

LINDSAY'S ORCHARD DRAINAGE

SOIL TYPE: B - FROM SEDAWICK COUNTY SOIL SURVEY

FRONT YARD AREAS:
C₂ = .52
C₁₀₀ = .67

BACK YARD AREAS:
C₂ = .25
C₁₀₀ = .41

T_c
AREAS C, D, E, F, I, J T_c = 15

A₁₀

219' LAWN OVERLAND FLOW @ .28% $\Rightarrow$ 13.03 min
330' SHALLOW GUTTER FLOW @ .774% $\Rightarrow$ 6.49 min
320' FULL GUTTER FLOW @ 1.54% $\Rightarrow$ 5.56 min
USE 23 min

200' LAWN OVERLAND FLOW @ .284% $\Rightarrow$ 17.81 min
100' PAVED WATERWAY FLOW @ 1.54% $\Rightarrow$ 2.31 min
USE 20 min

A₁₀
45' LAWN OVERLAND FLOW @ .28% $\Rightarrow$ 2.68 min
330' SHALLOW GUTTER FLOW @ .774% $\Rightarrow$ 6.49 min
440' FULL GUTTER FLOW @ 1.54% $\Rightarrow$ 5.44 min
USE 15 min

INLET ROUTING

AREA A Q₂ = 7.66 cfs Q₁₀₀ = 18.98
INLET ① Q₂ = 7.66 cfs
Q₁ = 1.92 cfs
Q₁₀₀ = 5.74 cfs

AREA B Q₂ = 3.21 cfs Q₁₀₀ = 9.34 cfs
INLET ② Q₂ = 3.21 cfs
Q₁ = 8.95 cfs
2 L' 10' INLETS, SUMP @ 26 cfs/cap = 52 cfs cap. Inlets ③ & ④

INLETS COLLECT ALL Q

AREA C Q₂ = .54 cfs Q₁₀₀ = 1.69 cfs
INLET ⑤ DROP INLET
552.25' = 3.84 ft
Q₁ = .6 A (2.5%) = .6 (3.84) 21(52.7)(11.4)
Q₁₀₀ = 18.49 cfs > Q₁₀₀

AREA D Q₂ = 5.77 cfs Q₁₀₀ = 14.30

2 L' 10' INLETS, SUMP @ 26 cfs/cap = 52 cfs cap. Inlet ⑥ & ⑦

INLETS COLLECT ALL Q

AREA E Q₂ = .69 cfs Q₁₀₀ = 2.18 cfs

INLET ⑧ DROP INLET Cap = 18.49 cfs > 2.18 cfs ok

AREA F Q₂ = .91 cfs Q₁₀₀ = 2.56 cfs
INLET ⑨ 3.94 ft = 1.29 min = 3.94 ft 21(32.7)(1.7)(2)
Cap = 21.4 cfs > 2.56 cfs ok

AREA G Q₂ = 2.40 cfs Q₁₀₀ = 6.23 cfs

INLET ⑩ DROP INLET Cap = 18.49 > 6.23 cfs ok

AREA H Q₂ = .36 cfs Q₁₀₀ = 1.13 cfs

INLET ⑪ DROP INLET Cap = 18.49 > 1.13 cfs

AREA I Q₂ = .70 cfs Q₁₀₀ = 2.39 cfs

INLET ⑫ 3.94 ft = 1.29 min = 3.94 ft 21(32.7)(1.7)(2)
Cap = 21.4 cfs > 2.39 cfs

Sheet

LINDSAY'S ORCHARD
SOIL TYPE: B

8/7/97

2-year Design Storm

	Area (ac)	T _c	i	c	Q
A	3.844189	15	3.83	0.52	7.656086
B	1.992497	23	3.1	0.52	9.408737
A+B	5.836685			0.25	0.53661
C	0.580428	15	3.83	0.52	5.770815
D	2.897577	15	3.83	0.52	0.689837
E	0.720457	15	3.83	0.25	0.810726
F	0.847111	15	3.83	0.52	2.464674
G	1.423351	20	3.42	0.52	5.012482
H	2.818535	19	3.83	0.25	0.357304
I	0.373163	15	3.83	0.25	0.757059
J	0.790862	15	3.83	0.25	0.757059

100-year Design Storm

	Area (ac)	T _c	i	c	Q
A	3.844189	15	7.37	0.67	18.98222
B	1.992497	23	6.13	0.67	23.97185
A+B	5.836685			0.41	1.693445
C	0.580428	15	7.37	0.67	14.30795
D	2.897577	15	7.37	0.41	2.177005
E	0.720457	15	7.37	0.41	2.555207
F	0.847111	15	6.53	0.67	6.227302
G	1.423351	20	6.68	0.67	12.01463
H	2.818535	19	7.37	0.41	1.127587
I	0.373163	15	7.37	0.41	2.389144
J	0.790862	15	7.37	0.41	2.389144

