

96-235 WHITETAIL ESTATES

July 30, 1997

2 Year, 20 Minute Duration Storm

1) Gross Area of Site = 22.09 Acres.

2) Pre-Developed Runoff.

$$Q_{pre} = 22.09 A^e @ 1.15 cfs/A^e = 25.40 cfs.$$

3) Post-Developed Runoff.

$$Q_{post} = 22.09 A^e @ 1.61 cfs/A^e = 35.56 cfs$$

$$4) Q_{post} - Q_{pre} = 35.56 - 25.40 = 10.16 cfs.$$

5) Q To Basin

$$Q = 15.29 A^e @ 1.61 cfs/A^e = 24.62 cfs$$

6) Attenuation Required = 10.16 cfs

7) Attenuation Provided = 12.68 cfs

216

SUBMITTAL DATE:

ELEVATION	AREA	VOLUME	CUM. VOLUME
494.00	0	8088	8088
496.00	8088	21707	29795
498.00	13619	28458	58253
499.90	16337		

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*****
*
* RECTANGULAR ORIFICE
* 8 in W X 36 in H ELEV= 494
*
* Outlet Pipe - 71.54 ft - 30 in pipe
* UFL= 491.53 LFL= 487.24 n= .013
*
* Overflow Structure - Standpipe
* DIAM= 42 in STANDPIPE ELEV= 497.84
*
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SUBMITTAL DATE:

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	246.20	246.20	0.00	246.20	494.06
2	492.40	738.60	1.56	737.04	494.18
3	738.60	1475.64	8.09	1467.55	494.36
4	984.80	2452.35	22.73	2429.62	494.60
5	1231.00	3660.62	48.43	3612.19	494.89
6	1477.20	5089.39	87.80	5001.59	495.24
7	1477.20	6478.79	143.05	6335.74	495.57
8	1477.20	7812.94	203.95	7608.99	495.88
9	1477.20	9086.19	268.42	8817.77	496.07
10	1477.20	10294.97	309.11	9985.86	496.17
11	1477.20	11463.06	333.57	11129.49	496.28
12	1477.20	12606.69	358.10	12248.59	496.38
13	1477.20	13725.79	382.66	13343.13	496.48
14	1477.20	14820.33	407.20	14413.13	496.58
15	1477.20	15890.33	431.68	15458.65	496.68
16	1477.20	16935.85	456.06	16479.79	496.77
17	1477.20	17956.99	480.29	17476.70	496.87
18	1477.20	18953.90	504.35	18449.55	496.95
19	1477.20	19926.75	528.20	19398.55	497.04
20	1477.20	20875.75	729.48	20146.27	497.11
21	1231.00	21377.27	745.59	20631.68	497.16
22	984.80	21616.48	755.87	20860.61	497.18
23	738.60	21599.21	760.67	20838.54	497.17
24	492.40	21330.94	760.21	20570.73	497.15
25	246.20	20816.93	754.59	20062.34	497.10
26	0.00	20062.34	743.80	19318.54	497.03

PEAK OUTFLOW= 12.68 CFS AT 23 MINUTES

96-235

WHITETAIL ESTATES

June 30, 1997

5 Year, 20 Minute Duration Storm

1) Gross Area of Site = 22.09 Acres.

2) Pre-Developed Runoff.

$$Q_{pre} = 22.09 \text{ A}^e @ 1.41 \text{ cfs/A}^e = 31.15 \text{ cfs}$$

3) Post-Developed Runoff

$$Q_{post} = 22.09 \text{ A}^e @ 1.98 \text{ cfs/A}^e = 43.74 \text{ cfs}$$

4) Increase in Runoff.

