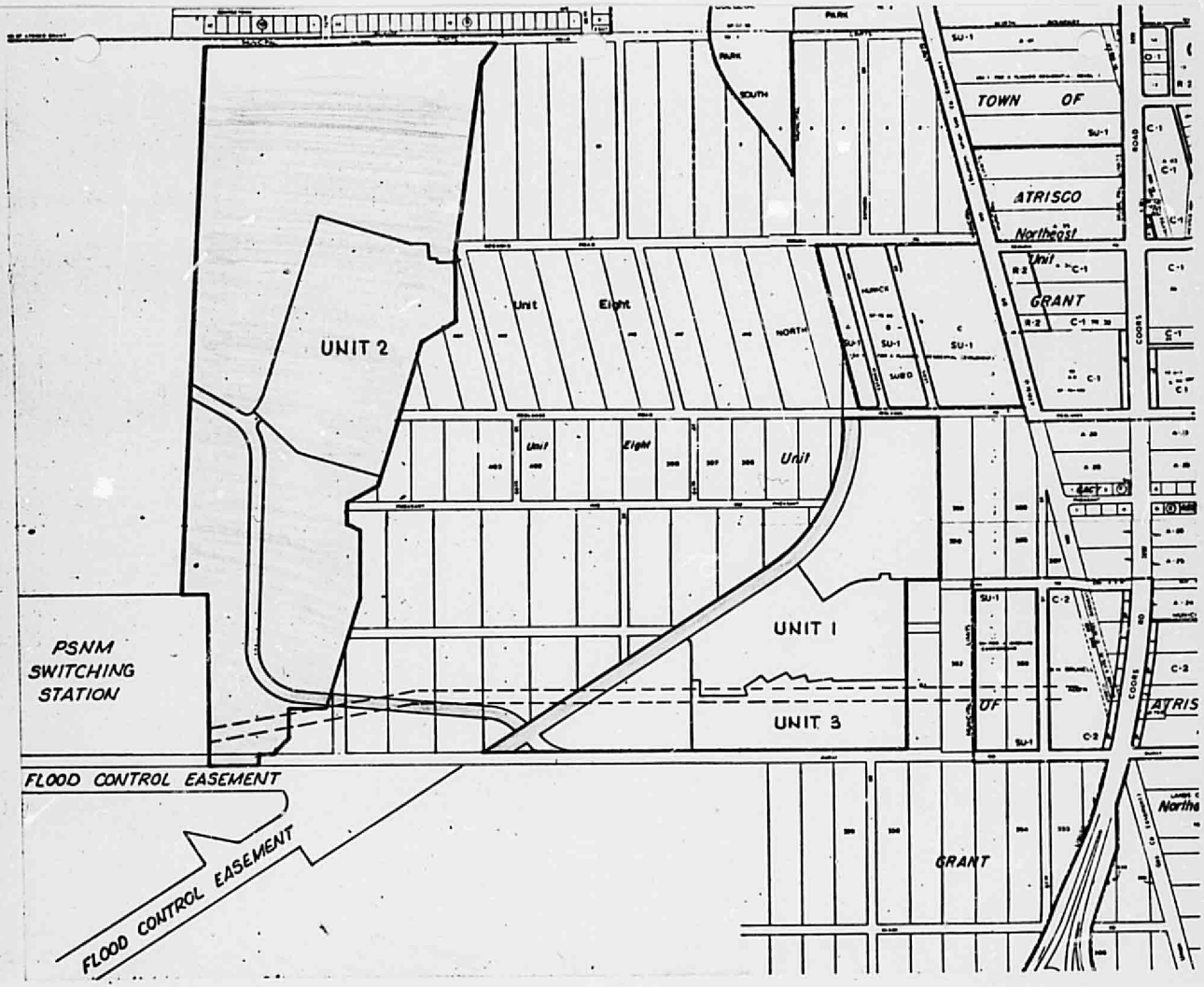
HW = 1.3' D = 5.2'

