A14/D2

0000 0000 0820

A14/D2

25×10 32×10

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FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 1, 1983

Mr. Dennis Lorenz
Espey, Huston and Associates, Inc.
4801 Indian School Road NE Suite 204
Albuquerque, NM 87110

REF: DRAINAGE REPORT FOR LAS TIENDAS SHOPPING CENTER (A14-D2)

Dear Mr. Lorenz:

The subject drainage plan dated November 8, 1983, is approved.

This approved plan will need to be included in the construction plans prior to sign-off and release of the building permit.

Also, for our records, would you please submit a signed copy of the permit with MRGCD for crossing the Corrales Acequia.

If I can be of further assistance, please contact me at 766-7644.

Yours truly,

Billy J. Goolsby

Billy J. Goolsby, PE
Civil Engineer/Hydrology

BJG:mrk

cc: Roger Byrnes

MUNICIPAL DEVELOPMENT DEPARTMENT

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

AN EQUAL OPPORTUNITY EMPLOYER

25×10 32×10

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MIDDLE RIO GRANDE CONSERVANCY DISTRICT
POST OFFICE BOX 581
1930 SECOND ST., S.W. PHONE 243-6796
ALBUQUERQUE, NEW MEXICO 87103

August 5, 1983

RECEIVED
Espy, Huston & Assoc. Inc.
Albuquerque, N.M.

AUG 8 1983

Mr. Billy J. Goolsby
Espy, Huston & Assoc.
4801 Indian School Rd. NE, Suite 204
Albuquerque, NM 87110

Dear Mr. Goolsby:

We are enclosing three copies of three licenses issued to Mr.John Black to install and maintain drain pipes under the Corrales Acequia in the following dimensions and stations:

1. 18" diameter at station 258+15±.
2. 10" diameter at station 251+90±.
3. 6" diameter at station 262+65±.

These licenses have been approved by both the Bureau of Reclamation and the District.

Please sign and date all three copies of each license, retain the originals, and return two signed copies of each to this office. Also, please be sure to notify Mr. Robert White, Albuquerque Division Manager, prior to installations.

Sincerely,

Charles R. Martinez
General Manager

CRM:cj
Enclosures

25×10 32×10

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ESPEY, HUSTON & ASSOCIATES, INC.
Engineering & Environmental Consultants
4801 INDIAN SCHOOL ROAD, N.E., SUITE 204
ALBUQUERQUE, N.M. 87110
(505) 255-1625

RECEIVED
FEB 15 1983
CITY ENGINEER

CORPORATE OFFICE
P.O. BOX 519
AUSTIN, TEXAS 78767

February 11, 1983

Mr. Chuck Easterling, P.E.
City of Albuquerque
Post Office Box 1293
Albuquerque, New Mexico 87103

SUBJECT: Las Tiendas Shopping Center
Conceptual Drainage Plan

Dear Chuck:

On September 10, 1982 we received approval for the subject document. The developer and architect have made some minor modifications to the site plan at the request of the EPC. The changes are principally in the building locations.

We have completed the revisions in our original report caused by the changes discussed above. The net result is the additional ponding area shown on the attached Conceptual Drainage Plan.

Since the method of calculation was the same as in the approved plan, the rate of discharge from the site has not changed and modifications are minor, we will not resubmit the entire report. If you agree with the changes shown on the revised Conceptual Drainage Plan, please acknowledge by signing in the appropriate place below and returning the original.

Very truly yours,

Mike Rengel

Mike Rengel, P.E.
Albuquerque Office Manager
Senior Staff Engineer

/cs

enclosure

D14-D2

Approved: City of Albuquerque
Engineering Department

By: Jim Fitch

Date: 3/7/83

25×10 32×10

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

A14 - D2

September 10, 1982

Mr. Mike Rengel
Espey, Huston & Associates, Inc.
4801 Indian School Road N.E., Suite 204
Albuquerque, N.M. 87110

RE: CONCEPTUAL GRADING AND DRAINAGE REPORT, LAS TIENDAS SHOPPING CENTER

Dear Mr. Rengel:

The above referenced conceptual grading and drainage plan is approved based on your submittal dated Aug. 27, 1982. Before any construction drawings are approved a detailed drainage and grading plan must be approved by this office. Enclosed in this plan must be a recorded document from the property owners to the east of this development accepting the proposed discharge, also licensing from the M.R.G.C.D. must be obtained to cross the Corrales Acequia.

If I can be of any further help, please call.

Sincerely,

Jim Fink

Jim Fink
Civil Engineer/Hydrology

JF/tsl

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

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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

install and maintain a 10" Ø drain pipe for buried crossing at Corrales Acequia, station 251+09±.

at Corrales Acequia, Sec. 5, T.11 N, R.3 E, Map 21, tract "F", station 251+09±.

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

John Black, c/o Bery, Huston & Assoc. - Billy J. Coolsby, 4801 Indian School Road NE, Suite 204, Albuquerque, NM 87110

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 Mr. Robert White, Albuquerque Division Manager, telephone 243-6736 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

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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: Charles L. Martinez
General Manager

DATE: July 6, 1983

BY: Joe D. Black
Licensee

DATE: Dec. 8, 1983

APPROVED:

BUREAU OF RECLAMATION

BY: Charles A. Collins

DATE: 8/1/83

FINAL CONSTRUCTION APPROVED:

BY: _____

DATE: _____

RECEIVED
AUG 3 1983
M.R.G.C. DISTRICT

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DRAINAGE COVENANT

THIS COVENANT made this 23rd day of May, 1983, by and between the City of Albuquerque, a municipal corporation (City) and Corrales Center Partnership (Owner, which term includes successors and assigns).

RECITAL

The Owner is owner of certain real property located at Las Tiendas de Corrales in Albuquerque, New Mexico, (the Property) and more particularly described as follows:

Tract F of Seven Bar Ranch Annexation comprising of 9.754 acres and Tracts 55A1 comprising 15.64 acres. (See attached Property Map).

That pursuant to City ordinances, regulations, and other applicable laws, the Owner is required to install and/or maintain certain drainage facilities on the Property, and the parties wish to provide for an agreement as to the obligations and responsibilities for same.

RECEIVED
MAY 24 1983
ENGINEERING

DESCRIPTION OF FACILITIES

The following facilities are to be constructed and/or maintained by the Owner:

Storm drainage siphons crossing the Corrales Acequia from Tract F to Tract 55A1, the associated sedimentation/detention ponds and their outlets.

CONSTRUCTION OF DRAINAGE FACILITIES

The Owner shall construct the drainage facilities in accordance with standards, plans, and specifications prescribed on the construction drawings and approved by the City.

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MAINTENANCE OF FACILITIES

The Owner shall, at his cost in accordance with the standards, plans, and specifications prescribed by the City, maintain said drainage facility. The City shall have the right to enter periodically upon the Property to inspect the drainage facility.

LIABILITY

The City shall not be liable for any damages to the Owner or public resulting from the construction, modification, or maintenance of said facilities.

NOTICE

The written notice provided for herein shall be accomplished by mailing same to:

Las Tiendas de Corrales Shopping Center
c/o Corrales Center Partnership
3615 Rio Rancho Blvd. N.W.
Suite 203-B
Albuquerque, New Mexico 87048

The Owner may change said address by giving written notice, certified mail, return receipt requested, to the City Engineer, City Hall, at 505 Marquette Street N.W., Albuquerque, New Mexico 87103.

INDEMNIFICATION AND HOLD HARMLESS

The Owner agrees to defend, indemnify, and hold harmless, the City, its officials, agents and employees from and against any and all claims, actions, suits, or proceedings of any kind brought against said parties for or on account of any matter arising from the drainage facility provided for herein or the Owner's failure to construct, maintain, or modify the drainage facility under this covenant.

25×10 32×10

0000 0000 0829

COVENANT RUNNING WITH THE PROPERTY

The obligation of the Owner set forth herein shall be binding upon the Owner, his heirs, and assigns, and the property of the Owner as described herein and will run with said property until released by the City.

OWNER

By: John S. Black
Title: Managing Partner

STATE OF NEW MEXICO)
COUNTY OF BERNALILLO) ss.

The foregoing instrument was acknowledged before me this 23rd day of May, 1983, by Mr. John Black on behalf of Corrales Center Partnership, a partnership.

Carol F. Sena
Notary Public
My Commission Expires: 8/1/83

CITY OF ALBUQUERQUE

_____
Chief Administration Officer

STATE OF NEW MEXICO)
COUNTY OF BERNALILLO) ss.

The foregoing instrument was acknowledged before me this _____ day of May, 1983, by _____, Chief administrative Office of the City of Albuquerque, municipal corporation, on behalf of said corporation.

_____
Notary Public
My Commission Expires:_____

25×10 32×10

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DRAINAGE INFORMATION SHEET

A14/D2

ZONE ATLAS/DRAINAGE FILE NO. ~~A-14 & B-14~~ ~~B-14/B-2~~

PROJECT TITLE: Las Tiendas de Corrales Center - Additional Driveways

LEGAL DESCRIPTION: NE 1/4 Section 8 and SE 1/4 Section 5, T11N, R3E

CITY ADDRESS: NE corner of Corrales Road and Alameda Blvd.

ENGINEERING FIRM: Easterling & Assoc. Inc. CONTACT: R.P. Bohannan, P.E.

ADDRESS: 5643 Paradise Blvd. N.W. PHONE: 898-8021

OWNER: Las Tiendas, Ltd. CONTACT: Greg Foltz

ADDRESS: 3615 Rio Rancho Blvd., Suite 203-B Albuquerque, NM 87048 PHONE: 897-7227

ARCHITECT: N/A CONTACT:

ADDRESS: PHONE:

SURVEYOR: N/A CONTACT:

ADDRESS: PHONE:

CONTRACTOR: N/A CONTACT:

ADDRESS: PHONE:

PRE-DESIGN MEETING:

___ YES

X NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

RECEIVED NOV 07 1989 HYDROLOGY SECTION

DRB NO.

EPC NO.

