Fik

PICKETT RAY & SILVER, INC.

CIVIL ENGINEERS
PLANNERS
LAND SURVEYORS

LETTER OF TRANSMITTAL

Transmittal Number: 5068
Job Number: 96221
Transmittal Date: 9/21/99
Job Name: BERKSHIRE DOWNS

Sent To: Mr. Chris Linneman, E.I.T.
City of O'Fallon
100 North Main
O'Fallon, Missouri 63366

Sent Via: Hand Deliver

Description: 1 Copy of Detention Basin A Calculations
1 Copy of Detention Basin B Calculations

RECEIVED
SEP 2 1 1999
ENGINEERING DEPARTMENT

Remarks:

☑ No "Copy To" Required OR

Copy To:

Typed by: kmh ☐ Label

Signed By:
Kurtis J. Daniels, P.E.
Project Engineer

333 MID RIVERS MALL DRIVE ST. PETERS, MISSOURI 63376 314-397-1211 FAX 314-397-1104

96

PICKETT RAY & SILVER

Civil Engineers
Planners
Land Surveyors

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

397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221-12
DATE 3.31.97
DESIGNER T. Dietz
PAGE 1 of IV

Basin "A" @ Lot 85 Design Storm : 2 yr/20 m
Stormwater Detention.

1. Predeveloped Conditions ;

onsite : 13.26 A^c @ 1.20 cfs/A^c : 15.91 cfs

2. Post-developed Conditions ;

T_{AC} :	8.14	@ 1.67 =	13.59 cfs
	5.94	}	9.92
	1.36	}	2.27
	3.22	@ 1.67 =	5.38
	8.80	=	14.70
	27.46	≈	45.86 cfs. x 60 = 2751.60

3. By-pass Basin (Post-developed)

4. Detention Required ;

45.86 cfs - 15.91 : 29.95 cfs

29.95 cfs x (30 min x 60 sec/min) : 53,910. cf. (volume)

STATE OF MISSOURI
HAROLD L. BARTELS
NUMBER E-17751
REGISTERED PROFESSIONAL ENGINEER
4/8/97

PICKETT RAY & SILVER
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DATE 3.31.97
DESIGNER T. Dietz
PAGE 2 of

Basin @ Lot 85 Design Storm: 2 yr/20 n
Stormwater Detention.

5. Outflow Structure (Principal Spillway)

Use 42" Riser w/ grate top, anti-vortex device.

(NWL: 558.0)

$Q = Ca\sqrt{2gh}$

$Q = 0.6(2)\sqrt{64.4(1)}$

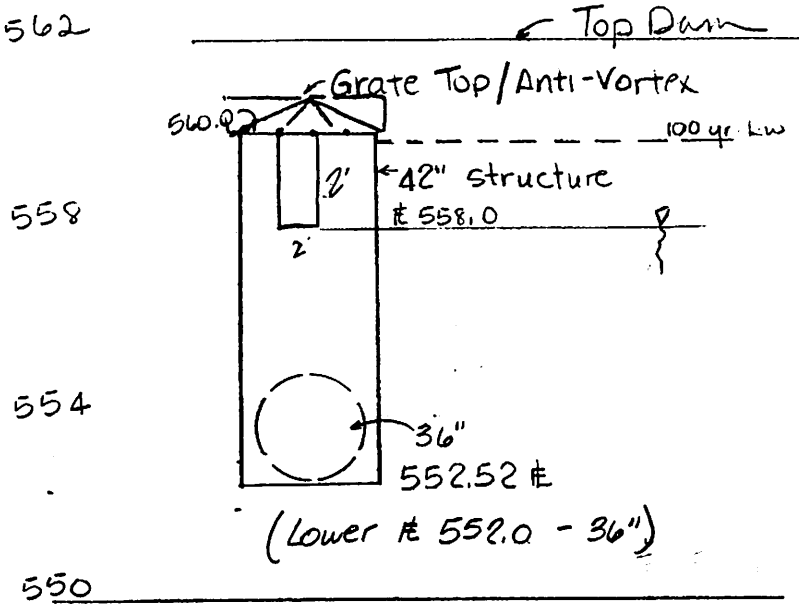
$Q = 9.63$ cfs.

Top Dam: 562.5
Top Structure: 560.0
Normal Water level: 558.0

$Q = CLH^{3/2}$

$= 3.0(11.0)(1.0)^{3/2}$

$Q = 33$ cfs



2 yr. HW:	559.07	(5.72 cfs)
5 yr. HW:	559.39	(8.09 cfs)
15 yr. HW:	559.69	(10.95 cfs)
25 yr. HW:	560.00	(14.75 cfs)
100 yr. HW	560.40	(27.39)

100 yr.:
$Q = 114.51$ cfs

$114.51 = 3.0(11.0)H^{3/2}$

$2.29 = H$

100 yr. HW $= 560 +$ $2.29 = 562.29$

```
*****************************************
*                                       *
*  RECTANGULAR ORIFICE                  *
*   24 in W X ~~36~~ 24 in H   ELEV= 558      *
*                                       *
*  Outlet Pipe -  52 ft - 36 in pipe    *
*  UFL= 552.52  LFL= 552   n= .013      *
*                                       *
*  Overflow Structure -  Standpipe      *
*  DIAM= 42 in   STANDPIPE ELEV= 560    *
*                                       *
*****************************************
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2yr

BERKSHIRE DOWNS 6-24-97 SUBMITTAL DATE: 6-24-97

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	137.58	137.58	0.00	137.58	558.00
2	275.16	412.74	0.05	412.69	558.01
3	412.74	825.43	0.26	825.17	558.02
4	550.32	1375.49	0.74	1374.75	558.03
5	687.90	2062.65	1.60	2061.05	558.04
6	825.48	2886.53	2.93	2883.60	558.06
7	963.06	3846.66	4.85	3841.81	558.08
8	1100.64	4942.45	7.46	4934.99	558.11
9	1238.22	6173.21	10.86	6162.35	558.13
10	1375.80	7538.15	15.16	7522.99	558.16
11	1513.38	9036.37	20.44	9015.93	558.19
12	1650.96	10666.89	26.83	10640.06	558.23
13	1788.54	12428.60	34.40	12394.20	558.27
14	1926.12	14320.32	43.24	14277.08	558.31
15	2063.70	16340.78	53.47	16287.31	558.35
16	2201.28	18488.59	65.14	18423.45	558.40
17	2338.86	20762.31	78.38	20683.93	558.45
18	2476.44	23160.37	93.23	23067.14	558.50
19	2614.02	25681.16	109.80	25571.36	558.55
20	2751.60	28322.96	128.15	28194.81	558.61
21	2614.02	30808.83	148.37	30660.46	558.66
22	2476.44	33136.90	168.26	32968.65	558.71
23	2338.86	35307.51	187.60	35119.90	558.76
24	2201.28	37321.18	206.27	37114.91	558.80
25	2063.70	39178.61	224.09	38954.52	558.84
26	1926.12	40880.64	240.95	40639.70	558.88
27	1788.54	42428.24	256.76	42171.48	558.91
28	1650.96	43822.44	271.40	43551.04	558.94
29	1513.38	45064.42	284.85	44779.57	558.97
30	1375.80	46155.37	296.98	45858.39	558.99
31	1238.22	47096.61	307.78	46788.83	559.01
32	1100.64	47889.47	317.18	47572.29	559.03
33	963.06	48535.35	325.17	48210.17	559.04
34	825.48	49035.65	331.74	48703.91	559.05
35	687.90	49391.81	336.86	49054.96	559.06
36	550.32	49605.28	340.50	49264.79	559.06
37	412.74	49677.53	342.70	49334.83	559.07
38	275.16	49609.99	343.41	49266.58	559.06
39	137.58	49404.16	342.70	49061.46	559.06
40	0.00	49061.46	340.58	48720.88	559.05

PEAK OUTFLOW= 5.72 CFS AT 38 MINUTES

PICKETT RAY & SILVER
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397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
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Basin @ Lot 85 Design Storm: 5 yr/20 m
Stormwater Detention.

1. Predeveloped Conditions;

onsite = 13.26 Ac @ 1.51 = 20.02

2. Post-developed Conditions;

onsite	8.14 Ac	@ 2.12 =	17.26
	5.94		12.59
	1.36		2.88
	3.22	@ 2.12 =	1.93
	8.80		18.66
	27.46 Ac		58.22 cfs. x 60. 3493.

3. By-Pass Basin (Post-developed)

4. Detention Required;

58.22 cfs - 20.02 = 38.20 cfs
38.20 x (30 min x 60 sec/min) = 68,760 cf

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*****************************************
*                                       *
*  RECTANGULAR ORIFICE                  *
*   24 in W X 24 in H   ELEV= 558       *
*                                       *
*  Outlet Pipe -  52 ft - 36 in pipe    *
*  UFL= 552.52  LFL= 552   n= .013      *
*                                       *
*  Overflow Structure -  Standpipe      *
*  DIAM= 42 in   STANDPIPE ELEV= 560    *
*                                       *
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5YR

BERKSHIRE DOWNS 6-24-97 SUBMITTAL DATE: 6-24-97

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	174.66	174.66	0.00	174.66	558.00
2	349.32	523.98	0.07	523.91	558.01
3	523.98	1047.89	0.37	1047.52	558.02
4	698.64	1746.16	1.06	1745.10	558.04
5	873.30	2618.40	2.29	2616.11	558.06
6	1047.96	3664.07	4.19	3659.88	558.08
7	1222.62	4882.50	6.94	4875.56	558.11
8	1397.28	6272.84	10.67	6262.17	558.14
9	1571.94	7834.11	15.53	7818.58	558.17
10	1746.60	9565.18	21.67	9543.51	558.21
11	1921.26	11464.77	29.22	11435.55	558.25
12	2095.92	13531.47	38.33	13493.14	558.29
13	2270.58	15763.72	49.12	15714.60	558.34
14	2445.24	18159.84	61.75	18098.09	558.39
15	2619.90	20717.99	76.30	20641.69	558.45
16	2794.56	23436.25	92.94	23343.31	558.50
17	2969.22	26312.53	111.77	26200.77	558.57
18	3143.88	29344.65	132.91	29211.74	558.63
19	3318.54	32530.28	156.47	32373.81	558.70
20	3493.20	35867.01	182.56	35684.45	558.77
21	3318.54	39002.99	211.27	38791.72	558.84
22	3143.88	41935.60	239.45	41696.15	558.90
23	2969.22	44665.37	266.83	44398.53	558.96
24	2794.56	47193.09	293.20	46899.89	559.01
25	2619.90	49519.79	318.31	49201.49	559.06
26	2445.24	51646.73	342.03	51304.70	559.11
27	2270.58	53575.28	364.20	53211.08	559.15
28	2095.92	55307.00	384.69	54922.31	559.19
29	1921.26	56843.57	403.40	56440.17	559.22
30	1746.60	58186.78	420.23	57766.55	559.25
31	1571.94	59338.49	435.14	58903.35	559.27
32	1397.28	60300.63	448.03	59852.60	559.29
33	1222.62	61075.22	458.90	60616.32	559.31
34	1047.96	61664.28	467.70	61196.58	559.32
35	873.30	62069.88	474.45	61595.43	559.33
36	698.64	62294.07	479.09	61814.98	559.34
37	523.98	62338.96	481.66	61857.30	559.34
38	349.32	62206.62	482.16	61724.46	559.33
39	174.66	61899.12	480.61	61418.51	559.33
40	0.00	61418.51	477.02	60941.49	559.32

PEAK OUTFLOW= 8.04 CFS AT 38 MINUTES

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
PAGE of

PICKETT RAY & SILVER

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

Civil Engineers
Planners
Land Surveyors

397-1211

Basin @ Lot 85 Design Storm : 15 yr/20 m

Stormwater Detention.

1. Pre-developed Conditions;

on site 13.26 Ac @ 1.87 = 24.80

2. Post-developed Conditions;

on site :	8.14 Ac	@	2.64	=	21.49	cfs
	5.94	@	(	=	15.68	
	1.36	@	)	=	3.59	
	3.22	@	2.64	=	8.50	
	~~8.80~~ 18.66 Ac	@	2.69	=	23.23 ~~49.26~~ 72.49	cfs x 60 · ~~2955~~ 4349

3. By-Pass Basin (Post-developed)

4. Detention Required;

~~49.26~~ 72.49 cfs - 24.80 cfs = ~~24.46~~ 47.69 cfs.

24.46 cfs x (30 min x 60 sec/min) = ~~44,028~~ cf 85,842 CF

5. Allowable Release;

_____ cfs - _____ cfs = _____ cfs

