

**PHASE 5**  
**Koyat CRTS**

File

Area  
Phase 5 - 7.90 ac  
Phase 2 (North) 2.10 ac  
10.30 ac

Post Developed Runoff:

P1 = 1.74	2yr = 18.03	P1 = 1.09	- 11.29
P1 = 2.13	5yr = 22.07	P1 = 1.33	- 13.78
P1 = 2.64	15yr = 27.35	P1 = 1.87	- 19.37
P1 = 3.26	25yr = 33.77	P1 = 2.31	- 23.93
P1 = 4.17	100yr = 42.20	P1 = 2.95	- 30.56

The Developed Runoff

MAX. Flood Discharge

2yr	11.29 - [0.99(1.74) + 0.87(1.74)] + [0.7(1.09) + 4.37(1.74)] - 16.42 cfs
5yr	13.78 - [0.99(2.13) + 0.87(2.13)] + [0.7(1.33) + 4.37(2.13)] - 20.57 cfs
15yr	19.37 - [0.99(2.64) + 0.87(2.64)] + [0.7(1.87) + 4.37(2.64)] - 27.31 cfs
25yr	23.93 - [0.99(3.26) + 0.87(3.26)] + [0.7(2.31) + 4.37(3.26)] - 33.73 cfs
100yr	30.56 - [0.99(4.17) + 0.87(4.17)] + [0.7(2.95) + 4.37(4.17)] - 43.09 cfs

Floods to Basin  
2yr - 20.62 cfs  
5yr - 25.24 cfs  
15yr - 32.94 cfs  
25yr - 40.69 cfs  
100yr - 45.81 cfs



6



GEORGE BUTLER ASSOCIATES, INC.

By \_\_\_\_\_ Chkd By \_\_\_\_\_

Job No. \_\_\_\_\_

Date \_\_\_\_\_

STAGE VS STORAGE

ELEV	AREA	AVG AREA	DEPTH	INC. VOL	VOL
528	0				0
530	1550	775	2	1550	1550
532	3100	2325	2	4650	6200
534	4800	3950	2	7900	14100
536	7600	6200	2	12400	26500

Try A 0.80' W x 4' H SLOT

Find  $T_c$

$$\text{Sheet } T_c = \frac{0.007 [0.24(25)]^{0.8} \cdot 3.5^{0.5} (0.05)^{0.2}}{0.8} = 3.11 \text{ min}$$

$$\text{SHALED VOL.} = V_i = 290 / 4.9 \frac{1}{2} = 1.05 \text{ min}$$

$$\text{BFD CHANNEL} = \frac{865}{74\%} = 2.06 \text{ min}$$

TOTAL  $\Rightarrow$  USE 6 MIN



Job No. \_\_\_\_\_

Date \_\_\_\_\_

GEORGE BUTLER ASSOCIATES, INC. By \_\_\_\_\_ Chkd By \_\_\_\_\_

0.6W SLOT

ELEV	H <sub>u</sub>	O <sub>u</sub>	H <sub>o</sub>	O <sub>o</sub>	O <sub>oF</sub>	D <sub>r</sub>	E <sub>a</sub>
S28.0	0	0			-	0	
S28.5	0.5	0.64			-	0	
S29.0	1.0	1.80			-	0.64	
S29.5	1.5	3.31			-	1.80	
S30.0	2.0	5.09			-	3.31	
S30.5	2.5	7.12			-	5.09	
S31.0	3.0	9.35			-	7.12	
S31.5	3.5	11.78			-	9.35	
S32.0	4.0	14.40			-	11.78	
S32.5	4.5	17.18			-	14.40	
S33.0	5.0	20.12			-	17.18	
S33.5	5.5	23.22			-	20.12	
S34.0	6.0	26.45			-	23.22	
S34.5	6.5	29.83			-	26.45	
S35.0	7.0	33.34			-	29.83	
						42.71	