PROJECT NO. Site Plan Z-79-146.1

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAINAGE PLAN

___ GRADING PLAN

X GRADING & DRAINAGE PLAN (Amendment)

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

X OTHER Grading & Drainage Approval (SPECIFY) for proposed Driveways

DATE SUBMITTED: 11/7/89 BY: Ronald P. Bohannan

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LETTER OF TRANSMITTAL

EASTERLING & ASSOCIATES, INC.
5643 Paradise Blvd., NW
ALBUQUERQUE, NEW MEXICO 87114
(505) 898-8021

RECEIVED
NOV 0 7 1989
HYDROLOGY SECTION

DATE 11/6/89 JOB NO. 2821
ATTENTION Fred Aguirre
RE: Los Tiendas Driveways

TO City of Albuquerque
Engineering Group - Hydrology
3rd Floor City Hall
Albuquerque, NM

WE ARE SENDING YOU ☑ Attached ☐ Under separate cover via courier the following items:

☐ Shop drawings ☑ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☐

COPIES	DATE	NO.	DESCRIPTION
2	10/25/89		Amended Site Grading and Drainage Plan for Los Tiendas de Corrales Center Zone Atlas Pages A-14 and B-14
1	11/7/89		Drainage Information Sheet

THESE ARE TRANSMITTED as checked below:

☑ For approval ☐ Approved as submitted ☐ Resubmit ____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit ____ copies for distribution
☑ As requested ☐ Returned for corrections ☐ Return ____ corrected prints
☐ For review and comment ☐
☐ FOR BIDS DUE ____ 19____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Fred:
The attached Amended Site Grading and Drainage Plan is transmitted for your review and approval as you requested. The plan amendment was suggested by Dave Harman in connection with the additional driveways proposed for Los Tiendas de Corrales Center.
Please call me if you have any questions or need any additional information.

Thanks,

COPY TO ____

SIGNED: Ken Paul Bohannon

If enclosures are not as noted, kindly notify us at once.

PRODUCT 240-2 NEBS Inc. Groton, Mass. 01471

25× 32×

0000 0000 0832

INFORMATION SHEET

PROJECT TITLE Las Tiendas de Corrales Ctr. TYPE OF SUBMITTAL Drainage Plan

ZONE ATLAS PAGE NO. A-14-D2 CITY ADDRESS 10000 Corrales Road N.W.

LEGAL DESCRIPTION Tract F, Seven Bar Ranch

ENGINEERING FIRM Espey-Huston & Assoc. CONTACT Dennis Lorenz

ADDRESS 4801 Indian School Rd. N.E. PHONE 255-1625

OWNER Corrales Center Partnership CONTACT Greg Foltz

ADDRESS 10011 Coors Road N.W. PHONE 898-6262

ARCHITECT Vogt & Byrnes P.A. CONTACT G. Brown

ADDRESS 1617 University Blvd. N.E. PHONE 242-1526

SURVEYOR Hugg Surveying CONTACT Garry Hugg

ADDRESS 1701 Grande Blvd. S.E. PHONE 892-8800

CONTRACTOR None CONTACT

ADDRESS PHONE

DATE SUBMITTED October 13, 1983

BY Dennis Lorenz

RECEIVED
OCT 14 1983
ENGINEERING

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0000 0000 0833

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

A14 - D2

June 9, 1983

Mr. Billy Goolsby
Espey-Huston & Associates
4801 Indian School Rd. N.E.
Suite 204
Albuquerque, N.M. 87110

RE: GRADING AND DRAINAGE PLAN FOR LAS TIENDAS SHOPPING CENTER

Dear Billy:

I have reviewed the referenced plan and it appears to be in general compliance with guidelines and criteria established by Chuck Easterling and Jim Fink. I did, however, want to point out several items:

a. In Jim Fink's letter of September 10, 1983 he requested that approval to cross the Corrales Acequia must be granted by the MRGCD. Has this been done?

b. Since the retention concept is viewed by this office as a temporary solution, I think it important to have in writing that the owner/developer of the shopping center realizes their obligation to tie the temporary system into the permanent solution once it's constructed.

c. I'm very pleased with your proposal to utilize hay bales as erosion control devices during construction. I plan to present a paper later this year at a symposium and my topic involves erosion control measures. I will be calling on your expertise regarding costs, advantages, disadvantages, etc. of this particular method.

d. Projects of this magnitude are difficult for this section to inspect. I would like to request that your firm investigate the possibility of certifying the construction.

Please call if you have any questions regarding any comments.

Very truly yours,

Brian G. Burnett
Civil Engineer/Hydrology

BGB/tsl

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ESPEY, HUSTON & ASSOCIATES, INC.
Engineering & Environmental Consultants
4801 INDIAN SCHOOL ROAD, N.E., SUITE 204
ALBUQUERQUE, N.M. 87110
(505) 255-1625

AB, 14

August 27, 1982

CORPORATE OFFICE
P.O. BOX 519
AUSTIN, TEXAS 78767

RECEIVED
AUG 27 1982
ENGINEERING

Mr. Jim Fink
Engineering Department
City of Albuquerque
Post Office Box 1293
Albuquerque, New Mexico 87103

SUBJECT: Conceptual Grading & Drainage Report
Las Tiendas Shopping Center

A14-02

Dear Jim:

Please find attached the subject report for your review. The information sheet can be found behind the cover sheet of the report.

The proposed drainage plan presented in this report is consistent with the drainage plan for the project site presented in the approved Seven Bar Development Sector Plan.

We have followed the procedures set forth in the DPM and have used the applicable check list to assure completeness of this report. However, if you have any questions or need additional information, please do not hesitate in requesting the same.

The Site Development Plan for the project site is up for review before the EPC in October and, as you are well aware, we need the drainage plan approved by that time.

Very truly yours,

Mike Rengel

Mike Rengel, P.E.
Albuquerque Office Manager
Senior Staff Engineer

enclosure

cc: John Black - Corrales Center Partnership

25×10 32×10

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FILE COPY

City of • Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

KEN SCHULTZ
MAYOR

November 16, 1989

Ronald P. Bohannan
Easterling & Associates, Inc.
5643 Paradise Boulevard, NW
Albuquerque, New Mexico 87114

RE: AMENDED DRAINAGE PLAN FOR ADDITIONAL DRAINAGE AT LAS TIENDAS DE CORRALES CENTER (A-14/D2) ENGINEER'S STAMP DATED OCTOBER 25, 1989

Dear Mr. Bohannan:

Based on the information provided on your submittal of November 7, 1989, revisions as indicated are satisfactory for the proposed driveways.

If I can be of further assistance, please call me at 768-2650.

Cordially,

Bernie J. Montoya, C.E.
Engineering Assistant

BJM/bsj
(WP+1449)

PUBLIC WORKS DEPARTMENT

Walter H. Nickerson, Jr., P.E.
Assistant Director Public Works

ENGINEERING GROUP

Telephone (505) 768-2500

AN EQUAL OPPORTUNITY EMPLOYER

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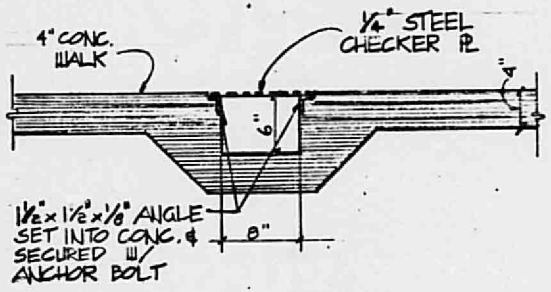
ENGINEERING

6/2-9 HANDICAP SYMBOL

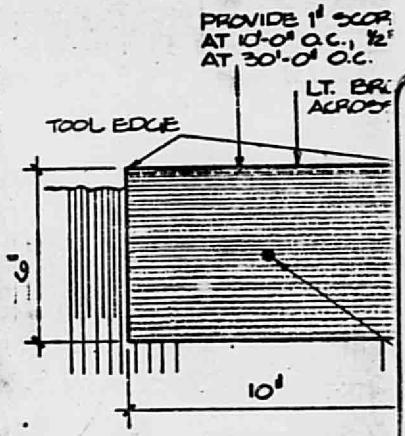
7/2-9 CONC. PRK'G B

NOT



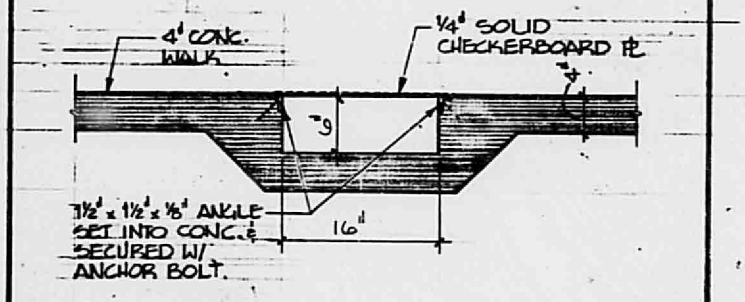
10/2-9 TRENCH GRATE SECTION

SCALE 1" : 1'-0"



11/2-9 MOWIN

S



TRENCH GRATE SECTION

5/2-10

SCALE 1":1'-0"

TRIC

N.T.S.

RECEIVED
NOV 1 0 1983
ENGINEERING

25 X
32 X

0000 0000 0838

ESPEY, HUSTON & ASSOCIATES INC.
Engineering & Environmental Consultants

SUBJECT INLET CAPACITY

LAS TIENDAS

SHEET 1 OF 1 BY DAL
DATE 11-8-83 CK BY

1. GRATE CAPACITY

USING EQN $Q = 5.37 A H^{\frac{1}{2}}$

(FROM DESIGN CRITERIA FOR DRAINAGE, NMSHD, DEC 1968)

A. $Q_{BASIN\ 'B'} = 11.8$ CFS

B. A_{GRATE}:

FROM COA K-

STD GRATE = $36\frac{3}{8}'' \times 25\frac{1}{2}''$

OPENING = $3/4''$

BAR = $1/2''$

→ 20 OPENININGS / GRATE

$A = 20 \times 3/4'' \times 36\frac{3}{8}'' = 545.62$ SI
$= 3.79$ SF

RECEIVED
NOV 10 1983
ENGINEERING

C. SOLVE FOR H:

$$H = \left[11.8 / 3.79\,(5.37) \right]^2 = 0.33'$$

2. CHECK PIPE INLET

USING ORIFACE EQN: $Q = CA\sqrt{2gh}$

WHERE $A = (1.5)^2 \pi / 4 = 1.77$ SF

$H = 6.33'$

$C = 0.86$

$g = 32.2$ F/s²

$$Q = 0.86(1.77)\sqrt{2g(6.33)} = 30.7 \text{ CFS} > Q_{BASIN\ 'B'}$$

25×10 32×10

0000 0000 0839

LAS TIERRAS
11-3-83

COMMENTS PER BILLY GOOSBY OVER TELEPHONE 11-3-83:

1. IN ROUGH GRADED AREA - NEED EROSION CONTROL w/ DITCH - DIKE TO PREVENT FLOWS TO COPPERAS ACEQUIA.

2. DO ROOFS DRAIN OVER OR UNDER S/W.

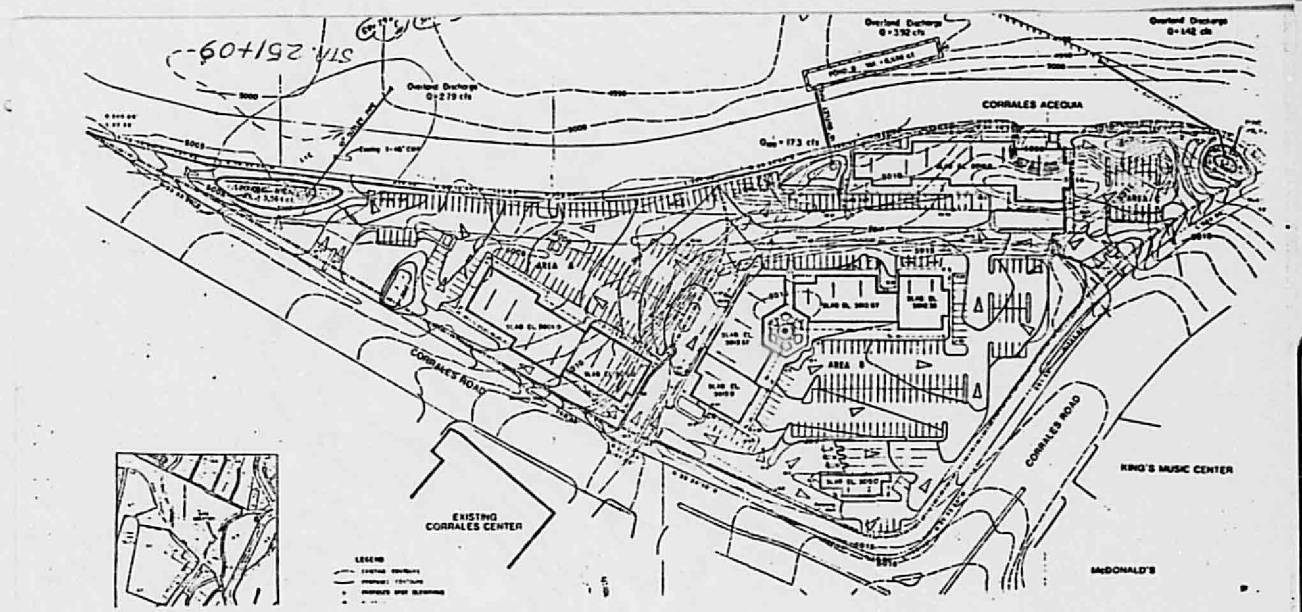
3. NOTE ALL CURB CUTS:
   - NEAR BLDG 'C'
   - AT END ASPHALT NEAR POND & BLDG 'B'

4. GIVE W.S. OVER GRATE INLET

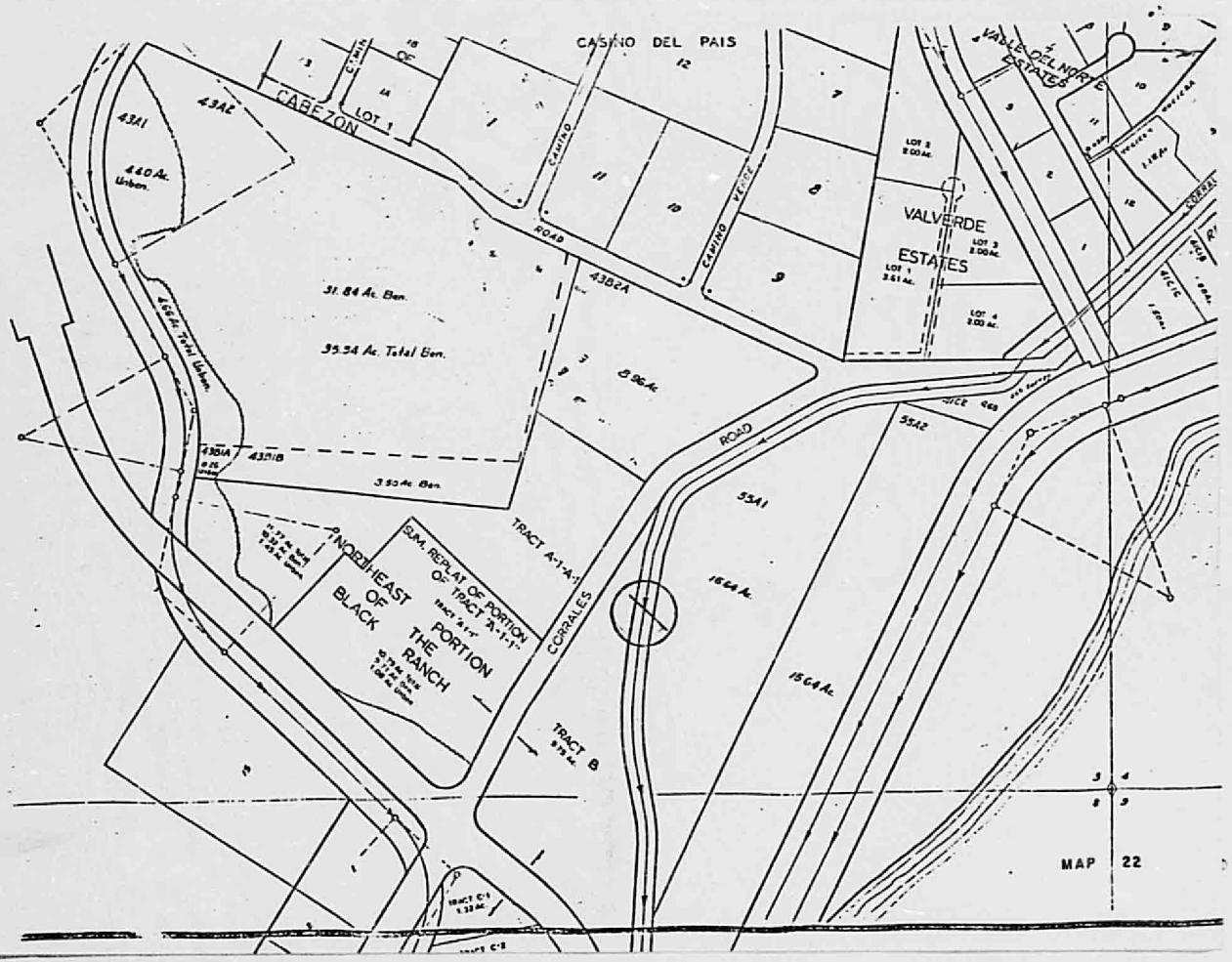
5. CHECK FOR AGREEMENT FROM PROP OWNER - EAST - FOR ACCEPTING RUNOFF.

RECEIVED
NOV 10 1983
ENGINEERING

25× 32×


STA. 251+09
Overland Discharge
Q = 279 cfs
Overland Discharge
Q = 392 cfs
Overland Discharge
Q = 142 cfs
CORRALES ACEQUIA
AREA A
AREA B
CORRALES ROAD
CORRALES ROAD
KING'S MUSIC CENTER
EXISTING
CORRALES CENTER
McDONALD'S
LEGEND

32 × 25



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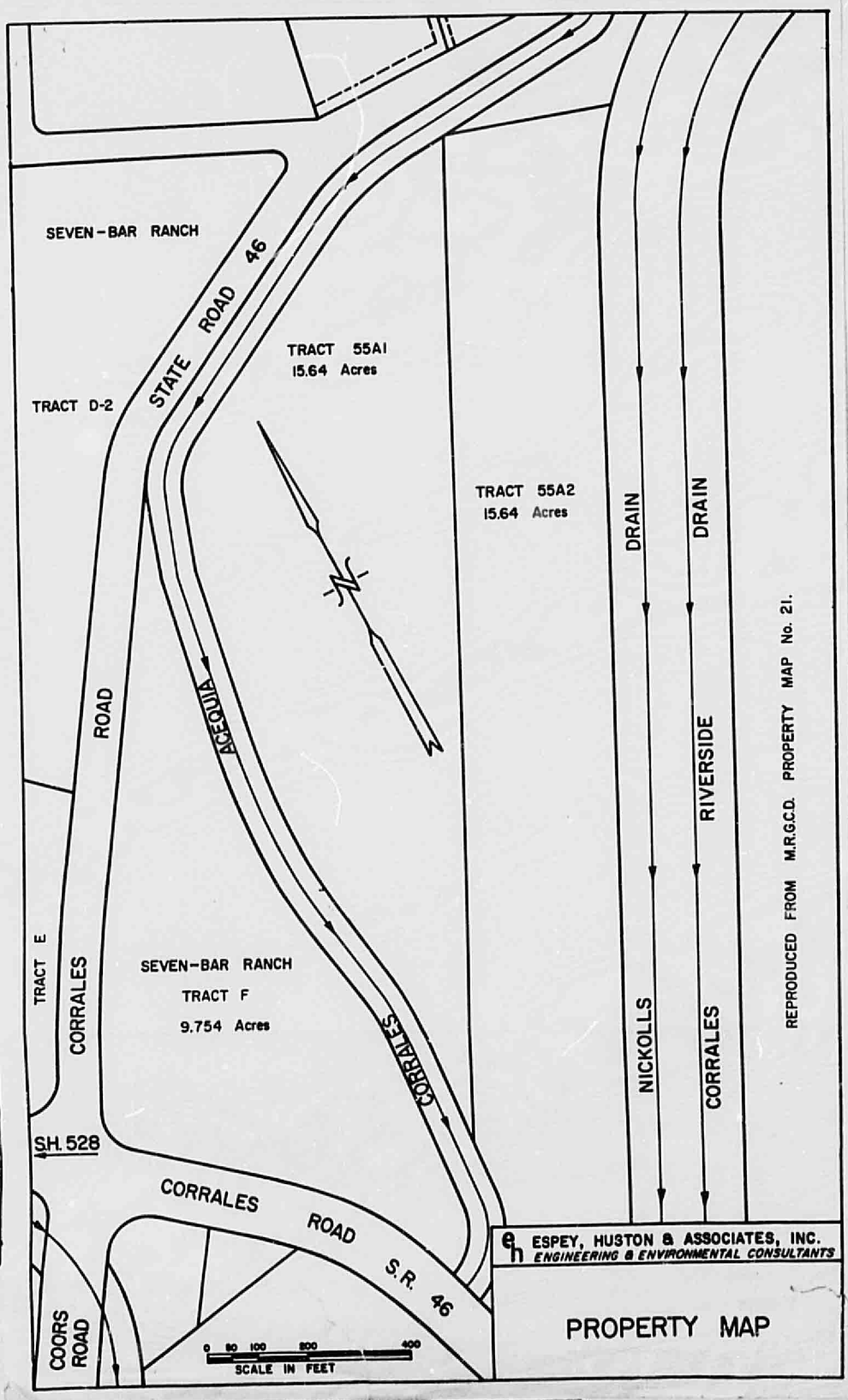

25×10 32×10

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A14/82

ESPEY, HUSTON & ASSOCIATES, INC.
Engineering & Environmental Consultants
4801 INDIAN SCHOOL ROAD, N.E., SUITE 204
ALBUQUERQUE, N.M. 87110
(505) 255-1625

EH&A Job No. 2413

CORPORATE OFFICE
P.O. BOX 519
AUSTIN, TEXAS 78767

GRADING AND DRAINAGE PLAN FOR LAS TIENDAS SHOPPING CENTER TRACT F SEVEN BAR RANCH

RECEIVED
OCT 4 1983
ENGINEERING

Prepared for:

Corrales Center Partnership
10011 Coors Rd. N.W.
Albuquerque, New Mexico 87114

May 1983

25×10 32×10

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ESPEY, HUSTON & ASSOCIATES, INC.

