SUPPLEMENTAL DRAINAGE REPORT

FOR

FOLIAGE ADDITION
Wichita, Kansas

AUGUST 2008

Supplemental Drainage Information

Existing Conditions

A portion of the site currently drains to the south through an 18" CMP that flows to the south and discharges north of Lakepoint at the same location the Waterfront lakes outlet. Pre-project flowrates were modeled in Hydraflow Hydrographs 2007, Appendix A. Pre-project flow rates are shown in Table 1. An existing 21" RCP flows from west to east under Webb Road between the Foliage Addition and the Waterfront Lake.

Table 1. Comparison of Pre and Post-Development Flowrates

Description	Design Storm Flows (cfs)			
	2-Yr	5-Yr	10-Yr	100-Yr
Pre-Project 18" CMP in Southeast Corner	4.0	4.9	6.9	9.2
Post-Project 18" CMP in Southeast Corner	4.0	4.8	5.5	7.7

Proposed Conditions

The site will continue to drain a portion of the site to the existing 18" CMP flowing south. The post-project flow rates for this system were determined using the Rational Method in Hydraflow Storm Sewers, Appendix B. The area draining to this pipe will not exceed 1.2 acres in order to maintain pre-project flow rates. The remaining site will drain to the existing 21" RCP under Webb Road and to a proposed 30" RCP. The proposed 30" pipe will be constructed under Webb Road to convey any additional drainage to the detention at the Waterfront. The proposed pipe was modeled using Hydraflow Storm Sewers, Appendix B. The pipe under Webb Road will be constructed with the first phase of the development. Additional storm water sewer that ties into these three lines will be designed as the site plans develop. An updated drainage and utility plan is in Appendix C. Detention calculations and detailed information regarding the detention provided for the Foliage Addition can be found in *Drainage Report for Waterfront Commercial, Waterfront Residential, and Greenwich Office Park Revised August 2007*.

Summary

Undetained runoff from the Foliage Addition will discharge through the existing storm water systems and through a proposed storm water sewer pipe. Flows to the existing 18" CMP will not increase from pre-project to post-project conditions. A proposed 30" RCP and an existing 21" storm water sewer pipe will convey runoff to the Waterfront detention pond. Design of the storm water system on site will be modified as final on site plans are determined. The Waterfront detention pond provides adequate detention for this site as calculated in the *Drainage Report for Waterfront Commercial, Waterfront Residential, and Greenwich Office Park Revised August 2007*.

Appendix A
Hydraflow Hydrographs 2007

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	Rational	10.51	1	34	0.492	----	------	------	Water entering South SWS
2	Reservoir	4.03	1	55	0.492	1	1370.26	0.247	Southeast Corner of Si

Proj. file: 2yr South of site.gpw | Return Period: 2 yr | Run date: 06-20-2005

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	Rational	15.24	1	32	0.672	----	------	------	Water entering South SWS
2	Reservoir	4.90	1	54	0.672	1	1370.52	0.400	Southeast Corner of Si

Proj. file: 5yr South of site.gpw	Return Period: 5 yr	Run date: 06-20-2005

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	Rational	23.39	1	28	0.902	----	------	------	Water entering South SWS
2	Reservoir	6.90	1	48	0.902	1	1370.84	0.593	Southeast Corner of Si

Proj. file: 10yr South of site.gpw | Return Period: 10 yr | Run date: 06-20-2005

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	Rational	55.93	1	19	1.464	----	------	------	Water entering South SWS
2	Reservoir	9.18	1	35	1.464	1	1371.35	1.163	Southeast Corner of Si

Proj. file: 100yr South of site.gpw | Return Period: 100 yr | Run date: 06-20-2005

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Hyd. No. 1

Water entering South SWS

Hydrograph type	= Rational	Peak discharge	= 55.93 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 12.5 ac	Runoff coeff.	= 0.67
Intensity	= 6.678 in/hr	Time of conc. (Tc)	= 19 min
IDF Curve	= SedgwickCoKS.IDF	Asc/Rec limb fact	= 1/1

Hydrograph Volume = 1.464 acft

Hydrograph Discharge Table

Time (hrs)	Outflow (cfs)
0.07	11.77
0.08	14.72
0.10	17.66
0.12	20.60
0.13	23.55
0.15	26.49
0.17	29.44
0.18	32.38
0.20	35.32
0.22	38.27
0.23	41.21
0.25	44.15
0.27	47.10
0.28	50.04
0.30	52.98
0.32	55.93 <<
0.33	52.98
0.35	50.04
0.37	47.10
0.38	44.15
0.40	41.21
0.42	38.27
0.43	35.32
0.45	32.38
0.47	29.44
0.48	26.49
0.50	23.55
0.52	20.60
0.53	17.66
0.55	14.72
0.57	11.77

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Hyd. No. 2

Southeast Corner of Si

Hydrograph type	= Reservoir	Peak discharge	= 9.18 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Inflow hyd. No.	= 1	Reservoir name	= South Pond
Max. Elevation	= 1371.35 ft	Max. Storage	= 1.163 acft

Storage Indication method used.

