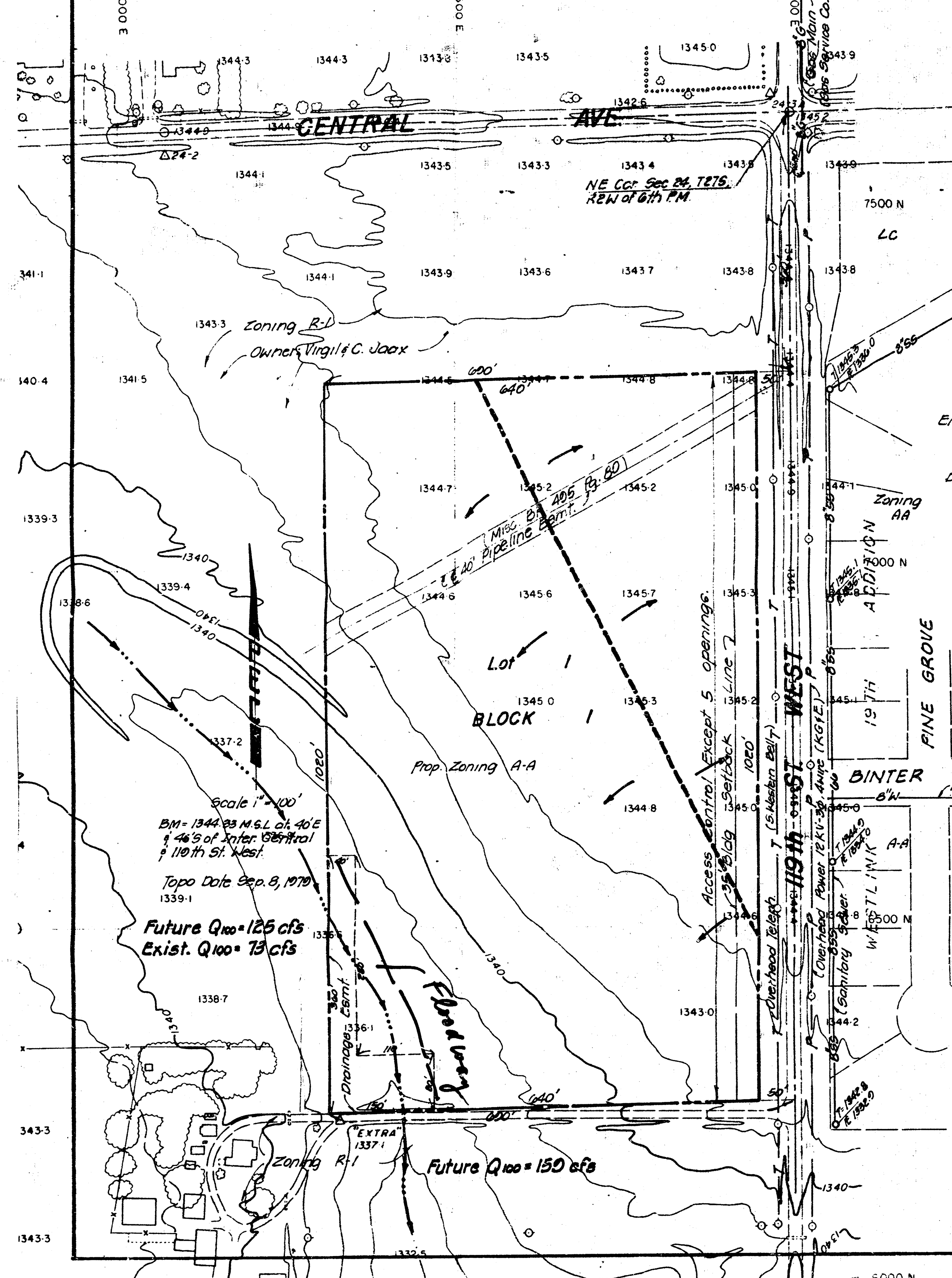
DRAINAGE PLAN
PRELIMINARY PLAT
ST. ELIZABETH ANN SETON ADD.
TO WICHITA, SEDGWICK COUNTY, KANSAS.
3-2-84

