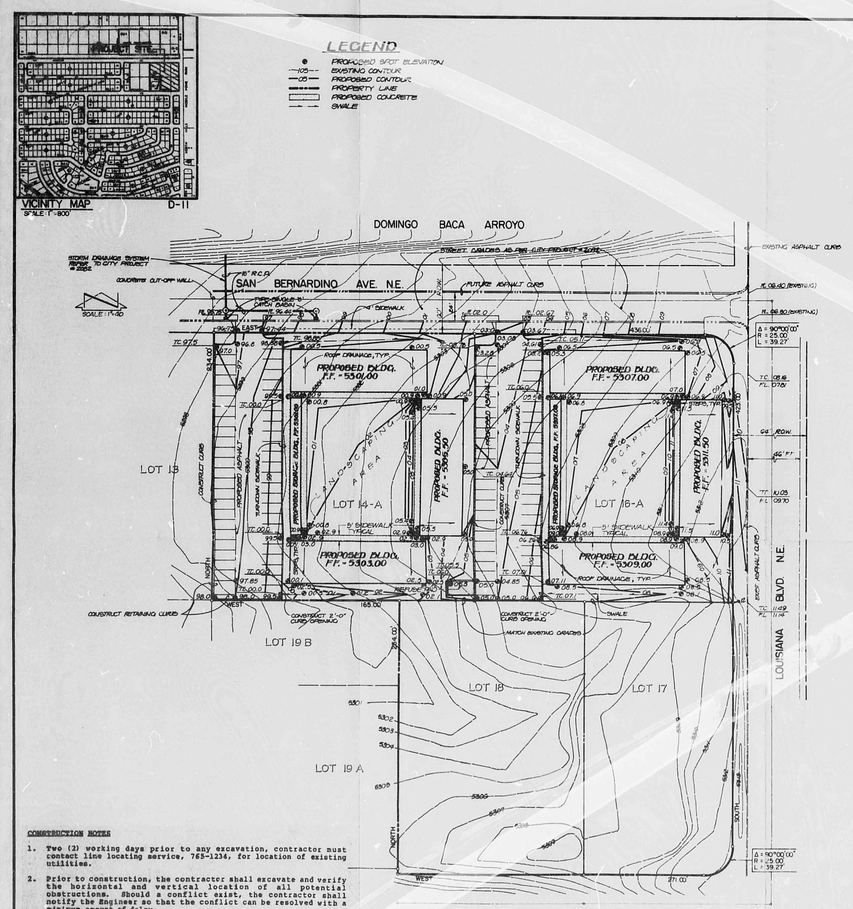
PUBLIC WORKS/HYDROLOGY

1 OF 2

F18/D13



DRAINAGE PLAN

The following items concerning the FCF Properties Drainage Plan are contained hereon:

1. Vicinity Map
2. Grading Plan
3. Calculations

The proposed improvements, as shown by the Vicinity Map, are located at the southwest corner of the intersection of Louisiana Boulevard N.E. and San Bernardino Avenue N.E. The project is more particularly described as Lot 14-A and Lot 16-A Tract A, Unit A of the North Albuquerque Acres Subdivision. Directly north of the site lies the Domingo Baca Arroyo. Directly south and west of the site is an undeveloped area from which there are no offsite flows expected to contribute to the proposed improvements.

As shown by Plate 10 of the Albuquerque Flood Plain Maps, the site does not lie within a designated Flood Hazard Zone and the potential for downstream flooding does not exist; therefore, the runoff generated by the proposed improvements will be discharged to San Bernardino Avenue N.E. and ultimately discharged into the Domingo Baca Arroyo per the construction plans prepared by Tom Mann & Associates. The existing drainage pattern of the area is one in which runoff runs from southeast to northwest. Offsite flows, as mentioned previously, will not impact the site from any adjacent development.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1' 0" intervals, 2) the limit and character of proposed improvements within the site, and 3) the limit and character of the proposed street improvements which are also being designed by this office. As shown by this plan, the proposed improvements include the construction of six apartment buildings, asphalt paving for access and parking, and landscaping. All runoff generated by this site will be discharged to San Bernardino Avenue N.E. and ultimately discharged through a proposed storm drain system into the Domingo Baca Arroyo. The storm drain system is also part of the construction plans for San Bernardino Avenue N.E.

