HYDROLOGY K22/D22 4 PLANS

K22/D22A

4 Plans

November 29, 1982

Mr. Harley V. Parr
Drainage Bureau Chief
NMSHD
P. O. Box 1149
Santa Fe, NM 87501-1149

Re: Juan Tabo – Interstate 40 Interchange K22-D22A

Dear Mr. Parr:

We have recently submitted a conceptual drainage plan to the City of Albuquerque for the La Cuesta Sector Plan area. This area is located in the northeast quadrant of the Juan Tabo-Interstate 40 Interchange. This area is bounded by Copper Avenue on the north and Zena Lona Street on the east.

On November 22, 1982, Dave Millikan, of our office, met with Ron Gaines, of your staff, to discuss your drainage concerns in this area. Upon reviewing your files, it appears that the 8'x4' concrete box culvert, which has been constructed beneath Ramp "C," is designed to accept flows from this area. Computations in your file indicate that the box culvert is designed to accept a peak flow due to a 100-year storm of 192 cfs. Its contributing area is 37.65 acres.

Our calculations indicate a peak 100-year flow rate of 90.4 cfs entering the box culvert from the La Cuesta Sector Plan area. A copy of our report is enclosed for your review. This flow rate is the total runoff from Basins B-1 through B-5, C-1 through C-7, and D-1.

The apparent reasons for the lesser flow rate are:

1. The area between the main roadway and Ramp "C" is no longer a part of the contributory area.

2. Our computations are based upon City of Albuquerque Development Process Manual procedures, not NMSHD procedures. The different procedures result in a lower runoff coefficient and intensity for our calculations than for yours.

3. Your computations were done at a time when less was known about the future development of this area.

BOHANNAN-HUSTON INC.

4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 (505) 881-1000
6713 VISCOUNT BLVD. EL PASO, TEXAS 79925 (915) 778-4481
330 GARFIELD SANTA FE, NEW MEXICO 87501 (505) 988-7671

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

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

We are enclosing a copy of the response received from Mr. Andre Houle, at the City, concerning our conceptual drainage plan. Mr. Houle expresses concern that some of the flows in Juan Tabo Boulevard will leave the Juan Tabo right-of-way and flow to the 8'x4' concrete box culvert beneath Ramp "C." Your analysis, and ours, assume that no flows from Juan Tabo Boulevard must be conveyed through the 8'x4' box culvert. It is our understanding that if any flows leave the Juan Tabo right-of-way they will enter the northwest quadrant, not the northeast. Your input on this matter will be appreciated.

The other item of concern Mr. Houle has is our proposal to discharge developed flows into the Interstate 40 concrete ditch. Since the developed drainage patterns are not significantly altered from the existing drainage patterns, we assumed this would not be a problem.

A proposed cross-section for the channel along Juan Tabo Boulevard is enclosed. Runoff from Basins C-1 through C-7 will be conveyed to the entrance of the box culvert in an adequately designed swale. Runoff from Basin D-1 will be conveyed to the invert of the roadside ditch along Ramp "C" in an adequately designed swale. Detailed design of these swales will be prepared at the time improvement drawings are prepared for development of these basins. Upon completion, the drawings will be submitted for your review along with a request for a permit to discharge into the highway right-of-way. Please notify us if this is an acceptable procedure with your staff.

If the proposals contained in our conceptual drainage plan and this letter are acceptable to you, please confirm this so we may forward a copy to Mr. Houle, at the City. If you have any questions, please call Dave Millikan or me.

Sincerely yours,

Michial M. Emery

Michial M. Emery, P.E.
Vice President

cc: Mr. Ron McConnell
Mr. Andre Houle

Enclosures

DMYM/dlh
Job No. 2 096 1

DMJM

RECEIVED
FEB 11 1986
HYDROLOGY SECTION

RECEIVED
FEB 11 1986
CITY ENGINEER

February 10, 1986

MDD/Engineering
Design Hydrology
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

ATTN: Mr. Fred Aguirre, P. E.

RE: Corte de Paz - AC 84594

Dear Fred:

I have, as a result of your telephone call, reviewed our files and find no correspondence at all. As I remember the original problem, it had to do with the construction of masonry rear yard walls instead of cedar fences and the method of handling roof drainage.

Attached is a print of a drawing prepared by our firm as a result of a conversation you and I had, discussing the existing report and the construction methods and materials desired by Roberson Construction Company.

If additional information is needed, please notify me.

Sincerely,

Jean J. Bardenave, P. E.

Attachment

JJB/dt

Daniel, Mann, Johnson, & Mendenhall
Suite 260, 5700 Harper Drive, N.E.
Albuquerque, New Mexico 87109
Telephone: 505/822-7955

Planning
Engineering
Systems
Economics

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

READING FILE

November 23, 1983

Mr. Andre Houle
CTS, Inc.
1100 Alvarado
Albuquerque, NM 87110

REF: SECURITY VILLAGE (K22-D22) and CORTE DE PAZ (K22-D22B) DATED 11/17/83

Dear Mr. Houle:

The referenced revised drainage plan is in accordance with our previous discussion; therefore, these plans are approved.

If you have any questions, please feel free to contact me at 766-7644.

Sincerely,

Fred J. Aguirre
Design Hydrologist

FJA:mrk

INFORMATION SHEET

PROJECT TITLE K22-D22B ~~[illegible]~~ TYPE OF SUBMITTAL AMENDMENT ~~[illegible]~~

ZONE ATLAS PAGE NO. Corte de Rosa CITY ADDRESS

LEGAL DESCRIPTION

ENGINEERING FIRM CTS, INC CONTACT ANDRE HOULE

ADDRESS 1100 ALVARADO PHONE 266-3445

OWNER RON McCONNELL CONTACT

ADDRESS PHONE

ARCHITECT CONTACT

ADDRESS PHONE

SURVEYOR CONTACT

ADDRESS PHONE

CONTRACTOR CONTACT

ADDRESS PHONE

DATE SUBMITTED 11-17-83

By Andre Houle

Amended to include paving section for letter of credit & Agreement processing

RECEIVED

NOV 17 1983

ENGINEERING

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

February 16, 1983

Mr. Michial M. Emery PE
Bohannan-Huston Inc.
4125 Carlisle Blvd. NE
Albuquerque, New Mexico 87107

Ref: Townhouse Parcel on Copper Avenue, La Cuesta Subdivision
(K11-D22A)

Dear Mr. Emery:

I have checked and verified with my supervisor that residential development can indeed have retention ponds. Therefore the drainage and grading proposal is hereby accepted by the City for development.

However in order to obtain a building permit or obtain a filed plat the following concerns must be addressed:

1. All drainage facilities such as streets, curb and gutters, channels along Juan Tabo and NMSHD department approval of outfall in NMSHD right-of-way must be finalized or an acceptable guarantee of these improvements be provided. The City will consider temporary facilities and a maintenance agreement in lieu of the final solution at this time. These measures are required because no Certificate of Occupancy is required for Townhouse developments and the leverage for development of drainage facilities must be attached on the platting request and/or the building permit.

Contact me if you need any additional information on these requirements.

Very truly,

Andre Houle, PE
Civil Engineer/Hydrology

AH/el

cc: Drainage File
Reading File

ENGINEERS PLANNERS PHOTOGRAMMETRISTS

BOHANNAN-HUSTON INC.

4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
6773 VISCOUNT BLVD., EL PASO, TEXAS 79925 915 778-4491
330 GARFIELD, SANTA FE, NEW MEXICO 87501 505 988-7671

February 10, 1983

Mr. Andre Houle
Civil Engineer/Hydrology
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: Townhouse Parcel on Copper Avenue in La Cuesta Subdivision

Dear Andre:

In response to your comments on the above-referenced project, we offer the following information:

1. Section 6, Clause F of the Drainage Ordinance refers to detention ponds. The ponds in the backyards of the townhouses on this project are designed to retain the volume of runoff generated within the backyards only. No runoff from the roofs of the buildings is to drain to these areas. Each pond is designed to retain the amount of runoff generated by the 100-year six-hour storm.

   The Development Process Manual, Section 22.2 C3, states that "It is understood that the grading of certain parcels may require the use of backyard ponds . . . however, no credit will be given in the overall determinations of peak rates of runoff and runoff volumes from the subdivision." Credit for the amount of runoff retained in these ponds is not necessary in this case.

2. It is recognized that the improvements to Zia Road and the associated drainage facilities will be required prior to issuance for a certificate of occupancy for the units on this parcel.

This information should satisfactorily address the concerns expressed in your letter, dated February 7, 1983, to Dave Millikan. Your prompt approval of this drainage plan will be appreciated.

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

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

If you have any additional questions, please contact Dave Millikan or me at this office.

Sincerely yours,

Michial M. Emery

Michial M. Emery, P.E.
Vice President

cc: Mr. Ron McConnell

DMYM/dlh
Job No. 2 097 3

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

February 7, 1983

Mr. David Millikan
Bohannan, Huston Inc.
4125 Carlisle Blvd. NE
Albuquerque, New Mexico 87107

Ref: Lots 5, 6, 19, 20, Block A
La Cuesta Subdivision
(K22-D22A)

Dear Mr. Millikan:

The Engineering Department's review of your proposed drainage and grading plan has the following comments:

1. The City does not allow detention ponds without an outfall (Drainage Ordinance Section 6, Clause F.).

2. Zia Road will be required to be paved with the necessary drainage facility along Juan Tabo to be built. The City will consider temporary drainage facilities with a maintenance agreement and a financial committment for the permanent drainage channel and a completed Zia Road street section.

Please contact me to further discuss these requirements or anything else regarding this site.

Very truly,

Andre Houle, PE
Civil Engineer/Hydrology

AH/el

cc: Drainage File
Reading File

INFORMATION SHEET

PROJECT TITLE Townhouse Development in Las Cuesta Subdivision

TYPE OF SUBMITTAL Drainage Report

ZONE ATLAS PAGE NO. K-22 - 022a

CITY ADDRESS

LEGAL DESCRIPTION Lots 5, 6, 19, 20, Block A – La Cuesta Subdivision

ENGINEERING FIRM Bohannan–Huston, Inc.

