

HYDRAULIC CALCULATION SHEET (SEE DRAINAGE AREA MAP SHEETS C22 & C22A FOR P.I. AND Q (inflow) FOR EACH STRUCTURE)

Project name: Progress West
 Project number: 204-3224
 Project Location: O'Fallon, MO

Calculated By: J.E.F.
 Checked By: G.M.S.
 Date: Oct. 20, 2004

Date Revised:
 1 - Nov. 17, 2004
 2 - March 02, 2005

Structure Number	LINE		FLOW LINE ELEVATIONS		Length (ft)	Flowline Grade ft/ft	Pipe Size (in.)	Full Flow Cap. (cfs)	Total (Q) (cfs)	Mean Full Flow Vel. (V) (ft/s)	Bend Coef.	Velocity Head (V _s) (ft)	QV _s (ft ³ /s)	Pipe Coef. (n)	H _f (ft)	Junction (ft)	Bend (ft)	Total H _{mt} (ft)	Hydraulic Elevations			Structure Upper H.E. + H _{mt}	TOP Structure Elevation	Free Board	Structure Number	
	Upper structure	Lower structure	Upper structure	Lower structure															Upper F.L. + Dia.	Lower H.E. + H _f	Lower H.E.					
71	71	70	539.10	538.96	14.00	0.0100	15	6.48	2.52	2.05	0	0.07	0.17	0.013	0.02	0.00	0.00	0.00	0.00	540.35	540.23	540.21	540.35	542.52	2.17	71
70																					540.21				70	
69	69	68	560.58	555.08	146.00	0.0377	15	12.57	2.42	1.97	0	0.06	0.15	0.013	0.20	0.00	0.00	0.00	0.00	561.83	556.53	556.33	561.83	564.00	2.17	69
68	68	57	554.88	554.10	77.70	0.0100	15	6.49	4.90	3.99	0	0.25	1.21	0.013	0.45	0.00	0.00	0.00	0.00	556.13	555.80	555.35	556.13	558.50	2.37	68
57																					555.35				57	
67	67	66	558.60	558.03	56.10	0.0102	15	6.53	0.49	0.40	0	0.00	0.00	0.013	0.00	0.00	0.00	0.00	0.00	559.85	559.28	559.28	559.85	562.02	2.17	67
66	66	56	557.83	557.45	37.50	0.0101	15	6.52	1.03	0.84	0	0.01	0.01	0.013	0.01	0.00	0.00	0.00	0.00	559.08	558.71	558.70	559.08	561.35	2.27	66
56																					558.70				56	
65	65	62	559.84	559.11	36.40	0.0201	15	9.17	0.28	0.23	0	0.00	0.00	0.013	0.00	0.00	0.00	0.00	0.00	561.09	560.36	560.36	561.09	563.26	2.17	65
62																					560.36				62	
64	64	63	567.22	566.49	36.40	0.0201	15	9.17	0.26	0.21	0	0.00	0.00	0.013	0.00	0.00	0.00	0.00	0.00	568.47	567.74	567.74	568.47	570.64	2.17	64
63	63	62	564.50	559.11	166.10	0.0325	15	11.67	0.47	0.38	0	0.00	0.00	0.013	0.01	0.00	0.00	0.00	0.00	565.75	560.37	560.36	565.75	570.64	4.89	63
62	62	61	558.91	557.37	105.90	0.0145	15	7.81	0.99	0.81	0	0.01	0.01	0.013	0.02	0.00	0.00	0.00	0.00	560.16	558.64	558.62	560.16	563.26	3.10	62
61	61	55	557.17	556.84	22.40	0.0147	15	7.86	1.30	1.06	0	0.02	0.02	0.013	0.01	0.00	0.00	0.00	0.00	558.42	558.10	558.09	558.42	560.79	2.37	61
55																					558.09				55	
EX60	EX60	59	561.44	560.84	75.00	0.0080	36	59.82	41.43	5.86	0	0.53	22.10	0.013	0.29	0.00	0.00	0.00	0.00	564.44	564.13	563.84	564.44	576.25	11.81	EX60
59	59	58	560.64	552.70	288.50	0.0275	36	110.95	42.03	5.95	0	0.55	23.07	0.013	1.15	0.00	0.00	0.00	0.00	563.84	556.85	555.70	563.84	569.00	5.36	59
58	58	57	552.50	551.23	126.70	0.0100	36	68.96	45.09	6.38	0	0.63	28.49	0.013	0.58	0.00	0.00	0.00	0.00	555.50	554.81	554.23	555.50	558.70	3.20	58
57	57	56	551.03	550.72	30.90	0.0100	36	66.99	49.99	7.07	0	0.78	38.82	0.013	0.17	0.00	0.00	0.00	0.00	554.03	553.89	553.72	554.03	561.42	7.39	57
56	56	55	550.52	549.25	126.90	0.0100	36	66.90	51.31	7.06	0	0.82	41.98	0.013	0.75	0.00	0.00	0.00	0.00	553.52	553.00	552.25	553.52	561.38	7.86	56