The Calculations which appear below analyze both existing and developed conditions for the 100-year, 6-hour rainfall event. The Rational Method has been used for the analysis in accordance with the City of Albuquerque Development Process Manual, Volume II. These calculations demonstrate that an increase in the peak discharge of runoff and the total volume of runoff from the site will be realized due to the proposed construction.

⚠ SUPPLEMENTAL TEXT

1. Free discharge has been permitted by Mr. Jim Fink, Hydrology Section, City of Albuquerque.
2. The storm drainage system is detailed in the construction plans for San Bernardino Avenue N.E., also prepared by Tom Mann & Associates.
3. A proposed water block at the intersection of San Bernardino Avenue N.E. and Louisiana Boulevard is also detailed in the construction plans for San Bernardino Avenue N.E.

EROSION CONTROL MEASURES

1. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE SITE INTO PUBLIC RIGHT-OF-WAY OR ONTO PRIVATE PROPERTY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AT THE PROPERTY LINES AND WETTING THE SOIL TO KEEP IT FROM BLOWING.
2. THE CONTRACTOR SHALL PROMPTLY CLEAN UP ANY MATERIAL EXCAVATED WITHIN THE PUBLIC RIGHT-OF-WAY SO THAT THE EXCAVATED MATERIAL IS NOT SUSCEPTIBLE TO BEING WASHED DOWN THE STREET.

PROJECT BENCHMARK = T.B.M.

AN ACS BRASS TABLET STAMPED "1-C-9 N.A.A., LOT 32, BLK. D", SET IN TOP OF A CONC. POST SET FLUSH W/GROUND. THE STATION IS LOCATED 25' EAST OF THE E. OF LOUISIANA BLVD. N.E. AND 30' NORTH OF THE E. OF LOS ANGELES DR. N.E. IN THE NORTHEAST QUADRANT OF INTERSECTION.
ELEVATION = 5363.20 FEET (N.G.V.D. - 1929).

APR 27 1984
HYDROLOGY SECTION

REGISTERED PROFESSIONAL ENGINEER
JOHN G. MANN
NEW MEXICO

CONSTRUCTION NOTES

1. Two (2) working days prior to any excavation, contractor must contact line locating service, 765-1234, for location of existing utilities.
2. Prior to construction, the contractor shall excavate and verify the horizontal and vertical location of all potential obstructions. Should a conflict exist, the contractor shall notify the Engineer so that the conflict can be resolved with a minimum amount of delay.
3. All work on the project shall be performed in accordance with applicable Federal, State and local laws, rules and regulations concerning construction safety and health.
4. All construction within public right-of-way shall be performed in accordance with applicable City of Albuquerque Standards and procedures.

CALCULATIONS

Ground Cover Information

From SCS Bernalillo County Soil Survey, Plate 11:
Ecto Embudo-Tijeras Complex
Hydrologic Soil Group B

Rational Method

Discharge: $Q = CiA$
where C varies
$i = P_6 (6.84) T_c^{-0.51} = 4.76$ in/hr
$P_6 = 3.25$ in (DPM PLate 22.2D-1)
$T_c = 10$ min (minimum)
A = area, acres

Volume: $V = CP_6A (1/12)$
where C varies
$P_6 = 2.25$ in (DPM Plate 22.2D-1)
A = area, sf

Existing Condition

a. Lot 14-A

$A_{total} = 53{,}936$ sf $= 1.2382$ Ac
$A_{imp} = 0$ sf; % impervious = 0%
$C^{imp} = 0.34$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.34\ (4.76)\ (1.2382) = 2.0$ cfs
$V_{100} = CP_6A = 0.34\ (\frac{2.25}{12})\ (53{,}936) = 3438$ cf

b. Lot 16-A

$A_{total} = 53{,}801$ sf $= 1.2351$ Ac
$A_{imp} = 0$ sf; % impervious = 0%
$C^{imp} = 0.34$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.34\ (4.76)\ (1.2351) = 2.0$ cfs
$V_{100} = CP_6A = 0.34\ (\frac{2.25}{12})\ (53{,}801) = 3429$ cf

c. Street

$A_{total} = 13{,}830$ sf $= 0.3175$ Ac
$A_{imp} = 0$ sf; % impervious = 0%
$C^{imp} = 0.34$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.34\ (4.76)\ (0.3175) = 0.5$ cfs
$V_{100} = CP_6A = 0.34\ (\frac{2.25}{12})\ (13{,}830) = 882$ cf

