Mary Ridge

Stormwater Runoff Information

1. Area of Tract: 15.09 Ac

Pre-developed land use: Unimproved, 5% Impervious

Post-developed land use: SFR PUD, 20% Impervious

2. Run-Off Estimates

Pre-developed:

25 Year: $Q = P1 \times A$

$Q = 2.31 \times 15.09$ Ac

$Q = 34.86$ cfs

Post-developed:

25 Year: $Q = P1 \times A$

$Q = 2.71 \times 15.09$ Ac

$Q = 40.89$ cfs

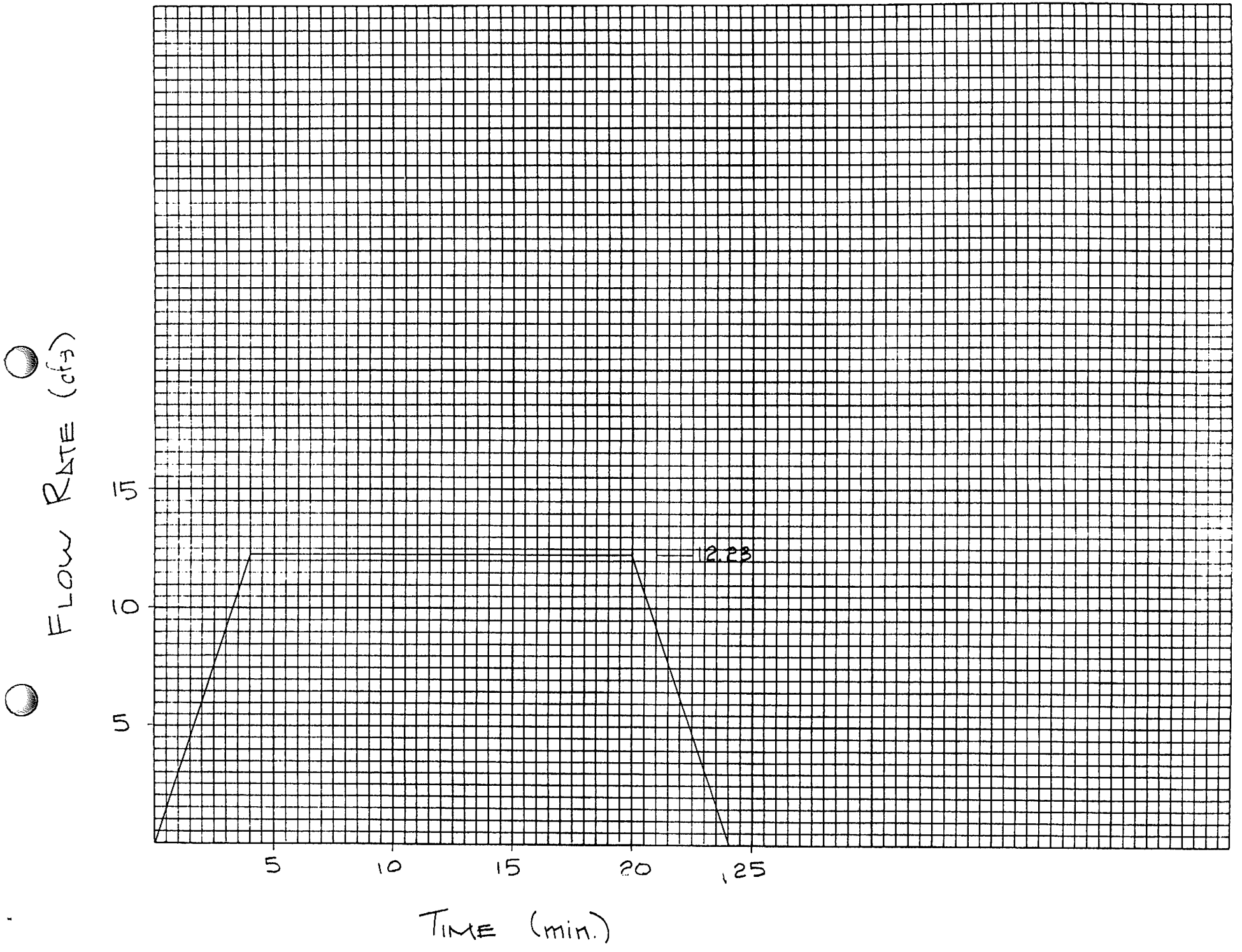
Estimate of Runoff Increase:

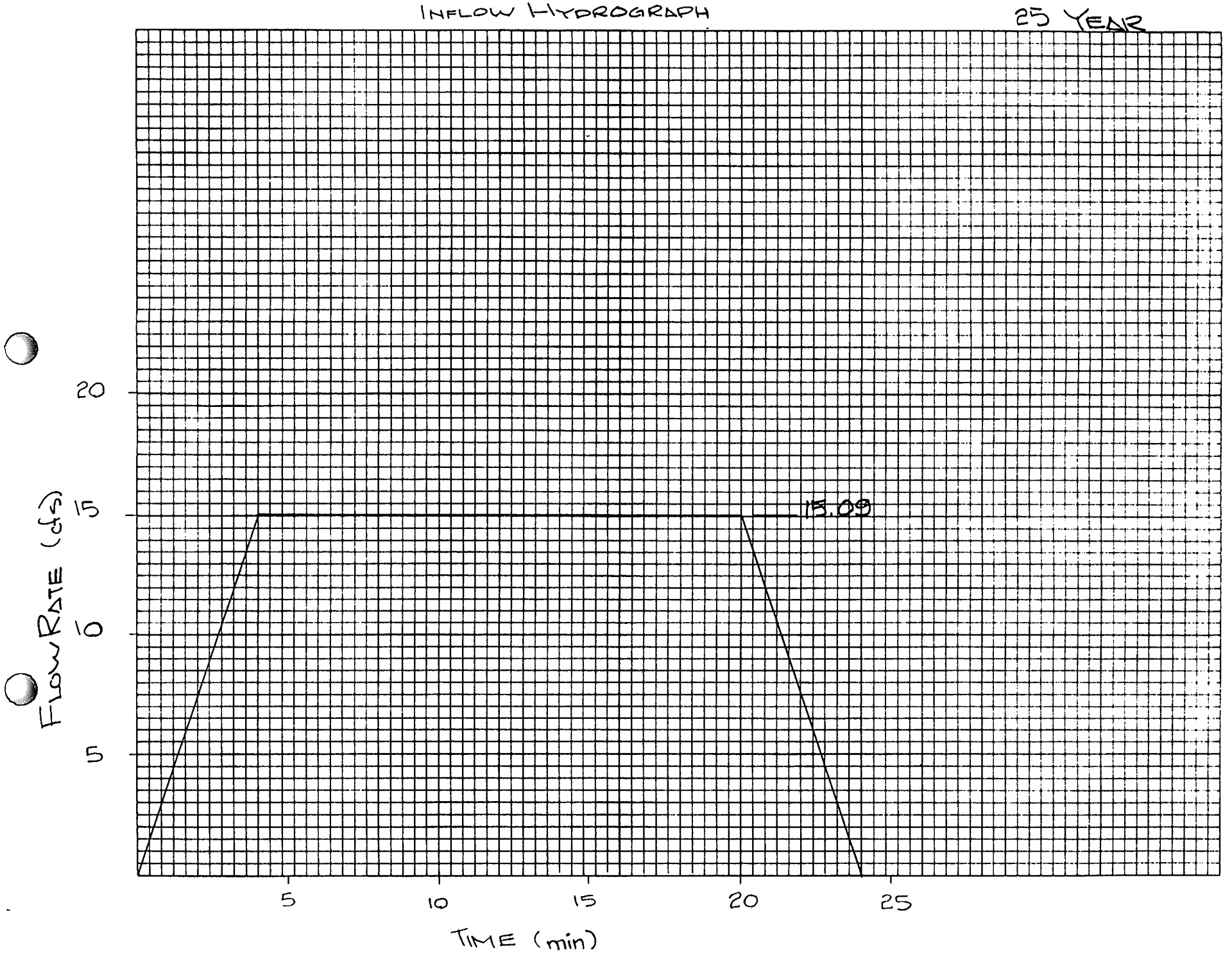
25 Year: Increase $\cong 40.89 - 34.86 \cong 6.03$ cfs