Outflow hydrograph volume = 1.464 acft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
0.08	14.72	1369.67	2.14	-----	-----	-----	-----	-----	-----	-----	-----	2.14
0.10	17.66	1369.80	2.63	-----	-----	-----	-----	-----	-----	-----	-----	2.63
0.12	20.60	1369.95	3.16	-----	-----	-----	-----	-----	-----	-----	-----	3.16
0.13	23.55	1370.03	3.41	-----	-----	-----	-----	-----	-----	-----	-----	3.41
0.15	26.49	1370.08	3.57	-----	-----	-----	-----	-----	-----	-----	-----	3.57
0.17	29.44	1370.14	3.74	-----	-----	-----	-----	-----	-----	-----	-----	3.74
0.18	32.38	1370.20	3.92	-----	-----	-----	-----	-----	-----	-----	-----	3.92
0.20	35.32	1370.27	4.05	-----	-----	-----	-----	-----	-----	-----	-----	4.05
0.22	38.27	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
0.23	41.21	1370.43	4.27	-----	-----	-----	-----	-----	-----	-----	-----	4.27
0.25	44.15	1370.51	4.88	-----	-----	-----	-----	-----	-----	-----	-----	4.88
0.27	47.10	1370.61	5.53	-----	-----	-----	-----	-----	-----	-----	-----	5.53
0.28	50.04	1370.71	6.15	-----	-----	-----	-----	-----	-----	-----	-----	6.15
0.30	52.98	1370.81	6.73	-----	-----	-----	-----	-----	-----	-----	-----	6.73
0.32	55.93 <<	1370.92	7.30	-----	-----	-----	-----	-----	-----	-----	-----	7.30
0.33	52.98	1371.01	7.75	-----	-----	-----	-----	-----	-----	-----	-----	7.75
0.35	50.04	1371.06	7.95	-----	-----	-----	-----	-----	-----	-----	-----	7.95
0.37	47.10	1371.10	8.14	-----	-----	-----	-----	-----	-----	-----	-----	8.14
0.38	44.15	1371.13	8.30	-----	-----	-----	-----	-----	-----	-----	-----	8.30
0.40	41.21	1371.17	8.45	-----	-----	-----	-----	-----	-----	-----	-----	8.45
0.42	38.27	1371.20	8.59	-----	-----	-----	-----	-----	-----	-----	-----	8.59
0.43	35.32	1371.23	8.70	-----	-----	-----	-----	-----	-----	-----	-----	8.70
0.45	32.38	1371.25	8.81	-----	-----	-----	-----	-----	-----	-----	-----	8.81
0.47	29.44	1371.28	8.90	-----	-----	-----	-----	-----	-----	-----	-----	8.90
0.48	26.49	1371.30	8.98	-----	-----	-----	-----	-----	-----	-----	-----	8.98
0.50	23.55	1371.31	9.04	-----	-----	-----	-----	-----	-----	-----	-----	9.04
0.52	20.60	1371.32	9.09	-----	-----	-----	-----	-----	-----	-----	-----	9.09
0.53	17.66	1371.33	9.13	-----	-----	-----	-----	-----	-----	-----	-----	9.13
0.55	14.72	1371.34	9.16	-----	-----	-----	-----	-----	-----	-----	-----	9.16
0.57	11.77	1371.35	9.18	-----	-----	-----	-----	-----	-----	-----	-----	9.18
0.58	8.83	1371.35 <<	9.18	-----	-----	-----	-----	-----	-----	-----	-----	9.18 <<
0.60	5.89	1371.34	9.18	-----	-----	-----	-----	-----	-----	-----	-----	9.18
0.62	2.94	1371.34	9.16	-----	-----	-----	-----	-----	-----	-----	-----	9.16
0.63	0.00	1371.33	9.13	-----	-----	-----	-----	-----	-----	-----	-----	9.13
0.65	0.00	1371.32	9.09	-----	-----	-----	-----	-----	-----	-----	-----	9.09
0.67	0.00	1371.31	9.05	-----	-----	-----	-----	-----	-----	-----	-----	9.05
0.68	0.00	1371.31	9.02	-----	-----	-----	-----	-----	-----	-----	-----	9.02
0.70	0.00	1371.30	8.98	-----	-----	-----	-----	-----	-----	-----	-----	8.98