d. Total

$Q_{100} = 2.0 + 2.0 + 0.5 = 4.5$ cfs
$V_{100} = 3438 + 3429 + 882 = 7749$ cf

Developed Condition

a. Lot 14-A

$A_{total} = 53{,}936$ sf $= 1.2382$ Ac
$A_{imp} = 32{,}236$ sf; % impervious = 59.8%
$C^{imp} = 0.63$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.63\ (4.76)\ (1.2382) = 3.7$ cfs
$V_{100} = CP_6A = 0.63\ (\frac{2.25}{12})\ (53{,}936) = 6371$ cf

b. Lot 16-A

$A_{total} = 53{,}801$ sf $= 1.2351$ Ac
$A_{imp} = 31{,}948$ sf; % impervious = 59.4%
$C^{imp} = 0.63$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.63\ (4.76)\ (1.2351) = 3.7$ cfs
$V_{100} = CP_6A = 0.63\ (\frac{2.25}{12})\ (53{,}801) = 6355$ cf

c. Street

$A_{total} = 13{,}830$ sf $= 0.3175$ Ac
$A_{imp} = 9266$ sf; % impervious = 67%
$C^{imp} = 0.66$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.66\ (4.76)\ (0.3175) = 1.0$ cfs
$V_{100} = CP_6A = 0.66\ (\frac{2.25}{12})\ (13{,}830) = 1711$ cf

d. Total

$Q_{100} = 3.7 + 3.7 + 1.0 = 8.4$ cfs
$V_{100} = 6371 + 6355 + 1711 = 14{,}437$ cf

Comparison

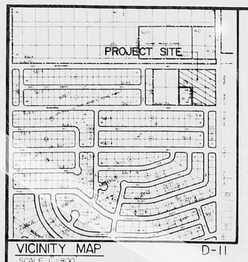
$\Delta Q_{100} = 8.4 - 4.5 = 3.9$ cfs (increase)
$\Delta V_{100} = 14{,}437 - 7749 = 6688$ cf (increase)

			REVISIONS	DESIGNED BY JGM, JTO	JOB NO 3-0303	FILE NO
NO	DATE	BY		DRAWN BY CGC, LBD	DATE 7/83	SHEET 1 OF 1
1	4-84	JTO	ADD SUPPLEMENTAL TEXT	APPROVED TTM, JGM		

BRYANT-MANN-INC
81 DALLAS N.E. - ALBUQUERQUE - NEW MEXICO 87108
ENGINEERS

GRADING AND DRAINAGE PLAN
F.C.F. PROPERTIES

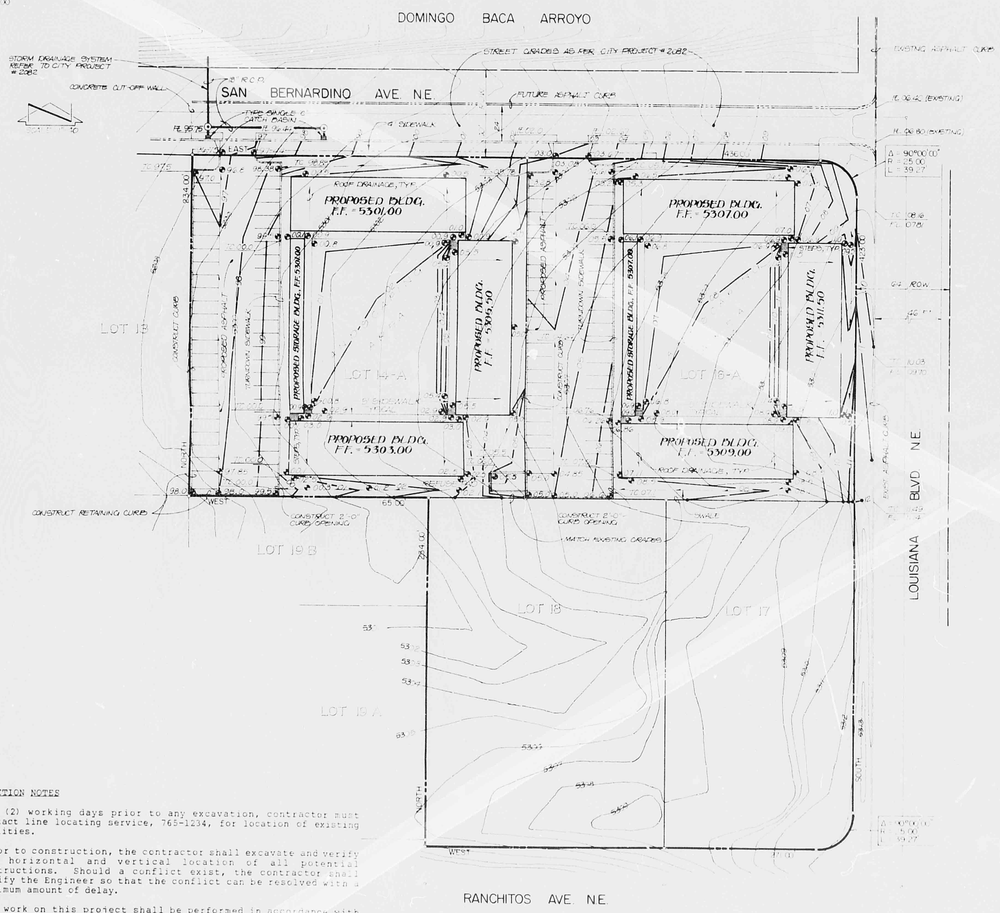
R# 26 DATE 3-26-92 CD
CITY OF ALBUQUERQUE
This microimage is certified to be a complete and accurate copy of the original as it appears in the files of the Public Works Department and was created in the normal course of business.
The photographic process used meets the Basic Microfilm Standards of the National Micrographics Association (MS115-1537)
DIRECTOR 11/5/92
NOTARY PUBLIC
OFFICIAL SEAL Roberta Duran NOTARY PUBLIC State of New Mexico
PLAN SHOT TWICE ONCE ON LIGHT ONCE ON DARK
CITY OF ALBUQUERQUE THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.
PLANS/PLATS ON FILE
FILE DESC: F18/D13
PLANS/PLATS 4



