CONCEPTUAL DRAINAGE PLAN

FOR

OFFICE BUILDING

ON

TRACT 2-B-1

OF THE

BELLAMAH OFFICE ADDITION

AUGUST 1981

SCANLON & ASSOCIATES, INC.
8008 PENNSYLVANIA CIRCLE NE
ALBUQUERQUE, NEW MEXICO 87110

CONCEPTUAL DRAINAGE PLAN

Purpose: The purpose of the conceptual drainage plan is to show the existing and the proposed drainage pattern for the site to be developed. Also to show the existing and proposed drainage patterns of those lots which border on its north and east sides. See Exhibit "A".

Existing Storm Drain Facilities: An existing 56 inch RCP storm drain is located in a ten (10) foot utility easement along the west side of the lot. A private 36 inch RCP storm drain runs along the east side of the lot in a fifteen (15) foot drainage easement. The 36 inch S.D. than runs east to the 66 inch RCP storm drain in Jeannedale Drive.

Topography and Soils: The site generally slopes from 0 to 5 percent to the south west. These areas have medium runoff and the erosion hazard is moderate.

Using the Soil Survey of Bernalillo County by the SCS, the major soils in the area are Tijeras gravelly fine sandy loam (TgB) and Embudo-Tijeras complex (EtC) with the majority of the lot falling on Tijeras gravelly fine sandy loam.

Development: The entire block will be developed into an office building complex, housing five (5) large office buildings, two of which are completed. The other three are now proposed. A four (4) story office building with the required parking will be constructed on the site.

Preliminary Analysis: Tract 2-B-1 is located such that no large drainage area outside of the proposed development will contribute storm flows to the drainage facilities. When the complex has been completed there should be little if any storm flow from adjacent tracts, see Exhibit "B". The following is a rough estimate of the 100 year storm flow.

PEAK RATE OF DISCHARGE - SCS METHOD

Hydrology Data: For Tract 2-B-1

1.	Total drainage area tract 2-B-1 (see Exhibit C)	2.96	acres
2.	Total roof area (20,775 s.f.)	0.48	acres
3.	Total parking area	1.89	acres
4.	Total lawn area	0.59	acres
5.	Length of flow path	500	feet
6.	Elevation difference (57-47)	10	feet
7.	Average slope	0.020	
8.	Soil Symbol (Tijeras)	TgB	
9.	Hydrologic Soil Grouping	B	
10.	Land use	commercial	
11.	Runoff Curve Number-AMC-II (Table 2-1)	95	CN
12.	Time of Concentration (Fig. 2-2)	0.075	hr.
13.	Rainfall, 24 hr. 100 yr. (Exh. 2-2)	2.70	in.
14.	Find potential retention $S = (1000/CN) - 10$	0.53	
15.	Find direct runoff - 24 hr. precipitation $R_{100} = (P - 0.20 \times S)^2/(P+0.80 \times S)$ $R_{100} = (2.70 - 0.11)^2/(2.70+0.42)$	2.94	in.
16.	Distribution curve (RM-2) (Exh. 2-3)	65	
17.	Cfs per acre per inch of runoff (Fig. 2-5)	1.30	CSM/in.
18.	Peak Discharge $q = A \times Q \times$ cfs/ac/in $q_{100} = 2.96 \times 2.94 \times 1.30$	11.3	cfs
19.	Volume of runoff $(Q \times A)/12$ $Vol = 2.94 \times 2.96/12$	0.73	ac.ft.

Hydrology Data: For Area of Coronado Draining to 36" RCP

1.	Total drainage area (see Exhibit D)	12.16	acres
2.	Length of flow path	2000	feet
3.	Elevation difference (84-56)	28	feet
4.	Average slope	0.0140	
5.	Land use	commercial	
6.	Runoff curve no. (Table 2-1)	95	CN
7.	Time of concentration (Figure 2-2)	0.23	hr.
8.	Rainfall, 24 hr. 100 yr. (Exhibit 2-2)	2.70	in.
9.	$S = (1000/CN) - 10$	0.53	
10.	$R_{100} = (2.70 - 0.11)^2/(2.70 + 0.42)$	2.94	in.
11.	Distribution curve (RM-2)	65	
12.	Cfs per acre per inch of runoff	1.20	CSM/in
13.	Peak Discharge $q = A \times Q \times$ cfs/ac/in $q100 = 12.16 \times 2.94 \times 1.20$	42.9	cfs

Recommendation: That the majority of the storm flow from Tract 2-B-1 be drained west to San Pedro Boulevard where it can be picked up by an on-site catch basin system and discharged directly into the existing 54 inch storm drain in San Pedro Boulevard. That the storm water that cannot be drained to the west, will be drained east and picked up by an on-site catch basin system and discharged into an existing 36 inch RCP storm drain that runs along the easterly boundary of Tract 2-B-1. Any over flow due to the combined entrance from Indian School could run through the One Towne Centre parking lot to its low point drain.

Conclusion: Most of the storm water from a major storm should be dissipated by the time the upstream drainage areas or the channel peak flow occur.

EXHIBIT "A"

H-18-Z

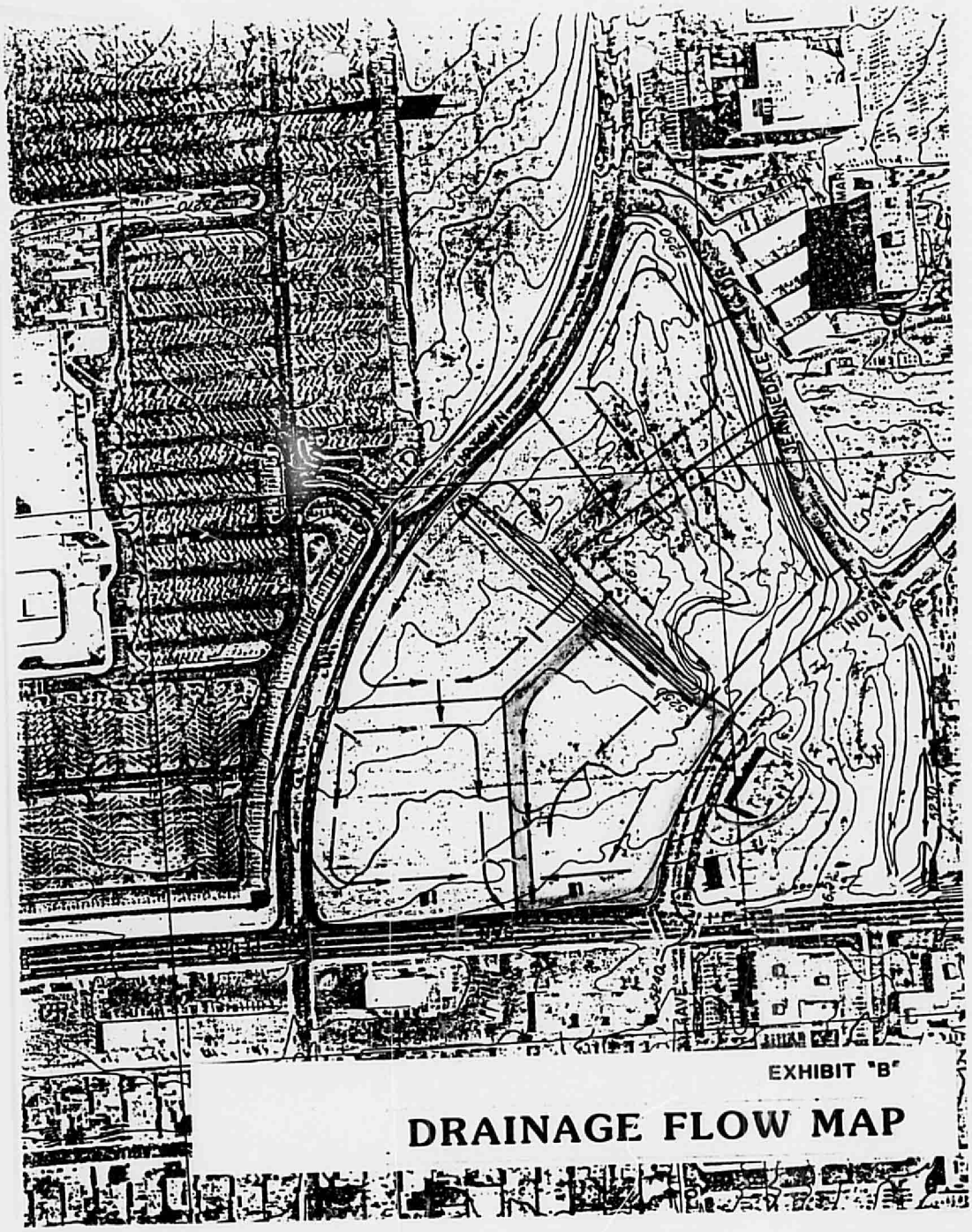
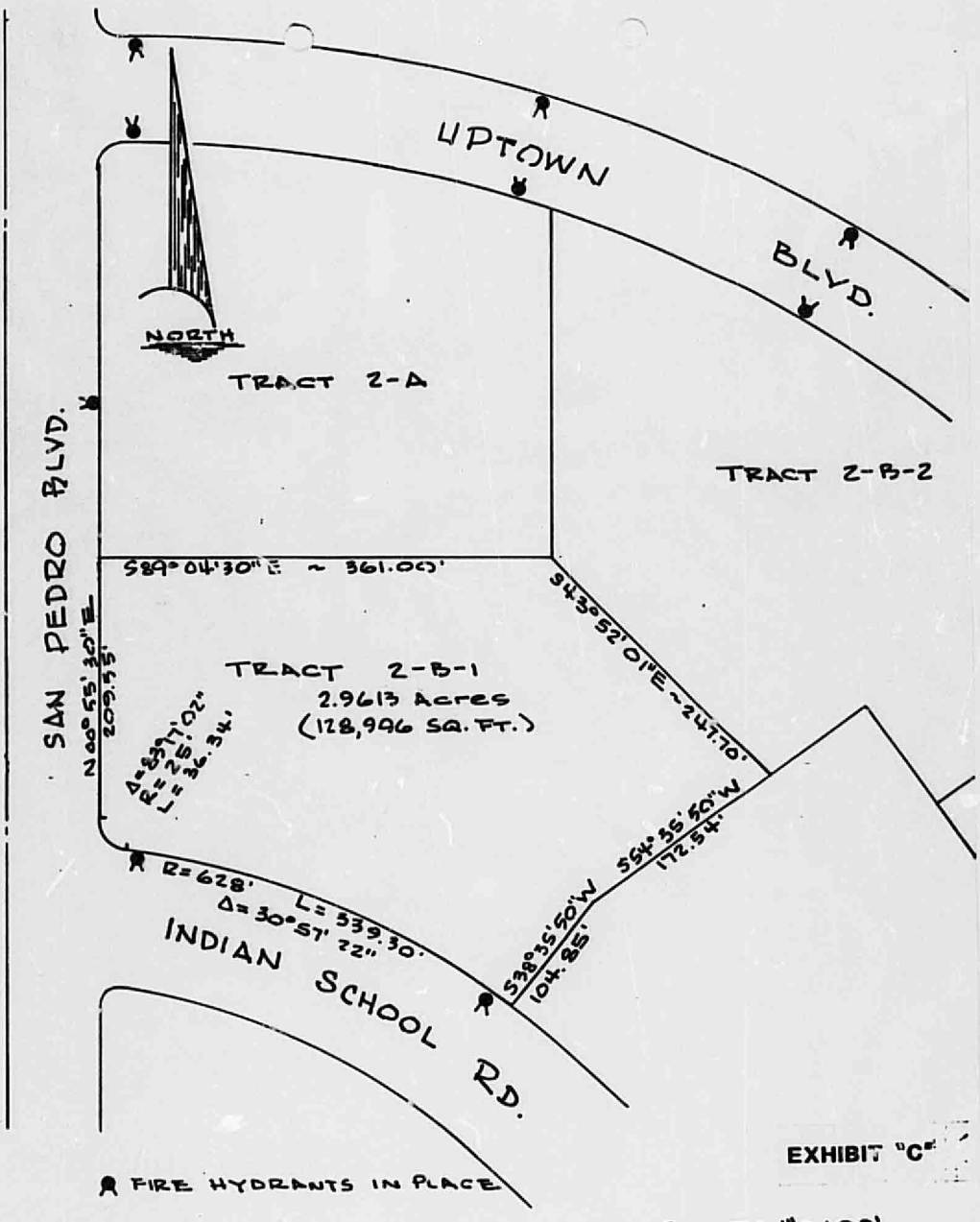
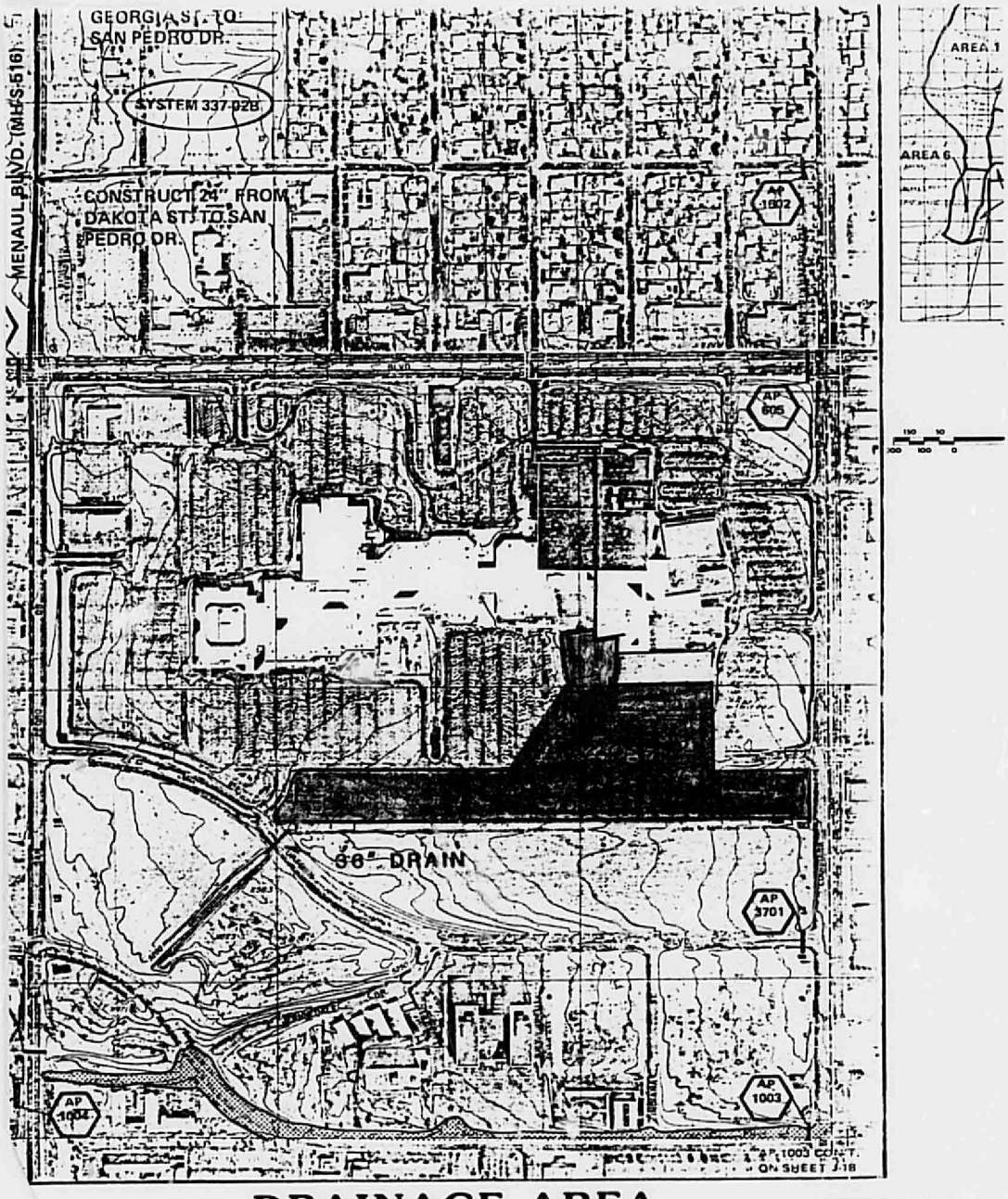


EXHIBIT "B"

DRAINAGE FLOW MAP


UPTOWN
BLVD.
NORTH
TRACT 2-A
TRACT 2-B-2
SAN PEDRO BLVD.
S89°04'30"E ~ 361.00'
S43°52'01"E ~ 247.70'
N00°55'30"E
209.55'
TRACT 2-B-1
2.9613 Acres
(128,996 SQ. FT.)
Δ=83°17'02"
R=25.00'
L=36.34'
R=628'
L=339.30'
Δ=30°57'22"
INDIAN SCHOOL RD.
S38°35'50"W
104.85'
S54°35'50"W
172.54'
FIRE HYDRANTS IN PLACE
EXHIBIT "C"
SCALE: 1" = 100'



DRAINAGE AREA

EXHIBIT "D"

LAW OFFICES OF
SUTIN, THAYER & BROWNE
A PROFESSIONAL CORPORATION

LINDA L. AIKIN
PAUL G. BARDACKE
STEPHEN CHARNAS
RICHARD M. DALY
GAIL GOTTLIEB
ROBERT G. HEYMAN
FRANKLIN JONES
MARY E. McDONALD
KESTER L. OMAN
JANET G. PERELSON
JANE ROBERTSHAW
RAYMOND W. SCHOWERS
SASHA SIEMEL
NORMAN S. THAYER
ROBERT J. WERNER
JOHN W. ZAVITZ

FRED W. ALVAREZ
M. SHARON BLACKWELL
SAUL COHEN
GERARD P. DUMAS
W. PATRICK HARMAN
ALLAN J. HISEY
BRIAN F. LANTER
IRWIN S. MOISE
LAFEL E. OMAN
CHARLES R. PRICE III
DONALD M. SALAZAR
ALISON K. SCHULER
JONATHAN S. SUTIN
TIMOTHY J. VIDAL
BARRY D. WILLIAMS

JOHN A. BANNERMAN
GRAHAM BROWNE
JAMES C. COMPTON, JR.
JACK L. FORTNER
JAY D. HERTZ
DONALD L. JONES
BRIAN T. McCABE
STEVEN K. MOISE
ROBERT PAMPELL
KEVIN V. REILLY
PHILIP R. SCHICHTEL
RONALD SEGEL
MICHAEL G. SUTIN
RICHARD L.C. VIRTUE
MARIANNE WOODARD

ALBUQUERQUE OFFICE
FIRST PLAZA
POST OFFICE BOX 1945
ALBUQUERQUE, NEW MEXICO 87103
505-842-8200

SANTA FE OFFICE
215 WASHINGTON AVENUE
POST OFFICE BOX 2187
SANTA FE, NEW MEXICO 87504
505-988-5521

H18-D15

March 22, 1982

RECEIVED
MAR 23 1982
CITY ENGINEER

Mr. Jim Fink
Assistant Engineer
City of Albuquerque
Engineering Division
City Hall, 4th Floor
400 Marquette Avenue, N.W.
Albuquerque, New Mexico 87102

Transamerica Properties
Drainage Covenant

Dear Mr. Fink:

On March 3, 1982, we delivered a Drainage Covenant, dated March 2, 1982 ("Covenant"), between the City of Albuquerque and our client, Transamerica Properties, covering Tract 2-B-1 of the Bellamah Office Addition to the City of Albuquerque, New Mexico.

If the Covenant has been approved and signed on behalf of the City, we would appreciate your returning a copy of the fully signed Covenant to us for our client's records. Based on our telephone conversation with you concerning this matter, we understand that the City does not plan to record the Covenant at this time and that the Covenant will be recorded only if it becomes necessary in the future.

Thank you for your assistance, and please forward a copy of the fully signed Covenant to us at your earliest convenience.

Very truly yours,

SUTIN, THAYER & BROWNE
A Professional Corporation

By Donald L. Jones
Donald L. Jones

DLJ:ms

cc: Mr. Lyman K. Lokken

Don Jones was called 3/26/82 and told that the drainage covenant was not need in order to obtain a building permit for this development Jim Fink

LAW OFFICES OF
SUTIN, THAYER & BROWNE
A PROFESSIONAL CORPORATION

LINDA L. AIKIN
FRED W. ALVAREZ
JOHN A. BANNERMAN
PAUL G. BARDACKE
SHARON BLACKWELL
GRAHAM BROWNE
STEPHEN CHARNAS
SAUL COHEN
JAMES C. COMPTON, JR.
RICHARD M. DALY
GAIL GOTTLIEB
W. PATRICK HARMAN
JAY D. HERTZ
ROBERT G. HEYMAN
ALLAN J. HISEY
DONALD L. JONES
FRANKLIN JONES
MARY E. McDONALD
IRWIN S. MOISE
STEVEN K. MOISE
KESTER L. OMAN
LAFEL E. OMAN
ROBERT PANPELL
JANET G. PERELSON
CHARLES P. PRICE III
KEVIN V. REILLY
HENRY M. RIVERA
JANE ROBERTSHAW
DONALD M. SALAZAR
PHILIP R. SCHICHTEL
RAYMOND W. SCHOWERS
ALISON K. SCHULER
RONALD SEGEL
SASHA SIEMEL
JONATHAN B. SUTIN
MICHAEL G. SUTIN
NORMAN S. THAYER
TIMOTHY J. VIDAL
RICHARD L. C. VIRTUE
ROBERT J. WERNER
BARRY D. WILLIAMS
MARIANNE WOODARD
JOHN W. ZAVITZ

ALBUQUERQUE OFFICE
FIRST PLAZA
POST OFFICE BOX 1945
ALBUQUERQUE, NEW MEXICO 87103
505-842-8200

SANTA FE OFFICE
215 WASHINGTON AVENUE
POST OFFICE BOX 2187
SANTA FE, NEW MEXICO 87501
505-988-8821

March 3, 1982

HAND DELIVERED

Mr. Jim Fink
Assistant Engineer
City of Albuquerque
Engineering Division
City Hall, 4th Floor
400 Marquette Avenue, N.W.
Albuquerque, New Mexico 87102

RECEIVED
MAR 0 3 1982
CITY ENGINEER

Dear Mr. Fink:

We enclose three copies of a Drainage Covenant, dated March 2, 1982 ("Covenant"), between the City of Albuquerque and our client, Transamerica Properties.