```
*****************************************
*                                       *
*  RECTANGULAR ORIFICE                  *
*   24 in W X ~~36~~ 29 in H   ELEV= 558      *
*                                       *
*  Outlet Pipe -  52 ft - 36 in pipe    *
*  UFL= 552.52  LFL= 552   n= .013      *
*                                       *
*  Overflow Structure -  Standpipe      *
*  DIAM= 42 in   STANDPIPE ELEV= 560    *
*                                       *
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15YR

BERKSHIRE DOWNS 6-24-97 SUBMITTAL DATE: 6-24-97

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	217.45	217.45	0.00	217.45	558.00
2	434.90	652.35	0.10	652.25	558.01
3	652.35	1304.60	0.52	1304.08	558.03
4	869.80	2173.88	1.48	2172.40	558.05
5	1087.25	3259.65	3.17	3256.48	558.07
6	1304.70	4561.18	5.82	4555.36	558.10
7	1522.15	6077.51	9.64	6067.87	558.13
8	1739.60	7807.47	14.81	7792.66	558.17
9	1957.05	9749.71	21.56	9728.15	558.21
10	2174.50	11902.65	30.07	11872.58	558.26
11	2391.95	14264.53	40.54	14223.99	558.31
12	2609.40	16833.39	53.17	16780.22	558.36
13	2826.85	19607.07	68.13	19538.94	558.42
14	3044.30	22583.24	85.60	22497.64	558.49
15	3261.75	25759.39	105.76	25653.64	558.55
16	3479.20	29132.84	128.76	29004.08	558.63
17	3696.65	32700.73	154.82	32545.92	558.70
18	3914.10	36460.02	184.00	36276.02	558.78
19	4131.55	40407.57	216.53	40191.04	558.87
20	4349.00	44540.04	252.51	44287.53	558.96
21	4131.55	48419.08	292.08	48127.00	559.04
22	3914.10	52041.10	330.90	51710.21	559.12
23	3696.65	55406.86	368.51	55038.35	559.19
24	3479.20	58517.55	404.68	58112.88	559.26
25	3261.75	61374.63	439.04	60935.59	559.32
26	3044.30	63979.89	471.43	63508.46	559.37
27	2826.85	66335.31	501.57	65833.75	559.42
28	2609.40	68443.15	529.40	67913.75	559.47
29	2391.95	70305.71	554.67	69751.03	559.51
30	2174.50	71925.53	577.35	71348.18	559.54
31	1957.05	73305.23	597.28	72707.96	559.57
32	1739.60	74447.56	614.42	73833.15	559.60
33	1522.15	75355.29	628.76	74726.53	559.61
34	1304.70	76031.25	640.19	75391.04	559.63
35	1087.25	76478.29	648.74	75829.55	559.64
36	869.80	76699.35	654.44	76044.91	559.64
37	652.35	76697.26	657.22	76040.04	559.64
38	434.90	76474.94	657.15	75817.79	559.64
39	217.45	76035.25	654.25	75381.00	559.63
40	0.00	75381.00	648.63	74732.36	559.61

PEAK OUTFLOW= 10.95 CFS AT 37 MINUTES

PICKETT RAY & SILVER

Civil Engineers
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Land Surveyors

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

397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
PAGE 8

Basin @ Lot 85 Design Storm: 25 yr/20 m
Stormwater Detention.

1. Pre-developed Conditions;

on site 13.26 Ac @ 2.31 = 30.63

2. Post-developed Conditions;

on site =	8.14 Ac	@	3.26	= 26.54
	5.94	@	[illegible]	= 19.36
	1.36	@		= 4.43
	3.22	@	3.26	= 10,50
	~~8.80~~			~~28.69~~
	~~18.66 Ac~~			~~60.83 cfs~~ x 60 = ~~3,65~~
	27.44			89.52 =53

3. By-Pass Basin (Post-developed)
(Extra 5.62 cfs discharge on SE corner)

4. Detention Required;

89.52 cfs - 30.63 cfs = 58.89 cfs.

58.89 cfs x (30 min x 60 sec/min) = 3,533.40 cf

5. Allowable Release;

_____ cfs - _____ cfs = _____ cfs.

PICKETT RAY & SILVER

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PAGE 8

Basin @ Lot 85 Design Storm: 25 yr/20 m
Stormwater Detention.

5. Outflow Structure; (Principal spillway)

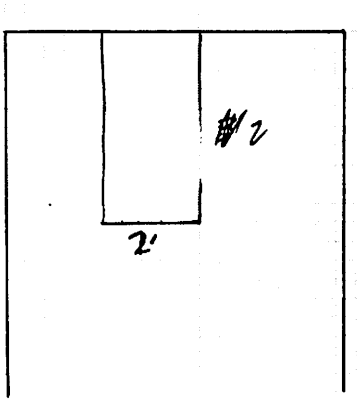
$Q = ca\sqrt{2gh}$

Use 42" Riser

top dam 562.5

$Q = 0.6(3.0)\sqrt{64.4(1)}$

$Q = 19.49$ cfs.



top 560
℄ 552.5
36" · 1%
℄ 552.00

Elev.	Area	Storage	Accum Storage
(NWL) 558.0	42,916	0	
560	49,639	92,555	92,555
562	57,137	106,776	199,331

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*****************************************
*                                       *
*  RECTANGULAR ORIFICE                  *
*   24 in W X 29 in H   ELEV= 558       *
*                                       *
*  Outlet Pipe -  52 ft - 36 in pipe    *
*  UFL= 552.52  LFL= 552   n= .013      *
*                                       *
*  Overflow Structure -  Standpipe      *
*  DIAM= 42 in   STANDPIPE ELEV= 560    *
*                                       *
*****************************************
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25YR

