HYDROLOGY

F17/D47

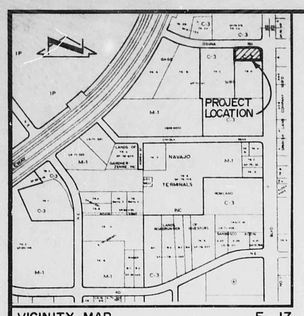
ONE PLAN

1 PLAN FOR

D'LITES

OSUNA RD. N.E.

F 17-D 47



VICINITY MAP F-17

SCALE : 1" = 800'

PROJECT BENCHMARK

A STANDARD N.M.S.H.D. BRASS TABLET, STAMPED "NM-367-1" SET ON TOP OF CONC. POST SET FLUSH W/GROUND. LOCATED 4.1' FROM THE NOSE OF THE MEDIAN IN SAN MATEO N.E., 55' NORTH OF THE INTERSECTION OF OSUNA RD. N.E. & SAN MATEO N.E. ELEVATION = 5210.60 FEET (MSLD)

T.B.M.:

TOP OF CURB @ N.E. PROPERTY CORNER PRO. ECTION OF TRACT C
ELEVATION = 5198.32 FEET (MSLD)

LEGAL DESCRIPTION

TRACT D-1, GAGE SUBDIVISION

SCALE 1" = 20'

·LEGEND·

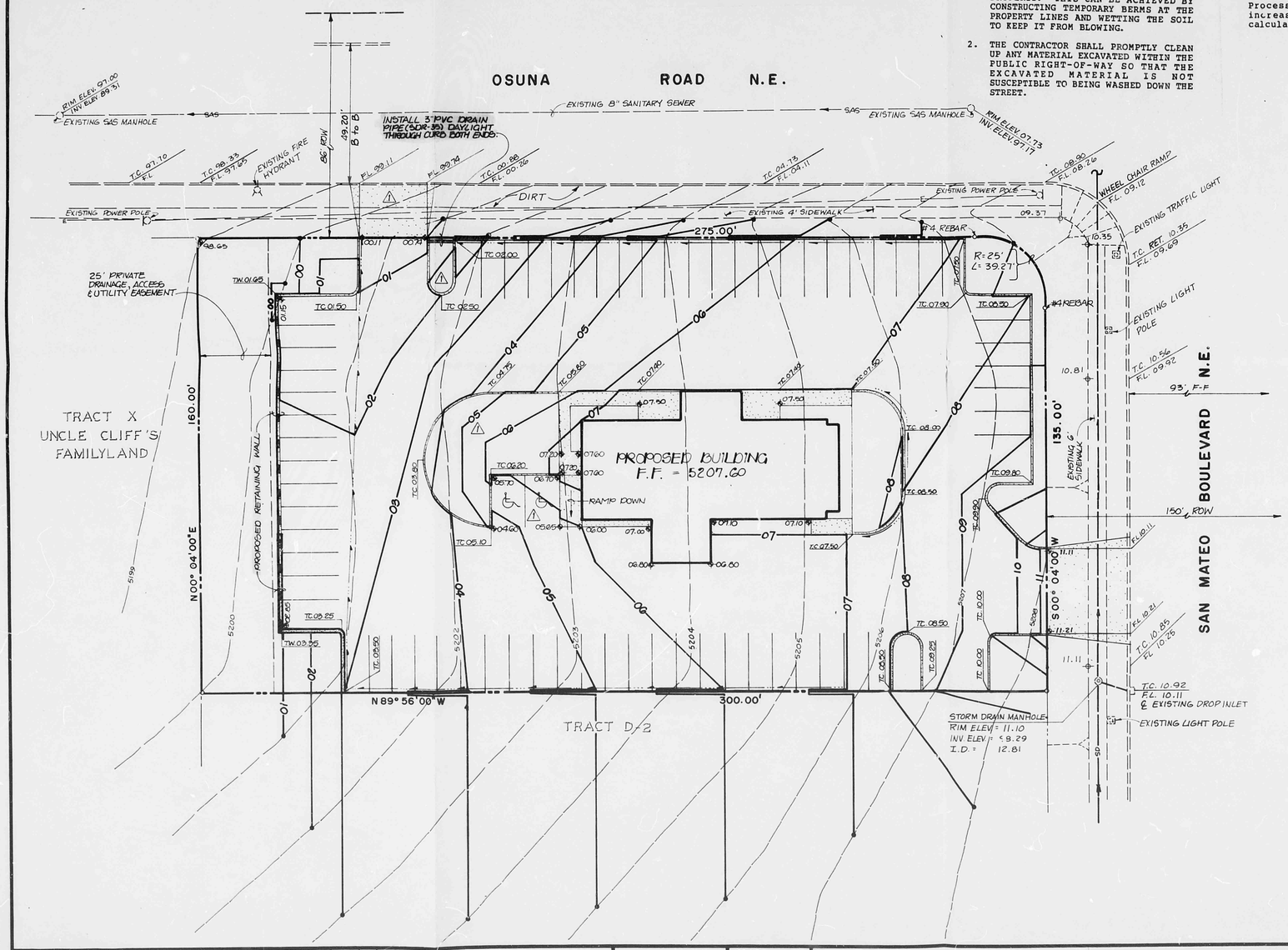
◆	PROPOSED SPOT ELEVATION
◆	EXISTING SPOT ELEVATION
5G	PROPOSED CONTOUR
5858G	EXISTING CONTOUR
	SWALE
	PROPERTY LINE
	CONCRETE
	PROPOSED ASPHALT
	PROPOSED FENCE
—x—x—	EXISTING FENCE
TC 02.00	TOP OF CURB
FL 01.65	FLOW LINE
	EXISTING SLOPE