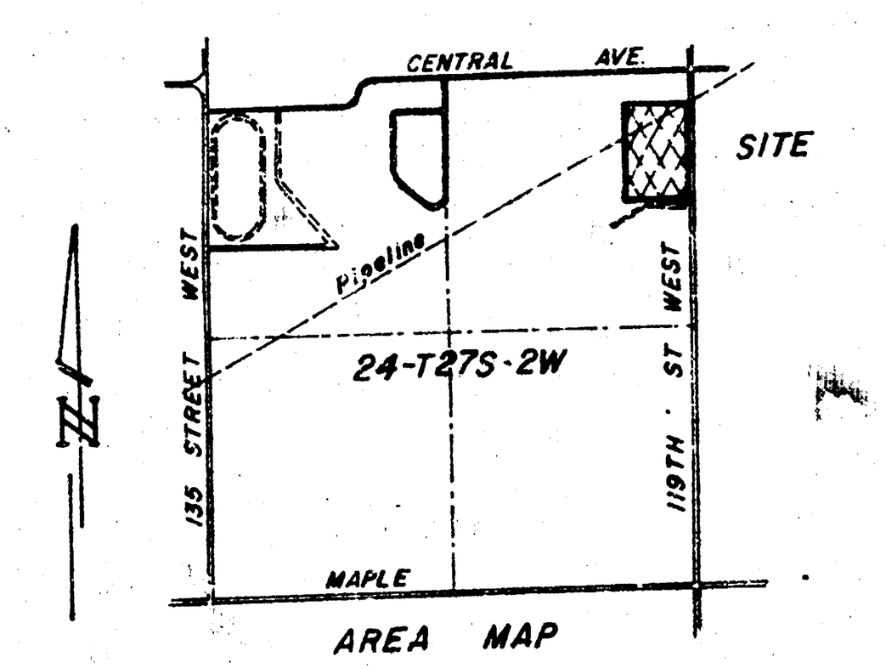


Owner: Catholic Diocese of Wichita
424 N Broadway
Wichita, Ks. 67202

Engineer: P.E.C.
1440 English
Wichita, Ks. 67211

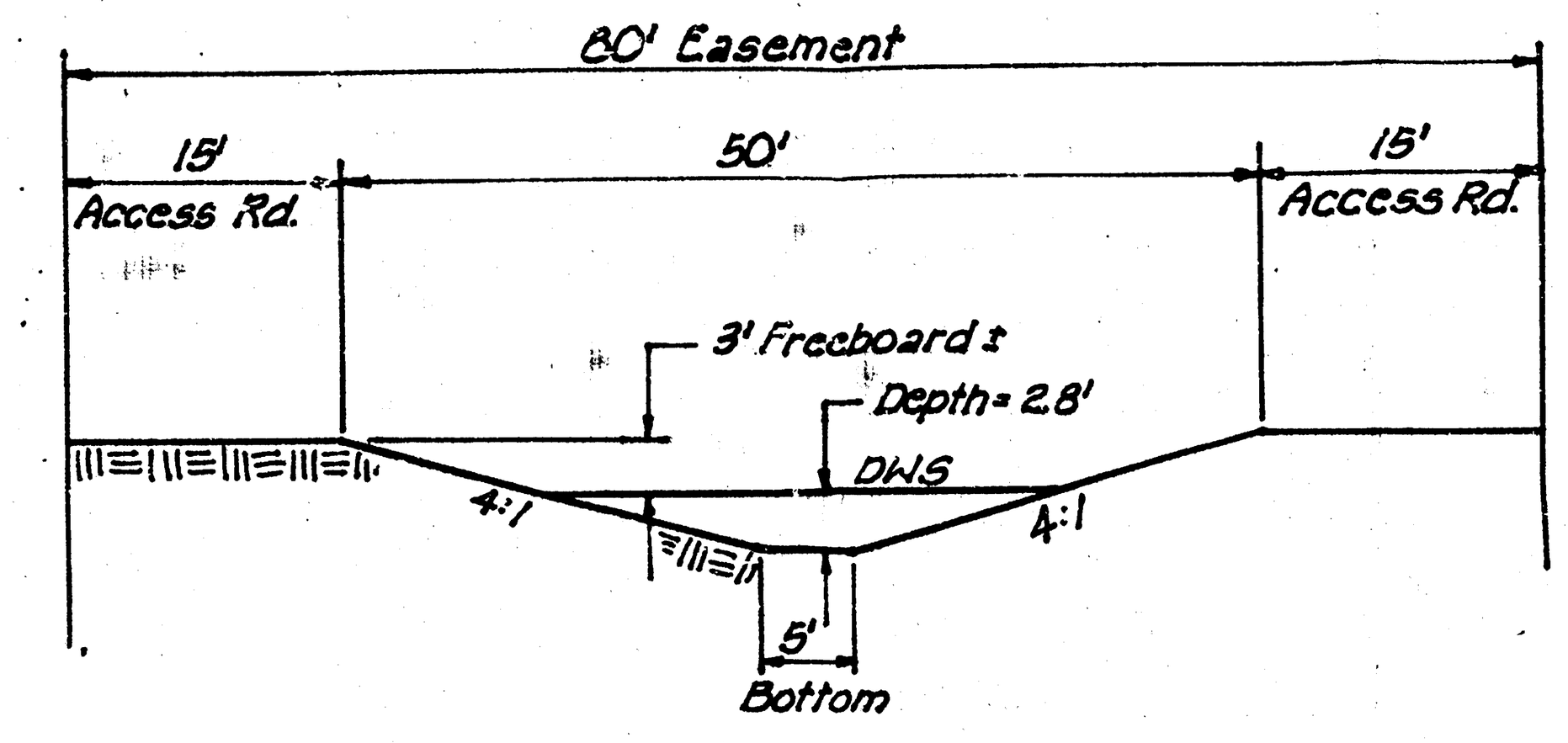
Date: Feb. 20, 1984

NOTE: The front of the lot shall be graded to drain to existing streets, ditches, gutters, and/or storm sewers via drives, flumes, private storm sewers and/or other approved drainage facilities. The rear of the lot shall be graded to the proposed drainage easement via drives, flumes, private storm sewers and/or other approved drainage facilities.



LEGEND

- DRAINAGE FLOW DIRECTION
- DRAINAGE BASIN BOUNDARY
- EXISTING DRAINAGE SWALE



TYPICAL SECTION

ST. ELIZABETH ANN SETON ADDITION
(Drainage)

MEMO

PROFESSIONAL ENGINEERING CONSULTANTS

TO: City of Wichita
Engineering Department
7th Floor - City Hall
455 N. Main
Wichita, KS 67202

ATTN: Chris Breiterstein, P. E.

