FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 22, 1988

Dennis Lorenz, P.E.
Espey, Huston & Associates, Inc.
317 Commercial Street, NE
Albuquerque, New Mexico 87102

RE: GRADING PLAN REVISION AND SUPPORTING DRAINAGE CALCULATIONS FOR TRAMWAY RIDGE BUSINESS PARK, SUBMITTED JANUARY 14, 1988, FOR POND VOLUME REDUCTION (F-22/D11A)

Dear Mr. Lorenz:

Your submittal, referred to above, is approved. I agree that the existing pond in the southwest corner of this subdivision is adequate to store the 100 year storm run-off as it is now graded and shown on the revised grading plan, dated January 13, 1988.

It will not be necessary for the contractor to remove any more dirt from the bottom of the pond.

If you have any questions, please call me at 768-2650.

Cordially

Stuart Reeder

G. Stuart Reeder, P.E.
C.E./Hydrology Section

xc: Jack Eichorn, M^{c}Clintic Development Corporation

ESPEY, HUSTON & ASSOCIATES INC.
Engineering & Environmental Consultants

TRAMWAY RIDGE

SUBJECT RETENTION POND VOLUME CALCULATION

SHEET 1 OF _____ BY DL

DATE 1-13-88 CK BY _____

I. CHECK AS-BUILT SEDIMENTATION POND VOLUME TO DETERMINE ADEQUACY:

A. HYDROLOGY

BASIN AREA = 0.6 AC ±

T_c = 10 min.

SOIL = Etc GROUP B.

DEV CN = 69 (LANDSCAPED)

P_{100} = 2.55"

R_{100} = 0.50

$$Q_{100} = \frac{45.4\,AR}{T_c} = 1.4 \text{ CFS}$$

$$V_{100} = 3630\,AR = 1089 \text{ CF}$$

AREA NOT LANDSCAPED:
COMPACTED DIRT — 82
PASTURE: POOR CONDITION — 79
USE CN = 80
Q_{RUNOFF} = 0.92"
$V_{100} = \left(\frac{0.92}{12}\right)(43560 \text{ ft}^2/\text{ACRE})(0.6 \text{ ACRE})$
= 2000 CF

B. AS-BUILT POND VOLUME

DETERMINE BASED ON COA SURVEY DATED 11-18-87

ELEVATION	AREA (SF)	VOLUME (CF)
95.88	0	
		98 ✓
96.0	1625	
		~~2413~~ 4825
98.0	3200	

$\Sigma' = 2511$

$\Sigma = 4922.5 \text{ FT}^3$

ESPEY, HUSTON & ASSOCIATES INC.
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TRAMWAY RIDGE

SUBJECT RETENTION POND VOLUME CALCULATION

SHEET 2 OF 2 BY DL

DATE 1-13-88 CK BY

AT ELEVATION 5898 VOL_{100} = 2511 CF ±

⇒ ASSUME LINEAR DEPTH / VOLUME RELATIONSHIP

$\therefore$ VOL_{VF} = 1184 CF

DEPTH @ 1089 CF = $\frac{1089}{1184}$ = 0.92'

ELEV = 95.88 + 0.92 = 96.80 ±

AS SHOWN BY EXISTING TOPOGRAPHY ON ADJOINING LOTS 7, 8 & 9, THIS ELEVATION INTERFACES WELL.

I. STREET HYDRAULICS

A. 40' F-F STREET

FROM UDFCD PLATE 22.3 D-2

WHERE,

$Q = 36.1$ CFS {BASIN I} OR $Q = 43.3$ CFS {BASIN II}
$S = 0.0565$ FT/FT OR $S = 0.0050$ FT/FT

THEREFORE,

$d = 0.42'$ OR $d = 0.64'$
$V = 6.3$ FPS $V = 3.0$ FPS

THE DEPTH AND VELOCITY FOR EACH CASE MEETS UDFCD CRITERIA FOR MAJOR-LOCAL STREETS.

B. 32' F-F STREET

FROM UDFCD PLATE 22.3 D-1.