BERKSHIRE DOWNS 6-24-97 SUBMITTAL DATE: 6-24-97

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	268.55	268.55	0.00	268.55	558.01
2	537.10	805.65	0.14	805.51	558.02
3	805.65	1611.16	0.72	1610.44	558.03
4	1074.20	2684.64	2.02	2682.62	558.06
5	1342.75	4025.37	4.36	4021.01	558.09
6	1611.30	5632.31	7.99	5624.32	558.12
7	1879.85	7504.17	13.22	7490.95	558.16
8	2148.40	9639.35	20.32	9619.03	558.21
9	2416.95	12035.98	29.57	12006.41	558.26
10	2685.50	14691.91	41.23	14650.68	558.32
11	2954.05	17604.73	55.58	17549.15	558.38
12	3222.60	20771.75	72.86	20698.89	558.45
13	3491.15	24190.04	93.33	24096.72	558.52
14	3759.70	27856.42	117.23	27739.19	558.60
15	4028.25	31767.44	144.80	31622.64	558.68
16	4296.80	35919.44	176.25	35743.20	558.77
17	4565.35	40308.55	211.77	40096.77	558.87
18	4833.90	44930.67	251.64	44679.03	558.97
19	5102.45	49781.48	295.97	49485.51	559.07
20	5371.00	54856.51	345.01	54511.51	559.18
21	5102.45	59613.96	398.87	59215.10	559.28
22	4833.90	64049.00	451.58	63597.42	559.37
23	4565.35	68162.78	502.65	67660.13	559.46
24	4296.80	71956.93	551.56	71405.37	559.54
25	4028.25	75433.62	597.99	74835.63	559.62
26	3759.70	78595.35	641.61	77953.73	559.68
27	3491.15	81444.88	682.13	80762.75	559.75
28	3222.60	83985.36	719.31	83266.05	559.80
29	2954.05	86220.10	753.00	85467.10	559.85
30	2685.50	88152.60	783.08	87369.52	559.89
31	2416.95	89786.48	809.35	88977.12	559.92
32	2148.40	91125.52	831.79	90293.74	559.95
33	1879.85	92173.60	850.31	91323.28	559.97
34	1611.30	92934.58	864.92	92069.66	559.99
35	1342.75	93412.42	875.53	92536.88	560.00
36	1074.20	93611.08	882.23	92728.86	560.00
37	805.65	93534.52	884.94	92649.58	560.00
38	537.10	93186.68	883.77	92302.92	559.99
39	268.55	92571.48	878.88	91692.60	559.98
40	0.00	91692.60	870.18	90822.42	559.96

PEAK OUTFLOW= 14.75 CFS AT 37 MINUTES

PICKETT RAY & SILVER

Civil Engineers
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397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
PAGE 8

Basin @ Lot _____ Design Storm : 100 yr/20 m.
Stormwater Detention.

1. Pre-developed Conditions;

on site 13.26 Ac @ 2.95 = 39.12

2. Post-developed Conditions;

on site =	8.14	Ac	@	4.17	= 33.94 cfs
	5.94		@	4.17	= 24.77
	1.36		@	4.17	= 5.67
	3.22		@	4.17	= 13.43
	~~8.80~~				~~36.70~~
	18.66	Ac			77.81 cfs x 60 = ~~4668.6~~
	27.46				114.51 = 6870.6

3. By-Pass Basin (Post-developed)

4. Detention Required;

114.51 cfs - 39.12 cfs = 75.39 cfs.

75.39 cfs x (30 min x 60 sec/min) = 4523.4 cf

5. Allowable Release;

_____ cfs - _____ cfs = _____ cfs

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*****************************************
*                                       *
*  RECTANGULAR ORIFICE                  *
*   24 in W X 25 in H   ELEV= 558       *
*                21                     *
*  Outlet Pipe -  52 ft - 36 in pipe    *
*  UFL= 552.52  LFL= 552   n= .013      *
*                                       *
*  Overflow Structure -  Standpipe      *
*  DIAM= 42 in   STANDPIPE ELEV= 560    *
*                                       *
*****************************************
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100YR

BERKSHIRE DOWNS 6-24-97 SUBMITTAL DATE: 6-24-97

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	343.53	343.53	0.00	343.53	558.01
2	687.06	1030.59	0.20	1030.39	558.02
3	1030.59	2060.98	1.04	2059.94	558.04
4	1374.12	3434.06	2.93	3431.13	558.07
5	1717.65	5148.78	6.30	5142.48	558.11
6	2061.18	7203.66	11.56	7192.10	558.16
7	2404.71	9596.81	19.11	9577.70	558.21
8	2748.24	12325.94	29.38	12296.56	558.27
9	3091.77	15388.33	42.73	15345.60	558.33
10	3435.30	18780.90	59.58	18721.32	558.40
11	3778.83	22500.15	80.28	22419.87	558.48
12	4122.36	26542.23	105.20	26437.03	558.57
13	4465.89	30902.92	134.72	30768.20	558.66
14	4809.42	35577.62	169.14	35408.48	558.77
15	5152.95	40561.43	208.82	40352.61	558.87
16	5496.48	45849.09	254.03	45595.06	558.99
17	5840.01	51435.07	305.11	51129.96	559.10
18	6183.54	57313.50	362.34	56951.16	559.23
19	6527.07	63478.23	425.95	63052.28	559.36
20	6870.60	69922.88	496.20	69426.69	559.50
21	6527.07	75953.76	573.32	75380.44	559.63
22	6183.54	81563.98	648.63	80915.35	559.75
23	5840.01	86755.36	721.35	86034.02	559.86
24	5496.48	91530.50	790.86	90739.64	559.96
25	5152.95	95892.60	856.62	95035.98	560.05
26	4809.42	99845.40	931.22	98914.18	560.12
27	4465.89	103380.10	1036.28	102343.80	560.18
28	4122.36	106466.20	1149.83	105316.40	560.24
29	3778.83	109095.20	1258.53	107836.60	560.29
30	3435.30	111271.90	1361.67	109910.30	560.33
31	3091.77	113002.00	1448.76	111553.30	560.36
32	2748.24	114301.50	1525.59	112775.90	560.38
33	2404.71	115180.70	1581.17	113599.50	560.39
34	2061.18	115660.70	1619.15	114041.50	560.40
35	1717.65	115759.20	1639.88	114119.30	560.40
36	1374.12	115493.40	1643.55	113849.90	560.40
37	1030.59	114880.50	1630.86	113249.60	560.39
38	687.06	113936.60	1602.95	112333.70	560.37
39	343.53	112677.20	1560.92	111116.30	560.35
40	0.00	111116.30	1501.23	109615.10	560.32

PEAK OUTFLOW= 27.39 CFS AT 36 MINUTES

PICKETT RAY & SILVER
Civil Engineers
Planners
Land Surveyors
333 Mid Rivers Mall Dr.
St. Peters, MO 63376
397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221-12
DATE 3.31.97
DESIGNER T. Dietz
PAGE 1 of 11

Basin B @ Lot 34 Stormwater Detention.

Design Storm: ___ yr/20 n

Base Information

Elev.	Area	Storage	Accum Storage
566	20538	0	0
568	25,963	46,501	46,501
570	31,872	57,835	104,336

Note: $Q = CLH^{3/2}$

$Q_{100} = 81.90 \text{ cfs} = 3.0(12.57)(H^{3/2})$

$1.67 = H$

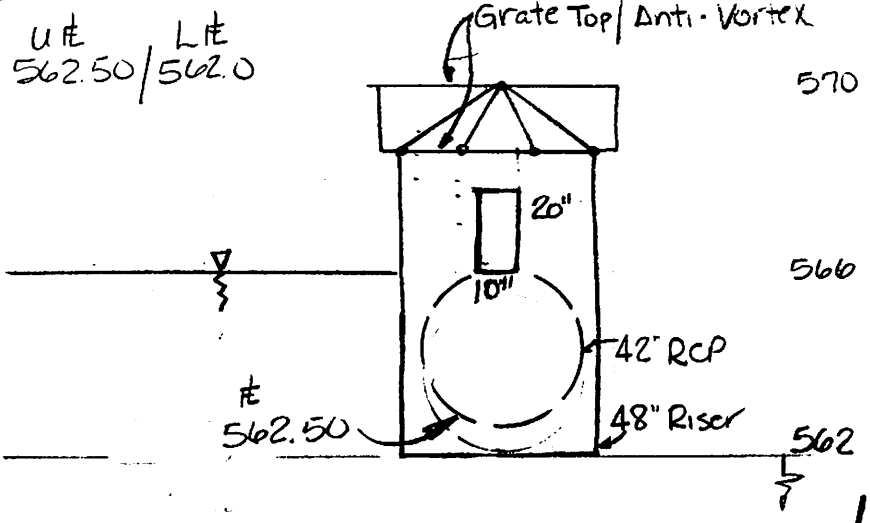
$568.5 + 1.67 = 570.17$

STATE OF MISSOURI
HAROLD J. BARTCH
NUMBER E-17751
REGISTERED PROFESSIONAL ENGINEER
4/8/97

Top of Dam = 570.5
Normal Water Level = 566.0

(48" Overflow) 50' - 42" RCP @ 1% U/E 562.50 / L/E 562.0

2yr. HW = 567.53 (4.12 cfs)
5yr. HW = 567.88 (6.97 cfs)
15yr. HW = 568.21 (11.5 cfs.)
25yr. HW = 568.49 (21.43 cfs)
100yr. HW = 568.80 (38.02 cfs)



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397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
PAGE 1 of

Basin @ Lot 34 Design Storm : 2 yr/20 m.
Stormwater Detention.