PROJECT NO. 36-83697-1-[illegible]
PROJECT: St. Elizabeth Ann Seton Addition
DATE: February 24, 1984

COPIES TO:
File
Louise Olivarez, MAPD
Jim Weber, SCDPW

FROM: Charles S. Brown, P. E.
REFERENCE: Drainage Plan

PLEASE ADVISE IMMEDIATELY OF ANY MISCONCEPTIONS OR OMISSIONS YOU BELIEVE TO BE CONTAINED HEREIN

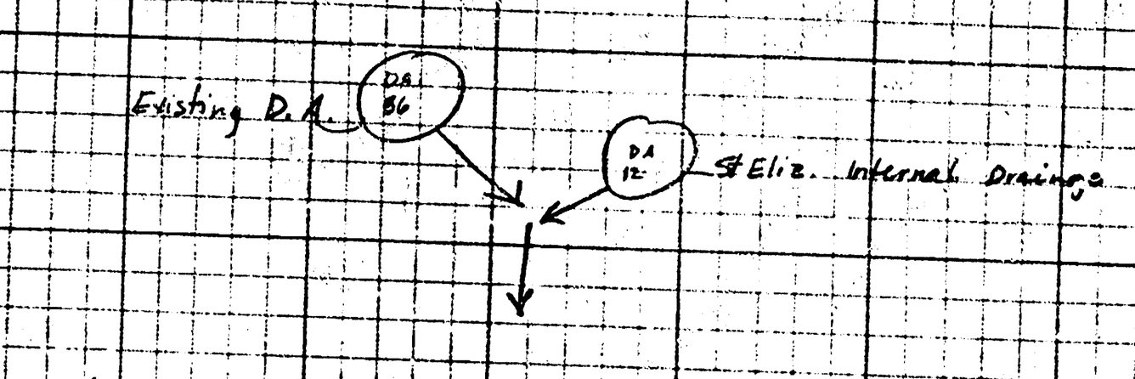
Transmitted herewith is one copy of the Drainage Plan and supporting calculations for the proposed St. Elizabeth Ann Seton Addition to Wichita, Kansas.

The preliminary plat will be submitted on March 2, 1984, for hearing by the Sub-Division Committee on March 15, 1984.

If you have any questions or need any additional information, please advise.

FEB [illegible] 1984
DESIGN DIVISION

Date February 16, 1984 Page 1 of 5
Project St. Elizabeth Addition
Item Drainage 36-83697-1-237



(I) DETERMINE Q of Existing D.A. (North & West)

Use Rational Formula $Q = CIA$

where $c = 0.35$
$A = 36$ Ac.

t_c = 500' @ 1% = 31 min
1500 @ 4 fps = 6 min
37

I_{100} = 5.76

$Q_{100} = 0.35 \times 5.76 \times 36$
= 73 cfs

$Q_2 = 0.35 \times 2.46 \times 36$
= 31 cfs

(II) DETERMINE Q of Proposed D.A. (North & West)

$Q = CIA$
$c = 0.5$
t_c = 300' @ 1% + 1600' @ 4 fps = 29 min
$I_{100} = 6.95$

$Q_{100} = 0.5 \times 6.95 \times 36$
= 125 cfs

$Q_2 = 0.5 \times 2.97 \times 36$
= 53 cfs

Date February 16, 1984 Page 2 of 5
Project St. Elizabeth Addition
Item Drainage

III DETERMINE RUNOFF FROM PROJECT SITE.

$Q = CIA$ where c = 1/3 @ 0.9 = .30
2/3 @ 0.3 = .20
0.50

t_c = 300' @ 1% + 800' @ 4 fps = 25 min
$I_{100} = 7.36$ A = 12 Ac.

$Q_{100} = 0.50 \times 7.36 \times 12$
= 44 cfs

$Q_2 = 0.50 \times 3.32 \times 12$
= 20 cfs

IV TOTAL Q SOUTH OF PROPERTY

A. Existing condition basin + proposed cond. @ church

73 cfs + $\frac{5.76}{7.36}$ (44)
= 73 + 34 = 107 cfs

B. Proposed condition basin + proposed condition @ church

125 + $\frac{5.76}{7.36}$ (44)
= 125 + 34
= 159 cfs

Date Feb. 16, 1984 Page 3 of 5
Project St. Elizabeth's Addition
Item Drainage

(IV) DETERMINE CHANNEL GEOMETRICS FOR VARIOUS RUNOFFS.

Use Manning's Equation

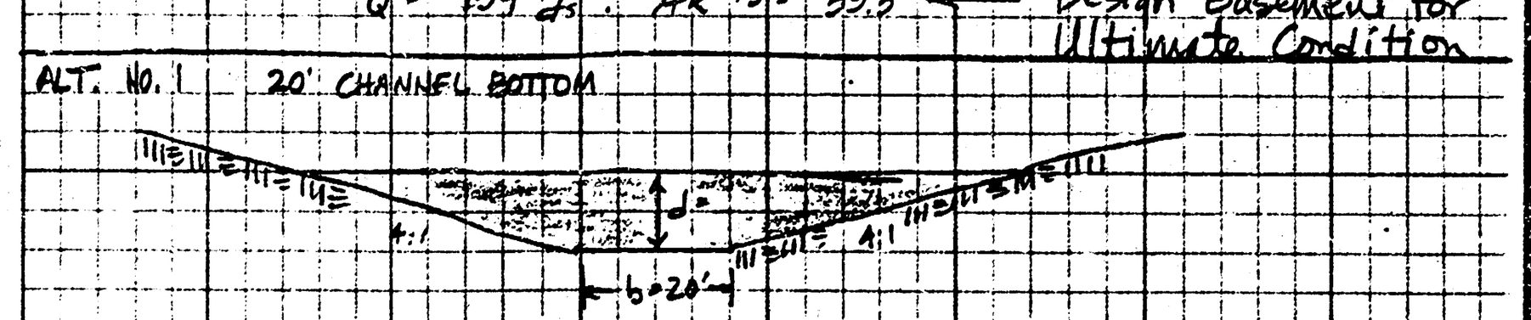
$Q = \frac{1.486}{n} AR^{2/3} s^{1/2}$ where n = 0.035, s = 0.4% ($\frac{10' \text{ drop}}{2800'}$)