1/4

$$Q_u = 3(0.6)H^{3/2}$$

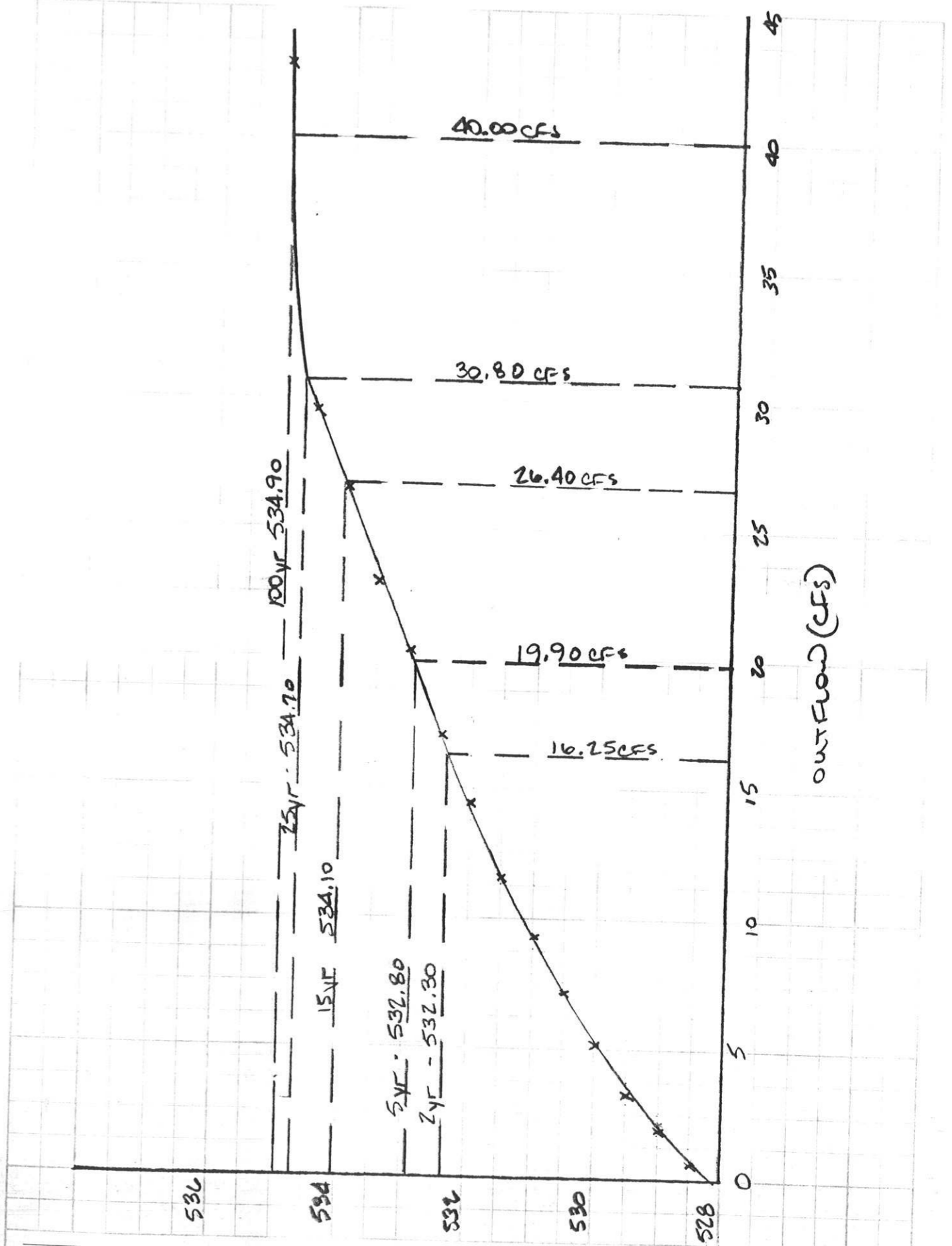
$$Q_{of} = 3(3.17)(6)H^{3/2}$$



GEORGE BUTLER ASSOCIATES, INC. By \_\_\_\_\_ Chkd By \_\_\_\_\_

Job No. \_\_\_\_\_  
Date \_\_\_\_\_

STAGE vs Outflow





GEORGE BUTLER ASSOCIATES, INC.

