PICKETT RAY & SILVER

Civil Engineers
Planners
Land Surveyors

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

441-1211
278-1211

PROJECT NAME VILLAGES AT DARDENNE-BATES VILLAGE
PROJECT #/JOB ORDER # 95-080 / 34202
DATE 4-22-96 REV. 06-06-96
DESIGNER TANYA D. / MARVIN G.
PAGE 1 OF 7

STORMWATER DETENTION BASIN "8" LAKE
DESIGN STORM 15 YEAR / 20 MINUTE

TOTAL ACRES of DEVELOPMENT:

NORTH WATERSHED	=	56.24 Ac
EAST WATERSHED	=	35.31 Ac
TOTAL	=	91.55 Ac.

EXISTING CONDITIONS .EAST WATERSHED:

35.31 Ac @ 1.87 = 66.03 CFS

POST DEVELOPMENT Q TO BASIN:

OFFSITE (0.49+0.03+0.04)	=	0.56 Ac @ 2.64	= 1.48 CFS
ONSITE	=	34.01 Ac @ 2.64	= 89.79 CFS
TOTAL	=	34.57 Ac	= 91.27 CFS

BYPASS BASIN:

ONSITE DEVELOPED	=	0.97 Ac @ 2.64	= 2.56 CFS
TOTAL	=	0.97 Ac.	2.56 CFS

DETENTION REQUIRED:

91.27 + 2.56 = 93.83 CFS - 66.03 CFS = 27.80 CFS
27.80 X 20 MIN. X 60 SEC/MIN. = 33,361 CU. FT. VOLUME

ALLOWABLE RELEASE FROM BASIN:

91.27 CFS - 27.80 CFS = 63.47 CFS

95080-13

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*                                            *
*  RECTANGULAR ORIFICE                       *
*   36 in W X 36 in H   ELEV= 516            *
*                                            *
*  Outlet Pipe -  80 ft - 48 in pipe         *
*  UFL= 504.8  LFL= 504   n= .013            *
*                                            *
*  Overflow Structure -  Standpipe           *
*  DIAM= 66 in   STANDPIPE ELEV= 519         *
*                                            *
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PROJECT NAME VILLAGES AT DARDENNE BATES VILLAGE

PROJECT #/JOB ORDER # 95-080 / 34207

DATE 4-22-96

DESIGNER TANYA R. / MARVIN G.

PAGE 2 OF 7

15 YEAR / 20 MIN.

VILLAGES AT DARDENNE-BATES VILLAGE 4-19-96 SUBMITTAL DATE: 4-22-96

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	1095.20	1095.20	0.00	1095.20	516.03
2	2190.40	3285.60	3.00	3282.60	516.10
3	3285.60	6568.20	15.56	6552.64	516.21
4	4380.80	10933.44	43.87	10889.57	516.34
5	5476.00	16365.57	93.97	16271.60	516.51
6	5476.00	21747.60	171.65	21575.95	516.68
7	5476.00	27051.95	262.11	26789.85	516.84
8	5476.00	32265.85	362.64	31903.21	517.00
9	5476.00	37379.21	471.26	36907.95	517.16
10	5476.00	42383.95	586.39	41797.56	517.32
11	5476.00	47273.56	706.71	46566.85	517.47
12	5476.00	52042.85	831.07	51211.78	517.61
13	5476.00	56687.78	958.44	55729.35	517.75
14	5476.00	61205.35	1088.03	60117.32	517.89
15	5476.00	65593.32	1219.03	64374.29	518.02
16	5476.00	69850.29	1345.70	68504.60	518.13
17	5476.00	73980.60	1452.59	72528.00	518.23
18	5476.00	78004.00	1559.23	76444.78	518.33
19	5476.00	81920.78	1665.48	80255.29	518.43
20	5476.00	85731.30	1771.10	83960.21	518.52
21	4380.80	88341.00	1875.80	86465.21	518.59
22	3285.60	89750.80	1947.72	87803.08	518.62
23	2190.40	89993.48	1986.51	88006.98	518.63
24	1095.20	89102.18	1992.48	87109.71	518.60
25	0.00	87109.71	1966.43	85143.28	518.55

PEAK OUTFLOW= 33.21 CFS AT 24 MINUTES

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PROJECT #/JOB ORDER # 95-080 / 34207
DATE 4-22-96
DESIGNER TANYA D. / MARVIN G.
PAGE 3 OF 7

STORMWATER DETENTION BASIN "B" LAKE
DESIGN STORM 25 YEAR / 20 MINUTE

TOTAL ACRES of DEVELOPMENT:

NORTH WATERSHED	=	56.24 Ac
EAST WATERSHED	=	35.31 Ac
TOTAL	=	91.55 Ac.