$AR^{2/3} = \frac{Qn}{1.486(s^{1/2})} = Q\frac{0.035}{1.486(.0632)}$

$AR^{2/3} = 0.37267\,Q$

for Q = 73 cfs : $AR^{2/3}$ = 27.2
Q = 107 cfs : $AR^{2/3}$ = 39.9
Q = 125 cfs : $AR^{2/3}$ = 46.6
Q = 159 cfs : $AR^{2/3}$ = 59.3 ← Design Easement for Ultimate Condition

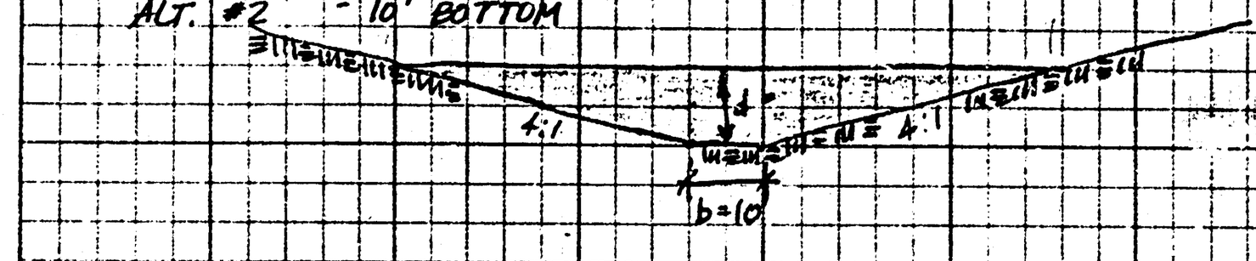
ALT. NO. 1 20' CHANNEL BOTTOM



d	A	P	R	$R^{2/3}$	$AR^{2/3}$
1.0	24.0	28.25	0.85	0.90	21.5
1.5	39.0	32.37	1.20	1.13	44.2
2.0	56.0	36.49	1.53	1.33	74.5

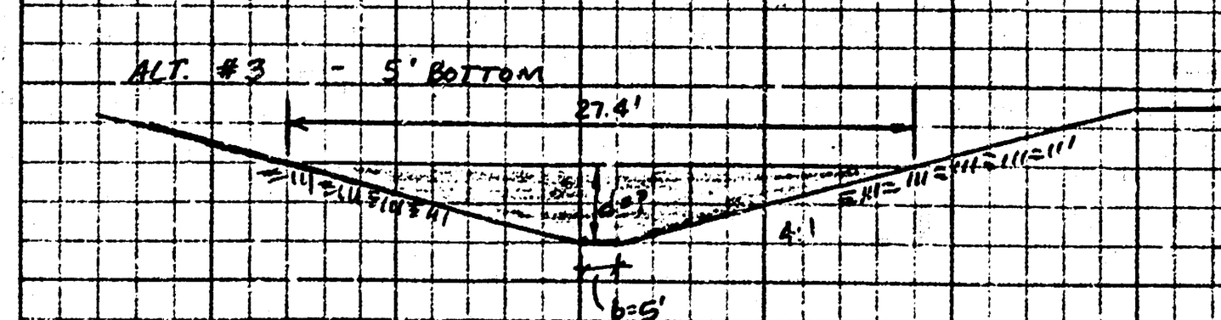
Date Feb 16, 1984 Page 4 of 5
Project St. Elizabeth
Item Drainage

ALT. #2 - 10' BOTTOM



d	A	P	R	$R^{2/3}$	$AR^{2/3}$
1.0	14.0	18.25	0.77	0.838	11.7
1.5	24.0	22.37	1.07	1.048	25.2
2.0	36.0	26.49	1.36	1.227	44.2
2.5	50.0	30.62	1.63	1.387	69.3

