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FAXED 12/19
FILE

GEORGE BUTLER ASSOCIATES, INC
Engineers • Architects
Suite 200, 225 South Main Street
O'Fallon, Missouri 63366-2892
Telephone (314) 272-2444
FAX (314) 281-2901

June 15, 1994

Mr. Frank Keeven
P.O. Box 147
O'Fallon, Missouri 63366

Re: Detention at Lake South of Winding Woods

Dear Mr. Keeven:

Attached is the hydraulic information submitted to the City of O'Fallon by St. Charles Engineering for Winding Woods.

The detention provided in the lake as shown on their plans for the 100 year storm is 323,014.2 C.F. The 100 year detention requirement is (171.68 cfs - 141.48) 6.08/3.85 x 1800 = 86,116 C.F. To develop the remaining 30.1 acres of undeveloped land for the 100 year storm will require an additional 30.1 (6.08-2.95) x 1800 = 169,583.4 C.F. This will leave still an abundance of 67.314.8 C.F. of detention remaining. The lake detention will provide for development on all your land.

Please call me if you have any questions on these matters.

Very truly yours,

GEORGE BUTLER ASSOCIATES, INC.

Gerald R. Hurlbert

Gerald R. Hurlbert, P.E.

Enclosure

cc: Mayor Ed Griesenauer
Pat Nasi
Frank Godwin
Wilber Copenhafer

25

1969 1994 25th ANNIVERSARY

Other Offices: Oklahoma City, Oklahoma
Kansas City, Missouri
Springfield, Missouri
Lenexa, Kansas

ST. CHARLES ENGINEERING & SURVEYING
Consulting Engineers and Land Surveyors
801 South Fifth Street, Suite 202
St. Charles, MO 63301-2973
(314) 947-0607
FAX 947-2448

FACSIMILE TRANSMITTAL

DATE: Dec. 18, 1997
TIME: 2:30
FAX NUMBER: 978-4144

ATTENTION: Mr. Frank Godwin
COMPANY: O'FALLON ENG. DEPT.
REFERENCE: WINDING WOODS ~ Detention comps.

FROM: PHIL TURNER
SENT BY:
NUMBER OF PAGES (Including this page): 7

COMMENTS:
For your info. per our telephone conversation.

Thank You,
Phil

WINDING WOODS 6/28/93

Drainage Area to Lake (Existing)

Lake Area	5.28 Ac	@	3.85	=	20.33 c.f.s.
Agricultural	53.07 Ac	@	1.87	=	99.24 "
rest of K Commercial	5.69 Ac	@	3.85	=	21.91 "
					141.48 c.f.s.

15yr.

Drainage Area to Lake (Proposed)

Lake Area	5.07 Ac	@	3.85	=	19.52 c.f.s.
K-Shop	4.84 Ac	@	"	=	18.63 "
Storage Shed	2.06 Ac	@	"	=	7.93 "
-st of K Commercial	5.69 Ac	@	"	=	21.91 "
-st of Site Commercial	1.20 Ac	@	"	=	4.62 "
WW -Single Family	16.27 Ac	@	2.64	=	42.95 "
Undeveloped	30.01 Ac	@	1.87	=	56.12 "
					171.68 c.f.s.

15yr.

15yr. Proposed Drainage Area to Lake 171.68(1.18) = 202.58 c.f.s.
15yr Existing " " " " 141.48(1.18) = 166.95 c.f.s.
Differential = 35.63 c.f.s.

Approximate Volume Detention needed = 35.63(1800) =
64,134 Cu. Ft.

100yr. Proposed Q = 171.68(1.39) = 238.64 c.f.s.

Proposed Lake Elevation 573.50

Outlet for Lake will be a 12" concrete pipe under spillway @ Elevation 573.50

Spillway Elevation will be 575.50

Top of Dam (East side of Lake) 577.60 ±

The attached outputs are for 15 yr, 25 yr, & 100 yr storms listing the following results:

	High Water	Peak Outflow
15 yr.	574.48	2.01 c.f.s.
25 yr.	574.64	3.08 c.f.s.
100 yr.	574.82	3.49 c.f.s.