INFORMATION SHEET

GRADING & DRAINAGE PLAN
LAS TIENDAS SHOPPING CENTER

Legal Description
Tract F
Seven Bar Ranch

Project Location
Northeast Corner of the Intersection of Coors Rd., Corrales Rd. and N.M. 528

Zone Atlas Page No.
A-14/B-14

Engineering Firm
Espey, Huston & Associates, Inc.
4801 Indian School Rd. N.E.
Suite 204
Albuquerque, New Mexico 87110
(505) 255-1625
Contact: Mike Rengel

Owner
Corrales Center Partnership
10011 Coors Rd. N.W.
Albuquerque, New Mexico 87114
(505) 898-6262
Contact: Greg Foltz

Architect
Vogt, Byrnes, P.A.
1617 University Blvd. N.E.
Albuquerque, New Mexico 87102
(505) 242-1526
Contact: Roger Byrnes

Surveyor
Hugg Syrveying Co.
1701 Grande Blvd. S.E.
Rio Rancho, N.M. 87124
(505) 892-8800
Contact: Garry Hugg

Submitted by:
Espey, Huston & Associates, Inc.
May 18, 1983

25× 32×

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ESPEY, HUSTON & ASSOCIATES, INC.

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- C. Joint Comprehensive Drainage Study
- D. Easements and Rights-Of-Way

V. EROSION CONTROL

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25×10 32×10

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ESPEY, HUSTON & ASSOCIATES, INC.

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25×10 32×10

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ESPEY, HUSTON & ASSOCIATES, INC.

I. PURPOSE

The purpose of this plan is to provide information as to the compatibility of the project site within grading, drainage, flood hazard and erosion control constraints as dictated by on-site physical features as well as adjacent properties and roadways.

II. SITE LOCATION AND DESCRIPTION

The Las Tiendas Shopping Center site is located on the northeast corner of the intersection of Coors Road, Corrales Road and State Highway 528. See Plate 1 - Vicinity Map. This property has recently been annexed into the City as Tract F, Seven Bar Ranch. See Plate 2 - Annexation Plat (in pocket).

The site is approximately 9.75 acres in size and is bounded on the northeast side by the Middle Rio Grande Conservancy District (MRGCD) easement for the Corrales Acequia irrigation canal. The majority of the property slopes in a northerly direction at approximately 0.7 percent. The remainder of the property slopes to the east at a more severe rate.

The soil on the project site and to the west consists primarily of Bluepoint loamy fine sands. To the east of the project site the soil consists of Gila clay loam and Agua silty clay loam.

25×10 32×10

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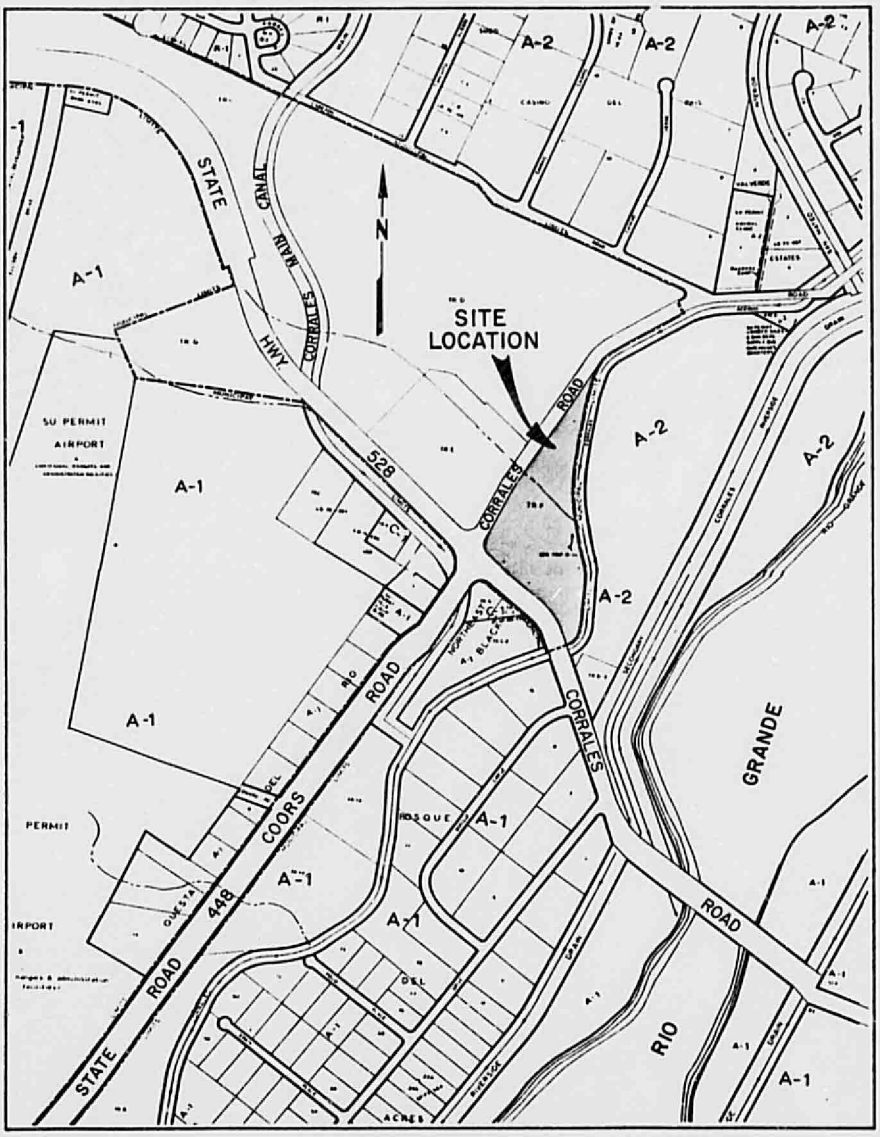

VICINITY MAP

PLATE I

25× 32×

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III. PRESENT CONDITIONS

A. On-Site Flows

The rainfall on the project site collects in a few limited natural ponding areas, but most will runoff the project site and discharge into the Corrales Acequia Canal or onto the Corrales Road right-of-way.

The total undeveloped runoff from the project site for various frequency storms calculated by the Rational Method are as follows:

Frequency	Undeveloped Flows
5 year	8.54 cfs
10 year	10.37 cfs
100 year	15.78 cfs

B. Off-Site Flows

The off-site flows from this project come solely from the runoff from one side of Corrales Road, which form the west and south boundary of this triangular shaped piece of property. Some of this flow will runoff onto the project site. The remainder will runoff onto the right-of-way.

The total off-site runoff for various storm frequencies calculated by the Rational Method are as follows:

25×10 32×10

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Frequency	Off-Site Flows
10 year	6.93 cfs
100 year	10.55 cfs

C. Existing Drainage Facilities

Since the Corrales Acequia receives some of the runoff from the project site, it can be considered a drainage facility. No other drainage facilities can be found in the area except for grading improvements within the right-of-way for Corrales Road. See Plate 3 - Existing Drainage Map (in pocket).

D. Flood Hazard

The project site is outside of the flood hazard area as currently defined by the preliminary flood hazard maps prepared by Bohannan-Houston & Associates. See Plate 4 - Flood Hazard Map. The proposed grading and drainage plan in no way will affect a flood hazard on the project site.

IV. PROPOSED CONDITIONS

A. On-Site Flows

The proposed drainage plan for this project is to pond the runoff from the 100-year frequency storm in sedimentation/detention facilities. The discharge from the sedimentation/detention ponds will be released at the 5-year frequency storm