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2-year Storm Contained in Curb

17'

$$A = 5.02 \text{ ft}^2$$

$$R = 1.253$$

$$V = \frac{1.49}{0.013} \left(\frac{2.55 \times 10^7}{5.02} \right)^{1/4} (0.0035)^{1/2} = 1.932$$

$$V \cdot A = 4.6633 \times 2 = 9.33 \text{ cfs}$$

100 year Storm

17'

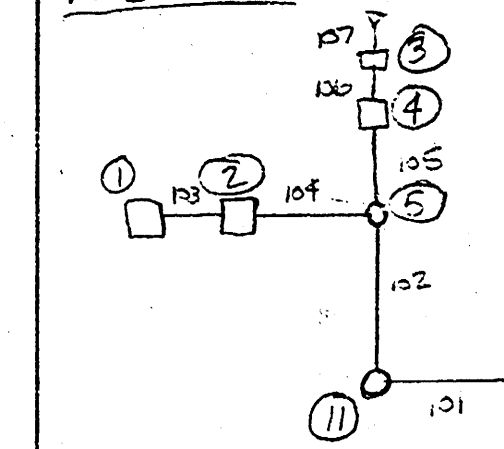
$$V = \frac{1.49}{0.013} \left(\frac{12.37}{32.55} \right)^{1/4} (0.0035)^{1/2} = 2.7262$$