If the enclosed Covenant is acceptable, please have it signed by the appropriate people on behalf of the City of Albuquerque and return one fully executed original to me for recording in the Bernalillo County Clerk's office. I will return the original Covenant to you after it has been recorded.

Thank you for your assistance and please call me if you have any questions concerning the Covenant or otherwise.

Very truly yours,

SUTIN, THAYER & BROWNE
A Professional Corporation

By Donald L. Jones
Donald L. Jones

DLJ:rr
Enclosures

cc: Mr. Lyman K. Lokken
Mr. Daniel B. Newman
Mr. Ross Schmidt

DRAINAGE COVENANT

THIS COVENANT made this 2nd day of March, 1982, by and between the City of Albuquerque, a municipal corporation, (City) and Transamerica Properties, a California Partnership (Owner, which term includes successors and assigns.)

RECITAL

The Owner is owner of certain real property located at 6001 Indian School Road, N.E. in Albuquerque, New Mexico, (the Property) and more particularly described as follows:

Tract 2-B-1, as the same is shown and designated on the Plat of Tracts 2-B-1, 2-B-2 and 2-B-3. BELLAMAH OFFICE ADDITION, Albuquerque, Bernalillo County, New Mexico, (being a Replat of Tract 2-B), filed in the office of the County Clerk of Bernalillo County, New Mexico, on the 20th day of May, 1981, Book of Plats Vol. C-18, Folio 85.

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.

DESCRIPTION OF FACILITIES

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

Transamerica Center, Albuquerque a five story, 80,000 sq.ft. office building.

CONSTRUCTION OF DRAINAGE FACILITIES

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

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.

FAILURE TO COMPLY AND LIEN

In the event that the Owner shall fail to construct the drainage facility in accordance with standards, plans, and specifications prescribed and approved by the City or fail to adequately maintain said facilities, the City shall give the Owner notice in writing to construct, correct, or maintain said

facilities, and if the Owner fails to comply therewith within 30 days, the City may enter upon said property to perform the necessary construction or maintenance. The cost of the City's performing such construction or maintenance shall be paid by the Owner. In the event the Owner fails to pay said cost within thirty (30) days after being billed for same, the City may file a lien against the Property.

LIABILITY

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

NOTICE

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

Transamerica Properties
c/o Transamerica Realty Investors
1150 S. Olive Street, Suite 2723
Los Angeles, California 90015
ATT: Lyman K. Lokken, Vice President

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, 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.

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 Transamerica Properties, a California Partnership

By: Transamerica Realty Investors, a California Trust, General Partner

By: Lyman K. Lokken

Lyman K. Lokken

Title: Vice President

REVIEWED BY THE LEGAL DEPARTMENT:

Assistant City Attorney

CITY OF ALBUQUERQUE

Chief Administrative Officer

ACKNOWLEDGEMENTS

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this _____ day of _____, 19__, by _____, _____ (Name of Officer) (Title) _____, a _____ (Name of Corporation) (State of Incorporation) corporation, on behalf of said corporation.

_____
Notary Public

My Commission Expires:

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this 2nd day of March, 1982, by Lyman K. Lokken, Vice-President of Transamerica Realty Investors, a California Trust, General Partner of Transamerica Properties, a California General Partnership, on behalf of said partnership.

Rebecca A. Richards
Notary Public

My commission expires:

1-15-84

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me by _____, on this _____ day of _____, 19__.

_____
Notary Public

My Commission Expires:

_____

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this _____ day of _____, 19__, by _____, Chief Administrative Officer of the City of Albuquerque, municipal corporation, on behalf of said corporation.

_____
Notary Public

My Commission Expires:

_____

D18-D15

309

81 53748

DRAINAGE COVENANT

THIS COVENANT made this _____ day of _____, 1981, by and between the City of Albuquerque, a municipal corporation, (City) and William T. Criswell and Sharon L. Criswell (Owner, which term includes successors and assigns.)

RECITAL

The Owner is owner of certain real property located at 6200 Uptown N.E. in Albuquerque, New Mexico, (the Property) and more particularly described as follows:

Tract 2-B-3, as the same is shown on the plat of Tracts 2-B-1, 2-B-2 and 2-B-3, BELLAMAR OFFICE ADDITION, Albuquerque, Bernalillo County, New Mexico (being a replat of Tract 2-B), filed in the office of the County Clerk of Bernalillo County, New Mexico, on the 20th day of May, 1981.

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.

DESCRIPTION OF FACILITIES

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

Drainage inlets with connection to existing storm sewer in Jeannedale Drive specifically shown on sheet A4 construction drawings dated June 5, 1981 prepared by Warden/Evans/Hill, Architects-Planners, Inc. and Rupley & Associates, Inc. attached hereto as Exhibit "A". More specifically an inlet structure on site and one off site (in curb on west side of Jeannedale Drive) all to connect to existing 72 inch storm sewer in Jeannedale Drive.

CONSTRUCTION OF DRAINAGE FACILITIES

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

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.

FAILURE TO COMPLY AND LIEN

In the event that the Owner shall fail to construct the drainage facility in accordance with standards, plans, and specifications prescribed and approved by the City or fail to adequately maintain said facilities, the City shall give the Owner notice in writing to construct, correct, or maintain said

facilities, and if the Owner fails to comply therewith within 180 days, the City may enter upon said property to perform the necessary construction or maintenance. The cost of the City's performing such construction or maintenance shall be paid by the Owner. In the event the Owner fails to pay said cost within thirty (30) days after being billed for same, the City may file a lien against the Property.

LIABILITY

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

NOTICE

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

William T. Criswell
5501 LBJ Freeway
Suite 900
Dallas, Texas 75240

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, 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.

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.

REVIEWED BY HYDROLOGY SECTION
CITY ENGINEER'S OFFICE

by: [signature]

OWNER

[signature]
William T. Criswell

[signature]
Sharon L. Criswell

REVIEWED BY THE LEGAL DEPARTMENT:

Malcolm W. Devers
Assistant City Attorney

CITY OF ALBUQUERQUE

[signature]
Chief Administrative Officer

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this _____ day of _____, 1981, by _____, _____ (Name of Officer) (Title) _____, a _____ (Name of Corporation) (State of Incorporation) corporation, on behalf of said corporation.

_____ Notary Public

My Commission Expires:
_____

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this _____ day of _____, 1981, by _____ (Name of Acknowledging Partner or Partners) on behalf of _____ (Name of Partnership), a partnership.

_____ Notary Public

My Commission Expires:
_____

STATE OF TEXAS)
) ss.
COUNTY OF DALLAS)

The foregoing instrument was acknowledged before me by William T. Criswell and Sharon L. Criswell, on this 11th day of September, 1981.

_____ Notary Public

My Commission Expires:
4/27/85

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this 9th day of October, 1981, by James E. Jaramillo, Chief Administrative Officer of the City of Albuquerque, municipal corporation, on behalf of said corporation.

_____ Notary Public

My Commission Expires:
2/24/85

OFFICIAL SEAL
KAREN M. ACEVES
NOTARY PUBLIC - STATE OF NEW MEXICO
My Commission Expires 2/24/85

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

February 23, 1982

Mr. Ross Schmidt
Scanlon & Associates
8008 Pennsylvania Circle N.E.
Albuquerque, N.M. 87110

RE: TRANSAMERICA CENTER OFFICE BUILDING, DRAINAGE REPORT

Dear Ross:

The above referenced drainage report is approved based on your submittal dated January 1982.

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

Sincerely,

Jim Fink
Civil Engineer

JF/tsl

cc: Lyman K. Lokken, Transamerica
David Hibbert, Landau Partnership
Jim Fink
Reading File

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

H18-D15

September 11, 1981

Mr. Ross Schmidt
Scanlon & Associates
8008 Pennsylvania Circle N.E.
Albuquerque, New Mexico 87110

Re: TRACT 2-B-1, BELLAMAH OFFICE ADDITION DRAINAGE REPORT

Dear Ross:

Mr. Charles M. Easterling, Principal Assistant City Engineer/Hydrology, concurs with the following proposals for the referenced site:

1. Storm runoff from Tract 2-B-1 may be collected by an on-site catch basin system and discharged directly in the 54 inch storm drain located in San Pedro Boulevard.

2. The private 36 inch RCP storm drain may be utilized for discharging storm runoff if written consent granting such use is obtained from the owner.

If I can be of further help on this matter, please call.

Very truly yours,

Brian G. Burnett
Civil Engineer/Hydrology

BGB/fs
8342A

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

H18-D15

September 8, 1981

Mr. Ross E. Schmidt
Scanlon & Associates
8008 Pennsylvania Circle N.E.
Albuquerque, New Mexico 87110

Re: CONCEPTUAL DRAINAGE PLAN, TRACT 2-B-1, BELLAMAH OFFICE ADDITION

Dear Mr. Schmidt:

The referenced drainage plan is hereby approved in concept based on your submittal of August 27, 1981. Per our earlier telephone conversations, an approval letter for use of the private 36" RCP storm sewer should be included in the report.

Please be advised that a completed Drainage Covenant will be required for this site. If I can be of further help on this matter, please call.

Very truly yours,

Brian G. Burnett

Brian G. Burnett
Civil Engineer/Hydrology

BGB/fs

SCANLON & ASSOCIATES INC.

CONSULTING ENGINEERS

August 27, 1981

W.O. 81070

C.M. Easterling
Municipal Development Department
Engineering Division
P.O. Box 1293
Albuquerque, NM 87103
Attn: Brian Burnett

RE: Conceptual Drainage Plan
Tract 2-B-1, Bellamah Office Addition

It is proposed to construct a four (4) story office building of 76,736 sq. ft. gross floor area on Tract 2-B-1 of the Bellamah Office Addition. This property is located on the Northeast corner of Indian School Road andSan Pedro Blvd. The site is approximately 2.56 acres.

Enclosed is a copy of the conceptual drainage plan, which shows the proposed flow patterns of the Bellamah Office Complex. The information shown on the drainage plan is preliminary in nature and as soon as a survey can be made of the property a final drainage study will be undertaken.

Sincerely yours,

SCANLON & ASSOCIATES, INC.

Russ E. Schmidt, P.E.

RES/jmr

Encl.: 1

RECEIVED

AUG 31 1981

CITY ENGINEER

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

PLEASE REPLY TO:

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

DRAINAGE REPORT
FOR THE
TRANSAMERCIA CENTER
OFFICE BUILDING

ON

TRACT 2-B-1
OF THE
BELLAMAH OFFICE ADDITION

JANUARY 1982

SCANLON & ASSOCIATES
8008 PENNSYLVNIA CIRCLE, NE
ALBUQUERQUE, NEW MEXICO 87110

DRAINAGE REPORT
FOR THE
TRANSAMERCIA CENTER
OFFICE BUILDING

ON

TRACT 2-B-1
OF THE
BELLAMAH OFFICE ADDITION

JANUARY 1982

SCANLON & ASSOCIATES
3008 PENNSYLVNIA CIRCLE, NE
ALBUQUERQUE, NEW MEXICO 87110

SCANLON & ASSOCIATES INC
CONSULTING ENGINEERS

February 3, 1982

81070

Mr. Chuck M. Easterling
Assistant City Engineer/Hydrology
Municipal Development Department
P. O. Box 1293
Albuquerque, NM 87103

Re: Transamerica Center Drainage Report
Tract 2-B-1 of the Bellamah Office Addition

Dear Mr. Easterling:

It is proposed to construct a five (5) story office building of 86,600 square feet gross floor area, which includes a 7,000 square foot basement, on Tract 2-B-1 of the Bellamah Office Addition. This property is located on the northeast corner of the intersection of Indian School Road and San Pedro Boulevard. The site contains approximately 2.94 acres.

For your approval, enclosed are two (2) copies of the drainage report which showing the present and future drainage patterns and facility requirements.

Sincerely,

SCANLON & ASSOCIATES, INC.

Ross Schmidt, P.E.
Project Engineer

RS:lcm

enclosure

PLEASE REPLY TO:
☐ ALBUQUERQUE, NEW MEXICO 87110 — 8003 PENNSYLVANIA CIRCLE NE — TELEPHONE: (505) 265-6941
☐ ARTESIA, NEW MEXICO 88210 — 510 WEST TEXAS AVENUE — TELEPHONE: (505) 748-1010
☐ FARMINGTON, NEW MEXICO 87401 — 1405 SCHOFIELD LANE — TELEPHONE: (505) 327-1023
☐ SANTA FE, NEW MEXICO 87501 — 1570 PACHECO STREET, SUITE A-7 — TELEPHONE: (505) 983-3323

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

81070

DRAINAGE REPORT INFORMATION SHEET

PROJECT TITLE Transamerica Center

ZONE ATLAS PAGE NO. H-18-Z CITY ADDRESS 6001 Indian School Road

LEGAL ADDRESS Tract 2-B-1, Bellamah Office Addition

ENGINEERING FIRM Scanlon & Associates, Inc. CONTACT Ross Schmidt

ADDRESS 8008 Pennsylvania Circle, NE PHONE (505) 265-6941

OWNER Transamerica Properties* CONTACT Lyman K. Lokken

ADDRESS 1150 South Olive Street PHONE (213) 742-4000

ARCHITECT/SURVEYOR Landau Partnership, Inc. CONTACT David Hibbert

ADDRESS 10850 Wiltshire Boulevard PHONE (213) 475-0534

DATE SUBMITTED

BY 2/3/82
Ross E. Schmidt, P.E.

ROSS E. SCHMIDT NEW MEXICO 6133 REGISTERED PROFESSIONAL ENGINEER

* Transamerica Properties, A California Partnership

TRANSAMERICA CENTER

DRAINAGE REPORT REQUIREMENTS

The following four (4) pages are in response to the drainage report requirements checklist.

GENERAL

1. Engineer Certifies: - Engineer certificates are not included in this report. The Drainage Report information sheet is filled out and included.

2. Planning History: - Present zone is C-2 which will allow for office buildings. See Exhibit "A", Zoning Map H-18-2.

3. Professional Certification: - The Engineer's professional stamp with signature and date appears on the title sheet of the drainage report and on the drainage plan. The Surveyor's professional stamp with signature and date appears on the drainage plan as required. The Architect's professional stamp with signature and date also appears on the drainage plan.

4. Flood Hazard Map: - The site has been delineated on the flood hazard boundary map. See Exhibit "C", from the Albuquerque Master Drainage Study, H-18. The only 100 year flood hazard area in the near vicinity is southeast of the site which is down stream. The majority of storm flow from this site drains to the existing 54 inch storm drain in San Pedro and does not effect that area.

5. Watershed Soil Map: - The soil type is T_gB, Tijeras gravelly fine sand loam. This site has been delineated on the soils map. See Exhibit "D", from the soil survey of Bernalillo County by S.C.S.

6. Soils: - A soils investigation report for ponding within 15 feet of the structure is not required since storm waters from the site are to be discharged directly into the 54 inch storm drain system on San Pedro Boulevard.

7. Watershed Area: - Lots to the north and east of the proposed site drain away from the tract boundary to self contained drainage structures. The area north of Uptown Boulevard is collected and drained into either the private 36 inch drain to the east or the 54 inch City Storm Drain on San Pedro Boulevard. The finished

floor elevation of the proposed building is elevation 5250.0 while the top of curb on San Pedro Boulevard is elevation 5245.0 at the northwest corner of the lot. See Exhibit "B".

8. Storm Flows: - The 100 year frequency storm flows from the 4.52 acres to the north contributes 7.05 cfs to the 54 inch city storm drain. This flow posses no hazard to the Transamerica Center Site.

9. Flow Depth and Velocity: - The only offsite flow that could affect Tract 2-B-1 is the storm flow on San Pedro Boulevard. The capacity of the street section to the crown is 96.46 cfs with a velocity of 4.70 fps, while the 100 year frequency storm flow from both the tracts to the north is only 7.05 cfs. See Hydrology Data Sheets.

10. Other Off-Site Conditions: - The two (2) tracts to the north of Tract 2-B-1, discharge directly into the 54 inch storm drain, in San Pedro, through a sump inlet. This flow is but a fraction of the capacity of the 54 inch drain and should have no effect on drainage on the Transamerican tract.

    The other discharge point into an existing 36" RCP side of the tract is affected by the discharge of a large portion of the Coronado Shopping Center. The Q_{100} from the shopping area is 42.9 cfs while the 36 inch drain will carry 47.1 cfs. This will allow for the Transamerica Site Q_{100} discharge of 1.41 cfs.

11. Proposed Treatment of Offsite Flows: - There is no requirement for treating offsite flows. The street capacity is sufficient to handle any storm flow which may occur due to clogged catch basins upstream of the site.

12. Right-of-Way and Easements: - There are no right-of-way or easements required to accommodate offsite flows.

13. Flow Volumes and Rates: - On site storm flow volumes and rates for undeveloped and proposed development are as follows:

Undeveloped Tract = 2.96 acres
Flow: Q_{100} - 24 hr. = 3.06 cfs
Q_{10} - 24 hr. = 1.53 cfs

Volume
Q_{100} = 0.20 ac. ft.
Q_{10} = 0.10 ac. ft.

Developed Tract - See Drainage Map.

Drainage Area	Flow		Volume	
	Q_{10}-24 hr	Q_{100}-24 hr	V_{10}	V_{100}
Area 1	1.15	1.83	0.07	0.12
2	0.62	1.00	0.04	0.06
3	0.66	1.04	0.04	0.07
4	0.61	0.96	0.04	0.06
5	0.25	0.40	0.02	0.03
6	0.23	0.37	0.02	0.02
7	0.89	1.41	0.06	0.09
8	0.02	0.04	0.001	0.003
9	0.05	0.09	0.003	0.006
Totals			0.30	0.46

14. Flow Depth and Velocity: - Flow depth and velocity across the parking lot will be comparatively small due to sheet flow and four (4) points of pick up. The largest volume has Q_{100} of 1.83 cfs with an average velocity of 2.7 fps. This would occur in Area No. 1 (see drainage plan) at the upper end of the storm drain system.

15. Proposed Treatment of On-site Drainage: - It is proposed to collect the runoff from the parking lot and roof and discharge the flow into the existing 54" storm drain systems as fast as is possible.

A. The required drainage facilities will include two (2) 18" storm drain pipes to two existing storm drain systems, one on the west side and the other on the east side of the tract. Four sump catch basins and a manhole are required.

B. Each of the four (4) catch basins will be sumped providing some ponding. Ponding as such is not a requirement of this project. See attached letter.

1. Pond Volume Calculations: - None required for this project. However, we are ponding two (2) small areas to stop flow on to Bellamah Tract. See Ponding Calcuations.

2. Positive Discharge: - Storm waters will be discharged as quickly as possible through two (2) 18 inch on-site storm drain systems.

3. Pond Emergency Spillway Calculations: - These are included in the report and the spillway is sufficient to discharge the 100 year frequency runoff from the parking lot.

4. Pond Fencing: - Pond fencing is not required.

5. Pond Landscaping: - Landscaping is not required.

6. Pond Maintenance: - Catch basin maintenance is required, cleaning of trash from the grating will be necessary from time to time, especially after a major storm .

7. Channel Characteristics: - There are no channel requirements.

8. Storm Sewer Characteristics: - The two (2) storm drains will be constructed of 18" RCP on a minimum slope of 0.0176. Four (4) drop inlet sump type catch basins and one (1) manhole are required.

9. Other Storm Drainage Facilities: - A small drain pipe will drain roof flows to the proposed manhole on the 54" City storm drain.

16. Rights-of-Way and Easements: - There will be only one drainage easement required on this project. This is an easement for an 18 inch storm drain pipe to join the existing manhole in the Bellamah Corporation Office Building Parking Lot on the east side. See attached agreement.

DRAINAGE REPORT

PURPOSE: The purpose of this drainage report is to show the existing and proposed drainage flow for the area effected by the proposed development on Tract 2-B-1 of the Bellamah Office Addition, (see Exhibit A). The report also shows the existing drainage pattern of those lots which border on the north and east sides (see Exhibit B).

TOPOGRAPHY AND SOILS: The site generally slopes from 0 to 5 percent to the southwest. These areas have medium runoff and erosion hazard is moderate.

Using the Soil Survey of Bernalillo County by the SCS, the major soils in the area are Tijeras gravelly fine sandy loam (T_gB) and Embudo-Tijeras complex (EtC) with the majority of the lot falling on the Tijeras gravelly fine sandy loam. (see Exhibit D).

DEVELOPMENT: The entire area will be developed into an office building complex, housing five (5) large office buildings, two of which are already completed. The other three (3) are now proposed or under construction. A five (5) story office building, with the required parking, will be constructed on the proposed site, Tract 2-B-1.

EXISTING STORM DRAIN FACILITIES: An existing 54 inch storm drain is located in a ten (10) foot utility easement along the west side of the tract. Another 36 inch storm drain runs along the east side of the tract in a fifteen (15) foot drainage easement. The 36 inch storm drain belongs to the Bellamah Corporation. They have given Transamerica Center permission to discharge 2.50 cfs into their storm drain. See Drainage Map. There is also a 72 inch storm drain in Jeannedale Drive to the east of the Bellamah building.