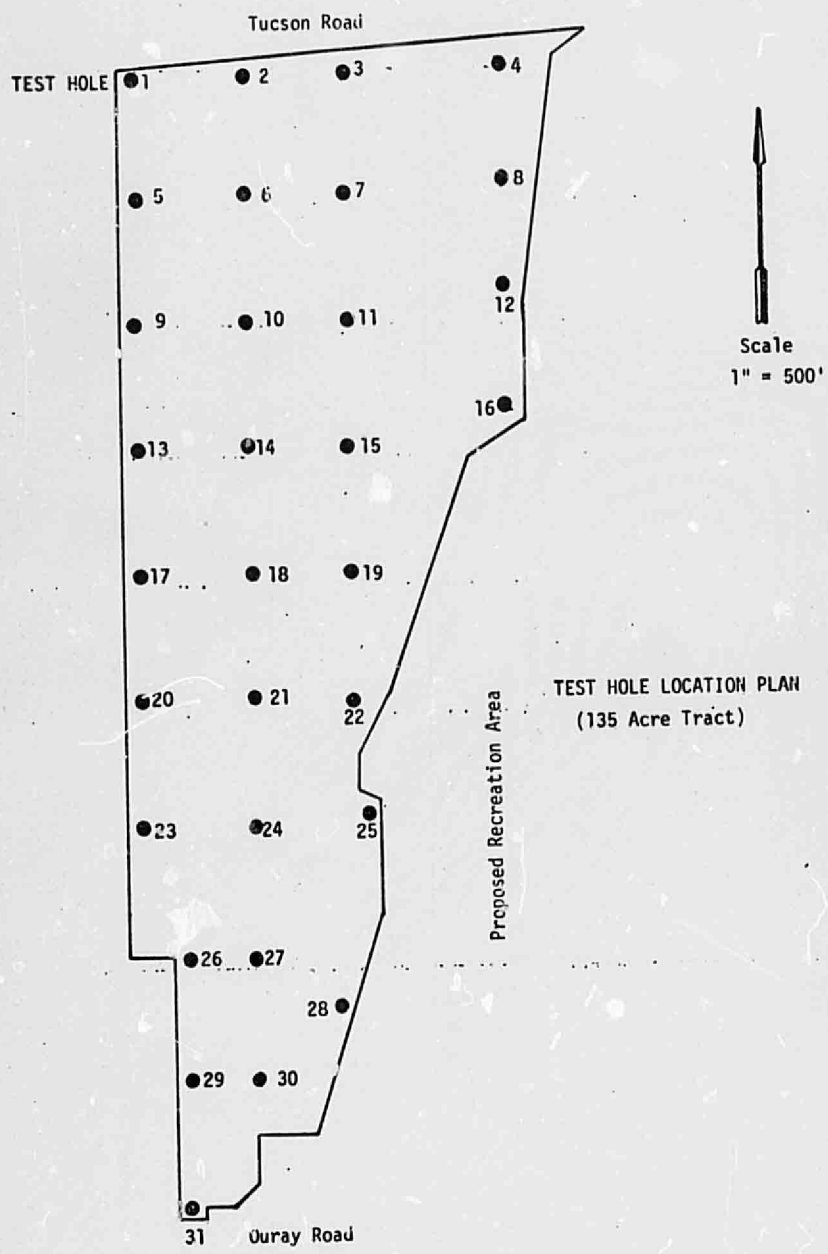
w/outlet control - from AMAFCA 100yr pond @ 5109.75

H = 3.3'

5109.75 + 3.3 = 5113.05 Set T.C. @ 5114




UNIT 2
Unit
Eight
NORTH
PARK
SOUTH
TOWN OF
ATRISCO
Northeast
GRANT
Unit
Eight
Unit
UNIT 1
UNIT 3
PSNM
SWITCHING
STATION
FLOOD CONTROL EASEMENT
FLOOD CONTROL EASEMENT
GRANT
COORS
ROAD



TEST HOLE LOCATION PLAN
(135 Acre Tract)