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
0.72	0.00	1371.29	8.94	-----	-----	-----	-----	-----	-----	-----	-----	8.94
0.73	0.00	1371.28	8.91	-----	-----	-----	-----	-----	-----	-----	-----	8.91
0.75	0.00	1371.27	8.87	-----	-----	-----	-----	-----	-----	-----	-----	8.87
0.77	0.00	1371.26	8.83	-----	-----	-----	-----	-----	-----	-----	-----	8.83
0.78	0.00	1371.25	8.80	-----	-----	-----	-----	-----	-----	-----	-----	8.80
0.80	0.00	1371.24	8.76	-----	-----	-----	-----	-----	-----	-----	-----	8.76
0.82	0.00	1371.23	8.72	-----	-----	-----	-----	-----	-----	-----	-----	8.72
0.83	0.00	1371.22	8.69	-----	-----	-----	-----	-----	-----	-----	-----	8.69
0.85	0.00	1371.22	8.65	-----	-----	-----	-----	-----	-----	-----	-----	8.65
0.87	0.00	1371.21	8.62	-----	-----	-----	-----	-----	-----	-----	-----	8.62
0.88	0.00	1371.20	8.58	-----	-----	-----	-----	-----	-----	-----	-----	8.58
0.90	0.00	1371.19	8.54	-----	-----	-----	-----	-----	-----	-----	-----	8.54
0.92	0.00	1371.18	8.51	-----	-----	-----	-----	-----	-----	-----	-----	8.51
0.93	0.00	1371.17	8.47	-----	-----	-----	-----	-----	-----	-----	-----	8.47
0.95	0.00	1371.16	8.43	-----	-----	-----	-----	-----	-----	-----	-----	8.43
0.97	0.00	1371.16	8.39	-----	-----	-----	-----	-----	-----	-----	-----	8.39
0.98	0.00	1371.15	8.36	-----	-----	-----	-----	-----	-----	-----	-----	8.36
1.00	0.00	1371.14	8.32	-----	-----	-----	-----	-----	-----	-----	-----	8.32
1.02	0.00	1371.13	8.29	-----	-----	-----	-----	-----	-----	-----	-----	8.29
1.03	0.00	1371.12	8.25	-----	-----	-----	-----	-----	-----	-----	-----	8.25
1.05	0.00	1371.11	8.21	-----	-----	-----	-----	-----	-----	-----	-----	8.21
1.07	0.00	1371.11	8.18	-----	-----	-----	-----	-----	-----	-----	-----	8.18
1.08	0.00	1371.10	8.14	-----	-----	-----	-----	-----	-----	-----	-----	8.14
1.10	0.00	1371.09	8.10	-----	-----	-----	-----	-----	-----	-----	-----	8.10
1.12	0.00	1371.08	8.07	-----	-----	-----	-----	-----	-----	-----	-----	8.07
1.13	0.00	1371.07	8.03	-----	-----	-----	-----	-----	-----	-----	-----	8.03
1.15	0.00	1371.07	7.99	-----	-----	-----	-----	-----	-----	-----	-----	7.99
1.17	0.00	1371.06	7.96	-----	-----	-----	-----	-----	-----	-----	-----	7.96
1.18	0.00	1371.05	7.92	-----	-----	-----	-----	-----	-----	-----	-----	7.92
1.20	0.00	1371.04	7.88	-----	-----	-----	-----	-----	-----	-----	-----	7.88
1.22	0.00	1371.03	7.85	-----	-----	-----	-----	-----	-----	-----	-----	7.85
1.23	0.00	1371.03	7.81	-----	-----	-----	-----	-----	-----	-----	-----	7.81
1.25	0.00	1371.02	7.77	-----	-----	-----	-----	-----	-----	-----	-----	7.77
1.27	0.00	1371.01	7.74	-----	-----	-----	-----	-----	-----	-----	-----	7.74
1.28	0.00	1371.00	7.70	-----	-----	-----	-----	-----	-----	-----	-----	7.70
1.30	0.00	1370.99	7.63	-----	-----	-----	-----	-----	-----	-----	-----	7.63
1.32	0.00	1370.97	7.55	-----	-----	-----	-----	-----	-----	-----	-----	7.55
1.33	0.00	1370.95	7.46	-----	-----	-----	-----	-----	-----	-----	-----	7.46
1.35	0.00	1370.94	7.38	-----	-----	-----	-----	-----	-----	-----	-----	7.38
1.37	0.00	1370.92	7.29	-----	-----	-----	-----	-----	-----	-----	-----	7.29
1.38	0.00	1370.90	7.21	-----	-----	-----	-----	-----	-----	-----	-----	7.21
1.40	0.00	1370.89	7.13	-----	-----	-----	-----	-----	-----	-----	-----	7.13
1.42	0.00	1370.87	7.04	-----	-----	-----	-----	-----	-----	-----	-----	7.04
1.43	0.00	1370.85	6.96	-----	-----	-----	-----	-----	-----	-----	-----	6.96
1.45	0.00	1370.84	6.87	-----	-----	-----	-----	-----	-----	-----	-----	6.87
1.47	0.00	1370.82	6.79	-----	-----	-----	-----	-----	-----	-----	-----	6.79
1.48	0.00	1370.81	6.71	-----	-----	-----	-----	-----	-----	-----	-----	6.71
1.50	0.00	1370.79	6.62	-----	-----	-----	-----	-----	-----	-----	-----	6.62
1.52	0.00	1370.78	6.54	-----	-----	-----	-----	-----	-----	-----	-----	6.54
1.53	0.00	1370.76	6.45	-----	-----	-----	-----	-----	-----	-----	-----	6.45
1.55	0.00	1370.75	6.37	-----	-----	-----	-----	-----	-----	-----	-----	6.37