WHERE,

$Q = 43.3$ CFS {BASIN II}
$S = 0.0167$ FT/FT

THEREFORE,

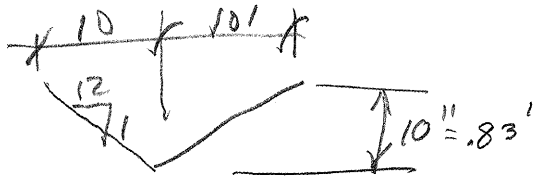
$d = 0.53'$
$V = 4.7$ FPS

THE DEPTH AND VELOCITY MEET UDFCD CRITERIA FOR LOCAL STREETS.

II. CHANNEL HYDRAULICS

A. SECTION B-B

$Q = 1.49/n \; R^{2/3} \; s^{1/2} \; A$ MANNING'S EQUATION



WHERE,

$Q = 36.1$ CFS {BASIN I}
$n = 0.017$
$s = 0.0167$ FT/FT (MINIMUM)

THEREFORE,

$d = 0.69'$
$V = 5.8$ FPS

TO DETERMINE SUPERELEVATION, THE TYPE OF FLOW IE. SUBCRITICAL OR SUPERCRITICAL MUST BE DETERMINED:

$$\frac{V}{\sqrt{gy}} > 1 \quad \therefore \text{ SUPERCRITICAL}$$

OR

$$\frac{V}{\sqrt{gy}} < 1 \quad \therefore \text{ SUBCRITICAL}$$

$$\frac{V}{\sqrt{gy}} = \frac{5.8}{\sqrt{(32.2)(0.69)}} = 1.23 > 1 \quad \therefore \underline{\text{SUPERCRITICAL}}$$

DETERMINE SUPERELEVATION FROM EQUATION;

$$e = \frac{1.3\ v^2\ (b + 2zD)}{gr}$$ (ASSUME TRAPEZOIDAL CHANNEL)

WHERE,

$V = 5.8$ FPS
$b = 4$ FT
$z = 1/(0.0833) = 12$
$D = 0.56'$

THEREFORE,

$e = 0.06'$

TOTAL DEPTH OF FLOW INCLUDING SUPERELEVATION NOT TO EXCEED

$d = 0.69' + 0.06' = 0.75' < 0.79'$, DEPTH OF CHANNEL ✓

B. SECTION H-H

$Q = 1.49/n\ R^{2/3}\ s^{1/2}\ A$ MANNING'S EQUATION

WHERE,

$Q = 36.1$ CFS {BASIN I}
$n = 0.017$
$s = 0.0145$ FT/FT (MINIMUM)

THEREFORE,

$d = 0.55'$
$v = 6.6$ FPS

DETERMINE TYPE OF FLOW

$$\frac{V}{\sqrt{gY}} = \frac{6.6}{\sqrt{(32.2)(0.55)}} = 1.57 > 1 \quad \therefore \text{ SUPERCRITICAL}$$

DETERMINE SUPERELEVATION FROM EQUATION;

$$e = \frac{V^2 b}{gr}$$ (ASSUME RECTANGULAR CHANNEL)

WHERE,

$V = 6.6$ FPS

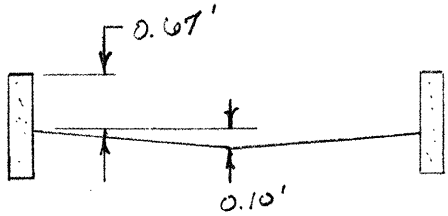
$b = 10$ FT

THEREFORE,

$e = 0.18'$

TOTAL DEPTH OF FLOW INCLUDING SUPERELEVATION NOT TO EXCEED

$d = 0.10' + 0.45' + 0.18' = 0.73' < 0.77'$ DEPTH OF CHANNEL



SECTION H-H (MINIMUM)
NOT TO SCALE

C. SECTION D-D

$Q = 1.49/n \; R^{2/3} \; S^{1/2} \; A$ MANNING'S EQUATION

WHERE,
$Q = 43.3$ CFS {BASIN II}
$n = 0.017$
$S = 0.0085$ FT/FT (MINIMUM)

THEREFORE,
$d = 0.88'$
$V = 4.9$ FPS

NO SUPERELEVATION NECESSARY.

