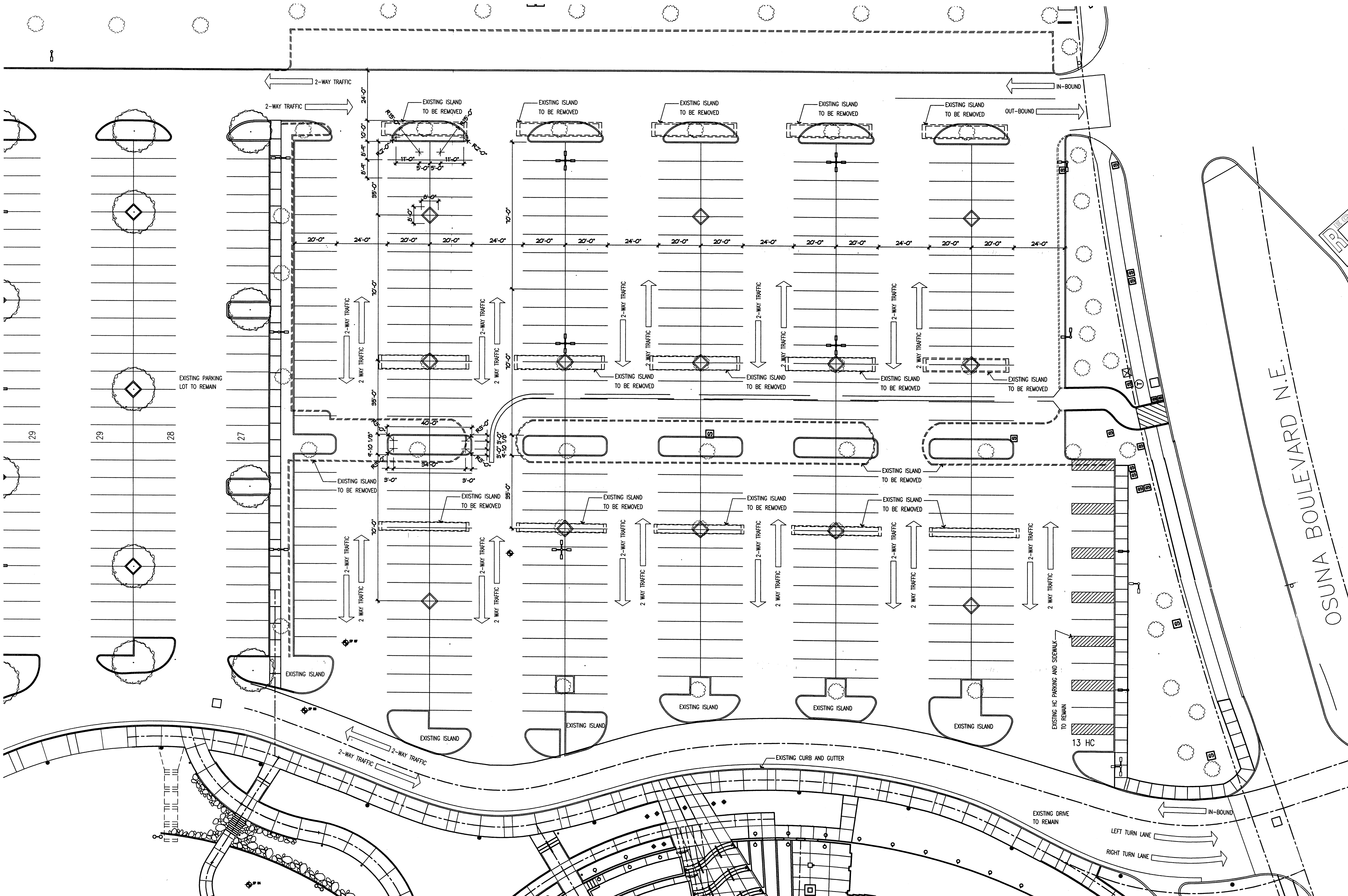


N **Traffic Circulation Layout**

1" = 20'-0"

architecture
interiors
planning
engineering

**Dekker
Perich
Sabatini**

6801 Jefferson NE
Suite 100
Albuquerque, NM 87109
505 761-9700
fax 761-4222
dps@dpsabq.com

ARCHITECT

RECEIVED MAY 22 2003 HYDROLOGY SECTION

STATE OF NEW MEXICO
DALE R. DEKKER
1054
REGISTERED ARCHITECT

ENGINEER

PROJECT

Calvary Chapel
Parking lot modifications
4001 Osuna
Albuquerque, NM 87109

REVISIONS

DRAWN BY	AVR
REVIEWED BY	MEA
DATE	05/12/03
PROJECT NO.	99108

DRAWING NAME

Traffic circulation layout

SHEET NO.