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
1.57	0.00	1370.73	6.29	-----	-----	-----	-----	-----	-----	-----	-----	6.29
1.58	0.00	1370.72	6.20	-----	-----	-----	-----	-----	-----	-----	-----	6.20
1.60	0.00	1370.70	6.12	-----	-----	-----	-----	-----	-----	-----	-----	6.12
1.62	0.00	1370.69	6.04	-----	-----	-----	-----	-----	-----	-----	-----	6.04
1.63	0.00	1370.67	5.95	-----	-----	-----	-----	-----	-----	-----	-----	5.95
1.65	0.00	1370.66	5.86	-----	-----	-----	-----	-----	-----	-----	-----	5.86
1.67	0.00	1370.65	5.78	-----	-----	-----	-----	-----	-----	-----	-----	5.78
1.68	0.00	1370.63	5.70	-----	-----	-----	-----	-----	-----	-----	-----	5.70
1.70	0.00	1370.62	5.62	-----	-----	-----	-----	-----	-----	-----	-----	5.62
1.72	0.00	1370.61	5.54	-----	-----	-----	-----	-----	-----	-----	-----	5.54
1.73	0.00	1370.60	5.45	-----	-----	-----	-----	-----	-----	-----	-----	5.45
1.75	0.00	1370.58	5.36	-----	-----	-----	-----	-----	-----	-----	-----	5.36
1.77	0.00	1370.57	5.28	-----	-----	-----	-----	-----	-----	-----	-----	5.28
1.78	0.00	1370.56	5.19	-----	-----	-----	-----	-----	-----	-----	-----	5.19
1.80	0.00	1370.55	5.11	-----	-----	-----	-----	-----	-----	-----	-----	5.11
1.82	0.00	1370.54	5.02	-----	-----	-----	-----	-----	-----	-----	-----	5.02
1.83	0.00	1370.52	4.94	-----	-----	-----	-----	-----	-----	-----	-----	4.94
1.85	0.00	1370.51	4.86	-----	-----	-----	-----	-----	-----	-----	-----	4.86
1.87	0.00	1370.50	4.78	-----	-----	-----	-----	-----	-----	-----	-----	4.78
1.88	0.00	1370.49	4.71	-----	-----	-----	-----	-----	-----	-----	-----	4.71
1.90	0.00	1370.48	4.64	-----	-----	-----	-----	-----	-----	-----	-----	4.64
1.92	0.00	1370.47	4.56	-----	-----	-----	-----	-----	-----	-----	-----	4.56
1.93	0.00	1370.46	4.49	-----	-----	-----	-----	-----	-----	-----	-----	4.49
1.95	0.00	1370.45	4.42	-----	-----	-----	-----	-----	-----	-----	-----	4.42
1.97	0.00	1370.44	4.35	-----	-----	-----	-----	-----	-----	-----	-----	4.35
1.98	0.00	1370.43	4.28	-----	-----	-----	-----	-----	-----	-----	-----	4.28
2.00	0.00	1370.42	4.22	-----	-----	-----	-----	-----	-----	-----	-----	4.22
2.02	0.00	1370.41	4.15	-----	-----	-----	-----	-----	-----	-----	-----	4.15
2.03	0.00	1370.30	4.09	-----	-----	-----	-----	-----	-----	-----	-----	4.09
2.05	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.07	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.08	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.10	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.12	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.13	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.15	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.17	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.18	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.20	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.22	0.00	1370.30	4.09	-----	-----	-----	-----	-----	-----	-----	-----	4.09
2.23	0.00	1370.29	4.08	-----	-----	-----	-----	-----	-----	-----	-----	4.08
2.25	0.00	1370.28	4.06	-----	-----	-----	-----	-----	-----	-----	-----	4.06
2.27	0.00	1370.27	4.04	-----	-----	-----	-----	-----	-----	-----	-----	4.04
2.28	0.00	1370.26	4.03	-----	-----	-----	-----	-----	-----	-----	-----	4.03
2.30	0.00	1370.25	4.01	-----	-----	-----	-----	-----	-----	-----	-----	4.01
2.32	0.00	1370.24	3.99	-----	-----	-----	-----	-----	-----	-----	-----	3.99
2.33	0.00	1370.23	3.98	-----	-----	-----	-----	-----	-----	-----	-----	3.98
2.35	0.00	1370.22	3.96	-----	-----	-----	-----	-----	-----	-----	-----	3.96
2.37	0.00	1370.21	3.94	-----	-----	-----	-----	-----	-----	-----	-----	3.94
2.38	0.00	1370.20	3.93	-----	-----	-----	-----	-----	-----	-----	-----	3.93
2.40	0.00	1370.19	3.90	-----	-----	-----	-----	-----	-----	-----	-----	3.90