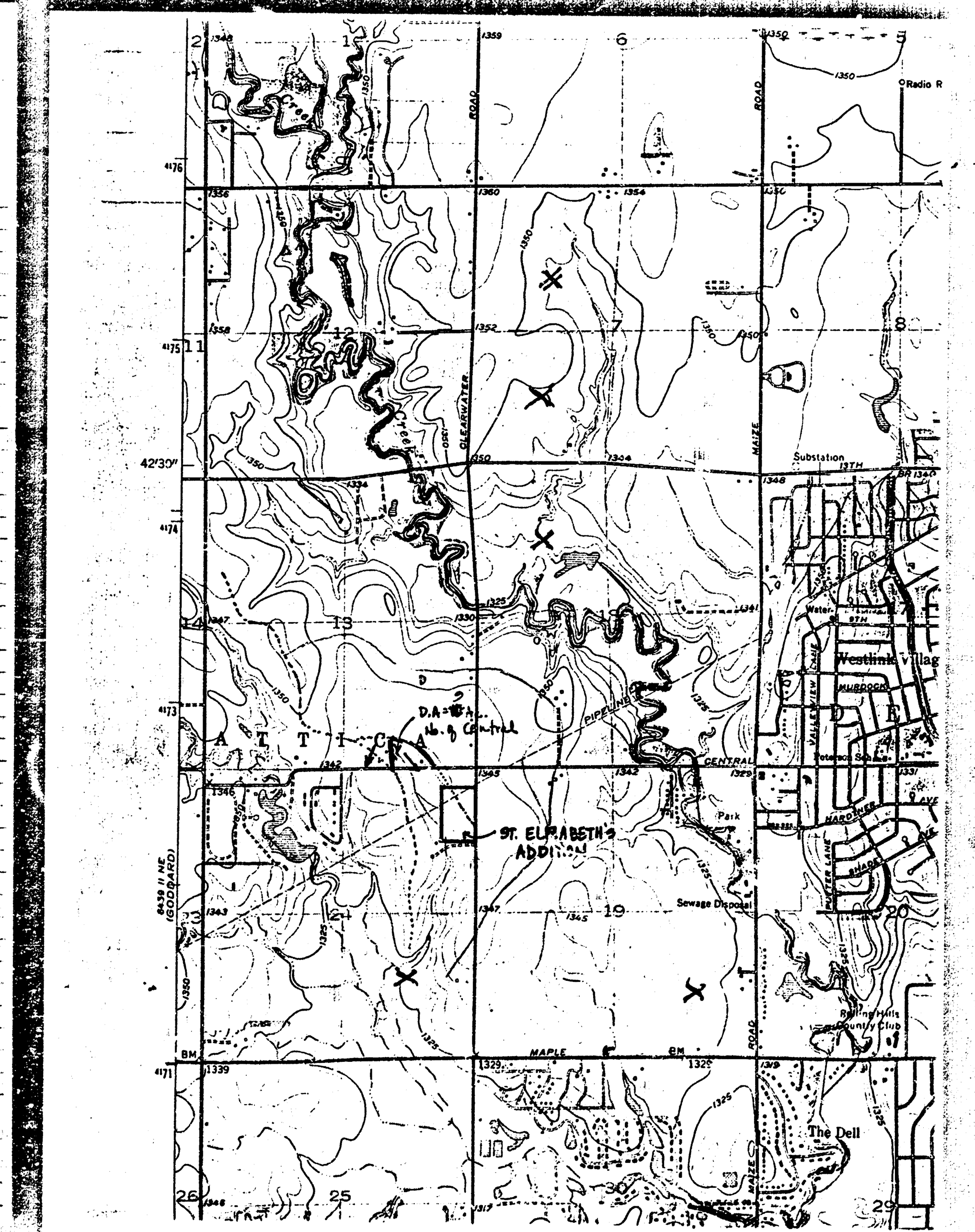
ALT. #3 - 5' BOTTOM



d	A	P	R	$R^{2/3}$	$AR^{2/3}$
2.0	26.0	21.49	1.21	1.138	29.5
2.5	37.5	25.62	1.46	1.289	48.3
3.0	51.0	29.74	1.71	1.432	73.1
→ 2.8	45.4	28.09	1.62	1.377	62.5 ← USE

VELOCITY = $\frac{159}{45.4}$ = 3.5 fps.

TOTAL ESMT = 27.4' + 3' × 4 × 2 (FREEBOARD) + 2 × 15 (ACCESS RD)