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.

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.



DRAINAGE PLAN

The following items concerning the Tract D-1, GAGE Subdivision Drainage Plan are contained hereon:

1. Vicinity Map
2. Grading Plan
3. Calculations

The proposed improvements, as shown by the Vicinity Map, are located on the southwest corner of the intersection of Osuna Road N.E. and San Mateo Boulevard N.E. Directly west of this site is the existing Uncle Cliff's Raceway. The land directly to the south of the site is presently undeveloped, but is scheduled for development in the near future.

As shown by Plate F-17 of the Albuquerque Master Drainage Study. the site does not lie within a designated Flood Hazard Zone, however, the potential for downstream flooding does exist. In a previous grading and drainage plan prepared for the development of Uncle Cliff's Raceway, (F17-D31) the permissible free discharge to Osuna Road was analyzed on a per acre basis. The result of this analysis is 3.1 cfs per acre permissible free discharge. Runoff generated by the developed site will be discharged to Osuna Road N.E. at a rate in accordance with the above release rate. Existing runoff is mainly in the form of sheetflow, and flows from east to west. Offsite flows are not anticipated to impact the site from any direction.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1' 0" intervals, 2) continuity between existing and proposed grades, and 3) the limit and character of the proposed improvements. As shown by this plan, the proposed improvements consist of a restaurant building, asphalt paving and landscaping. Runoff generated by this site will be routed from east to west and discharged into Osuna Road N.E. under free discharge conditions. The allowable free discharge to Osuna Road is shown to be equal to 3.4 cfs for the subject site.

The Calculations which appear below analyze both the existing and developed conditions for the 100-year, 6-hour rainfall event. The Rational Method has been used for this analysis in accordance with the City of Albuquerque Development Process Manual, Volume II. As shown by these calculations, the proposed improvements constructed on Tract D-1 will increase the peak discharge by 1.7 cfs. The allowable free discharge to Osuna Road N.E. has also been shown in the calculations.

