

STORM SEWER CALCULATIONS

Design Return Period: 25 Year

Project Name: Magnolia Ridge

Mannings 'n': 0.012

Project #: 18-3339

Date: 10/22/18

1 NO.	SUB-BASIN NO.	UPSTREAM STRUCTURE	PIPE #	DOWNSTREAM STRUCTURE	LENGTH (ft)	Cj	Aj (ac.)	CjAj	SUM CjAj	Tj (min)	Tcum (min)	I (in/hr)	PIPE Q (cfs)	PIPE DIA. (in)	PIPE SLOPE (ft/ft)	I.E. (Upstream)	I.E. (Downstream)	CAP. (cfs)	TRAVEL VELOCITY (ft/sec)	TIME (min)
1	5	CI 500	501	CI 502	42	0.652	1.59	1.04	1.04	20.08	20.08	4.564	4.73	12	0.0164	411.13	410.44	4.94	6.29	0.11
1	4	CI 502	503	AD 504	136	0.604	0.87	0.53	1.56	15.42	20.19	4.553	7.11	18	0.0042	410.44	409.87	7.37	4.17	0.54
1	3	AD 504	505	CI 506	33	0.417	1.18	0.49	2.05	8.91	20.73	4.503	9.25	18	0.0072	409.87	409.63	9.65	5.47	0.10
1	2	CI 506	507	CI 508	26	0.597	0.73	0.44	2.49	14.52	20.83	4.494	11.19	18	0.0105	409.63	409.36	11.66	6.60	0.07
1	1 + OS-1B	CI 508	509	AD 516	147	0.520	1.72	0.89	3.38	17.37	20.90	4.487	15.19	18	0.0193	409.36	406.52	15.80	8.95	0.27
1	20	CI 510	511	CI 514	76	0.571	0.56	0.32	0.32	16.18	16.18	4.924	1.57	12	0.0050	407.70	407.32	2.73	3.48	0.36
1	8	CI 512	513	CI 514	26	0.587	0.58	0.34	0.34	16.98	16.98	4.849	1.65	12	0.0100	408.69	408.43	3.86	4.92	0.09
1	7	CI 514	515	AD 516	170	0.612	0.39	0.24	0.90	15.54	17.07	4.842	4.35	15	0.0047	407.32	406.52	4.80	3.91	0.72
1	6	AD 516	517	FES 518	116	0.419	0.29	0.12	4.40	9.98	21.17	4.462	19.65	24	0.0069	406.52	405.72	20.35	6.48	0.30
2	10 + OS-8A	AD 520	521	CI 522	105	0.313	12.34	3.86	3.86	15.34	15.34	5.001	19.32	18	0.0320	411.70	408.34	20.35	11.52	0.15
2	11	CI 522	523	CI 524	26	0.581	1.31	0.76	4.62	16.65	16.65	4.880	22.56	21	0.0195	408.34	407.83	23.96	9.97	0.04
2	12	CI 524	525	MH 526	122	0.602	0.96	0.58	5.20	17.97	17.97	4.759	24.75	21	0.0325	407.83	403.87	30.93	12.87	0.16
2		MH 526	527	FES 528	23				5.20	11.21	18.13	4.744	24.68	21	0.0440	403.87	402.86	35.99	14.97	0.03
3		FES 530	531	AD 532	34									12	0.0240	402.86	402.04	5.98	7.61	0.07
3		AD 532	533	CI 534	25								53.56	18	0.0165	402.04	401.63	14.61	8.27	0.05
3	16	CI 534	535	CI 536	26	0.614	1.00	0.61	0.61	17.67	17.67	4.786	56.50	18	0.0168	401.63	401.19	14.74	8.35	0.05
3	17	CI 536	537	FES 538	110	0.612	0.36	0.22	0.83	17.61	17.72	4.778	57.55	24	0.0034	401.19	400.82	14.29	4.55	0.40
4	14	CI 542	543	CI 544	26	0.609	0.84	0.51	0.51	16.26	16.26	4.917	2.52	12	0.0051	403.56	403.43	2.76	3.51	0.12
4	15	CI 544	545	FES 546	44	0.550	0.53	0.29	0.80	16.19	16.38	4.905	3.94	12	0.0130	403.43	402.86	4.40	5.60	0.13
5	OS-1A+18+19	FES 548	549	FES 550	50	0.399	28.02	11.18	11.18	20.01	20.01	4.570	51.09	42	0.0040	404.50	404.30	68.91	7.17	0.12
6	24 + OS-9A	CI 556	557	CI 558	26	0.514	1.73	0.89	0.89	16.79	16.79	4.867	4.33	12	0.0191	412.90	412.40	5.33	6.79	0.06
6	25	CI 558	559	FES 560	163	0.549	0.41	0.23	1.11	13.45	16.85	4.862	5.42	18	0.0025	412.40	412.00	5.69	3.22	0.84