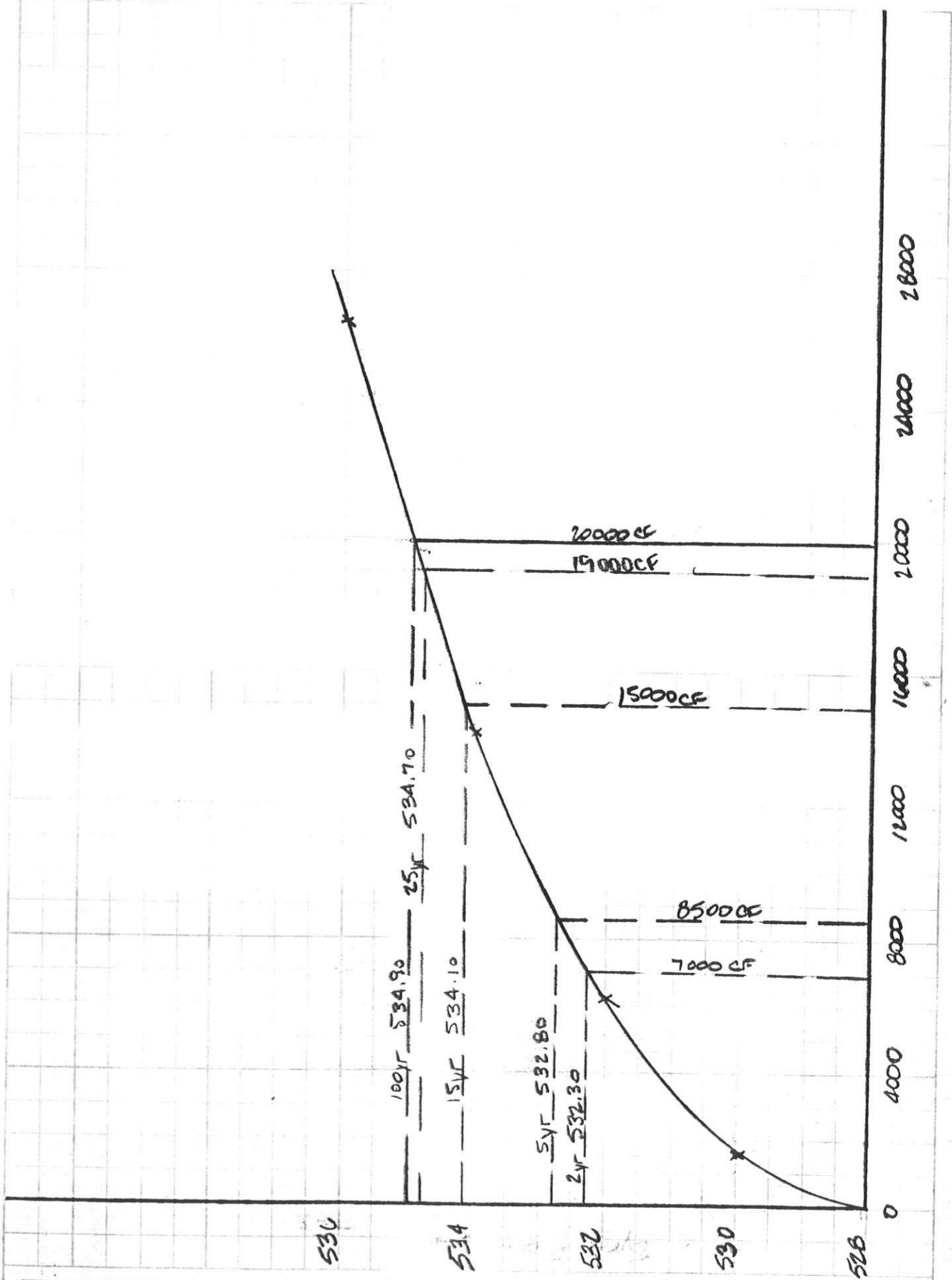
By \_\_\_\_\_

Chkd By \_\_\_\_\_

Job No. \_\_\_\_\_