D. SECTION L-L

$Q = 1.49/n \; R^{2/3} \; S^{1/2} \; A$ MANNING'S EQUATION

WHERE,
$Q = 43.3$ CFS {BASIN II}
$n = 0.017$
$S = 0.0085$ FT/FT (MINIMUM)

THEREFORE,
$d = 0.46'$
$V = 4.7$ FPS

NO SUPERELEVATION NECESSARY.

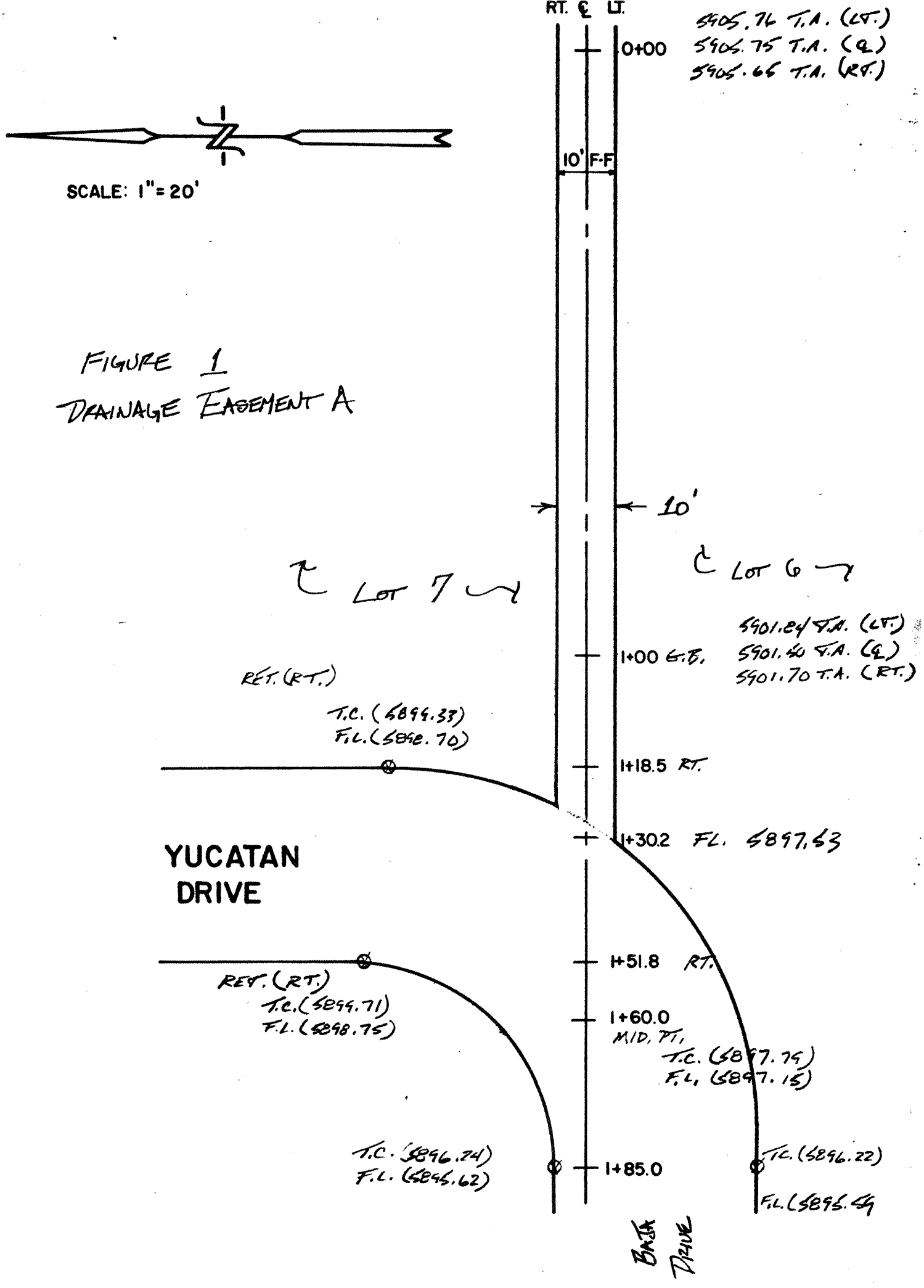
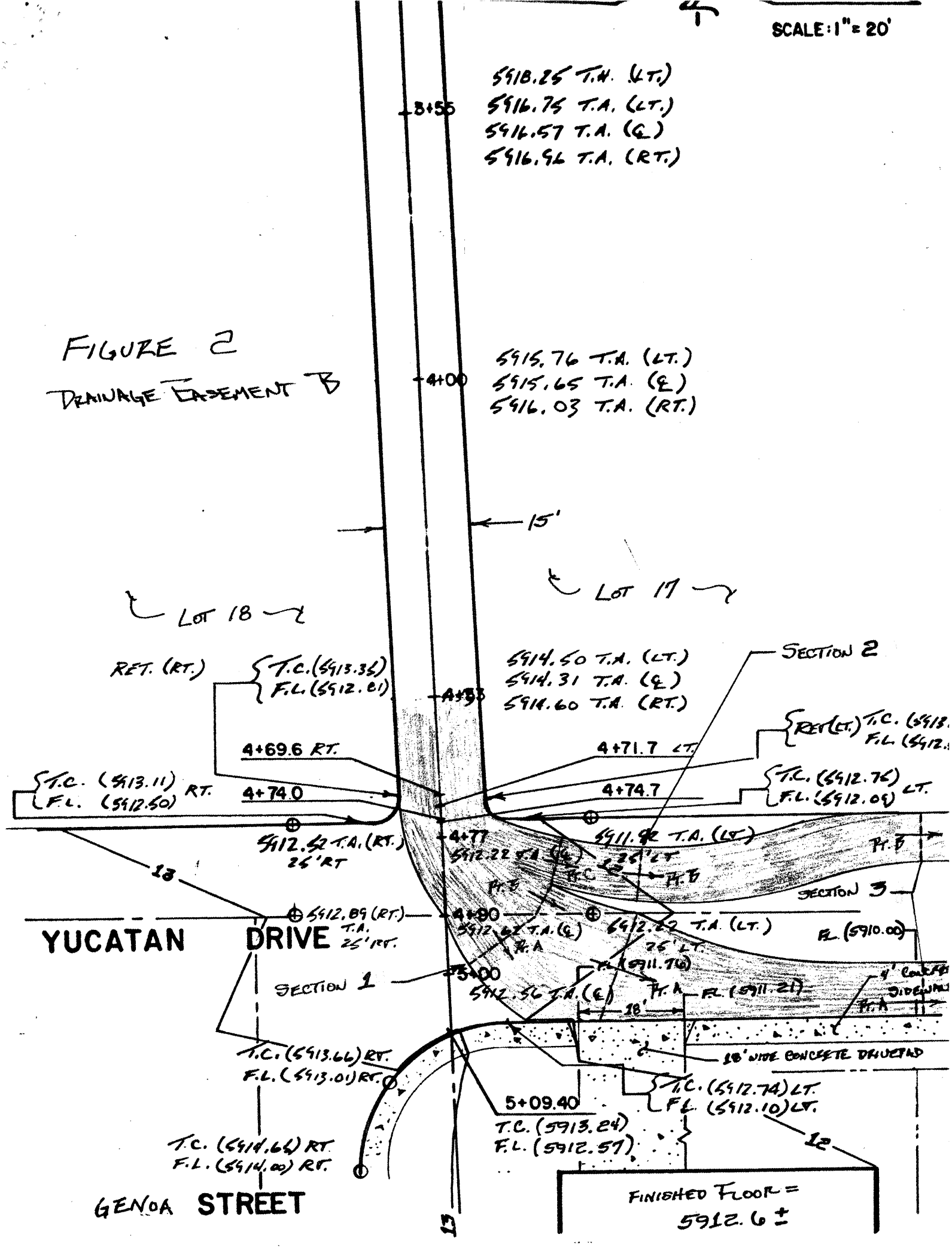