CALCULATIONS

Ground Cover Information

From SCS Bernalillo County Soil Survey, Plate 21:
EmB (Embudo) and TgB (Tijeras) Gravelly Fine Sandy Loam
Hydrologic Soil Group B

Rational Method

Discharge: $Q = CiA$
where C varies
$i = P_6 (6.84)\ T_c^{-0.51} = 4.65$ in/hr
$P_6 = 2.2$ in (DPM Plate 22.2D-1)
$T_c = 10$ min (minimum)
A = area, acres
Volume: $V = CP_6A(1/12)$
where C varies
$P_6 = 2.2$ in (DPM Plate 22.2D-1)
A = area, sf

Existing Condition

$A_{total} = 47{,}915$ sf $= 1.10$ Ac
$A_{imp} = 0$ sf; % impervious = 0%
$C = 0.34$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.34\ (4.65)(1.10) = 1.7$ cfs
$V_{100} = CP_6A = 0.34\ (2.2/12)(47{,}915) = 2985$ cf

Developed Condition

$A_{total} = 47{,}915$ sf $= 1.10$ Ac
$A_{imp} = 36{,}750$ sf; % impervious = 77%
$C = 0.67$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.67\ (4.65)(1.10) = 3.4$ cfs
$V_{100} = CP_6A = 0.67\ (2.2/12)(47{,}915) = 5885$ cf

Comparison

$\Delta Q_{100} = 3.4 - 1.7 = 1.7$ cfs (increase)
$\Delta V_{100} = 5885 - 2985 = 2900$ cf (increase)

Allowable Free Discharge

$Q_{permissible} = 3.1$ cfs/acre (From F17-D31)
$Q_{allowable} = Q_{permissible} \times$ acres $= 3.1 \times 1.10 = 3.4$ cfs
$Q_{allowable} = 3.4$ cfs $\geq Q_{100} = 3.4$ cfs

RECEIVED
JAN 31 1985
HYDROLOGY SECTION

JEFFREY G. MORTENSEN
NEW MEXICO
REGISTERED PROFESSIONAL ENGINEER
10/23/84
01/27/85

TOM WARD ASSOCIATES INC. ENGINEERS, 811 DALLAS, N.E. · ALBUQUERQUE · NEW MEXICO · 87110	NO. / DATE / BY / REVISIONS: 1 / 01/85 / JGM / REVISE PARKING LAYOUT & ADJUST GRADES	DESIGNED BY J.G.M. / DRAWN BY S.G.H. / APPROVED J.G.M.	JOB NO. 41253 / DATE 9-84

GRADING & DRAINAGE PLAN
D'LITES

F17/D47

FILE NO.