7	28	AD 562	563	CI 568	143	0.364	2.92	1.06	1.06	17.53	17.53	4.799	5.10	15	0.0072	414.70	413.67	5.94	4.84	0.49
7	26	CI 564	565	CI 566	26	0.627	0.86	0.54	0.54	16.61	16.61	4.884	2.63	12	0.0085	416.40	416.18	3.56	4.53	0.10
7	27	CI 566	567	CI 568	88	0.581	0.50	0.29	0.83	18.36	18.36	4.722	3.92	12	0.0240	416.18	414.07	5.98	7.61	0.19
7	29 + OS-6A	CI 568	569	CI 570	39	0.488	1.81	0.88	2.78	23.18	23.18	4.277	11.87	18	0.0136	413.67	413.14	13.27	7.51	0.09
7	31	AD 572	573	CI 574	66	0.328	2.37	0.78	0.78	14.17	14.17	5.181	4.03	12	0.0140	414.75	413.83	4.57	5.82	0.19
7	32 + OS-9B	CI 574	575	CI 576	26	0.567	2.38	1.35	2.13	17.62	17.62	4.791	10.19	15	0.0310	413.83	413.02	12.32	10.04	0.04
7	33	CI 576	571	CI 570	85	0.606	0.75	0.45	2.58	14.30	17.66	4.787	12.36	24	0.0030	413.02	412.77	13.42	4.27	0.33
7	30	CI 570	577	FES 578	174	0.542	0.53	0.29	5.64	15.85	23.27	4.268	24.09	30	0.0044	412.77	412.00	29.46	6.01	0.48
8	34	AD 580	581	CI 582	132	0.531	0.58	0.31	0.31	9.86	9.86	5.960	1.84	12	0.0060	414.85	414.06	2.99	3.81	0.58
8	35	CI 582	583	CI 584	57	0.603	0.91	0.55	0.86	19.96	19.96	4.574	3.92	15	0.0040	414.06	413.83	4.42	3.61	0.26
8	36	CI 584	585	FES 586	172	0.620	0.70	0.43	1.29	14.02	20.22	4.507	5.82	15	0.0106	413.83	412.01	7.20	5.87	0.49
9	38	AD #592	593	CI 594	173	0.492	1.23	0.61	0.61	13.59	13.59	5.285	3.20	12	0.0090	416.75	415.19	3.66	4.66	0.62
9	39	CI 594	595	CI 596	26	0.619	0.75	0.46	1.07	16.00	16.00	4.940	5.28	15	0.0112	415.19	414.90	7.40	6.04	0.07
9	40	CI 596	597	FES 598	164	0.598	0.55	0.33	1.40	16.55	16.55	4.890	6.84	18	0.0055	414.90	414.00	8.44	4.78	0.57
10	43	AD 600	601	MH 602	137	0.364	1.29	0.47	0.47	16.17	16.17	4.925	2.31	12	0.0045	416.25	415.63	2.59	3.30	0.69
10		MH 602	603	CI 604	25				0.47		16.86	4.861	2.28	12	0.0100	415.63	415.38	3.86	4.92	0.08
10	44	CI 604	605	CI 606	26	0.607	0.93	0.56	1.03	14.03	16.95	4.853	5.02	18	0.0030	415.02	414.94	6.23	3.53	0.12
10	45	CI 606	607	FES 608	164	0.590	1.02	0.60	1.64	17.30	17.30	4.820	7.88	18	0.0057	414.94	414.00	8.62	4.88	0.56
11	41	CI 610	611	CI 612	26	0.604	0.87	0.53	0.53	13.82	13.82	5.243	2.76	12	0.0220	415.24	414.67	5.72	7.29	0.06
11	42	CI 612	613	FES 614	154	0.641	0.79	0.51	1.03	11.86	13.88	5.233	5.40	18	0.0043	414.67	414.00	7.49	4.24	0.60
12	50B	FES 624	625	CI 626	18	0.417	0.16	0.07	0.07	11.10	11.10	5.729	0.38	12	0.0222	412.50	412.10	5.75	7.32	0.04
12	50A + OS-6B	CI 626	627	CI 628	41	0.385	1.99	0.77	0.83	19.91	19.91	4.579	3.81	12	0.0122	412.10	411.60	4.26	5.43	0.13
12	52A	CI 628	629	FES 630	18	0.572	0.48	0.27	1.11	13.79	20.04	4.567	5.06	18	0.0025	411.60	411.56	5.69	3.22	0.09
13	OS-10	FES 632	633	FES 634	68	0.430	0.52	0.22	0.22	10.73	10.73	5.794	1.30	12	0.0070	404.50	404.02	3.23	4.11	0.28
14	51A + OS-2	FES 636	637	FES 638	151	0.441	2.52	1.11	1.11	15.29	15.29	5.006	5.56	15	0.0072	420.30	419.21	5.94	4.84	0.52