CONTACT Dave Woods

ADDRESS 4125 Carlisle Blvd., NE

PHONE 881-2000

OWNER R.D. McConnell

CONTACT R.D. McConnell

ADDRESS 1255 Church Street

PHONE (415) 676-8969

ARCHITECT

CONTACT

ADDRESS

PHONE

SURVEYOR

CONTACT

ADDRESS

PHONE

CONTRACTOR

CONTACT

ADDRESS

PHONE

DATE SUBMITTED December 3, 1982

BY David M. G. Miller

RECEIVED

DEC 06 1982

ENGINEERING

DRAINAGE INFORMATION SHEET

PROJECT TITLE: Corte de Paz ZONE ATLAS/DRNG. FILE #: K22/D22A

LEGAL DESCRIPTION: Corte de Paz

CITY ADDRESS:

ENGINEERING FIRM: DMJM CONTACT: J. J. Bordenave

ADDRESS: 5700 Harper NE PHONE: 822-7955

OWNER: various CONTACT:

ADDRESS: PHONE:

ARCHITECT: unknown CONTACT:

ADDRESS: PHONE:

SURVEYOR: DMJM CONTACT: J. J. Bordenave

ADDRESS: PHONE: 822-7955

CONTRACTOR: Roberson Const. Co. CONTACT: Coda Roberson

ADDRESS: 6001 Atrisco NW PHONE: 897-4996

RECEIVED APR 16 1986 HYDROLOGY SECTION

PRE-DESIGN MEETING

___YES DRB NO. –

_X_ NO EPC NO. –

_X_ COPY OF CONFERENCE RECAP SHEET PROVIDED PROJ. NO. –

TYPE OF SUBMITTAL:

___DRAINAGE REPORT

___DRAINAGE PLAN

___CONCEPTUAL GRADING & DRAINAGE PLAN

___GRADING PLAN

___EROSION CONTROL PLAN

_X_ ENGINEER'S CERTIFICATION

~~_X_ RECORD DRAWING~~

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 ~~Hydrology~~ For compliance with Corte De Paz's Subdivision Improvements Agreement. (SPECIFY) ~~Satisfaction~~

DATE SUBMITTED: 4-16-86

BY: J J Bordenave

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

April 22, 1986

Jake Bordenave
DMJM
5700 Harper Drive, NE Suite 280
Albuquerque, New Mexico 87109

RE: CERTIFICATION FOR CORTE DE PAZ (K-22/D22A)
RECEIVED APRIL 16, 1986

Dear Mr. Bordenave:

A field inspection was conducted on April 18, 1986. Our inspection revealed that the items listed below are contrary to the approved drainage plan.

1. Water crossing West property line thru wall into adjacent property.

2. Roof drainage not as shown on plan. Downspouts on sides and rear of buildings.

3. Turned blocks only at two walls (others may be covered by landscaping).

4. Your grades on your certification plan indicates that the flows in the rear yards will never reach the two streets (Zia & Copper).

Before final approval may be granted, the above concerns will need to be addressed.

If I can be of further assistance, please feel free to call me at 766-7644.

Cordially,

Bernie J. Montoya

Bernie J. Montoya, C.E.
Engineering Assistant

BJM/bsj

Fred Aguirre

RECEIVED
SEP 09 1986
HYDROLOGY SECTION

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

K221 D22A

September 9, 1986

Mr. Ron McConnell
600 Paisano NE
Albuquerque, NM 87123

SUBJECT: RELEASE OF AGREEMENTS

Dear Mr. McConnell:

In accordance with your request on Wednesday, August 20th I have investigated the following six agreements.

Paisano Street - La Questa Subdivision

Zia Road - La Questa Subdivision

All World Travel - Zia Road - La Questa Subdivision

Security Village - La Questa Subdivision

Corte de Paz Subdivision

Domingo Road

Release of agreements for Paisano Street, Zia Road, All World Travel - Zia Road, and Domingo Road have all been signed and forwarded to Legal for final processing. Of course, Domingo Road continues to carry the covenant requiring maintenance since it is a private street. Two releases have not been signed. These are Security Village - La Questa Subdivision and Corte de Paz Subdivision.

Upon investigation of the drainage requirements and subsequent construction of a wall necessary for drainage it appears that dirt fill which provides support for the wall may lie on property adjacent to Security Village. It is further my understanding that permission for this fill has not been given by the adjacent property owner and he contests placement of the fill. Without the fill, the integrity of the wall is damaged, and it is believed the retaining wall may not stand. As a consequence, since it is possible the retaining wall may fall if dirt is ordered removed by

the adjacent property owner, we can not release the agreement. We would be pleased to release the agreement as soon as either the wall is constructed in such a manner as to not depend upon soil support on the adjacent property or the adjacent property owner agrees in writing to allow the support soil to remain. In order to release covenants for Security Village it is necessary that one of the above two conditions be met.

With respect to the Corte de Paz Subdivision, a meeting between Jake Bordenave, Fred Aguirre, and myself occurred on Wednesday, August 27, 1986. The original requirements set forth in the K22D22B drainage improvements have not been met. More specifically, rainfall from the roofs of apartment drain to the back yard of the apartments and insufficient provisions to channel rainfall from the back yards have been provided. In order to obtain release of the agreement successful completion of any one of the following three alternatives will suffice.

1. Block drainage pipes which drain to the back yards of properties.

2. Insure that wall openings are available for draining water across the properties to the street, in accordance with the engineering design.

3. Survey back yards in order to ascertain rather sufficient ponding capacity is available within each yard for drainage from its respective roof, and certification that such ponding will not cause damage to adjacent walls or buildings.

All three of these alternatives have been discussed with your Engineer, Jake Bordenave. Implementation of any one requirement will satisfy the City's requirements. In order to release the agreement the City must have the developer's Engineer Certify that the drainage improvements per City drainage file K22D22B have been constructed or, alternatively, one of the above three alternatives have been implemented.

I trust this addresses these issues sufficiently so as to clearly state the City's position. If there are any questions on any of the above or if further information or elaboration is needed, please let me know.

George E. Selvia, Assistant Director
Public Works/Engineering

GES/njb
Ref: 5707E

xc: Bill Mueller, Adelia Kearny, Fred Aguirre, Jake Bordenave, Andre Houle, Della Gallegos, and Pending

DRAINAGE REPORT
FOR
A TOWNHOUSE DEVELOPMENT
IN
LA CUESTA SUBDIVISION

December, 1982

BOHANNAN-HUSTON INC.

RECEIVED

DEC 06 1982

ENGINEERING

DRAINAGE REPORT
FOR
A TOWNHOUSE DEVELOPMENT
IN
LA CUESTA SUBDIVISION

December, 1982

DRAINAGE REPORT
FOR
A TOWNHOUSE DEVELOPMENT
IN
LA CUESTA SUBDIVISION

DECEMBER, 1982

PREPARED FOR:

R.D. McCONNELL
1255 CHURCH STREET
BENICIA, CA 94510

PREPARED BY:

BOHANNAN–HUSTON, INC.
4125 CARLISLE BOULEVARD, N.E.
ALBUQUERQUE, NM 87107

DAVID M. Y. MILLIKAN
NEW MEXICO
7547
12-3-82
REGISTERED PROFESSIONAL ENGINEER

David M Y Millikan

DAVID M.Y. MILLIKAN
N.M.P.E. NO. 7547

INDEX

	Page
PURPOSE AND SCOPE	1
SITE LOCATION AND DESCRIPTION	1
METHOD OF ANALYSIS	2
UNDEVELOPED DRAINAGE	2
DEVELOPED DRAINAGE	2
EROSION CONTROL PLAN	3
SUMMARY	3

FIGURES

1 – Site Location Map
2 – Soils Map
3 – DPM Plate 22.2 D-1
4 – DPM Plate 22.2 D-2
5 – DPM Plate 22.2 C-1
6 – AMDS – Flood Hazard Boundary Map

APPENDIXES

1 – Undeveloped Drainage Calculations
2 – Developed Drainage Calcuations

PLATES

1 – Undeveloped Drainage
2 – Developed Drainage

DRAINAGE REPORT
FOR
A TOWNHOUSE DEVELOPMENT
IN
LA CUESTA SUBDIVISION

PURPOSE AND SCOPE

This drainage report has been prepared to outline the treatment of storm water generated within a townhouse development in La Cuesta Subdivision. It has been prepared in conformance with the guidelines of the City of Albuquerque's Development Process Manual (DPM), Chapter 22, entitled "Drainage and Flood Control."

A conceptual drainage report has been prepared for the entire La Cuesta Sector Plan area. It was prepared by Bohannan–Huston, Inc. in October, 1982. An analysis of upland flows and recommendations for development of the area within La Cuesta Sector Plan area are outlined in that plan. Development of this parcel, as outlined in this report is in conformance with the recommendations of the conceptual drainage plan for La Cuesta Sector Plan area. Therefore, the upland flows impacting this site are not reanalyzed in this report.

SITE LOCATION AND DESCRIPTION

The site is located in the northeast heights of Albuquerque, New Mexico. It is bounded on the north by Copper Avenue and on the south by Zia Road. It is located just east of Paisano Avenue (see Figure 1). The site contains approximately 0.95 acres. It slopes from east to west at approximately 4%. The soils on the site consist primarily of Tijeras gravelly fine sandy loam (TgB) and Embudo-Tijeras complex (EtC). The locations of each soil type are indicated on the enclosed copy of the Soil Survey of Bernalillo County prepared by the Soil Conservation Service (see Figure 2). Both soil types are classified as hydrologic soil group "B."

METHOD OF ANALYSIS

The peak flow rates for the developed and undeveloped drainage basins were determined by application of the Rational Method. The total runoff volumes were calculated using the Modified Rational Method. Both these methods are outlined in the DPM. The time of concentration was found to be less than ten minutes for all basins. Therefore, ten minutes was used in all computations.