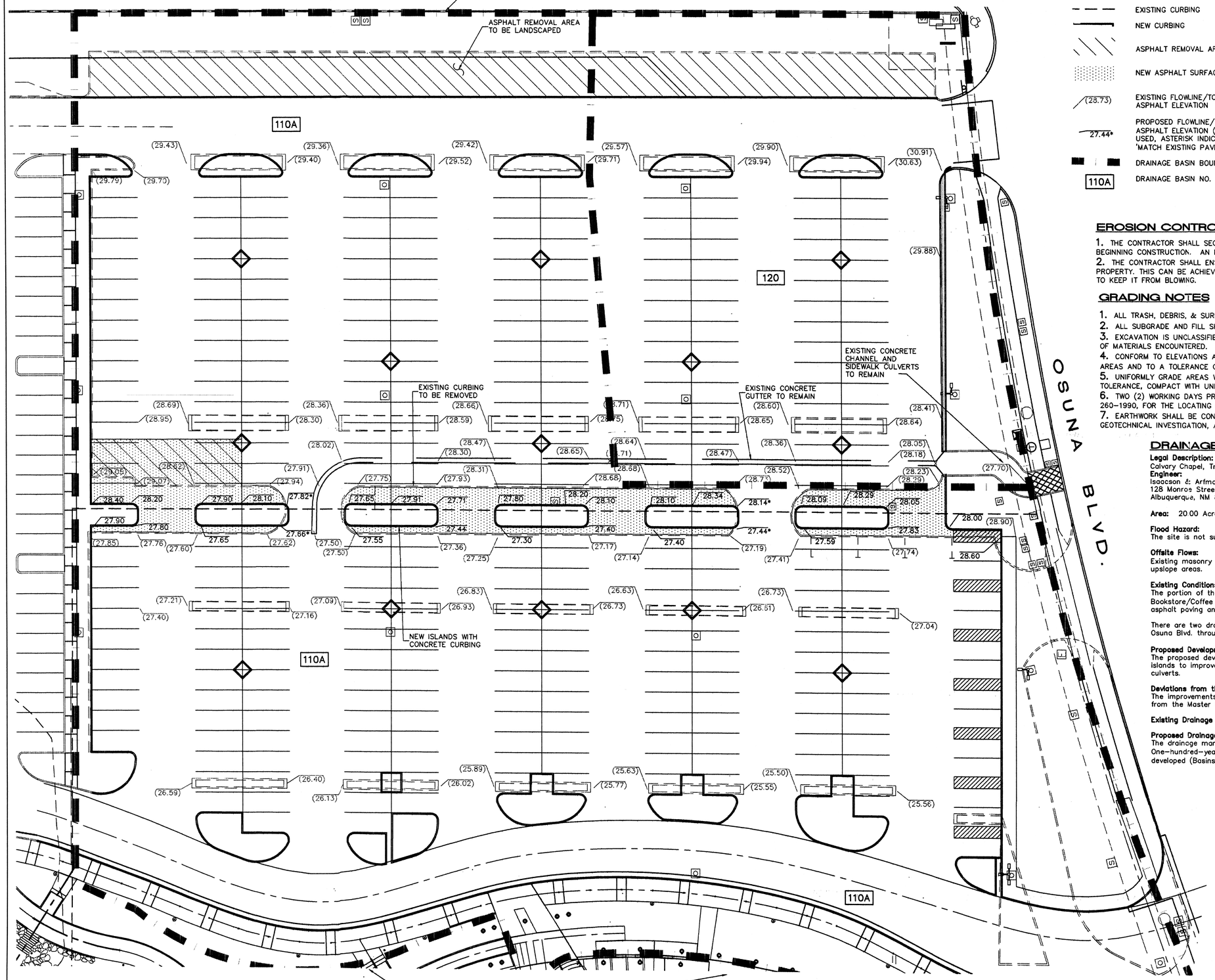
A071

OF

SCALE:
1"=20'

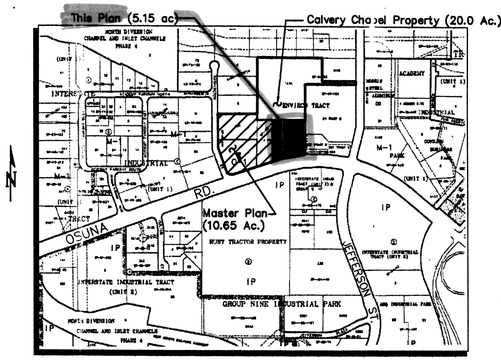
GENERAL NOTES

1. ALL PROPOSED CURBS ARE 6" HIGH. ADD 0.5' TO PROPOSED FLOWLINE ELEVATIONS FOR NEW TOP OF CURB ELEVATIONS.



LEGEND

- EXISTING CURBING
- NEW CURBING
- ASPHALT REMOVAL AREA
- NEW ASPHALT SURFACING
- (28.73) EXISTING FLOWLINE/TOP OF ASPHALT ELEVATION
- 27.44* PROPOSED FLOWLINE/TOP OF ASPHALT ELEVATION (WHEN USED, ASTERISK INDICATES 'MATCH EXISTING PAVEMENT')
- DRAINAGE BASIN BOUNDARY
- 110A DRAINAGE BASIN NO.



VICINITY MAP

EROSION CONTROL

1. THE CONTRACTOR SHALL SECURE "TOPSOIL DISTURBANCE PERMIT" FROM CITY ENVIRONMENTAL HEALTH DEPARTMENT PRIOR TO BEGINNING CONSTRUCTION. AN EXCAVATION PERMIT IS REQUIRED FOR ANY WORK WITHIN PUBLIC RIGHT-OF-WAY.
2. 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 EROSION CONTROL BERMS AT THE PROPERTY LINES AND WETTING THE SOIL TO KEEP IT FROM BLOWING.

GRADING NOTES

1. ALL TRASH, DEBRIS, & SURFACE VEGETATION SHALL BE CLEARED AND LEGALLY DISPOSED OFFSITE.
2. ALL SUBGRADE AND FILL SHALL BE COMPACTED TO A MINIMUM OF 90% ASTM D-1557.
3. EXCAVATION IS UNCLASSIFIED AND INCLUDES EXCAVATION TO SUBGRADE ELEVATIONS INDICATED, REGARDLESS OF CHARACTER OF MATERIALS ENCOUNTERED.
4. CONFORM TO ELEVATIONS AND DIMENSIONS SHOWN ON PLANS WITHIN A TOLERANCE OF 0.05'± FOR CONCRETE AND ASPHALT AREAS AND TO A TOLERANCE OF 0.10'± FOR LANDSCAPING AREAS.
5. UNIFORMLY GRADE AREAS WITHIN LIMITS OF GRADING AS SHOWN ON PLANS. SMOOTH FINISHED SURFACE WITHIN SPECIFIED TOLERANCE, COMPACT WITH UNIFORM SLOPES BETWEEN POINTS WHERE ELEVATIONS ARE INDICATED.
6. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL SYSTEM, 260-1990, FOR THE LOCATING OF EXISTING UTILITIES.
7. EARTHWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE EARTHWORK PROCEDURES GIVEN IN THE APPENDIX OF THE GEOTECHNICAL INVESTIGATION, ADDITIONS TO CALVARY CHAPEL CHURCH, ALBUQUERQUE, NEW MEXICO DATED AUGUST 30, 2000.

DRAINAGE INFORMATION

Legal Description:
Calvary Chapel, Tract A, filed 8/3/2000
Engineer:
Isaacson & Arfman, P.A.
128 Monros Street NE
Albuquerque, NM 87108

Area: 20.00 Acres (Tract A), 5.15 acres this plan.

Flood Hazard:
The site is not subject to any flood hazard areas according to Map 35001C0136 of the Flood Rate Insurance Maps.

Offsite Flows:
Existing masonry walls and private drainage channels along the site's east boundary intercept all flows from upslope areas.

Existing Conditions:
The portion of the existing parking lot covered in this Plan is immediately east of the Church Sanctuary and Bookstore/Coffee Shop (under construction) and has an area of 5.15 acres. It is a typical, private parking lot with asphalt paving and landscaped islands.

There are two drainage basins in the parking lot, Basins 11 and 12, which collect to private rundowns and flow to Osuna Blvd. through sidewalk culverts.

Proposed Development (this plan):
The proposed development given in this plan removes the existing parking lot islands and replaces them with new islands to improve traffic circulation in the parking lot. There are no changes to the existing rundowns or sidewalk culverts.