25×10 32×10

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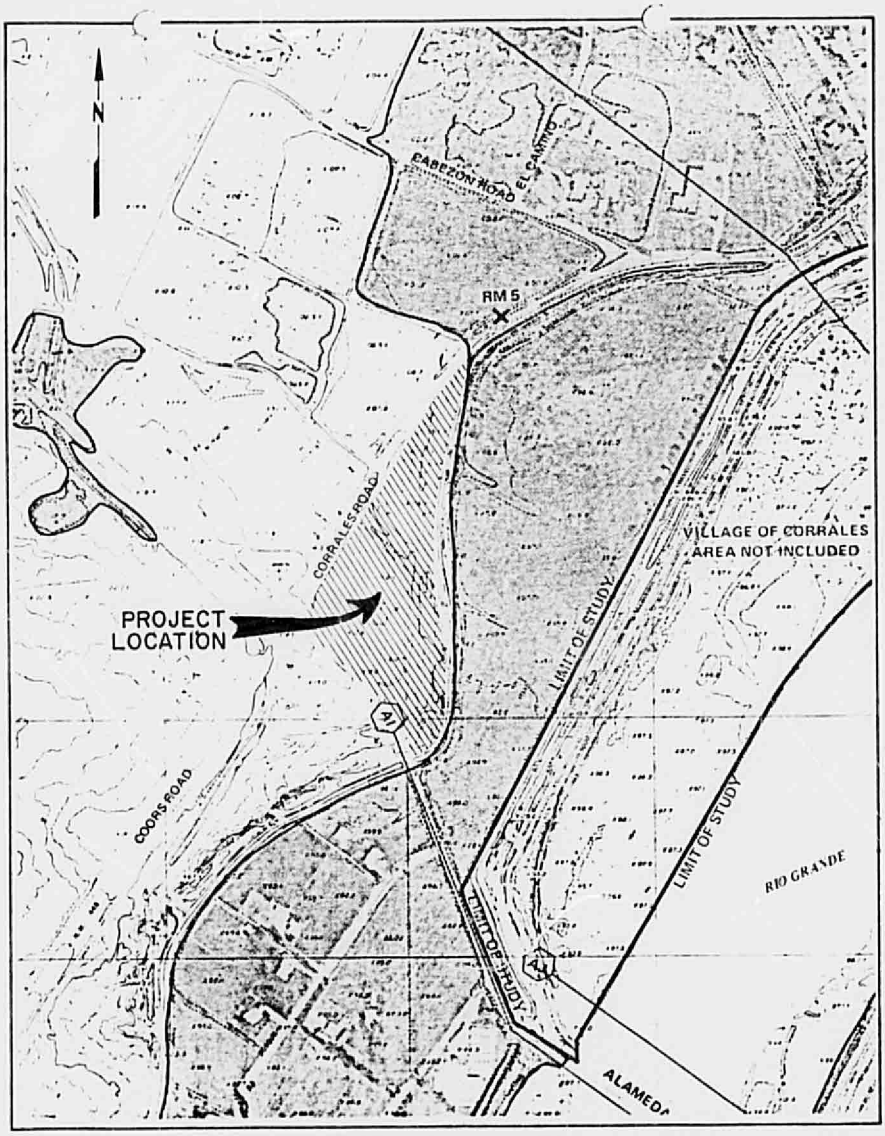

400 250 0 500
350
SCALE (FEET)

FLOOD HAZARD MAP

PLATE 4

25× 32×

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rates, under undeveloped conditions (9.83 cfs), consistent with the City of Albuquerque and Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) standards. The discharge will be released on the adjacent fields to the east of the project site or until such time that an agreement can be reached with MRGCD to discharge into the Corrales Acequia. Negotiations with MRGCD are in progress pending the outcome of the study described in Section IV.C.

The total runoff from the project site under developed conditions for various storm flows calculated by the Rational Method are as follows:

Frequency	Developed Flows
10 year	20.67 cfs
100 year	31.41 cfs

The proposed drainage plan is consistent with the approved Seven Bar Ranch Development Sector Plan which includes the project site. See Plate 5 - Grading & Drainage Plan (in pocket).

B. Off-Site Flows

The project site will be curbed and the entrance ways will be designed such to allow the off-site drainage flows to by-pass the project site and flow down the Corrales Road right-of-way.

C. Joint Comprehensive Drainage Study

Espey, Huston & Associates, Inc. is currently under contract with the Corrales Watershed District to prepare a comprehensive drainage study for the watershed around the project site. The study is funded by AMAFCA, MRGCD, Corrales

25×10 32×10

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Watershed District, Sandoval County Water Commissioner, and the Las Tiendas Shopping Center developer. The purpose of the study is to determine the most cost effective manner of disposing of the flood waters from the study area. See Plate 6 - Joint Comprehensive Drainage Study Area.

The drainage plan for this project is consistent with the objectives and results of the study to this date.

D. Easements and Rights-Of-Way

The MRGCD holds an easement for the Corrales Acequia irrigation canal. An agreement must be reached with MRGCD to discharge the project runoff into the Acequia even though it currently receives runoff from the project site. A drainage agreement has been obtained from the adjacent property owner to discharge runoff from the project site until an agreement with MRGCD can be reached.

There are existing utility rights-of-way and pipelines that cross the project site. The building, driveway, and parking locations as well as the proposed grading plan have been selected and prepared so as not to conflict with these features.

V. EROSION CONTROL

Erosion will not occur as a result of the proposed development. Temporary erosion control measures will be used during the construction period. These will include, but are not limited to, installing hay bales adjacent to the Corrales Acequia. After construction the drainage improvements will control the runoff to less than erosive velocities.

25×10 32×10

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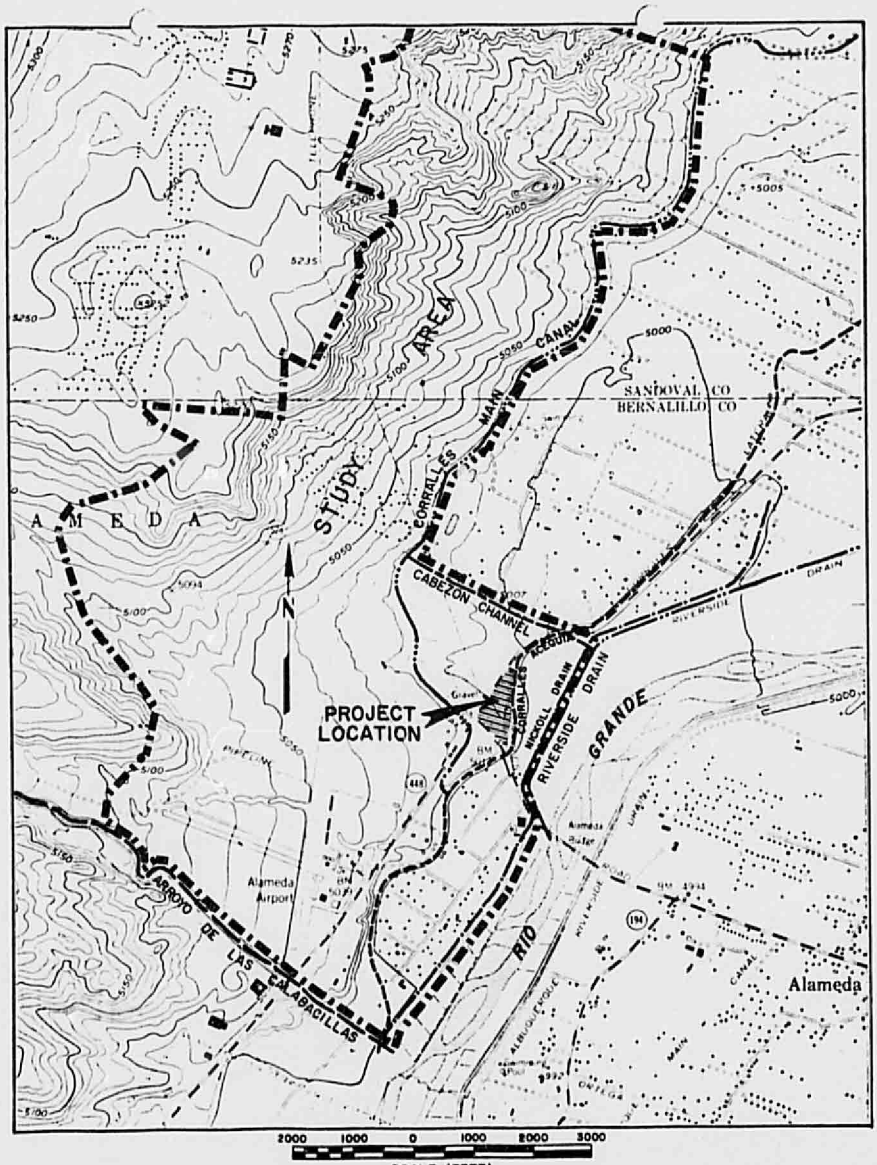

JOINT COMPREHENSIVE DRAINAGE STUDY AREA

PLATE 6

25×10 32×10

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VI. CONCLUSIONS

The proposed project will control the storm runoff in a manner consistent with the City of Albuquerque and AMAFCA policies as well as the Seven Bar Ranch Development Sector Plan. The project site is not within the preliminary designated flood hazard area. Minor site grading will be necessary but will not create an erosion hazard once construction is completed. Temporary erosion control techniques will be utilized during construction.

There are no grading or drainage restraints that we are aware of that could prevent development of the Las Tiendas Shopping Center site.

The overland discharge on the tract to the east of Corrales Acequia will be on agricultural land and that which is not infiltrated or evaporated will collect in the southeast corner of the property. A temporary ponding area will have to be provided at this location with an emergency overflow into Nickoli's Drain. At the present time cottonwood trees are located in this area and are high water users. At such time when the property is no longer used for agricultural purposes, a permanent discharge system will have to be designed and approved by the City.

BILLY J. GOOLSBY
NEW MEXICO
6218
REGISTERED PROFESSIONAL ENGINEER

5/23/83

25×10 32×10

0000 0000 0856

ESPEY, HUSTON & ASSOCIATES, INC.

APPENDIX

Drainage Computations

25×10 32×10

0000 0000 0857

SELECTED METHOD : RATIONAL

$Q = CIA$

A DRAINAGE AREAS – ONSITE

AREA A = 8.66 ACRES

AREA B = .23 ACRES

AREA C = .86 ACRES

TOTAL = 9.75 ACRES

B DRAINAGE AREAS – OFFSITE

AREA A

WEST = 1.21 ACRES

SOUTH = .57 ACRES

1.78 ACRES

AREA C = .57 ACRES

C INTENSITY

DETERMINE t_c

AREA A → $t_c = .0078 \frac{L^{0.77}}{S^{0.385}} = 14.25$ min.

$L = 1440$ FT

$S = .007$

AREA B → USE 10 min. MINIMUM

AREA C → USE 10 min. MINIMUM

25×10 32×10

0000 0000 0858

ESPEY, HUSTON & ASSOCIATES INC.
Engineering & Environmental Consultants

LAS TIENDAS SHOPPING CENTER

SUBJECT Rainfall Runoff
SHEET 2 OF 3 BY
DATE CK BY

D. ONSITE FLOWS

1. 100 YR. UNDEVELOPED

$Q = CIA$ $C = 0.40$ UNDEVELOPED

$Q_A = .40\ (3.96)(8.66) = 13.72$

$Q_B = .40\ (4.73)(0.23) = 0.44$

$Q_C = .40\ (4.73)\ (0.86) = 1.62$

Q_{pd} 15.78 CFS

2. 10 YR UNDEVELOPED

$Q = .657\ (15.78) = 10.37$ CFS

3. 5 YR UNDEVELOPED

$Q_A = .541\ (13.72) = 7.42$

$Q_B = .541\ (0.44) = 0.24$

$Q_C = .541\ (1.62) = 0.88$

$Q_5 = 8.54$ CFS

25×10 32×10

0000 0000 0859

E. OFFSITE FLOWS

1. 100 YR UNDEVELOPED

t_c = 10 min. MINIMUM C = .95, PAVEMENT

a) AREA A

WEST Q = CIA

Q = .95 (4.73) (1.21)

Q = 5.43 CFS

SOUTH Q = .95 (4.73) (0.57)

Q = 2.56 CFS

b) AREA C

SOUTH Q = .95 (4.73) (0.57)

Q = 2.56 CFS

TOTAL = 10.55 CFS

2. 10 YR UNDEVELOPED

a) AREA A

WEST Q = .657 (5.43) = 3.57 CFS

SOUTH Q = .657 (2.56) = 1.68 CFS

b) AREA C

SOUTH Q = .657 (2.56) = 1.68 CFS

TOTAL = 6.93 CFS

25×10 32×10

0000 0000 0860

Drainage

F. On-Site Developed Condition

Area "A" = 54.89 sq. in. = 3.15 ac.

