PICKETT RAY & SILVER

Civil Engineers
Planners
Land Surveyors

333 Mid Rivers Mall Dr.
St. Peters, MO 63376

441-1211
278-1211

PROJECT NAME SALVATION ARMY
PROJECT #/JOB ORDER # 91-215
DATE 10-21-92
DESIGNER KENDRICK
PAGE

TOTAL AREA OF DEVELOPMENT: 5.08 ACRES

AREA DRAINING TO BASIN (15YR):

ONSITE:	2.66 AC. @ 3.85	=	10.24 CFS
OFFSITE:	4.42 AC. @ 1.87	=	8.26 CFS
		TQ	18.50 CFS

AREA DRAINING TO BASIN (25 YR):

ONSITE:	2.66 AC @ 4.75	=	12.64 CFS
OFFSITE:	4.42 AC @ 2.31	=	10.21 CFS
		TQ	22.85 CFS

AREA DRAINING TO BASIN (100 YR):

ONSITE:	2.66 AC @ 6.08	=	16.17 CFS
OFFSITE:	4.42 AC @ 2.95	=	13.04 CFS
		TQ	29.21 CFS

AREA TO PASS THRU SPILLWAY (100 YR):

ONSITE:	2.66 AC @ 6.08	=	16.17 CFS
OFFSITE:	4.42 AC @ 6.08	=	26.87 CFS
		TQ	43.04 CFS

DIFFERENTIAL RUNOFF: (25 YR.)

UNDEVELOPED:	5.08 AC. @ 2.31 P.I.	=	11.73 cfs
DEVELOPED	: 5.08 AC. @ 4.75 P.I.	=	24.13 cfs
INCREASED RUNOFF:	5.08 AC @ 2.44 P.I.	=	12.40 cfs

STORAGE REQUIRED (15YR.)

5.08 AC x 3.85 = 19.56 CFS - (5.08 AC x 1.87) = 10.06 CFS
10.06 CFS x (30 MIN x 60 SEC) = 18,108 CF

STORAGE REQUIRED: (25 YR.)

12.40 cfs x (30 MIN x 60 SEC) = 22,320 CF ✓

STORAGE REQUIRED (100 YR.)

5.08 AC x 6.08 = 30.89 cfs - (5.08 x 2.91) = 16.11 cfs
16.11 cfs x (30 MIN. x 60 SEC) = 28,998 CF

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ALLOWABLE RELEASE: (25 YR.)

22.85 CFS – 12.40 CFS = 10.45 CFS

EXISTING FLOW TO DISCHARGE POINT: (25 YR)

7.38 AC @ 2.31 = 17.05 CFS

ADDITION SEDIMENT STORAGE REQUIRED:

115 x 5.08 AC x 2 YR. = 1170 CU. FT. ✓

MINIMUM STORAGE w/ SEDIMENT FACTOR:

22,320 CU. YD. + 1170 CU. YD. = 23,490 CU. YD.

25 YEAR

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ELEV.	AREA	STORAGE	ACCUM. STORAGE
547.0	0 S.F.	0	0
548.0	4860 S.F.	$\frac{0 + 4860}{2} \times 1$	2430 CU. FT.
550.0	9122 S.F.	$\frac{4860 + 9122}{2} \times 2$	13,982 CU. FT.
551.75	14,868 S.F.	$\frac{9122 + 14868}{2} \times 1.75$	34,973 CU. FT.
552.00	15,689 S.F.	$\frac{14,868 + 15689}{2} \times .25$	38,793 CU. FT.
554.00	23,230 S.F.	$\frac{15689 + 23,230}{2} \times 2$	77,712 CU. FT.

15 YR.

SALVATION ARMY 10-22-92 SUBMITTAL DATE: 10-22-92

ELEVATION	AREA	VOLUME	CUM. VOLUME
547.00	0		
		2430	2430
548.00	4860		
		13982	16412
550.00	9122		
		20991	37403
551.75	14868		
		3819	41222
552.00	15689		
		38919	80141
554.00	23230		

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*******************************************
*                                         *
*  PIPE OUTLET                            *
*  1  73 ft - 9 in pipe(s)                *
*  UFL= 547  LFL= 541.82   n= .013         *
*                                         *
*******************************************
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Tc = 4 MIN.

SALVATION ARMY 10-22-92 SUBMITTAL DATE: 10-22-92

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.	
1	277.50	277.50	0.00	277.50	547.11	
2	555.00	832.50	2.19	830.31	547.34	
3	832.50	1662.81	18.09	1644.72	547.68	
4	1110.00	2754.72	53.78	2700.94	548.04	
5	1110.00	3810.94	105.72	3705.22	548.18	
6	1110.00	4815.22	116.60	4698.62	548.32	
7	1110.00	5808.62	126.44	5682.18	548.47	
8	1110.00	6792.18	135.49	6656.70	548.60	
9	1110.00	7766.70	143.89	7622.81	548.74	
10	1110.00	8732.81	151.76	8581.05	548.88	
11	1110.00	9691.05	159.18	9531.87	549.02	
12	1110.00	10641.87	166.22	10475.65	549.15	
13	1110.00	11585.65	172.92	11412.73	549.28	
14	1110.00	12522.73	179.33	12343.40	549.42	
15	1110.00	13453.40	185.47	13267.93	549.55	
16	1110.00	14377.93	191.38	14186.55	549.68	
17	1110.00	15296.55	197.07	15099.48	549.81	
18	1110.00	16209.48	202.58	16006.90	549.94	
19	1110.00	17116.90	207.90	16909.00	550.04	
20	1110.00	18019.00	211.89	17807.11	550.12	
21	832.50	18639.61	214.84	18424.77	550.17	
22	555.00	18979.77	216.85	18762.92	550.20	
23	277.50	19040.42	217.94	18822.48	550.20	← 15YR. H.W.
24	0.00	18822.48	218.13	18604.35	550.18	
25	0.00	18604.35	217.43	18386.92	550.16	