Deviations from the Master Drainage Plan:
The improvements shown on this plan follow those shown on the Master Drainage Plan. There are no deviations from the Master Drainage Plan.

Existing Drainage Condition: See Sheet 3 of the Master Drainage Plan.

Proposed Drainage Management Plan:
The drainage management plan is in accordance with the plan proposed on Sheet 3 of the Master Drainage Plan. One-hundred-year runoff to Osuna Blvd. is reduced from 22.5 cfs existing (Basins 11 and 12) to 16.7 cfs developed (Basins 110 and 120). See Sheet 3 of the Master Drainage Plan for calculations.

RECEIVED
MAY 22 2003
HYDROLOGY SECTION

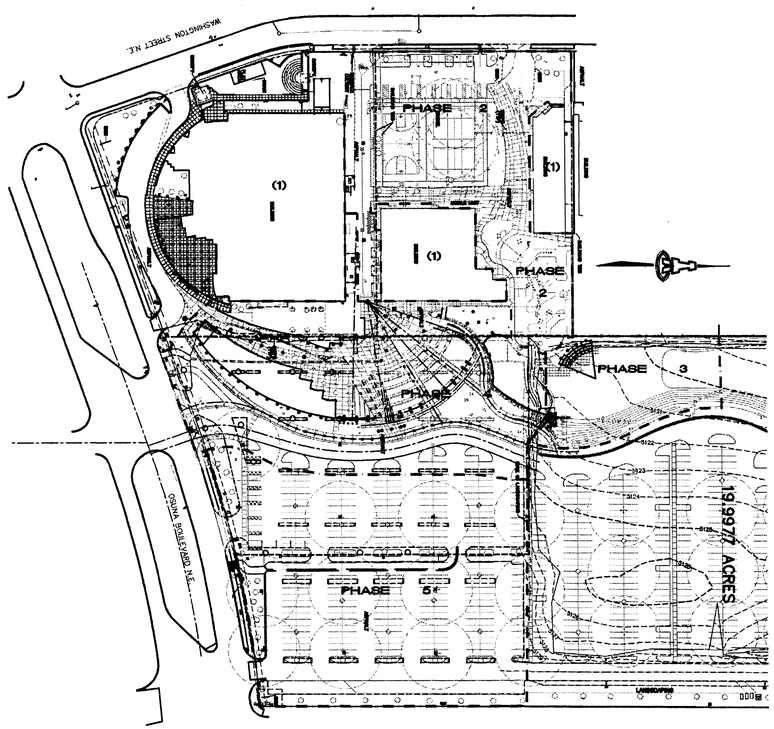
REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
No. 3895
NEW MEXICO
THOMAS G. ISAACSON
4/17/03

CALVARY CHAPEL
PARKING LOT MODIFICATIONS
GRADING & DRAINAGE PLAN

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monros Street N.E.
Albuquerque New Mexico

106.07GRD.DWGnav | 04/17/03

SHEET 1 OF 1



PHASING PLAN

SCALE: 1"=100'

NOTES

(1) EXISTING BUILDINGS, NO CHANGE.
PHASE 2 – COMPLETED
PHASE 3 – COMPLETED
PHASE 4 – UNDER CONSTRUCTION
PHASE 5 – UNDER DESIGN

DRAINAGE INFORMATION

Legal Description:
Calvary Chapel, Tract A, filed 8/3/2000

Engineer:
Isaacson & Arfman, P.A.
128 Monroe Street NE
Albuquerque, NM 87108

Area: 20.00 Acres (Tract A), 10.65 acres this plan.

Flood Hazard:
The site is not subject to any flood hazard areas according to Map 35001C0136 of the Flood Rate Insurance Maps.

Offsite Flows:
Existing masonry walls and private drainage channels along the site's east boundary intercept all flows from upslope areas.

Existing Development:
Calvary Chapel, which is located at the northwest corner of Osuna and Washington, presently consists of the main Church building (31,000 sq. ft.) and two recently acquired adjacent buildings to the north (17,000 sq. ft.), a gravel parking lot (12,500 sq. ft.) and associated drives, handicap and service parking, landscaping, and playgrounds. This area surface drains to the west to Washington Street.

Immediately to the east of the building complex there is a 3 acre paved church parking lot which surface drains to the south to Osuna Blvd.

Proposed Development:
The proposed development for the Church includes:
1.) a 10,600 sq. ft. addition to the main Church building,
2.) a 8,100 sq. ft. new Coffee Shop/Bookstore building,
3.) a 13,600 sq. ft. skateboard park,*
4.) a 12,000 sq. ft. outdoor basketball court/ volleyball playground,*
5.) a 8,400 sq. ft. paved parking lot,*
6.) a 27,700 sq. ft pedestrian plaza,
7.) and approximately 30,000 sq. ft of landscaped private park.*
Approximately 60,000 sq. ft. of existing paved parking east of the Church will be converted to the building addition, plaza, and private park development.

* Now completed

Existing Drainage Conditions:
Basin 10 (see sheet 1) drains to Washington Street and includes the building portion of the site. 100-year runoff rates are calculated below. The site is located within Precipitation Zone 2.

Basin 10:
A_T = 5.5 ac, A_B = 0.35 ac, A_C = 0.81 ac, A_D = 4.34 ac
Q_{100} =(0.35x2.28)+(0.81x3.14)+(4.34x4.70) = 23.7 cfs

Basins 11 and 12 include the existing Church parking lot which drains to Osuna Road. 100-year runoff calculations follow:

Basin 11:
A_T = 4.36 ac, A_B = 0.42 ac, A_C = 0.15 ac, A_D = 3.79 ac
Q_{100} =(0.42x2.28)+(0.15x3.14)+(3.79x4.70) = 19.2 cfs

Basin 12:
A_T = 0.79 ac, A_B = 0.15 ac, A_C = 0.03 ac, A_D = 0.61 ac
Q_{100} =(0.15x2.28)+(0.03x3.14)+(0.61x4.70) = 3.30 cfs

Proposed Drainage Management Plan:
The proposed building expansion and development plan shown on Sheet 2 will encroach into the existing parking lot east of the present Church building. This will increase the tributary drainage area to Washington Street and reduce the drainage areas to Osuna Road. The proposed Skate Park will have depressed bowls which will be at a lower elevation than the gutter grades in Washington Street which will necessitate a private storm drain and pump station to evacuate storm waters. A portion of the adjacent building to the south drains to the skate park and runoff from this area will combine with skate park runoff. The skate park bowls will function as detention basins and discharge will be controlled by the pumping capacity of 130 gpm (0.29 cfs) at the pump station. The area tributary to the skate park is Basin 101 (see sheet 2). 100-year runoff volume to Basin 101 is calculated as follows:

Basin 101:
A_T = 0.69 ac, A_B = 0.02 ac A_C = 0.03 ac, A_D = 0.64 ac
Weighted E = $\frac{(0.02x0.78)+(0.03x1.13)+(0.64x2.12)}{0.69}$ = 2.04"

$V_{100} = (\frac{2.04}{12})(0.69)(43,560)$ = 5105 cu. ft.