$\therefore$ Minimum Attenuation Required: 6.03 cfs

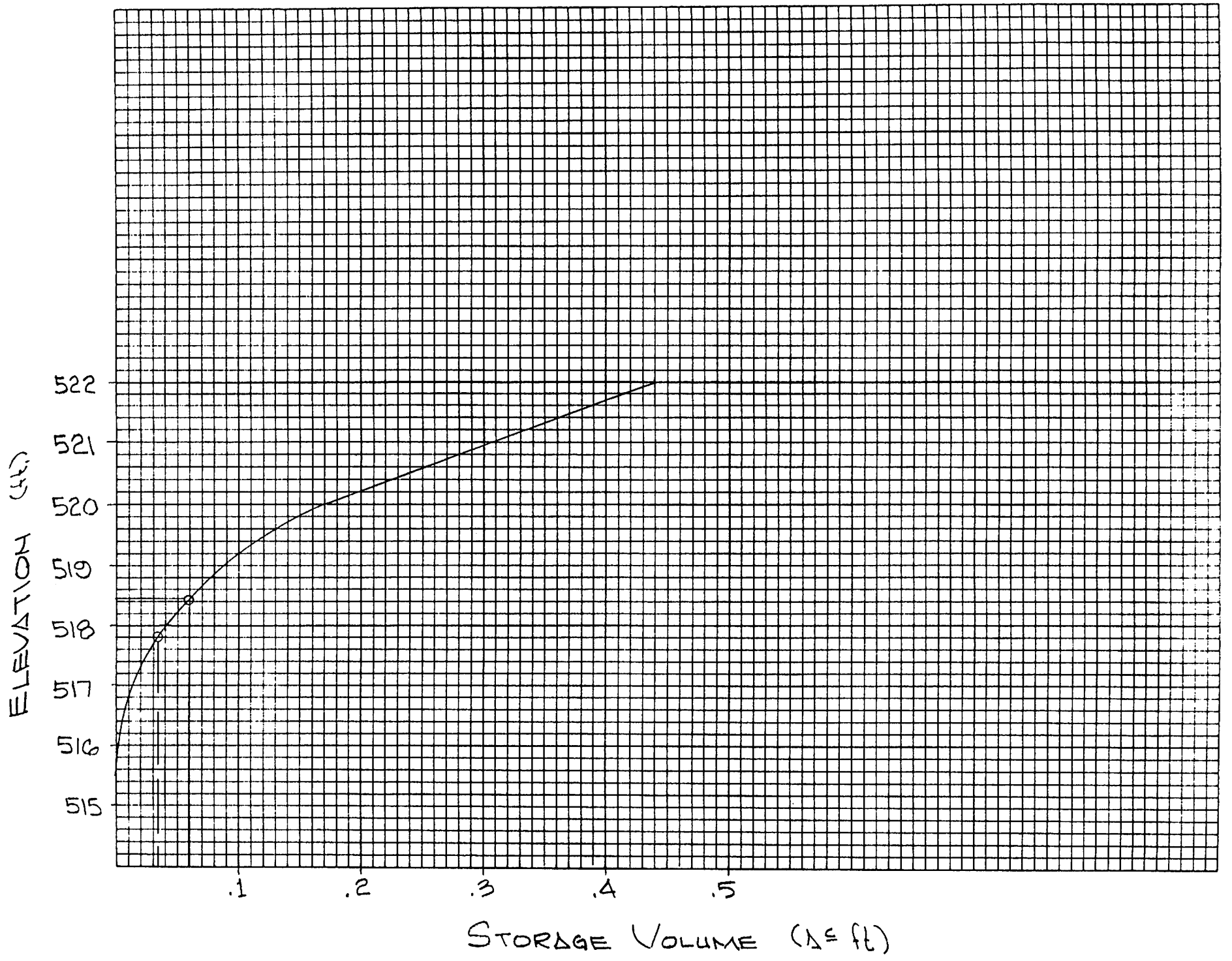
Peak Inflow $\cong 2.58 \times 5.85 = 15.09$

INFLOW HYDROGRAPH 15 YEAR




INFLOW HYDROGRAPH
25 YEAR
20
15
10
5
15.09
FLOW RATE (cfs)
5
10
15
20
25
TIME (min)

