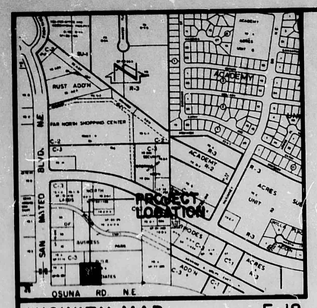
HYDROLOGY

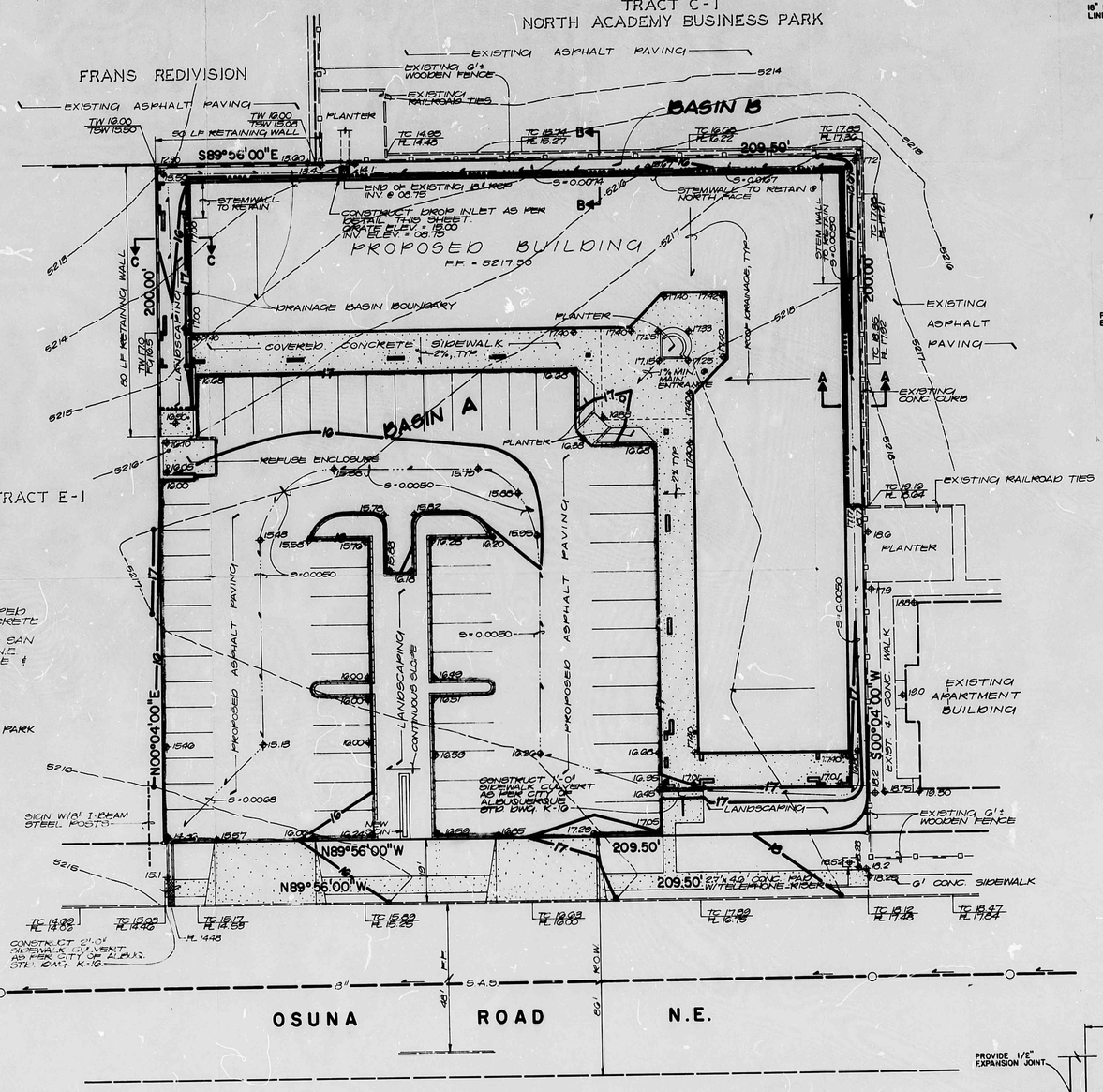
E18/D41
ONE PLAN

E 18/D 41

1 PLAN



VICINITY MAP E-18
SCALE: 1" = 800'