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
2.42	0.00	1370.18	3.88	-----	-----	-----	-----	-----	-----	-----	-----	3.88
2.43	0.00	1370.18	3.85	-----	-----	-----	-----	-----	-----	-----	-----	3.85
2.45	0.00	1370.17	3.83	-----	-----	-----	-----	-----	-----	-----	-----	3.83
2.47	0.00	1370.16	3.80	-----	-----	-----	-----	-----	-----	-----	-----	3.80
2.48	0.00	1370.15	3.78	-----	-----	-----	-----	-----	-----	-----	-----	3.78
2.50	0.00	1370.14	3.75	-----	-----	-----	-----	-----	-----	-----	-----	3.75
2.52	0.00	1370.13	3.73	-----	-----	-----	-----	-----	-----	-----	-----	3.73
2.53	0.00	1370.12	3.70	-----	-----	-----	-----	-----	-----	-----	-----	3.70
2.55	0.00	1370.12	3.68	-----	-----	-----	-----	-----	-----	-----	-----	3.68
2.57	0.00	1370.11	3.65	-----	-----	-----	-----	-----	-----	-----	-----	3.65
2.58	0.00	1370.10	3.63	-----	-----	-----	-----	-----	-----	-----	-----	3.63
2.60	0.00	1370.09	3.60	-----	-----	-----	-----	-----	-----	-----	-----	3.60
2.62	0.00	1370.08	3.57	-----	-----	-----	-----	-----	-----	-----	-----	3.57
2.63	0.00	1370.07	3.55	-----	-----	-----	-----	-----	-----	-----	-----	3.55
2.65	0.00	1370.07	3.52	-----	-----	-----	-----	-----	-----	-----	-----	3.52
2.67	0.00	1370.06	3.49	-----	-----	-----	-----	-----	-----	-----	-----	3.49
2.68	0.00	1370.05	3.47	-----	-----	-----	-----	-----	-----	-----	-----	3.47
2.70	0.00	1370.04	3.44	-----	-----	-----	-----	-----	-----	-----	-----	3.44
2.72	0.00	1370.03	3.42	-----	-----	-----	-----	-----	-----	-----	-----	3.42
2.73	0.00	1370.03	3.39	-----	-----	-----	-----	-----	-----	-----	-----	3.39
2.75	0.00	1370.02	3.37	-----	-----	-----	-----	-----	-----	-----	-----	3.37
2.77	0.00	1370.01	3.34	-----	-----	-----	-----	-----	-----	-----	-----	3.34
2.78	0.00	1370.00	3.32	-----	-----	-----	-----	-----	-----	-----	-----	3.32
2.80	0.00	1369.98	3.24	-----	-----	-----	-----	-----	-----	-----	-----	3.24
2.82	0.00	1369.95	3.15	-----	-----	-----	-----	-----	-----	-----	-----	3.15
2.83	0.00	1369.92	3.05	-----	-----	-----	-----	-----	-----	-----	-----	3.05
2.85	0.00	1369.89	2.96	-----	-----	-----	-----	-----	-----	-----	-----	2.96
2.87	0.00	1369.86	2.86	-----	-----	-----	-----	-----	-----	-----	-----	2.86
2.88	0.00	1369.84	2.77	-----	-----	-----	-----	-----	-----	-----	-----	2.77
2.90	0.00	1369.81	2.67	-----	-----	-----	-----	-----	-----	-----	-----	2.67
2.92	0.00	1369.79	2.58	-----	-----	-----	-----	-----	-----	-----	-----	2.58
2.93	0.00	1369.76	2.49	-----	-----	-----	-----	-----	-----	-----	-----	2.49
2.95	0.00	1369.74	2.41	-----	-----	-----	-----	-----	-----	-----	-----	2.41
2.97	0.00	1369.72	2.32	-----	-----	-----	-----	-----	-----	-----	-----	2.32
2.98	0.00	1369.70	2.24	-----	-----	-----	-----	-----	-----	-----	-----	2.24
3.00	0.00	1369.68	2.16	-----	-----	-----	-----	-----	-----	-----	-----	2.16
3.02	0.00	1369.66	2.08	-----	-----	-----	-----	-----	-----	-----	-----	2.08
3.03	0.00	1369.64	2.01	-----	-----	-----	-----	-----	-----	-----	-----	2.01
3.05	0.00	1369.62	1.94	-----	-----	-----	-----	-----	-----	-----	-----	1.94
3.07	0.00	1369.60	1.87	-----	-----	-----	-----	-----	-----	-----	-----	1.87

...End

Reservoir Report

Reservoir No. 1 - South Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1368.90	00	0.000	0.000
0.50	1369.40	420	0.002	0.002
1.10	1370.00	12,402	0.088	0.091
2.10	1371.00	39,645	0.597	0.688
3.10	1372.00	79,790	1.371	2.059

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 18.0	0.0	0.0	0.0
Span in	= 18.0	0.0	0.0	0.0
No. Barrels	= 1	0	0	0
Invert El. ft	= 1368.91	0.00	0.00	0.00
Length ft	= 70.0	0.0	0.0	0.0
Slope %	= 0.32	0.00	0.00	0.00
N-Value	= .013	.000	.000	.000
Orif. Coeff.	= 0.60	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 0.00	0.00	0.00	0.00
Crest El. ft	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 0.00	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration Rate = 0.00 in/hr/sqft Tailwater Elev. = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
0.00	0.000	1368.90	0.00	---	---	---	---	---	---	---	---	0.00
0.05	0.000	1368.95	0.01	---	---	---	---	---	---	---	---	0.01
0.10	0.000	1369.00	0.05	---	---	---	---	---	---	---	---	0.05
0.15	0.001	1369.05	0.10	---	---	---	---	---	---	---	---	0.10
0.20	0.001	1369.10	0.20	---	---	---	---	---	---	---	---	0.20
0.25	0.001	1369.15	0.29	---	---	---	---	---	---	---	---	0.29
0.30	0.001	1369.20	0.46	---	---	---	---	---	---	---	---	0.46
0.35	0.002	1369.25	0.60	---	---	---	---	---	---	---	---	0.60
0.40	0.002	1369.30	0.76	---	---	---	---	---	---	---	---	0.76
0.45	0.002	1369.35	0.94	---	---	---	---	---	---	---	---	0.94
0.50	0.002	1369.40	1.03	---	---	---	---	---	---	---	---	1.03
0.56	0.011	1369.46	1.34	---	---	---	---	---	---	---	---	1.34
0.62	0.020	1369.52	1.56	---	---	---	---	---	---	---	---	1.56
0.68	0.029	1369.58	1.79	---	---	---	---	---	---	---	---	1.79
0.74	0.038	1369.64	2.02	---	---	---	---	---	---	---	---	2.02
0.80	0.047	1369.70	2.25	---	---	---	---	---	---	---	---	2.25
0.86	0.055	1369.76	2.48	---	---	---	---	---	---	---	---	2.48
0.92	0.064	1369.82	2.70	---	---	---	---	---	---	---	---	2.70
0.98	0.073	1369.88	2.92	---	---	---	---	---	---	---	---	2.92
1.04	0.082	1369.94	3.12	---	---	---	---	---	---	---	---	3.12
1.10	0.091	1370.00	3.31	---	---	---	---	---	---	---	---	3.31
1.20	0.150	1370.10	3.63	---	---	---	---	---	---	---	---	3.63
1.30	0.210	1370.20	3.92	---	---	---	---	---	---	---	---	3.92
1.40	0.270	1370.30	4.10	---	---	---	---	---	---	---	---	4.10
1.50	0.330	1370.40	4.09	---	---	---	---	---	---	---	---	4.09
1.60	0.389	1370.50	4.78	---	---	---	---	---	---	---	---	4.78
1.70	0.449	1370.60	5.49	---	---	---	---	---	---	---	---	5.49
1.80	0.509	1370.70	6.11	---	---	---	---	---	---	---	---	6.11
1.90	0.569	1370.80	6.68	---	---	---	---	---	---	---	---	6.68
2.00	0.628	1370.90	7.20	---	---	---	---	---	---	---	---	7.20
2.10	0.688	1371.00	7.69	---	---	---	---	---	---	---	---	7.69
2.20	0.825	1371.10	8.15	---	---	---	---	---	---	---	---	8.15
2.30	0.962	1371.20	8.59	---	---	---	---	---	---	---	---	8.59