Figure 1

SUMMARY OF LABORATORY TEST DATA

Hole No.	Depth of Sample (ft)	Natural Dry Density (pcf)	Natural Moisture Content (%)	Atterberg Limits LL	Atterberg Limits PI	Sieve Analysis % Passing No. 4	No. 10	No. 40	No. 200	Soil Description	Remarks
7	2	100	1.3	NV	NP	100	100	98	9	slightly silty SAND	Figure 10
8	1	101	1.7	NV	NP	100	100	92	8	slightly silty SAND	Figure 10
16	5	109	5.2	22	3	100	99	94	44	very silty SAND	Figure 11
17	2	102	2.7	NV	NP	100	100	97	14	silty SAND	Figure 11
18	6	105	2.2	NV	NP	98	97	84	33	silty SAND	Figure 12
20	5	108	1.4	NV	NP	100	99	80	10	slightly silty SAND	Figure 12
26	5	105	5.4	NV	NP	100	100	95	26	silty SAND	Figure 13
26	14	112	5.4	NV	NP	100	100	99	51	very sandy SILT	
28	6	97	8.3	NV	NP	100	100	95	55	sandy SILT	Figure 13

Table 1

(*d*) Usual summertime condition (not recently cultivated and at least 1 in. of rain since last cultivation; not excessively trampled or otherwise compacted).

An easily described point on a standard curve for bare soil may be selected as a sort of "characteristic" of that soil. The infiltration capacity for a few broad classes of soil after 1 hour (f_1) of continuous rainfall is given in Table 9, in which, in the interest of simplicity, only the following three classes are mentioned in Table 9.

TABLE 9.—VALUES OF f_1 (INFILTRATION CAPACITY SHOWN BY STANDARD CURVE AT TIME OF 1 HOUR) FOR BARE SOILS

Soil group	Range in f_1 (in. per hr)
High	0.50 to 1.00
Intermediate	0.10 to 0.50
Low	0.01 to 0.10

Sandy Soil.—A soil containing a high proportion of sand particles and a low proportion of fine materials and, consequently, relatively incohesive and structureless. (For purposes of scientific classification, soil physicists define a soil as sandy if its sand content exceeds 80%; sand being defined as particles from 2 mm to 0.05 mm in diameter.)

Clay Soil.—A soil containing a sufficiently high proportion of clay to make it "heavy" and plastic and sticky at high moisture contents. (Under the scheme of classification previously mentioned, a clay soil is one that contains more than 30% clay, clay being defined as particles smaller than 0.002 mm.)

Loam.—In everyday use the term loam has a very general and indefinite meaning, being applied to any soil that contains a sufficient variety of particle sizes and enough organic matter to produce the aggregated structure which gives a soil the quality of being "friable," the characteristic most generally associated with the term loam. (To qualify for classification as a loam by soil physicists, a soil must contain less than 20% clay and a preponderance of silt particles and (or) fine sand, silt being defined as particles from 0.002 mm to 0.05 mm in diameter. However, in scientific classification loams are subdivided into numerous classes.)

The soil characteristics of the groups given in Table 9 are as follows:

High Group.—Embraces many sandy soils but also includes open-structured soils of other textures, particularly the most friable of the silt loams.

The higher values of f_1 in the range indicated are ordinarily associated with relatively loose and porous sandy soils. Some soils that appear quite coarse upon casual inspection actually contain considerable proportions of fine material. When such soils are subjected to the pelting of raindrops the fine particles tend to block the entrances to the larger pores, forming a thin layer that largely controls the rate of infiltration, making it much lower than would be the case were the drops prevented from striking the soil surface by vegetal cover, humus, or mulch.

The lower values are associated with soils characterized by a low clay content, a high organic matter content, a high degree of aggregation, and relatively small amounts of swelling and shrinking with change in moisture content. (Useful indicators: Easy tillage with absence of clod formation over a wide

range of moisture content; little or no tendency for surface crust to form on tilled land after rain; vigorous natural vegetation and good crops when properly managed; and quick disappearance of standing water after rain.)

Intermediate Group.—The higher values of f_1 in the range indicated are associated with soils approaching the "high group" in structural and other characteristics.

The lower values are associated with soils approaching the "low group" in structural and other characteristics.