DRAINAGE ANALYSIS: Tract 2-B-1 is located on the lower extremity of a drainage area, which is bounded by San Pedro Boulevard on the west, by Menaul Boulevard on the north, by Louisiana Boulevard on the east and by Indian School Road on the south. See Exhibit C. That portion of the drainage area to the north of Uptown Boulevard, Coronado shopping Center, is divided into four (4) subdrainage areas. Area I, the northwesterly portion, drains westerly toward San Pedro Boulevard where it is sumped in the parking lot and through sump catch basins discharged into a 54 inch storm drain on San Pedro Boulevard. Area II, the northeasterly portion, drains to sump catch basins in the parking lot and is discharged into a 72 inch storm drain in Jeannedale Drive. The south portion is divided into two sub-areas, Area III and Area IV. Area No. III, drains into a private 36 inch storm

drain owned by Bellamah Land Company. Area IV the southern most portion drains south to Uptown Boulevard where it is picked up by several catch basins and discharged into a 72 inch storm drain on Jeannedale Drive.

The four (4) lots that are to the north and east of the proposed site drain, as shown on Exhibit B, either to the 54 inch, 36 inch or 72 inch storm drains. At the intersection of Jeannedale Drive and Indian School Road is the beginning of an open channel. The channel collects street flows and discharges them directly into the I-40 channel. Catch basins on San Pedro Boulevard discharges directly into a 54 inch storm drain which in turn discharges into the I-40 channel.

There is no danger of the Transamerica Center Office Building being flooded from off-site flow, since the finished floor is 5.0 feet above the top of curb on the northwest corner. Any over flow from the site, which may occur due to catch basin malfunction, will discharge onto San Pedro Boulevard and flow south to catch basins or an emergency spillway chute at the I-40 channel.

Storm flows from the tract itself are divided into nine (9) areas of origin, see Drainage Plan. Areas 1, 2 and 3 (the parking lot) and area 4, (the roof) will drain into a catch basin system and will discharge into the existing City 54 inch storm drain on San Pedro Boulevard. Area 7, (a parking lot) will drain into a drain system and discharge into an existing 36 inch storm drain on the Bellamah Tract. Areas 5 and 6, (a lawn area) have a total possible discharge into San Pedro of Q_{100} = 0.77 cfs which is much smaller than the Undeveloped Q_{10} = 1.53 cfs. When the area is grassed the discharge should be much less than 0.77 cfs. Areas 8 and 9, (lawn area) have a total possible discharge of 0.14 cfs and very little volume. These areas have been sumped to catch the runoff. Both areas will have sufficient ponding volume after the lawns have become well established. See Ponding Calculations.

Using Soil Conservation Services' Chapter 2, (Revised October, 1973 for New Mexico) Engineering Field Manual for Conservation Practices Peak Rates of Discharge for Small Watersheds. The following are the expected segment storm flows for the 100 and 10 year frequency storms.

DESIGN CRITERIA

Drainage Area Number	Drainage Area in acres	Length of run in ft.	Elev. Diff. in ft	Slope in %	Velocity in fps	Time of Concentration in hr.
1	0.74	280	5	1.8	2.7	0.03
2	0.40	280	5	1.8	2.7	0.03
3	0.42	180	3	1.7	2.6	0.02
4	0.39	250	1.5	0.6	1.5	0.05
5	0.16	190	6	3.2	3.6	0.02
6	0.15	200	7	3.5	3.7	0.02
7	0.57	280	6	2.1	2.8	0.03
8	0.04	80	2	2.5	3.2	0.01
9	0.09	180	6	3.3	3.6	0.01
Total	2.96					

Hydrologic Soil Group	B	
Runoff Curve Number CN (Commercial Area)	95	
Percent of 1 hour/24 hour (DC)	65	
24 Hour Rainfall 10 Year Frequency	1.70	in
Direct Runoff @ P = 1.70 in. @ CN = 95	1.20	in
24 Hour Rainfall 100 Year Frequency	2.40	in
Direct Runoff @ P = 2.40 in. @ CN = 95	1.90	in
cfs per acre per inch of runoff	1.30	in
Runoff Curve Number, CN (Lawn Area)	79	
Direct Runoff @ P = 2.40 in. @ CN = 79	0.80	in
Direct Runoff @ P = 1.70 @ CN = 79	0.40	in

100 YEAR FREQUENCY FLOWS

Drainage Area No.	Area	TC in Hours	24 hr. Rainfall 100 yr Freq.	Direct Runoff	cfs/ac. per in.	cfs Peak Discharge Q_{100}	Ac. Ft. Volume of Runoff
1	0.74	0.03	2.40	1.90	1.30	1.83	0.12
2	0.40	0.03	2.40	1.90	1.30	1.00	0.06
3	0.42	0.02	2.40	1.90	1.30	1.04	0.07
4	0.39	0.05	2.40	1.90	1.30	0.96	0.06
5	0.16	0.02	2.40	1.90	1.30	0.40	0.03
6	0.15	0.02	2.40	1.90	1.30	0.37	0.02
7	0.57	0.03	2.40	1.90	1.30	1.41	0.09
8	0.04	0.01	2.40	0.80	1.30	0.042	0.003
9	0.09	0.01	2.40	0.80	1.30	0.094	0.006

10 YEAR FREQUENCY FLOWS

Drainage Area No.	Area	TC in Hours	24 hr. Rainfall 10 yr Freq.	Direct Runoff	cfs/ac. per in.	cfs Peak Discharge Q_{10}	Ac. Ft. Volume of Runoff
1	0.74	0.03	1.70	1.20	1.30	1.15	0.07
2	0.40	0.03	1.70	1.20	1.30	0.62	0.04
3	0.42	0.02	1.70	1.20	1.30	0.66	0.04
4	0.39	0.05	1.70	1.20	1.30	0.61	0.04
5	0.16	0.02	1.70	1.20	1.30	0.25	0.02
6	0.15	0.02	1.70	1.20	1.30	0.23	0.02
7	0.57	0.03	1.70	1.20	1.30	0.89	0.06
8	0.04	0.01	1.70	0.40	1.30	0.021	0.001
9	0.09	0.01	1.70	0.40	1.30	0.047	0.003

Peak storm discharge from the two tracts directly to the north of Tract 2-B-1.

1.	Total Drainage Area	4.52	acres
2.	Length of Flow Path	850	ft.
3.	Elevation Difference (52-46)	6	ft.
4.	Average Slope	0.0071	
5.	Land Use	Commercial	
6.	Runoff Curve Number (Table 2-1)	95	CN
7.	Time of Concentration (Figure 2-2)	0.01	hr.
8.	Rainfall, 24 hour-100 year (Exhibit 2-2)	2.70	in
9.	Direct Runoff (Figure 2-4) "Q"	1.20	in
10.	Percent of 1 hr/24 hr (DC)(Exhibit 2-3)	65	
11.	Cfs per acre per inch of runoff(Fig.2-5)	1.30	cfs
12	Peak Discharge g=A x Qxcfs/ac/in g = 4.52 x 1.20 x 1.30	7.05	cfs
13	Volume of Runoff (Q x A)/12 V = 1.20 x 4.52/12	0.45	ac.ft.

Peak Storm Discharge from Areaa of Coronado Center Draining to 36" RCP

1.	Total Drainage Area (See Exhibit)	12.16	acres
2.	Length of Flow Path	2000	ft.
3.	Elevation Difference '84-56)	28	ft.
4.	Average Slope	0.0140	
5.	Land Use	Commercial	
6.	Runoff Curve No. (Table 2-1)	95	
7.	Time of Concentraction (Figure 2-2)	0.23	hr.
8.	Rainfall 24 hour-100 year (Exhibit 2-2)	2.70	in
9.	Direct Runoff (Figure 2-4) "Q"	1.20	in
10.	Percent 1 hr/24 hr (DC)(Exhibit 2-3)	65	RM-2
11.	Cfs per acre per inch of runoff (Fig.2-5)	1.20	cfs
12.	Peak Discharge g=A x Q x cfs/ac/in g = 12.16 x 1.20 x 1.20	1.75	cfs
13.	Volume of Runoff (Q x A)/12	1.22	ac. ft.

Capacity of Existing 36" Storm Drain

1.	Pipe Size	36	in
2.	n Factor	0.013	
3.	Slope of Pipe	0.005	
4.	$S^{1/2}$	0.0707	
5.	Cross Section Area	7.069	sq. ft.
6.	$d^{8/3}$	18.70	
7.	K' for pipe running full	0.463	
8.	$Q = (K'/n)\ d^{8/3}\ S^{1/2}$	47.1	cfs

Storm Drain Pipe Design

1.	Q_{100} at 54 inch storm drain	3.84	cfs
2.	Top of 54 inch pipe	39.0	ft
3.	Grate elevation of sump catch basin no. 3	45.0	ft.
4.	18 inch pipe slope	0.0176	
5.	$S^{1/2}$	0.1328	
6.	Pipe type for proposed storm drain	RCP	
7.	n Factor	0.015	
8.	Invert elevation at sump CB No. 3	40.0	ft.
9.	Trial pipe size	18	inch
10.	Cross section area	1.767	sq. ft.
11.	$d^{8/3}$	2.95	
12.	$d^{5/2}$	2.756	
13.	Approximate $Q = (0.463/n)\, d^{8/3}\, S^{1/2}$	12.1	cfs
14.	Normal depth in pipe for Q_{100} =	3.84	cfs
15.	$K' = Q\, n/d^{8/3}\, S^{1/2}$	0.147	
16.	D_n	0.39	
17.	D_n/d	0.59	ft.
18.	$A = C\, d^2$ (C = 0.2836)	0.638	sq. ft.
19.	$V = Q/A$	6.02	f.p.s.
20.	H_v	0.56	ft.
21.	Critical depth in pipe for Q_{100} =	3.84	cfs
22.	$K'_c = d^{5/2}$	1.393	
23.	D_c/d	0.500	
24.	D_c	0.75	ft.
25.	$A = C\, d^2$ (C = 0.393)	0.884	sq. ft.
26.	$V = Q/A$	4.34	f.p.s.

27. Use 18" R.C.P. throughout drainage system to prevent clogging and maintain a flushing velocity.

Required Grated Catch Basin Opening

1.	Q_{100} from area No. 1		1.83	c.f.s.
2.	Grating width (Gross) 25.5"		2.125	ft.
3.	Grating Length (Gross) 41.375"		3.448	ft.
4.	Grating width (net) 15.5"		1.292	ft.
5.	Grating Length (net) 33.375"		2.781	ft.
6.	Clear area of grating (1.292 x 2.781)	A	3.593	sq. ft.
7.	Depth of Grating		3.5	inch
8.	Thickness of grating		0.5	inch
	$Q = CA\ (2\ gh)^{1/2}$			
9.	Coefficient of discharge	C	0.60	
10.	Area		3.593	sq. ft.
11.	2g		64.4	
12.	Depth of water over grating	h	0.8	ft.
13.	$Q = 0.60 \times 3.59\ (64.4 \times 0.8)^{1/2}$		15.46	cfs
14.	Assume grate 1/2 clogged, Use	Q	7.73	cfs
15.	Check with Hydraulic capacity chart, median catch basin (Ref. Exhibit "F")	Q	7.4	cfs
	1.83 <7.4 ok			
16.	Number of single grated drop inlets required		3	ea

Emergency Spillway Calculations from Parking Lot to San Pedro Boulevard

Design Criteria

1.	Spillway Crest Elevation	5045.32	
2.	Width of Spillway, L =	24	ft.
3.	C	2.70	
4.	Q_{100}	3.87	cfs
5.	Top of Curb	5045.92	ft.
	$Q = CLH^{1.5} = 2.70 \times 24 \times H^{1.5}$	$64.8H^{1.5}$	
6.	Trial No. 1, Water Surface Elevation	45.72	ft.
7.	H	0.40	ft.
8.	C	2.70	
9.	$Q = 64.8\ (0.40)^{1.5}$	16.4	cfs
10.	Trial No. 2, Water Surface = T.C.	45.92	ft.
11.	H	0.60	ft.
12.	C	2.70	ft.
13.	$Q = 64.8\ (0.60)^{1.5}$	30.1	cfs
14.	Q from parking lot area 1, 2 and 3	3.87	cfs
15.	Trial No. 3, Water Surface Elevation	45.52	ft.
16.	H	0.20	ft.
17.	C	2.70	
18.	$Q = 64.8\ (0.20)^{1.5}$	5.80	cfs
19.	5.80 is larger than 3.87		

Ponding for Areas 8 and 9 Drainage Plan

Ponding For Area 8

1.	Storage area high elevation of pond	47.35	ft.
2.	Surface area @ elevation 47.35	330	sq. ft.
3.	Depth of pond	0.5	ft.
4.	Surface area @ elevation 46.35	320	
5.	Volume of pond (330+320/2x0.5)	162	cu.ft.
6.	Required volume for Q_{100}	0.0027	ac. ft.
	V = 0.04 x 0.80/12	116	cu. ft.
	V = 0.0027 x 43,560		
	116 < 162 ok		

Ponding for Area 9

1.	Storage area high elevation of pond	48.0	ft.
2.	Surface area @ elevation 48.0	630	sq. ft.
3.	Depth of pond	0.75	ft.
4.	Surface area @ elevation 47.25	120	sq. ft.
5.	Volume of pond (630+120/2x0.75)	281	cu. ft.
6.	Required volume for Q_{100}	0.006	ac. ft.
	V = 0.09x0.80/12	261	cu. ft.
	V = 0.006 x 43,560		

San Pedro Cross Section Flow Capacity

1.	Right-of-way width	100	ft.
2.	Street section width	64	ft.
3.	Cross slope	2	%
4.	Crown height at street center line	0.64	ft.
5.	Curb height at gutter	0.667	ft.
6.	Length of curb and gutter	220	ft.
7.	Elevation difference (5045-5042)	3	ft.
8.	Slope of gutter line	0.0136	
9.	S 1/2	0.1168	
10.	Coefficient "n"	0.017	
	Assume water in street to crown height.		
11.	Depth of water to gutter	0.64	ft.
12.	Width of water surface to crown	32	ft.
13.	Water area: one half street	10.24	sq. ft.
14.	Wetted perimeter	32.64	ft.
15.	Hydraulic radius	0.3137	
16.	$R^{2/3}$	0.4615	
17.	$V = (1.486/n)\ R^{2/3}\ S^{1/2}$	4.71	fps
18.	Q: one half street	48.23	c.f.s.
19.	Q: full street	96.46	c.f.s.

AREAS 8 AND 9

Two Year Storm Flows and Volume

1.	Drainage Area	Area 8	0.04	ac
		Area 9	0.09	ac
2.	Time of Concrentration	Area 8	0.01	hours
		Area 9	0.01	hours
3.	Hydrologic Soil Group		B	
4.	CN		80	
5.	Rainfall 24 hr, 2 yr. Frequency		1.00	inch
6.	Direct Runoff	Q	0.10	
7.	Distribution Curve No.	DC	65	
8.	cfs per acre per inch of runoff		1.30	cfs/ac/in
9.	Peak Discharge			
	Area 8, q = 0.04 x 0.20 x 1.30		0.0052	cfs
	Area 9, q = 0.09 x 0.20 x 1.30		0.0117	cfs
10.	Volulme of Runoff			
	Area 8, V = 0.04 x 0.10/12		0.0003	ac ft
	Area 9, V = 0.09 x 0.10/12		0.0008	ac ft
11.	Volume			
	Area 8, V = 0.0003 x 43,560		145	cu ft
	Area 9, V = 0.0008 x 43,560		327	cu ft

Quantity of Stone Required in Sump to Absorb Two Year Frequency Volume

1.	Size of Stone	2	inch
2.	Volume of Voids	34	%
3.	Volume of Stone Required		
	Area 8, (145/0.34)/27	16	cu yd
	Area 9, (327/0.34)/27	36	cu yd

Alternate Sump Drain to 18 inch RCP

Subdrainage Area No. 8			
1.	Pipe size	4	inch
2.	Pipe type	PVC	
3.	Cross Section Area	0.0873	sq. ft.
4.	$d^{8/3}$	0.0534	
5.	$d^{5/2}$	0.0642	
6.	n	0.013	
7.	Length of pipe	25	ft.
8.	Elevation Difference (46.6-41.0)	5.6	ft.
9.	Slope of pipe	0.224	
10.	$S^{1/2}$	0.473	
11.	Total head available	6.35	ft.
12.	$Q = (0.463/n)\ d^{8/3}\ S^{1/2}$	0.90	cfs
13.	100 yr. flow from area 8	0.042	cfs
14.	Normal depth for Q100 $K' = Qn/d^{8/3}\ S^{1/2}$	0.0216	
15.	D_n/d	0.15	
16.	$D_n = 0.15 \times 0.333$	0.05	ft.
17.	$A = Cd^2 = 0.0739\ (0.333)^2$	0.0082	sq. ft.
18.	$V = Q/A$	5.13	fps
Subdrainage Area No. 9			
1.	Pipe size	4	inch
2.	Pipe type	PVC	
3.	Cross Section Area	0.0873	sq. ft.
4.	$d^{8/3}$	0.0534	
5.	$d^{5/2}$	0.0642	
6.	n	0.013	
7.	Length of pipe	85	ft.
8.	Elevation Difference (47.0-41.0)	7.0	ft.
9.	Slope of pipe	0.0824	
10.	$S^{1/2}$	0.287	
11.	Total head available	8.0	ft.
12.	$Q = (0.463/n)\ d^{8/3}\ S^{1/2}$	0.546	cfs
13.	100 yr. flow from area 9	0.094	cfs
14.	Normal depth for Q100 $K' = Qn/d^{8/3}\ S^{1/2}$	0.0797	
15.	D_n/d	0.28	
16.	$D_n =$	0.093	ft.
17.	$A = Cd^2 = 0.18\ (0.333)^2$	0.020	sq. ft.
18.	$V = Q/A$	4.71	fps

HYDROLOGY DATA SHEET

(Chapter 2 - Engineering Field Manual for Conservation Practices)

PROJECT Transamerica Center PROJECT NO. 81070

LOCATION NE Corner of San Pedro Boulevard and Indian School Road

OWNER Transamerica Properties

KIND OF STRUCTURE Over Land Flow BY RES DATE _____

DRAINAGE AREA: A = 2.94 acres

LENGTH: (longest waterway to the ridge) L = 500 ft.

ELEVATION DIFFERENCE: (to farthest ridge) H = 10 ft.

AVERAGE WATERSHED SLOPE S = 0.020
- Use USGS quads or hand level
- H = S% x Lin. Ft. x 100

HYDROLOGIC SOIL GROUP (Exhibit 2-1) Group = B

RUNOFF CURVE NUMBER: (Table 2-1 or Fig. 2-1) CN = 80

TIME OF CONCENTRATION: (Fig. 2-2 or 2-3) T_c = 0.075 hr.

RAINFALL, 24 hr. (Exhibit 2-2) Freq. 10 yr. F_{24} = 1.70 in.

DIRECT RUNOFF: (Fig. 2-4) Q = 0.40 in.

DISTRIBUTION CURVE NO.: (Exhibit 2-3) DC = 65

c.f.s. PER ACRE PER INCH OF RUNOFF (Fig. 2-5) csf/ac/in = 1.30 c.f.s.

PEAK DISCHARGE: q = A x Q x cfs/ac/in

q = 2.94 x 0.40 x 1.30 q = 1.53 c.f.s.

VOLUME OF RUNOFF: (Q x A) / 12

Vol. = 0.40 x 2.94 / 12 Vol. = 0.10 ac. ft.

HYDROLOGY DATA SHEET

(Chapter 2 - Engineering Field Manual for Conservation Practices)

PROJECT Transamerica Center PROJECT NO. 81070

LOCATION NE Corner of San Pedro Blvd and Indian School Road

OWNER Transamerica Properties

KIND OF STRUCTURE Over Land Flow BY RES DATE _____

DRAINAGE AREA: A = 2.94 acres

LENGTH: (longest waterway to the ridge) L = 500 ft.

ELEVATION DIFFERENCE: (to farthest ridge) H = 10 ft.

AVERAGE WATERSHED SLOPE S = 0.020
- Use USGS quads or hand level
- H = S% x Lin. Ft. x 100

HYDROLOGIC SOIL GROUP (Exhibit 2-1) Group = B

RUNOFF CURVE NUMBER: (Table 2-1 or Fig. 2-1) CN = 80

TIME OF CONCENTRATION: (Fig. 2-2 or 2-3) T_c = 0.075 hr.

RAINFALL, 24 hr. (Exhibit 2-2) Freq. 100 yr. F_{24} = 2.40 in.

DIRECT RUNOFF: (Fig. 2-4) Q = 0.80 in.

DISTRIBUTION CURVE NO.: (Exhibit 2-3) DC = 65

c.f.s. PER ACRE PER INCH OF RUNOFF (Fig. 2-5) csf/ac/in = 1.30 c.f.s.

PEAK DISCHARGE: q = A x Q x cfs/ac/in

q = 2.94 x 0.80 x 1.30 q = 3.06 c.f.s.

VOLUME OF RUNOFF: (Q x A) / 12

Vol. = 0.80 x 2.94 / 12 Vol. = 0.20 ac. ft.