SCALE 1" = 20'

LEGEND

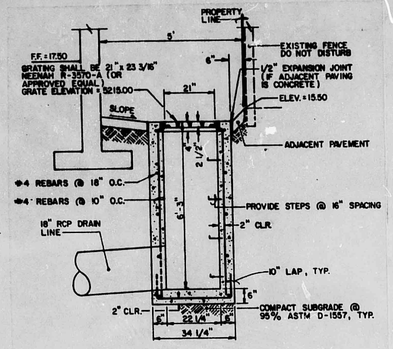
- 5215 — EXISTING CONTOUR
- 15 — PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- EXISTING WOODEN FENCE
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- PROPOSED RETAINING WALL
- DRAINAGE BASIN BOUNDARY

PROJECT BENCHMARK

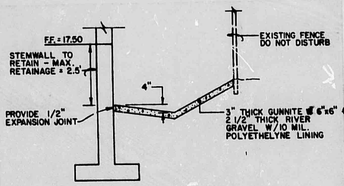
A STANDARD ACS BRASS TABLET, STAMPED "1-E18A 1978," SET IN TOP OF A CONCRETE POST FLUSH WITH THE GROUND. THE STATION IS LOCATED 0.1 MILES EAST OF SAN MATEO BLVD NE ON ACADEMY ROAD N.E. IN THE MEDIAN 128' WEST OF THE NOSE & 15.5' NORTH OF THE SOUTHERLY CURB.
ELEVATION = 5222.49 FEET (M.S.L.D.)

LEGAL DESCRIPTION

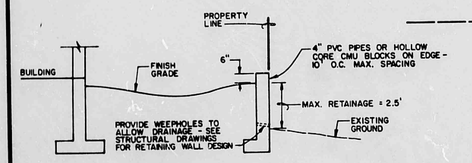
TRACT E-2, NORTH ACADEMY BUSINESS PARK



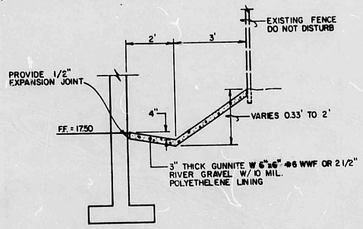
INLET SECTION
SCALE: 1" = 2'-6"



SECTION B-B
SCALE: 1" = 3'



SECTION C-C
SCALE: 1" = 4'



SECTION A-A
SCALE: 1" = 3'

DRAINAGE PLAN

The following items concerning the Tierra Encantada Drainage Plan are contained hereon:

1. Vicinity Map
2. Grading Plan
3. Calculations

The proposed improvements as shown on the Vicinity Map are located on the north side of Osuna Road just east of San Mateo Boulevard. More particularly the site is located on Tract E-2, North Academy Business Park. The proposed improvements consist of a one-story retail building, asphalt paved parking lot and landscaping.

The Academy Business Park Master Drainage Report was approved by the City of Albuquerque in Noverber 1981. The Report was updated in May, 1983 and January, 1984 to reflect changes in the plan. The plan shown hereon is consistent with the Master Drainage Report.

The site slopes from east to west at approximately 1%. The site is located at the bottom of a watershed. The watershed is near fully developed. A 60" storm drain pipe conveys runoff from the Osuna/San Mateo intersection north to the Bear Arroyo box culvert, which lies approximately 800' north of Osuna. The Silverado Apartments, located on Tract C-1, North Academy Business Park, has constructed a storm drain system consistent with the Master Drainage Report, and has provided an 18" RCP stubout to serve Tracts E-1 and E-2. This private storm drain system is maintained by the North Academy Business Park owners, as governed by recorded covenants.

Due to the topography of the site, a portion of the site has been graded to drain north to the Silverado Apartment Storm drain system, while the remainder of the site will discharge south to Osuna. It is felt that:

1. Due to the proximity of the site to the bottom of the watershed, peak developed flows from the site will pass through the 60" San Mateo storm drain system prior to the peak discharge from the watershed. On-site ponding would only delay the peak flows and add to the peak for the watershed.