Date \_\_\_\_\_

Stock VS Storage



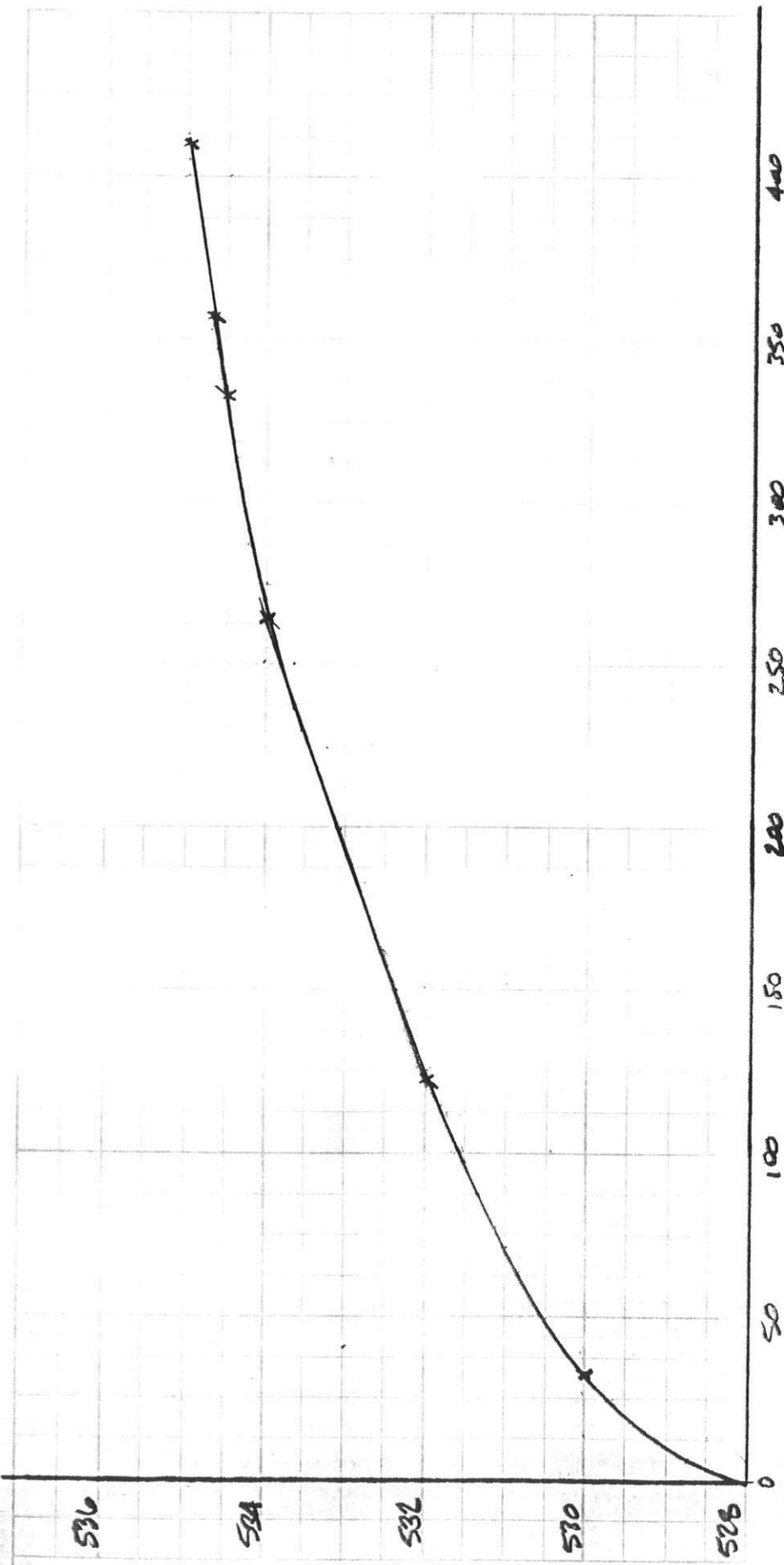


GEORGE BUTLER ASSOCIATES, INC.