Recommendation: The storm flow from areas 1, 2 and 3 (parking lot areas) be collected in an 18 inch storm drain through three (3) sump catch basins and be discharged into an existing 54 inch storm drain on San Pedro Blvd. The storm flow from area 7 (parking lot area) be collected in an 18 inch storm drain through a sump catch basin and be discharged into an existing private 36 inch storm drain on the easterly side of the tract. The storm flow from areas 8 and 9 (lawn areas) be collected into sumps and drained into the area 7 storm drain through four (4) inch PVC drain pipes. The storm flow from areas 5 and 6 (lawn areas) be discharged as sheet flow into San Pedro Blvd. and Indian School Road respectfully. The storm flow from area 4 (Roof area) be split into two areas, east and west, and be drained through pipes to the areas 1, 2 and 3 storm drain.

SCANLON & ASSOCIATES INC.

CONSULTING ENGINEERS

August 26, 1981

Dale Bellamah Land Company, Inc.
6121 Indian School Road, NE
P.O. Box 3325
Albuquerque, NM 87190

Attention: Mr. V. M. Kimmick

RE: Storm water flow from Tract 2-B-1 into existing 36 inch RCP along easterly boundary.

Dear Mr. Kimmick:

Per our phone conversation Monday, August 25, 1981: this is a request to discharge 2.50 cfs into the existing 36 inch RCP storm drain along the easterly boundary of Tract 2-B-1. The total Q 100 from the 2.96 acres is approximately 11.3 cfs. The above discharge is about 25 per cent of the total runoff. It is anticipated that the final discharge into the 36 inch RCP will be less than the 2.50 cfs requested.

Enclosed, for your information, is a copy of the Conceptual Drainage plan. Should there be any questions concerning this request, please contact our office.

Sincerely,

SCANLON & ASSOCIATES, INC.

Ross E. Schmidt, P.E.

RECEIVED
SEP 2 1981
SCANLON & ASSOCIATES

RES/jmr

enclosure

Approved for discharge of 2.50 cfs into 36 inch private storm drain.

V. M. Kimmick, P.E., Development Manager

Date 9-1-81

PLEASE REPLY TO:

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

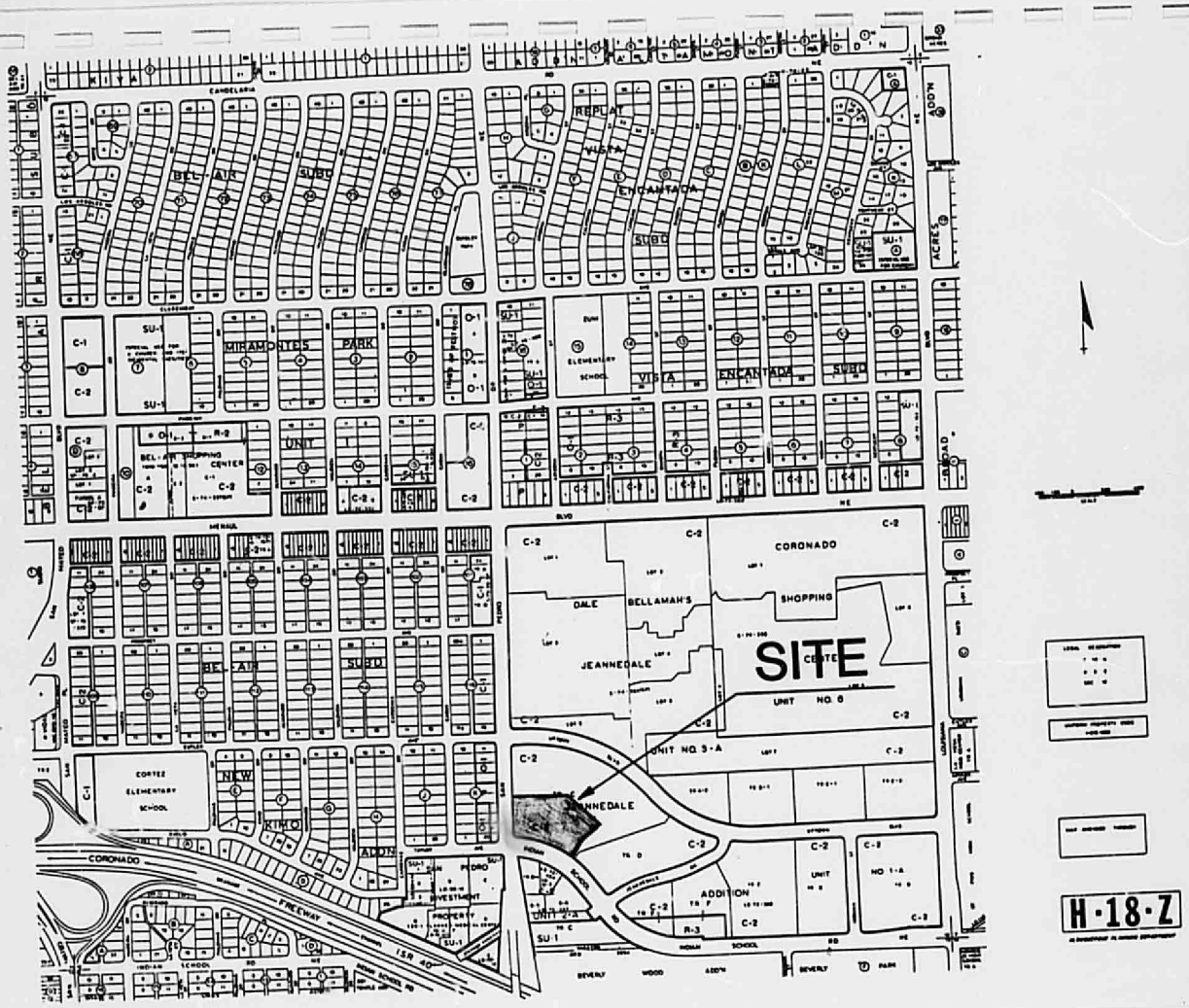
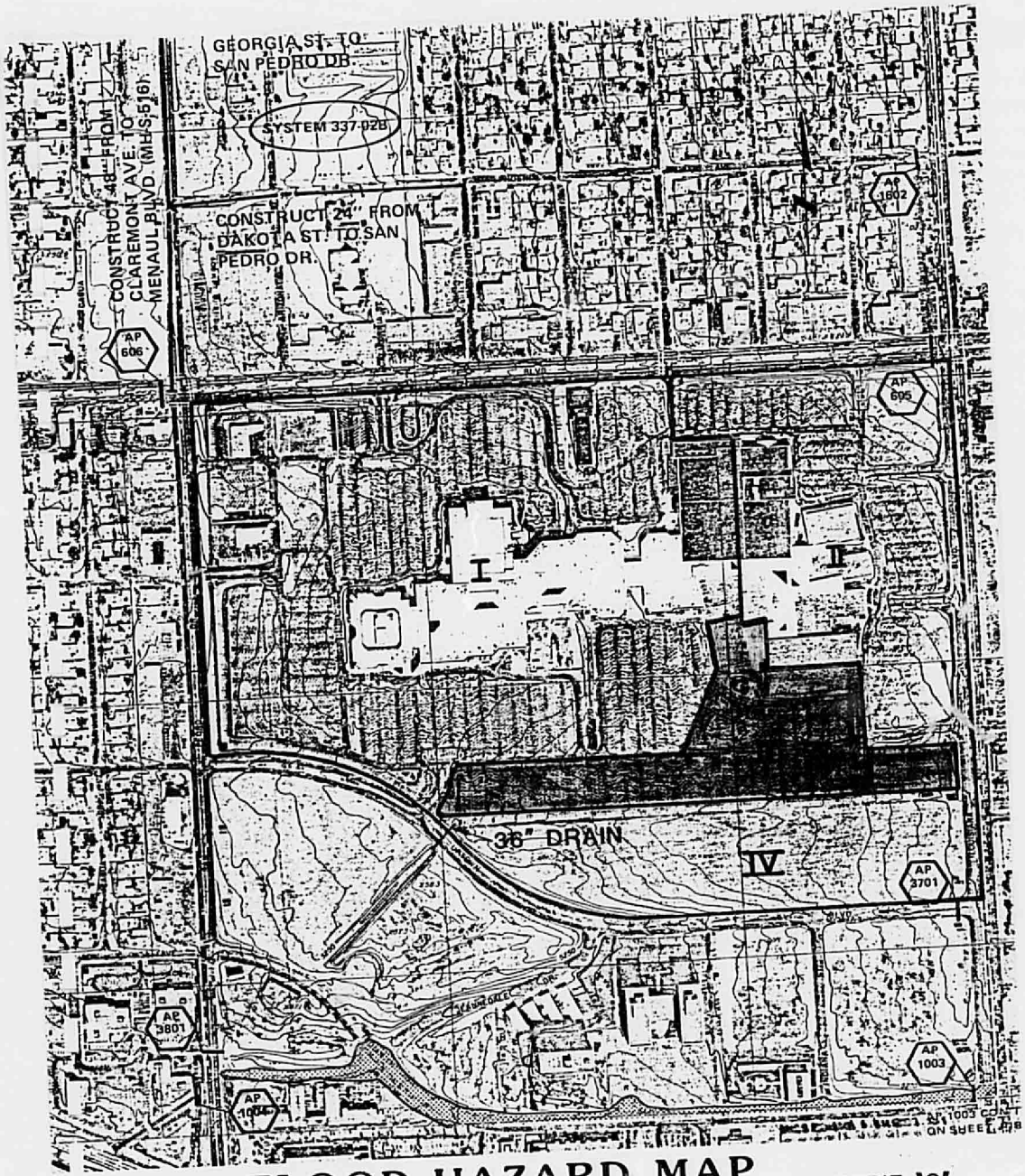

SITE
BEL-AIR SUBD
REPLAT VISTA ENCANTADA SUBD
MIRAMONTES PARK
VISTA ENCANTADA SUBD
UNIT 1
BEL-AIR SHOPPING CENTER
CORONADO SHOPPING CENTER
DALE BELLAMAH'S
JEANNEDALE
UNIT NO. 6
UNIT NO. 3-A
ADDITION
CORTEZ ELEMENTARY SCHOOL
NEW KIMO ADDN
CORONADO FREEWAY
ISR 40
H-18-Z

EXHIBIT "A"

DRAINAGE FLOW MAP

EXHIBIT "B"

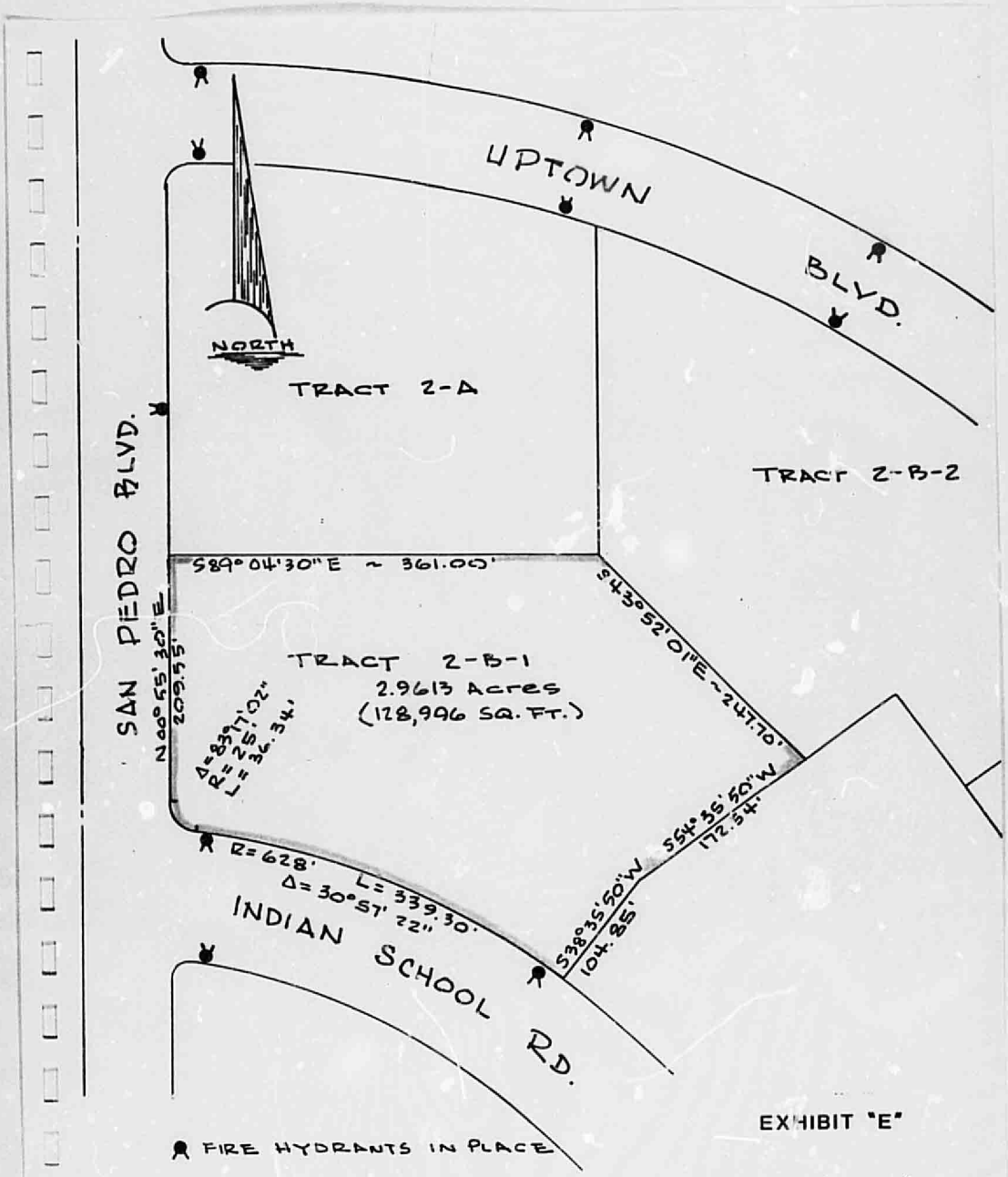


FLOOD HAZARD MAP

EXHIBIT "C"

SOILS MAP

EXHIBIT "D"


UPTOWN
BLVD.
NORTH
TRACT 2-A
TRACT 2-B-2
SAN PEDRO BLVD.
N00°55'30"E
209.55'
S89°04'30"E ~ 361.00'
S43°52'01"E ~ 247.70'
TRACT 2-B-1
2.9613 Acres
(128,996 SQ. FT.)
Δ=83°17'02"
R=25.00'
L=36.34'
R=628'
L=339.30'
Δ=30°57'22"
INDIAN SCHOOL RD.
S38°35'50"W
104.85'
S54°35'50"W
172.54'
FIRE HYDRANTS IN PLACE
EXHIBIT "E"
SCALE: 1" = 100'

HYDRAULIC CAPACITY CHART
MEDIAN CATCH BASIN

Standard C-15.08 CB Type 4
(Off roadway location)
50% Clogging

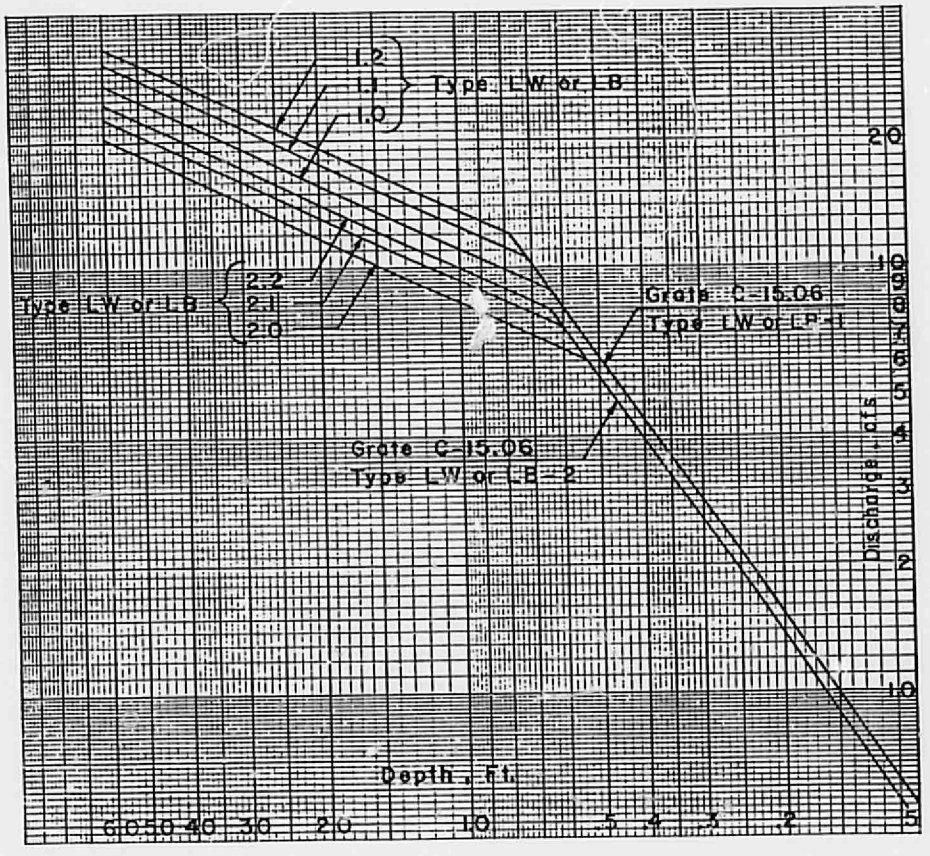
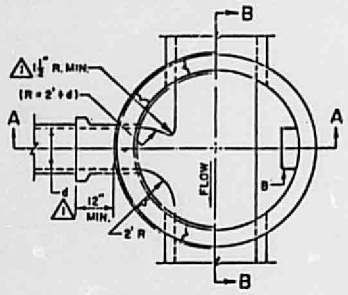


Chart 1

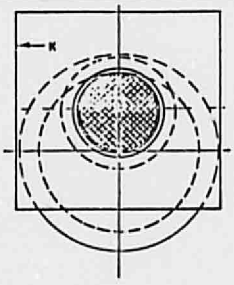
EXHIBIT "F"

AHD
Structures Section
Hydraulics Branch
10-15-72

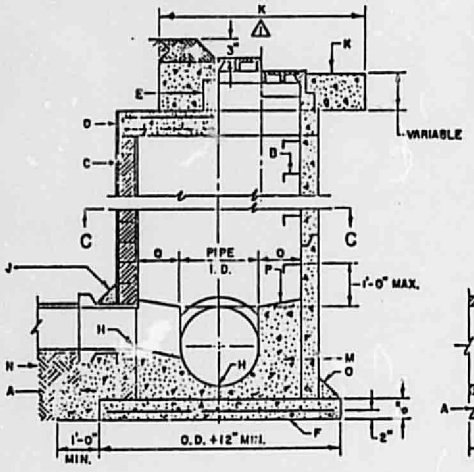
FHWA
HEC #12



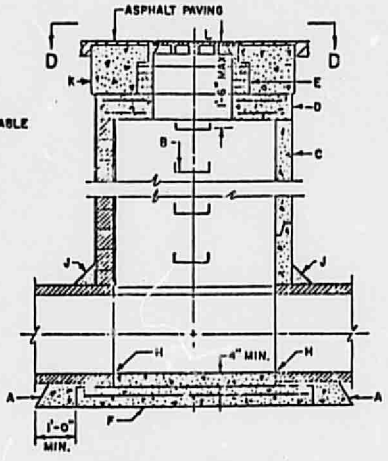
FLOOR PLAN AT C-C



PLAN AT D-D



CROSS SECTION A-A



CROSS SECTION B-B

GENERAL NOTES:

1. USE M H "TYPE C" FOR DEPTHS OF LESS THAN 8 FT. MEASURED FROM INV. TO RIM.
2. CONTRACTOR HAS OPTION TO CONSTRUCT "TYPE C" MH IN LIEU OF "TYPE E" MH FOR DEPTHS OF 6 FT. OR MORE.
3. THIS M H DESIGN APPLIES TO 4, 6 OR 8 FT. I.D.
4. M H GREATER THAN 18 FT. IN DEPTH SHALL BE CONSTRUCTED OF PRECAST CONC. SECTIONS ONLY.
5. USE NON-SHRINK GROUT FOR JOINTS & FILLETS.

CONSTRUCTION NOTES:

A. CONC. PIPE SUPPORTS SHALL EXTEND OUTSIDE MH TO BELL OF FIRST JOINT & SHALL CRADLE PIPE TO SPRING LINE.

2 B. FIRST TWO STEPS TO PROTRUDE 4" INTO MH, ALL OTHERS 5" STEPS TO BE PRECAST IN PLACE OR SET IN EPOXY CEMENT (HUNT PROCESS HB-230 OR APPROVED EQUAL) AT 16" O.C. SEE DWG. S-11 FOR STEP DETAIL.

C. M H MAY BE CONSTRUCTED OF CONC. BLOCK, GRADE MS BRICK, POURED CONC. OR PRECAST REINF CONC. IF BLOCK OR BRICK, PLASTER INSIDE & OUT WITH ONE HALF INCH MORTAR. SEE DWG. S-6 FOR DETAIL.

D. SEE DWG. S-3 FOR PRECAST CONC. COVER.

E. USE FOUR COURSES OF GRADE MS BRICK ON UN-PAVED STREETS FOR FUTURE ADJUSTMENT OF M H FRAME TO PAVEMENT GRADE.

F. CONC. BASE TO BE POURED IN PLACE USING NO. 4 BARS AT 6" O.C. EACH WAY TO. M H DEPTH OF 10' OR GREATER. USE NO. 4 BARS AT 12" O.C. EACH WAY FOR M H LESS THAN 10' IN DEPTH.