2. Runoff from the site will not cause flooding downstream. Runoff from the site will have minimal impact on the Bear Arroyo and the North Diversion Channel.

3. The Silverado storm drain system has sufficient capacity to convey the proposed discharge. Should the storm drain system become clogged, runoff from the site will spill to the Silverado site and into the emergency pond provided on the Silverado site. Surface drainage easements have been provided as per the covenants for the North Academy Business Park.

The Grading Plan shows 1) existing contours at 1' 0" intervals, 2) proposed grades indicated by spot elevations and contours at 1' 0" intervals, 3) continuity between existing elevations, and 4) the limit and character of proposed improvements.

The Calculations of runoff in the existing and developed states for the 100-year, 6-hour storm appear below. The SCS Curve Method has been used in order to maintain consistency with the approved Master Drainage Report previously prepared by this office. Pipe capacities have been analyzed by the Manning Equation.

CALCULATIONS

Ground Cover Information

From SCS Bernalillo County Soil Survey,
Plate: 21, EmB Complex
Hydrologic Soil Group: B
Existing Pervious CN = 70 (DPM Plate 22.2 C-2
Pasture or Range Land: fair condition)
Developed Pervious CN = 61 (DPM Plate 22.2 C-2)

Time of Concentration/Time to Peak

$T_c = 0.0078\ L^{0.77}/s^{0.385}$ 10 min (Kirpich Equation)

$T_p = T_c =$ 10 min.

Point Rainfall

$P_6 =$ 2.4 in. (DPM Plate 22.2 D-1)

Existing Condition

$A_{total} =$ 44,200 sf = 1.01 Ac
$A_{imp} =$ 0 sf; % impervious = 0 %
Composite CN = 70 (DPM Plate 22.2 C-3)
DRO = 0.5 in (DPM Plate 22.2 C-4)
$q_p = 45.4\ A/T_p = 4.58$ cfs/in runoff

$Q_{100} = Q_{peak} = q_p$ (DRO) = 2.3 cfs

$V_{100} = 3630$ (DRO)A = 1830 cf

Developed Condition Basin A

$A_{total} =$ ~~37,900~~ 41,975 sf = ~~0.70~~ 0.96 Ac
$A_{imp} =$ ~~29,600~~ sf; % impervious = ~~87~~ 90 %
Composite CN = 94 (DPM Plate 22.2 C-3)
DRO = 1.5 in (DPM Plate 22.2 C-4)
$q_p = 45.4\ A/T_p =$ ~~3.54~~ 4.36 cfs/in runoff

$Q_{100} = Q_{peak} = q_p$ (DRO) = ~~3.2~~ 6.54 cfs

$V_{100} = 3630$ (DRO) A = ~~7250~~ 5225 cf

Developed Condition Basin B

$A_{total} =$ ~~18,300~~ 2,225 sf = ~~0.24~~ 0.05 Ac 68
$A_{imp} =$ ~~9,650~~ sf; % impervious = ~~94~~ %
Composite CN = ~~95.96~~ (DPM Plate 22.2 C-3)
DRO = 1.9 in (DPM Plate 22.2 C-4)
$q_p = 45.4\ A/T_p =$ ~~1.09~~ 0.23 cfs/in runoff

$Q_{100} = Q_{peak} = q_p$ (DRO) = ~~2.1~~ 0.43 cfs

$V_{100} = 3630$ (DRO) A = ~~1650~~ 350 cf

Comparison

$Q_{100} =$ ~~2.3~~ 6.54 + ~~2.1~~ 0.43 - 2.3 = ~~+5.1~~ +4.67
$V_{100} =$ ~~7250~~ 5225 + ~~1650~~ 350 - 1830 = ~~+7070~~ +3745 cf

Pipe Capacity

1) Manning Equation $Q = \frac{1.49}{n} AR^{2/3} s^{1/2}$

Where A = area, sf
R = hydraulic radius, ft
s = slope, ft/ft
n = Manning Coefficient, dimensionless