1. Pre-developed Conditions;

On-Site = 6.03 Ac @ 1.20 = 7.24
Off-site = 19.04 Ac @ 1.20 = 22.85

30.09 cfs

2. Post-developed @ to Basin;

2.73 Ac (sheet) on-site : 6.17 @ 1.67 = 10.30 cfs
0.93
2.51
6.17 Ac

off-site : 19.04 @ 1.20 = 22.85

33.15 cfs
(x 60 = 1,989.)

3. By-pass Basin (Post-developed)

4. Detention Required;

33.15 − 30.09 = 3.06

3.06 x (30 min x 60 sec/min) = 5508 cf

5. Allowable Release from Basin;

6. Peak Outflow;

BERKSHIRE DOWNS - 2 YR 4-1-97 SUBMITTAL DATE:

ELEVATION	AREA	VOLUME	CUM. VOLUME
566.00	20538		
		46501	46501
568.00	25963		
		57835	104336
570.00	31872		

```
*********************************************
*                                           *
*  RECTANGULAR ORIFICE                      *
*    10 in W X 20 in H    ELEV= 566         *
*                                           *
*  Outlet Pipe -  50 ft - 42 in pipe        *
*  UFL= 562.5  LFL= 562    n= .013          *
*                                           *
*  Overflow Structure -  Standpipe          *
*  DIAM= 48 in    STANDPIPE ELEV= 568       *
*                                           *
*********************************************
```

BERKSHIRE DOWNS - 2 YR 4-1-97 SUBMITTAL DATE:

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	99.45	99.45	0.00	99.45	566.00
2	198.90	298.35	0.04	298.31	566.01
3	298.35	596.66	0.19	596.47	566.03
4	397.80	994.27	0.53	993.74	566.04
5	497.25	1490.99	1.15	1489.84	566.06
6	596.70	2086.54	2.11	2084.43	566.09
7	696.15	2780.58	3.49	2777.09	566.12
8	795.60	3572.69	5.37	3567.32	566.15
9	895.05	4462.37	7.81	4454.56	566.19
10	994.50	5449.06	10.90	5438.16	566.23
11	1093.95	6532.11	14.70	6517.41	566.28
12	1193.40	7710.81	19.30	7691.51	566.33
13	1292.85	8984.36	24.74	8959.62	566.39
14	1392.30	10351.92	31.10	10320.82	566.44
15	1491.75	11812.57	38.45	11774.12	566.51
16	1591.20	13365.32	46.85	13318.47	566.57
17	1690.65	15009.12	56.36	14952.76	566.64
18	1790.10	16742.86	67.05	16675.81	566.72
19	1889.55	18565.36	78.96	18486.40	566.80
20	1989.00	20475.40	92.17	20383.23	566.88
21	1889.55	22272.78	106.72	22166.07	566.95
22	1790.10	23956.17	121.01	23835.16	567.03
23	1690.65	25525.81	134.93	25390.88	567.09
24	1591.20	26982.08	148.35	26833.73	567.15
25	1491.75	28325.48	161.18	28164.30	567.21
26	1392.30	29556.60	173.32	29383.28	567.26
27	1292.85	30676.13	184.70	30491.43	567.31
28	1193.40	31684.83	195.23	31489.60	567.35
29	1093.95	32583.55	204.90	32378.65	567.39
30	994.50	33373.15	213.64	33159.51	567.43
31	895.05	34054.56	221.42	33833.14	567.46
32	795.60	34628.74	228.19	34400.55	567.48
33	696.15	35096.70	233.96	34862.74	567.50
34	596.70	35459.44	238.69	35220.74	567.51
35	497.25	35717.99	242.38	35475.61	567.53
36	397.80	35873.41	245.02	35628.39	567.53
37	298.35	35926.74	246.59	35680.15	567.53
38	198.90	35879.05	247.14	35631.91	567.53
39	99.45	35731.36	246.64	35484.72	567.53
40	0.00	35484.72	245.11	35239.61	567.52

PEAK OUTFLOW= 4.12 CFS AT 38 MINUTES

PICKETT RAY & SILVER

Civil Engineers
Planners
Land Surveyors

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

397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
PAGE 6

Basin @ Lot 34 Design Storm : 5 yr/20 m.
Stormwater Detention.

1. Pre-developed Conditions;

On-Site =	6.03 Ac @ 1.51	9.10
Off-site :	19.04 Ac @ 1.51	28.75
		37.85 cfs

2. Post-developed @ to Basin;

2.73 Ac (sheet)	on-site :	6.17 @ 2.12	13.08
0.93			
2.51	off-site :	19.04 @ 1.51	28.75
6.17 Ac			41.83 cfs
			(x 60 = 2509.8-)

3. By-pass Basin (Post-developed)

4. Detention Required;

41.83 − 37.85 · 3.98

3.98 x (30 mun x 60 sec/min) = 7164 cf

5. Allowable Release from Basin;

6. Peak Outflow;

BERKSHIRE DOWNS - 5 YR 4-1-97 SUBMITTAL DATE:

ELEVATION	AREA	VOLUME	CUM. VOLUME
566.00	20538		
		46501	46501
568.00	25963		
		57835	104336
570.00	31872		

```
*********************************************
*                                           *
*  RECTANGULAR ORIFICE                      *
*   10 in W X 20 in H   ELEV= 566           *
*                                           *
*  Outlet Pipe -  50 ft - 42 in pipe        *
*  UFL= 562.5  LFL= 562   n= .013           *
*                                           *
*  Overflow Structure -  Standpipe          *
*  DIAM= 48 in   STANDPIPE ELEV= 568        *
*                                           *
*********************************************
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BERKSHIRE DOWNS - 5 YR 4-1-97 SUBMITTAL DATE:

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	125.49	125.49	0.00	125.49	566.01
2	250.98	376.47	0.05	376.42	566.02
3	376.47	752.89	0.27	752.62	566.03
4	501.96	1254.58	0.76	1253.82	566.05
5	627.45	1881.27	1.63	1879.64	566.08
6	752.94	2632.58	2.99	2629.59	566.11
7	878.43	3508.02	4.94	3503.08	566.15
8	1003.92	4507.00	7.60	4499.40	566.19
9	1129.41	5628.81	11.07	5617.74	566.24
10	1254.90	6872.64	15.44	6857.20	566.29
11	1380.39	8237.59	20.82	8216.77	566.35
12	1505.88	9722.65	27.31	9695.34	566.42
13	1631.37	11326.71	35.01	11291.70	566.49
14	1756.86	13048.56	44.00	13004.56	566.56
15	1882.35	14886.91	54.38	14832.53	566.64
16	2007.84	16840.37	66.24	16774.13	566.72
17	2133.33	18907.46	79.66	18827.80	566.81
18	2258.82	21086.62	94.73	20991.90	566.90
19	2384.31	23376.21	111.52	23264.69	567.00
20	2509.80	25774.49	130.12	25644.37	567.10
21	2384.31	28028.68	150.59	27878.10	567.20
22	2258.82	30136.92	170.68	29966.24	567.29
23	2133.33	32099.57	190.21	31909.36	567.37
24	2007.84	33917.20	209.02	33708.18	567.45
25	1882.35	35590.53	226.93	35363.60	567.52
26	1756.86	37120.46	243.86	36876.60	567.59
27	1631.37	38507.97	259.67	38248.30	567.65
28	1505.88	39754.18	274.30	39479.88	567.70
29	1380.39	40860.27	379.33	40480.94	567.74
30	1254.90	41735.84	388.67	41347.17	567.78
31	1129.41	42476.58	396.56	42080.03	567.81
32	1003.92	43083.76	403.13	42680.83	567.84
33	878.43	43559.26	408.42	43150.84	567.86
34	752.94	43903.78	412.52	43491.27	567.87
35	627.45	44118.72	415.46	43703.26	567.88
36	501.96	44205.22	417.29	43787.94	567.88
37	376.47	44164.41	418.01	43746.40	567.88
38	250.98	43997.38	417.65	43579.72	567.87
39	125.49	43705.21	416.22	43288.99	567.86
40	0.00	43288.99	413.72	42875.27	567.84

PEAK OUTFLOW= 6.97 CFS AT 37 MINUTES

PICKETT RAY & SILVER

Civil Engineers
Planners
Land Surveyors

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

397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
PAGE 6 of

Basin @ Lot 34 Design Storm : 15 yr/20 m.
Stormwater Detention.

1. Pre-developed Conditions;

On-Site =	6.03 Ac @	1.87	= 11.28
Off-site :	19.04 Ac @	1.87	35.60
			46.88 cfs

2. Post-developed Q to Basin;

2.73 Ac (sheet)	on-site :	6.17 @ 2.64	= 16.29
0.93			
2.51			
6.17 Ac	off-site :	19.04 @ 1.87	35.60
			51.89 cfs
			(x 60 = 3113.4)

3. By-pass Basin (Post-developed)

4. Detention Required;

51.89 − 46.88 = 5.01

5.01 x (30 min x 60 sec/min) = 9018 cf

5. Allowable Release from Basin;

6. Peak Outflow;

BERKSHIRE DOWNS - 15 YR 4-1-97 SUBMITTAL DATE:

ELEVATION	AREA	VOLUME	CUM. VOLUME
566.00	20538		
		46501	46501
568.00	25963		
		57835	104336
570.00	31872		