G. IN UNPAVED AREAS, TOP OF MH COVER SHALL BE SET 3" BELOW GRADE.

H. INVERT ELEVATION OF STUB OR LATERAL AS SHOWN ON PLANS.

J. 6" GROUT FILLET ON UPPER HALF OF PIPE.

1 K. USE CONC. PAD 5' X 5' IN ALL AREAS.

L. SEE DWG. S-5 FOR M H FRAMES AND COVERS.

M. CONC. FILL TO BE TYPE II CEMENT.

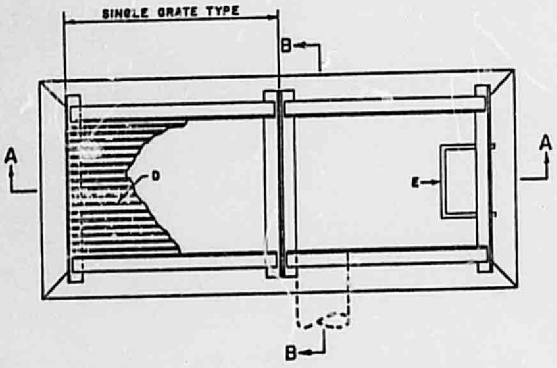
N. COMPACTED FILL.

O. 6" GROUT FILLET AROUND BASE.

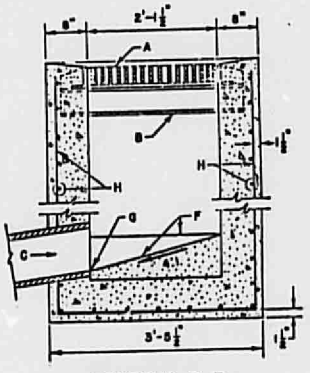
P. SLOPE ONE INCH PER FT.

Q. SHELF TO BE A MIN. OF 6" WIDE.

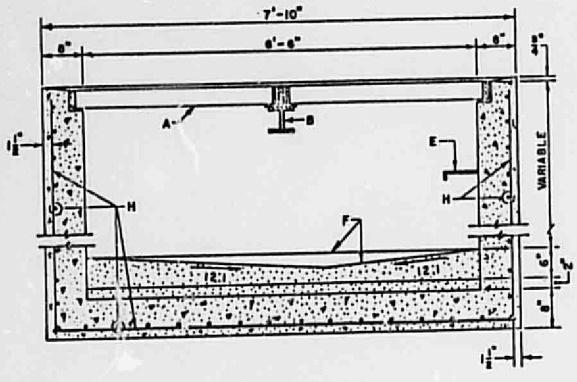
REVISIONS	CITY OF ALBUQUERQUE
1 4-2-80 2 1-28-81	SEWER MANHOLE TYPE C DWG. S-1-2 NOV 1979



PLAN



SECTION B-B



SECTION A-A

GENERAL NOTES:

1. FOR SINGLE GRATE TYPE CATCH BASIN, MOVE ONE END WALL TO FORM NEW SINGLE GRATE CATCH BASIN.
2. FRAME OF GRATING SHALL BE WELDED AND/OR RIVETED.
3. AFTER CLEANING SURFACE OF SCALE, RUST ETC., GRATING FRAME AND CENTER SUPPORT TO BE PAINTED WITH ONE SHOP COAT RED OXIDE. TWO FINISH COATS ALUMINUM PAINT (AASHO M69).

CONSTRUCTION NOTES:

A. SEE DWG. K-8 FOR FRAME AND GRATING DETAILS.

B. SEE DWG. K-9 FOR CENTER SUPPORT ASSEMBLY.

C. CUT ONE HORIZONTAL AND ONE VERTICAL BAR MAX. AT PIPE OPENING.

D. SPACERS, SEE DWG. K-8.

⚠1 E. USE STANDARD MH STEPS, SEE DWG. S-11, FIRST STEP TO BE 18" FROM TOP OF GRATE AND SHALL PROTRUDE 7" SPACING BETWEEN STEPS TO BE AT 12" O.C., LAST STEP 18" MAX. FROM BOTTOM.

F. CONC. FILL, SEE NOTE E, DWG. K-1.

G. INVERT PER DESIGN.

H. NO. 4 BARS AT 6" O.C. EACH WAY.

CITY OF ALBUQUERQUE

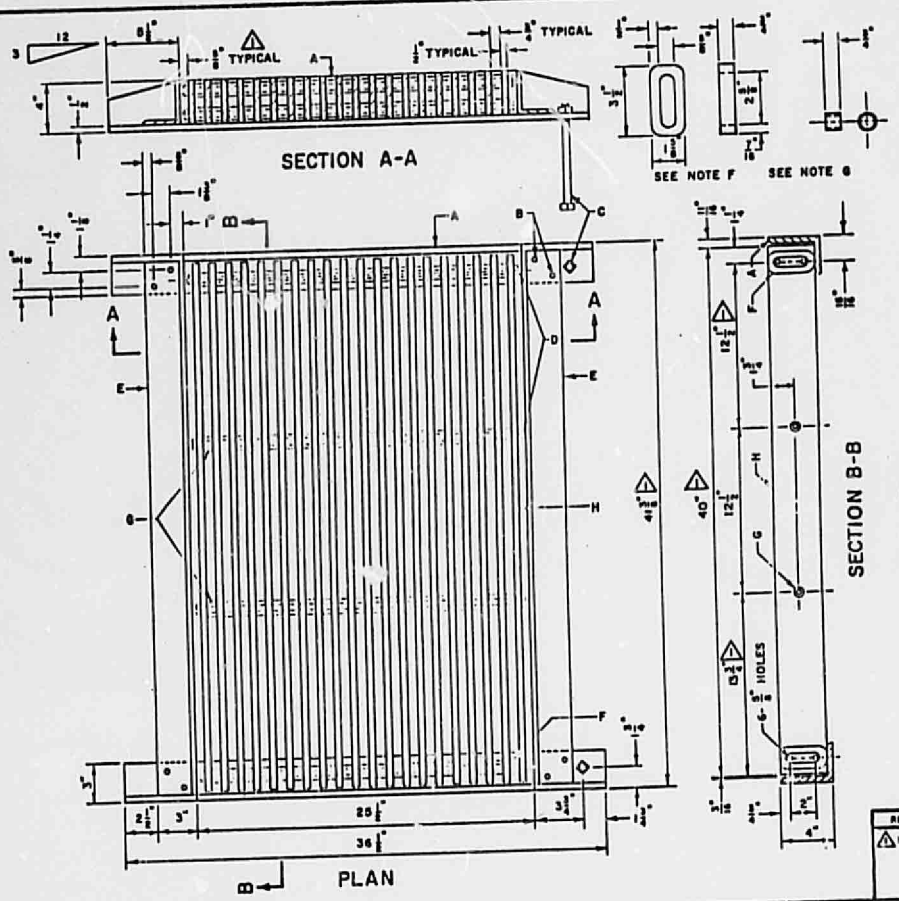
DRAINAGE

CATCH BASIN DOUBLE "D"

DWG. K-6-1

NOV. 1979

REVISIONS
⚠1-26-81



GENERAL NOTES:

1. ALL EXPOSED METAL PARTS SHALL BE PAINTED PRIOR TO ASSEMBLY. WELDING, MACHINING AND DRILLING SHALL BE DONE BEFORE PAINTING. ALL DIMENSIONS ARE FINISH DIMENSIONS.
2. NUTS USED TO SECURE GRATING BARS MAY BE HELD TIGHT BY PEENING THREADS OR OTHER SUITABLE MEANS IN LIEU OF TACK WELDS.
3. ALL PARTS SHALL BE OF STRUCTURAL GRADE STEEL, EXCEPT SPACERS, WHICH MAY BE OF EITHER C.I. OR STEEL.
4. SEE DWG. K-9, GENERAL NOTE 4 FOR CLEANING AND PAINTING.
5. ANY DAMAGE TO PAINTING SHALL BE REPAIRED IN AN APPROVED MANNER.
6. FRAME MAY BE WELDED OR RIVETED.

CONSTRUCTION NOTES:

A. 4"X 3"X $\frac{1}{4}$" X 36$\frac{1}{2}$" ∠.

B. 2-$\frac{3}{4}$" COUNTERSUNK RIVETS AT EACH CORNER, SEE NOTE 6.

C. $\frac{3}{4}$"X 8" BOLTS WITH SQ. HEADS AND NUTS AT OUTSIDE CORNERS OF BASIN.

D. 6-$\frac{1}{2}$" X 25$\frac{3}{4}$" STEEL RODS, 1-NUT AT EACH END, TACK WELD NUTS TO ADJACENT BARS AFTER ASSEMBLY, SEE NOTE 2.

⚠ E. 3$\frac{1}{2}$" X 3" X $\frac{3}{8}$" X 40$\frac{1}{8}$" ∠.

F. END SPACERS.

G. STANDARD $\frac{1}{2}$" PIPE INTERIOR SPACERS

⚠ H. 20-$\frac{3}{8}$" X 3$\frac{1}{2}$" X 40" BARS.

REVISIONS
⚠ 1-26-81

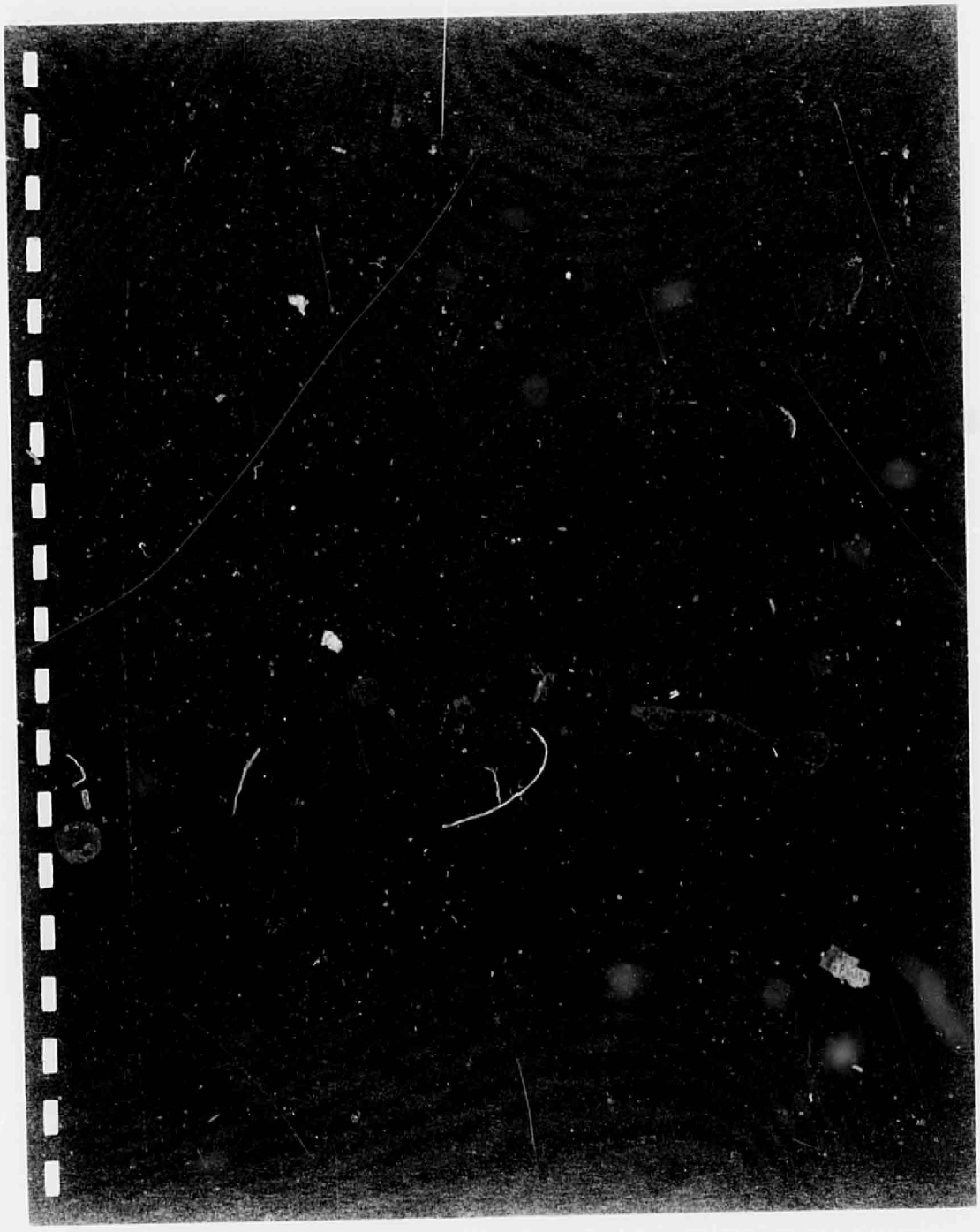
CITY OF ALBUQUERQUE

DRAINAGE

CATCH BASIN FRAME & GRATING

DWG. K-8-1

NOV. 1979



Address 6001 Indian Sch. NE Engr/~~Arch~~ Spencer

Plans Approved ~~X~~ - Cond. 4-15-82

Comments: N-18-015

S.U. 19 REQUIRED

3-18-83

Inspection Requested 10-27-82 Contractor Bradbury & Stamm

Appr. 3/24/83 Disappr. _____ 30 Day Temp. _____

Comments: partial approval on 3/24/83 need certification of sump catch basins

Reinspection and/or comments:

SCANLON & ASSOCIATES INC.

CONSULTING ENGINEERS

March 22, 1983

81070

City of Albuquerque
Engineering Division
Municipal Development Department
Hydrology Section 123 Central Avenue, NW
Albuquerque, NM 87103

Attention: Bernie Montoya

Re: Transamerica Center Drainage Plans
Sheets C-1 and C-2 approved January, 1982
Permit No. 13157

6001 INDIAN SCHOOL, N.E.
H18-015

Gentlemen:

This is to certify that the two sump catch basins shown on Sheet No. C-1 of the referenced plans were constructed in close compliance to the drawings. I inspected the storm drain facilities on October 5, 1982. The sump catch basins had been poured, the grating and a large pile of stone were near by. The sump catch basins were located at the bottom of their respective sumps.

Sincerely

SCANLON & ASSOCIATES, INC.

Ross E. Schmidt, PE
Project Engineer

RES:lcm

PLEASE REPLY TO:
- ☐ ALBUQUERQUE, NEW MEXICO 87110
- ☐ ARTESIA, NEW MEXICO 88210
- ☐ FARMINGTON, NEW MEXICO 87401
- ☐ SANTA FE, NEW MEXICO 87501

8008 PENNSYLVANIA CIRCLE NE
510 WEST TEXAS AVENUE
1405 SCHOFIELD LANE
1570 PACHECO STREET, SUITE A-7

TELEPHONE: (505) 265-6941
TELEPHONE: (505) 748-1010
TELEPHONE: (505) 327-1023
TELEPHONE: (505) 983-3323

SCANLON & ASSOCIATES INC.
CONSULTING ENGINEERS

March 22, 1983

81070

City of Albuquerque
Engineering Division
Municipal Development Department
Hydrology Section 123 Central Avenue, NW
Albuquerque, NM 87103

Attention: Bernie Montoya

Re: Transamerica Center Drainage Plans
Sheets C-1 and C-2 approved January, 1982
Permit No. 13157

Gentlemen:

This is to certify that the two sump catch basins shown on Sheet No. C-1 of the referenced plans were constructed in close compliance to the drawings. I inspected the storm drain facilities on October 5, 1982. The sump catch basins had been poured, the grating and a large pile of stone were near by. The sump catch basins were located at the bottom of their respective sumps.

Sincerely

SCANLON & ASSOCIATES, INC.

Ross E. Schmidt, PE
Project Engineer

RES:lcm

PLEASE REPLY TO:
☐ ALBUQUERQUE, NEW MEXICO 87110
☐ ARTESIA, NEW MEXICO 88210
☐ FARMINGTON, NEW MEXICO 87401
☐ SANTA FE, NEW MEXICO 87501

8008 PENNSYLVANIA CIRCLE NE
510 WEST TEXAS AVENUE
1405 SCHOFIELD LANE
1570 PACHECO STREET, SUITE A-7

TELEPHONE: (505) 265-6941
TELEPHONE: (505) 748-1010
TELEPHONE: (505) 327-1023
TELEPHONE: (505) 983-3323

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE November 23, 1982 REF. NO._____

TO: Fed Aguirre, Drainage

FROM: Barry C. Simmons, Civil Senior Engineer

SUBJECT: TRANS AMERICA FACILITY DRAINAGE

All storm drainage facilities shown on the plans attached to the special order 19 for the referenced facility have been constructed. The drainage facilities were constructed in substantial compliance with the plong and day deniations are reflected on the as builts. I consider the work acceptable.

cc: Bernie Montoya

BCS/rvg

DRAINAGE REPORT
FOR THE
TRANSAMERCIA CENTER
OFFICE BUILDING

ON

TRACT 2-B-1
OF THE
BELLAMAH OFFICE ADDITION

JANUARY 1982

SCANLON & ASSOCIATES
8008 PENNSYLVNIA CIRCLE, NE
ALBUQUERQUE, NEW MEXICO 87110

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

February 23, 1982

Mr. Ross Schmidt
Scanlon & Associates
8008 Pennsylvania Circle N.E.
Albuquerque, N.M. 87110

RE: TRANSAMERICA CENTER OFFICE BUILDING, DRAINAGE REPORT

Dear Ross:

The above referenced drainage report is approved based on your submittal dated January 1982.

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

Sincerely,

Jim Fink
Civil Engineer

JF/tsl

cc: Lyman K. Lokken, Transamerica
David Hibbert, Landau Partnership
Jim Fink
Reading File

RECEIVED
FEB 25 1982
Scanlon & Associates, Inc.

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

SCANLON & ASSOCIATES INC.
CONSULTING ENGINEERS

February 3, 1982 81070

Mr. Chuck M. Easterling
Assistant City Engineer/Hydrology
Municipal Development Department
P. O. Box 1293
Albuquerque, NM 87103

Re: Transamerica Center Drainage Report
Tract 2-B-1 of the Bellamah Office Addition

Dear Mr. Easterling:

It is proposed to construct a five (5) story office building of 86,600 square feet gross floor area, which includes a 7,000 square foot basement, on Tract 2-B-1 of the Bellamah Office Addition. This property is located on the northeast corner of the intersection of Indian School Road and San Pedro Boulevard. The site contains approximately 2.94 acres.

For your approval, enclosed are two (2) copies of the drainage report which showing the present and future drainage patterns and facility requirements.

Sincerely,

SCANLON & ASSOCIATES, INC.

Ross Schmidt, P.E.
Project Engineer

RS:lcm

enclosure

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

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

81070

DRAINACE REPORT INFORMATION SHEET

PROJECT TITLE Transamerica Center

ZONE ATLAS PAGE NO. H-18-Z CITY ADDRESS 6001 Indian School Road

LEGAL ADDRESS Tract 2-B-1, Bellamah Office Addition

ENGINEERING FIRM Scanlon & Associates, Inc. CONTACT Ross Schmidt

ADDRESS 8008 Pennsylvania Circle, NE PHONE (505) 265-6941

OWNER Transamerica Properties* CONTACT Lyman K. Lokken

ADDRESS 1150 South Olive Street PHONE (213) 742-4000

ARCHITECT/SURVEYOR Landau Partnership, Inc. CONTACT David Hibbert

ADDRESS 10850 Wiltshire Boulevard PHONE (213) 475-0534

DATE SUBMITTED

BY 2/3/82
Ross E. Schmidt, P.E.

ROSS E. SCHMIDT NEW MEXICO 6133 REGISTERED PROFESSIONAL ENGINEER

* Transamerica Properties, A California Partnership

MUNICIPAL DEVELOPMENT DEPARTMENT

Richard S. Heller, P.E., City Engineer ENGINEERING DIVISION Telephone (505) 766-7467

TRANSAMERICA CENTER

DRAINAGE REPORT REQUIREMENTS

The following four (4) pages are in response to the drainage report requirements checklist.

GENERAL

1. Engineer Certifies: - Engineer certificates are not included in this report. The Drainage Report information sheet is filled out and included.

2. Planning History: - Present zone is C-2 which will allow for office buildings. See Exhibit "A", Zoning Map H-18-2.

3. Professional Certification: - The Engineer's professional stamp with signature and date appears on the title sheet of the drainage report and on the drainage plan. The Surveyor's professional stamp with signature and date appears on the drainage plan as required. The Architect's professional stamp with signature and date also appears on the drainage plan.

4. Flood Hazard Map: - The site has been delineated on the flood hazard boundary map. See Exhibit "C", from the Albuquerque Master Drainage Study, H-18. The only 100 year flood hazard area in the near vicinity is southeast of the site which is down stream. The majority of storm flow from this site drains to the existing 54 inch storm drain in San Pedro and does not effect that area.

5. Watershed Soil Map: - The soil type is T_gB, Tijeras gravelly fine sand loam. This site has been delineated on the soils map. See Exhibit "D", from the soil survey of Bernalillo County by S.C.S.

6. Soils: - A soils investigation report for ponding within 15 feet of the structure is not required since storm waters from the site are to be discharged directly into the 54 inch storm drain system on San Pedro Boulevard.

7. Watershed Area: - Lots to the north and east of the proposed site drain away from the tract boundary to self contained drainage structures. The area north of Uptown Boulevard is collected and drained into either the private 36 inch drain to the east or the 54 inch City Storm Drain on San Pedro Boulevard. The finished

floor elevation of the proposed building is elevation 5250.0 while the top of curb on San Pedro Boulevard is elevation 5245.0 at the northwest corner of the lot. See Exhibit "B".

8. Storm Flows: - The 100 year frequency storm flows from the 4.5± acres to the north contributes 7.05 cfs to the 54 inch city storm drain. This flow posses no hazard to the Transamerica Center Site.