Continues on next page...

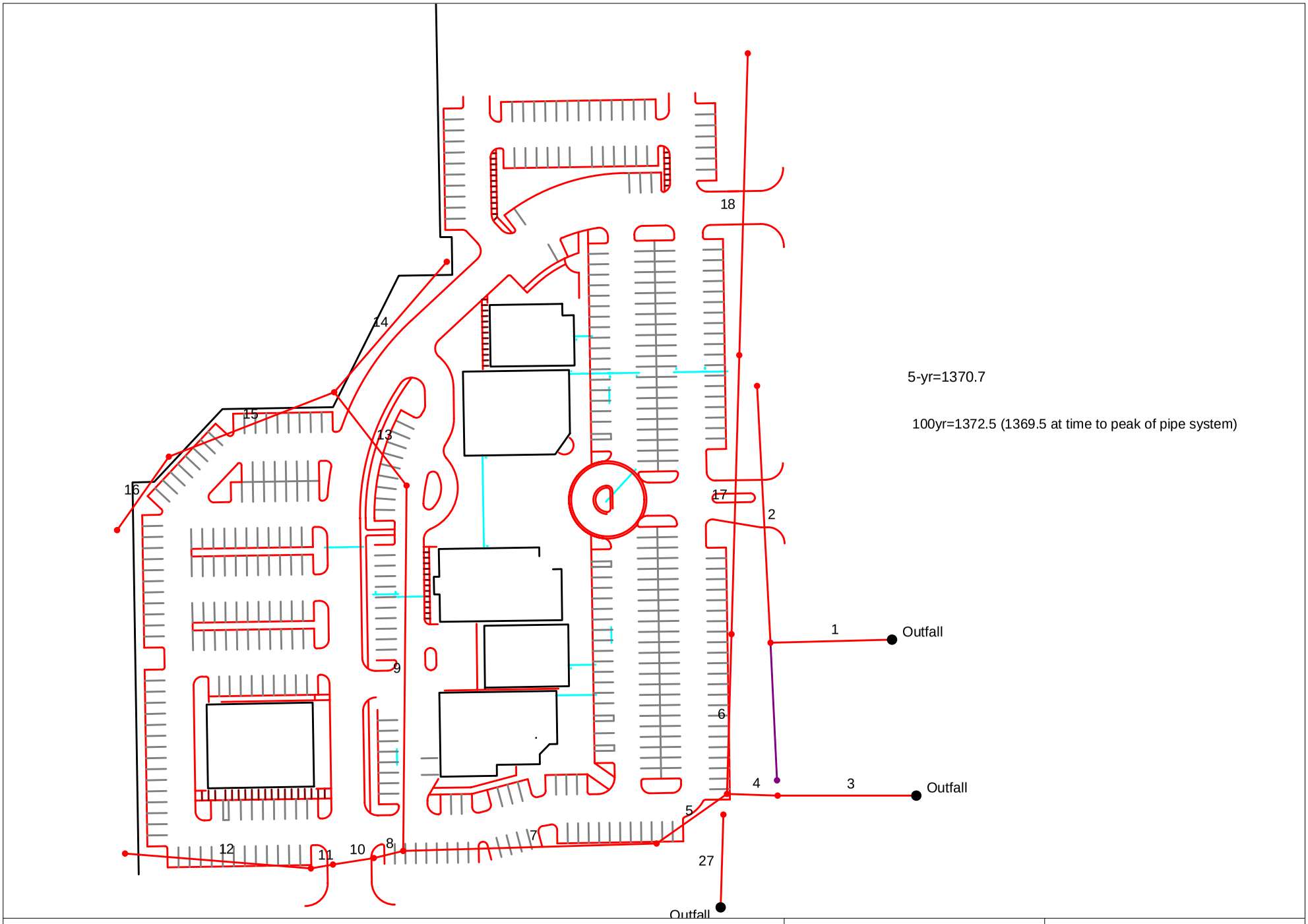
Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
2.40	1.099	1371.30	9.00	---	---	---	---	---	---	---	---	9.00
2.50	1.237	1371.40	9.40	---	---	---	---	---	---	---	---	9.40
2.60	1.374	1371.50	9.77	---	---	---	---	---	---	---	---	9.77
2.70	1.511	1371.60	10.14	---	---	---	---	---	---	---	---	10.14
2.80	1.648	1371.70	10.49	---	---	---	---	---	---	---	---	10.49
2.90	1.785	1371.80	10.83	---	---	---	---	---	---	---	---	10.83
3.00	1.922	1371.90	11.16	---	---	---	---	---	---	---	---	11.16
3.10	2.059	1372.00	11.49	---	---	---	---	---	---	---	---	11.49