```
*********************************************
*                                           *
*  RECTANGULAR ORIFICE                      *
*   10 in W X 20 in H    ELEV= 566          *
*                                           *
*  Outlet Pipe -  50 ft - 42 in pipe        *
*  UFL= 562.5  LFL= 562    n= .013          *
*                                           *
*  Overflow Structure -  Standpipe          *
*  DIAM= 48 in   STANDPIPE ELEV= 568        *
*                                           *
*********************************************
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BERKSHIRE DOWNS - 15 YR 4-1-97 SUBMITTAL DATE:

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	155.67	155.67	0.00	155.67	566.01
2	311.34	467.01	0.07	466.94	566.02
3	467.01	933.95	0.37	933.58	566.04
4	622.68	1556.26	1.05	1555.21	566.07
5	778.35	2333.56	2.25	2331.31	566.10
6	934.02	3265.33	4.13	3261.20	566.14
7	1089.69	4350.89	6.83	4344.06	566.19
8	1245.36	5589.42	10.50	5578.92	566.24
9	1401.03	6979.95	15.28	6964.67	566.30
10	1556.70	8521.37	21.31	8500.06	566.37
11	1712.37	10212.43	28.74	10183.69	566.44
12	1868.04	12051.73	37.68	12014.05	566.52
13	2023.71	14037.76	48.29	13989.47	566.60
14	2179.38	16168.85	60.67	16108.18	566.69
15	2335.05	18443.23	74.97	18368.26	566.79
16	2490.72	20858.98	91.29	20767.69	566.89
17	2646.39	23414.08	109.74	23304.34	567.00
18	2802.06	26106.40	130.45	25975.95	567.12
19	2957.73	28933.68	153.52	28780.16	567.24
20	3113.40	31893.56	179.04	31714.52	567.36
21	2957.73	34672.25	207.10	34465.15	567.48
22	2802.06	37267.21	234.62	37032.58	567.59
23	2646.39	39678.97	261.32	39417.65	567.70
24	2490.72	41908.37	378.76	41529.61	567.79
25	2335.05	43864.66	398.21	43466.46	567.87
26	2179.38	45645.84	415.25	45230.59	567.95
27	2023.71	47254.30	430.19	46824.12	568.01
28	1868.04	48692.16	445.13	48247.03	568.06
29	1712.37	49959.40	482.07	49477.33	568.10
30	1556.70	51034.03	527.35	50506.68	568.14
31	1401.03	51907.71	571.82	51335.89	568.17
32	1245.36	52581.25	613.69	51967.56	568.19
33	1089.69	53057.25	646.37	52410.88	568.20
34	934.02	53344.90	670.30	52674.60	568.21
35	778.35	53452.96	684.99	52767.97	568.22
36	622.68	53390.65	690.24	52700.41	568.21
37	467.01	53167.42	686.37	52481.05	568.21
38	311.34	52792.39	674.19	52118.20	568.19
39	155.67	52273.87	654.48	51619.39	568.18
40	0.00	51619.39	628.17	50991.22	568.16

PEAK OUTFLOW= 11.5 CFS AT 36 MINUTES

PICKETT RAY & SILVER

Civil Engineers
Planners
Land Surveyors

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

397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
PAGE 8

Basin @ Lot 34 Design Storm: 25 yr/20 m
Stormwater Detention.

1. Pre-developed Conditions;

On-Site = 6.03 Ac @ 2.31 = 13.93 cfs.
Off-site = 19.04 Ac @ 2.31 = 43.98

57.91 cfs.

2. Post-developed @ to Basin;

2.73 Ac (sheet) on-site = 6.17 @ 3.26 = 20.11
0.93
2.51
6.17 Ac

off-site = 19.04 @ 2.31 = 43.98

64.09 cfs
(x 60 = 3845.4)

3. By-pass Basin (Post-developed)

4. Detention Required;

64.09 − 57.91 = 6.18 cfs

6.18 x (30 min x 60 sec/min) = 11124 cf

5. Allowable Release from Basin;

6. Peak Outflow;

BERKSHIRE DOWNS - 25 YR 4-1-97 SUBMITTAL DATE:

ELEVATION	AREA	VOLUME	CUM. VOLUME
566.00	20538		
		46501	46501
568.00	25963		
		57835	104336
570.00	31872		

```
*******************************************
*                                         *
*  RECTANGULAR ORIFICE                    *
*   10 in W X 20 in H   ELEV= 566         *
*                                         *
*  Outlet Pipe -  50 ft - 42 in pipe      *
*  UFL= 562.5  LFL= 562   n= .013         *
*                                         *
*  Overflow Structure -  Standpipe        *
*  DIAM= 48 in   STANDPIPE ELEV= 568      *
*                                         *
*******************************************
```

BERKSHIRE DOWNS - 25 YR 4-1-97 SUBMITTAL DATE:

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	192.27	192.27	0.00	192.27	566.01
2	384.54	576.81	0.10	576.71	566.02
3	576.81	1153.52	0.51	1153.01	566.05
4	769.08	1922.09	1.43	1920.66	566.08
5	961.35	2882.01	3.09	2878.92	566.12
6	1153.62	4032.54	5.67	4026.87	566.17
7	1345.89	5372.76	9.37	5363.39	566.23
8	1538.16	6901.55	14.40	6887.15	566.30
9	1730.43	8617.58	20.96	8596.62	566.37
10	1922.70	10519.32	29.23	10490.09	566.45
11	2114.97	12605.06	39.40	12565.66	566.54
12	2307.24	14872.90	51.65	14821.25	566.64
13	2499.51	17320.76	66.16	17254.60	566.74
14	2691.78	19946.38	83.11	19863.27	566.85
15	2884.05	22747.32	102.65	22644.67	566.97
16	3076.32	25720.99	124.95	25596.04	567.10
17	3268.59	28864.63	150.16	28714.47	567.24
18	3460.86	32175.33	178.42	31996.92	567.38
19	3653.13	35650.05	209.87	35440.18	567.52
20	3845.40	39285.58	244.65	39040.93	567.68
21	3653.13	42694.06	375.17	42318.88	567.82
22	3460.86	45779.74	405.24	45374.50	567.95
23	3268.59	48643.09	431.38	48211.71	568.06
24	3076.32	51288.03	480.94	50807.10	568.15
25	2884.05	53691.15	585.77	53105.38	568.23
26	2691.78	55797.16	709.46	55087.70	568.30
27	2499.51	57587.21	835.36	56751.85	568.35
28	2307.24	59059.09	954.76	58104.33	568.40
29	2114.97	60219.30	1054.67	59164.63	568.44
30	1922.70	61087.33	1136.87	59950.46	568.47
31	1730.43	61680.89	1213.43	60467.46	568.48
32	1538.16	62005.62	1256.59	60749.03	568.49
33	1345.89	62094.92	1280.47	60814.45	568.50
34	1153.62	61968.07	1286.03	60682.04	568.49
35	961.35	61643.39	1274.78	60368.61	568.48
36	769.08	61137.69	1248.28	59889.40	568.46
37	576.81	60466.21	1208.47	59257.74	568.44
38	384.54	59642.28	1144.27	58498.01	568.41
39	192.27	58690.28	1084.79	57605.50	568.38
40	0.00	57605.50	1017.24	56588.26	568.35

PEAK OUTFLOW= 21.43 CFS AT 34 MINUTES

PICKETT RAY & SILVER

Civil Engineers
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Land Surveyors

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

397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
PAGE 8

Basin @ Lot 34 — Design Storm : 100 yr/20 m
Stormwater Detention.

1. Pre-developed Conditions;

On-Site =	6.03 Ac @ 2.95 =	17.79 cfs
Off-site =	19.04 Ac @ 2.95 =	56.17
		73.96 cfs

2. Post-developed Q to Basin;

2.73 Ac (sheet)	on-site =	6.17 @ 4.17 =	25.73 cfs
0.93			
2.51	off-site =	19.04 @ 2.95 =	56.17
6.17 Ac			81.90 cfs

3. By-pass Basin (Post-developed) (x 60 = 4914)

4. Detention Required;

81.90 − 73.96 = 7.94

7.94 x (30 min x 60 sec/min) = 14,292 cf

5. Allowable Release from Basin;

6. Peak Outflow;

ELEVATION	AREA	VOLUME	CUM. VOLUME
566.00	20538		
		46501	46501
568.00	25963		
		57835	104336
570.00	31872		

```
*********************************************
*                                           *
*  RECTANGULAR ORIFICE                      *
*   10 in W X 20 in H   ELEV= 566           *
*                                           *
*  Outlet Pipe -  50 ft - 42 in pipe        *
*  UFL= 562.5  LFL= 562   n= .013           *
*                                           *
*  Overflow Structure -  Standpipe          *
*  DIAM= 48 in   STANDPIPE ELEV= 568        *
*                                           *
*********************************************
```

BERKSHIRE DOWNS - 100 YR 4-1-97 SUBMITTAL DATE:

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	245.70	245.70	0.00	245.70	566.01
2	491.40	737.10	0.14	736.96	566.03
3	737.10	1474.06	0.73	1473.33	566.06
4	982.80	2456.13	2.07	2454.06	566.11
5	1228.50	3682.56	4.46	3678.10	566.16
6	1474.20	5152.30	8.18	5144.12	566.22
7	1719.90	6864.02	13.53	6850.49	566.29
8	1965.60	8816.09	20.79	8795.30	566.38
9	2211.30	11006.60	30.25	10976.35	566.47
10	2457.00	13433.35	42.17	13391.18	566.58
11	2702.70	16093.88	56.82	16037.06	566.69
12	2948.40	18985.46	74.47	18910.99	566.81
13	3194.10	22105.09	95.36	22009.73	566.95
14	3439.80	25449.53	119.74	25329.79	567.09
15	3685.50	29015.29	147.82	28867.47	567.24
16	3931.20	32798.67	179.85	32618.83	567.40
17	4176.90	36795.73	216.03	36579.70	567.57
18	4422.60	41002.30	256.54	40745.76	567.75
19	4668.30	45414.06	391.09	45022.97	567.94
20	4914.00	49936.97	428.45	49508.53	568.10
21	4668.30	54176.83	528.63	53648.20	568.25
22	4422.60	58070.80	741.27	57329.53	568.37
23	4176.90	61506.43	996.73	60509.71	568.48
24	3931.20	64440.91	1260.16	63180.75	568.58
25	3685.50	66866.25	1513.29	65352.96	568.65
26	3439.80	68792.76	1755.42	67037.35	568.71
27	3194.10	70231.46	1929.20	68302.25	568.75
28	2948.40	71250.65	2106.72	69143.93	568.78
29	2702.70	71846.63	2201.13	69645.50	568.80
30	2457.00	72102.50	2258.13	69844.37	568.81
31	2211.30	72055.68	2280.98	69774.69	568.80
32	1965.60	71740.29	2272.88	69467.41	568.79
33	1719.90	71187.31	2237.79	68949.51	568.78
34	1474.20	70423.71	2179.21	68244.50	568.75
35	1228.50	69473.00	2100.25	67372.75	568.72
36	982.80	68355.55	1964.62	66390.93	568.69
37	737.10	67128.03	1861.71	65266.31	568.65
38	491.40	65757.71	1712.79	64044.92	568.61
39	245.70	64290.62	1594.67	62695.95	568.56
40	0.00	62695.95	1468.62	61227.33	568.51

PEAK OUTFLOW= 38.02 CFS AT 31 MINUTES

Det. Calcs for Basin A File.

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397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221-12
DATE 3.31.97
DESIGNER T. Dietz
PAGE 1 of IV

Basin "A" @ Lot 85 Design Storm : 2 yr/20 m.
Stormwater Detention.

1. Predeveloped Conditions;
   onsite : 13.26 A_c @ 1.20 cfs/A_c : 15.91 cfs

2. Post-developed Conditions;

T_{AC} :	8.14	@ 1.67 =	13.59 cfs
	5.94	}	9.92
	1.36	}	2.27
	3.22	@ 1.67 =	5.38
	8.80	=	14.70
	27.46	≈	45.86 cfs. x 60 = 2751.60

3. By-pass Basin (Post-developed)

4. Detention Required;
   45.86 cfs - 15.91 = 29.95 cfs
   29.95 cfs x (30 min x 60 sec/min) = 53,910 cf. (volume)

STATE OF MISSOURI
HAROLD R. BARTLETT
NUMBER E-17751
REGISTERED PROFESSIONAL ENGINEER
4/8/97

PICKETT RAY & SILVER
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Land Surveyors
333 Mid Rivers Mall Dr.
St. Peters, MO 63376
397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
PAGE 2 of

Basin @ Lot 85 Design Storm : 2 yr/20 m.
Stormwater Detention.

5. Outflow Structure (Principal Spillway)

Use 42" Riser w/ grate top, anti-vortex device.

(NWL : 558.0)

$Q = Ca\sqrt{2gh}$

$Q = 0.6(2)\sqrt{64.4(1)}$

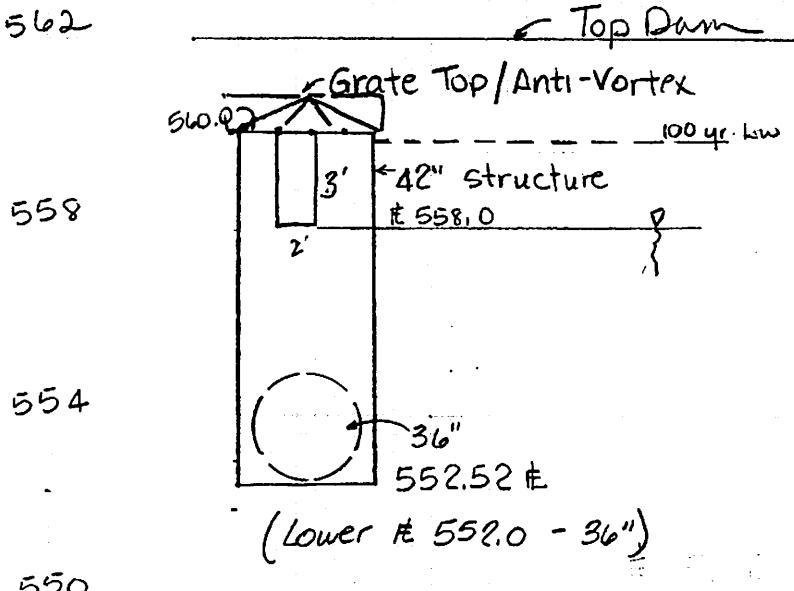
$Q = 9.63$ cfs.

Top Dam : 562.5
Top Structure : 560.0
Normal Water level : 558.0

$Q = CLH^{3/2}$

$= 3.0(11.0)(1.0)^{3/2}$

$Q = 33$ cfs



2 yr. HW :	559.07	(5.72 cfs)
5 yr. HW :	559.39	(8.09 cfs)
15 yr. HW :	559.69	(10.95 cfs)
25 yr. HW :	560.00	(14.75 cfs)
100 yr. HW	560.40	(27.39)

100 yr. :
Q = 114.51 cfs

$114.51 = 3.0(11.0)H^{3/2}$

$2.29 = H$

100 yr. HW = 560 + 2.29 = 562.29

```
*****************************************
*                                       *
*  RECTANGULAR ORIFICE                  *
*   24 in W X 36 in H   ELEV= 558       *
*                                       *
*  Outlet Pipe -  52 ft - 36 in pipe    *
*  UFL= 552.52  LFL= 552   n= .013      *
*                                       *
*  Overflow Structure -  Standpipe      *
*  DIAM= 42 in   STANDPIPE ELEV= 560    *
*                                       *
*****************************************
```

2yr

BERKSHIRE DOWNS 6-24-97 SUBMITTAL DATE: 6-24-97

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	137.58	137.58	0.00	137.58	558.00
2	275.16	412.74	0.05	412.69	558.01
3	412.74	825.43	0.26	825.17	558.02
4	550.32	1375.49	0.74	1374.75	558.03
5	687.90	2062.65	1.60	2061.05	558.04
6	825.48	2886.53	2.93	2883.60	558.06
7	963.06	3846.66	4.85	3841.81	558.08
8	1100.64	4942.45	7.46	4934.99	558.11
9	1238.22	6173.21	10.86	6162.35	558.13
10	1375.80	7538.15	15.16	7522.99	558.16
11	1513.38	9036.37	20.44	9015.93	558.19
12	1650.96	10666.89	26.83	10640.06	558.23
13	1788.54	12428.60	34.40	12394.20	558.27
14	1926.12	14320.32	43.24	14277.08	558.31
15	2063.70	16340.78	53.47	16287.31	558.35
16	2201.28	18488.59	65.14	18423.45	558.40
17	2338.86	20762.31	78.38	20683.93	558.45
18	2476.44	23160.37	93.23	23067.14	558.50
19	2614.02	25681.16	109.80	25571.36	558.55
20	2751.60	28322.96	128.15	28194.81	558.61
21	2614.02	30808.83	148.37	30660.46	558.66
22	2476.44	33136.90	168.26	32968.65	558.71
23	2338.86	35307.51	187.60	35119.90	558.76
24	2201.28	37321.18	206.27	37114.91	558.80
25	2063.70	39178.61	224.09	38954.52	558.84
26	1926.12	40880.64	240.95	40639.70	558.88
27	1788.54	42428.24	256.76	42171.48	558.91
28	1650.96	43822.44	271.40	43551.04	558.94
29	1513.38	45064.42	284.85	44779.57	558.97
30	1375.80	46155.37	296.98	45858.39	558.99
31	1238.22	47096.61	307.78	46788.83	559.01
32	1100.64	47889.47	317.18	47572.29	559.03
33	963.06	48535.35	325.17	48210.17	559.04
34	825.48	49035.65	331.74	48703.91	559.05
35	687.90	49391.81	336.86	49054.96	559.06
36	550.32	49605.28	340.50	49264.79	559.06
37	412.74	49677.53	342.70	49334.83	559.07
38	275.16	49609.99	343.41	49266.58	559.06
39	137.58	49404.16	342.70	49061.46	559.06
40	0.00	49061.46	340.58	48720.88	559.05

PEAK OUTFLOW= 5.72 CFS AT 38 MINUTES

PICKETT RAY & SILVER

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397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
PAGE 4 of

Basin @ Lot 85 Design Storm: 5 yr/20 m
Stormwater Detention.