9. Flow Depth and Velocity: - The only offsite flow that could affect Tract 2-B-1 is the storm flow on San Pedro Boulevard. The capacity of the street section to the crown is 96.46 cfs with a velocity of 4.70 fps, while the 100 year frequency storm flow from both the tracts to the north is only 7.05 cfs. See Hydrology Data Sheets.

10. Other Off-Site Conditions: - The two (2) tracts to the north of Tract 2-B-1, discharge directly into the 54 inch storm drain, in San Pedro, through a sump inlet. This flow is but a fraction of the capacity of the 54 inch drain and should have no effect on drainage on the Transamerican tract.

    The other discharge point into an existing 36" RCP side of the tract is affected by the discharge of a large portion of the Coronado Shopping Center. The Q_{100} from the shopping area is 42.9 cfs while the 36 inch drain will carry 47.1 cfs. This will allow for the Transamerica Site Q_{100} discharge of 1.41 cfs.

11. Proposed Treatment of Offsite Flows: - There is no requirement for treating offsite flows. The street capacity is sufficient to handle any storm flow which may occur due to clogged catch basins upstream of the site.

12. Right-of-Way and Easements: - There are no right-of-way or easements required to accommodate offsite flows.

13. Flow Volumes and Rates: - On site storm flow volumes and rates for undeveloped and proposed development are as follows:

Undeveloped Tract — 2.96 acres

Flow: Q_{100} - 24 hr. = 3.06 cfs

Q_{10} - 24 hr. = 1.53 cfs

Volume

Q_{100} = 0.20 ac. ft.

Q_{10} = 0.10 ac. ft.

Developed Tract - See Drainage Map.

Drainage Area	Flow		Volume	
	Q_{10}-24 hr	Q_{100}-24 hr	V_{10}	V_{100}
Area 1	1.15	1.83	0.07	0.12
2	0.62	1.00	0.04	0.06
3	0.66	1.04	0.04	0.07
4	0.61	0.96	0.04	0.06
5	0.25	0.40	0.02	0.03
6	0.23	0.37	0.02	0.02
7	0.89	1.41	0.06	0.09
8	0.02	0.04	0.001	0.003
9	0.05	0.09	0.003	0.006
Totals			0.30	0.46

14. Flow Depth and Velocity: - Flow depth and velocity across the parking lot will be comparatively small due to sheet flow and four (4) points of pick up. The largest volume has Q_{100} of 1.83 cfs with an average velocity of 2.7 fps. This would occur in Area No. 1 (see drainage plan) at the upper end of the storm drain system.

15. Proposed Treatment of On-site Drainage: - It is proposed to collect the runoff from the parking lot and roof and discharge the flow into the existing 54" storm drain systems as fast as is possible.

    A. The required drainage facilities will include two (2) 18" storm drain pipes to two existing storm drain systems, one on the west side and the other on the east side of the tract. Four sump catch basins and a manhole are required.

    B. Each of the four (4) catch basins will be sumped providing some ponding. Ponding as such is not a requirement of this project. See attached letter.

1. Pond Volume Calculations: - None required for this project. However, we are ponding two (2) small areas to stop flow on to Bellamah Tract. See Ponding Calcuations.

2. Positive Discharge: - Storm waters will be discharged as quickly as possible through two (2) 18 inch on-site storm drain systems.

3. Pond Emergency Spillway Calculations: - These are included in the report and the spillway is sufficient to discharge the 100 year frequency runoff from the parking lot.

4. Pond Fencing: - Pond fencing is not required.

5. Pond Landscaping: - Landscaping is not required.

6. Pond Maintenance: - Catch basin maintenance is required, cleaning of trash from the grating will be necessary from time to time, especially after a major storm .

7. Channel Characteristics: - There are no channel requirements.

8. Storm Sewer Characteristics: - The two (2) storm drains will be constructed of 18" RCP on a minimum slope of 0.0176. Four (4) drop inlet sump type catch basins and one (1) manhole are required.

9. Other Storm Drainage Facilities: - A small drain pipe will drain roof flows to the proposed manhole on the 54" City storm drain.

16. Rights-of-Way and Easements: - There will be only one drainage easement required on this project. This is an easement for an 18 inch storm drain pipe to join the existing manhole in the Bellamah Corporation Office Building Parking Lot on the east side. See attached agreement.

DRAINAGE REPORT

PURPOSE: The purpose of this drainage report is to show the existing and proposed drainage flow for the area effected by the proposed development on Tract 2-B-1 of the Bellamah Office Addition, (see Exhibit A). The report also shows the existing drainage pattern of those lots which border on the north and east sides (see Exhibit B).

TOPOGRAPHY AND SOILS: The site generally slopes from 0 to 5 percent to the southwest. These areas have medium runoff and erosion hazard is moderate.

Using the Soil Survey of Bernalillo County by the SCS, the major soils in the area are Tijeras gravelly fine sandy loam (T_gB) and Embudo-Tijeras complex (EtC) with the majority of the lot falling on the Tijeras gravelly fine sandy loam. (see Exhibit D).

DEVELOPMENT: The entire area will be developed into an office building complex, housing five (5) large office buildings, two of which are already completed. The other three (3) are now proposed or under construction. A five (5) story office building, with the required parking, will be constructed on the proposed site, Tract 2-B-1.

EXISTING STORM DRAIN FACILITIES: An existing 54 inch storm drain is located in a ten (10) foot utility easement along the west side of the tract. Another 36 inch storm drain runs along the east side of the tract in a fifteen (15) foot drainage easement. The 36 inch storm drain belongs to the Bellamah Corporation. They have given Transamerica Center permission to discharge 2.50 cfs into their storm drain. See Drainage Map. There is also a 72 inch storm drain in Jeannedale Drive to the east of the Bellamah building.

DRAINAGE ANALYSIS: Tract 2-B-1 is located on the lower extremity of a drainage area, which is bounded by San Pedro Boulevard on the west, by Menaul Boulevard on the north, by Louisiana Boulevard on the east and by Indian School Road on the south. See Exhibit C. That portion of the drainage area to the north of Uptown Boulevard, Coronado shopping Center, is divided into four (4) subdrainage areas. Area I, the northwesterly portion, drains westerly toward San Pedro Boulevard where it is sumped in the parking lot and through sump catch basins discharged into a 54 inch storm drain on San Pedro Boulevard. Area II, the northeasterly portion, drains to sump catch basins in the parking lot and is discharged into a 72 inch storm drain in Jeannedale Drive. The south portion is divided into two sub-areas, Area III and Area IV. Area No. III, drains into a private 36 inch storm

drain owned by Bellamah Land Company. Area IV the southern most portion drains south to Uptown Boulevard where it is picked up by several catch basins and discharged into a 72 inch storm drain on Jeannedale Drive.

The four (4) lots that are to the north and east of the proposed site drain, as shown on Exhibit B, either to the 54 inch, 36 inch or 72 inch storm drains. At the intersection of Jeannedale Drive and Indian School Road is the beginning of an open channel. The channel collects street flows and discharges them directly into the I-40 channel. Catch basins on San Pedro Boulevard discharges directly into a 54 inch storm drain which in turn discharges into the I-40 channel.

There is no danger of the Transamerica Center Office Building being flooded from off-site flow, since the finished floor is 5.0 feet above the top of curb on the northwest corner. Any over flow from the site, which may occur due to catch basin malfunction, will discharge onto San Pedro Boulevard and flow south to catch basins or an emergency spillway chute at the I-40 channel.

Storm flows from the tract itself are divided into nine (9) areas of origin, see Drainage Plan. Areas 1, 2 and 3 (the parking lot) and area 4, (the roof) will drain into a catch basin system and will discharge into the existing City 54 inch storm drain on San Pedro Boulevard. Area 7, (a parking lot) will drain into a drain system and discharge into an existing 36 inch storm drain on the Bellamah Tract. Areas 5 and 6, (a lawn area) have a total possible discharge into San Pedro of Q_{100} = 0.77 cfs which is much smaller than the Undeveloped Q_{10} = 1.53 cfs. When the area is grassed the discharge should be much less than 0.77 cfs. Areas 8 and 9, (lawn area) have a total possible discharge of 0.14 cfs and very little volume. These areas have been sumped to catch the runoff. Both areas will have sufficient ponding volume after the lawns have become well established. See Ponding Calculations.

Using Soil Conservation Services' Chapter 2, (Revised October, 1973 for New Mexico) Engineering Field Manual for Conservation Practices Peak Rates of Discharge for Small Watersheds. The following are the expected segment storm flows for the 100 year frequency storm.

DESIGN CRITERIA

Drainage Area Number	Drainage Area in acres	Length of run in ft.	Elev. Diff. in ft	Slope in %	Velocity in fps	Time of Concentration in hr.
1	0.74	280	5	1.8	2.7	0.03
2	0.40	280	5	1.8	2.7	0.03
3	0.42	180	3	1.7	2.6	0.02
4	0.39	250	1.5	0.6	1.5	0.05
5	0.16	190	6	3.2	3.6	0.02
6	0.15	200	7	3.5	3.7	0.02
7	0.57	280	6	2.1	2.8	0.03
8	0.04	80	2	2.5	3.2	0.01
9	0.09	180	6	3.3	3.6	0.01
Total	2.96					

Hydrologic Soil Group	B	
Runoff Curve Number CN (Commercial Area)	95	
Percent of 1 hour/24 hour (DC)	65	
24 Hour Rainfall 10 Year Frequency	1.70	in
Direct Runoff @ P = 1.70 in. @ CN = 95	1.20	in
24 Hour Rainfall 100 Year Frequency	2.40	in
Direct Runoff @ P = 2.40 in. @ CN = 95	1.90	in
cfs per acre per inch of runoff	1.30	in
Runoff Curve Number, CN (Lawn Area)	79	
Direct Runoff @ P = 2.40 in. @ CN = 79	0.80	in
Direct Runoff @ P = 1.70 @ CN = 79	0.40	in

100 YEAR FREQUENCY FLOWS

Drainage Area No.	Area	TC in Hours	24 hr. Rainfall 100 yr Freq.	Direct Runoff	cfs/ac. per in.	cfs Peak Discharge Q_{100}	Ac. Ft. Volume of Runoff
1	0.74	0.03	2.40	1.90	1.30	1.83	0.12
2	0.40	0.03	2.40	1.90	1.30	1.00	0.06
3	0.42	0.02	2.40	1.90	1.30	1.04	0.07
4	0.39	0.05	2.40	1.90	1.30	0.96	0.06
5	0.16	0.02	2.40	1.90	1.30	0.40	0.03
6	0.15	0.02	2.40	1.90	1.30	0.37	0.02
7	0.57	0.03	2.40	1.90	1.30	1.41	0.09
8	0.04	0.01	2.40	0.80	1.30	0.042	0.003
9	0.09	0.01	2.40	0.80	1.30	0.094	0.006

10 YEAR FREQUENCY FLOWS

Drainage Area No.	Area	TC in Hours	24 hr. Rainfall 100 yr Freq.	Direct Runoff	cfs/ac. per in.	cfs Peak Discharge Q_{100}	Ac. Ft. Volume of Runoff
1	0.74	0.03	1.70	1.20	1.30	1.15	0.07
2	0.40	0.03	1.70	1.20	1.30	0.62	0.04
3	0.42	0.02	1.70	1.20	1.30	0.66	0.04
4	0.39	0.05	1.70	1.20	1.30	0.61	0.04
5	0.16	0.02	1.70	1.20	1.30	0.25	0.02
6	0.15	0.02	1.70	1.20	1.30	0.23	0.02
7	0.57	0.03	1.70	1.20	1.30	0.89	0.06
8	0.04	0.01	1.70	0.40	1.30	0.021	0.001
9	0.09	0.01	1.70	0.40	1.30	0.047	0.003

Peak storm discharge from the two tracts directly to the north of Tract 2-B-1.

1.	Total Drainage Area	4.52	acres
2.	Length of Flow Path	850	ft.
3.	Elevation Difference (52-46)	6	ft.
4.	Average Slope	0.0071	
5.	Land Use	Commercial	
6.	Runoff Curve Number (Table 2-1)	95	CN
7.	Time of Concentration (Figure 2-2)	0.01	hr.
8.	Rainfall, 24 hour-100 year (Exhibit 2-2)	2.70	in
9.	Direct Runoff (Figure 2-4) "Q"	1.20	in
10.	Percent of 1 hr/24 hr (DC)(Exhibit 2-3)	65	
11.	Cfs per acre per inch of runoff(Fig.2-5)	1.30	cfs
12	Peak Discharge g=A x Qxcfs/ac/in g = 4.52 x 1.20 x 1.30	7.05	cfs
13	Volume of Runoff (Q x A)/12 V = 1.20 x 4.52/12	0.45	ac.ft.

Peak Storm Discharge from Areaa of Coronado Center Draining to 36" RCP

1.	Total Drainage Area (See Exhibit)	12.16	acres
2.	Length of Flow Path	2000	ft.
3.	Elevation Difference (84-56)	28	ft.
4.	Average Slope	0.0140	
5.	Land Use	Commercial	
6.	Runoff Curve No. (Table 2-1)	95	
7.	Time of Concentraction (Figure 2-2)	0.23	hr.
8.	Rainfall 24 hour-100 year (Exhibit 2-2)	2.70	in
9.	Direct Runoff (Figure 2-4) "Q"	1.20	in
10.	Percent 1 hr/24 hr (DC)(Exhibit 2-3)	65	RM-2
11.	Cfs per acre per inch of runoff (Fig.2-5)	1.20	cfs
12.	Peak Discharge g=A x Q x cfs/ac/in g = 12.16 x 1.20 x 1.20	1.7[illegible]	cfs
13.	Volume of Runoff (Q x A)/12	1.22	ac. ft.

Capacity of Existing 36" Storm Drain

1.	Pipe Size	36	in
2.	n Factor	0.013	
3.	Slope of Pipe	0.005	
4.	$S^{1/2}$	0.0707	
5.	Cross Section Area	7.069	sq. ft.
6.	$d^{8/3}$	18.70	
7.	K' for pipe running full	0.463	
8.	$Q = (K'/n)\ d^{8/3}\ S^{1/2}$	47.1	cfs

Storm Drain Pipe Design

1.	Q_{100} at 54 inch storm drain	3.84	cfs
2.	Top of 54 inch pipe	39.0	ft
3.	Grate elevation of sump catch basin no. 3	45.0	ft.
4.	18 inch pipe slope	0.0176	
5.	$S^{1/2}$	0.1328	
6.	Pipe type for proposed storm drain	RCP	
7.	n Factor	0.015	
8.	Invert elevation at sump CB No. 3	40.0	ft.
9.	Trial pipe size	18	inch
10.	Cross section area	1.767	sq. ft.
11.	$d^{8/3}$	2.95	
12.	$d^{5/2}$	2.756	
13.	Approximate $Q = (0.463/n)\, d^{8/3}\, S^{1/2}$	12.1	cfs
14.	Normal depth in pipe for Q_{100} =	3.84	cfs
15.	$K' = Q\, n/d^{8/3}\, S^{1/2}$	0.147	
16.	D_n	0.39	
17.	D_n/d	0.59	ft.
18.	$A = C\, d^2$ (C = 0.2836)	0.638	sq. ft.
19.	$V = Q/A$	6.02	f.p.s.
20.	H_v	0.56	ft.
21.	Critical depth in pipe for Q_{100} =	3.84	cfs
22.	$K'_c = d^{5/2}$	1.393	
23.	D_c/d	0.500	
24.	D_c	0.75	ft.
25.	$A = C\, d^2$ (C = 0.393)	0.884	sq. ft.
26.	$V = Q/A$	4.34	f.p.s.

27. Use 18" R.C.P. throughout drainage system to prevent clogging and maintain a flushing velocity.

Required Grated Catch Basin Opening

1.	Q_{100} from area No. 1		1.83	c.f.s.
2.	Grating width (Gross) 25.5"		2.125	ft.
3.	Grating Length (Gross) 41.375"		3.448	ft.
4.	Grating width (net) 15.5"		1.292	ft.
5.	Grating Length (net) 33.375"		2.781	ft.
6.	Clear area of grating (1.292 x 2.781)	A	3.593	sq. ft.
7.	Depth of Grating		3.5	inch
8.	Thickness of grating		0.5	inch
	$Q = CA\ (2\ gh)^{1/2}$			
9.	Coefficient of discharge	C	0.60	
10.	Area		3.593	sq. ft.
11.	2g		64.4	
12.	Depth of water over grating	h	0.8	ft.
13.	$Q = 0.60 \times 3.59\ (64.4 \times 0.8)^{1/2}$		15.46	cfs
14.	Assume grate 1/2 clogged, Use	Q	7.73	cfs
15.	Check with Hydraulic capacity chart, median catch basin (Ref. Exhibit "F")	Q	7.4	cfs
	1.83 <7.4 ok			
16.	Number of single grated drop inlets required		3	ea

Emergency Spillway Calculations from Parking Lot to San Pedro Boulevard

Design Criteria

1.	Spillway Crest Elevation	5045.32	
2.	Width of Spillway, L =	24	ft.
3.	C	2.70	
4.	Q_{100}	3.87	cfs
5.	Top of Curb	5045.92	ft.
	$Q = CLH^{1.5} = 2.70 \times 24 \times H^{1.5}$	$64.8H^{1.5}$	
6.	Trial No. 1, Water Surface Elevation	45.72	ft.
7.	H	0.40	ft.
8.	C	2.70	
9.	$Q = 64.8\ (0.40)^{1.5}$	16.4	cfs
10.	Trial No. 2, Water Surface = T.C.	45.92	ft.
11.	H	0.60	ft.
12.	C	2.70	ft.
13.	$Q = 64.8\ (0.60)^{1.5}$	30.1	cfs
14.	Q from parking lot area 1, 2 and 3	3.87	cfs
15.	Trial No. 3, Water Surface Elevation	45.52	ft.
16.	H	0.20	ft.
17.	C	2.70	
18.	$Q - 64.8\ (0.20)^{1.5}$	5.80	cfs
19.	5.80 is larger than 3.87		

Ponding for Areas 8 and 9 Drainage Plan

Ponding For Area 8

1.	Storage area high elevation of pond	47.35	ft.
2.	Surface area @ elevation 47.35	330	sq. ft.
3.	Depth of pond	0.5	ft.
4.	Surface area @ elevation 46.35	320	
5.	Volume of pond (330+320/2x0.5)	162	cu.ft.
6.	Required volume for Q_{100}		
	V = 0.04 x 0.80/12	0.0027	ac. ft.
	V = 0.0027 x 43,560	116	cu. ft.
	116 < 162 ok		

Ponding for Area 9

1.	Storage area high elevation of pond	48.0	ft.
2.	Surface area @ elevation 48.0	630	sq. ft.
3.	Depth of pond	0.75	ft.
4.	Surface area @ elevation 47.25	120	sq. ft.
5.	Volume of pond (630+120/2x0.75)	281	cu. ft.
6.	Required volume for Q_{100}		
	V = 0.09x0.80/12	0.006	ac. ft.
	V = 0.006 x 43,560	261	cu. ft.

San Pedro Cross Section Flow Capacity

1.	Right-of-way width	100	ft.
2.	Street section width	64	ft.
3.	Cross slope	2	%
4.	Crown height at street center line	0.64	ft.
5.	Curb height at gutter	0.667	ft.
6.	Length of curb and gutter	220	ft.
7.	Elevation difference (5045-5042)	3	ft.
8.	Slope of gutter line	0.0136	
9.	S 1/2	0.1168	
10.	Coefficient "n"	0.017	
	Assume water in street to crown height.		
11.	Depth of water to gutter	0.64	ft.
12.	Width of water surface to crown	32	ft.
13.	Water area: one half street	10.24	sq. ft.
14.	Wetted perimeter	32.64	ft.
15.	Hydraulic radius	0.3137	
16.	$R^{2/3}$	0.4615	
17.	$V = (1.486/n)\ R^{2/3}\ S^{1/2}$	4.71	fps
18.	Q: one half street	48.23	c.f.s.
19.	Q: full street	96.46	c.f.s.