2) 18" RCP
n = 0.013
A = 1.77 sf
R = 0.38 ft
s = 0.0050
Q = 7.5 cfs capacity

3) 24" RCP
n = 0.013
A = 3.14 sf
R = 0.50 ft
s = 0.0050
Q = 16.0 cfs (capacity)
Q_{100} basin 4-A = 2.7 cfs (See Tract C)
Q_{100} basin 4-B = 5.3 cfs (See Tract C)
Q_{100} Project site = ~~2.1~~ 0.4 cfs
Q_{100} Total = ~~10.1~~ 8.4 cfs

REGISTERED PROFESSIONAL ENGINEER — STATE OF NEW MEXICO — TIMOTHY T. MANN, JR. — 3792 — AND LAND SURVEYOR

4-21-86

RECEIVED APR 29 1986 HYDROLOGY SECTION

NO.	DATE	BY	REVISIONS
1	5/7/86	SKS	ELIMINATE 18" RCP STUB TO TRACT E-1.
2	4/15/86	SKS	DELETED SIDEWALK, RETAINING WALL, CHANGE ROOF DRAINAGE, GENERAL.

DESIGNED BY: SKS
DRAWN BY: LBD
APPROVED: T.T.M.
JOB NO. 60141
DATE 2·86

GRADING & DRAINAGE PLAN
TIERRA ENCANTADA RETAIL CENTER

E18/D41

FILE NO.
SHEET 1 OF 1

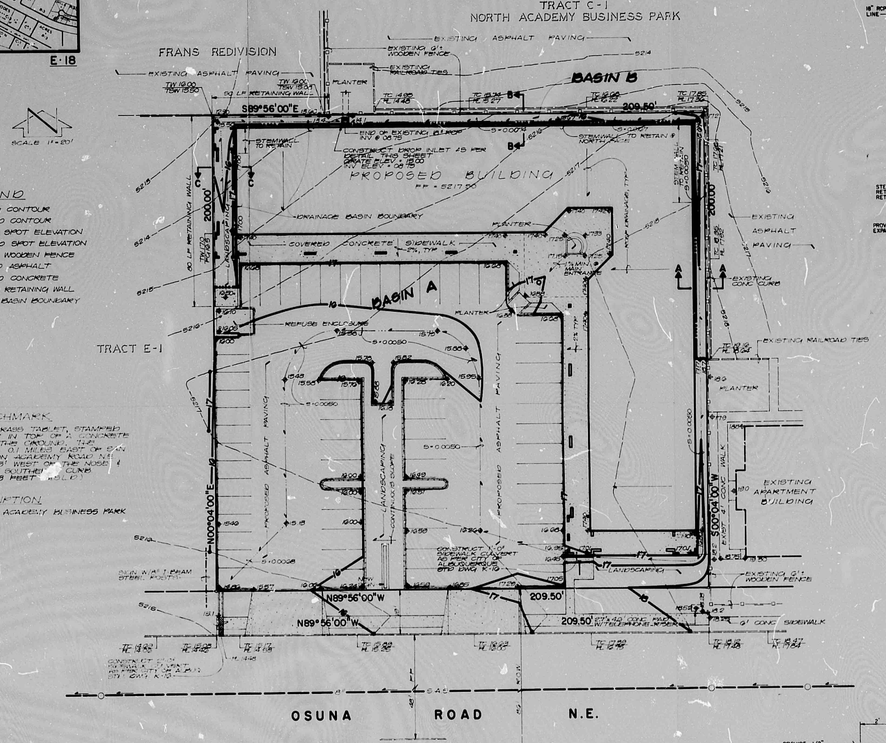
MANN/MANN/ASSOCIATES, INC.
811 DALLAS N.E. · ALBUQUERQUE · NEW MEXICO · 87110
ENGINEERS

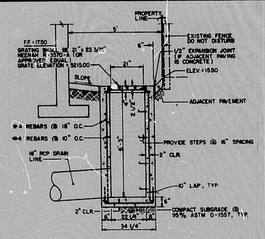
PUBLIC WORKS/HYDROLOGY

E18/D41

VICINITY MAP E-18

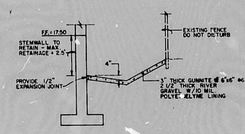
SCALE 1" = 800'





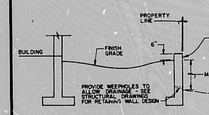
INLET SECTION

SCALE : 1" = 2'-6



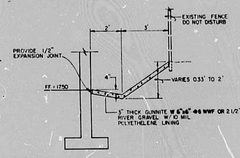
SECTION B-B

SCALE : 1" = 3'



SECTION C-C

SCALE 1" = 4'



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SCALE 1" = 3'

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Hydrologic Soil Group: B
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Pasture or Range Land: fair condition)
Developed Pervious CN = 61 (DPM Plate 22.2 C-2)

Time of Concentration/Time to Peak

$T_c = 0.0078\ L^{0.77}/S^{0.385}$ 10 min (Kirpich Equation)

$T_p = T_c =$ 10 min.