Water Surface Elevation (WSEL) calculations (without pumping) are determined from the following storage volume data for the skate park bowls:

Elevation	Storage Volume (c.f.)
14	635
15	3898
16	8349

By interpolation at WSEL = 15.3, V = 5105 cf.

A storm water detention pond is also proposed for Basin 102. The pond will be evacuated by a simplex pump station with a pumping capacity of 48 gpm (0.11 cfs). Hydrologic calculations for this Basin are as follows:

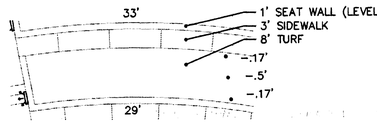
Basin 102:
A_T = 0.38 ac, A_B = 0.16 ac, A_C = 0.12 ac, A_D = 0.10 ac
Weighted E = $\frac{(0.16x0.78)+(0.12x1.13)+(0.10x2.12)}{0.38}$ = 1.24"

$V_{100} = \frac{1.24}{12}(0.38)(43,560)$ = 1715 cu. ft.

WSEL pond calculations for V_{100}:

Contour	Storage Volume (c.f.)
19	169
20	2933

WSEL = 19.5, for V = 1715 cf.



Basin 102A: A retention basin consisting of four separate turf planter sub-areas graded to store $2V_{100}$. A typical planter (see above) with calculations for runoff and storage is given as follows:
A_T = 372 SF, A_B = 244 SF, A_D = 128 SF
$2V_{100} = \frac{(244x0.78)+(128x2.12)}{372x12} x(372x2)$ = 77 cf

Storage Volume = $(0.17+\frac{0.33}{2})(8)(\frac{29+31.7}{2})$ = 81 cf, OK

Basin 103: (Revision to Basin 103, Calvary Chapel Park, E17-D35C). Storm water runoff ponded in retention pond.
A_T = 1.52 ac, A_B = 0.91 ac, A_C = 0.57 ac, A_D = 0.04 ac
$V_{100} = \frac{(.91x.78)+(.57x1.13)+(.04x2.12)}{12}$ x 43,560 = 5,222 cu.ft.

$2V_{100}$ = 10,444 cu. ft.

Pond Volume:

Elevation	Area (sf)	Avg. Area (sf)	Volume (cu. ft.)
5116.5	0		
5117	3442	1721	860
5118	18,900	11,170	12,030

ELEV. 5117.9(±) = 10,444 cu. ft. VOLUME

The remainder of the site, Basin 100, will drain uncontrolled to Washington Street. A private storm drain shown on Sheet 2, is planned to intercept and reduce runoff within pedestrian areas. This private improvement will discharge within Basin 100 and its effects on peak discharge rates is disregarded for analysis purposes. 100-year peak discharge from Basin 100 is calculated as follows:

Basin 100:
A_T = 4.97 ac, A_A = 0.19 ac, A_B = 0.34 ac, A_C = 0.42 ac, A_D = 4.02 ac.
Q_{100} = (0.19x1.56)+(0.34x2.28)+(0.42x3.14)+(4.02x4.70)
= 21.28 cfs

Q_{100} runoff to Washington Street:
Basin 100 = 21.28 cfs
Basin 101 = 0.29 cfs (pumping rate)
Basin 102 = 0.11 cfs (pumping rate)
Basin 110C = 0.22 cfs (overflow)
21.90 cfs

Runoff to Osuna Road will be reduced due to a decrease in size of tributary drainage area.

Basin 110A (revised Basin 11):
A_T = 2.67 ac, A_B = 0.29 ac, A_C = 0.28 ac, A_D = 2.10 ac,
Q_{100} = (0.29x2.28)+(0.28x3.14)+(2.10x4.70)
= 11.41 cfs

Basin 110B: (Roof Runoff from Coffee Shop/Bookstore) Roof flows are collected and piped to rundown flowing to Osuna.
A_T = A_D = 0.21 ac
Q_{100} = 0.21x4.7 = 0.99 cfs

Basin 110C: (South Plaza) Runoff is collected in a trench drain and an area inlet and pumped by the duplex pump station to the rundown flowing to Osuna.
A_T = 0.28 ac, A_B = 0.01 ac, A_D = 0.27 ac
Q_{100} = (0.01x2.28)+(0.27x4.70) = 1.29 cf
Pump station capacity is 480 gpm (1.07 cfs), therefore 1.07 cfs will flow to Osuna and 1.29 – 1.07 = 0.22 cfs will overflow to Washington.

Total Q_{100} Flows to Osuna: (at rundown)
Basin 110A = 11.41
Basin 110B = 0.99
Basin 110C = 1.07
13.47 cfs

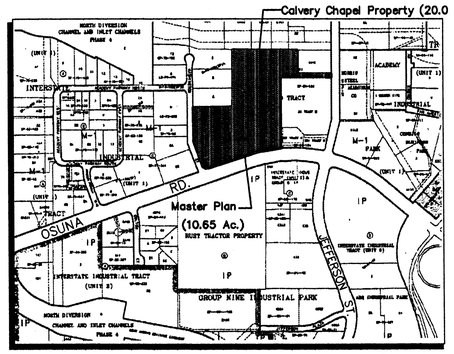
Basin 120 (revised Basin 12):
A_T = 0.79 ac, A_B = 0.14 ac, A_C = 0.08 ac, A_D = 0.57 ac
Q_{100} = (0.14x2.28)+(0.08x3.14)+(0.57x4.70)
= 3.25 cfs

Runoff Summary:
Washington Street flows decrease by 23.7-21.9 = 1.8 cfs
Osuna Road flows decrease by 19.2-(13.47+3.25) = 2.5 cfs.

Downstream Capacity:
Washington Street drains north into the concrete-lined Pino Arroyo Channel. The limiting capacity of Washington Street occurs at its north end where street flows enter a 19 foot wide by 1 foot deep concrete channel. 100-year peak flows at this location for the proposed developed condition are calculated as follows:
A_T = 11.07 ac, A_A = 0.19 ac, A_B = 0.54 ac, A_C = 3.07 ac, A_D = 7.27 ac.
Q_{100} = (0.19x1.56)+(0.54x2.28)+(3.07x3.14)+(7.27x4.70)
= 45.3 cfs
+ 0.6 (Pump Station Discharges and overflow)
= 45.9 cfs

Flow capacity of Washington Street Channel is determined by the broad-crested weir formula: $Q = 3.087 L H^{3/2}$
for L = 19' and $H = 1'$
$Q = 3.087 (19) 1$
= 58.6 cfs

Summary:
Flows in Washington will decrease by 1.8 cfs. Downstream capacity is adequate.