Area "B" = 90.40 sq. in. = 5.19 ac.

Area "C" = 24.60 sq. in. = 1.41 ac.

Total = 9.75

Developed Condition "C" Factor

Area "A"

	Area	% Total	"C"		C_A
Roof	0.399 ac.	12.67	.90	=	0.114
Pavement	1.356 ac.	43.04	.95	=	0.409
Sidewalks	0.210 ac.	6.67	.95	=	0.006
Landscape	1.185 ac.	37.62	.35	=	0.132
Total	= 3.150 ac.		Composite "C"	=	0.661

$t_c = 0.0078 \left(\frac{L^{0.77}}{S^{0.385}} \right)$ in minutes

$L = 600$ ft.

$S = 0.0108$ ft./ft.

$t_c = 0.0078 \left[\frac{(600)^{0.77}}{(0.0108)^{0.385}} \right] = 6.14$ min. Use 10 min

25× 32×

0000 0000 0861

Developed Condition "C" Factor (Cont.)

Area "B"

	Area	% Total	"C"		C_B
Roof	0.739 ac.	14.24	0.90	=	0.128
Pavement	1.998 ac.	38.50	0.95	=	0.366
Sidewalk	0.496 ac.	9.55	0.95	=	0.091
Landscape	1.957 ac.	37.71	0.35	=	0.132
Total =	5.190 ac.		Composite "C"	=	0.717

$t_c = 0.0078 \left[\frac{L^{0.77}}{S^{0.385}} \right]$ in minutes

$L = 825$ ft.

$S = .01825$ '/ft.

$t_c = 0.0078 \left[\frac{(825)^{0.77}}{(.01825)^{0.385}} \right] = 6.41$ min. <u>use 10 minutes</u>

25×10 32×10

0000 0000 0862

Developed Condition "C" Factor (Cont.)

Area "C"

	Area	% Total	"C"		C_c
Roof	0.296 ac.	20.99	0.90	=	0.189
Pavement	0.365 ac.	25.89	0.95	=	0.246
Sidewalk	0.128 ac.	9.08	0.95	=	0.086
Landscape	0.621 ac	44.04	0.35	=	0.154
Total	1.410 ac		Composite "C"	=	0.675

$t_c = 0.0078 \left[\frac{L^{0.77}}{S^{0.385}} \right]$ in minutes

$L = 260$ ft.

$S = .0125$ '/ft.

$t_c = 0.0078 \left[\frac{(260)^{0.77}}{(.0125)^{0.385}} \right] = 3.05$ min. Use 10 minutes

25×10 32×10

0000 0000 0863

Developed Condition Runoff

Area "A" $Q = CIA$

$C = 0.661$ $I_{10min} = 4.65$ inches/hr.-100yr.

$A = 3.15$ ac. $= 3.06$ in./hr. -10yr.

$Q_{100} = 0.661\ (4.65)\ 3.15 = \underline{9.68}$ cfs

$Q_{10} = 0.661\ (3.06)\ 3.15 = \underline{6.37}$ cfs

Area "B"

$C = 0.717$ $I_{10min.} = 4.65$ in./hr.

$A = 5.19$ ac.

$Q_{100} = 0.717\ (4.65)\ 5.19 = \underline{17.30}$ cfs

$Q_{10} = 0.717\ (3.06)\ 5.19 = \underline{11.39}$ cfs

Area "C"

$C = 0.675$ $I_{10min} = 4.65$ in/hr.

$A = 1.41$ ac.

$Q_{100} = 0.675\ (4.65)\ 1.41 = \underline{4.43}$ cfs

$Q_{10} = 0.675\ (3.06)\ 1.41 = \underline{2.91}$ cfs

25×10 32×10

0000 0000 0864

ESPEY, HUSTON & ASSOCIATES INC.
Engineering & Environmental Consultants

SUBJECT _____

SHEET 5 OF 5 BY _____
DATE _____ CK BY _____

6. OFFSITE DEVELOPED WILL REMAIN THE SAME AS OFFSITE UNDEVELOPED

25×10 32×10

0000 0000 0865

HYDROGRAPH COMPUTATION WORKSHEET

DATE 4/25/83
COMPUTED BY [illegible]
CHECK BY

PROJECT Las Tiendas

LOCATION Corrales Center

ANALYSIS POINT # A

(DR. AREA) A = 3.15 ACRES

T_c 10 MIN

POINT RAINFALL 2.2 IN. FROM PLATE 22.2 D-1

CN = _____ FROM PLATES 22.2 C-2, 22.2 C-3

RUNOFF VOLUME R = ____ IN. FROM PLATE 22.2 C-4

COMPUTED T_p = 10 MIN. (Rounded to even minute) $T_p = T_c$

$q_p = \frac{45.4A}{T_p}$ = _____ CFS./INCH OF RUNOFF

$(R \times q_p) = Q_{peak}$ = 9.68 CFS

$t(\text{COLUMN}) = (t/T_p)$ $t = T_p(t/T_p)$

$y = \frac{Q}{Q_{peak}}$ $Q = y(Q_{peak})$

	(t/T_p)	t (min.)	y	Q (cfs)
1	0	0	0	0
2	.1	1.0	.03	0.29
3	.2	2.0	.10	0.97
4	.3	3.0	.190	1.84
5	.4	4.0	.310	3.00
6	.5	5.0	.470	4.55
7	.6	6.0	.660	6.39
8	.7	7.0	.820	7.94
9	.8	8.0	.930	9.00
10	.9	9.0	.990	9.58
11	1.0	10.0	1.00	9.68
12	1.1	11.0	.990	9.58
13	1.2	12.0	.930	9.00
14	1.3	13.0	.860	8.32
15	1.4	14.0	.780	7.55
16	1.5	15.0	.680	6.58
17	1.6	16.0	.560	5.42
18	1.7	17.0	.460	4.45
19	1.8	18.0	.390	3.78
20	1.9	19.0	.330	3.19
21	2.0	20.0	.280	2.71
22	2.2	22.0	.207	2.00
23	2.4	24.0	.147	1.42
24	2.6	26.0	.107	1.04
25	2.8	28.0	.077	0.75
26	3.0	30.0	.055	0.53
27	3.2	32.0	.040	0.39
28	3.4	34.0	.029	0.28
29	3.6	36.0	.021	0.20
30	3.8	38.0	.015	0.15
31	4.0	40.0	.011	0.11
32	4.5	45.0	.005	0.05
33	5.0	50.0	.000	0

$Q_{5\,u.a} = 0.40(2.52)\ 3.15$

$Q_{5\,u.a.} = 3.18$ cfs

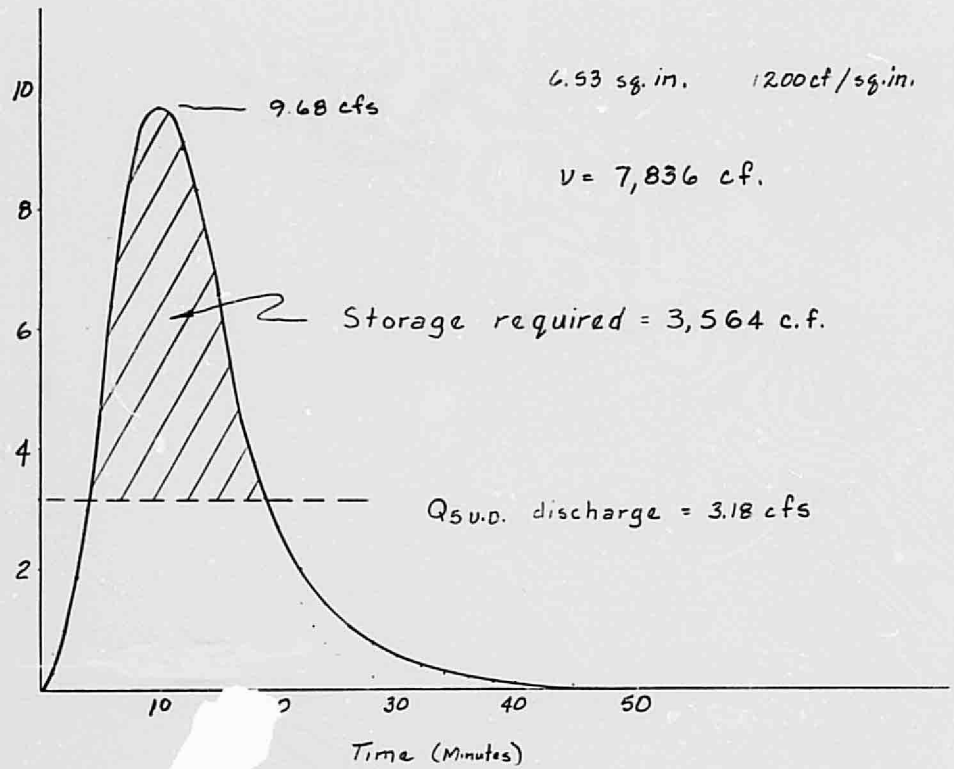
PLATE 22.2 F-1

25×10 32×10

ESPEY, HUSTON & ASSOCIATES INC.
Engineering & Environmental Consultants

SUBJECT _____
SHEET ___ OF ___ BY ___
DATE _____ CK BY _____

Area - A



6.53 sq. in. 1200 cf/sq.in.

$V = 7{,}836$ cf.