$$Q_{post} - Q_{pre} = 43.74 - 31.15 = 12.59 \text{ cfs}$$

5) Q To Basin

$$Q = 15.29 \text{ A}^e @ 1.98 \text{ cfs/A}^e = 30.27 \text{ cfs}$$

6) Attenuation Required = 12.59 cfs

7) Attenuation Provided = 16.08 cfs

SUBMITTAL DATE: 5/4

ELEVATION	AREA	VOLUME	CUM. VOLUME
494.00	0	8088	8088
496.00	8088	21707	29795
498.00	13619	28458	58253
499.90	16337		

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* RECTANGULAR ORIFICE
* 8 in W X 36 in H ELEV= 494
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* Outlet Pipe - 71.54 ft - 30 in pipe
* UFL= 491.53 LFL= 487.24 n= .013
*
* Overflow Structure - Standpipe
* DIAM= 42 in STANDPIPE ELEV= 497.84
*
*****

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SUBMITTAL DATE:

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	302.70	302.70	0.00	302.70	494.07
2	605.40	908.10	2.13	905.97	494.22
3	908.10	1814.07	11.03	1803.04	494.45
4	1210.80	3013.84	30.96	2982.88	494.74
5	1513.50	4496.38	65.88	4430.50	495.10
6	1816.20	6246.70	119.26	6127.44	495.52
7	1816.20	7943.64	193.97	7749.67	495.92
8	1816.20	9565.87	275.90	9289.97	496.11
9	1816.20	11106.17	318.92	10787.25	496.25
10	1816.20	12603.45	350.69	12252.76	496.38
11	1816.20	14068.96	382.75	13686.21	496.52
12	1816.20	15502.41	415.00	15087.41	496.64
13	1816.20	16903.61	447.35	16456.26	496.77
14	1816.20	18272.46	479.73	17792.73	496.89
15	1816.20	19608.93	512.06	19096.87	497.01
16	1816.20	20913.07	722.87	20190.20	497.12
17	1816.20	22006.40	746.53	21259.87	497.21
18	1816.20	23076.07	768.97	22307.10	497.31
19	1816.20	24123.30	790.32	23332.98	497.40
20	1816.20	25149.18	810.69	24338.49	497.50
21	1513.50	25851.99	830.18	25021.81	497.56
22	1210.80	26232.61	843.16	25389.45	497.59
23	908.10	26297.55	850.06	25447.49	497.60
24	605.40	26052.89	851.15	25201.75	497.58
25	302.70	25504.45	846.54	24657.91	497.53
26	0.00	24657.91	836.28	23821.64	497.45

PEAK OUTFLOW= 14.19 CFS AT 24 MINUTES

(96-235)

WHITETAIL ESTATES

June 17, 1999;
Rev. 7/30/97

15 Year, 20 Minute Duration Storm

1) Gross Area of Site = 22.09 Acres

2) Pre-Developed Runoff.

$$Q_{pre} = 22.09 \text{ Ac} @ 1.87 \text{ cfs/Ac} = 41.31 \text{ cfs}$$

3) Post-Developed Runoff.

$$Q_{post} = 22.09 \text{ Ac} @ 2.3 \text{ cfs/Ac} = 50.81 \text{ cfs}$$

4) Increase in Runoff

$$Q_{post} - Q_{pre} = 50.81 - 41.31 = 9.50 \text{ cfs}$$

5) Q to Basin

$$Q = 15.29 \text{ Ac} @ 2.3 \text{ cfs/Ac} = 35.16 \text{ cfs}$$

6) Attenuation Required = 9.50 cfs

7) Attenuation Provided = 18.11 cfs

(96-235) WHITETAIL ESTATES

June 17, 1997
Rev. 7/30/97

25 Year, 20 Minute Duration Storm

1) Gross Area of Site = 22.09 Acres

2) Pre-Developed Runoff.

$$Q_{pre} = 22.09 A^e @ 2.31 \text{ cfs}/A^e = 51.03 \text{ cfs}$$

3) Post-Developed Runoff.

$$Q_{post} = 22.09 A^e @ 2.71 \text{ cfs}/A^e = 59.86 \text{ cfs}$$

4) Increase in Runoff

$$Q_{post} - Q_{pre} = 59.86 - 51.03 = 8.83 \text{ cfs}$$

5) Q To Basin

$$Q = 15.29 A^e @ 2.71 \text{ cfs}/A^e = 41.44 \text{ cfs}$$

6) Attenuation Required = 8.83 cfs

7) Attenuation Provided = 16.03 cfs

25%
 SUBMITTAL DATE:

ELEVATION	AREA	VOLUME	CUM. VOLUME
494.00	0	8088	8088
496.00	8088	21707	29795
498.00	13619	28458	58253
499.90	16337		

 *
 * RECTANGULAR ORIFICE *
 * 8 in W X 36 in H ELEV= 494 *
 *
 * Outlet Pipe - 71.54 ft - 30 in pipe *
 * UFL= 491.53 LFL= 487.24 n= .013 *
 *
 * Overflow Structure - Standpipe *
 * DIAM= 42 in STANDPIPE ELEV= 497.84 *
 *

SUBMITTAL DATE:

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	414.40	414.40	0.00	414.40	494.10
2	828.80	1243.20	3.41	1239.79	494.31
3	1243.20	2482.99	17.65	2465.34	494.61
4	1657.60	4122.94	49.50	4073.44	495.01
5	2072.00	6145.44	105.14	6040.30	495.49
6	2486.40	8526.70	189.85	8336.85	496.02
7	2486.40	10823.25	299.23	10524.02	496.22
8	2486.40	13010.42	345.04	12665.38	496.42
9	2486.40	15151.78	391.95	14759.83	496.61
10	2486.40	17246.23	439.71	16806.52	496.80
11	2486.40	19292.92	488.13	18804.79	496.99
12	2486.40	21291.19	537.00	20754.19	497.17
13	2486.40	23240.59	758.45	22482.15	497.33
14	2486.40	24968.55	793.84	24174.71	497.48
15	2486.40	26661.11	827.04	25834.08	497.64
16	2486.40	28320.48	858.34	27462.15	497.79
17	2486.40	29948.55	887.98	29060.57	497.93
18	2486.40	31546.97	966.14	30580.84	498.05
19	2486.40	33067.24	1117.21	31950.03	498.14
20	2486.40	34436.43	1264.85	33171.59	498.23
21	2072.00	35243.59	1417.81	33825.78	498.27
22	1657.60	35483.38	1503.81	33979.57	498.28
23	1243.20	35222.77	1524.66	33698.11	498.26
24	828.80	34526.91	1486.72	33040.19	498.22
25	414.40	33454.59	1401.07	32053.52	498.15
26	0.00	32053.52	1276.69	30776.83	498.07

PEAK OUTFLOW= 25.41 CFS AT 23 MINUTES

100 yr.

100 yr.

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*****
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* RECTANGULAR ORIFICE
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*
* Outlet Pipe - 71.54 ft - 30 in pipe
* UFL= 491.53 LFL= 487.24 n= .013
*
* Overflow Structure - Standpipe
* DIAM= 42 in STANDPIPE ELEV= 497.84
*
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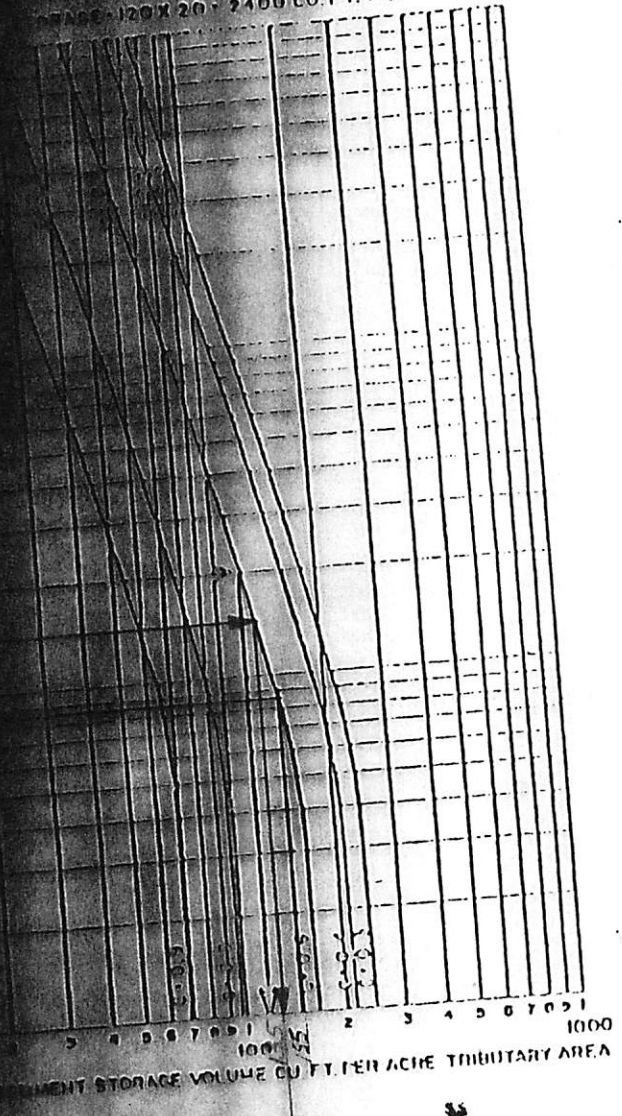
SUBMITTAL DATE:

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	532.10	532.10	0.00	532.10	494.13
2	1064.20	1596.30	4.96	1591.34	494.39
3	1596.30	3187.64	25.67	3161.97	494.78
4	2128.40	5290.37	71.90	5218.47	495.29
5	2660.50	7878.97	152.45	7726.52	495.91
6	3192.60	10919.12	274.66	10644.46	496.24
7	3192.60	13837.06	347.62	13489.44	496.50
8	3192.60	16682.04	410.52	16271.52	496.75
9	3192.60	19464.12	475.31	18988.81	497.00
10	3192.60	22181.41	720.49	21460.92	497.23
11	3192.60	24653.52	773.11	23880.41	497.46
12	3192.60	27073.01	821.36	26251.65	497.67
13	3192.60	29444.25	866.04	28578.21	497.89
14	3192.60	31770.81	926.40	30844.41	498.07
15	3192.60	34037.01	1143.11	32893.90	498.21
16	3192.60	36086.50	1382.60	34703.90	498.33
17	3192.60	37896.50	1638.37	36258.13	498.43
18	3192.60	39450.73	1891.49	37559.24	498.52
19	3192.60	40751.84	2140.05	38611.79	498.59
20	3192.60	41804.39	2330.27	39474.12	498.65
21	2660.50	42134.62	2533.43	39601.19	498.65
22	2128.40	41729.59	2558.44	39171.15	498.63
23	1596.30	40767.45	2474.37	38293.08	498.57
24	1064.20	39357.28	2271.79	37085.49	498.49
25	532.10	37617.59	2027.84	35589.75	498.39
26	0.00	35589.75	1770.50	33819.25	498.27

PEAK OUTFLOW= 42.64 CFS AT 22 MINUTES

WHITETAIL ESTATES

INCHES
 COEFFICIENT "C" = 0.6
 PER CENT PER ACRE PER YEAR
 RATE = 120 X 20 = 2400 CU. FT. PER YEAR.



ANNUAL SEDIMENT STORAGE

FIG. 1

$$135 \text{ ft}^3 \times 15.29 \times 2^4 = 4,128 \text{ ft}^3 \text{ Sediment Storage Required}$$