Rainfall intensities were determined by applying Plates 22.2 D-1 (Figure 3) and 22.2 D-2 (Figure 4) of the DPM. The 100-year intensity was determined to be 5.19 in./hr. The 10-year intensity is 3.41 in./hr.

The runoff coefficient for Basins A and B was estimated as 0.76. This is based on calculations showing these Basins to be approximately 80% impervious (Figure 5).

UNDEVELOPED CONDITIONS

The undeveloped site has a total runoff of 1.64 cfs. The overland flow from Basin 1 (0.71 cfs) ultimately discharges to Copper Avenue. The overland flow from Basin 2 (0.93 cfs) discharges to Zia Road (see Plate 1). The site is located outside of any Flood Hazard Area (see Figure 6).

DEVELOPED CONDITIONS

According to the drainage master plan for La Cuesta Subdivision, the allowable discharge to Copper Avenue and Zia Road from this site is 2.2 cfs and 1.8 cfs, respectively.

The developed site is divided into three basins (see Plate 2). Basins A and B include the building runoff and discharge to Copper Avenue and Zia Road. The developed runoff for Basins A and B is 1.49 cfs and 1.00 cfs respectively. Both of these are significantly below the allowable discharge.

Basin C contains the interior of the site. The only areas included within Basin C are the fenced back yards. Each yard will be required to pond the runoff it generates due to the 100-year storm.

The runoff coefficient for Basin C has been calculated to be 0.38. There are two different sizes of back yards. The back yards on the end units are larger than the back yards of the interior units. The end unit lots will each require 105 cubic feet of ponding. The interior lots will each require 86 cubic feet of ponding. The grading shown on Plate 2 provides the required pond volumes in each rear yard.

EROSION CONTROL PLAN

The grading of the site will be done along with construction of the units. Due to the small size of the site (0.95 acres) and the short period of time required for construction of the units, significant erosion is not anticipated.

Upon final development, the areas of the site which are unpaved shall be covered with irrigated-maintained grass or another form of permanent landscaping. This will prevent erosion after completion of the project.

SUMMARY

- The runoff from Basins A and B shall be allowed to discharge at an uncontrolled rate to Copper Avenue and Zia Road.

- The back yards shall be graded, as shown on Plate 2, with ponds to retain their runoff from the 100-year storm.

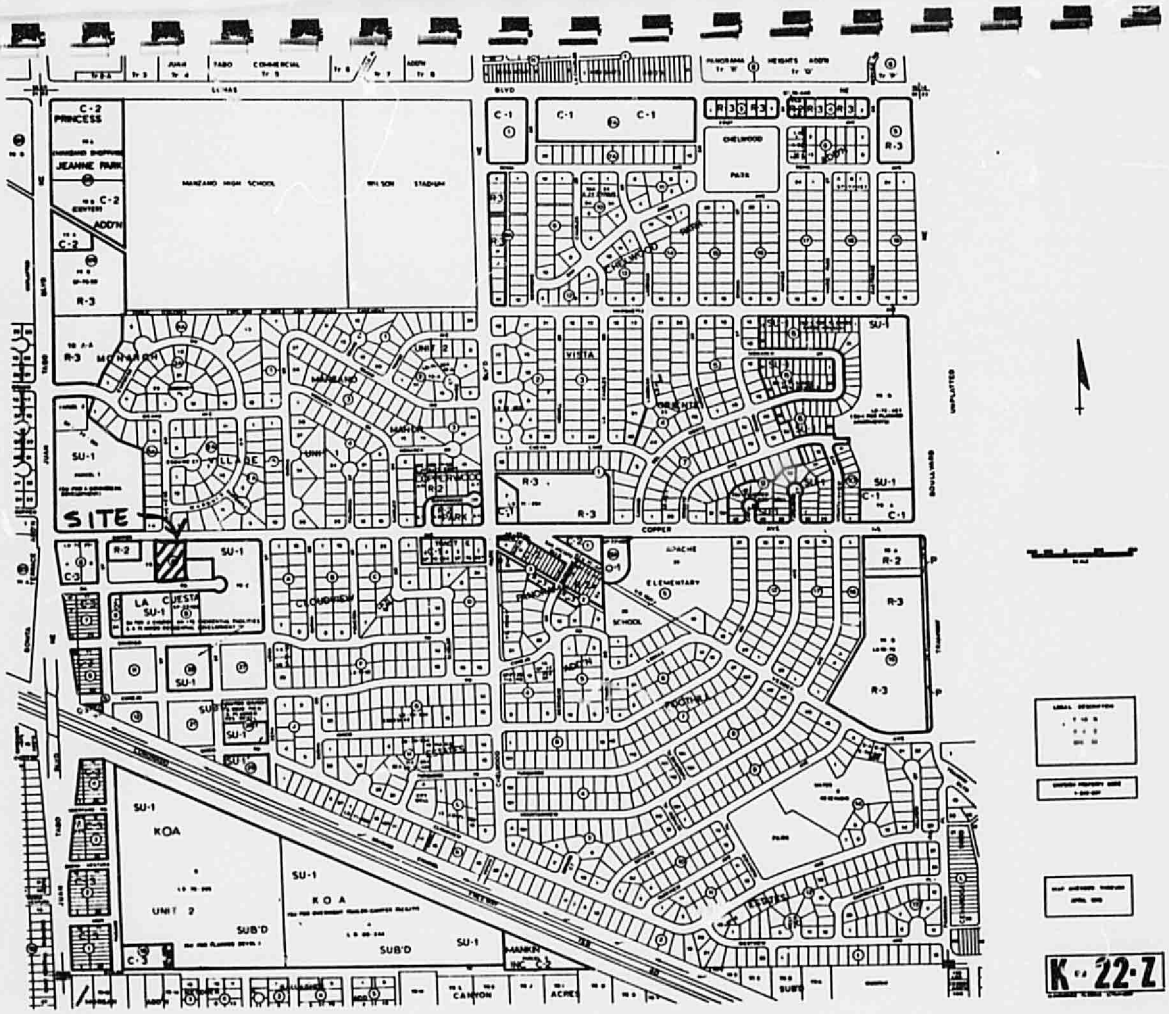

C-2
PRINCESS
JEANNE PARK
C-2
CENTER
ADD'N
C-2
R-3
R-3
MONARCH
SU-1
SITE
R-2
SU-1
LA CIESTA
SU-1
SU-1
SU-1
KOA
UNIT 2
SUB'D
SU-1
KOA
SUB'D
SU-1
C-3
MANZANO HIGH SCHOOL
WILSON STADIUM
C-1
C-1
C-1
CHELWOOD
PARK
R-3
R-3
VISTA
SU-1
R-3
R-3
SU-1
SU-1
C-1
C-1
COPPER
APACHE
ELEMENTARY
SCHOOL
R-2
R-3
R-3
PARK
CANYON
ACRES
K-22-Z

FIGURE 1

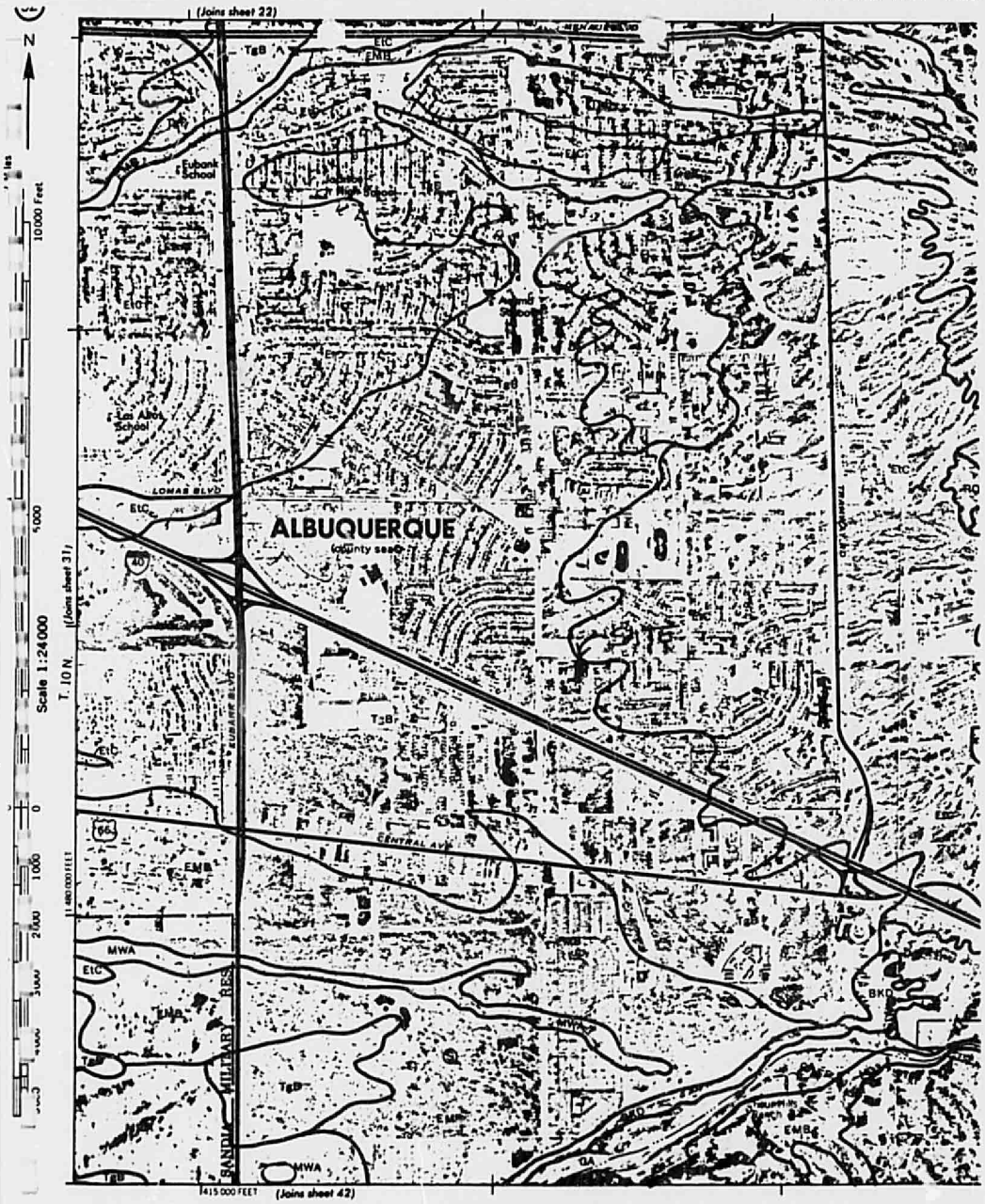
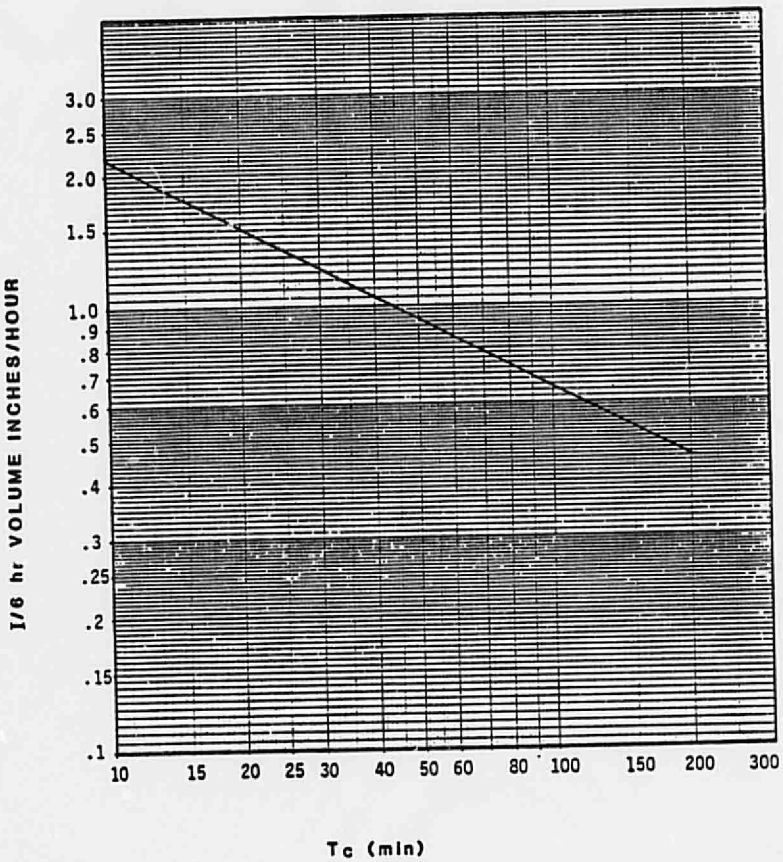