25×10
32×10

0000 0000 0867

HYDROGRAPH COMPUTATION WORKSHEET

DATE 4/25/83
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CHECK BY

PROJECT Las Tiendas

LOCATION Corrales Center

ANALYSIS POINT # B

(DR. AREA) A = 5.19 ACRES

T_c 10 MIN

POINT RAINFALL 2.2 IN. FROM PLATE 22.2 D-1

CN = _____ FROM PLATES 22.2 C-2, 22.2 C-3

RUNOFF VOLUME R = ____ IN. FROM PLATE 22.2 C-4

COMPUTED T_p = 10 MIN. $T_p = T_c$
(Rounded to even minute)

$q_p = \frac{45.4A}{T_p}$ = _____ CFS./INCH OF RUNOFF

$(R \times q_p) = Q_{peak}$ = 17.30 CFS

$t(\text{COLUMN}) = (t/T_p)$ $t = T_p(t/T_p)$

$y = \frac{Q}{Q_{peak}}$ $Q = y(Q_{peak})$

	(t/T_p)	t (min.)	y	Q (cfs)
1	0	0	0	0
2	.1	1.0	.03	0.52
3	.2	2.0	.10	1.73
4	.3	3.0	.190	3.29
5	.4	4.0	.310	5.36
6	.5	5.0	.470	8.13
7	.6	6.0	.660	11.42
8	.7	7.0	.820	14.19
9	.8	8.0	.930	16.09
10	.9	9.0	.990	17.13
11	1.0	10.0	1.00	17.30
12	1.1	11.0	.990	17.13
13	1.2	12.0	.930	16.09
14	1.3	13.0	.860	14.88
15	1.4	14.0	.780	13.49
16	1.5	15.0	.680	11.76
17	1.6	16.0	.560	9.69
18	1.7	17.0	.460	7.96
19	1.8	18.0	.390	6.75
20	1.9	19.0	.330	5.71
21	2.0	20.0	.280	4.84
22	2.2	22.0	.207	3.58
23	2.4	24.0	.147	2.54
24	2.6	26.0	.107	1.85
25	2.8	28.0	.077	1.33
26	3.0	30.0	.055	0.95
27	3.2	32.0	.040	0.69
28	3.4	34.0	.029	0.50
29	3.6	36.0	.021	0.36
30	3.8	38.0	.015	0.26
31	4.0	40.0	.011	0.19
32	4.5	45.0	.005	0.09
33	5.0	50.0	.000	0

$Q_{5u.o} = 0.40(2.52)5.19$

$Q_{5u.o.} = 5.23$ cfs

PLATE 22.2 F-1

25×10 32×10

A14/D2

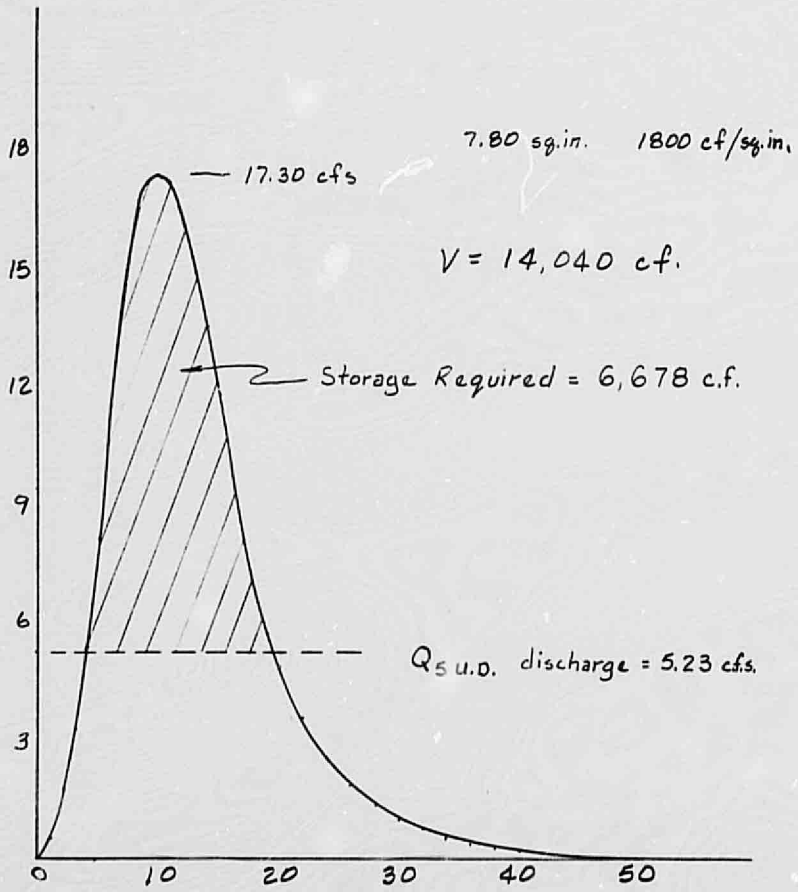
0000 0000 0868

ESPEY, HUSTON & ASSOCIATES INC.
Engineering & Environmental Consultants

SUBJECT _____

Area B

SHEET ___ OF ___ BY _____
DATE _____ CK BY _____



25×10 32×10

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HYDROGRAPH COMPUTATION WORKSHEET

DATE _____
COMPUTED BY _____
CHECK BY _____

PROJECT Las Tiendas

LOCATION Corrales Center

ANALYSIS POINT # C

(DR. AREA) A = 1.41 ACRES

T_c 10 MIN

POINT RAINFALL 2.2 IN. FROM PLATE 22.2 D-1

CN = _____ FROM PLATES 22.2 C-2, 22.2 C-3

RUNOFF VOLUME R = ___ IN. FROM PLATE 22.2 C-4

COMPUTED T_p = 10 MIN. $T_p = T_c$
(Rounded to even minute)

$q_p = \frac{45.4A}{T_p}$ = _____ CFS./INCH OF RUNOFF

$(R \times q_p) = Q_{peak}$ = 4.43 CFS

t(COLUMN)=(t/T_p) $t=T_p(t/T_p)$

$y = \frac{Q}{Q_{peak}}$ $Q = y(Q_{peak})$

	(t/T_p)	t (min.)	y	Q (cfs)
1	0	0	0	0
2	.1	1.0	.03	0.13
3	.2	2.0	.10	0.44
4	.3	3.0	.190	0.84
5	.4	4.0	.310	1.37
6	.5	5.0	.470	2.08
7	.6	6.0	.660	2.92
8	.7	7.0	.820	3.63
9	.8	8.0	.930	4.12
10	.9	9.0	.990	4.39
11	1.0	10.0	1.00	4.43
12	1.1	11.0	.990	4.39
13	1.2	12.0	.930	4.12
14	1.3	13.0	.860	3.81
15	1.4	14.0	.780	3.46
16	1.5	15.0	.680	3.01
17	1.6	16.0	.560	2.48
18	1.7	17.0	.460	2.04
19	1.8	18.0	.390	1.73
20	1.9	19.0	.330	1.46
21	2.0	20.0	.280	1.24
22	2.2	22.0	.207	0.92
23	2.4	24.0	.147	0.65
24	2.6	26.0	.107	0.47
25	2.8	28.0	.077	0.31
26	3.0	30.0	.055	0.24
27	3.2	32.0	.040	0.18
28	3.4	34.0	.029	0.13
29	3.6	36.0	.021	0.09
30	3.8	38.0	.015	0.07
31	4.0	40.0	.011	0.05
32	4.5	45.0	.005	0.02
33	5.0	50.0	.000	0

$Q_{5\ u.d.} = 0.40(2.52)1.41$

$Q_{5\ u.d.} = 1.42$ cfs

PLATE 22.2 F-1

25×10 32×10

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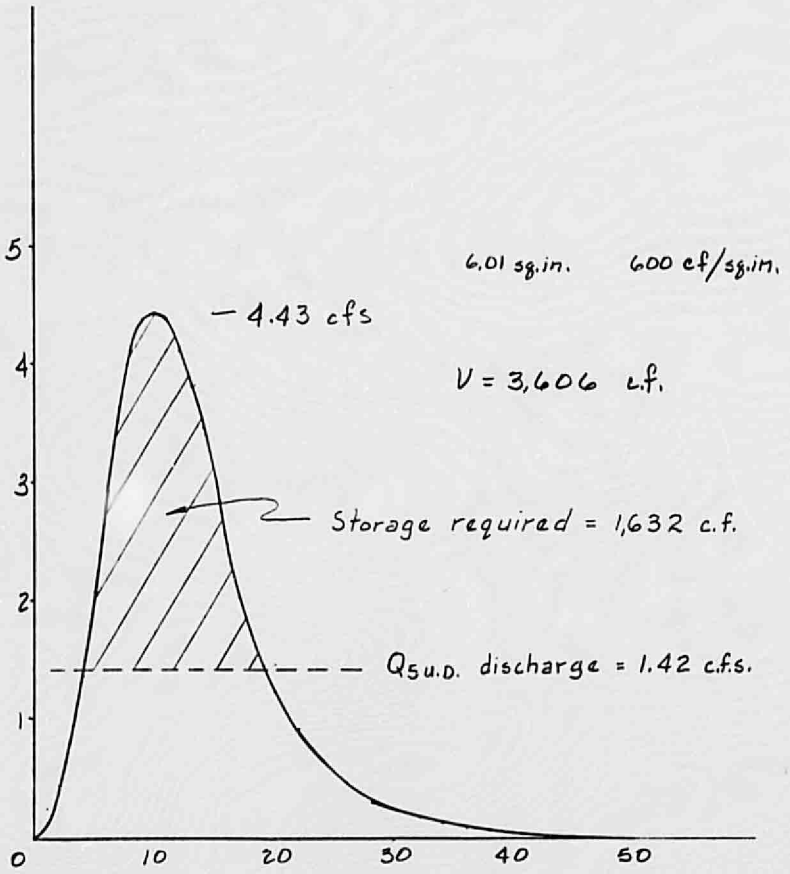
ESPEY, HUSTON & ASSOCIATES INC.
Engineering & Environmental Consultants

SUBJECT _____

Area C

SHEET ___ OF ___ . BY _____
DATE _____ CK BY _____



25×10 32×10

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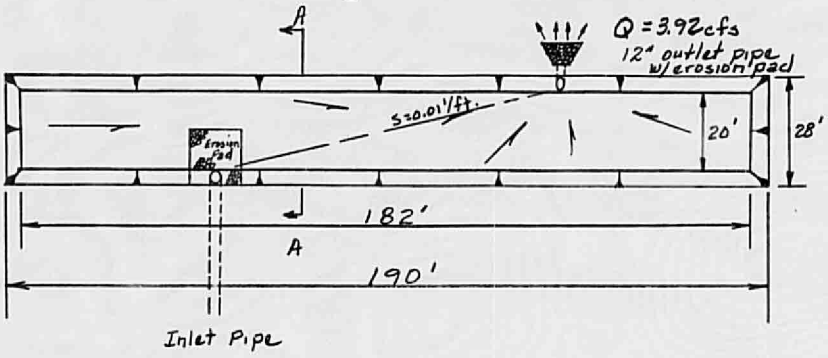
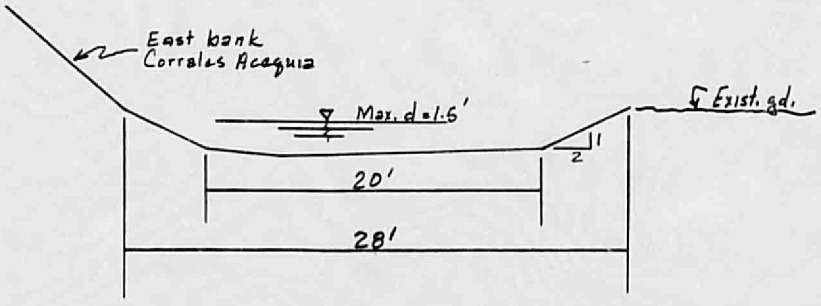
ESPEY, HUSTON & ASSOCIATES INC.
Engineering & Environmental Consultants

SUBJECT Las Tiendas Shopping Center
SHEET 1 OF 1 BY
DATE 5/6/83 CK BY

Pond For Drainage "B"

Ponding Vol. = 6,678 c.f.