EXISTING CONDITIONS EAST WATERSHED:

35.31 Ac @ 2.31 = 81.57 CFS

POST DEVELOPMENT Q TO BASIN:

OFFSITE (0.49+0.03+0.04)	=	0.56 Ac @ 3.26	= 1.83 CFS
ONSITE	=	34.01 Ac @ 3.26	= 110.87 CFS
TOTAL	=	34.57 Ac	= 112.70 CFS

BYPASS BASIN:

ONSITE DEVELOPED	=	0.97 Ac @ 3.26	= 3.16 CFS
TOTAL	=	0.97 Ac.	3.16 CFS

DETENTION REQUIRED:

112.70 + 3.16 = 115.86 CFS − 81.57 CFS = 34.29 CFS
34.29 X 20 MIN. X 60 SEC/MIN. = 41,148 CU. FT. VOLUME

ALLOWABLE RELEASE FROM BASIN:

112.70 CFS − 34.29 CFS = 78.41 CFS

RECTANGULAR ORIFICE
36 in W X 36 in H ELEV= 516

Outlet Pipe - 80 ft - 48 in pipe
UFL= 504.8 LFL= 504 n= .013

Overflow Structure - Standpipe
DIAM= 66 in STANDPIPE ELEV= 519

PROJECT NAME VILLAGES AT DARDENNE BATES VILLAGE
PROJECT #/JOB ORDER # 95-080 / 34207
DATE 4-22-96
DESIGNER TANYA D. / MARVIN G.
PAGE 4 OF 7

25 YEAR / 20 MIN.

VILLAGES AT DARDENNE-BATES VILLAGE 4-19-96 SUBMITTAL DATE: 4-22-96

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	1352.40	1352.40	0.00	1352.40	516.04
2	2704.80	4057.20	4.12	4053.09	516.13
3	4057.20	8110.29	21.34	8088.95	516.25
4	5409.60	13498.55	60.16	13438.39	516.42
5	6762.00	20200.39	128.82	20071.57	516.63
6	6762.00	26833.57	235.18	26598.39	516.84
7	6762.00	33360.39	358.75	33001.64	517.04
8	6762.00	39763.64	495.82	39267.82	517.24
9	6762.00	46029.82	643.54	45386.28	517.43
10	6762.00	52148.28	799.67	51348.61	517.62
11	6762.00	58110.61	962.30	57148.31	517.80
12	6762.00	63910.31	1129.84	62780.47	517.98
13	6762.00	69542.47	1300.93	68241.55	518.12
14	6762.00	75003.55	1445.66	73557.88	518.26
15	6762.00	80319.88	1586.96	78732.93	518.39
16	6762.00	85494.92	1728.68	83766.25	518.52
17	6762.00	90528.24	1870.29	88657.94	518.64
18	6762.00	95419.94	2011.47	93408.48	518.77
19	6762.00	100170.50	2151.75	98018.74	518.88
20	6762.00	104780.70	2290.93	102489.80	519.00
21	5409.60	107899.40	2428.68	105470.70	519.07
22	4057.20	109527.90	3372.17	106155.80	519.09
23	2704.80	108860.60	3411.69	105448.90	519.07
24	1352.40	106801.30	3370.83	103430.50	519.02
25	0.00	103430.50	3269.44	100161.00	518.94

PEAK OUTFLOW= 56.86 CFS AT 23 MINUTES

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DATE 4-22-96
DESIGNER TANYA D. / MARVIN G.
PAGE 5 OF 7

STORMWATER DETENTION BASIN "B" LAKE
DESIGN STORM 100 YEAR / 20 MINUTE

TOTAL ACRES OF DEVELOPMENT:

NORTH WATERSHED = 56.24 AC
EAST WATERSHED = 35.31 AC
TOTAL = 91.55 AC.

EXISTING CONDITIONS EAST WATERSHED:

35.31 AC @ 2.95 = 104.16 CFS

POST DEVELOPMENT Q TO BASIN:

OFFSITE (0.49 + 0.03 + 0.04) = 0.56 AC @ 4.17 = 2.34 CFS
ONSITE = 34.01 AC @ 4.17 = 141.82 CFS
TOTAL = 34.57 AC = 144.16 CFS

BYPASS BASIN:

ONSITE DEVELOPED = 0.97 AC @ 4.17 = 4.04 CFS
TOTAL = 0.97 AC. 4.04 CFS

DETENTION REQUIRED:

144.16 + 4.04 = 148.20 CFS − 104.16 CFS = 44.04 CFS
44.04 × 20 MIN. × 60 SEC/MIN. = 52,848 CU. FT. VOLUME

ALLOWABLE RELEASE FROM BASIN:

144.16 CFS − 44.04 CFS = 100.12 CFS

RECTANGULAR ORIFICE
36 in W X 36 in H ELEV= 516

Outlet Pipe - 80 ft - 48 in pipe
UFL= 504.8 LFL= 504 n= .013

Overflow Structure - Standpipe
DIAM= 66 in STANDPIPE ELEV= 519

PROJECT NAME VILLAGES AT DARDENNE-BATES VILLAGE

PROJECT #/JOB ORDER # 95-080 / 34202

DATE 4-22-96

DESIGNER TANYA D. / MARVIN G.