DEPTH-STORAGE VOLUME

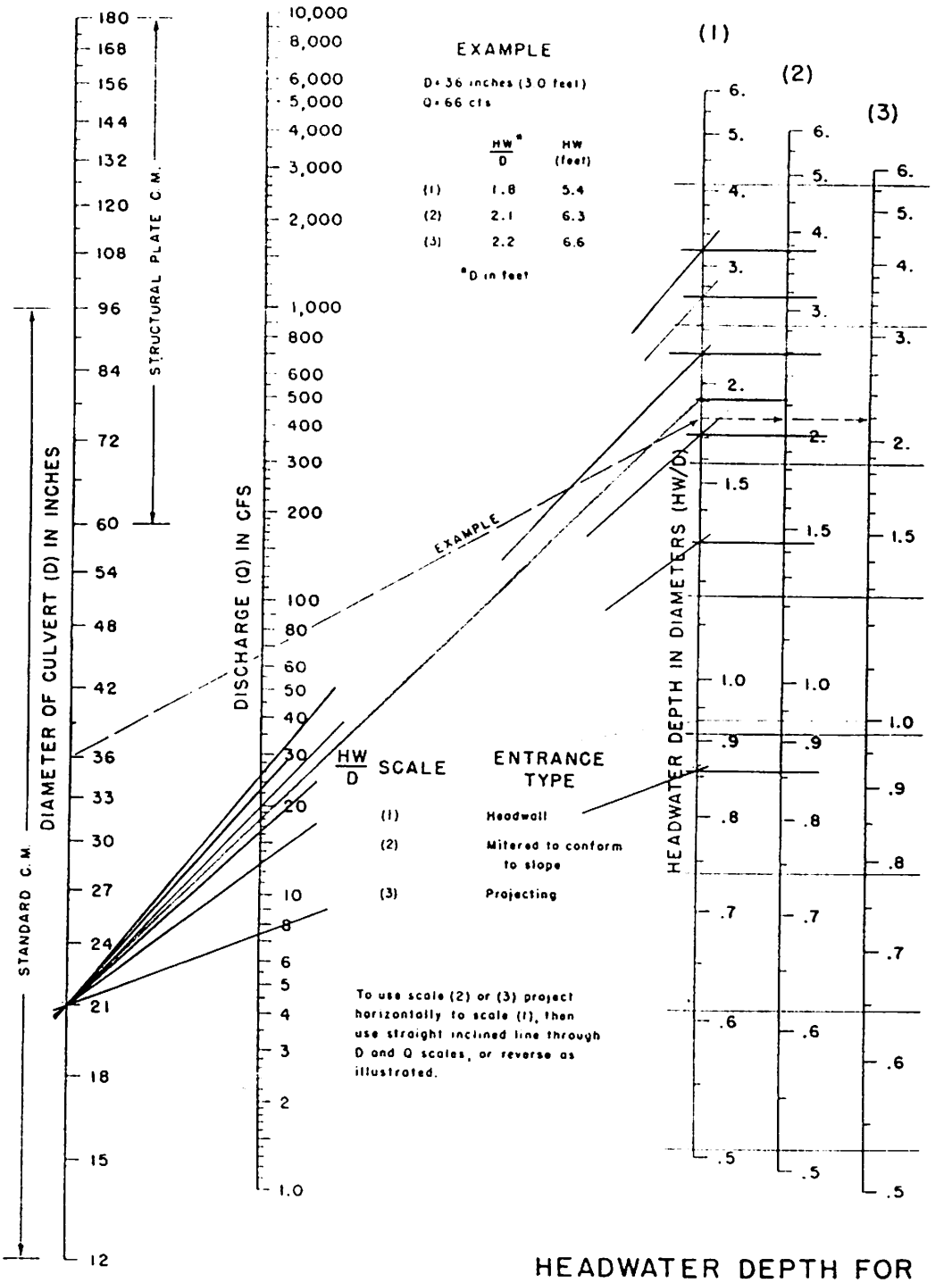


21" CMP FE @ 515.5

℄ pipe @ 516.4

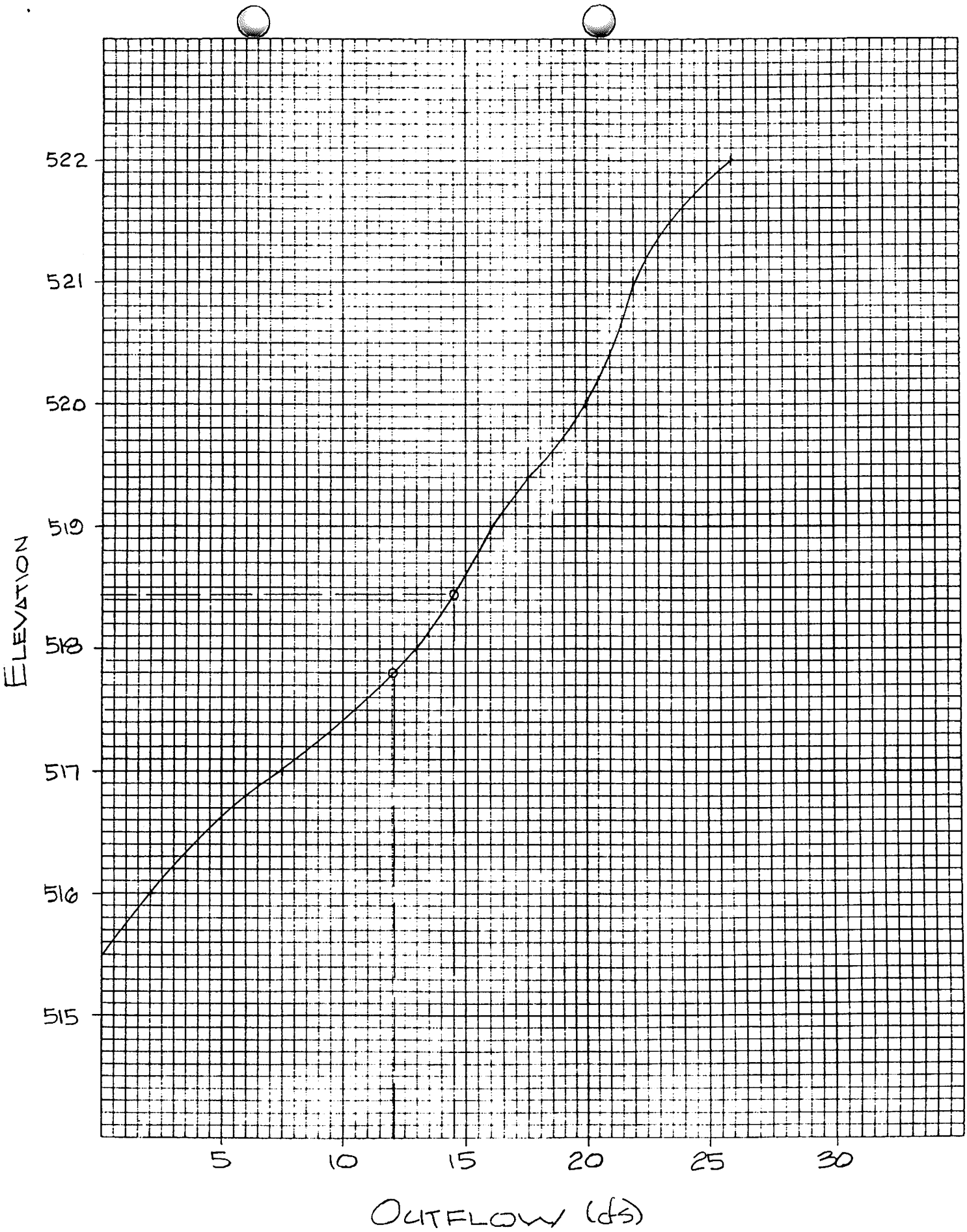
Ponding Elev.	HW	HW/D	Q_{out}
515.5	0	0	0
516.0	0.5	0.29	2.0
517.0	1.5	0.86	7.5
518.0	2.5	1.43	13.0
519.0	3.5	2.0	16.0
520.0	4.5	2.57	20.0
521.0	5.5	3.14	22.0
522.0	6.5	3.71	26.0

CHART 5



HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN 1963


522
521
520
519
518
517
516
515
ELEVATION
5
10
15
20
25
30
OUTFLOW (cfs)