(Joins sheet 22)
(Joins sheet 31)
(Joins sheet 42)
Scale 1:24 000
T. 10 N.
ALBUQUERQUE
(county seat)
Eubank School
Los Altos School
LOMAS BLVD
CENTRAL AVE
BUBANK BLVD
SANDIA MILITARY RES
EIC
EMB
MWA
TgB
TzB
BKD
BA
40
66
10 000 Feet
5 000
0
1 000
2 000
3 000
4 000
1 000 000 FEET
415 000 FEET

FIGURE 2

DIMENSIONLESS RAINFALL INTENSITIES

$I = (6\text{-hr. rain})6.84\ t_c^{-0.51}$



note: To get actual intensities, multiply rainfall volume from plate D-1 by value from curve. Use reduction factors on Plate D-1 for other than 100-yr.

FIGURE 3

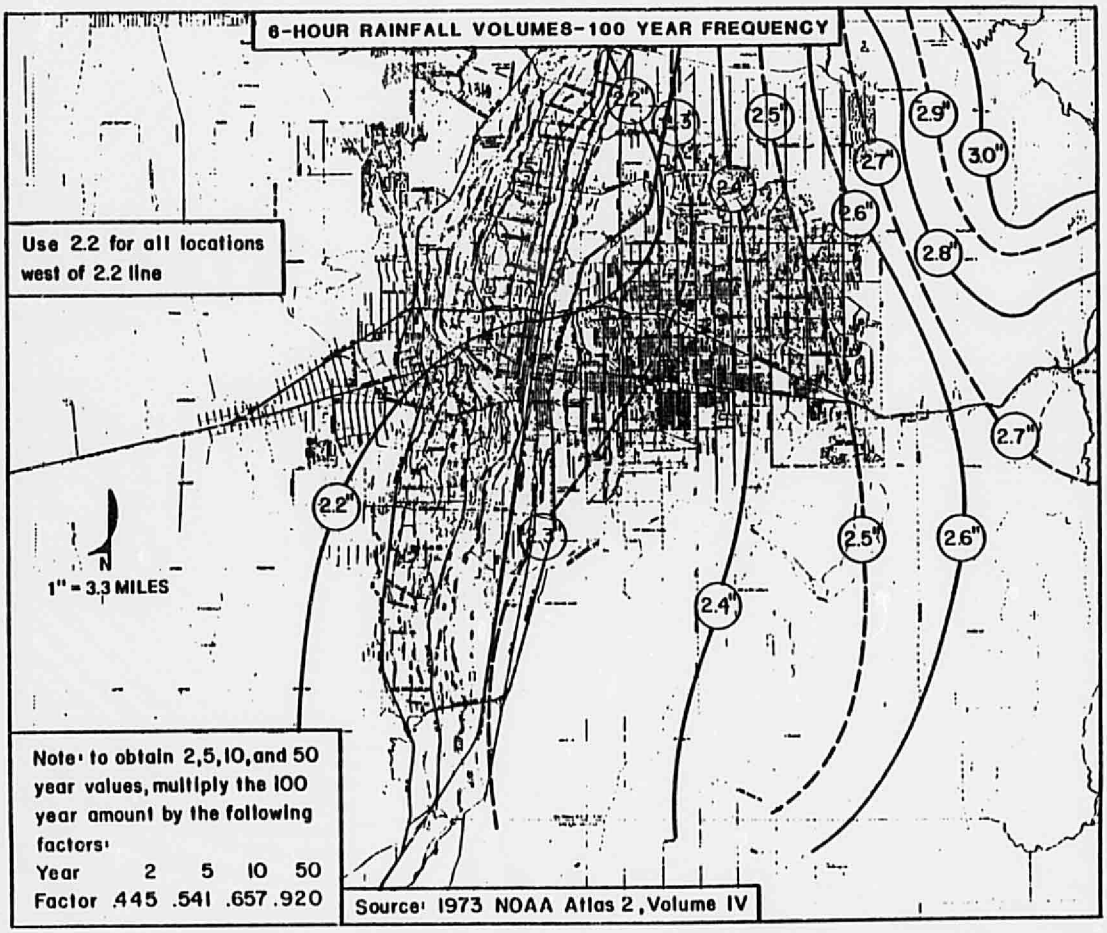

6-HOUR RAINFALL VOLUMES-100 YEAR FREQUENCY
Use 2.2 for all locations west of 2.2 line
2.2"
2.3"
2.4"
2.5"
2.6"
2.7"
2.8"
2.9"
3.0"
N
1" = 3.3 MILES
Note: to obtain 2,5,10,and 50 year values, multiply the 100 year amount by the following factors:
Year 2 5 10 50
Factor .445 .541 .657 .920
Source: 1973 NOAA Atlas 2, Volume IV