VICINITY MAP D-11
SCALE 1" = 800'

LEGEND

- PROPOSED SPOT ELEVATION
- 5125 EXISTING CONTOUR
- 5125 PROPOSED CONTOUR
- PROPERTY LINE
- PROPOSED CONCRETE
- SWALE



CONSTRUCTION NOTES

1. Two (2) working days prior to any excavation, contractor must contact line locating service, 765-1234, for location of existing utilities.
2. Prior to construction, the contractor shall excavate and verify the horizontal and vertical location of all potential obstructions. Should a conflict exist, the contractor shall notify the Engineer so that the conflict can be resolved with a minimum amount of delay.
3. All work on this project shall be performed in accordance with applicable Federal, State and local laws, rules and regulations concerning construction safety and health.
4. All construction within public right-of-way shall be performed in accordance with applicable City of Albuquerque Standards and procedures.

DRAINAGE PLAN

The following items concerning the FCF Properties Drainage Plan are contained hereon:

1. Vicinity Map
2. Grading Plan
3. Calculations

The proposed improvements, as shown by the Vicinity Map, are located at the southwest corner of the intersection of Louisiana Boulevard N.E. and San Bernardino Avenue N.E. The project is more particularly described as Lot 14-A and Lot 16-A Tract A, Unit A of the North Albuquerque Acres Subdivision. Directly north of the site lies the Domingo Baca Arroyo. Directly south and west of the site is an undeveloped area from which there are no offsite flows expected to contribute to the proposed improvements.

As shown by Plate 10 of the Albuquerque Flood Plain Maps, the site does not lie within a designated Flood Hazard Zone and the potential for downstream flooding does not exist, therefore, the runoff generated by the proposed improvements will be discharged to San Bernardino Avenue N.E. and ultimately discharged into the Domingo Baca Arroyo per the construction plans prepared by Tom Mann & Associates. The existing drainage pattern of the area is one in which runoff runs from southeast to northwest. Offsite flows, as mentioned previously, will not impact the site from any adjacent development.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1' 0" intervals, 2) the limit and character of proposed improvements within the site, and 3) the limit and character of the proposed street improvements which are also being designed by this office. As shown by this plan, the proposed improvements include the construction of six apartment buildings, asphalt paving for access and parking, and landscaping. All runoff generated by this site will be discharged to San Bernardino Avenue N.E. and ultimately discharged through a proposed storm drain system into the Domingo Baca Arroyo. The storm drain system is also part of the construction plans for San Bernardino Avenue N.E.