FIGURE 1

DRAINAGE EASEMENT A


SCALE: 1" = 20'
5918.25 T.H. (LT.)
8+55
5916.75 T.A. (LT.)
5916.57 T.A. (℄)
5916.92 T.A. (RT.)
FIGURE 2
DRAINAGE EASEMENT B
4+00
5915.76 T.A. (LT.)
5915.65 T.A. (℄)
5916.03 T.A. (RT.)
15'
LOT 18
LOT 17
RET. (RT.)
T.C. (5913.35)
F.L. (5912.81)
4+53
5914.50 T.A. (LT.)
5914.31 T.A. (℄)
5914.60 T.A. (RT.)
SECTION 2
4+69.6 RT.
4+71.7 LT.
T.C. (5913.11)
F.L. (5912.50) RT.
4+74.0
4+74.7
T.C. (5912.76)
F.L. (5912.09) LT.
5912.52 T.A. (RT.)
25' RT
4+77
5912.22 T.A. (℄)
5911.92 T.A. (LT.)
25' LT.
Pr. B
SECTION 3
5912.89 (RT.)
T.A.
25' RT.
4+90
5912.62 T.A. (℄)
5912.62 T.A. (LT.)
FL. (5910.00)
YUCATAN DRIVE
SECTION 1
5+00
5912.56 T.A. (℄)
FL. (5911.21)
4' CONCRETE SIDEWALK
18'
18' WIDE CONCRETE DRIVEWAY
T.C. (5913.66) RT.
F.L. (5913.01) RT.
T.C. (5912.74) LT.
F.L. (5912.10) LT.
5+09.40
T.C. (5913.24)
F.L. (5912.57)
12
T.C. (5914.64) RT.
F.L. (5914.00) RT.
GENOA STREET
FINISHED FLOOR = 5912.6 ±

SECTION E-E

DETERMINE: DEPTH OF FLOW IN SECTION E-E WITH $Q_{100} = 54.6$ CFS

WHERE, $Q = 54.6$ CFS
$s = 0.0357$
$n = 0.017$

THEREFORE, DEPTH OF FLOW, $D = 0.57'$ @ INVERT OF RUNDOWN

SECTION 1

ASSUMPTIONS: RECTANGULAR FLOW
INSTANTANEOUS DEPTH CHANGE AT CONTIGUOUS POINTS

POINT A

$Q = [14/(14+5.5+8)] \times 54.6 = 27.8$ CFS
WIDTH $= 14'$
$s = 0.5'/19' = 0.0263$
$n = 0.017$

$D = 0.31'$
$V_{PT.A} = 6.41$ FPS

POINT B

$Q = [5.5/(14+5.5+8)] \times 54.6 = 10.9$ CFS
WIDTH $= 5.5'$
$s = 0.02'/25' = 0.0008$
$n = 0.017$

$D = 0.98'$
$V_{PT.B} = 2.02$ FPS

POINT C

$Q = [8.0/(14+5.5+8)] \times 54.6 = 15.9$ CFS
WIDTH $= 8.0'$
$s = 0.22'/30' = 0.0073$
$n = 0.017$