FIGURE 4

DRAINAGE CRITERIA

DETERMINATION OF RATIONAL FORMULA 'C' FACTOR

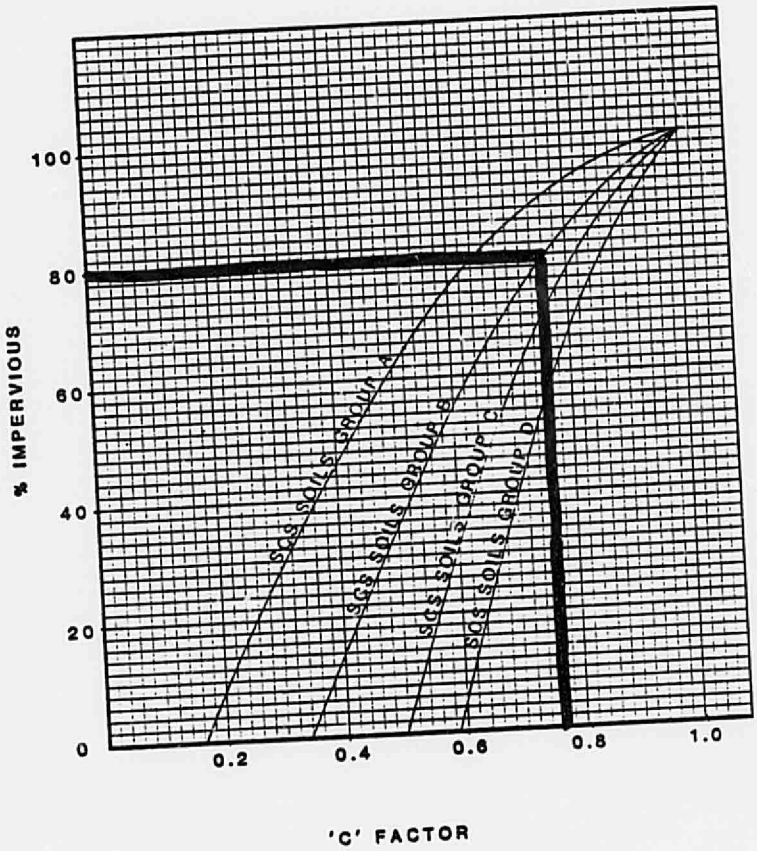


FIGURE 5

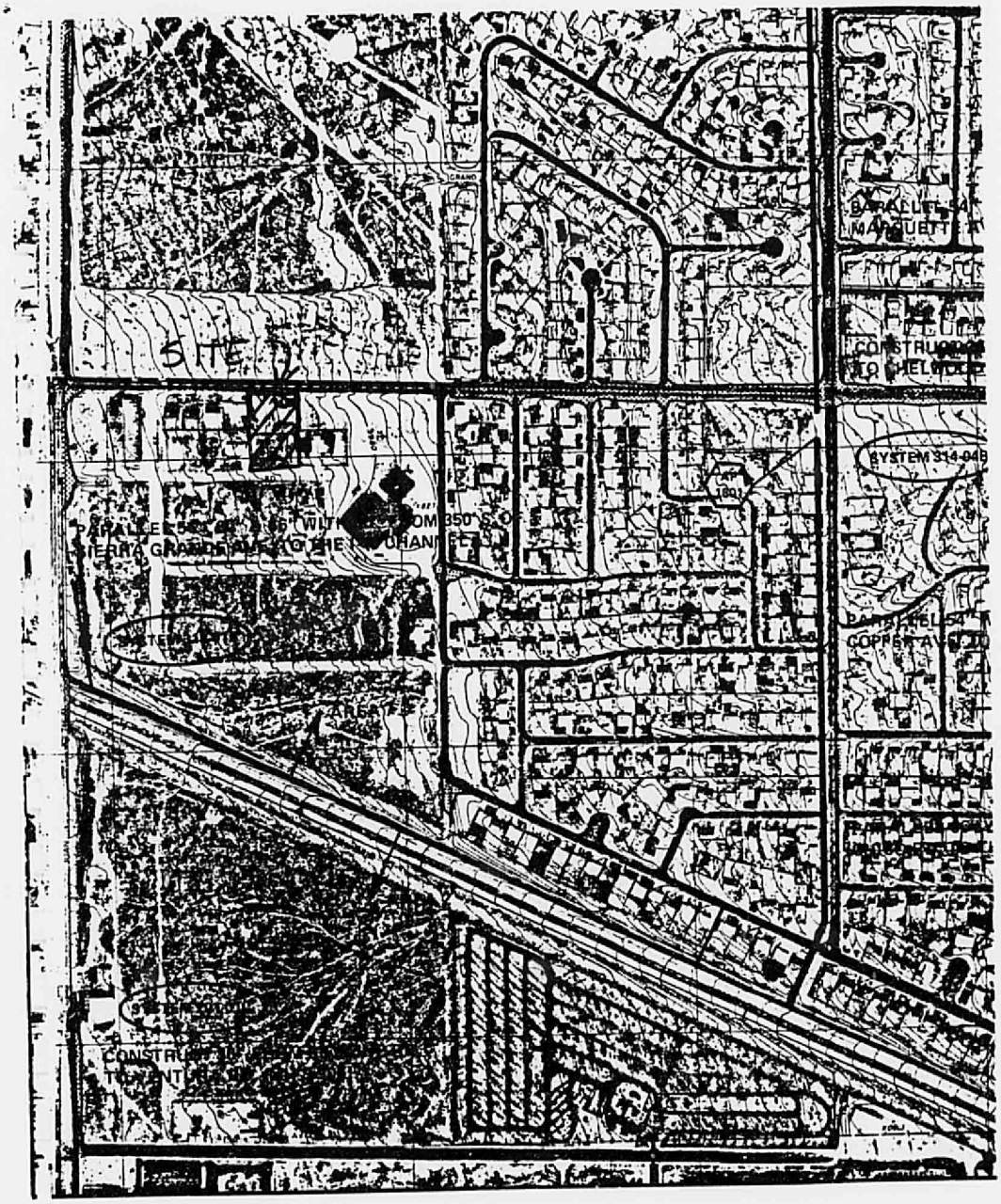


FIGURE 6

APPENDIX

UNDEVELOPED

BASIN 1

AREA = .41 ac.

T_c = 10 min

I_{100} = 5.19

I_{10} = 3.41

c = .34

Q_{100} = 0.71 cfs

Q_{10} = 0.48 cfs

BASIN 2

AREA = 0.54 ac.

T_c = 10 min

I_{100} = 5.19

I_{10} = 3.41

c = .34

Q_{100} = 0.93 cfs

Q_{10} = 0.63 cfs

DEVELOPED DRAINAGE

BASIN A

AREA = .38ac

$c = 0.76$

$T_c = 10 min$

$I_{100} = 5.19$

$I_{10} = 3.41$

$I/6hr = 2.5 in$

$Q_{100} = 1.49 cfs$

$Q_{10} = 0.98 cfs$

$Vol_{100} = .38(.76)(2.5)\frac{43560}{12}$

$Vol_{100} = 2620 cf$

BASIN B

AREA = 0.25

$c = 0.76$

$T_c = 10 min$

$I_{100} = 5.19$

$I_{10} = 3.41$

$I/6hr = 2.5 in$

$Q_{100} = 1.00 cfs$

$Q_{10} = 0.65 cfs$

$Vol_{100} = 1724 cf$

BASIN C

AREA = .32 ac

$c = 0.38$

$I/6hr = 2.5 in$

$V = (C)(P)(A) = (.4)\frac{(2.5)}{12}(.32)(43560) =$

End Unit Yards Area = 0.0305ac/ea

Interior Unit Yards Area = 0.0248ac/ea

$Vol_{100} = Area \times I/6 \times c \times \frac{43560}{12} = 2904 c.f.$

End Units-Vol_{100} = 105cf

Interior Units-Vol_{100} = 86cf

242 c.f.

PROJECT NAME

PROJECT NO. 20973

SUBJECT Developed Drainage

SHEET 2 OF 2

BY Dmyn DATE 12/3/92

CH'D DATE

HYDROLOGY K22/D22 1 PLAN

K22/D22

1 Plan

INFORMATION SHEET

PROJECT TITLE La Cuesta Sector Plan Area TYPE OF SUBMITTAL Conceptual

ZONE ATLAS PAGE NO. K-22 CITY ADDRESS East of Juan Tabo, North of I-40, West of Zena Lona, and South of Copper.

LEGAL DESCRIPTION

ENGINEERING FIRM Bohannan–Huston, Inc. CONTACT Dave Millikan

ADDRESS 4125 Carlisle Blvd., N.E. PHONE 881-2000

OWNER Ron McConnell, Christian Center and Individual lot owners. CONTACT

ADDRESS PHONE

ARCHITECT N/A CONTACT

ADDRESS HONE

SURVEYOR Bohannan–Huston, Inc. TACT

ADDRESS same PHONE

CONTRACTOR N/A CONTACT

ADDRESS PHONE

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DATE SUBMITTED 10-6-82

BY

Use this Information Sheet when submitting the following:

Drainage report or plan, conceptual grading and drainage plan, engineer's certification plan, erosion plan and grading plan. Provide the information applicable to your submittal.

BASIN	AREA (AC.)	Tc (MIN.)	"C"	Q (CFS)
A-1	0.8	10	.77	3.3
A-2	1.6	10	.77	6.5
A-3	0.8	10	.77	2.9
B-1	0.3	10	.77	1.2
B-2	0.7	10	.77	2.9
B-3	3.7	10	.77	15.0
B-4	0.8	10	.77	3.3
B-5	0.6	10	.77	2.4
C-1	0.8	10	.77	3.3
C-2	0.7	10	.77	2.9
C-3	2.0	10	.77	8.1
C-4	1.1	10	.77	4.5
C-5	2.5	10	.77	10.2
C-6	5.5	10	.77	22.4
C-7	2.8	10	.77	11.4
D-1	1.8	10	.77	7.3

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107.2

Type "B" Soil (TgB)
80% Impervious, "c" = .77, see Table 22.2 C-1
2.4" Rain / 6 hr.
I/6 hr = 2.2
I = 5.28 in/hr.

$(26.2)(5.28)(.77) = 107.2$ c.f.s.

PLATE IV

PROJECT NAME La Cuesta Area Drainage SHEET OF
PROJECT NO. 20961 BY Smyn DATE 10-4-82
SUBJECT Peak Flow Rate Computations CHKD DATE

LOCATION	Q	SLOPE	STREET WIDTH	CROWN	DEPTH	VELOCITY
West End Of Zia Road	23.6cfs	3.5%	40'	5"	.31'	4.2fps
West End Of Private Utility, Drainage & Access Esmt.	12.6cfs	3.5%	24'	3"	.24'	3.6fps
Paisano Avenue at Access Esmt.	44.0cfs	1.5%	40'	5"	.47'	4.5fps

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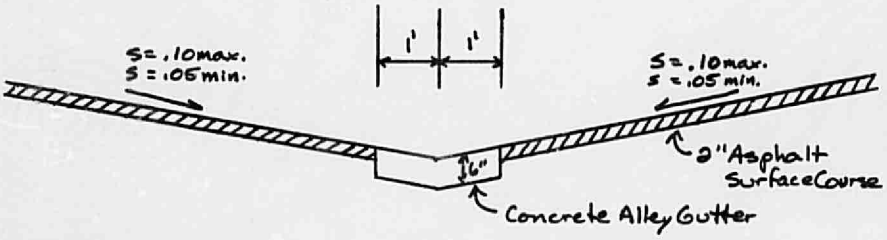
PLATE V

PROJECT NAME La Cuesta Area Drainage SHEET
PROJECT NO. 20961 BY Bmyer DATE 10-4-82
SUBJECT Street Flow Calculations CH'D DATE



Longitudinal Slope = 2%
59.5cfs
at .10 sides : D=.90 Top Width= 18'
at .05 sides : D= .69 Topwidth =28'