The Calculations which appear below analyze both existing and developed conditions for the 100-year, 6-hour rainfall event. The Rational Method has been used for the analysis in accordance with the City of Albuquerque Development Process Manual, Volume II. These calculations demonstrate that an increase in the peak discharge of runoff and the total volume of runoff from the site will be realized due to the proposed construction.

SUPPLEMENTAL TEXT

- Free discharge has been permitted in Mr. Jim Funk, Hydrology Section, City of Albuquerque.
- The storm drainage system is detailed in the construction plans for San Bernardino Avenue N.E., also prepared by Tom Mann & Associates.
- A stepped water block at the intersection of San Bernardino Avenue N.E. and Louisiana Boulevard is also detailed in the construction plans for San Bernardino Avenue N.E.

EROSION CONTROL MEASURES

1. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE SITE INTO PUBLIC RIGHT-OF-WAY OR ONTO PRIVATE PROPERTY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AT THE PROPERTY LINES AND WETTING THE SOIL TO KEEP IT FROM BLOWING.
2. THE CONTRACTOR SHALL PROMPTLY CLEAN UP ANY MATERIAL EXCAVATED WITHIN THE PUBLIC RIGHT-OF-WAY SO THAT THE EXCAVATED MATERIAL IS NOT SUSCEPTIBLE TO BEING WASHED DOWN THE STREET.

PROJECT BENCHMARK - TBM

AN ACS BRASS TABLET STAMPED "L 09 N.A.A." LOCATED ON THE EAST SIDE OF A CONC. POST SET FLUSH W/GROUND. THE POST IS LOCATED 26' EAST OF THE E. OF LOUISIANA BLVD. N.E. AND 25' NORTH OF THE N. OF LOS ANGELES DR. N.E. IN THE NORTHWEST QUADRANT OF INTERSECTION. ELEVATION = 5344.20 FEET (OLD - 929).

CALCULATIONS

Ground Cover Information

From SCS Bernalillo County Soil Survey, Plate 11:
ETC Embudo-Tijeras Complex
Hydrologic Soil Group B

Rational Method

Discharge: $Q = CIA$
where C varies
$i = F_6 (6.84) T_c^{-0.51} = 4.76$ in/hr
$F_6 = 2.25$ in (DPM Plate 22.2D-1)
$T_c = 10$ min (minimum)
A = area, acres
Volume: $V = CF_6A\ (1/12)$
where C varies
$F_6 = 2.25$ in (DPM Plate 22.2D-1)
A = area, sf

Existing Condition

a. Lot 14-A

$A_{total} = 53,936$ sf $= 1.2382$ Ac
$A_{AVE} = 0$ sf; % impervious = 0%
$C_{AVE} = 0.34$ (DPM Plate 22.2C-1)
$Q_{100} = CIA = 0.34\ (4.76)\ (1.2382) = 2.0$ cfs
$V_{100} = CF_6A = 0.34\ \frac{(2.25)}{12}\ (53,936) = 3438$ cf

b. Lot 16-A

$A_{total} = 53,801$ sf $= 1.2351$ Ac
$A_{AVE} = 0$ sf; % impervious = 0%
$C_{AVE} = 0.34$ (DPM Plate 22.2C-1)
$Q_{100} = CIA = 0.34\ (4.76)\ (1.2351) = 2.0$ cfs
$V_{100} = CF_6A = 0.34\ \frac{(2.25)}{12}\ (53,801) = 3429$ cf

c. Street

$A_{total} = 13,830$ sf $= 0.3175$ Ac
$A_{AVE} = 0$ sf; % impervious = 0%
$C_{AVE} = 0.34$ (DPM Plate 22.2C-1)
$Q_{100} = CIA = 0.34\ (4.76)\ (0.3175) = 0.5$ cfs
$V_{100} = CF_6A = 0.34\ \frac{(2.25)}{12}\ (13,830) = 882$ cf

d. Total

$Q_{100} = 2.0 + 2.0 + 0.5 = 4.5$ cfs
$V_{100} = 3438 + 3429 + 882 = 7749$ cf

Developed Condition

a. Lot 14-A

$A_{total} = 53,936$ sf $= 1.2382$ Ac
$A_{AVE} = 32,236$ sf; % impervious = 59.8%
$C_{AVE} = 0.63$ (DPM Plate 22.2C-1)
$Q_{100} = CIA = 0.63\ (4.76)\ (1.2382) = 3.7$ cfs
$V_{100} = CF_6A = 0.63\ \frac{(2.25)}{12}\ (53,936) = 6371$ cf