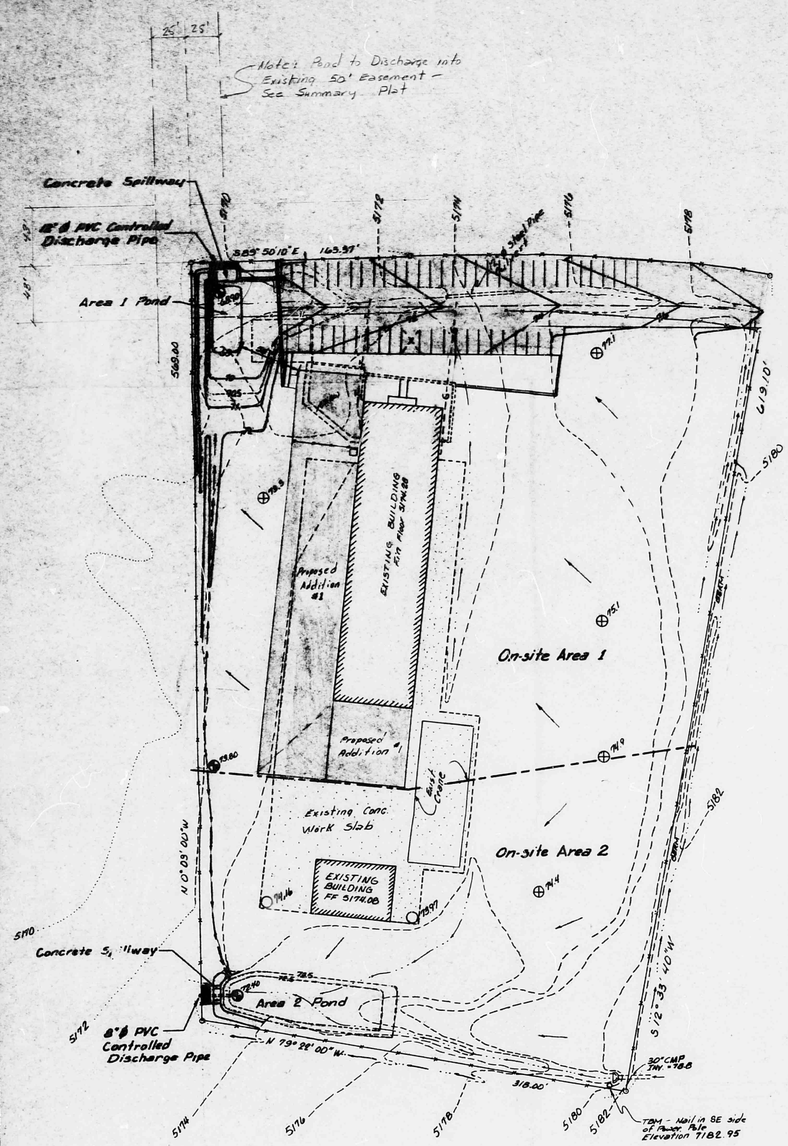
SHEET 1 OF 1

HYDROLOGY

D17/D47
1 PLAN

D17/D47

1 PLAN



SITE DRAINAGE PLAN
SCALE 1" = 50'-0"

DRAINAGE CALCULATIONS

I. OFF-SITE FLOWS

A. Circle K Property

1. Time of concentration. Area du site that drains to NW corner of lot = 5.085 acres.
   High point = 5194 Low point = 5175 Delta Elev. = 15'
   Length between high and low points = 650' s = 0.0231'/'
   $T_c = C_1 L^{0.77} / s^{0.385}$
   $T_c = 0.0078\ (650)^{0.77} / (0.0231)^{0.385} = 4.87$ minutes
   use 10 minutes

2. Intensity for T_c = 10 min.
   6 hour, 100 year rainfall from plate 22.2 D-1 is 2.2 in.
   $I = (2.2)\ (6.84)\ (10)^{-0.51} = 4.65$ in./hr.
   Q = CIA = 0.95(4.65)(5.085) = 22.46 cfs

B. Circle K property and land south of Circle K property drains to the southwest corner of the Circle K lot.
   Circle K property 0.57Ac.
   land south of Circle K property and Martinez lot 1.2 Ac.
   Total 1.77Ac.

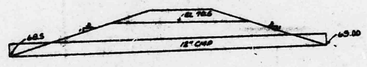
1. Weighted "C" factor
   0.95 x 0.57 + 0.5 x 1.2 / 1.77 = 0.64
2. Peak flow
   Q = CIA = 0.64 x 4.65 x 1.77 = 5.27 cfs

II. ON-SITE FLOWS.

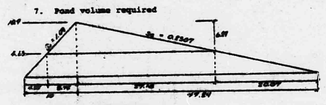
A. Area 1 - North portion of Martinez Lot. Area of lot = 5.103 Ac.

1. Area	TOTAL	PERVIOUS	IMPERVIOUS
	3.447	2.050	1.397

2. Weighted "C" factor
   (1.397 x 0.95) + (2.050 x 0.5) / 3.447 = 0.68
3. Peak Flow
   Q = CIA = 0.68 x 4.65 x 3.447 = 10.899 cfs use 10.9 cfs
4. Total volume
   (2.2/12) 3.447 x 43560 x 0.68 = 18719 cf
5. Total duration of runoff
   $T = 2V/Q_p$ = 2(18719)/(10.9 x 60) = 57.24
6. Pond Discharge rate
   Orifice equation $Q = CA\sqrt{2gh}$
   $Q = 0.6\ (0.7854)\sqrt{2 \times 32.2 \times 1.5}$
   Q = 4.63 cfs