Page 1 of 3

RAINFALL INTENSITY TABLE

for

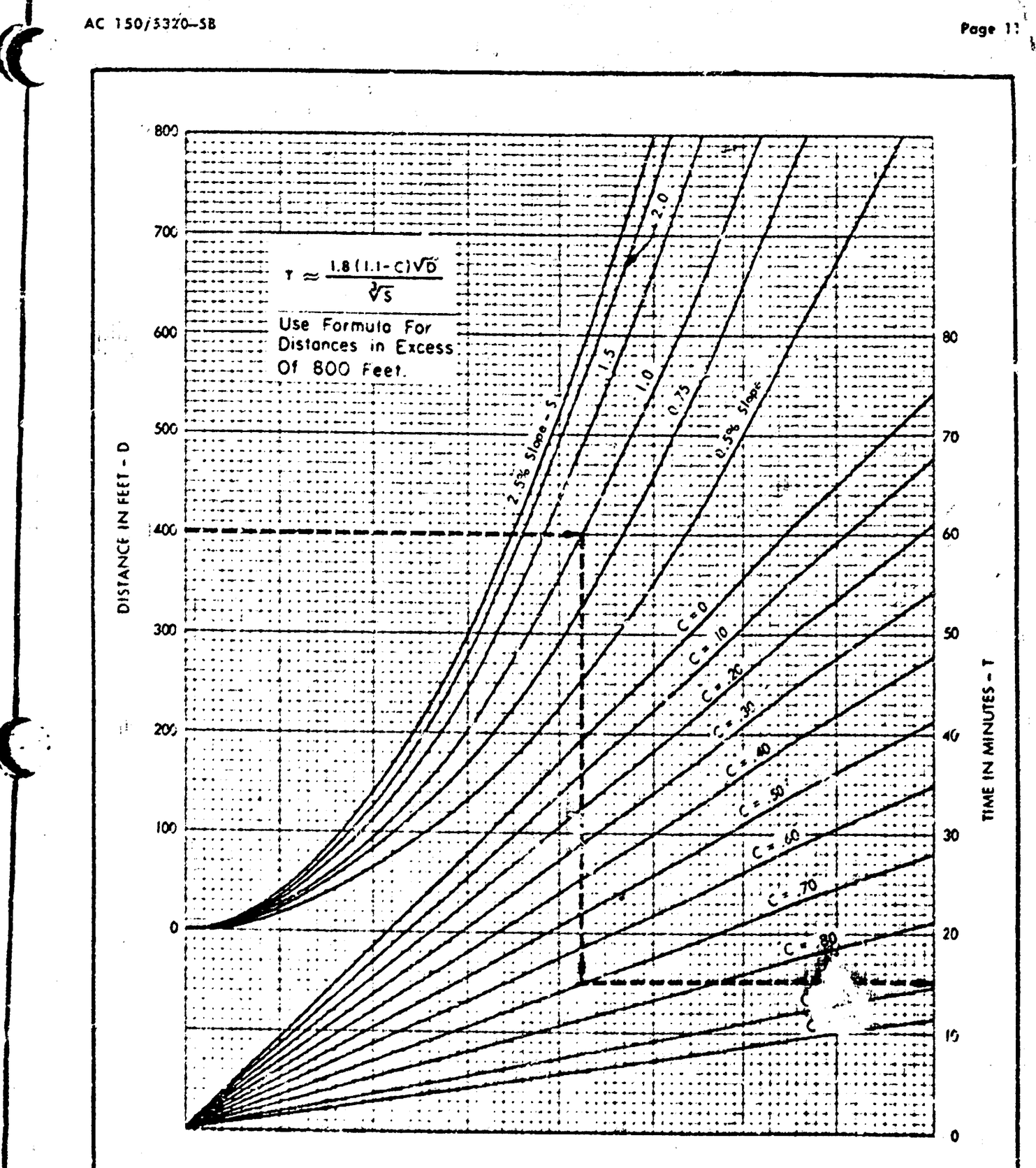
SEDGWICK COUNTY KANSAS

The following tabulation contains rainfall intensity in inches per hour as derived from ESSA Weather Bureau Technical Paper 40.

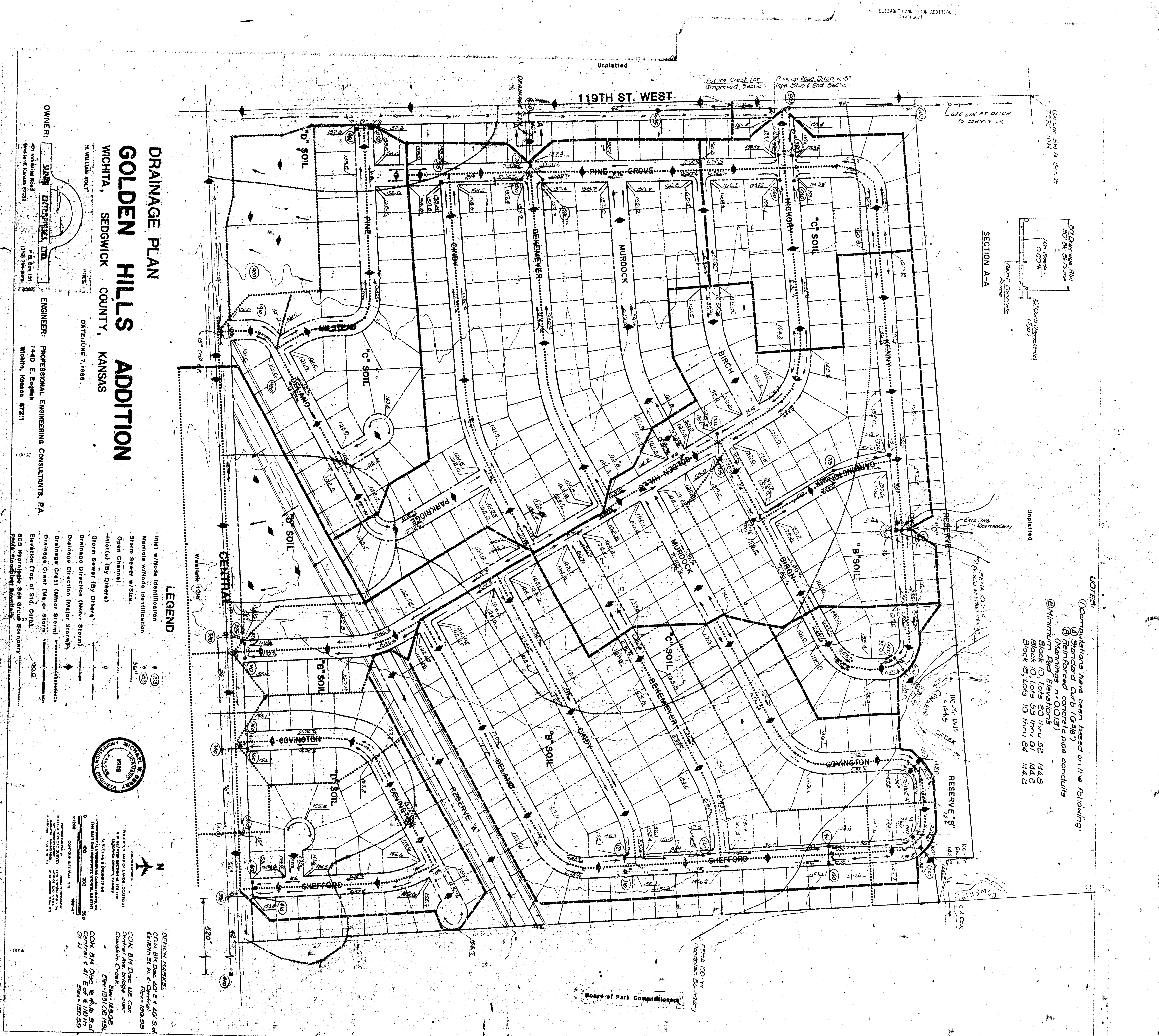
DURATION IN MINUTES	1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
			RETURN PERIODS OF				
5	4.67	6.23	8.00	9.34	10.67	12.23	13.79
6	4.35	5.80	7.45	8.70	9.94	11.39	12.84
7	4.09	5.46	7.02	8.19	9.36	10.72	12.09
8	3.88	5.18	6.66	7.77	8.89	10.18	11.48
9	3.71	4.95	6.36	7.43	8.49	9.72	10.96
10	3.56	4.75	6.11	7.13	8.15	9.33	10.52
11	3.43	4.58	5.89	6.87	7.85	8.99	10.14
12	3.32	4.43	5.69	6.64	7.59	8.69	9.80
13	3.21	4.29	5.51	6.43	7.35	8.42	9.50
14	3.12	4.17	5.36	6.25	7.14	8.18	9.23
15	3.04	4.06	5.21	6.08	6.95	7.97	8.98
16	2.96	3.96	5.09	5.93	6.78	7.77	8.76
17	2.90	3.86	4.97	5.79	6.62	7.59	8.55
18	2.83	3.78	4.86	5.67	6.48	7.42	8.37
19	2.77	3.70	4.76	5.55	6.34	7.27	8.19
20	2.72	3.63	4.66	5.44	6.22	7.12	8.03
21	2.67	3.56	4.57	5.34	6.10	6.99	7.88
22	2.62	3.49	4.49	5.24	5.99	6.86	7.74
23	2.57	3.43	4.41	5.15	5.89	6.74	7.60
24	2.53	3.38	4.34	5.07	5.79	6.63	7.48
25	2.49	3.32	4.27	4.99	5.70	6.53	7.36
26	2.45	3.23	4.21	4.91	5.61	6.43	7.25
27	2.42	3.13	4.15	4.84	5.53	6.33	7.14
28	2.38	3.05	4.09	4.77	5.45	6.25	7.04
29	2.35	2.97	4.02	4.68	5.38	6.16	6.95
30	2.32	2.89	3.92	4.56	5.31	6.08	6.79
31	2.29	2.82	3.82	4.44	5.19	6.00	6.62
32	2.26	2.75	3.73	4.33	5.07	5.87	6.45
33	2.24	2.68	[illegible]	4.23	4.95	5.73	6.30
34	2.19	2.62	3.55	4.13	4.83	5.60	6.16
35	2.14	2.57	3.47	4.04	4.73	5.47	6.02
36	2.09	2.51	3.40	3.95	4.62	5.35	5.89
37	2.05	2.46	3.33	3.87	4.52	5.23	5.76
38	2.00	2.41	3.26	3.79	4.43	5.13	5.64
39	1.96	2.36	3.19	3.71	4.34	5.02	5.53
40	1.92	2.32	3.13	3.64	4.26	4.92	5.42
41	1.89	2.27	3.07	3.57	4.18	4.83	5.32
42	1.85	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