$D = 0.41'$
$V_{PT.C} = 4.23$ FPS

SECTION 2

ASSUMPTIONS: RECTANGULAR FLOW
INSTANTANEOUS DEPTH CHANGE AT CONTIGUOUS POINTS

POINT A

$Q = 38.7$ CFS
WIDTH = 20'
$S = 0.60'/14 = 0.0429$
$n = 0.017$

$D = 0.26'$
$V_{PT.\ A} = 7.44$ FPS

POINT B

$Q = 15.9$ CFS
WIDTH = 9.0'
$S = 0.15'/10' = 0.0150$
$n = 0.017$

$D = 0.35'$
$V_{PT.\ B} = 5.05$ FPS

SECTION 3

DOWNSTREAM CONDITIONS = STREET FLOW

POINT A

$Q = 38.7$ CFS
$S = 0.0285$
$n = 0.017$

FROM DPM PLATE 22.3 D-1; $D = 0.58'$
$V = 8.1$ FPS

POINT B

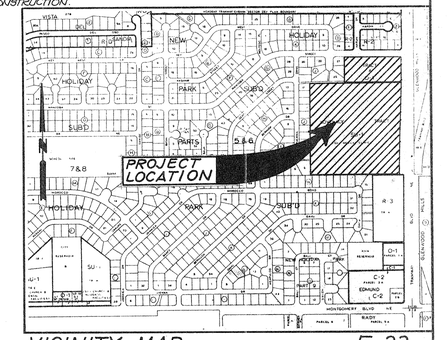
$Q = 15.9$ CFS
$S = 0.0285$
$n = 0.017$

FROM DPM PLATE 22.3 D-1; $D = 0.44'$
$V = 4.9$ FPS

EROSION CONTROL NOTES:

1. PROVIDE TEMPORARY EROSION CONTROL BERM (SEE SHEET 15 OF 15) AT LOCATION AS SHOWN ON THIS GRADING PLAN TO REMAIN UNTIL SUCH TIME THAT LOT IS DEVELOPED.
2. TEMPORARY EROSION CONTROL BERM.

SCALE: 1" = 50'



VICINITY MAP F-22

SCALE: 1" = 800'

LEGAL DESCRIPTION

LOTS 1 THROUGH 14, TRAMWAY RIDGE

APPROVED FOR ROUGH GRADING #1
Billy J. Grubbs 8/8/86
HYDROLOGY SECTION DATE

BENCHMARK

THE STATION IS LOCATED 9.5 MILES NORTHEAST OF DOWNTOWN ALBUQUERQUE AT THE JUNCTION OF TRAMWAY ROAD & MANITOBA ST. N.E. TO REACH THE STATION FROM THE INTERSECTION OF MONTGOMERY BLVD. & TRAMWAY RD. GO NORTH ON TRAMWAY RD. 0.5 MI. TO MANITOBA ST. THE STATION IS ON THE NORTHSIDE OF MANITOBA ST. 100 FT. WEST OF THE ROAD JUNCTION. THE STATION MARK IS A STANDARD ACS BRASS TABLET, STAMPED "1-F22", SET IN TOP OF A CONCRETE POST PROJECTING 0.3' ABOVE GROUND ELEVATION = 5957.02 (MSLD 29).

LEGEND

- PROPOSED CURB & GUTTER
- EXISTING CURB & GUTTER
- FUTURE CURB & GUTTER
- PROPOSED SIDEWALK & WHEEL CHAIR RAMP
- PROPOSED CONCRETE VALLEY GUTTER
- PROPOSED EASEMENT LINE
- PROPERTY LINE
- 5925 EXISTING CONTOUR LINE
- 28 PROPOSED CONTOUR LINE
- x 5903.3 EXISTING SPOT ELEVATIONS
- ⊕ 96.4 AS-BUILT ELEVATIONS.
- ⊕ 25.0 PROPOSED SPOT ELEVATIONS
- TC 30.09 / FE 29.42 TOP OF CURB & FLOWLINE ELEVATIONS (PROPOSED)
- TEMPORARY ASPHALT PAVEMENT
- DRAINAGE BASIN BOUNDARY
- PROPOSED DRAINAGE SWALE
- DIRECTION OF FLOW

NO.	REVISIONS	BY	DATE
2	ADDED BASIN 'A' FOR POND VOLUME CALCULATION	DL	1-13-88
1	PROVIDED AS-BUILT POND GRADES PER C.O.A. SURVEY	DL	1-13-88

TRAMWAY RIDGE BUSINESS PARK
GRADING PLAN

RECEIVED JAN 14 1988 HYDROLOGY SECTION

REGISTERED PROFESSIONAL ENGINEER DENNIS A. LOBERG NEW MEXICO 9647

7-17-86 1-13-88 DL

ESPEY, HUSTON & ASSOC., INC.
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PHONE (505) 255-1625

DESIGNED BY J.T.O. DATE 6/17/85
DRAWN BY P.D. F.B.
CHECKED BY D.L. JOB NO. 8047
APPROVED BY D.L.

SHEET NO. 4 OF 15 SHEETS