1. Predeveloped Conditions;

onsite : 13.26 Ac @ 1.51 = 20.02

2. Post-developed Conditions;

onsite :	8.14 Ac	@ 2.12 =	17.26
	5.94		12.59
	1.36		2.88
	3.22	@ 2.12 =	6.83
	8.80		18.66
	27.46 Ac		58.22 cfs. x 60. 3493

3. By-Pass Basin (Post-developed)

4. Detention Required;

58.22 cfs - 20.02 : 38.20 cfs

38.20 x (30 min x 60 sec/min) : 68,760 cf

```
*******************************************
*                                         *
*  RECTANGULAR ORIFICE                    *
*   24 in W X 36 in H   ELEV= 558         *
*                                         *
*  Outlet Pipe -  52 ft - 36 in pipe      *
*  UFL= 552.52  LFL= 552   n= .013        *
*                                         *
*  Overflow Structure -  Standpipe        *
*  DIAM= 42 in   STANDPIPE ELEV= 560      *
*                                         *
*******************************************
```

5YR

BERKSHIRE DOWNS 6-24-97 SUBMITTAL DATE: 6-24-97

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	174.66	174.66	0.00	174.66	558.00
2	349.32	523.98	0.07	523.91	558.01
3	523.98	1047.89	0.37	1047.52	558.02
4	698.64	1746.16	1.06	1745.10	558.04
5	873.30	2618.40	2.29	2616.11	558.06
6	1047.96	3664.07	4.19	3659.88	558.08
7	1222.62	4882.50	6.94	4875.56	558.11
8	1397.28	6272.84	10.67	6262.17	558.14
9	1571.94	7834.11	15.53	7818.58	558.17
10	1746.60	9565.18	21.67	9543.51	558.21
11	1921.26	11464.77	29.22	11435.55	558.25
12	2095.92	13531.47	38.33	13493.14	558.29
13	2270.58	15763.72	49.12	15714.60	558.34
14	2445.24	18159.84	61.75	18098.09	558.39
15	2619.90	20717.99	76.30	20641.69	558.45
16	2794.56	23436.25	92.94	23343.31	558.50
17	2969.22	26312.53	111.77	26200.77	558.57
18	3143.88	29344.65	132.91	29211.74	558.63
19	3318.54	32530.28	156.47	32373.81	558.70
20	3493.20	35867.01	182.56	35684.45	558.77
21	3318.54	39002.99	211.27	38791.72	558.84
22	3143.88	41935.60	239.45	41696.15	558.90
23	2969.22	44665.37	266.83	44398.53	558.96
24	2794.56	47193.09	293.20	46899.89	559.01
25	2619.90	49519.79	318.31	49201.49	559.06
26	2445.24	51646.73	342.03	51304.70	559.11
27	2270.58	53575.28	364.20	53211.08	559.15
28	2095.92	55307.00	384.69	54922.31	559.19
29	1921.26	56843.57	403.40	56440.17	559.22
30	1746.60	58186.78	420.23	57766.55	559.25
31	1571.94	59338.49	435.14	58903.35	559.27
32	1397.28	60300.63	448.03	59852.60	559.29
33	1222.62	61075.22	458.90	60616.32	559.31
34	1047.96	61664.28	467.70	61196.58	559.32
35	873.30	62069.88	474.45	61595.43	559.33
36	698.64	62294.07	479.09	61814.98	559.34
37	523.98	62338.96	481.66	61857.30	559.34
38	349.32	62206.62	482.16	61724.46	559.33
39	174.66	61899.12	480.61	61418.51	559.33
40	0.00	61418.51	477.02	60941.49	559.32

PEAK OUTFLOW= 8.04 CFS AT 38 MINUTES

PICKETT RAY & SILVER

Civil Engineers
Planners
Land Surveyors

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

397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
PAGE 6

Basin @ Lot 85 Design Storm : 15 yr/20 m.
Stormwater Detention.

1. Pre-developed Conditions;

on site : 13.26 A^c @ 1.87 = 24.80

2. Post-developed Conditions;

on site =	8.14	A^c	@	2.64	= 21.49 cfs
	5.94		@	[illegible]	= 15.68
	1.36		@	[illegible]	= 3.59
	3.22		@	2.64	= 8.50
	8.80		@	2.64	= 23.23
	18.66	A^c			~~49.26~~ cfs

72.49 cfs x 60 · ~~2955~~ 0349.

3. By-Pass Basin (Post-developed)

4. Detention Required;

~~49.26~~ 72.49 cfs - 24.80 cfs = ~~24.46~~ 47.69 cfs.

24.46 cfs x (30 min x 60 sec/min) = ~~44,038~~ cf
85,042 CF.

5. Allowable Release;

_____ cfs - _____ cfs = _____ cfs.

```
*****************************************
*                                       *
*  RECTANGULAR ORIFICE                  *
*   24 in W X 36 in H   ELEV= 558       *
*                                       *
*  Outlet Pipe --  52 ft - 36 in pipe   *
*  UFL= 552.52  LFL= 552   n= .013      *
*                                       *
*  Overflow Structure =  Standpipe      *
*  DIAM= 42 in   STANDPIPE ELEV= 560    *
*                                       *
*****************************************
```

15YR

BERKSHIRE DOWNS 6-24-97 SUBMITTAL DATE: 6-24-97

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	217.45	217.45	0.00	217.45	558.00
2	434.90	652.35	0.10	652.25	558.01
3	652.35	1304.60	0.52	1304.08	558.03
4	869.80	2173.88	1.48	2172.40	558.05
5	1087.25	3259.65	3.17	3256.48	558.07
6	1304.70	4561.18	5.82	4555.36	558.10
7	1522.15	6077.51	9.64	6067.87	558.13
8	1739.60	7807.47	14.81	7792.66	558.17
9	1957.05	9749.71	21.56	9728.15	558.21
10	2174.50	11902.65	30.07	11872.58	558.26
11	2391.95	14264.53	40.54	14223.99	558.31
12	2609.40	16833.39	53.17	16780.22	558.36
13	2826.85	19607.07	68.13	19538.94	558.42
14	3044.30	22583.24	85.60	22497.64	558.49
15	3261.75	25759.39	105.76	25653.64	558.55
16	3479.20	29132.84	128.76	29004.08	558.63
17	3696.65	32700.73	154.82	32545.92	558.70
18	3914.10	36460.02	184.00	36276.02	558.78
19	4131.55	40407.57	216.53	40191.04	558.87
20	4349.00	44540.04	252.51	44287.53	558.96
21	4131.55	48419.08	292.08	48127.00	559.04
22	3914.10	52041.10	330.90	51710.21	559.12
23	3696.65	55406.86	368.51	55038.35	559.19
24	3479.20	58517.55	404.68	58112.88	559.26
25	3261.75	61374.63	439.04	60935.59	559.32
26	3044.30	63979.89	471.43	63508.46	559.37
27	2826.85	66335.31	501.57	65833.75	559.42
28	2609.40	68443.15	529.40	67913.75	559.47
29	2391.95	70305.71	554.67	69751.03	559.51
30	2174.50	71925.53	577.35	71348.18	559.54
31	1957.05	73305.23	597.28	72707.96	559.57
32	1739.60	74447.56	614.42	73833.15	559.60
33	1522.15	75355.29	628.76	74726.53	559.61
34	1304.70	76031.25	640.19	75391.04	559.63
35	1087.25	76478.29	648.74	75829.55	559.64
36	869.80	76699.35	654.44	76044.91	559.64
37	652.35	76697.26	657.22	76040.04	559.64
38	434.90	76474.94	657.15	75817.79	559.64
39	217.45	76033.25	654.25	75381.00	559.63
40	0.00	75381.00	648.63	74732.36	559.61

PEAK OUTFLOW= 10.95 CFS AT 37 MINUTES

PICKETT RAY & SILVER

Civil Engineers
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Land Surveyors

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

397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
PAGE 8

Basin @ Lot 85 Design Storm : 25 yr/20 m.
Stormwater Detention.

1. Pre-developed Conditions;

on site 13.26 A^c @ 2.31 = 30.63

2. Post developed Conditions;

on site =	8.14 A^c	@	3.26	= 26.54
	5.94	@	(	= 19.36
	1.36	@		= 4.43
	3.22	@	3.26	= 10.50
	~~8.80~~			~~28.69~~
	~~18.66 A^c~~			~~60.83 cfs~~ x 60 = ~~3,65~~
	27.46			89.52 =537

3. By-Pass Basin (Post-developed)
(Extra 5.62 cfs discharge on SE corner)

4. Detention Required;

89.52 cfs - 30.63 cfs = 58.89 cfs.

58.89 cfs x (30 min x 60 sec/min) = 3,533.40 cf

5. Allowable Release;

_____ cfs - _____ cfs = _____ cfs.

PICKETT RAY & SILVER

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397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
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Basin @ Lot 85 Design Storm : 25 yr/20 m.
Stormwater Detention.