b. Lot 16-A

$A_{total} = 53,801$ sf $= 1.2351$ Ac
$A_{AVE} = 31,948$ sf; % impervious = 59.4%
$C_{AVE} = 0.63$ (DPM Plate 22.2C-1)
$Q_{100} = CIA = 0.63\ (4.76)\ (1.2351) = 3.7$ cfs
$V_{100} = CF_6A = 0.63\ \frac{(2.25)}{12}\ (53,801) = 6355$ cf

c. Street

$A_{total} = 13,830$ sf $= 0.3175$ Ac
$A_{AVE} = 9266$ sf; % impervious = 67%
$C_{AVE} = 0.66$ (DPM Plate 22.2C-1)
$Q_{100} = CIA = 0.66\ (4.76)\ (0.3175) = 1.0$ cfs
$V_{100} = CF_6A = 0.66\ \frac{(2.25)}{12}\ (13,830) = 1711$ cf

d. Total

$Q_{100} = 3.7 + 3.7 + 1.0 = 8.4$ cfs
$V_{100} = 6371 + 6355 + 1711 = 14,437$ cf

Comparison

$Q_{100} = 8.4 - 4.5 = 3.9$ cfs (increase)
$V_{100} = 14,437 - 7749 = 6688$ cf (increase)

NO.	DATE	BY	REVISIONS
1	4-84	JTO	ADD SUPPLEMENTAL TEXT

DESIGNED BY JTO
DRAWN BY
APPROVED TMM, JGM
DWG. NO. 3-0303
DATE 7/83

GRADING AND DRAINAGE PLAN
F.C.F. PROPERTIES

FILE NO.
SHEET 1 OF 1

PLAN SHOT TWICE ONCE ON LIGHT ONCE ON DARK

CITY OF ALBUQUERQUE
THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

R# 26 DATE 3-26-02 DP

CITY OF ALBUQUERQUE
This microimage is certified to be a complete and accurate copy of the original as it appears in the files of the Public Works Department and was created in the normal course of business.
The photographic process used meets the Basic Microfilm Standards of the National Micrographics Association (MS115-1977)
DIRECTOR 11/15/02

NOTARY PUBLIC
OFFICIAL SEAL Roberta Duran NOTARY PUBLIC 8/18/02

D 24 C 20 B 16 A 12 CITY OF ALBUQERQUE C D

GREENER & SUMNER ARCHITECTS INC.