E-17 1"=750'±

VICINITY MAP

SIDEWALK CULVERT SIZING

At Osuna (Basin 110):
Q_{100} = 13.47 cfs
24" Culvert Capacity (Manning)
@ 0.5' flow depth and S=2%

$Q = \frac{1.486}{.017} (1.00) (0.33)^{2/3} (0.02)^{1/2}$
= 5.9 cfs
Use 3 ea. 24" wide culverts, capacity = 3x5.9 = 17.7 cfs.

At Washington:
Uncontrolled, Aa = 0.19 ac, Ac = 0.05 ac, A_D = 0.21 ac

Q_{100} = (0.19x1.56)+(0.05x3.14)+(0.21x4.70) = 1.4 cfs
Pump Station 0.3 cfs
Private Drain Line (12" full) 3.5 cfs
5.2 cfs

Use 2 ea. 24" wide culverts, capacity = 11.8 cfs

MASTER DRAINAGE PLAN
for
CALVARY CHAPEL

DRAINAGE INFORMATION, CALCULATIONS & PHASING PLAN

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR NEW MEXICO 9965 THOMAS G. ISAACSON 4/17/03

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque New Mexico

REVISED 04/15/03 nav

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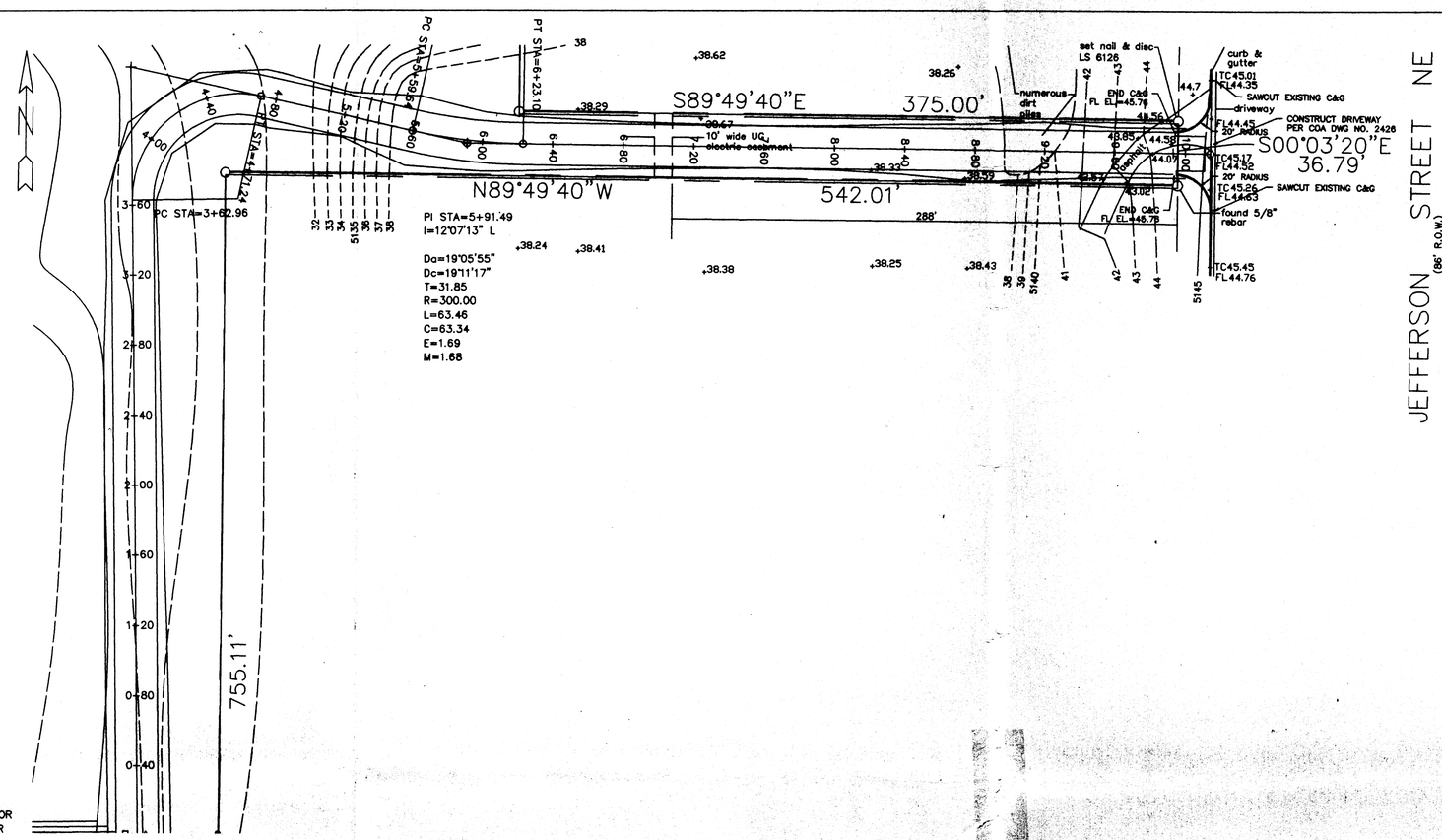
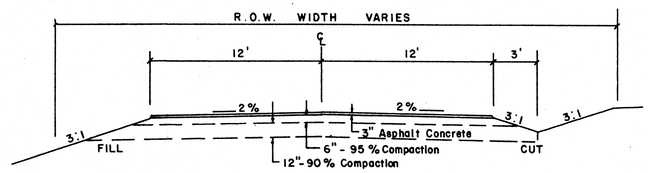
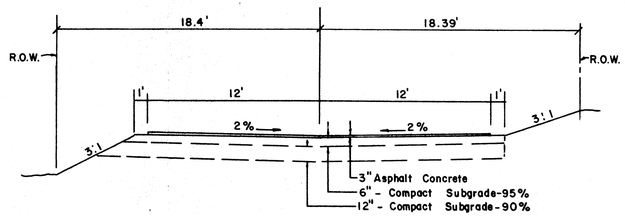
SHEET 3 OF 3