Section A-A

25× 32×

0000 0000 0872

Discharge Pipes

Allowable discharge from Pond "A"

$Q_{5uo.} = 3.18$ cfs

Assuming a maximum head of 1.5' above the invert of the outlet.

Try a 12" pipe $H = 1'$ $a = 0.79$ sq.ft.

Using the Orifice Equation

$Q = C\,a\sqrt{2gH}$ where: $C = 0.62$, $g = 32.16$

a = area of pipe

H = Head above center of pipe

$\therefore Q = 0.62(0.79)\sqrt{2(32.16)(1)}$

$Q = 3.92$ cfs > allowable

Try 10" pipe $H = 1.08'$ $a = 0.54$ sq.ft.

$Q = 0.62(0.54)\sqrt{2(32.16)(1.08)}$

$Q = 2.79$ cfs < allowable $\therefore$ OK

Time to drain

Vol. = 3,564 c.f.

$Vol./Q = T = 3{,}564/2.79 = 1{,}277.42$ sec.

or 21.3 min. OK

$Vel = Q/A = 2.79/0.54$
$= 5.17$ fps
Erosion pad required

25×10 32×10

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Discharge Pipes

Allowable discharge from Pond "B"
$Q_{5\,u.d.} = 5.23$ cfs

Assuming a maximum head of 1.5' above the invert of the outlet.

Try a 12" pipe $H = 1$ ft. $a = 0.79$ sq. ft.

$Q = 0.62\,(0.79)\sqrt{2(32.16)(1)}$

$Q = 3.92$ cfs < allowable OK

Try a 15" pipe $H = 0.88$ ft. $a = 1.23$ sq. ft.

$Q = 0.62\,(1.23)\sqrt{2(32.16)(0.88)}$

$Q = 5.74$ cfs > allowable, Use 12"

Time to drain

Vol. = 6,678 cf.

$T = Vol./Q = 6{,}678/3.92$

$T = 1703.57$ sec

or 28.4 min. OK

Outlet velocity

Vel. = $Q/A = 3.92/1.23$

Vel. = 3.19 fps

Erosion pad not required but is recommended.

25×10 32×10

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Discharge Pipes

Allowable discharge from Area "C"
$Q_{5\,u.d.} = 1.42$ cfs

Ponding will be provided on-site

Assuming a maximum head of 1.5' above the outlet. — Catch basin

Try a 4" pipe $H = 8.5$ ft. $a = 0.087$

$Q = 0.62\,(0.087)\sqrt{2(32.16)(8.5)}$

$Q = 1.26$ cfs < allowable ok

Time to drain

Vol. = 1,632 c.f.

$T = \text{Vol.}/Q = 1{,}632/1.26$
$T = 1{,}295.24$ sec.
or 21.6 min. Ok

Outlet velocity

Vel. = Q/A = 1.26/0.087
Vel. = 14.48

Erosion pad and maybe a baffle str. required.

25×10 32×10

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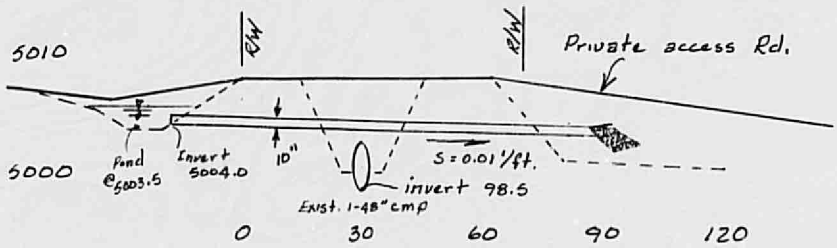
Discharge Pipes

SUBJECT Las Tiendas Shopping Center
SHEET 4 OF 7 BY
DATE 5/17/83 CK BY

Outlet works from on-site Pond "A"



See sheet 1 of Discharge Pipes for pipe calculations.

25×10 32×10

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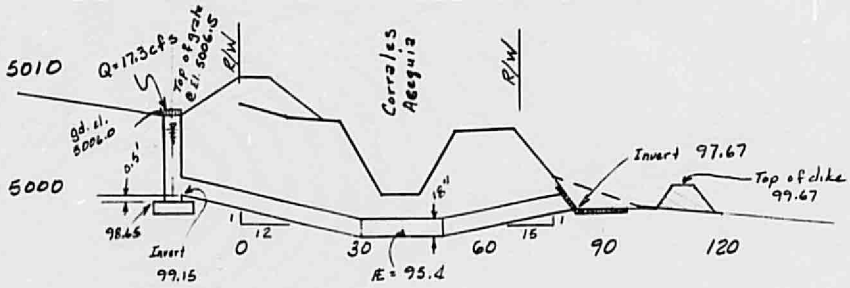
Discharge Pipes

SUBJECT Las Tiendas Shopping Center
SHEET 5 OF 9 BY
DATE 5/19/83 CK BY

Outlet works from Area "B" to Pond "B"



Grate Capacity

Limiting the head to 1 ft. to keep ponded water away from adjacent building foundation Solve for the area of opening

Using the equation $Q/A = 5.37 H^{1/2}$ (From Design Criteria For Drainage - NMSHD, Dec. 1968)

$A = Q / 5.37 H^{1/2} = 17.30 / 5.37 (1)^{1/2} = \underline{3.22}$ sq. ft.

$A = \underline{463.68}$ sq. in.

A grate w/ 8-2"x30" openings will work

A 34" sq. grate or anything comparable will work.

25×10 32×10

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Pipe Design [Using Design of Small Canal Structures - U.S. Bureau of Reclamation, 1978]

Using an 18" pipe $a = 1.77$ sq.ft. $V_o = 9.79$ fps.
Inlet control - $h = 4.80$ ft. or el. = 5003.95

V @ Inlet ≅ 16 fps @ 0.9' depth
$h_{vin} = 3.98$ ft. h_v through grate = 0.45 ft.

V @ Outlet = 9.79 fps @ 1.5' depth
$h_{vout} = 1.49$ ft.

$wp = \pi$ dia. $= 3.1416\ (1.5) = 4.71$ ft.
$r = a/wp = 1.77/4.71 = 0.376$ ft.
$n = 0.011$
$S_f = \left(\frac{1}{2.2\, r^{1/3}}\right) n^2 V^2 = \left(\frac{1}{2.2(.376)^{1/3}}\right)(.011)^2(9.79)^2 = 0.0194$

$H_L = 1.1\,(h_i + h_f + h_b + h_o)$
$= 1.1\,[0.4\,\Delta h_v + \text{pipe length} \times S_f + \sum h_{vp} \times 2 + 0.7\,\Delta h_v)$
$= 1.1\,[0.4(3.98-1.49) + (100 \times 0.0194) + (0.04 \times 1.49)\,2 + 0.7(3.98-1.49)]$
$= 1.1\,[1.0 + 1.94 + 0.12 + 1.74]$
$= 1.1\,[4.80] = 5.28$ ft.

Head provided = 7.83 ft. > 5.28 ft. required OK

25× 32×

0000 0000 0878

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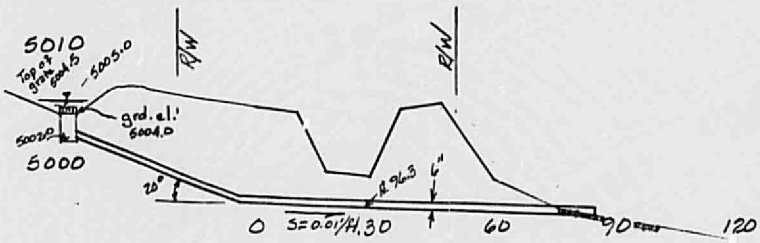
SUBJECT Las Tiendas Shopping Center
SHEET 7 OF 7 BY
DATE CK BY

Discharge Pipes

Outlet works from on-site Pond "C"



By Orifice Equation

$Q = 0.62\, a \sqrt{2gH}$

6" pipe

$a = 0.20$ sq. ft.

and Solving for H

$H = (Q/0.62\, a)^2 / 2g$

$H = (1.46/0.62(0.20))^2 / 64.32$

$H = 2.16$ ft.

25× 32×

0000 0000 0879

VOGT & BYRNES, P.A.
ARCHITECTS - ENGINEERS
1617 University Blvd., NE Phone 242-1526
Albuquerque, New Mexico 87102

April 4, 1983

MINUTES OF MEETING

Project: Las Tiendas de Corrales Shopping Center

Met with the Mid Rio Grande Conservency District

Persons present: Mike Rengal, Greg Foltz, Gerry Brown, Charles Martinez and Shaw ----

Items discussed:

1. Can not discharge into Acequia unless there is a wasteway downstream into the river.

2. November - February is the only time when the acequia can be open cut for the outlet pipe.

3. May not allow the 8' wide bike path on the right-of-way.
   Possible alternatives are:
   a. Concrete line the acequia
   b. Increase the R.O.W.
   c. Look at exact profiles

25×10 32×10

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PLANS/PLATS ON FILE

FILE DESC:

AH/D2

PLANS/PLATS 6

25×10 32×10

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