Job No. \_\_\_\_\_

Date \_\_\_\_\_

By \_\_\_\_\_ Chkd By \_\_\_\_\_



ELV	S	$Z_s/\Delta t + 0$
528	0	0
530	1550	32.62
532	2000	122.53
534	14100	261.45
534.5	18100	331.50
534.7	19000	357.47
535.0	20000	409.38

$$Z_s/\Delta t + 0 = \frac{25 \text{ (mi.)}}{2 \text{ (mi.)} / 100 \text{ (sec)}} + 0 = 0.0125 + 0$$

21 ~ 7











GEORGE BUTLER ASSOCIATES, INC. By \_\_\_\_\_ Chkd By \_\_\_\_\_

Date \_\_\_\_\_

Job No. \_\_\_\_\_

25yr Route - Allocated Revenue Rate = 33.73 (p.1)

T  $I_n$   $I_{n+1}$   $I_{n+1} - I_n$   $2\frac{1}{2}\% I_n - I_n$   $2\frac{1}{2}\% I_{n+1} + I_{n+1}$  Elev  $\circ$  Street

0	0	0	0	0	0	0
2	13.56	13.56	40.69	10.56	13.56	1.50
4	27.13	27.13	40.69	37.05	51.25	7.10
6	40.69	40.69	67.82	80.87	104.87	12.00
8	40.69	40.69	81.38	80.87	162.25	16.70
10	40.69	40.69	81.38	130.05	211.43	19.90
12	40.69	40.69	81.38	171.63	253.01	24.60
14	40.69	40.69	81.38	203.81	285.19	26.70
16	40.69	40.69	81.38	231.79	313.17	29.50
18	40.69	40.69	81.38	254.17	335.55	29.70
20	40.69	40.69	81.38	276.15	357.53	30.60
22	27.13	27.13	67.82	296.33	364.15	30.80
24	13.56	13.56	40.69	302.55	343.24	30.20
26	0	0	0	0	0	0
28	0	0	0	0	0	0

534.70 30.80 -19000

OK < 33.73

10.12



GEORGE BUTLER ASSOCIATES, INC.

Job No. \_\_\_\_\_

Date \_\_\_\_\_

By \_\_\_\_\_  
Chkd By \_\_\_\_\_

100 yr Round - Annual Return Rate = 43.09% (Pa.1)

T I I 2 3/4 + 0 2 3/4 + 0 Fuel 0 Steaks

0	0	0	0	0	528.0	0	0
2	15.27	15.27	0	0	15.27	1.60	0
4	30.54	45.81	12.07	57.88	7.50	1.60	0
6	45.81	76.35	42.88	119.23	14.20	1.60	0
8	45.81	91.62	90.83	182.45	17.90	1.60	0
10	45.81	91.62	146.65	238.27	23.50	1.60	0
12	45.81	91.62	191.27	282.89	26.60	1.60	0
14	45.81	91.62	239.69	321.51	29.60	1.60	0
16	45.81	91.62	292.11	355.73	30.50	1.60	0
18	45.81	91.62	292.73	384.35	37.10	1.60	0
20	45.81	91.62	310.15	401.77	40.00	1.60	0
22	30.54	76.35	321.77	398.12	39.90	1.60	0
24	15.27	45.81					
26	0	0					
28	0	0					

OK < 43.09%

11 ~ 12



GEORGE BUTLER ASSOCIATES, INC. By \_\_\_\_\_

Chkd By \_\_\_\_\_

Date \_\_\_\_\_

Job No. \_\_\_\_\_

1991.06

### Sediment Storage Calculations

Rusoff Coefficient for Residential Areas  
Equals 0.60

Area Drainage to Basis = 13.57 acres

Annual Sediment = 120 CF/AC

$$\begin{array}{r} \times 13.57 \text{ ac} \\ \hline 1628.4 \text{ CF/YR} \times 2 = 3257 \text{ CF} \end{array}$$