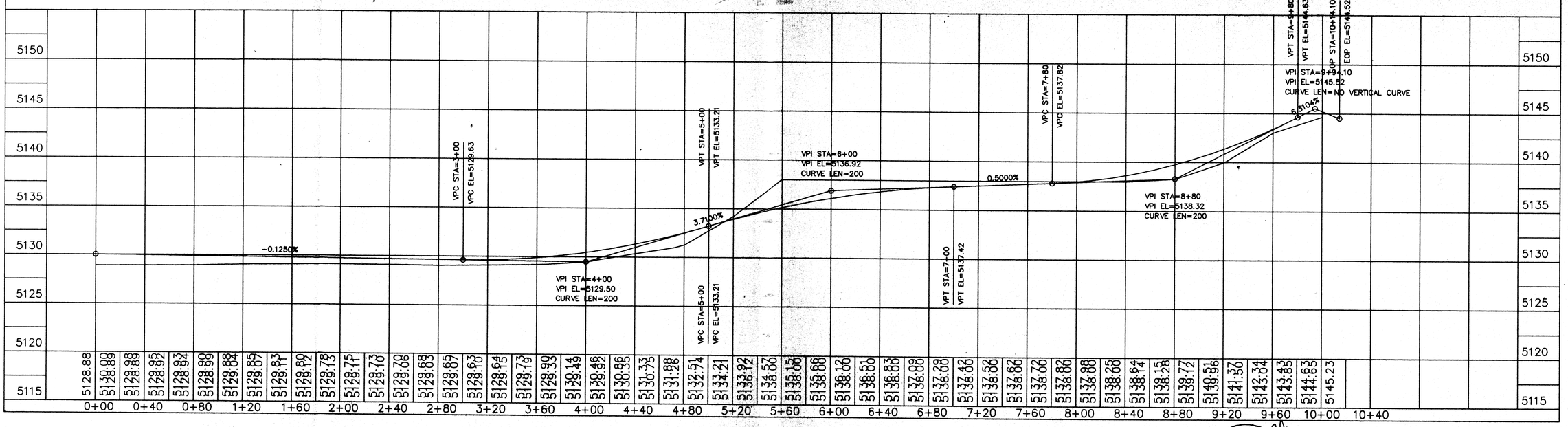




TYPICAL SECTION - ACCESS ROAD - STATION 0+00.00 TO STATION 6+00.00
1" = 5' Horiz. & Vert.



TYPICAL SECTION - ACCESS ROAD - STATION 6+00.00 TO STATION 9+94.10
1" = 5' Horiz. & Vert.



FRANK D. LOVELADY
NEW MEXICO
8512
6-23-94
REGISTERED PROFESSIONAL ENGINEER

REVISED 6-14-94

LOVELADY AND ASSOCIATES	FILE:
7319 4TH STREET, N.W.	DATE:
ALBUQUERQUE, NEW MEXICO 87107	
TEL. (505) 898-0142	SHEET 3 OF 3

JUN 14 1994

Tract D
filed 4/3/1974
Book C9, page 171

Tract C
filed 5/5/1973
Book A4, Page 175

Tract AB-2
filed 9/26/1985
Book C28, page 187

Lot 4
filed 3/1/1990
Book 90C, page 55

Lot 1-A-1
(10.0930 acres)

Lot 3-A
(1.1798 acres)

Envirco Tract
Lot 2, Tract B
filed 12/10/1982
Book C20, page 120

JEFFERSON STREET NE (86' R.O.W.)

S89°49'40"E 375.00'

N89°49'40"W 542.01'

S00°03'20"E 36.79'

755.11'

N00°03'20"W 307.00'

S89°56'40"W 411.10'

129.30'

S00°03'20"E 281.80'

95.00'

S89°56'40"W

N00°03'20"W 281.80'

S00°03'20"E 281.80'

50' wide nonexclusive ingress and egress easement filed 7/2/1990 Book BCR 90-11, page 1226-1230

10' wide private utility easement

10' wide buried telephone easement

24' x 30' joint use access easement

2" - 5" dia. trees (typ.)

6' chain link fence

concrete curb

block wall

GRAVEL

found 1/2" rebar w/cap LS 7476

found 5/8" rebar

set nail & disc LS 6126

numerous dirt piles

10' wide UG electric easement

concrete curb & gutter

SAWCUT EXISTING C&G

driveway

CONSTRUCT DRIVEWAY PER COA DWG NO. 2426

20' RADIUS

END C&G FL EL=45.78

found 5/8" rebar

BEGIN ROAD STA. 0+00.00

CONSTRUCT 4 EA. 2'-0" WIDE SIDEWALK CULVERTS PER COA STD DRAWING 2236

R=1569.95'
L=40.45'

OSUNA ROAD NE

Detail
no scale

DESIGN NOTE:
SPOT ELEVATIONS SHOWN ON THE PARKING LOT ARE TOP OF ASPHALT. ADD 0.50 FT. TO OBTAIN TOP OF CURB ELEVATIONS.

40 0 40 80 120 Feet

VICINITY MAP

E-17-Z

NEW ACCESS ROAD

New Parking Lot

OSUNA ROAD N.E.

JEFFERSON ST

SECTION A-A
SCALE: 1"= 1'-0"

NOTE:
SEE CITY OF ALBUQUERQUE STANDARD DWG 2415

SECTION B-B

LEGEND:

EXISTING	NEW	DESCRIPTION
5125	5125	CONTOUR
+25.0	25.00	SPOT ELEVATION
		PROPERTY LINE
		SWALE
		SHEET FLOW
	TA	TOP OF ASPHALT
	TC	TOP OF CURB/CONCRETE
	FL	FLOWLINE
	PP	POWER POLE

28.00

15' RAD.

grass

valve boxes

wc ramp

27.89

CONSTRUCT 4 EACH 2 FT. WIDE SIDEWALK CULVERTS PER COA STD. DWG. 2236.

concrete curb & gutter

MATCH EXISTING FLOWLINE

JUN 14 1994

REVISED 6-14-94

FRANK D. LOVELADY
NEW MEXICO
6-12
23-94
REGISTERED PROFESSIONAL ENGINEER

LOVELADY AND ASSOCIATES
7319 4TH STREET, N.W.
ALBUQUERQUE, NEW MEXICO 87107
TEL. (505) 898-0142

FILE:
DATE:
SHEET 1 OF 3

DRAINAGE CALCULATIONS

EXISTING CONDITIONS: STD. DRAIN CALCS. - ZONE 2

The term "site" as used herein is defined as Lot 1-A-1 and Lot 3-A, Envirco Tract, Albuquerque, New Mexico. The site is located on the north side of Osuna Road, N.E. west of Jefferson Street N.E. The entire site is not to be developed at this time; only Lot 3-A and a small portion of Lot 1-A-1 adjacent to the east side of the existing parking lot are to be developed for parking lot expansion. In addition, an access road from the parking lot to Jefferson Street will utilize a narrow strip of land from Lot 1-A-1. The site slopes in a generally westerly direction. The site is bounded on the north by a 50' drainage easement which contains a concrete-lined drainage channel for the Arroyo Del Pino. The site is bounded on the east by partially developed land zoned M-1. The site is bounded on the south by Osuna Road and the existing Calvary Chapel parking lot. And, the site is bounded on the west by the existing Calvary Chapel parking lot and by developed land zoned M-1. The land lying between the site and Jefferson Street has an area of approximately 12.5 acres, the majority of which drains across the site.