Since we were allowed a discharge of 166.95 c.f.s. (25 yr. pre-developed rate and are discharging 3.08 c.f.s.; detention requirements have more than been satisfied.

6-28-93 SUBMIT TE:

ATION	AREA	VOLUME	CUM. VOLUME
573.50	197327		
		209088	209088
574.50	220849		
		232610	441698
575.50	244371		

} Planimetered Areas

```
*****************************************
*                                       *
*  PIPE OUTLET                          *
*  1  25 ft - 12 in pipe(s)             *
*  UFL= 573.5  LFL= 573   n= .013       *
*                                       *
*  Overflow Structure -  Box Structure  *
*  PERIMETER= 16 ft/SILL ELEV= 575.5    *
*  Outlet Pipe -  50 ft - 24 in pipe    *
*                 LFL= 570    n= .013   *
*                                       *
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WINDING WOODS 6-28-93 SUBMITTAL DATE:

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	10300.80	10300.80	0.00	10300.80	573.55
2	10300.80	20601.60	0.51	20601.09	573.60
3	10300.80	30901.89	2.00	30899.89	573.65
4	10300.80	41200.69	4.43	41196.26	573.70
5	10300.80	51497.06	7.74	51489.32	573.75
6	10300.80	61790.12	11.88	61778.24	573.80
7	10300.80	72079.04	16.81	72062.25	573.84
8	10300.80	82363.04	21.57	82341.47	573.89
9	10300.80	92642.26	27.76	92614.50	573.94
10	10300.80	102915.30	34.55	102880.70	573.99
11	10300.80	113181.50	41.88	113139.70	574.04
12	10300.80	123440.50	49.69	123390.80	574.09
13	10300.80	133691.60	56.56	133635.00	574.14
14	10300.80	143935.80	66.23	143869.60	574.19
15	10300.80	154170.40	74.80	154095.60	574.24
16	10300.80	164396.40	83.43	164312.90	574.29
17	10300.80	174613.70	92.10	174521.60	574.33
18	10300.80	184822.40	99.34	184723.10	574.38
19	10300.80	195023.90	107.33	194916.50	574.43
20	10300.80	205217.30	114.62	205102.70	574.48
21	0.00	205102.70	120.82	204981.90	574.48
22	0.00	204981.90	120.79	204861.10	574.48

PEAK OUTFLOW= 2.01 CFS AT 21 MINUTES

6-28-93 SUBMI[illegible]TE:

...FION	AREA	VOLUME	CUM. VOLUME
573.50	197327		
		209088	209088
574.50	220849		
		232610	441698
575.50	244371		

```
*******************************************
*                                         *
*  PIPE OUTLET                            *
*  1  25 ft - 12 in pipe(s)               *
*  UFL= 573.5  LFL= 573   n= .013         *
*                                         *
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WINDING WOODS 6-28-93 SUBMITTAL DATE:

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.	
1	12154.80	12154.80	0.00	12154.80	573.56	
2	12154.80	24309.60	0.72	24308.88	573.62	
3	12154.80	36463.68	2.84	36460.84	573.67	
4	12154.80	48615.64	5.77	48609.88	573.73	
5	12154.80	60764.68	10.27	60754.42	573.79	
6	12154.80	72909.22	15.89	72893.33	573.85	
7	12154.80	85048.12	22.57	85025.56	573.91	
8	12154.80	97180.36	30.16	97150.21	573.96	
9	12154.80	109305.00	37.51	109267.50	574.02	
10	12154.80	121422.30	46.57	121375.70	574.08	
11	12154.80	133530.50	56.10	133474.40	574.14	
12	12154.80	145629.20	66.18	145563.10	574.20	
13	12154.80	157717.90	76.40	157641.40	574.25	
14	12154.80	169796.20	85.61	169710.60	574.31	
15	12154.80	181865.40	95.71	181769.70	574.37	
16	12154.80	193924.50	105.45	193819.10	574.43	
17	12154.80	205973.90	114.30	205859.60	574.48	
18	12154.80	218014.40	121.05	217893.30	574.54	
19	12154.80	230048.10	169.18	229879.00	574.59	
20	12154.80	242033.70	177.09	241856.70	574.64	← 25 yr.
21	0.00	241856.70	184.67	241672.00	574.64	
22	0.00	241672.00	184.56	241487.40	574.64	