AREAS 8 AND 9

Two Year Storm Flows and Volume

1.	Drainage Area	Area 8	0.04	ac
		Area 9	0.09	ac
2.	Time of Concrentration	Area 8	0.01	hours
		Area 9	0.01	hours
3.	Hydrologic Soil Group		B	
4.	CN		80	
5.	Rainfall 24 hr, 2 yr. Frequency		1.00	inch
6.	Direct Runoff	Q	0.10	
7.	Distribution Curve No.	DC	65	
8.	cfs per acre per inch of runoff		1.30	cfs/ac/in
9.	Peak Discharge			
	Area 8, q = 0.04 x 0.20 x 1.30		0.0052	cfs
	Area 9, q = 0.09 x 0.20 x 1.30		0.0117	cfs
10.	Volulme of Runoff			
	Area 8, V = 0.04 x 0.10/12		0.0003	ac ft
	Area 9, V = 0.09 x 0.10/12		0.0008	ac ft
11.	Volume			
	Area 8, V = 0.0003 x 43,560		145	cu ft
	Area 9, V = 0.0008 x 43,560		327	cu ft

Quantity of Stone Required in Sump to Absorb Two Year Frequency Volume

1.	Size of Stone	2	inch
2.	Volume of Voids	34	%
3.	Volume of Stone Required		
	Area 8, (145/0.34)/27	16	cu yd
	Area 9, (327/0.34)/27	36	cu yd

Alternate Sump Drain to 18 inch RCP

Subdrainage Area No. 8

1.	Pipe size	4	inch
2.	Pipe type	PVC	
3.	Cross Section Area	0.0873	sq. ft.
4.	$d^{8/3}$	0.0534	
5.	$d^{5/2}$	0.0642	
6.	n	0.013	
7.	Length of pipe	25	ft.
8.	Elevation Difference (46.6-41.0)	5.6	ft.
9.	Slope of pipe	0.224	
10.	$S^{1/2}$	0.473	
11.	Total head available	6.35	ft.
12.	$Q = (0.463/n)\ d^{8/3}\ S^{1/2}$	0.90	cfs
13.	100 yr. flow from area 8	0.042	cfs
14.	Normal depth for Q100 $K' = Qn/d^{8/3}\ S^{1/2}$	0.0216	
15.	D_n/d	0.15	
16.	$D_n = 0.15 \times 0.333$	0.05	ft.
17.	$A = Cd^2 = 0.0739\ (0.333)^2$	0.0082	sq. ft.
18.	V = Q/A	5.13	fps

Subdrainage Area No. 9

1.	Pipe size	4	inch
2.	Pipe type	PVC	
3.	Cross Section Area	0.0873	sq. ft.
4.	$d^{8/3}$	0.0534	
5.	$d^{5/2}$	0.0642	
6.	n	0.013	
7.	Length of pipe	85	ft.
8.	Elevation Difference (47.0-41.0)	7.0	ft.
9.	Slope of pipe	0.0824	
10.	$S^{1/2}$	0.287	
11.	Total head available	8.0	ft.
12.	$Q = (0.463/n)\ d^{8/3}\ S^{1/2}$	0.546	cfs
13.	100 yr. flow from area 9	0.094	cfs
14.	Normal depth for Q100 $K' = Qn/d^{8/3}\ S^{1/2}$	0.0797	
15.	D_n/d	0.28	
16.	D_n =	0.093	ft.
17.	$A = Cd^2 = 0.18\ (0.333)^2$	0.020	sq. ft.
18.	V = Q/A	4.71	fps

HYDROLOGY DATA SHEET

(Chapter 2 - Engineering Field Manual for Conservation Practices)

PROJECT Transamerica Center PROJECT NO. 81070

LOCATION NE Corner of San Pedro Boulevard and Indian School Road

OWNER Transamerica Properties

KIND OF STRUCTURE Over Land Flow BY RES DATE _____

DRAINAGE AREA: A = 2.94 acres

LENGTH: (longest waterway to the ridge) L = 500 ft.

ELEVATION DIFFERENCE: (to farthest ridge) H = 10 ft.

AVERAGE WATERSHED SLOPE S = 0.020
- Use USGS quads or hand level
- H = S% x Lin. Ft. x 100

HYDROLOGIC SOIL GROUP (Exhibit 2-1) Group = B

RUNOFF CURVE NUMBER: (Table 2-1 or Fig. 2-1) CN = 80

TIME OF CONCENTRATION: (Fig. 2-2 or 2-3) T_c = 0.075 hr.

RAINFALL, 24 hr. (Exhibit 2-2) Freq. 10 yr. F_{24} = 1.70 in.

DIRECT RUNOFF: (Fig. 2-4) Q = 0.40 in.

DISTRIBUTION CURVE NO.: (Exhibit 2-3) DC = 65

c.f.s. PER ACRE PER INCH OF RUNOFF (Fig. 2-5) csf/ac/in = 1.30 c.f.s.

PEAK DISCHARGE: q = A x Q x cfs/ac/in

q = 2.94 x 0.40 x 1.30 q = 1.53 c.f.s.

VOLUME OF RUNOFF: (Q x A) / 12

Vol. = 0.40 x 2.94 / 12 Vol. = 0.10 ac. ft.

HYDROLOGY DATA SHEET

(Chapter 2 - Engineering Field Manual for Conservation Practices)

PROJECT Transamerica Center PROJECT NO. 81070

LOCATION NE Corner of San Pedro Blvd and Indian School Road

OWNER Transamerica Properties

KIND OF STRUCTURE Over Land Flow BY RES DATE _____

DRAINAGE AREA:	A =	2.94	acres
LENGTH: (longest waterway to the ridge)	L =	500	ft.
ELEVATION DIFFERENCE: (to farthest ridge)	H =	10	ft.
AVERAGE WATERSHED SLOPE - Use USGS quads or hand level - H = S% x Lin. Ft. x 100	S =	0.020	
HYDROLOGIC SOIL GROUP (Exhibit 2-1)	Group =	B	
RUNOFF CURVE NUMBER: (Table 2-1 or Fig. 2-1)	CN =	80	
TIME OF CONCENTRATION: (Fig. 2-2 or 2-3)	T_c =	0.075	hr.
RAINFALL, 24 hr. (Exhibit 2-2) Freq. 100 yr.	F_{24} =	2.40	in.
DIRECT RUNOFF: (Fig. 2-4)	Q =	0.80	in.
DISTRIBUTION CURVE NO.: (Exhibit 2-3)	DC =	65	
c.f.s. PER ACRE PER INCH OF RUNOFF (Fig. 2-5)	csf/ac/in =	1.30	c.f.s.

PEAK DISCHARGE: q = A x Q x cfs/ac/in

q = 2.94 x 0.80 x 1.30 q = 3.06 c.f.s.

VOLUME OF RUNOFF: (Q x A) / 12

Vol. = 0.80 x 2.94 / 12 Vol. = 0.20 ac. ft.

Recommendation: The storm flow from areas 1, 2 and 3 (parking lot areas) be collected in an 18 inch storm drain through three (3) sump catch basins and be discharged into an existing 54 inch storm drain on San Pedro Blvd. The storm flow from area 7 (parking lot area) be collected in an 18 inch storm drain through a sump catch basin and be discharged into an existing private 36 inch storm drain on the easterly side of the tract. The storm flow from areas 8 and 9 (lawn areas) be collected into sumps and drained into the area 7 storm drain through four (4) inch PVC drain pipes. The storm flow from areas 5 and 6 (lawn areas) be discharged as sheet flow into San Pedro Blvd. and Indian School Road respectfully. The storm flow from area 4 (Roof area) be split into two areas, east and west, and be drained through pipes to the areas 1, 2 and 3 storm drain.

SCANLON & ASSOCIATES INC.

CONSULTING ENGINEERS

August 26, 1981

Dale Bellamah Land Company, Inc.
6121 Indian School Road, NE
P.O. Box 3325
Albuquerque, NM 87190

Attention: Mr. V. M. Kimmick

RE: Storm water flow from Tract 2-B-1 into existing 36 inch RCP along easterly boundary.

Dear Mr. Kimmick:

Per our phone conversation Monday, August 25, 1981: this is a request to discharge 2.50 cfs into the existing 36 inch RCP storm drain along the easterly boundary of Tract 2-B-1. The total Q 100 from the 2.96 acres is approximately 11.3 cfs. The above discharge is about 25 per cent of the total runoff. It is anticipated that the final discharge into the 36 inch RCP will be less than the 2.50 cfs requested.

Enclosed, for your information, is a copy of the Conceptual Drainage plan. Should there be any questions concerning this request, please contact our office.

Sincerely,

SCANLON & ASSOCIATES, INC.

Ross E. Schmidt, P.E.

RECEIVED
SEP 2 1981
SCANLON & ASSOCIATES

RES/jmr

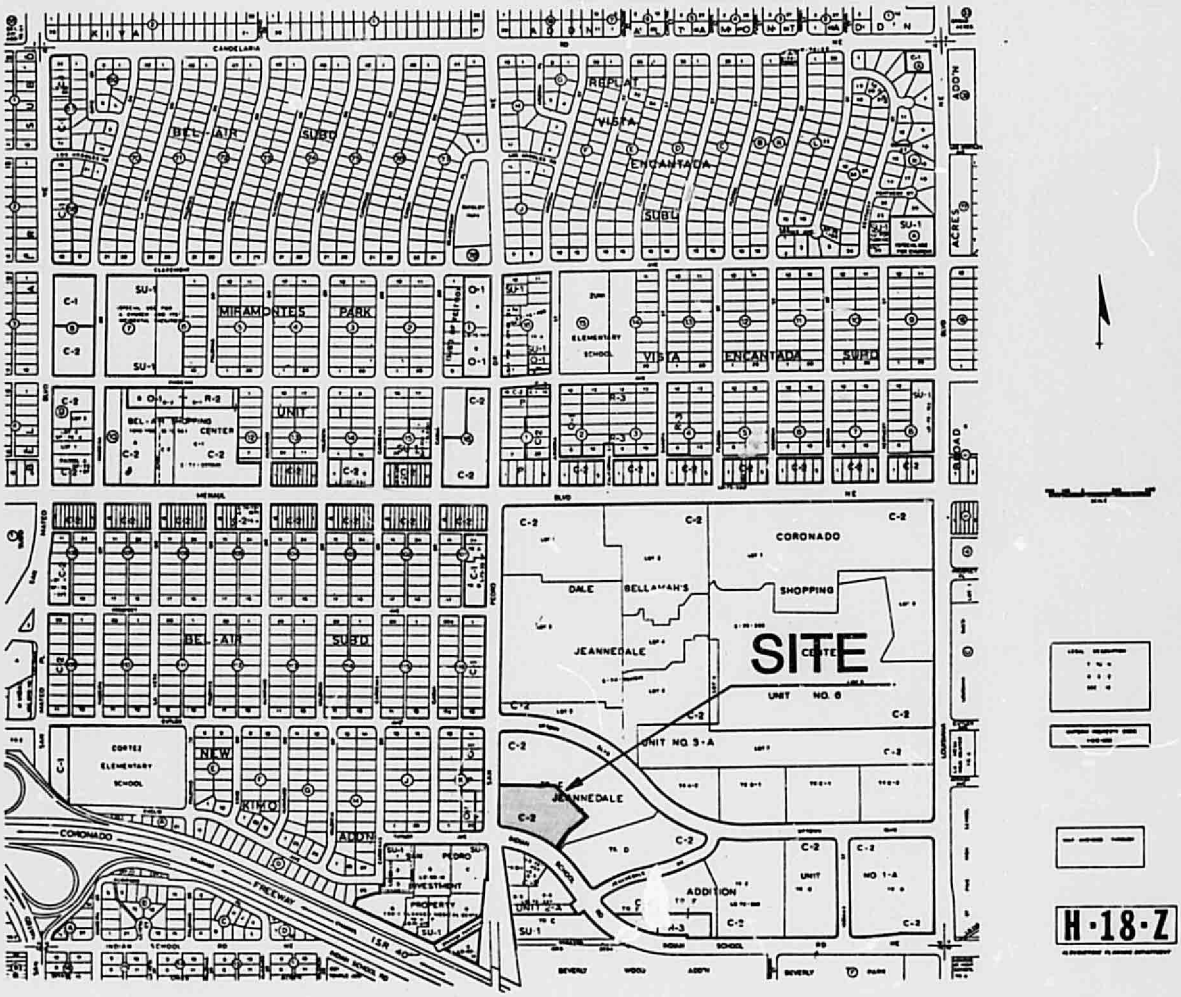
enclosure

Approved for discharge of 2.50 cfs into 36 inch private storm drain.

V. M. Kimmick, P.E., Development Manager Date 9-1-81

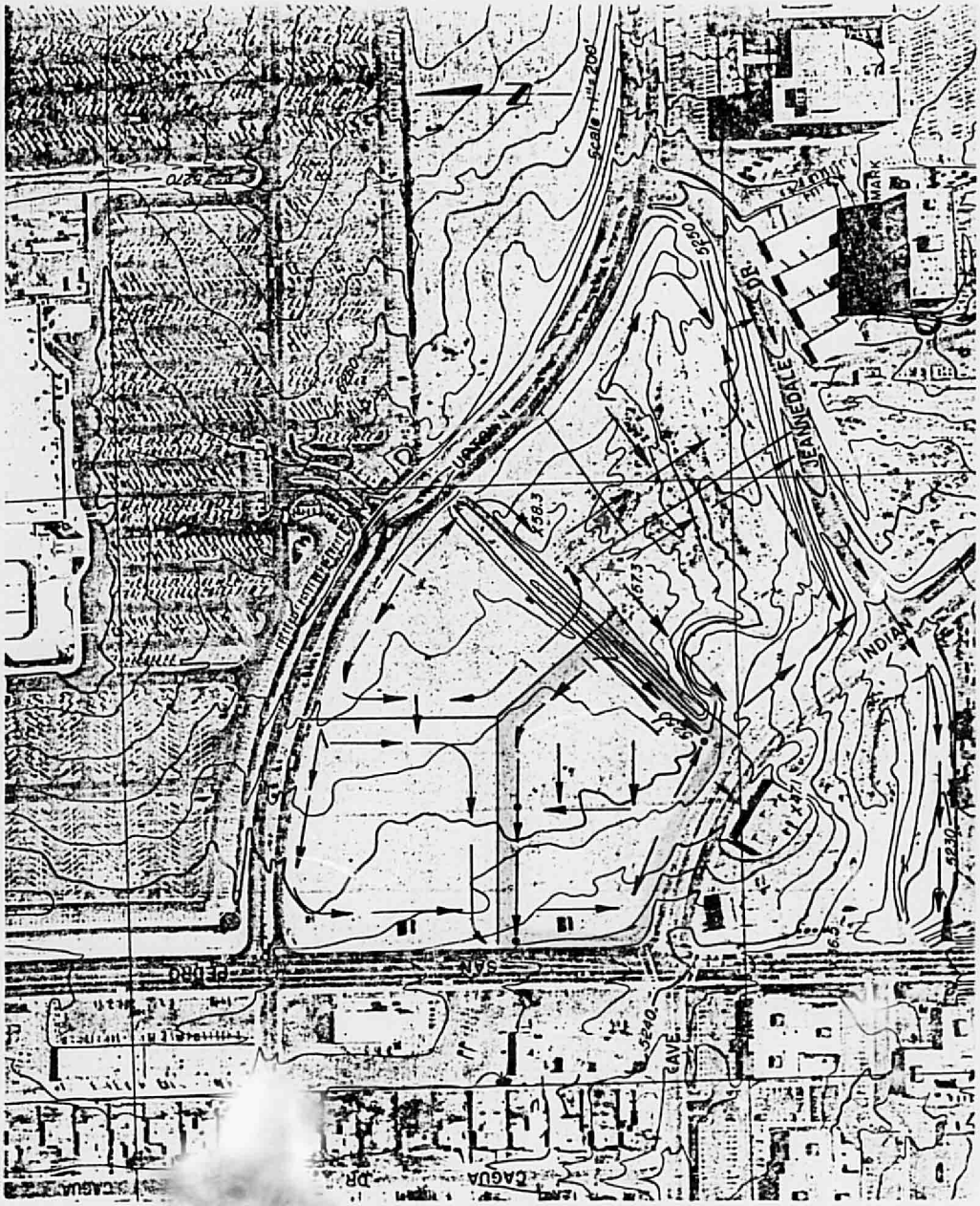
PLEASE REPLY TO:

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



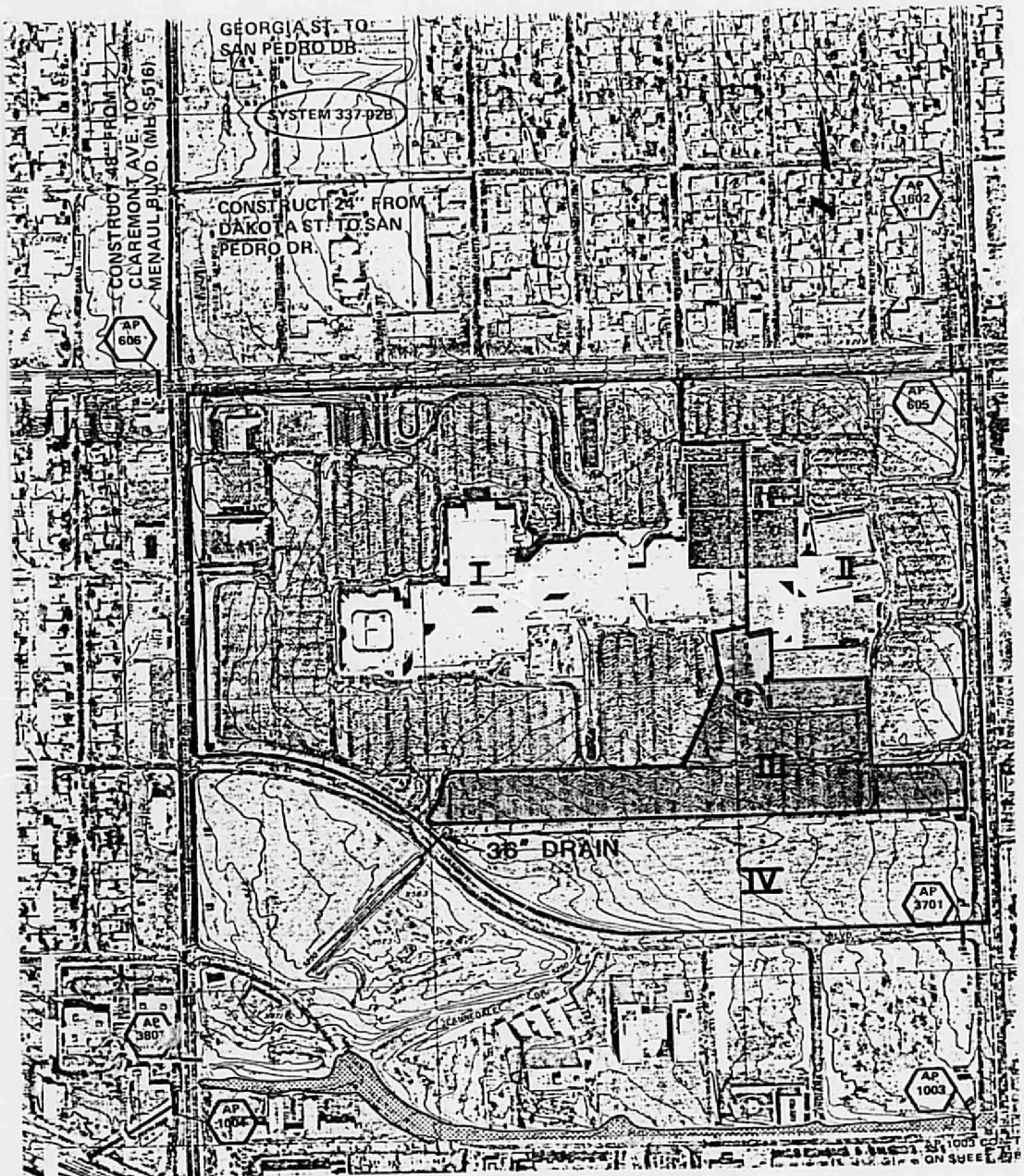
CANDELARIA
BEL-AIR SUBD
REPLAT
VISTA
ENCANTADA
SUBD
ADDN
ACRES
MIRAMONTES PARK
ELEMENTARY SCHOOL
VISTA ENCANTADA SUBD
BEL-AIR SHOPPING CENTER
UNIT 1
BROAD
MENAUL
CORONADO
DALE
BELLAMAH'S
SHOPPING
JEANNEDALE
SITE
UNIT NO. 6
UNIT NO. 3-A
JEANNEDALE
BEL-AIR SUBD
CORTEZ ELEMENTARY SCHOOL
NEW
KIMO
ADDN
CORONADO
FREEWAY
ISR 40
SAN PEDRO
INVESTMENT
PROPERTY
ADDITION
UNIT
NO 1-A
H-18-Z

EXHIBIT "A"



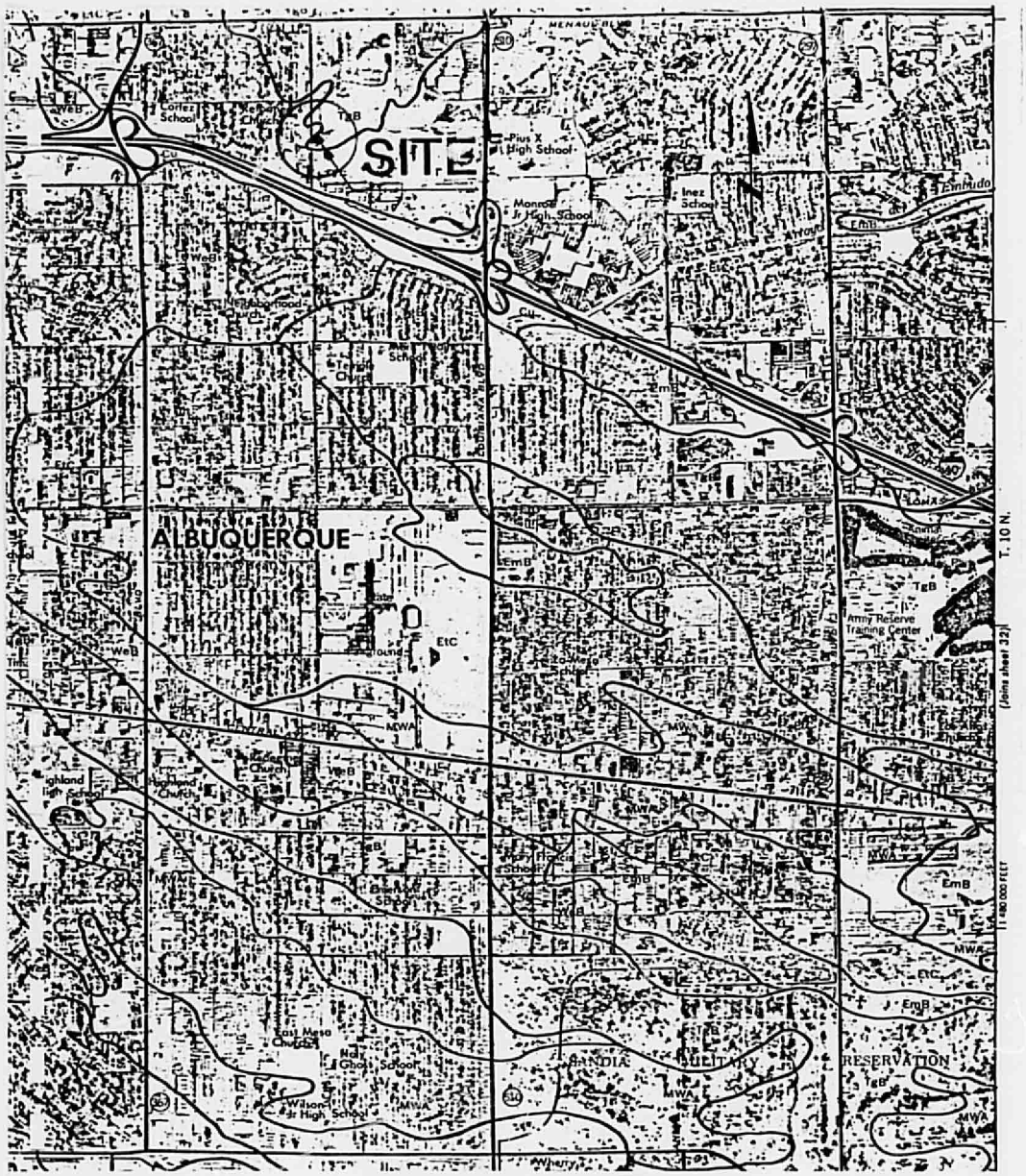
DRAINAGE FLOW MAP

EXHIBIT "B"