PAGE 6 OF 7

100 YEAR / 20 MIN.

VILLAGES AT DARDENNE-BATES VILLAGE 4-19-96 SUBMITTAL DATE: 4-22-96

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	1730.00	1730.00	0.00	1730.00	516.05
2	3460.00	5190.00	5.96	5184.05	516.16
3	5190.00	10374.05	30.87	10343.18	516.33
4	6920.00	17263.18	86.98	17176.20	516.54
5	8650.00	25826.20	186.17	25640.03	516.81
6	8650.00	34290.03	339.55	33950.48	517.07
7	8650.00	42600.48	517.33	42083.15	517.33
8	8650.00	50733.15	713.95	50019.21	517.58
9	8650.00	58669.21	925.17	57744.04	517.82
10	8650.00	66394.04	1147.59	65246.45	518.04
11	8650.00	73896.46	1368.06	72528.40	518.23
12	8650.00	81178.40	1559.30	79619.10	518.41
13	8650.00	88269.10	1753.31	86515.80	518.59
14	8650.00	95165.80	1949.24	93216.56	518.76
15	8650.00	101866.60	2146.05	99720.52	518.93
16	8650.00	108370.50	2343.07	106027.50	519.09
17	8650.00	114677.50	3404.09	111273.40	519.22
18	8650.00	119923.40	3769.29	116154.10	519.35
19	8650.00	124804.10	4186.69	120617.40	519.46
20	8650.00	129267.40	4642.38	124625.00	519.56
21	6920.00	131545.10	5092.86	126452.20	519.61
22	5190.00	131642.20	5300.04	126342.10	519.61
23	3460.00	129802.10	5287.43	124514.70	519.56
24	1730.00	126244.70	5080.62	121164.10	519.48
25	0.00	121164.10	4698.61	116465.50	519.36

PEAK OUTFLOW= 88.33 CFS AT 22 MINUTES

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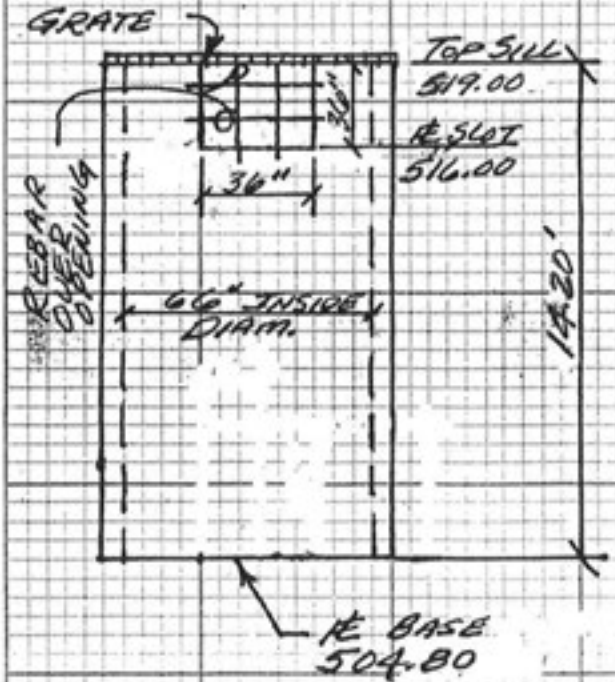
BASIN STORAGE:

VILLAGES AT DARDENNE-BATES VILLAGE 4-19-96 SUBMITTAL DATE: 4-22-96

ELEVATION	AREA	VOLUME	CUM. VOLUME
516.00	28791		
		63511	63511
518.00	34720		
		78159	141670
520.00	43439		

OVERFLOW STRUCTURE: (66" INSIDE DIAM. STANDPIPE) WITH GRATE ON TOP



CHECK LOW FLOW BLOCKED WIER EQUATION: 25 YEAR/20 MIN.

$Q = C L H^{3/2}$

$112.70 = (3.0)(17.28')(H^{3/2})$

$112.70 = (51.84)(H^{3/2})$

$\frac{112.70}{51.84} = H^{3/2}$

$2.17 = H^{3/2}$

$2.17^{2/3} = H$

$1.68' = H$

(519.09 H.W. + 1.68' = 520.77 ELEV.)

DAM ELEVATION:

100 YEAR H.W. ELEV. = 519.61
TOP DAM ELEV. = 520.80 (1.19' FREEBOARD)