DEVELOPED CONDITIONS:

The site is proposed to be partially developed as a parking lot and access road as shown on the plans. All developed runoff will be discharged to Osuna Road either directly, by means of sidewalk culverts, or indirectly through the existing parking lot.

DRAINAGE CRITERIA:

The calculations shown on this plan were prepared in accordance with Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria, for the City of Albuquerque in cooperation with Bernalillo County, New Mexico and the Albuquerque Metropolitan Arroyo Flood Control Authority, January 1993.

PRECIPITATION ZONE:

The site is west of San Mateo Boulevard and is, therefore, in Precipitation Zone 2.

ON-SITE LAND TREATMENT AREAS, PEAK DISCHARGE PER ACRE AND EXCESS PRECIP.:

The existing site is Land Treatment C since it has nearly all been graded at one time or another. The developed land treatment areas are shown in the following table:

Land Treatment	PEAK DISCH./ACRE q 100-yr.	q 10-yr.	EXCESS PRECIP. E 100-yr.	E 10-yr.	Percent of Site	Area of Site Sq.Ft.	Area of Site Acres
A	1.56	0.38	0.53	0.13	0.0	0,000	0.000
B	2.28	0.95	0.78	0.28	3.7	18,261	0.419
C	3.14	1.71	1.13	0.52	77.7	381,462	8.757
D	4.70	3.14	2.12	1.34	18.6	91,320	2.097
Totals					100.0	491,043	11.273

VOLUME, 100-YEAR AND 10-YEAR, 6-HOUR:

Existing Conditions:

V_{100} =491,043 X (1.13/12) = 46,240 CF

V_{10} =491,043 X (0.52/12) = 21,279 CF

Developed Conditions:

V_{100} = (0.78 X 18261 + 1.13 X 381462 + 2.12 X 91320)/12 = 53241 CF

V_{10} = (0.28 X 18261 + 0.52 X 381462 + 1.34 X 91320)/12 = 27154 CF

PEAK DISCHARGE, 100-YEAR AND 10-YEAR:

Existing Conditions:

Q_{100} = 11.273 X 3.14 = 35.40 CFS

Q_{10} = 11.273 X 1.71 = 19.28 CFS

Developed Conditions:

Q_{100} = 2.28 X 0.419 + 3.14 X 8.757 + 4.70 X 2.097 = 38.31 CFS

Q_{10} = 0.95 X 0.419 + 1.71 X 8.757 + 3.14 X 2.097 = 21.96 CFS

OFF-SITE FLOW:

The site has two off-site flow areas that are intercepted by the proposed parking lot (Area No. 2, approximately 3.830 acres, and Area No. 3, approximately 0.152 acres), and an off-site flow area that is intercepted by the proposed access road (Area No. 1, approximately 5.323 acres). The present percentage of Treatment D is far less than the standard of 70% for light industrial given in Table A-5 of the Criteria. The percentage of Treatment "D" is approximately 26.1% at this time. Treatment B is approximately 20.6% at this time. This leaves the remaining 53.3 percent to be Treatment C. However, to account for possible future development, the standard percentage of Treatment D is used. D = 70% C = 20% B = 10%.

q_{100} = 0.10 X 2.28 + 0.20 X 3.14 + 0.70 X 4.70 = 4.14 CFS/AC.
q_{10} = 0.10 X 0.95 + 0.20 X 1.71 + 0.70 X 3.14 = 2.64 CFS/AC.

Off-site flow Area No. 1 Q_{100} = 5.323 X 4.14 = 22.04 cfs
Q_{10} = 5.323 X 2.64 = 14.05 cfs

Off-site flow Area No. 2 Q_{100} = 0.152 X 4.14 = 0.63 cfs
Q_{10} = 0.152 X 2.64 = 0.40 cfs

Off-site flow Area No. 3 Q_{100} = 3.830 X 4.14 = 15.86 cfs
Q_{10} = 3.838 X 2.64 = 10.13 cfs

PARKING LOT RUNOFF:

TYPE OF SURFACE	AREA OF PARKING LOT SQ. FT.	ACRES	PERCENT OF SITE
ASPHALT	68,040	1.562	78.8
LANDSCAPING	18,261	0.419	21.2
TOTAL	86,301	1.981	100.0

E_{100} = 0.788 X 2.12 + 0.212 X 0.78 = 1.83 IN.
E_{10} = 0.788 X 1.34 + 0.212 X 0.28 = 1.12 IN.

q_{100} = 0.788 X 4.70 + 0.212 X 2.28 = 4.19 CFS/AC
q_{10} = 0.788 X 3.14 + 0.212 X 0.95 = 2.68 CFS/AC

V_{100} = 86,301 (1.83 / 12) = 13,161 cf
V_{10} = 86,301 (1.12 / 12) = 8,055 cf

Q_{100} = 1.981 X 4.19 = 8.30 cfs
Q_{10} = 1.981 X 2.68 = 5.31 cfs

BASIN A 54% Q_{100} = 0.54 X 8.30 = 4.48 CFS
Q_{10} = 0.54 X 5.31 = 2.87 CFS
BASIN B 46% Q_{100} = 0.46 X 8.30 = 3.82 CFS
Q_{10} = 0.46 X 5.31 = 2.44 CFS

ACCESS ROAD DRAINAGE:

Because of extremely flat grades, it is not practical to drain the access road to Osuna Road. The peak discharge generated by the access road is as follows:
Q_{100} = [(960 X 24) / 43560] [4.70 - 3.14] = 0.83 CFS

Considering the size of the tract, this is an inconsequential increase in runoff. Off-site flow Area No. 1 drains across the road. The area is a large, flat, unpaved truck staging area which drains very slowly, if at all. What little off-site flow is generated will be allowed to flow across the roadway surface rather than concentrating the flow at point locations with the use of culverts.