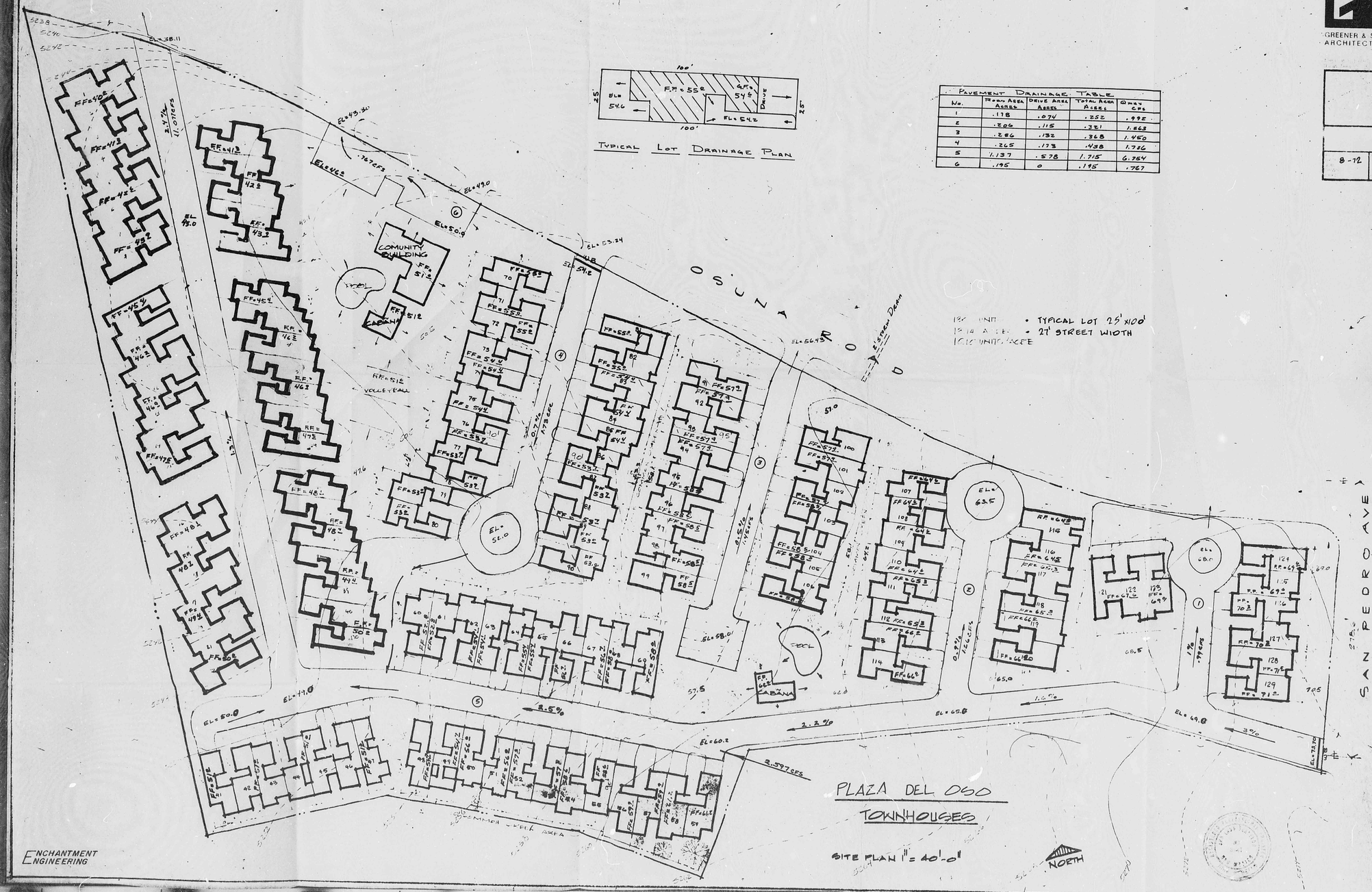
8-72 1/1

TYPICAL LOT DRAINAGE PLAN

PAVEMENT DRAINAGE TABLE

No.	Roof Area Acres	Drive Area Acres	Total Area Acres	Q max CFS
1	.118	.074	.252	.995
2	.206	.115	.321	1.263
3	.206	.132	.368	1.450
4	.265	.173	.438	1.726
5	1.137	.578	1.715	6.754
6	.195	0	.195	.767

- TYPICAL LOT 25' X 100'
- 27' STREET WIDTH



ENCHANTMENT ENGINEERING

CITY OF ALBUQUERQUE
THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

R# 26 DATE 3-26-82 OD

CITY OF ALBUQUERQUE

This microimage is certified to be a complete and accurate copy of the original as it appears in the files of the **Public Works Department** and was created in the normal course of business.

The photographic process used meets the Basic Microfilm Standards of the National Micrographics Association (MS115-1977)