...End

Appendix B
Hydraflow Stormsewers

Foliage 4th Addition



Project File: 04274SWS 8-11-08.stm	Number of lines: 27	Date: 08-18-2008

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	110	1.10	2.20	0.87	0.96	1.91	15.0	16.7	7.0	13.49	5.65	5.93	21	0.13	1368.10	1368.24	1369.57	1370.47	0.00	1372.34	
2	1	233	1.10	1.10	0.87	0.96	0.96	15.0	15.0	7.4	7.05	8.12	2.24	24	0.13	1368.74	1369.04	1371.61	1371.84	1372.34	1372.18	
3	End	126	0.40	12.90	0.87	0.35	9.63	15.0	45.3	4.4	41.97	41.09	8.55	30	1.00	1363.00	1364.26	1369.50	1370.82	1365.50	1372.90	
4	3	46	0.40	12.50	0.87	0.35	9.28	15.0	45.2	4.4	40.50	41.06	8.25	30	1.00	1366.95	1367.41	1371.46	1371.91	1372.90	1373.78	
5	4	78	1.40	7.50	0.87	1.22	4.93	15.0	44.9	4.4	21.59	14.70	4.40	30	0.13	1367.63	1367.73	1374.26	1374.47	1373.78	1375.00	
6	4	145	0.30	4.60	0.87	0.26	4.00	15.0	17.0	7.0	28.05	27.06	5.71	30	0.44	1367.53	1368.16	1374.05	1374.73	1373.78	1375.00	
7	5	230	0.00	6.10	0.00	0.00	3.71	0.0	43.8	4.4	16.48	17.12	3.36	30	0.17	1368.23	1368.63	1374.87	1375.24	1375.00	1374.00	
8	7	27	0.20	2.50	0.87	0.17	2.02	15.0	17.7	6.9	13.91	11.48	4.43	24	0.26	1369.33	1369.40	1375.42	1375.52	1374.00	1373.00	
9	7	331	0.00	3.60	0.00	0.00	1.69	0.0	41.5	4.6	7.72	11.40	2.46	24	0.25	1369.13	1369.97	1375.50	1375.88	1374.00	1376.00	
10	8	37	0.60	2.30	0.87	0.52	1.85	15.0	17.5	6.9	12.76	11.08	4.06	24	0.24	1369.60	1369.69	1375.72	1375.84	1373.00	1373.00	
11	10	20	1.20	1.70	0.87	1.04	1.32	15.0	17.4	6.9	9.18	11.22	2.92	24	0.25	1369.89	1369.94	1376.09	1376.13	1373.00	1374.00	
12	11	169	0.50	0.50	0.56	0.28	0.28	15.0	15.0	7.4	2.06	6.96	1.17	18	0.44	1370.44	1371.18	1376.30	1376.37	1374.00	1375.00	
13	9	107	0.40	3.60	0.43	0.17	1.69	15.2	40.8	4.6	7.79	11.37	2.48	24	0.25	1370.17	1370.44	1375.95	1376.07	1376.00	1377.00	
14	13	156	2.00	2.00	0.43	0.86	0.86	40.0	40.0	4.7	4.01	4.26	3.27	15	0.44	1371.19	1371.87	1376.28	1376.88	1377.00	1376.00	
15	13	161	0.70	1.20	0.54	0.38	0.66	30.1	30.1	5.4	3.55	5.31	2.01	18	0.26	1371.14	1371.55	1376.31	1376.50	1377.00	1377.00	
16	15	81	0.50	0.50	0.56	0.28	0.28	15.0	15.0	7.4	2.06	4.30	1.68	15	0.44	1371.90	1372.26	1376.57	1376.66	1377.00	1377.00	
17	6	253	2.40	4.30	0.87	2.09	3.74	15.0	16.2	7.1	26.73	14.83	5.45	30	0.13	1368.66	1368.99	1375.03	1376.10	1375.00	1374.00	
18	17	273	1.90	1.90	0.87	1.65	1.65	15.0	15.0	7.4	12.17	11.37	3.88	24	0.25	1369.59	1370.28	1376.56	1377.35	1374.00	1374.00	
19	End	77	1.70	3.10	0.56	0.95	1.74	15.0	17.9	6.8	11.88	4.03	9.71	15	0.39	1370.25	1370.55	1371.47	1373.95	0.00	1375.50	
20	19	48	0.00	1.40	0.00	0.00	0.78	0.0	17.8	6.9	5.38	2.86	6.85	12	0.65	1370.80	1371.11	1375.41	1376.50	1375.50	1376.50	
21	20	183	0.50	1.00	0.56	0.28	0.56	15.0	17.2	7.0	3.90	2.63	4.97	12	0.55	1371.21	1372.21	1377.58	1379.78	1376.50	1380.00	
22	21	134	0.20	0.50	0.56	0.11	0.28	15.0	16.3	7.1	1.99	2.55	2.54	12	0.51	1372.31	1373.00	1380.64	1381.06	1380.00	1380.00	
23	22	127	0.30	0.30	0.56	0.17	0.17	15.0	15.0	7.4	1.24	2.36	1.58	12	0.44	1373.10	1373.66	1381.17	1381.33	1380.00	1379.00	