Total Storage Req 100 yr event

$$3257 \text{ CF} + 20000 = 23257 \text{ CF}$$

Storage Provided = 27500 CF ; OK ✓

HYDRAULIC DATA | PROJECT: 7391.06 ROYAL OAKS PHASE 5 SHEET 1 OF 1

Computed By CHL Date 11/27/10 Checked By \_\_\_\_\_ Date \_\_\_\_\_

LINE	Upper Station	Lower Station	Length	Size	Upper Flow Line	Lower Flow Line	F.L. Grade %	Upper St. Elev.	Lower St. Elev.	Depth to H.G. Under End	Upper H.G. Elev.	Lower H.G. Elev.	Hy. Grade	Frict. Head	Velod. Ft./sec.	$\frac{V^2}{2g}$ feet	$\frac{V^2}{2g}$ V-HOOD	Turn Loss	Sleeve Inlet	Inlet Corp. Curves	Area Acres	Q. cu.ft./sec.	Pipe Cap. cu.ft./sec.			
OF324	FE523		61.31	36"	527.50	527.00	0.82	535.24	-	4.74	530.29	530.00	0.00472	0.29	6.48	0.65	0	0	-	-	-	-	45.81	45.81	60.36	
																								Q100		
C122	C121		32.58	12"	531.36	530.30	3.49	536.61	-	2.37	534.24	534.10	0.00433	0.14	2.99	0.14	-	-	Low	4.0	0.89	2.64	2.35	2.35	6.66	
																									15 ft HW FROM DETECTED BASIN CALCS.	
A125	A120		89.54	15"	535.21	534.31	1.00	542.72	540.14	4.68	538.04	537.67	0.00415	0.37	3.39	0.18	-	0	-	11.0	1.08	2.64	4.14	4.14	6.47	
																									ON SITE OFFSITE	
C120	C119		34.08	18"	534.11	533.77	1.00	540.14	540.14	2.47	537.67	537.58	0.00259	0.09	3.03	0.14	0	0	Low	4.0	0.85	2.64	1.19	5.35	10.50	
A119A	A119		22.71	18"	539.75	538.81	5.00	546.92	542.72	5.67	541.04	540.89	0.00458	0.15	4.82	0.36	-	0	Low	11.0	3.23	2.64	8.53	8.53	23.48	
																									ON SITE OFFSITE	
A119	C116		43.47	21"	538.61	538.18	1.00	542.72	544.38				0.00445	0.25	4.95	0.38	0.32	0	Low	11.0	1.07	2.64	3.38	11.91	15.83	
A118	C117		105.67	18"	543.00	541.89	1.05	548.72	547.41	5.20	543.32	543.19	0.00186	0.20	2.56	0.10	0.12	0.01	-	11.0	0.48	2.64	2.99	4.53	10.76	
																									ON SITE OFFSITE	
C117	C116		88.21	18"	541.69	538.18	3.98	547.41	544.38	4.22	541.68	541.34	0.00241	0.21	2.92	0.13	0.07	0.06	-	11.0	0.28	2.64	1.08	5.61	20.95	
																									ON SITE OFFSITE	
C116	C115		122.09	24"	537.98	534.98	2.46	544.38	540.98	3.04	541.34	537.81	0.00676	0.85	6.00	0.56	0.38	0.30	-	11.0	0.35	2.64	1.35	18.86	24.83	
																									ON SITE OFFSITE	
C115	C114		34.03	24"	534.78	534.44	1.00	540.98	540.98	1.17	539.81	539.36	0.00756	0.26	6.25	0.61	0	0.19	-	11.0	0.16	2.64	0.79	19.65	22.62	
																									ON SITE OFFSITE	
C114	C113		47.14	24"	534.24	533.77	1.00	540.98	540.14	1.62	539.36	538.10	0.00818	0.39	6.51	0.66	0.10	0.27	-	11.0	0.30	2.64	0.79	20.44	22.62	
																									ON SITE OFFSITE	
C113	M412		85.45	27"	533.51	532.71	1.00	540.14	540.70	1.54	538.00	537.57	0.00741	0.63	6.73	0.44	0	0.40	Low	4.0	0.36	2.64	0.95	26.74	30.95	
																									ON SITE OFFSITE	
M412	A111		273.93	27"	532.51	529.77	1.00	540.70	538.32	3.13	537.57	535.24	0.00741	2.03	6.73	0.44	0	0.30	-	11.0	-	-	-	0	26.74	30.95
																									ON SITE OFFSITE	
A111	FE10		107.61	30"	529.57	528.50	1.00	538.32	-	3.08	535.24	534.10	0.00522	0.58	6.14	0.59	0.27	0.29	-	11.0	1.28	2.64	3.38	30.12	41.01	
																									15 ft HW FROM DETECTED BASIN CALCS.	