CHECK CAPACITY OF EXISTING SIDEWALK CULVERT:

(See Hydrology File No. E-17/D-69) The existing sidewalk culvert was designed for 24.38 cfs. Check flow by new criteria to see if the design is still adequate. Existing parking lot area = 139,958 sf (3.213 acres) of which 94.2% is asphalt and 5.8% is landscaping).
q_{100} = 0.058 X 2.28 + 0.942 X 4.70 = 4.56 CFS/AC.
Q_{100} = 3.213 X 4.56 = 14.65 CFS In addition it will have Basin A of the new parking lot plus off-site flow Area No. 2.
Total Q_{100} = 14.65 + 4.48 + 0.63 = 19.76 CFS < 24.38 CFS. Existing sidewalk culvert is adequate.

NEW SIDEWALK CULVERT AND INLET CHANNEL:

Design for the 10-year peak discharge. Runoff area includes parking lot Basin B and off-site flow Area 3. Q_{10} = 2.44 + 10.13 = 12.57 CFS

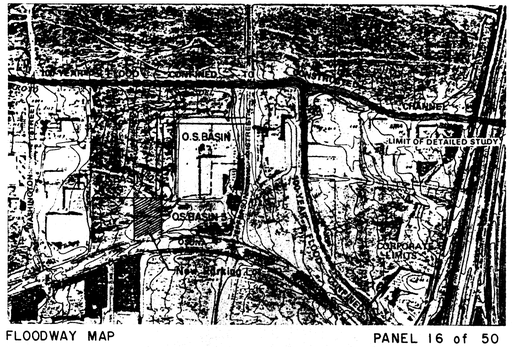
Select channel width at entrance. Use Wier Equation, $Q = CLH^{3/2}$ C = 2.65
H = 0.5 Q= 2.65 X 9.0 X $0.67^{3/2}$ = 13.08 CFS > 12.57 CFS. A 9-foot wide opening is required.

Select channel width between parking lot and sidewalk culvert. S = 0.0050 ft./ft. For 4' width and 8" depth. A = 4 X 0.67 = 2.68 SF N = 0.013
P = 4 + 0.67 + 0.67 = 5.34 R = A / P = 2.68 / 5.34 = 0.502
V = (1.486/0.013)$(0.502)^{2/3}(0.005)^{1/2}$ = 5.10 FT/SEC
Q = AV = 2.68 X 5.10 = 13.67 CFS > 12.57 CFS

Select sidewalk culverts. Use orifice equation, $Q = CA(2GH)^{1/2}$ C = 0.6
H = 0.30'
for a 2' sidewalk culvert, ave. depth = 7.25" A = 2 X 7.25/12 = 1.21 SF
Q = 0.6 X 1.21(2 X 32.2 X 0.3)$^{1/2}$ = 3.19 CFS / SW culvert
12.57 / 3.19 = 3.94 Use 4 each 2' wide sidewalk culverts.

PARKING LOT SWALE BY SOUTHERLY DRIVEWAY ENTRANCE:

Side slopes are 0.6' in 12' or 0.0500 ft./ft. Area = (24' X 0.6')/2 = 7.2 SF. P = 24.02' N = 0.017 S = 0.0500 ft./ft.
R = A / P = 7.2 / 24.02 = 0.30
V = (1.486 / 0.017)$(0.30)^{2/3}(0.0050)^{1/2}$ = 2.77 fps
Q = AV = 2.77 X 7.2 = 19.94 cfs > 19.68 cfs The swale has adequate capacity so that there is no overflow through the driveway into the westerly parking lot.



FLOODWAY MAP PANEL 16 of 50

CITY OF ALBUQUERQUE
DRAINAGE FACILITIES WITHIN CITY RIGHT-OF-WAY (S.O. 19)
NOTICE TO CONTRACTOR

1. AN EXCAVATION/CONSTRUCTION PERMIT WILL BE REQUIRED BEFORE BEGINNING ANY WORK WITHIN CITY RIGHT-OF-WAY. AN APPROVED COPY OF THESE PLANS MUST BE SUBMITTED AT THE TIME OF APPLICATION FOR THIS PERMIT.
2. ALL WORK DETAILED ON THIS PLAN TO BE PERFORMED UNDER CONTRACT, EXCEPT AS STATED OR PROVIDED FOR HEREON, SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1986, AS REVISED.
3. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE, 765-1234, FOR LOCATION OF EXISTING UTILITIES.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
5. BACKFILL COMPACTION SHALL BE ACCORDING TO ARTERIAL STREET USE.
6. MAINTENANCE OF THESE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY SERVED.
7. THE ADDRESS OF THE PROPERTY SERVED IS 4001 OSUNA ROAD NE

APPROVALS:

HYDROLOGY Barry J. Montoya (NAME) 6/17/94 (DATE)
INSPECTOR _____ (NAME) _____ (DATE)
CONSTRUCTION _____ (NAME) _____ (DATE)

EROSION CONTROL NOTES:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH THE FOLLOWING:

1. NO SEDIMENT-BEARING WATER SHALL BE ALLOWED TO DISCHARGE FROM THE SITE DURING CONSTRUCTION.
2. DURING GRADING OPERATIONS AND UNTIL THE PROJECT HAS BEEN COMPLETED, ALL ADJACENT PROPERTY, RIGHTS-OF-WAY, AND EASEMENTS SHALL BE PROTECTED FROM FLOODING BY RUNOFF FROM THE SITE.
3. SHOULD THE CONTRACTOR FAIL TO PREVENT SEDIMENT-BEARING WATER FROM ENTERING PUBLIC RIGHT-OF-WAY, HE SHALL PROMPTLY REMOVE FROM THE PUBLIC RIGHT-OF-WAY ANY AND ALL SEDIMENTATION ORIGINATING FROM THE SITE.
4. CONTROL OF SEDIMENT-BEARING WATERS WILL BE ACCOMPLISHED BY USE OF A COMPACTED EARTH BERM OF ADEQUATE HEIGHT. THE BERM SHALL BE LOCATED ALONG THE DOWNSTREAM PERIMETER OF THE PROPERTY.

BENCH MARK:

City of Albuquerque Station 7-E17, a square chiseled on top of curb, located on the south side of Osuna Road, N.E. 550 feet west of the intersection of Jefferson Street, N.E. Elevation = 5130.09 Feet.

TEMPORARY BENCH MARK:

No temporary bench mark was set since the bench mark is directly across Osuna Road from the proposed parking lot.

LEGAL DESCRIPTION:

Lot 1-A-1 and Lot 3-A, ENVIRCO TRACT, Albuquerque, New Mexico.

FRANK O. LOVELADY NEW MEXICO 8512 5/23/94 REGISTERED PROFESSIONAL ENGINEER

REVISED 6-14-94

JUN 14 1994

LOVELADY AND ASSOCIATES
7319 4TH STREET, N.W.
ALBUQUERQUE, NEW MEXICO 87107
TEL. (505) 898-0142

FILE:
DATE:
SHEET 2 OF 3