WHITETAIL ESTATES

Top of Berm Calculations

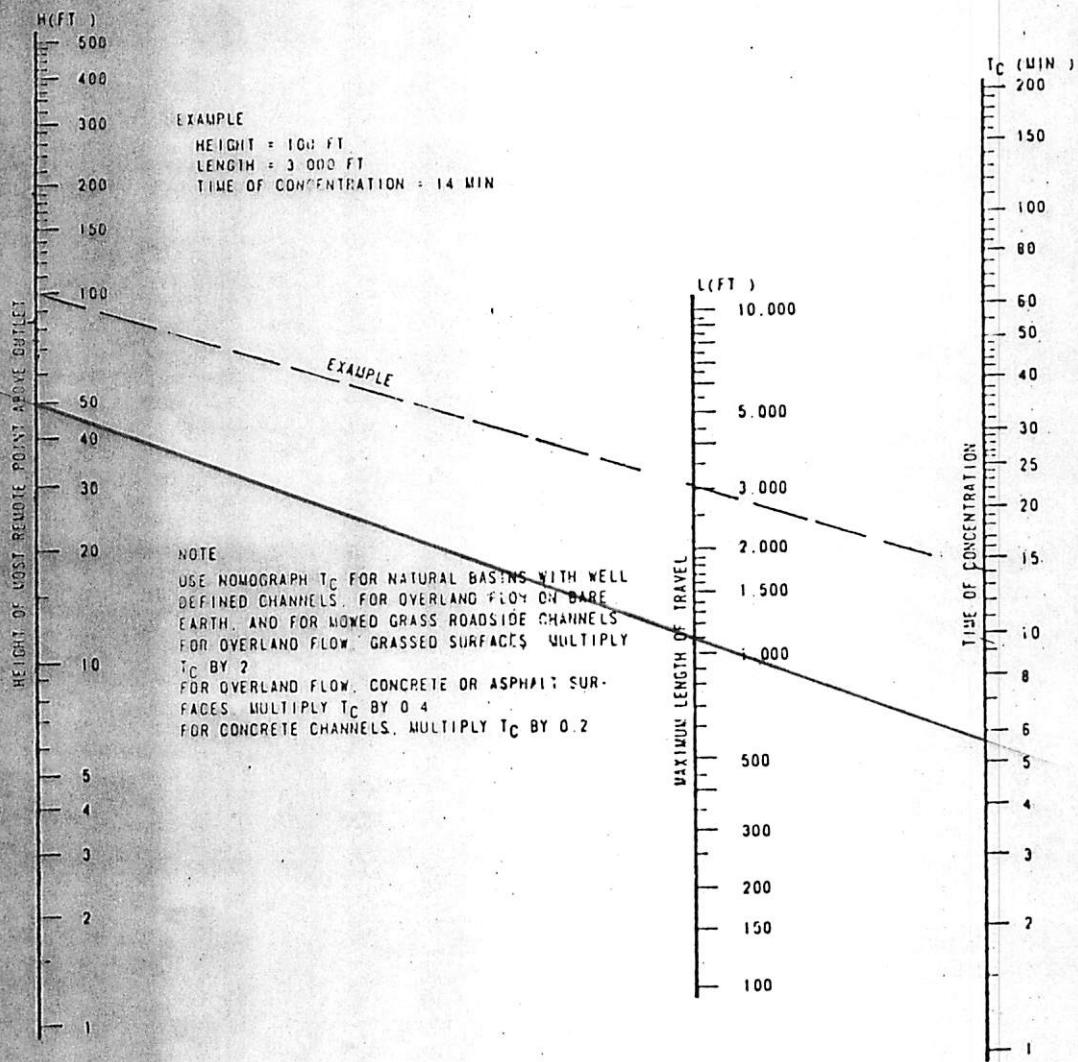
25 Year Storm.

$$\begin{array}{r} 497.84 = \text{Top of O.S. 2} \\ + 0.30 \text{ 2Yr Required Sediment Storage.} \\ \hline 498.14 \\ + 2.00 \text{ Freeboard.} \\ \hline 500.14 \leftarrow \text{Top of Berm.} \end{array} \quad \begin{array}{r} 497.84 \\ \quad .75 \text{ 5yr.} \\ \hline 498.59 \\ \quad \longrightarrow 1.55' \end{array}$$

100 Yr. Storm.

$$\begin{array}{r} 498.65 \\ + 0.30 \text{ 2Yr.} \\ \hline 498.95 \\ + 1.00 \text{ Freeboard} \\ \hline 499.95 \end{array} \quad \begin{array}{r} 498.65 \\ \quad .75 \text{ 5yr.} \\ \hline 499.40 \\ \quad \longrightarrow \text{Freeboard} \end{array} \quad \begin{array}{r} 500.14 \\ - 499.40 \\ \hline .74' \end{array}$$

Whitetail



$T_c = 5.6 \text{ Min}$

FIGURE 1

TIME OF CONCENTRATION OF SMALL DRAINAGE BASINS