5. Outflow Structure; (Principal spillway)

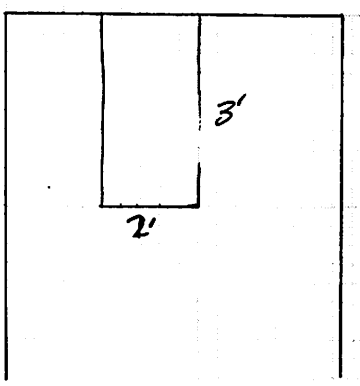
$Q = ca\sqrt{2gh}$

Use 42" Riser

top dam 562.5

$Q = 0.6(3.0)\sqrt{64.4(1)}$

$Q = 19.44$ cfs.



top 560
℄ 552.52
36" · 1%
℄ 552.00

Elev.	Area	Storage	Accum storage
(NWL) 558.0	42,916	0	
560	49,639	92,555	92,555
562	57,137	106,776	199,331

Sed. Acc for 5 yrs.
(28 Ac)(160) 5Y = 28,400 ✓

```
*******************************************
*                                         *
*  RECTANGULAR ORIFICE                    *
*   24 in W X 36 in H   ELEV= 558         *
*                                         *
*  Outlet Pipe -  52 ft - 36 in pipe      *
*  UFL= 552.52  LFL= 552   n= .013        *
*                                         *
*  Overflow Structure -  Standpipe        *
*  DIAM= 42 in   STANDPIPE ELEV= 560      *
*                                         *
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25YR

BERKSHIRE DOWNS 6-24-97 SUBMITTAL DATE: 6-24-97

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	268.55	268.55	0.00	268.55	558.01
2	537.10	805.65	0.14	805.51	558.02
3	805.65	1611.16	0.72	1610.44	558.03
4	1074.20	2684.64	2.02	2682.62	558.06
5	1342.75	4025.37	4.36	4021.01	558.09
6	1611.30	5632.31	7.99	5624.32	558.12
7	1879.85	7504.17	13.22	7490.95	558.16
8	2148.40	9639.35	20.32	9619.03	558.21
9	2416.95	12035.98	29.57	12006.41	558.26
10	2685.50	14691.91	41.23	14650.68	558.32
11	2954.05	17604.73	55.58	17549.15	558.38
12	3222.60	20771.75	72.86	20698.89	558.45
13	3491.15	24190.04	93.33	24096.72	558.52
14	3759.70	27856.42	117.23	27739.19	558.60
15	4028.25	31767.44	144.80	31622.64	558.68
16	4296.80	35919.44	176.25	35743.20	558.77
17	4565.35	40308.55	211.77	40096.77	558.87
18	4833.90	44930.67	251.64	44679.03	558.97
19	5102.45	49781.48	295.97	49485.51	559.07
20	5371.00	54856.51	345.01	54511.51	559.18
21	5102.45	59613.96	398.87	59215.10	559.28
22	4833.90	64049.00	451.58	63597.42	559.37
23	4565.35	68162.78	502.65	67660.13	559.46
24	4296.80	71956.93	551.56	71405.37	559.54
25	4028.25	75433.62	597.99	74835.63	559.62
26	3759.70	78595.35	641.61	77953.73	559.68
27	3491.15	81444.88	682.13	80762.75	559.75
28	3222.60	83985.36	719.31	83266.05	559.80
29	2954.05	86220.10	753.00	85467.10	559.85
30	2685.50	88152.60	783.08	87369.52	559.89
31	2416.95	89786.48	809.35	88977.12	559.92
32	2148.40	91125.52	831.79	90293.74	559.95
33	1879.85	92173.60	850.31	91323.28	559.97
34	1611.30	92934.58	864.92	92069.66	559.99
35	1342.75	93412.42	875.53	92536.88	560.00
36	1074.20	93611.08	882.23	92728.86	560.00
37	805.65	93534.52	884.94	92649.58	560.00
38	537.10	93186.68	883.77	92302.92	559.99
39	268.55	92571.48	878.88	91692.60	559.98
40	0.00	91692.60	870.18	90822.42	559.96

PEAK OUTFLOW= 14.75 CFS AT 37 MINUTES

PICKETT RAY & SILVER

Civil Engineers
Planners
Land Surveyors

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

397-1211

PROJECT NAME "Berkshire Downs"
PROJECT #/JOB ORDER # 96221
DATE 3.31.97
DESIGNER T. Dietz
PAGE 8

Basin @ Lot _____ Design Storm : 100 yr/20 m.
Stormwater Detention.

1. Pre-developed Conditions;
   on site 13.26 A^c @ 2.95 = 39.12

2. Post-developed Conditions;

on site =	8.14	A^c	@ 4.17	= 33.94	cfs
	5.94		@ 4.17	= 24.77	
	1.36		@ 4.17	= 5.67	
	3.22		@ 4.17	= 13.43	
	~~8.80~~			~~36.70~~	
	18.66	A^c		77.81 cfs x 60 =	~~4668.6~~
	27.46			114.51	= 6870.6

3. By-Pass Basin (Post-developed)

4. Detention Required;
   114.51 cfs - 39.12 cfs = 75.39 cfs.
   75.39 cfs x (30 min x 60 sec/min) = 4523.4 cf

5. Allowable Release;
   _____ cfs - _____ cfs = _____ cfs

```
*****************************************
*                                       *
*  RECTANGULAR ORIFICE                  *
*   24 in W X 36 in H   ELEV= 558       *
*                                       *
*  Outlet Pipe -  52 ft - 36 in pipe    *
*  UFL= 552.52  LFL= 552   n= .013      *
*                                       *
*  Overflow Structure -  Standpipe      *
*  DIAM= 42 in   STANDPIPE ELEV= 560    *
*                                       *
*****************************************
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100YR

BERKSHIRE DOWNS 6-24-97 SUBMITTAL DATE: 6-24-97

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	343.53	343.53	0.00	343.53	558.01
2	687.06	1030.59	0.20	1030.39	558.02
3	1030.59	2060.98	1.04	2059.94	558.04
4	1374.12	3434.06	2.93	3431.13	558.07
5	1717.65	5148.78	6.30	5142.48	558.11
6	2061.18	7203.66	11.56	7192.10	558.16
7	2404.71	9596.81	19.11	9577.70	558.21
8	2748.24	12325.94	29.38	12296.56	558.27
9	3091.77	15388.33	42.73	15345.60	558.33
10	3435.30	18780.90	59.58	18721.32	558.40
11	3778.83	22500.15	80.28	22419.87	558.48
12	4122.36	26542.23	105.20	26437.03	558.57
13	4465.89	30902.92	134.72	30768.20	558.66
14	4809.42	35577.62	169.14	35408.48	558.77
15	5152.95	40561.43	208.82	40352.61	558.87
16	5496.48	45849.09	254.03	45595.06	558.99
17	5840.01	51435.07	305.11	51129.96	559.10
18	6183.54	57313.50	362.34	56951.16	559.23
19	6527.07	63478.23	425.95	63052.28	559.36
20	6870.60	69922.88	496.20	69426.69	559.50
21	6527.07	75953.76	573.32	75380.44	559.63
22	6183.54	81563.98	648.63	80915.35	559.75
23	5840.01	86755.36	721.35	86034.02	559.86
24	5496.48	91530.50	790.86	90739.64	559.96
25	5152.95	95892.60	856.62	95035.98	560.05
26	4809.42	99845.40	931.22	98914.18	560.12
27	4465.89	103380.10	1036.28	102343.80	560.18
28	4122.36	106466.20	1149.83	105316.40	560.24
29	3778.83	109095.20	1258.53	107836.60	560.29
30	3435.30	111271.90	1361.67	109910.30	560.33
31	3091.77	113002.00	1448.76	111553.30	560.36
32	2748.24	114301.50	1525.59	112775.90	560.38
33	2404.71	115180.70	1581.17	113599.50	560.39
34	2061.18	115660.70	1619.15	114041.50	560.40
35	1717.65	115759.20	1639.88	114119.30	560.40
36	1374.12	115493.40	1643.55	113849.90	560.40
37	1030.59	114880.50	1630.86	113249.60	560.39
38	687.06	113936.60	1602.95	112333.70	560.37
39	343.53	112677.20	1560.92	111116.30	560.35
40	0.00	111116.30	1501.23	109615.10	560.32

PEAK OUTFLOW= 27.39 CFS AT 36 MINUTES

City of O'Fallon, Missouri

138 South Main Street
O'Fallon, MO 63366
Phone 314-240-2000
Fax 314-978-4144

July 9, 1997

Kurt Daniels
Pickett Ray & Silver
333 Mid Rivers Mall Drive
St. Peters, MO 63376

RE: Berkshire Downs
Improvement Plan Comments

Dear Mr. Daniels:

The improvement plans for the proposed Berkshire Downs Subdivision are not approved. The following are comments on the subject site plan:

1. Show the location of the existing well.

2. Please show a circular temporary turn-around at the end of Castlebrook Drive on all sheets.

3. A temporary construction easement is needed from Lots 270 and 271 unless the lots are vacant.

4. Provide approval letters from the Fire District, the water company, and Duckett Creek.

5. The routings for Detention Basin A State that the opening for the outfall structure is 2' by 3' and the detail shows a 1' by 2' opening. Please clarify.

Sincerely,

Colleen Young

Colleen Young
Engineer III

cc: J. Heitkamp, F. Godwin, B. Hedden BH
Glenmaro Five 7283 Highway N
O'Fallon, MO 63366