The central values are associated with the loams typical of the better agricultural regions. These typical loams contain considerable clay and much silt, but are rather highly aggregated and, therefore, friable at ordinary moisture contents. (Useful indicators: Fairly easy tillage and little trouble with clod formation at ordinary moisture contents; clods and surface crusts break down readily; little checking or cracking when dry; fairly sticky when wet; and good crops under proper management.)

Low Group.—Embraces most clays and clay loams, but also includes soils of other texture that are dense in structure.

The higher values of f_1 in the range indicated are ordinarily associated with the heavy loams. Such loams are characterized by a high clay content, a low degree of aggregation (dense structure), and excessive swelling and shrinking with change in moisture content. (Useful indicators: Cracking of the surface during dry periods—soils that check and crack during dry periods almost always have low infiltration capacities when wet, but it must be kept in mind that, when these soils are extensively and deeply cracked, the initial rainfall during a storm will be infiltrated at a high rate; as soon as the soil becomes wetted, and the cracks are closed by the resultant swelling, the infiltration capacity will decrease rapidly to the low rates associated with these heavy soils; a very narrow range of moisture content in which tillage is possible without excessive formation of long lasting clods; extreme stickiness when wet; a strong tendency for tilled land to crust after rain; usually inferior natural vegetation; and slow disappearance of standing water after rains.)

TABLE 10.—COVER FACTORS

Cover[a]		Range in value of cover factor[b]
Type	Condition	
Permanent (forest and grass)	Good	3.0 to 7.5
	Medium	2.0 to 3.0
	Poor	1.2 to 1.4
Close growing crops	Good	2.5 to 3.0
	Medium	1.6 to 2.0
	Poor	1.1 to 1.3
Row crop	Good	1.3 to 1.5
	Medium	1.1 to 1.3
	Poor	1.0 to 1.1

[a] The covers referred to are described in the text. [b] This factor is the ratio of f_1 for given soil with cover to f_1 for same soil without cover.

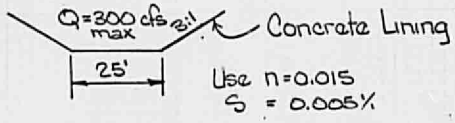
The lower values are usually associated with the clay soils. These soils are stickier and denser than the heavy loams previously described and are highly plastic when wet.

The profound influence of cover upon the infiltration capacity of a soil is shown by the factors in Table 10, which give the general magnitude of this

DRAINAGE REPORT
EL RANCHO ATRISCO - TRACT 2

DROP STRUCTURES

Approach Channel



Use n=0.015
S = 0.005%

@ Q, cfs	d_n, ft.	V_n, fps	d_c, ft.	V_c, fps
50	0.92	1.96	0.49	3.86
100	1.38	2.49	0.77	4.77
200	2.05	3.12	1.20	5.85
300	2.57	3.56	1.54	6.56

Chute

Assumptions

1. water @ drop has free fall condition and chute velocity is therefore computed on this condition. (this will produce max. possible velocity)
2. depth of flow @ top of chute is $0.8 d_c$
3. height of drop = 3.5 feet and max. vertical component of chute velocity is 3.5 fps ∴
4. chute section same as channel section

@ Q, cfs	d_{crest}, ft. $= 0.8 d_c$	A_{crest}, ft²	V_{crest}, fps	V_{chute}, fps max. possible
50	0.39	10.21	4.90	6.0
100	0.62	16.65	6.00	6.95
200	0.96	26.76	7.47	8.25
300	1.23	35.29	8.50	9.19

$$A = 25 d_{crest} + 3 d_{crest}^2$$

DRAINAGE REPORT
EL RANCHO ATRISCO - TRACT 2

DROP STRUCTURES

Chute (cont.)

@Q, cfs	Vchute, fps	Achute, ft.²	dchute, ft.	Froude Number	[illegible], ft.
50	6.0	8.33	0.32	1.9	[illegible]
100	6.95	14.39	0.54	1.7	[illegible]
200	8.25	24.24	0.88	1.5	[illegible]
300	9.19	32.64	1.15	1.5	[illegible]

Froude Number less than 2.5 for flow range ∴ no actual jump
No means of energy dissipation required.
Place end sill on drop structure to form plunge pool.