Routing Curve Calculations

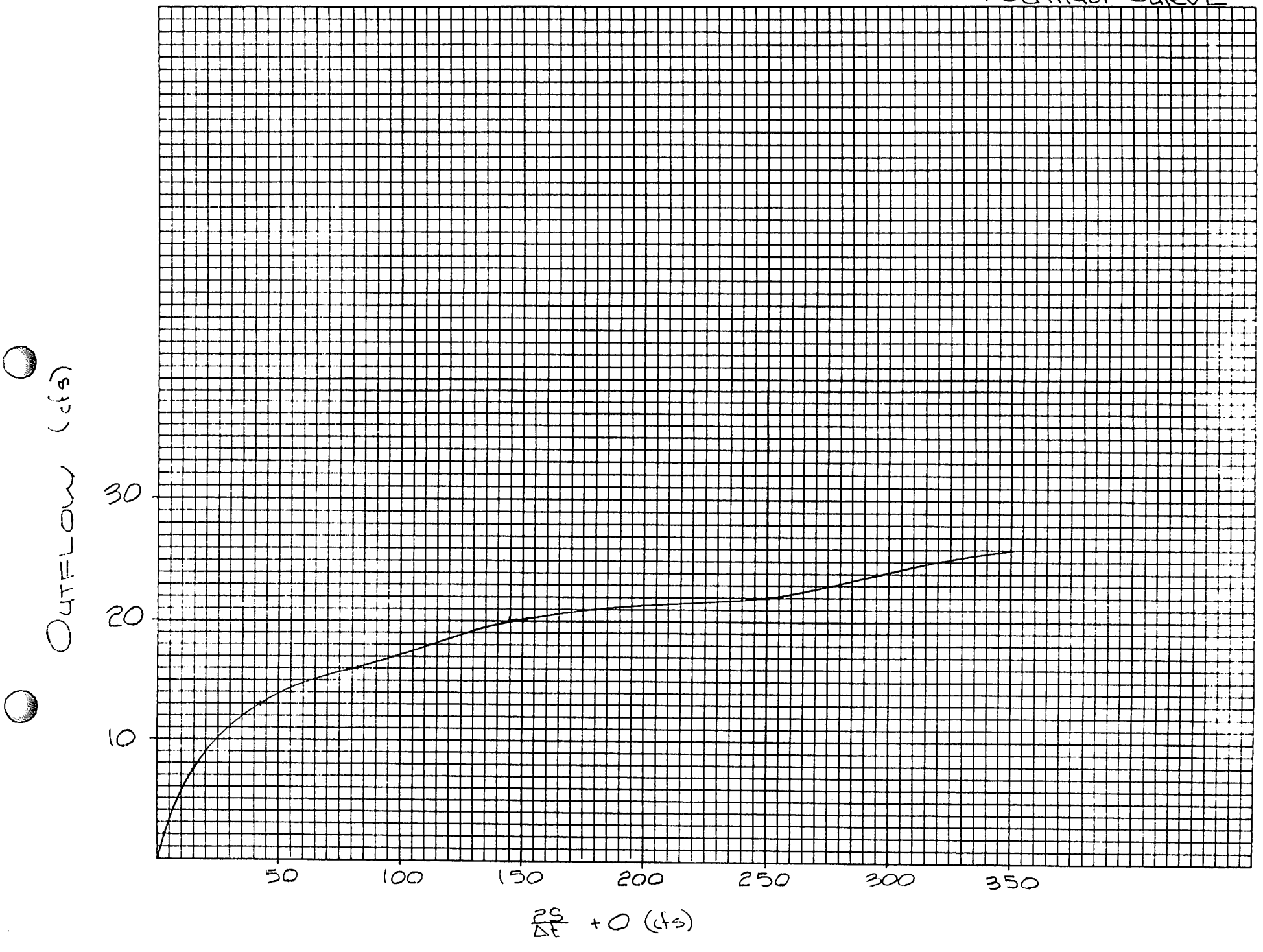
Let Δt = 2 minutes = .033 hrs

Then $\frac{2S}{\Delta t} + O = \frac{2S(\Delta\text{-ft})}{.033\text{hrs}} \times \frac{24\ \text{hrs/day}}{1.98\ \Delta\text{-ft}^3/\text{sec day}} + O$ cfs

$\frac{2S}{\Delta t} + O = 734.625 + O$ cfs

ELEV.	$\frac{S}{(\Delta\text{-ft})}$	$\frac{O}{(\text{cfs})}$	$\frac{2S}{\Delta t} + O$ (cfs)
515.5	0	0	0
516.0	.001	2.0	2.73
517.0	.01	7.5	14.85
518.0	.04	13.0	42.39
519.0	.09	16.0	82.12
520.0	.17	20.0	144.88
521.0	.31	22.0	249.73
522.0	.44	26.0	349.23