DIRECTOR

NOTARY PUBLIC

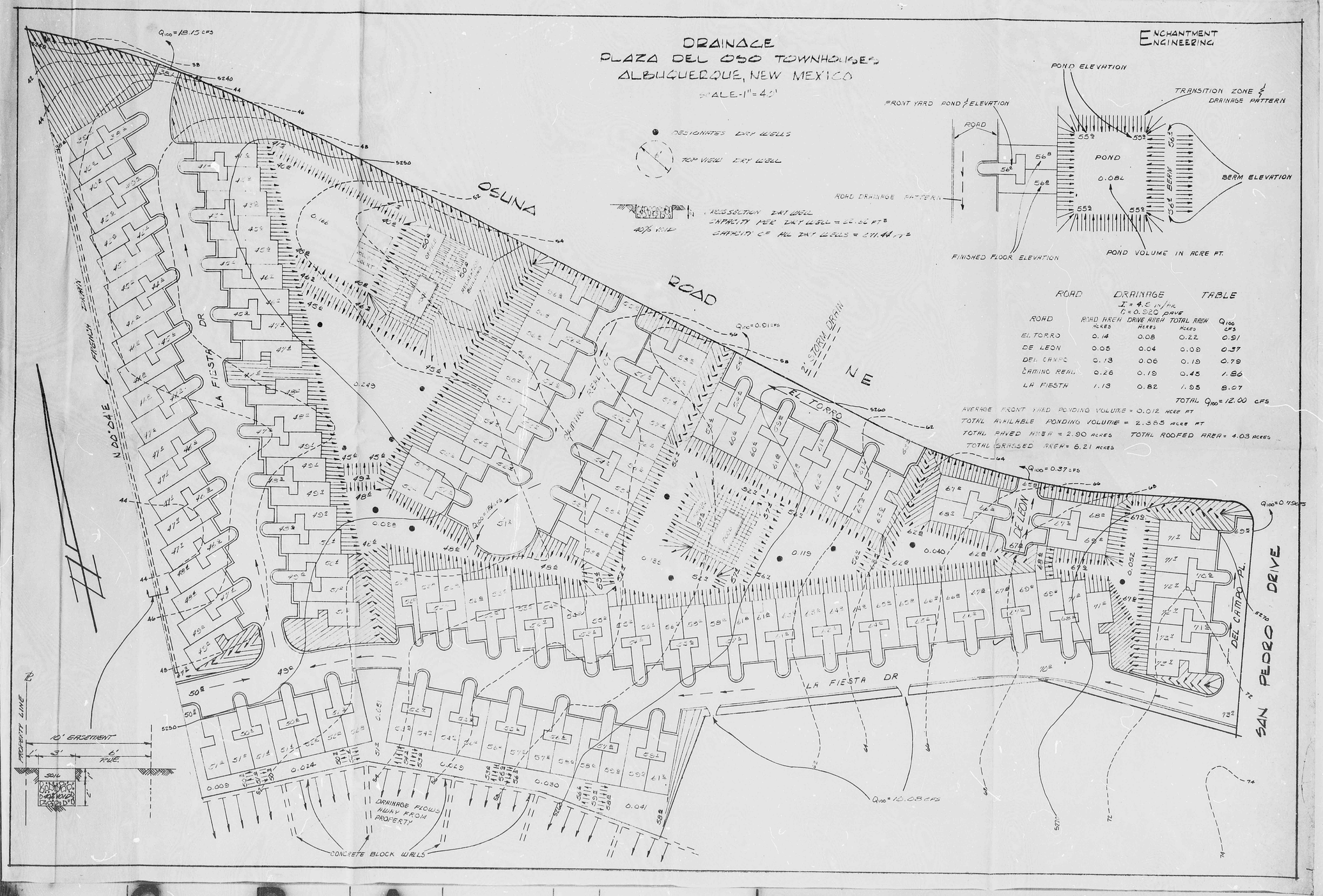
OFFICIAL SEAL
Roberta Duran
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: 11/15/82

D 24 C 20 B 16 A 12 CITY OF ALBUQUERQUE C

DRAINAGE
PLAZA DEL OSO TOWNHOUSES
ALBUQUERQUE, NEW MEXICO

SCALE-1" = 40'

ENCHANTMENT ENGINEERING



ROAD DRAINAGE TABLE

I = 4.5 in/hr
C = 0.920 PAVE

ROAD	ROAD AREA ACRES	DRIVE AREA ACRES	TOTAL AREA ACRES	Q_{100} CFS
EL TORRO	0.14	0.08	0.22	0.91
DE LEON	0.05	0.04	0.09	0.37
DEL CAMPO	0.13	0.06	0.19	0.79
CAMINO REAL	0.26	0.19	0.45	1.86
LA FIESTA	1.13	0.82	1.95	8.07
			TOTAL Q_{100} =	12.00 CFS

AVERAGE FRONT YARD PONDING VOLUME = 0.012 ACRE FT
TOTAL AVAILABLE PONDING VOLUME = 2.365 ACRE FT
TOTAL PAVED AREA = 2.90 ACRES TOTAL ROOFED AREA = 4.03 ACRES
TOTAL GRASSED AREA = 6.21 ACRES

CITY OF ALBUQUERQUE
THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

R# 26 DATE 3-26-92 OP ESP.

CITY OF ALBUQUERQUE

This microimage is certified to be a complete and accurate copy of the original as it appears in the files of the Public Works Department and was created in the normal course of business.

The photographic process used meets the Basic Microfilm Standards of the National Micrographics Association (MS115-1977)

DIRECTOR 11/5/92

NOTARY PUBLIC
OFFICIAL SEAL
Roberta Duran
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires 7/08/92

D 24 C 20 B 16 A 12 CITY OF ALBUQUERQUE C