PEAK OUTFLOW= 3.64 CFS AT 24 MINUTES

25 YR.

SALVATION ARMY 10-22-92 SUBMITTAL DATE: 10-22-92

ELEVATION	AREA	VOLUME	CUM. VOLUME
547.00	0		
		2430	2430
548.00	4860		
		13982	16412
550.00	9122		
		20991	37403
551.75	14868		
		3819	41222
552.00	15689		
		38919	80141
554.00	23230		

```
*******************************************
*                                         *
*  PIPE OUTLET                            *
*  1  73 ft - 9 in pipe(s)                *
*  UFL= 547  LFL= 541.82   n= .013        *
*                                         *
*******************************************
```

Tc = 4 MIN.

SALVATION ARMY 10-22-92 SUBMITTAL DATE: 10-22-92

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	342.75	342.75	0.00	342.75	547.14
2	685.50	1028.25	3.42	1024.83	547.42
3	1028.25	2053.08	25.82	2027.26	547.83
4	1371.00	3398.26	87.94	3310.32	548.13
5	1371.00	4681.32	112.44	4568.88	548.31
6	1371.00	5939.88	125.20	5814.68	548.48
7	1371.00	7185.68	136.66	7049.02	548.66
8	1371.00	8420.02	147.13	8272.89	548.84
9	1371.00	9643.89	156.83	9487.06	549.01
10	1371.00	10858.06	165.89	10692.17	549.18
11	1371.00	12063.17	174.42	11888.75	549.35
12	1371.00	13259.75	182.49	13077.26	549.52
13	1371.00	14448.26	190.18	14258.08	549.69
14	1371.00	15629.08	197.51	15431.57	549.86
15	1371.00	16802.57	204.54	16598.03	550.02
16	1371.00	17969.03	210.85	17758.18	550.11
17	1371.00	19129.18	214.68	18914.50	550.21
18	1371.00	20285.50	218.43	20067.07	550.30
19	1371.00	21438.07	222.10	21215.97	550.40
20	1371.00	22586.97	225.70	22361.27	550.50
21	1028.25	23389.52	229.24	23160.28	550.56
22	685.50	23845.78	231.67	23614.11	550.60
23	342.75	23956.86	233.04	23723.82	550.61
24	0.00	23723.82	233.37	23490.45	550.59
25	0.00	23490.45	232.67	23257.78	550.57

23,500 STORE REQ'D.

OVER

OK

25YR. H.W.

SPILLWAY:

```
PEAK OUTFLOW= 3.89 CFS AT 24 MINUTES
QUANTITY OF WATER  43.04
WIDTH OF SPILLWAY  10
C VALUE=  3
HEIGHT OF WATER  1.27204
VELOCITY=  3.383543
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100 YR.

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*******************************************
*                                         *
*  PIPE OUTLET                            *
*  1  73 ft - 9 in pipe(s)                *
*  UFL= 547  LFL= 541.82   n= .013        *
*                                         *
*******************************************
```

Tc = 4 MIN.

SALVATION ARMY 10-22-92 SUBMITTAL DATE: 10-22-92

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.	
1	438.25	438.25	0.00	438.25	547.18	
2	876.50	1314.75	5.40	1309.35	547.54	
3	1314.75	2624.10	38.97	2585.13	548.02	
4	1753.00	4338.13	104.39	4233.74	548.26	
5	1753.00	5986.74	121.93	5864.81	548.49	
6	1753.00	7617.81	137.10	7480.71	548.72	
7	1753.00	9233.71	150.63	9083.09	548.95	
8	1753.00	10836.09	162.93	10673.16	549.18	
9	1753.00	12426.16	174.29	12251.87	549.40	
10	1753.00	14004.87	184.87	13820.00	549.63	
11	1753.00	15573.00	194.82	15378.18	549.85	
12	1753.00	17131.18	204.23	16926.95	550.04	
13	1753.00	18679.95	211.94	18468.00	550.17	
14	1753.00	20221.00	216.99	20004.01	550.30	
15	1753.00	21757.01	221.90	21535.11	550.43	
16	1753.00	23288.11	226.69	23061.42	550.55	
17	1753.00	24814.42	231.37	24583.05	550.68	
18	1753.00	26336.05	235.94	26100.11	550.81	
19	1753.00	27853.11	240.41	27612.70	550.93	
20	1753.00	29365.70	244.79	29120.91	551.06	
21	1314.75	30435.66	249.07	30186.59	551.15	
22	876.50	31063.09	252.06	30811.03	551.20	
23	438.25	31249.28	253.79	30995.49	551.22	← 100YR H.W.
24	0.00	30995.49	254.30	30741.19	551.19	
25	0.00	30741.19	253.60	30487.59	551.17	

PEAK OUTFLOW= 4.24 CFS AT 24 MINUTES