ROUTING CURVE



Design Pond Routing

15 YEAR

	0	1	2	3	4	5	6	7	
Line	Time	I_1	I_1+I_2	$\frac{2S_1}{\Delta t} - O_1$	$\frac{2S_2}{t} + O_2$	Elev	Outflow O_2	Storage S_2	
1	0	0			0		0		
2	2	6.12	6.12	0	6.12		3.5		
3	4	12.23	18.35	-0.88	17.47		8.4		
4	6	12.23	24.46	0.67	25.13		10.0		
5	8	12.23	24.46	5.13	29.59		11.0		
6	10	12.23	24.46	7.59	32.05		11.4		
7	12	12.23	24.46	9.25	33.71		11.5		
8	14	12.23	24.46	10.71	35.17		12.0		
9	16	12.23	24.46	11.17	35.63		12.0		
10	18	12.23	24.46	11.63	36.09		12.0		
11	20	12.23	24.46	12.09	36.55	517.80	12.1	.035 Δ≤ ft 1525 cu ft	PEAK OUTFLOW
12	22	6.12	18.35	12.35	30.70		11.0		
13	24	0	6.12	8.70	14.82		7.5		
14	26	0	0	-0.18					
15									

Design Pond Routing

25 YEAR

	0	1	2	3	4	5	6	7	
Line	Time	I_1	I_1+I_2	$\frac{2S_1}{\Delta t} - O_1$	$\frac{2S_2}{t} + O_2$	Elev	Outflow O_2	Storage S_2	
1	0	0			0		0		
2	2	7.55	7.55	0	7.55		4.5		
3	4	15.09	22.64	-1.45	21.19		9.0		
4	6	15.09	30.18	3.19	33.37		11.5		
5	8	15.09	30.18	10.37	40.55		12.5		
6	10	15.09	30.18	15.55	45.73		13.0		
7	12	15.09	30.18	19.73	49.91		14.0		
8	14	15.09	30.18	21.91	52.09		14.0		
9	16	15.09	30.18	24.09	54.27		14.5		
10	18	15.09	30.18	25.27	55.45		14.5		
11	20	15.09	30.18	26.45	56.63	518.44	14.5	0.06 Ac ft. 2614 cu.ft.	PEAK OUTFLOW
12	22	7.55	22.64	27.63	50.27		14.0		
13	24	0	7.55	22.27	29.82		11.0		
14	26	0	0	7.82	7.82		4.5		
15									

INLET CONTROL FOR THE 100 YEAR STORM

$Q = 3.06 \times 5.85$

$= 17.90$ cfs

FROM THE INLET CONTROL NOMOGRAPH:

$\frac{HW}{D} = 2.24$

$\therefore HW = 3.92'$

HW ELEV. $= 515.5 + 3.92 = 519.42$

LOW OF STREET $= 522.48$

HW ELEV. $= 519.42$

$\therefore$ FREEBOARD $= 3.06'$

SUMMARY

ALTHOUGH NO DETENTION IS REQUIRED DUE TO THE LESS THAN 1 cfs/acre INCREASE OF STORMWATER RUNOFF, THERE IS APPROXIMATELY 0.59 cfs OF ATTENUATION.

FILE

CITY OF O'FALLON
State of Missouri

January 20, 1993

Mr. Bill Kankolenski
Frontier Land Service Corp
164 Clarkson Executive Park
Ellisville, Mo. 63011

RE: Maryridge Record Plat

Dear Mr. Kankolenski

Listed below are my comments on the Record Plat submitted 1-20-93

1. Need to show addresses on plat.
2. Change City approval script. (See enclosure).
3. Centerline radius should be 150' min. it was shown as 150' on construction plans.
4. Please locate existing house and shed on plat.
5. Need an engineers cost estimate for review and approval then the signed escrow agreement for plat acceptance.
6. Show 10' easement along Emge Road.
7. Need additional easement shown for cross road culvert and lift station.

Thank you for your cooperation in this matter. If you have any additional questions, please contact this office.

Sincerely yours

Frank Godwin

Frank Godwin
Techincal Engineer/Inspector

FG/pl

Enc: 1 sheet

cc. T. Price
J. Hurlbert

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