$$n = \frac{15(0.8) + 25(1.755)}{32.55} = 0.023$$

$$V \cdot A = 27.5 \times 2 = 55.01 \text{ cfs}$$

$$A = 12.37 \text{ ft}^2$$

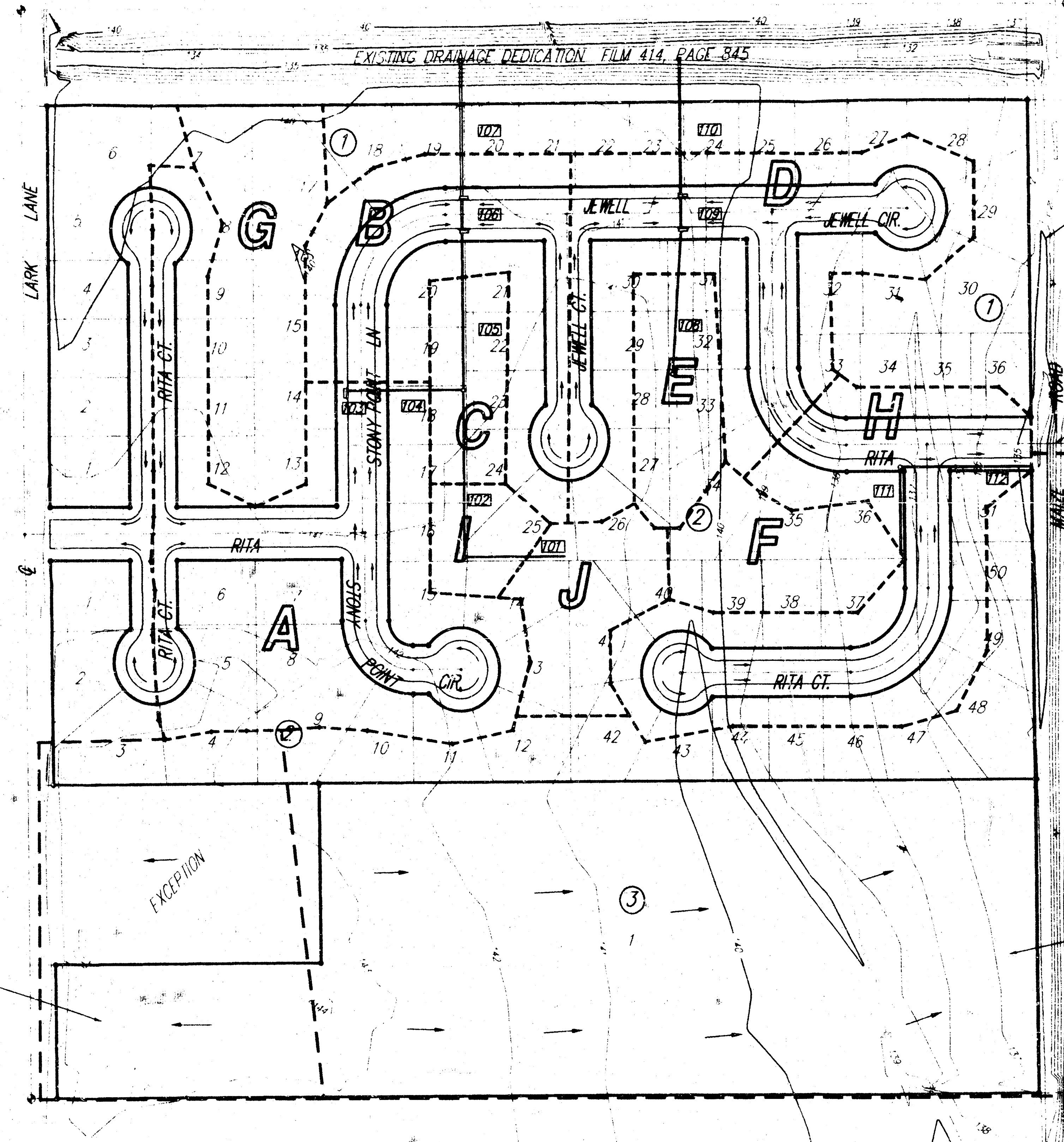
PIPE SIZES



101 - 2.39 cfs $\Rightarrow$ 15"
102 - 3.52 cfs $\Rightarrow$ 15"
103 - 1.67 cfs $\Rightarrow$ 15"
104 - 3.39 cfs $\Rightarrow$ 15"
105 - 8.55 cfs $\Rightarrow$ 21"
106 - 21.21 cfs $\Rightarrow$ 30"
107 - 34.03 cfs $\Rightarrow$ 36" or 30"

108 - 2.17 cfs $\Rightarrow$ 15"
109 - 9.32 cfs $\Rightarrow$ 21"
110 - 16.47 cfs $\Rightarrow$ 24"

111 - 2.56 cfs $\Rightarrow$ 15"
112 - 2.56 cfs $\Rightarrow$ 15"



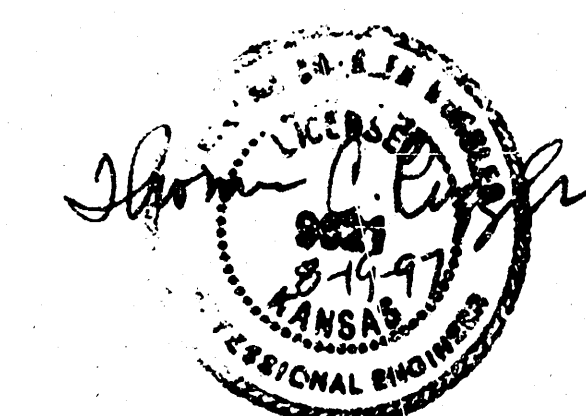
Area (ac)	Tc	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{64}$	$\frac{1}{128}$	$\frac{1}{256}$
A 3.84	15	3.83	7.37	0.52	0.67	7.66	18.99		
B 1.99	15	3.83	7.37	0.52	0.67	3.97	9.84		
C 0.56	15	3.83	7.37	0.25	0.41	0.54	1.69		
D 2.90	15	3.83	7.37	0.52	0.67	5.77	14.31		
E 0.72	15	3.83	7.37	0.25	0.41	0.69	2.18		
F 0.85	15	3.83	7.37	0.25	0.41	0.81	2.56		
G 1.42	20	3.33	6.53	0.52	0.67	2.46	6.23		
H 2.82	19	3.42	6.88	0.52	0.67	5.01	12.61		
I 0.37	15	3.83	7.37	0.25	0.41	0.36	1.13		
J 0.79	15	3.83	7.37	0.25	0.41	0.76	2.39		

Pipe	Size	Q (cfs)	Grade
101	15"	2.39	0.50%
102	15"	3.52	0.50%
103	15"	1.67	0.50%
104	15"	3.34	0.50%
105	21"	8.55	0.50%
106	30"	21.29	0.50%
107	30"	34.03	0.50%
108	15"	2.17	0.50%
109	21"	9.32	0.50%
110	24"	16.47	0.50%
111	15"	2.56	0.50%
112	15"	2.56	0.50%

A = 3.28 ac.
Tc = 23 min.
 $\frac{1}{100}$ = 6.13 in./hr
 C_{100} = 41
 Q_{100} = 8.2 cfs

A = 10.65 ac.
Tc = 31 min.
 $\frac{1}{100}$ = 5.32 in./hr
 C_{100} = 41
 Q_{100} = 23.2 cfs

SCALE: 1" = 100'



DRAINAGE PLAN
LINDSAY'S ORCHARD
WICHITA, KANSAS

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 Wichita, Kansas 67203
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 Fax: 313-4471
 E-mail: srbs@earthlink.net

SAVOY, RUGGLES & BOHM, P.A.
 ENGINEERING & SURVEYING
 PROJECT NUMBER: _____
 DATE: Aug. '08, 1997

DESIGN: CMB
 DRAWN: AML
 CHECKED: _____
 DATE: _____

REVISION: _____
 DATE: _____
 BY: _____

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