7. Pond volume required



8. Actual pond volume

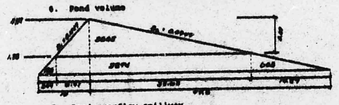
Contour Line	Planimeter Ave. of 2	Area at contour	Ave. Area sq. ft.	Depth ft.	Volume cu.ft.
69	0.43	1075			
			2713	1.0	2713
70	1.74	4350			
			5187	0.7	3630
70.5	2.41	6025			
					6343

9. Pond overflow spillway
   Size the overflow spillway for the 100 year peak flow of Area 1 plus Circle K
   Area 1 = 10.9 cfs Circle K = 22.5 cfs Total = 33.4 cfs
   Use weir equation $Q = CL\ H^{3/2}$
   C = 3.28 Try H = 8" and L = 20'
   $Q = 3.28(20)\ (0.667)^{1.5} = 35.73 > 33.4$

B. Area 2 - South portion of Martinez Lot. Area = 1.656 Ac.
   Slab and building = .312 "
   pervious area 1.344 "

1. Weighted "C" factor
   (0.312 x 0.95) + (1.344 x 0.5) / 1.656 = 0.58
2. Peak Flow
   Q = CIA = 0.58 (4.65)1.656 = 4.47 cfs
3. Total Volume
   V = (2.2/12) (1.656)(43560)0.58 = 7870 cu.ft.
4. Total duration of runoff.
   $T = 2V/Q_p$ = 2(7870)/4.47 x 60 = 97.20 min.
5. Pond discharge rate
   $Q = CA\sqrt{2gh}$ = 0.6 (0.3491)$\sqrt{2 \times 32.2 \times 0.67}$ = 1.38 cfs

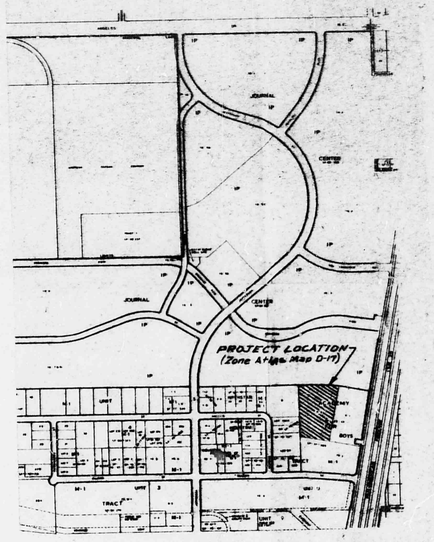
6. Pond volume



7. Pond overflow spillway
   Weir equation $Q = CLH^{3/2}$
   C = 3.28 L = 8' H = 4"
   $Q = 3.28(8)(4/12)^{3/2}$ = 6.05 cfs > 4.47 cfs

Bench Mark:

Legal Description:
Tract A-2 Academy For Boys



VICINITY MAP
Scale 1" = 800' (Approx)

N

LEGEND

Description	New	Existing
Spot Elevations	⊕	⊕
Contour lines	—76—	- - - - 5182
Drainage Area Boundary	-·-·-	
Direction of Flow	←	

FRANK D. LOVELADY NEW MEXICO 8512 REGISTERED PROFESSIONAL ENGINEER

RECEIVED MAR 22 1984 HYDROLOGY SECTION

JOB NUMBER 116/84
DATE MARCH 1, 1984
DRAWN N.M.
CHECKED N.M.

PROJECT SHOP BUILDING ADDITION
7401 PAN AMERICAN FREEWAY N.E.
ALBUQUERQUE, N.M. 87109
OWNER MARTINEZ CUSTOM TRAILERS CO.
ALBUQUERQUE, NEW MEXICO
TITLE SITE DRAINAGE PLAN, DRAINAGE CALCULATIONS

MIGUEL TRUJILLO AND ASSOCIATES
ARCHITECTURE PLANNING
8610 LA MIRADA ROAD N.E. SUITE 600 (505)298-7535
ALBUQUERQUE, NEW MEXICO 87109

SHEET C·3