Parking Lot Swale Detail

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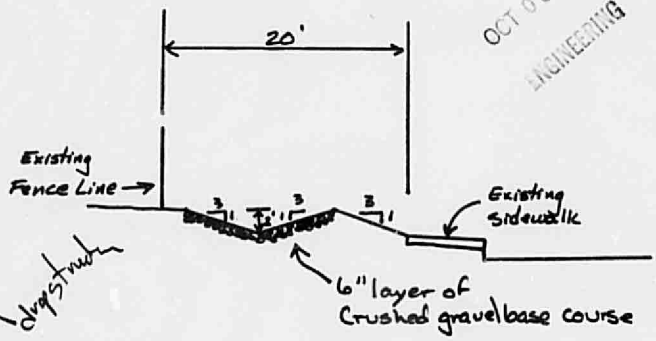

Q=23.6cfs
s= .005 drop structure
n=.026
D= 1.5'
V= 3.3 fps

Channel Along Juan Tabo

PLATE VI

PROJECT NAME LaCuesta Area Drainage SHEET OF
PROJECT NO 20161 BY Dmyn DATE 10-4-82
SUBJECT Drainage Details CH'D DATE

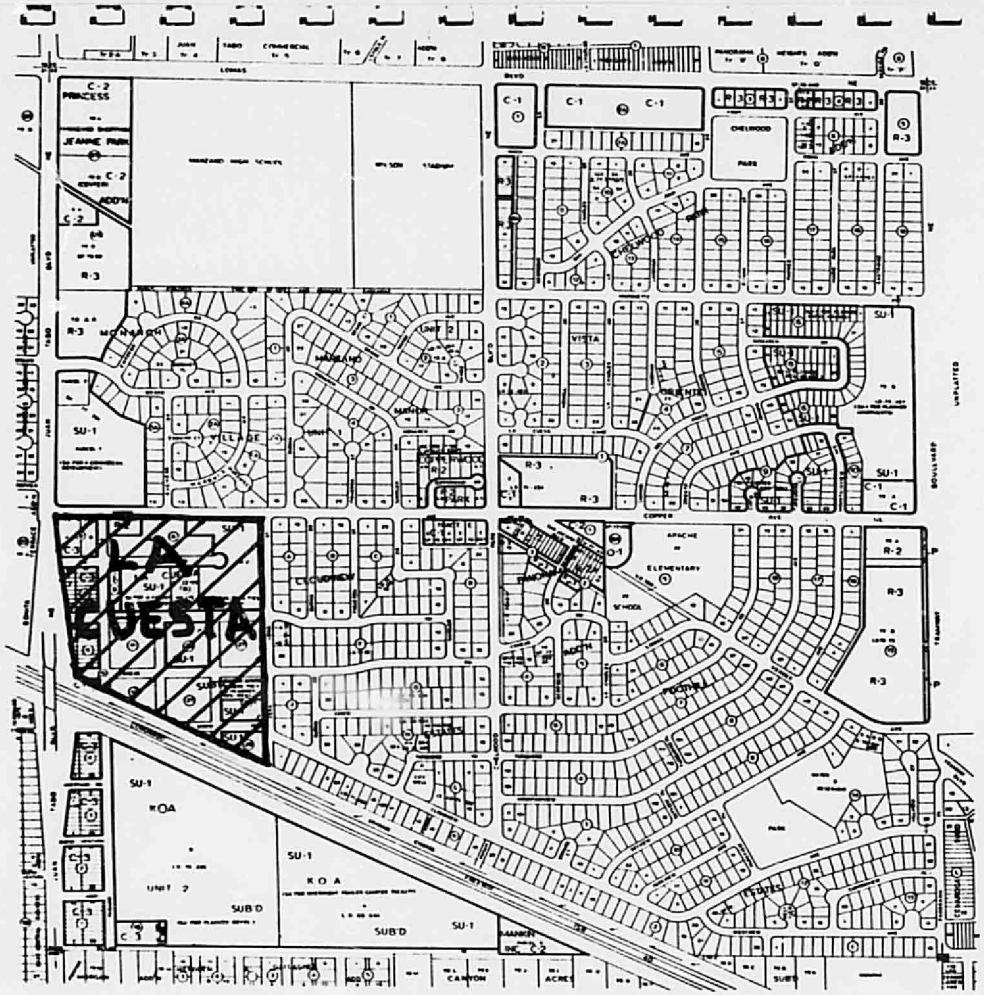

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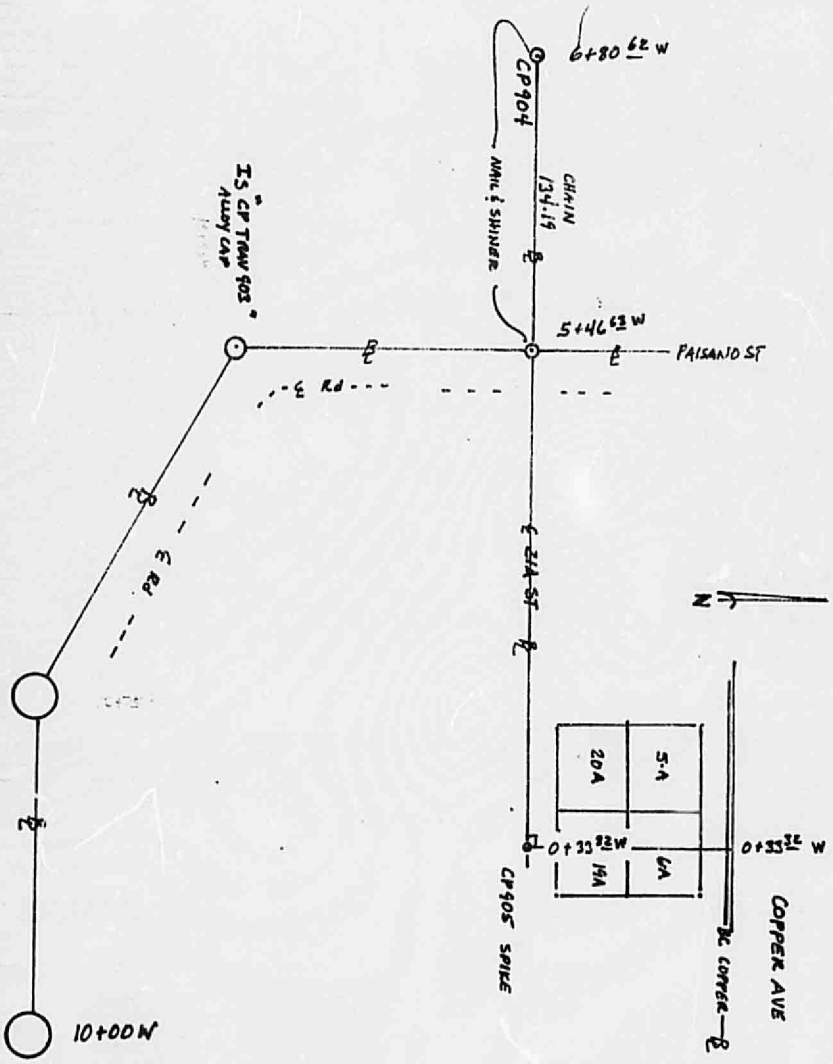
PLATE I

K-22-Z

DMJM / AHA ALBUQUERQUE	PROJECT ZENA LONA - PAISANO - 21A TOPOS	PROJECT NO.		PAGE 1
		BY:	DATE:	
SUBJECT BASELINE LAYOUT				



PAISANO / ZIA

41

7-11-83
HWEP/JC

ZIA St Topo

STA - Y - SECTION

COPPER AVE -X- SECTION

TBM P.Pole 65.71
TP 72.31

All levels red dots = elevs
SEE FIELD SHEET No 1
FOR BASELINE LAYOUTS

			74.14		
			73.37 FL	73.55 TBC	0+00
0+00	3-HD LT CONC. WALK				
0+00	BC = Bottom APRON				
0+03	BC = top Apron	73.87 TC			
	Bottom Apron	73.22 TC			
0+16	TBC =	73.28			
0+17	FL RUNDOWN	72.61			
0+18	TBC = BC PARKING LOT	73.20			
0+25	TBC = EAST R 'T' ON TC			72.31 FL	73.01 TBC	73.07 TW	0+25
0+25	5.95 LT FND #5 Rebar				
0+37	2' LT WATER METER				
				71.36 FL	72.01 TBC	72.09 TW
0+50					
0+75					
0+79	BC = Top APRON	70.96 TC	70.31 FL	70.45 FL	71.11 TBC	71.15 TW
0+83	BC = Bottom APRON	70.25 TC	70.15 FL		
				69.57 FL	69.72 TBC	70.14 TW

PAISANO/ZIA

7-11-83
HWEP x

42

STA	X-SECTION			See Field Sheet ① For Baseline Layouts			
	Copper Ave-X-SECTION						
1+03	bottom Apron	64.60 TC	65.05 FL				
1+07.5	top Apron	67.47 TC	69.30 FL				
1+07.5	6.15 LT FND 3/4 IRON PIPE (BENT)			68.67 FL	69.33 TC	69.40 TW	1+25
℄ RE	6A/5A w/2 7/16/83						
1+49	1 LT WATER METER			67.79 FL	68.48 TC	68.53 TW	1+50
1+61.2	Top Apron	68.07 TC	67.41 FL				
1+65.2	Bottom Apron	67.44 TC	67.26 FL	66.98 FL	67.08 TC	67.64 TW	1+75
1+84	bottom Apron	66.91 TC	66.44 FL				
1+85.2	Top Apron	67.28 TC	66.54 FL				
1+89.96	6.20 LT FND 1" IRON PIPE			66.97 FL	66.75 TC	66.85 TW	2+00
1+88.2	DROP INLET	67.18 TC	66.11 FL				
1+95.3	" "	66.90 TC	65.92 FL				
2+00	#34 LT BACK SIDEWALK						

BOHANNAN-HUSTON INC.
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6773 VISCOUNT BLVD., EL PASO, TEXAS 79925 915 778-4491
330 GARFIELD, SANTA FE, NEW MEXICO 87501 505 988-7671

October 1, 1982

OCT 6 1982
ENGINEERING

Mr. Charles M. Easterling
Assistant City Engineer – Hydrology
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: La Cuesta Sector Development Plan Area Conceptual Drainage Plan

Dear Chuck:

On February 16, 1982, the City Council approved the La Cuesta Sector Development Plan, as amended. We are preparing a replat of the area which will be submitted to the Development Review Board in the near future. This letter is intended to serve as the Conceptual Drainage Plan for this area. This plan presents drainage concepts for the purpose of determining necessary easements and public facilities only. It is not intended to replace or eliminate the need for detailed drainage reports as each remaining parcel develops.