PEAK OUTFLOW= 3.08 CFS AT 21 MINUTES

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*******************************************
*                                         *
*  PIPE OUTLET                            *
*  1  25 ft - 12 in pipe(s)               *
*  UFL= 573.5  LFL= 573   n= .013         *
*                                         *
*******************************************
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##########################################
#                                        #
#  PIPE OUTLET                           #
#  0  25 ft - 12 in pipe(s)              #
#  UFL= 573.5  LFL= 573   n= .013        #
#                                        #
##########################################
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WINDING WOODS 6-28-93 SUBMITTAL DATE:

MIN	INFLOW	STORAGE	OUTFLOW	NET DET.	ELEV.
1	16260.00	16260.00	0.00	16260.00	573.58
2	16260.00	32520.00	1.28	32518.72	573.66
3	16260.00	48778.72	4.99	48773.73	573.73
4	16260.00	65033.73	10.28	65023.45	573.81
5	16260.00	81283.46	18.04	81265.43	573.89
6	16260.00	97525.42	27.58	97497.84	573.97
7	16260.00	113757.90	38.64	113719.20	574.04
8	16260.00	129979.20	49.82	129929.40	574.12
9	16260.00	146189.40	62.96	146126.40	574.20
10	16260.00	162386.40	76.55	162309.90	574.28
11	16260.00	178569.90	90.30	178479.60	574.35
12	16260.00	194739.60	102.62	194637.00	574.43
13	16260.00	210897.00	114.54	210782.40	574.51
14	16260.00	227042.40	164.30	226878.10	574.58
15	16260.00	243138.10	175.15	242963.00	574.65
16	16260.00	259223.00	185.36	259037.60	574.71
17	16260.00	275297.60	195.02	275102.50	574.78
18	16260.00	291362.50	204.23	291158.30	574.85
19	16260.00	307418.30	213.03	307205.30	574.92
20	16260.00	323465.30	221.48	323243.80	574.99
21	0.00	323243.80	229.62	323014.20	574.99 — 100 yr.
22	0.00	323014.20	229.50	322784.70	574.99

PEAK OUTFLOW= 3.83 CFS AT 21 MINUTES

	STORAGE		OW	NET DET.	ELEV.	
	14318.40	14318.40	0.00	14318.40	573.57	
2	14318.40	28636.80	0.99	28635.81	573.64	
3	14318.40	42954.21	3.86	42950.35	573.71	
4	14318.40	57268.75	8.48	57260.28	573.77	
5	14318.40	71578.68	13.97	71564.71	573.84	
6	14318.40	85883.12	21.49	85861.62	573.91	
7	14318.40	100180.00	30.31	100149.70	573.98	
8	14318.40	114468.10	40.24	114427.90	574.05	
9	14318.40	128746.30	51.12	128695.10	574.12	
10	14318.40	143013.60	62.66	142950.90	574.18	
11	14318.40	157269.30	73.40	157195.90	574.25	
12	14318.40	171514.30	85.49	171428.80	574.32	
13	14318.40	185747.20	97.32	185649.90	574.39	
14	14318.40	199968.30	108.48	199859.80	574.46	
15	14318.40	214178.20	118.20	214060.00	574.52	
16	14318.40	228378.40	166.57	228211.90	574.58	
17	14318.40	242530.20	176.02	242354.20	574.64	
18	14318.40	256672.70	184.98	256487.70	574.70	
19	14318.40	270806.10	193.53	270612.50	574.76	
20	14318.40	284931.00	201.70	284729.30	574.83	
21	0.00	284729.30	209.55	284519.70	574.82	← 100 yr.
22	0.00	284519.70	209.44	284310.30	574.82	

PEAK OUTFLOW= 3.49 CFS AT 21 MINUTES