DURATION IN MINUTES	RETURN PERIODS OF 1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
46	1.72	2.08	2.81	3.27	3.82	4.41	4.86
47	1.69	2.04	2.76	3.21	3.75	4.33	4.78
48	1.67	2.01	2.72	3.16	3.69	4.26	4.70
49	1.64	1.98	2.67	3.11	3.63	4.19	4.63
50	1.61	1.95	2.63	3.06	3.58	4.13	4.56
51	1.59	1.92	2.59	3.01	3.52	4.06	4.49
52	1.56	1.89	2.55	2.97	3.47	4.00	4.42
53	1.54	1.86	2.51	2.92	3.42	3.94	4.35
54	1.52	1.84	2.48	2.88	3.37	3.88	4.29
55	1.50	1.81	2.44	2.84	3.32	3.83	4.23
56	1.47	1.79	2.41	2.80	3.27	3.77	4.17
57	1.45	1.76	2.37	2.76	3.23	3.72	4.11
58	1.43	1.74	2.34	2.73	3.19	3.67	4.06
59	1.42	1.72	2.31	2.69	3.14	3.62	4.01
60	1.40	1.69	2.28	2.65	3.10	3.57	3.95
61	1.38	1.67	2.25	2.62	3.06	3.53	3.90
62	1.36	1.65	2.22	2.59	3.02	3.48	3.85
63	1.34	1.63	2.20	2.55	2.99	3.44	3.81
64	1.33	1.61	2.17	2.52	2.95	3.40	3.76
65	1.31	1.59	2.14	2.49	2.92	3.35	3.71
66	1.30	1.57	2.12	2.46	2.88	3.31	3.67
67	1.28	1.56	2.09	2.44	2.85	3.27	3.63
68	1.26	1.54	2.07	2.41	2.81	3.24	3.59
69	1.25	1.52	2.05	2.38	2.78	3.20	3.54
70	1.24	1.50	2.02	2.35	2.75	3.16	3.51
71	1.22	1.49	2.00	2.33	2.72	3.13	3.47
72	1.21	1.47	1.98	2.30	2.69	3.09	3.43
73	1.20	1.46	1.96	2.28	2.66	3.06	3.39
74	1.18	1.44	1.94	2.25	2.63	3.03	3.36
75	1.17	1.43	1.92	2.23	2.61	3.00	3.32
76	1.16	1.41	1.90	2.21	2.58	2.96	3.29
77	1.15	1.40	1.88	2.18	2.55	2.93	3.25
78	1.13	1.38	1.86	2.16	2.53	2.90	3.22
79	1.12	1.37	1.84	2.14	2.50	2.88	3.19
80	1.11	1.36	1.82	2.12	2.48	2.85	[illegible]
81	1.10	1.34	1.81	2.10	2.46	2.82	3.13
82	1.09	1.33	1.79	2.08	2.43	2.79	3.10
83	1.08	1.32	1.77	2.06	2.41	2.76	3.07
84	1.07	1.31	1.75	2.04	2.39	2.74	3.04
85	1.06	1.30	1.74	2.02	2.37	2.71	3.01
86	1.05	1.28	1.72	2.00	2.34	2.69	2.99
87	1.04	1.27	1.71	1.99	2.32	2.66	2.96
88	1.03	1.26	1.69	1.97	2.30	2.64	2.93
89	1.02	1.25	1.68	1.95	2.28	2.62	2.91
90	1.01	1.24	1.66	1.93	2.26	2.59	2.88