The "Drainage Study for a Portion of La Cuesta Subdivision," by Chambers, Campbell, Isaacson and Chaplin, Inc., in March 1974, and the Christian Center Drainage Addendum, by Mike Emery, dated May 7, 1979, analyze the upland drainage basins thoroughly. For this reason, they will not be reanalyzed in this study. The flow rates determined in those studies for the streets surrounding the La Cuesta Sector Development Plan Area are indicated on Plate III. The only major change, since those studies were prepared, has been the widening of Juan Tabo Boulevard and construction of the on-ramps and off-ramps at Interstate 40. The result of this change has improved hydraulic capacity of Juan Tabo Boulevard. [The runoff within Juan Tabo Boulevard and in Copper Avenue, adjacent to the site, is conveyed at less than curb height and does not impact the site. (297 cfs ?)] requires further research

As stated in the Christian Center Drainage Addendum, "At no time does the water reach a depth higher than the curb and gutter along Zena Lona throughout its entire reach." However, at the intersections of Zena Lona Street with Domingo Road and Cloudview Avenue, there are substantial flows entering Zena Lona Street. In

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PATRICK L. STIEHR, P. E.
DAVID M. Y. MILLIKAN, P. E.

order to insure that these flows do not enter this site (if they should overtop the curb at these intersections) we recommend that waterblocks (a minimum of 18" in height) be constructed at all entrances to the site from Zena Lona Street. In addition to this, a berm (one foot above top of curb) should be constructed along the west side of Zena Lona from Domingo Road to the south as these properties develop. O.K.

As indicated on Plate III, many of the properties within this area are already developed. There have been some changes since the aerial photo was taken. However, these changes do not affect the ultimate developed conditions of the area. In order to estimate the runoff from the basins, a runoff coefficient of 0.77 was used. This is based upon Type "B" soils and an assumption that each parcel within this area would be 80% impervious upon ultimate development.

The maximum time of concentration from the most distant point to the outlet is less than ten minutes, therefore, a value of ten minutes was used in all cases.

The proposed drainage improvements outlined in this report assume that existing developed sites will be able to discharge at their present rates and locations. Runoff from all areas in the site eventually reach the channel along the north side of Interstate 40. Flows from developed basins A-1 through A-3 are conveyed to the channel within public rights-of-ways around the site. Flows from Basins B-2 through B-5 (23.6 cfs) are collected at the west end of Zia Road. From this point they will be conveyed in a channel (see Plate IV) along the Juan Tabo Boulevard right-of-way to the existing 4'x8' concrete box culvert (see Plate III). Flows from Basin B-1 enter the channel along Juan Tabo and are conveyed to the box culvert. @ 0.005 slope → need drop structures.

design of channel & structures

Flows from Basins C-6 and C-7 are conveyed to the intersection of Paisano with the private utility, drainage, and access easement through Paisano Street. Flows from Basins C-3 and C-4 are conveyed to the same point through the private utility, drainage, and access easement. Flows from Basins C-2 and C-5 also converge at this point. From here they will be conveyed through an asphalt-lined parking lot swale (with a concrete invert) to the 4'x8' concrete box culvert.

acceptance of developed runoff requires easement

easement required

easement requirements that CJ

Basin C-1 will discharge into the roadside ditch along Interstate 40 and be conveyed to the 4'x8' concrete box culvert.

demonstrate adequacy & obtain discharge permission from SHD

Flows from Basin D-1 will be conveyed along the west property line of the basin to the roadside ditch along Interstate 40. From this point, they will be conveyed within the roadside ditch to the 4'x8' concrete box culvert.

easement

The La Cuesta Sector Development Plan Area and the area of the off-ramp which drains to the roadside ditch is all that drains to the 4'x8' concrete box culvert. This facility has adequate capacity to accept uncontrolled discharge from these areas. prove

Plan Tabo & copper

Permit req'd.

The approved sector development plan calls for a 24' wide paved street with curb to be constructed within the private utility, drainage, and access easement. This street will have sufficient capacity to convey the runoff from Basins C-3 and C-4 at less than curb height.

An easement will be required across Basin C-1 to convey the runoff from Paisano Street to the box culvert. The temporary pond west of the skating rink may be abandoned along with construction of the improvements in Paisano Street. Under present conditions, the discharge from the skating rink is not concentrated at any particular location. Therefore, a 5' drainage easement will be required across the tract immediately west of the skating rink to convey its runoff to the north or south. An asphalt-lined parking lot swale (with concrete invert) will be constructed along the right-of-way line for Interstate 40 to carry flows from the skating rink property to Paisano Street.

Runoff from the single-family residence on Zena Lona must be conveyed across the parking lot to Paisano Street. A floating easement will be granted across the parking lot along with dedication of the plat. appropriate for drainage.

Runoff from the single-family residence in Basin C-3 must be conveyed across the western boundary of Basin C-3 to the private utility, drainage, and access easement. A floating easement will be granted along with dedication of the plat.

Proposed cross-sections of the channel along Juan Tabo Boulevard and the asphalt-lined parking lot swales (with concrete inverts) are shown on Plate VI. Calculations indicating the peak discharges from each basin are enclosed. Calculations indicating street capacities at key points are also enclosed.

Anticipated phasing of development in this area is as follows:

Phase I – Construction of all improvements within dedicated public rights-of-way. Construction of a temporary earth channel through Basin C-1. require approval of channel section

Phase II – Construction of the improvements within the private utility, drainage, and access easement will be required along with development of Basin C-3 or C-5 or upon demand of owner of Basin C-4 for paved access.

of sediment control & detention of

Phase III – Construction of improvements in Basin C-7 will be required along with development of the area presently used for temporary ponding.

Phase IV – Construction of asphalt-lined swale across Basin C-1 will be required along with development of Basin C-1. w/ circulation work

Phase V – A satisfactory means of conveying flows from Basin D-1 to the roadside ditch must be constructed along with development of Basin D-1. & NPDES permit.

Phases II–V may occur in any sequence. Erosion control will be performed along with construction of the public improvements. This will consist of a 9" (±3") high wind row being constructed along the downhill side of each undeveloped lot that discharges to a paved street (public or private). This will minimize the amount of sediment which is removed from the lots during minor storms. No regrading of the tracts is required along with development of the drainage and paving improvements.

If you have any questions, please feel free to contact Dave Millikan or me.

Sincerely yours,

Michial M. Emery

Michial M. Emery, P.E.
Vice President

cc: Mr. Ron McConnell

DMYM/dlh
Job No. 2 096 1

BOHANNAN-HUSTON INC.
ENGINEERS PLANNERS PHOTOGRAMMETRIST
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6713 VISCOUNT BLVD., EL PASO, TEXAS 79925 915 778-4491
330 GARFIELD, SANTA FE, NEW MEXICO 87501 505 988-7671

January 13, 1983

RECEIVED
JAN 17 1983
CITY ENGINEER

Mr. Andre Houle
City Engineer/Hydrology
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: La Cuesta Sector Development Plan Area Conceptual Drainage Plan

Dear Andre:

In response to the request in your letter dated January 6, 1983, we offer the following information:

The design and construction of the minor improvements to the channel along the east side of Juan Tabo Boulevard (south of Paisano) will be performed along with the design and construction of the streets within the La Cuesta Sector Development Plan area. It is our understanding that these improvements will be done as part of an assessment district as soon as the plat is filed.

Permits to discharge into the NMSHD right-of-way will be obtained at the time construction drawings are approved for improvements which result in changes, from the existing conditions, in the flow rates or discharge points.

It is our understanding that this completes the requirements for receiving approval of the drainage plan for this area. Thank you for your assistance in proceeding one more step towards providing an improved street network in this area.

If you have any questions, feel free to call Dave Millikan or me.

Sincerely yours,

Michial M. Emery

Michial M. Emery, P.E.
Vice President

cc: Mr. Ron McConnell
Mr. Charles Easterling

DMYM/dlh
Job No. 2 096 1

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DAVID M. Y. MILLIKAN, P. E.

Protected outlet. SAD 200 HYDRO FILE

TO RR file

Anita Milly 7411

January 13, 1983

K22-D22

Mr. Andre Houle
City Engineer/Hydrology
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

RECEIVED
JAN 14 1983
CITY ENGINEER

Re: La Cuesta Sector Development Plan Area Conceptual Drainage Plan

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If you have any questions, feel free to call Dave Millikan or me.

Sincerely yours,

Michial M. Emery, P.E.
Vice President

cc: Mr. Ron McConnell
Mr. Charles Easterling

DMYM/dlh
Job No. 2 096 1

BOHANNAN-HUSTON INC.

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330 GARFIELD SANTA FE, NEW MEXICO 87501 (505) 988-7671

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DAVID M.Y. MILLIKAN, P.E.

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

January 6, 1983

Mr. Michial M. Emery
Vice President
Bohannon-Huston, Inc.
4125 Carlisle 87107
Albuquerque, N.M.

Ref: La Cuesta Sector Plan
Conceptual Drainage Plan

Dear Mr. Emery:

Consider this letter a conceptual approval of your drainage plan for the sector plan.

Please note that in order to proceed with the platting and development stage of this area the following information is required:

1. Time schedule and monetary responsibility for the Juan Tabo Channel.
2. Approval by the NMSHD for a discharge permit in State Highway Department R.O.W.

Please contact me if I can be of further assistance.