Foliage 4th Addition | Number of lines: 27 | Run Date: 08-18-2008

NOTES: Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
24	20	129	0.40	0.40	0.56	0.22	0.22	15.0	15.0	7.4	1.65	2.54	2.10	12	0.51	1371.21	1371.87	1377.90	1378.17	1376.50	1375.50	
25	End	181	0.80	1.60	0.56	0.45	0.90	15.0	15.1	7.3	6.58	2.63	8.41	12	0.55	1370.25	1371.24	1371.22	1377.06	0.00	1379.50	
26	25	32	0.80	0.80	0.56	0.45	0.45	15.0	15.0	7.4	3.30	2.35	4.20	12	0.43	1371.34	1371.48	1378.42	1378.69	1379.50	1379.50	
27	End	84	1.20	1.20	0.87	1.04	1.04	15.0	15.0	7.4	7.69	5.37	4.35	18	0.26	-1.50	-1.28	0.00	0.45	0.00	0.00	

Foliage 4th Addition | Number of lines: 27 | Run Date: 08-18-2008

NOTES: Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; c = cir e = ellip b = box

Appendix C
Drainage and Utility Plan

EXISTING DETENTION POND

NP=1371.8
100-YR WSEL=1374.4

EXIST 30" CMP

EXIST 10.2' WEIR

CHANNEL
100-YR WSEL=1373.3

EXIST 18" RCP

EXIST 2-3X5 RCBs
FL=1368.46

EXIST SAN MH
TOP=1374.48

PROP. 8" SAN.

PROP. 18" SWS

PROP. 8" SWS

PROP. 8" WTR.

PROP 15" SWS

PROP. 8" WTR.

PROP. 8" WTR.

PROP 15" SWS

PROP. 8" SAN.

PROP. 8" SAN.

PROP. 8" SAN.

UNPLATTED
ZONED "SF-5"

UNPLATTED
ZONED "SF-5"

PROP. 8" WTR.

FOLIAGE CENTER ADDITION
ZONED "CUP DP-282"

PROP 15" SWS

PROP. BERM

PROP. 8" WTR.

PROP 18" SWS

PROP 15" SWS

PROP 24" SWS

PROP. BERM

PROP. 8" SAN.

PROP. 8" SAN.

PROP. 8" SAN.

PROP 18" SWS

PROP 30" SWS

PROP. 8" SAN.
EXIST 18" CMP

PROP 24" SWS

EXIST 24" CMP

EXIST 54" CMP

E. 13th ST.

N. WEBB RD.

THE WATERFRONT THIRD ADDITION

RESERVE "C"
ZONED "LI"

THE WATERFRONT ADDITION

EXIST 3X3 INLET
FL=1371.38

NP=1368.7
100-YR=1372.5

EXIST 21" SWS
FL=1371.63

PROP 48" SWS

EXIST SAN

NOTE 1: FINAL SWS ALIGNMENT WILL BE DETERMINED WITH FINAL SITE LAYOUT AND WILL BE CONFINED IN A 20-FOOT PUBLIC DRAINAGE EASEMENT.

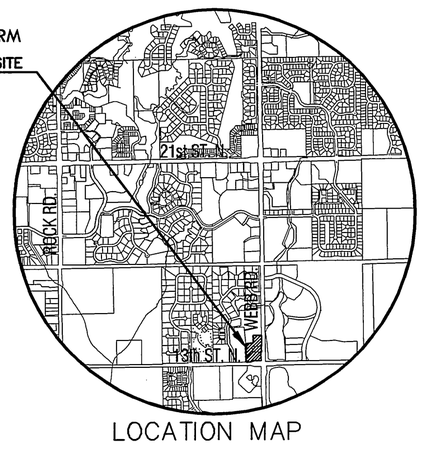
NOTE 2: STORM SEWER WAS SIZED AS FOLLOWS:
RESIDENTIAL AREA= 2-YR. DESIGN STORM
COMMERCIAL AREA= 5-YR. DESIGN STORM
30" LINE CROSSING WEBB RD.= 100-YR. DESIGN STORM

BENCH MARK

Datum BM

Square cut on SW. corner of signal light pole base at NE. corner of Webb Rd. and 13th St.
Elev.=1373.345 (NGVD 29)

PROJECT SITE



LOCATION MAP

LEGEND

- 6IN - CONIFEROUS TREE
- 3IN - DECIDUOUS TREE
- SN - SIGN
- PP - POWER POLE
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- SECTION CORNER
- BM - BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- GAS PIPELINE
- TELEPHONE LINE
- UNDERGROUND ELEC.
- OVERHEAD ELECTRIC
- FIBER OPTIC CABLE !
- DRAINAGE SUB BASIN
- FLOW ARROW
- A17 - AREA FOR SWS SIZING

N

SCALE: 1"=60'
0 60 120

REVISED: AUGUST 2008

J:\Civil\04274\dwg\prop\drng\Foliage4thAdd\04274DUP.dwg

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

THE FOLIAGE DEVELOPMENT
PROJECT NAME

DRAINAGE AND UTILITY PLAN
SHEET TITLE

TMH	CMJ	TMH
DESIGN BY:	DRAWN BY:	CHECKED BY:
MARCH 2008	04274	1 / 1
DATE	JOB NO.	SHEET/OF