Point Rainfall

$P_6 =$ 2.4 in. (DPM Plate 22.2 D-1)

Existing Condition

Atotal = 44,200 sf = 1.01 Ac
Aimp = 0 sf; % impervious = 0 %
Composite CN = 70 (DPM Plate 22.2 C-3)
DRO = 0.5 in (DPM Plate 22.2 C-4)
Q_p = 45.4 A/Tp = 4.58 cfs/in runoff

$Q_{100} = Q_{peak} = Q_p$ (DRO) = 2.3 cfs

V_{100} = 3630 (DRO)A = 1830 cf

Developed Condition Basin A

Atotal = 41,975 sf = 0.96 Ac
Aimp = 37,675 sf; % impervious = 90 %
Composite CN = 94 (DPM Plate 22.2 C-3)
DRO = 1.5 in (DPM Plate 22.2 C-4)
Q_p = 45.4 A/Tp = 4.36 cfs/in runoff

$Q_{100} = Q_{peak} = Q_p$ (DRO) = 6.54 cfs

V_{100} = 3630 (DRO) A = 5225 cf

Developed Condition Basin B

Atotal = 22,900 sf = 0.525 Ac
Aimp = 21,600 sf; % impervious = 94 %
Composite CN = 96 (DPM Plate 22.2 C-3)
DRO = 1.9 in (DPM Plate 22.2 C-4)
Q_p = 45.4 A/Tp = 1.20 / 0.25 cfs/in runoff

$Q_{100} = Q_{peak} = Q_p$ (DRO) = 2.3 cfs

V_{100} = 3630 (DRO) A = 1830 cf

Comparison

Q_{100} = 6.54 / 2.3 = 2.3 + 4.23 cfs
V_{100} = 5225 / 1830 + 1420 / 350 = 1830 + 1770 cf

Pipe Capacity

1) Manning Equation $Q = \frac{1.49}{n} AR^{2/3} S^{1/2}$

Where A = area, sf
R = hydraulic radius, ft
S = slope, ft/ft
n = Manning Coefficient, dimensionless

2) 18" RCP
n = 0.013
A = 1.77 sf
R = 0.38 ft
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Q_{100} basin 4-A = 2.7 cfs (See Tract C)
Q_{100} basin 4-B = 5.3 cfs (See Tract C)
Q_{100} Project site = 6.54 cfs

Q_{100} Total = 14.3 / 8.4 cfs

NO	DATE	BY	REVISIONS
1	3/25/86		ELIMINATE 18" RCP STUB TO TRACT E-1
2	4/21/86		UPDATE SITE, SIDEWALK, RETAINING WALL, GRADES
			MISC. CHANGES, GENERAL

DESIGNED BY SKB
DRAWN BY LBD
APPROVED TTM

JOB NO 60141
DATE 2-86

GRADING & DRAINAGE PLAN
TIERRA ENCANTADA RETAIL CENTER

E18/D41

FILE NO
SHEET 1 OF 1

811 DALLAS N.E. · ALBUQUERQUE · NEW MEXICO · 87110
ENGINEERS

REGISTERED PROFESSIONAL ENGINEER — STATE OF NEW MEXICO — 1372 — 4-21-86

RECEIVED APR 29 1986 HYDROLOGY SECTION

R1 25 DATE 3-15-92 OK

CITY OF ALBUQUERQUE

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DIRECTOR 11-15-92

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STATE OF NEW MEXICO
My Commission Expires

CITY OF ALBUQUERQUE
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PLANS/PLATS ON FILE

FILE DESC: E18/D41

PLANS/PLATS 1

E 30 D 24 C 20 B 16 A 12 CITY OF ALBUQUERQUE C D F