55	55	54	549.05	547.33	171.60	0.0100	36	66.96	52.98	7.50	0	0.87	46.22	0.013	1.08	0.00	0.00	0.00	0.00	552.05	551.41	550.33	552.05	560.79	8.74	55
54	54	53	547.14	544.45	268.40	0.0100	36	66.95	57.96	8.20	0	1.04	60.51	0.013	2.03	0.00	0.00	0.00	0.00	550.14	549.78	547.75	550.14	560.79	10.65	54
53	53	52	544.25	542.49	176.60	0.0100	42	100.71	67.34	7.00	0	0.76	51.22	0.013	0.79	0.00	0.00	0.00	0.00	547.75	546.78	545.99	547.75	555.36	7.61	53
52	52	51	542.29	537.00	103.00	0.0514	42	228.62	75.73	7.87	0	0.96	72.86	0.013	0.58	0.00	0.00	0.00	0.00	545.79	541.08	540.50	545.79	550.30	4.51	52
51	51	50	529.92	528.00	48.00	0.0400	42	201.76	75.73	7.87	0	0.96	72.86	0.013	0.27	0.00	0.00	0.00	0.00	533.42	533.27	533.00	533.42	544.00	10.58	51
50																					533.00				50	
45	45	44	538.93	538.09	93.00	0.0090	15	6.16	0.83	0.69	0	0.01	0.01	0.013	0.02	0.00	0.00	0.00	0.00	540.18	539.36	539.34	540.18	542.35	2.17	45
44	44	43	537.89	535.26	291.80	0.0090	15	6.15	3.96	3.23	0	0.16	0.64	0.013	1.10	0.00	0.00	0.00	0.00	539.14	537.66	536.56	539.14	542.35	3.21	44
43	43	42	535.06	534.86	22.40	0.0089	18	9.95	6.65	3.76	0	0.22	1.46	0.013	0.09	0.00	0.00	0.00	0.00	536.56	536.45	536.36	536.56	547.00	10.44	43
42	42	41	534.86	533.13	152.70	0.0100	18	10.54	6.86	3.88	0	0.23	1.61	0.013	0.65	0.00	0.00	0.00	0.00	536.16	535.30	534.65	536.16	547.00	10.84	42
41	41	40	532.93	532.27	59.60	0.0111	18	11.08	8.59	4.86	0	0.37	3.15	0.013	0.40	0.00	0.00	0.00	0.00	534.43	534.65	534.25	534.65	545.00	10.35	41
40																					534.25				40	
38	38	37	570.84	567.79	215.20	0.0100	15	6.48	3.49	2.84	0	0.13	0.44	0.013	0.63	0.00	0.00	0.00	0.00	572.09	569.67	569.04	572.09	572.09	0.00	38
37	37	12	567.59	559.72	204.10	0.0386	15	12.72	3.49	2.84	0	0.13	0.44	0.013	0.60	0.00	0.00	0.00	0.00	568.84	562.62	562.02	568.84	575.00	6.16	37
12																					562.02				12	
36	36	28	555.00	554.42	62.40	0.0093	15	6.24	3.99	3.25	0	0.16	0.65	0.013	0.24	0.00	0.00	0.00	0.00	556.25	555.96	555.72	556.25	558.66	2.41	36
28																					555.72				28	
35	35	34	559.28	555.61	104.20	0.0352	15	12.16	0.42	0.34	0	0.00	0.00	0.013	0.00	0.00	0.00	0.00	0.00	560.53	556.86	556.86	560.53	562.70	2.17	35
34	34	33	555.41	554.14	91.40	0.0139	15	7.64	0.83	0.68	0	0.01	0.01	0.013	0.02	0.00	0.00	0.00	0.00	556.66	555.41	555.39	556.66	559.03	2.37	34
33	33	32	553.94	553.12	82.50	0.0100	15	6.48	1.41	1.15	0	0.02	0.03	0.013	0.04	0.00	0.00	0.00	0.00	555.19	554.41	554.37	555.19	557.55	2.36	33
32	32	24	552.92	552.09	83.00	0.0100	15	6.48	2.53	2.06	0	0.07	0.17	0.013	0.13	0.00	0.00	0.00	0.00	554.17	553.47	553.34	554.17	556.90	2.73	32
24																					553.34				24	
31	31	23	559.34	554.84	146.60	0.0307	15	11.35	0.63	0.51	0	0.00	0.00	0.013	0.01	0.00	0.00	0.00	0.00	560.59	556.10	556.09	560.59	563.00	2.41	31
23																					556.09				23	
30	30	29	563.08	562.35	36.40	0.0201	15	9.17	0.59	0.48	0	0.00	0.00	0.013	0.00	0.00	0.00	0.00	0.00	564.33	563.60	563.60	564.33	566.50	2.17	30
29	29	28	562.05	557.37	118.70	0.0394	15	12.86	0.96	0.78	0	0.01	0.01	0.013	0.03	0.00	0.00	0.00	0.00	563.30	558.65	558.62	563.30	566.50	3.20	29
28	28	27	564.																							