Very truly,

Andre Houle, PE
Civil Engineer/Hydrology

AH/e

cc: Drainage File
Reading File

BOHANNAN-HUSTON INC.
4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
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330 GARFIELD, SANTA FE, NEW MEXICO 87501 505 988-7671

December 15, 1982

RECEIVED
DEC 17 1982
CITY ENGINEER

Mr. Andre Houle
A & E Service Section
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: La Cuesta Sector Plan Area Conceptual Drainage Plan

Dear Andre:

Enclosed is a copy of our response from the New Mexico State Highway Department concerning the Conceptual Drainage Plan for the La Cuesta Sector Plan Area.

This letter addresses your concerns expressed in your letter dated November 12, 1982. Your prompt approval of the conceptual drainage plan will be appreciated.

If you have any questions, please call Dave Millikan or me.

Sincerely yours,

Michial M. Emery

Michial M. Emery, P.E.
Vice President

cc: Mr. Ron McConnell

Enclosure

DMYM/dlh
Job No. 2 096 1

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0-02 20961

STATE OF NEW MEXICO
HIGHWAY DEPARTMENT

M - Drainage

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88202-1457
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District Three Office
P.O. Box 3768-Station D
Albuquerque, NM
87109-3768
505-821-4651

District Four Office
P.O. Box 30
Las Vegas, NM
87701-0030
505-425-7527

District Five Office
P.O. Box 4127-Coronado Sta.
Santa Fe, NM
87502-4127
505-983-0221

AN EQUAL
OPPORTUNITY
EMPLOYER

December 14, 1982

Michial M. Emery
Bohannan-Huston Inc.
4125 Carlisle Boulevard N.E.
Albuquerque, N.M. 87107

Dear Mr. Emery:

Subject: La Cuesta Sector Plan, Juan Tabo - Interstate 40 Interchange

As requested by your letter dated November 29, 1982, we have reviewed your proposed drainage plan concept for the subject development and offer the following comments.

We are unsure of the actual amount of flow in Juan Tabo Boulevard immediately south of Copper Avenue. It would appear that if 300 c.f.s. does flow in Juan Tabo at this location as stated by Mr. Houle, then the majority of the flow will come from the east on Copper Avenue which has a very steep slope and high velocities that will cause a significant amount of the flow to cross to the west side of Juan Tabo. In addition, a storm sewer system is in place on Juan Tabo which will intercept a significant amount of the flow in the street. Therefore, without performing a detailed study of this area, it appears that only a minimal amount of flow will get to our 8'x4' CBC from Juan Tabo.

As for the concept of your La Cuesta drainage plan, we have no objections to your proposals since they do approximate the existing drainage patterns for this area.

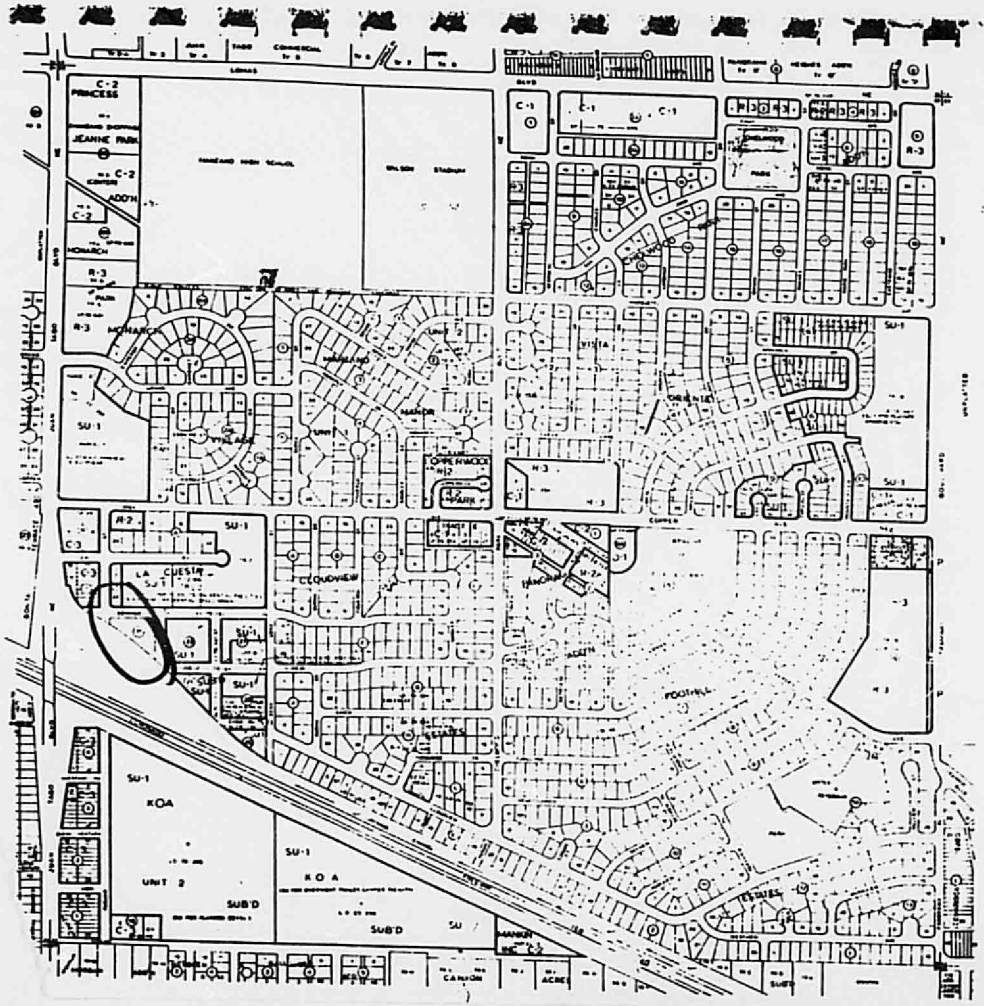
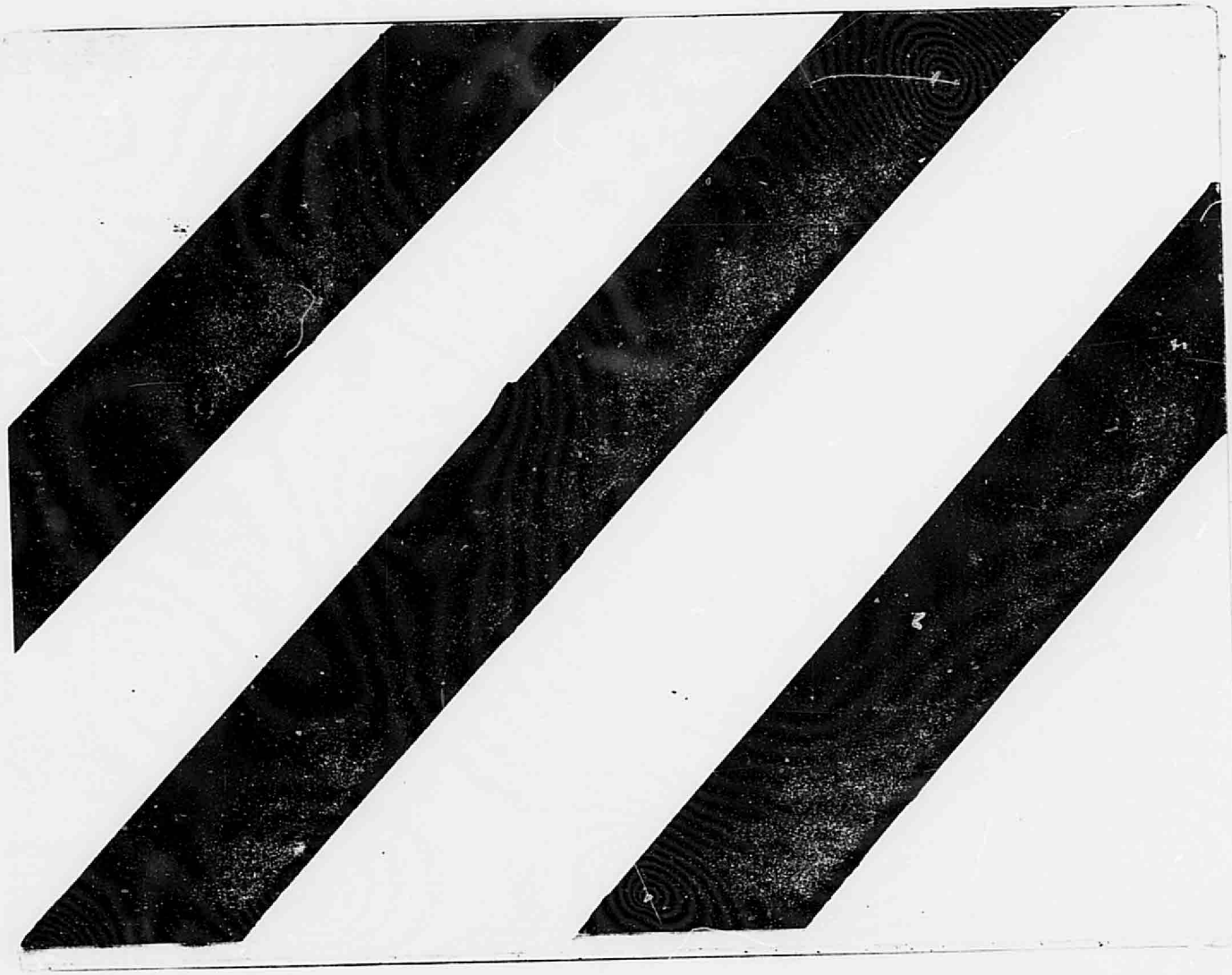
As noted in your letter, detailed drawings should be submitted with your application for a permit to discharge into State Highway Department right of way.

If there are any questions, please advise.

Very truly yours,

H. V. Parr
Drainage Engineer

jc
cc: C. E. Serna


C-2
PRINCESS
JEANNE PARK
ADD'N
HOMECREST
R-3
SU-1
LA CUESTA
CLOVERVIEW
KOA
UNIT 2
SUB'D
FOOTHILL
TRUSS
CANYON
ACRES

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