FLOOD HAZARD MAP

EXHIBIT "C"



SOILS MAP

EXHIBIT "D"

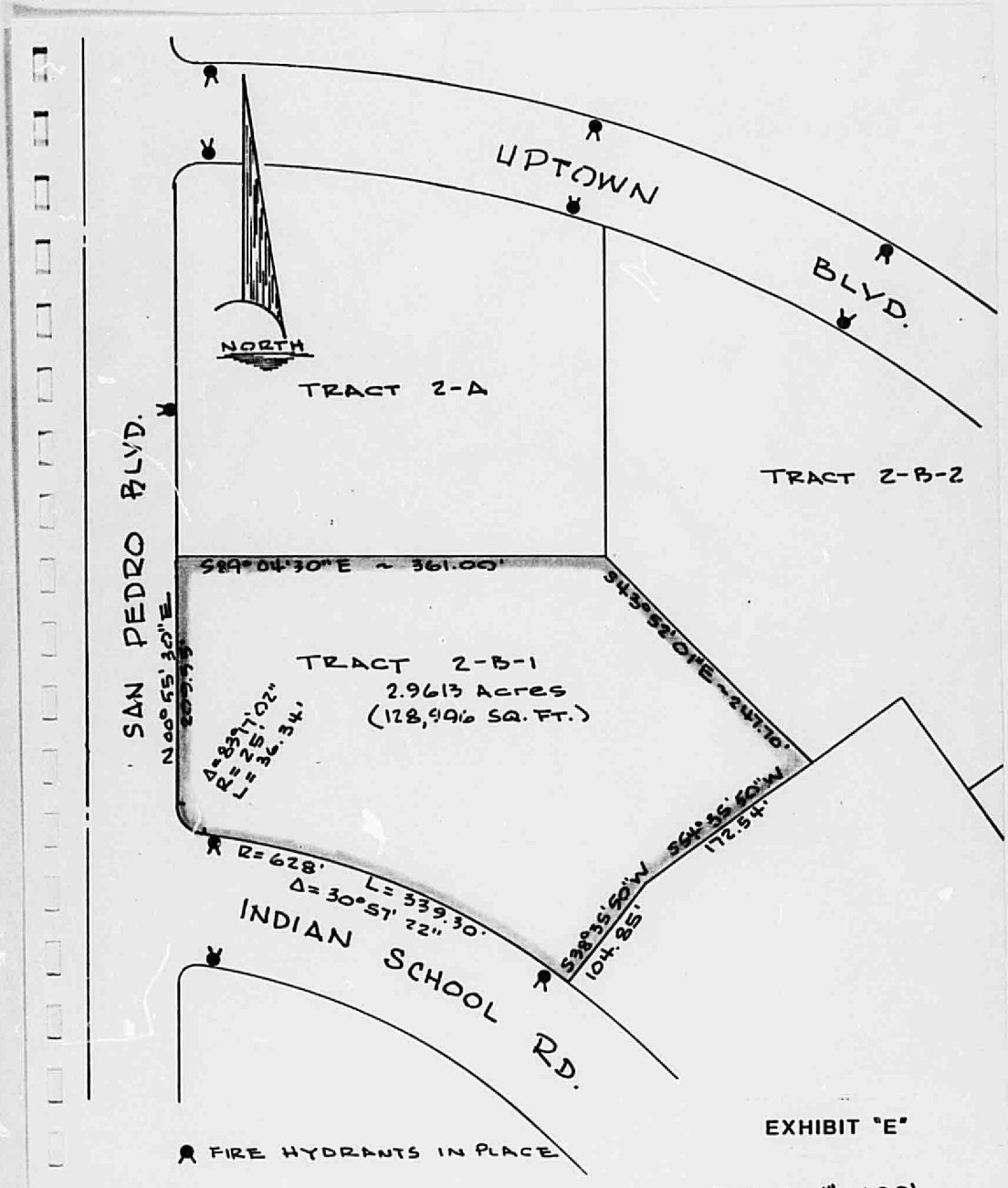


EXHIBIT "E"

SCALE: 1" = 100'

HYDRAULIC CAPACITY CHART
MEDIAN CATCH BASIN

Standard C-15.08 CB Type 4
(Off roadway location)
50% Clogging

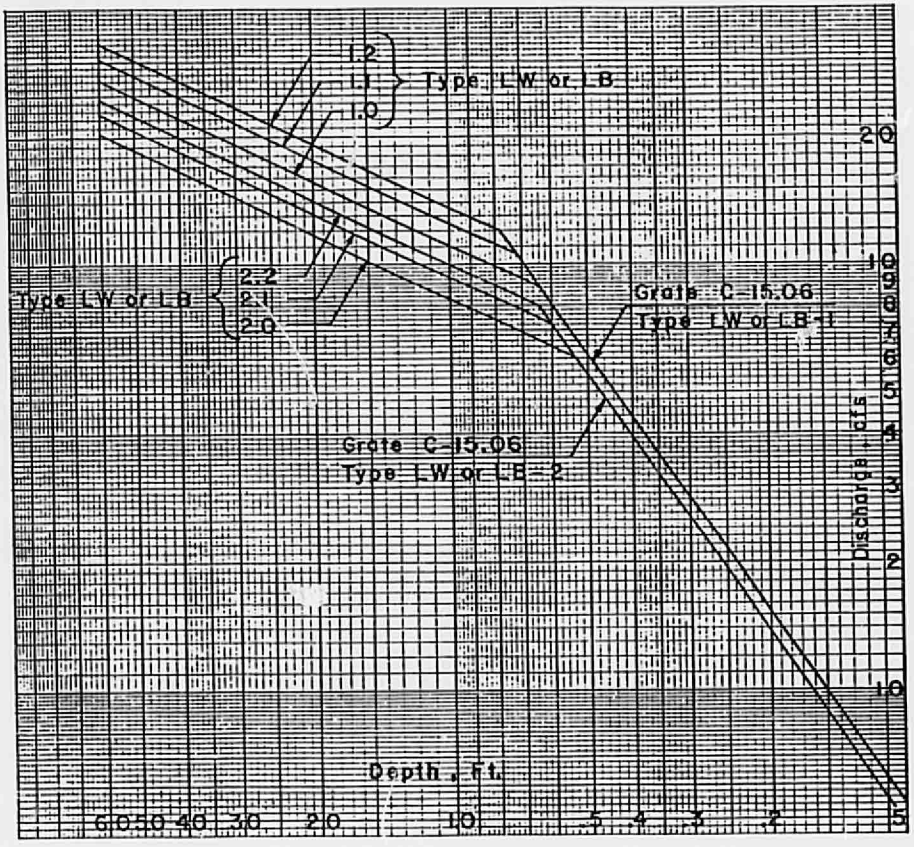
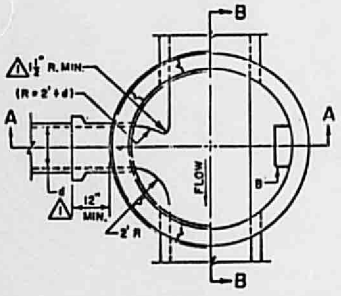


Chart 1

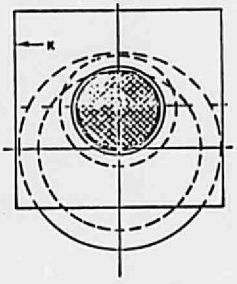
EXHIBIT "F"

AHD
Structures Section
Hydraulics Branch
10-15-72

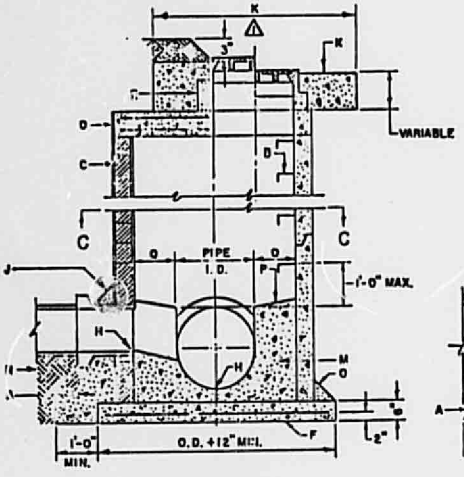
FHWA
HEC #12



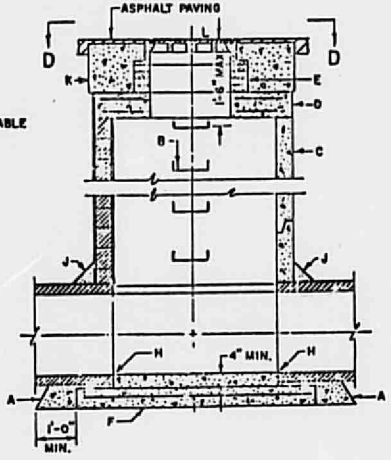
FLOOR PLAN AT C-C



PLAN AT D-D



CROSS SECTION A-A



CROSS SECTION B-B

GENERAL NOTES:

1. USE M H "TYPE C" FOR DEPTHS OF LESS THAN 6 FT. MEASURED FROM INV. TO RIM.
2. CONTRACTOR HAS OPTION TO CONSTRUCT "TYPE C" MH IN LIEU OF "TYPE E" MH FOR DEPTHS OF 6 FT. OR MORE.
3. THIS M H DESIGN APPLIES TO 4, 6 OR 8 FT. I.D.
4. M H GREATER THAN 18 FT. IN DEPTH SHALL BE CONSTRUCTED OF PRECAST CONC. SECTIONS ONLY.
5. USE NON-SHRINK GROUT FOR JOINTS & FILLETS.

CONSTRUCTION NOTES:

A. CONC. PIPE SUPPORTS SHALL EXTEND OUTSIDE MH TO BELL OF FIRST JOINT & SHALL CRADLE PIPE TO SPRING LINE.

△2 B. FIRST TWO STEPS TO PROTRUDE 4" INTO MH, ALL OTHERS 5. STEPS TO BE PRECAST IN PLACE OR SET IN EPOXY CEMENT (HUNT PROCESS HS-230 OR APPROVED EQUAL) AT 16" O.C. SEE DWG. S-11 FOR STEP DETAIL.

C. M H MAY BE CONSTRUCTED OF CONC. BLOCK, GRADE MS BRICK, POURED CONC. OR PRECAST REINF CONC. IF BLOCK OR BRICK, PLASTER INSIDE & OUT WITH ONE HALF INCH MORTAR. SEE DWG. S-6 FOR DETAIL.

D. SEE DWG. S-3 FOR PRECAST CONC. COVER.

E. USE FOUR COURSES OF GRADE MS BRICK ON UN-PAVED STREETS FOR FUTURE ADJUSTMENT OF M H FRAME TO PAVEMENT GRADE.

F. CONC. BASE TO BE POURED IN PLACE USING NO.4 BARS AT 6" O.C. EACH WAY FOR M H DEPTH OF 16' OR GREATER. USE NO. 4 BARS AT 12" O.C. EACH WAY FOR M H LESS THAN 16' IN DEPTH.

G. IN UNPAVED AREAS, TOP OF MH COVER SHALL BE SET 3" BELOW GRADE.

H. INVERT ELEVATION OF STUB OR LATERAL AS SHOWN ON PLANS.

J. 6" GROUT FILLET ON UPPER HALF OF PIPE.

△1 K. USE CONC. PAD 5' X 5' IN ALL AREAS.

L. SEE DWG. S-5 FOR M H FRAMES AND COVERS.

M. CONC. FILL TO BE TYPE II CEMENT.

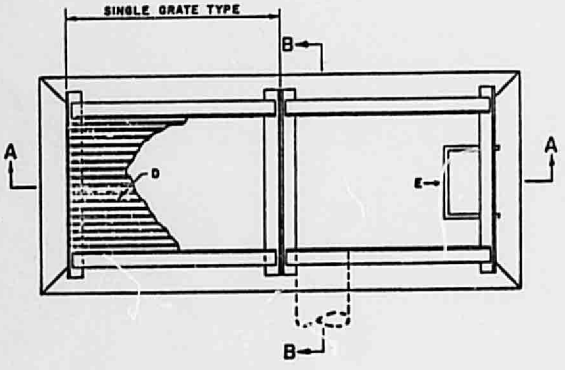
N. COMPACTED FILL.

O. 6" GROUT FILLET AROUND BASE.

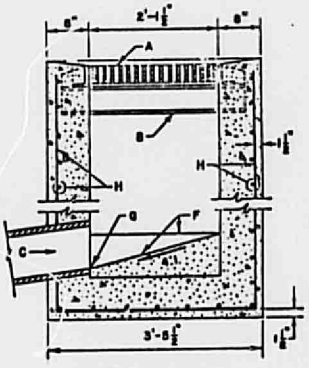
P. SLOPE ONE INCH PER FT.

Q. SHELF TO BE A MIN. OF 6" WIDE.

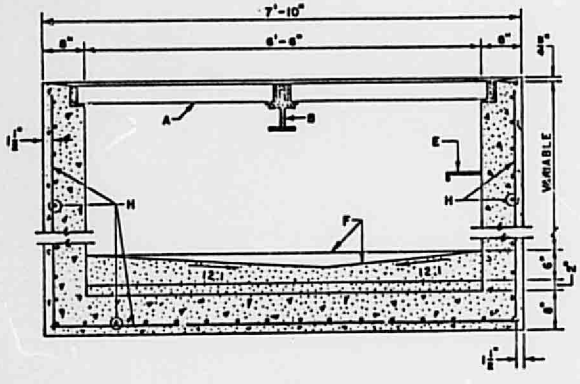
REVISIONS	CITY OF ALBUQUERQUE
△1 4-2-80 △2 1-28-81	SEWER MANHOLE TYPE C DWG. S-1-2 NOV 1979



PLAN



SECTION B-B



SECTION A-A

GENERAL NOTES:

1. FOR SINGLE GRATE TYPE CATCH BASIN, MOVE ONE END WALL TO FORM NEW SINGLE GRATE CATCH BASIN.
2. FRAME OF GRATING SHALL BE WELDED AND/OR RIVETED.
3. AFTER CLEANING SURFACE OF SCALE, RUST ETC., GRATING FRAME AND CENTER SUPPORT TO BE PAINTED WITH ONE SHOP COAT RED OXIDE. TWO FINISH COATS ALUMINUM PAINT (AASHO M69).

CONSTRUCTION NOTES:

A. SEE DWG. K-8 FOR FRAME AND GRATING DETAILS.

B. SEE DWG. K-9 FOR CENTER SUPPORT ASSEMBLY.

C. CUT ONE HORIZONTAL AND ONE VERTICAL BAR MAX. AT PIPE OPENING.

D. SPACERS, SEE DWG. K-8.

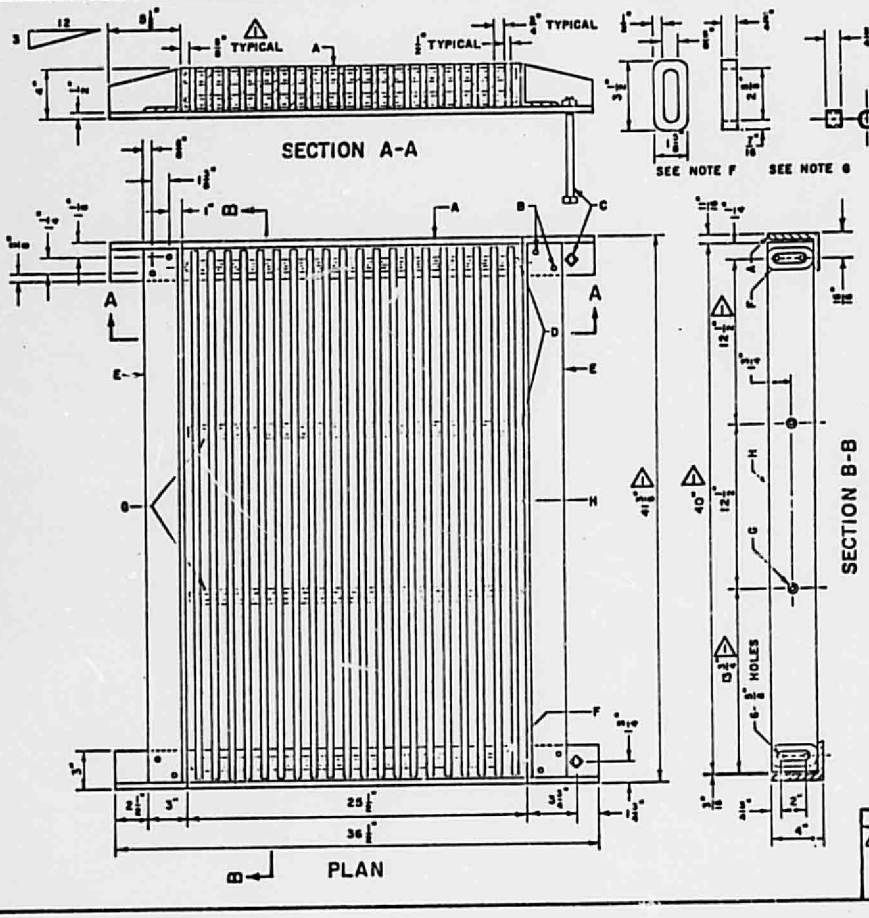
⚠1 E. USE STANDARD MH STEPS, SEE DWG. S-11. FIRST STEP TO BE 18" FROM TOP OF GRATE AND SHALL PROTRUDE 7." SPACING BETWEEN STEPS TO BE AT 12" O.C., LAST STEP 18" MAX. FROM BOTTOM.

F. COMC. FILL, SEE NOTE E, DWG. K-1.

G. INVERT PER DESIGN.

H. NO. 4 BARS AT 6" O.C. EACH WAY.

REVISIONS	CITY OF ALBUQUERQUE
⚠1-86-H	DRAINAGE
	CATCH BASIN DOUBLE "D"
	DWG. K-6-1 NOV. 1979



GENERAL NOTES:

1. ALL EXPOSED METAL PARTS SHALL BE PAINTED PRIOR TO ASSEMBLY. WELDING, MACHINING AND DRILLING SHALL BE DONE BEFORE PAINTING. ALL DIMENSIONS ARE FINISH DIMENSIONS.
2. NUTS USED TO SECURE GRATING BARS MAY BE HELD TIGHT BY PEENING THREADS OR OTHER SUITABLE MEANS IN LIEU OF TACK WELDS.
3. ALL PARTS SHALL BE OF STRUCTURAL GRADE STEEL, EXCEPT SPACERS, WHICH MAY BE OF EITHER C.I. OR STEEL.
4. SEE DWG. K-9, GENERAL NOTE 4 FOR CLEANING AND PAINTING.
5. ANY DAMAGE TO PAINTING SHALL BE REPAIRED IN AN APPROVED MANNER.
6. FRAME MAY BE WELDED OR RIVETED.

CONSTRUCTION NOTES:

A. 4"X 3"X $\frac{1}{4}$" X 36$\frac{3}{4}$" ∠.

B. 2-$\frac{3}{4}$" COUNTERSUNK RIVETS AT EACH CORNER, SEE NOTE 6.

C. $\frac{3}{4}$" X 8" BOLTS WITH SQ. HEADS AND NUTS AT OUTSIDE CORNERS OF BASIN.

D. 6-$\frac{1}{2}$" X 25$\frac{3}{4}$" STEEL RODS, 1-NUT AT EACH END, TACK WELD NUTS TO ADJACENT BARS AFTER ASSEMBLY, SEE NOTE 2.

⚠1 E. 3$\frac{1}{2}$" X 3" X $\frac{3}{8}$" X 40$\frac{3}{4}$" ∠.

F. END SPACERS.

G. STANDARD 1$\frac{1}{2}$" PIPE INTERIOR SPACERS.

⚠1 H. 20-$\frac{1}{2}$" X 3$\frac{3}{4}$" X 40" BARS.

REVISIONS	CITY OF ALBUQUERQUE
⚠1 1-28-81	DRAINAGE
	CATCH BASIN FRAME & GRATING
	DWG. K-8-1 NOV. 1979