DURATION IN MINUTES	RETURN PERIODS OF 1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
91	1.00	1.23	1.65	1.92	2.24	2.57	2.86
92	1.00	1.22	1.63	1.90	2.22	2.55	2.83
93	0.99	1.21	1.62	1.89	2.20	2.53	2.81
94	0.98	1.20	1.61	1.87	2.19	2.51	2.79
95	0.97	1.19	1.59	1.85	2.17	2.49	2.76
96	0.96	1.18	1.58	1.84	2.15	2.46	2.74
97	0.96	1.17	1.57	1.82	2.13	2.44	2.72
98	0.95	1.16	1.56	1.81	2.12	2.42	2.70
99	0.94	1.15	1.54	1.80	2.10	2.41	2.67
100	0.93	1.14	1.53	1.78	2.08	2.39	2.65
101	0.93	1.13	1.52	1.77	2.07	2.39	2.65
102	0.92	1.13	1.51	1.75	2.05	2.35	2.61
103	0.91	1.12	1.50	1.74	2.04	2.33	2.59
104	0.90	1.11	1.49	1.73	2.02	2.31	2.57
105	0.90	1.10	1.47	1.72	2.01	2.30	2.55
106	0.89	1.09	1.46	1.70	1.99	2.28	2.54
107	0.88	1.09	1.45	1.69	1.98	2.26	2.52
108	0.88	1.08	1.44	1.68	1.96	2.25	2.50
109	0.87	1.07	1.43	1.67	1.95	2.23	2.48
110	0.87	1.06	1.42	1.65	1.93	2.21	2.46
111	0.86	1.06	1.41	1.64	1.92	2.20	2.45
112	0.85	1.05	1.40	1.63	1.91	2.18	2.43
113	0.85	1.04	1.39	1.62	1.89	2.17	2.41
114	0.84	1.03	1.38	1.61	1.88	2.15	2.40
115	0.84	1.03	1.37	1.60	1.87	2.14	2.38
116	0.83	1.02	1.36	1.59	1.86	2.12	2.36
117	0.82	1.01	1.36	1.58	1.84	2.11	2.35
118	0.82	1.01	1.35	1.57	1.83	2.09	2.33
119	0.81	1.00	1.34	1.56	1.82	2.08	2.32
120	0.81	0.99	1.33	1.55	1.81	2.07	2.30
121	0.80	0.99	1.32	1.54	1.80	2.05	2.29
122	0.80	0.98	1.31	1.53	1.79	2.04	2.27
123	0.79	0.97	1.30	1.52	1.77	2.03	2.26
124	0.79	0.97	1.30	1.51	1.76	2.01	2.24
125	0.78	0.96	1.29	1.50	1.75	2.00	2.23
126	0.78	0.96	1.28	1.49	1.74	1.99	2.22
127	0.77	0.95	1.27	1.48	1.73	1.98	2.20
128							
129							
130							
131							
132							
133							
134							
135							



ST. ELIZABETH ANN SETON ADDITION (Drainage)


DRAINAGE PLAN
GOLDEN HILLS ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS
DATE: JUNE 7, 1985
OWNER: SUNNY ENTERPRISES, LTD.
491 Industrial Road
Goddard, Kansas 67052
P.O. Box 131
(316) 794-8625
M. WILLIAM SOLT PRES.
ENGINEER: PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
1440 E. English
Wichita, Kansas 67211
LEGEND
Inlet w/Node Identification
Manhole w/Node Identification
Storm Sewer w/Size
Open Channel
Inlet(s) (By Others)
Storm Sewer (By Others)
Drainage Direction (Minor Storm)
Drainage Direction (Major Storm)
Drainage Crest (Minor Storm)
Drainage Crest (Major Storm)
Elevation (Top of Std. Curb)
SCS Hydrologic Soil Group Boundary
FEMA Floodplain Boundary
NOTES:
1) Computations have been based on the following:
A) Standard Curb (Q 5/8")
B) Reinforced concrete pipe conduits (Mannings n=0.013)
2) Minimum Pad Elevations:
Block 10, Lots 20 thru 52 144.8
Block 10, Lots 53 thru 61 144.2
Block 12, Lots 10 thru 24 144.2
Unplatted
119TH ST. WEST
PINE GROVE
HICKORY
BEKEMEYER
MURDOCK
BIRCH
KENNY
GOLDEN HILLS
PARKRIDGE
DARRINGTON
CENTRAL
COVINGTON
SHEFFORD
RESERVE "A"
RESERVE "B"
RESERVE "C"
SECTION A-A
EXISTING DRAINAGEWAY
FEMA 100-Yr Floodplain Boundary
COWSKIN CREEK
Board of Park Commissioners