14" x 23" Elliptical RCP Req'd

STORM SEWER CALCULATIONS

Design Return Period: 25 Year

Project Name: **Magnolia Ridge**

Mannings 'n': 0.012

Project #: 18-3339
Date: 9/21/18

1 NO.	SUB-BASIN NO.	UPSTREAM STRUCTURE	PIPE #	DOWNSTREAM STRUCTURE	LENGTH (ft)	Cj	Aj (ac.)	CJAj	SUM CJAj	Tj (min)	Tcum (min)	I (in/hr)	PIPE Q (cfs)	PIPE DIA. (in)	PIPE SLOPE (ft/ft)	I.E. (Upstream)	I.E. (Downstream)	CAP. (cfs)	TRAVEL VELOCITY (ft/sec)	TIME (min)	
1	5	CI 500	501	CI 502	42	0.652	1.59	1.04	1.04	20.08	20.08	4.564	4.73	12	0.0164	411.13	410.44	4.94	6.29	0.11	
1	4	CI 502	503	AD 504	136	0.604	0.87	0.53	1.56	15.42	20.19	4.553	7.11	18	0.0042	410.44	409.87	7.37	4.17	0.54	
1	3	AD 504	505	CI 506	33	0.417	1.18	0.49	2.05	8.91	20.73	4.503	9.25	18	0.0072	409.87	409.63	9.65	5.47	0.10	
1	2	CI 506	507	CI 508	26	0.597	0.73	0.44	2.49	14.52	20.83	4.494	11.19	18	0.0105	409.63	409.36	11.66	6.60	0.07	
1	1 + OS-1B	CI 508	509	AD 516	147	0.520	1.72	0.89	3.38	17.37	20.90	4.487	15.19	18	0.0193	409.36	406.52	15.80	8.95	0.27	
1	20	CI 510	511	CI 514	76	0.571	0.56	0.32	0.32	16.18	16.18	4.924	1.57	12	0.0050	407.70	407.32	2.73	3.48	0.36	
1	8	CI 512	513	CI 514	26	0.587	0.58	0.34	0.34	16.98	16.98	4.849	1.65	12	0.0100	408.69	408.43	3.86	4.92	0.09	
1	7	CI 514	515	AD 516	170	0.612	0.39	0.24	0.90	15.54	17.07	4.842	4.35	15	0.0047	407.32	406.52	4.80	3.91	0.72	
1	6	AD 516	517	FES 518	116	0.419	0.29	0.12	4.40	9.98	21.17	4.462	19.65	24	0.0069	406.52	405.72	20.35	6.48	0.30	
2	10 + OS-8A	AD 520	521	CI 522	105	0.313	12.34	3.86	3.86	15.34	15.34	5.001	19.32	18	0.0320	411.70	408.34	20.35	11.52	0.15	
2	11	CI 522	523	CI 524	26	0.581	1.31	0.76	4.62	16.65	16.65	4.880	22.56	21	0.0195	408.34	407.83	23.96	9.97	0.04	
2	12	CI 524	525	MH 526	122	0.602	0.96	0.58	5.20	17.97	17.97	4.759	24.75	21	0.0325	407.83	403.87	30.93	12.87	0.16	
2		MH 526	527	FES 528	23				5.20	11.21	18.13	4.744	24.68	21	0.0440	403.87	402.86	35.99	14.97	0.03	
3		FES 530	531	AD 532	34									12	0.0240	402.86	402.04	5.98	7.61	0.07	
3		AD 532	533	CI 534	25								94.42	18	0.0165	402.04	401.63	14.61	8.27	0.05	
3	16	CI 534	535	CI 536	26	0.614	1.00	0.61	0.61	17.67	17.67	4.786	97.36	18	0.0150	401.63	401.24	13.93	7.89	0.05	
3	17	CI 536 plot	537	FES 538	120	0.612	0.36	0.22	0.83	17.61	17.72	4.778	98.41	24	0.0035	401.24	400.82	14.49	4.62	0.43	
4	14	CI 542	543	CI 544	26	0.609	0.84	0.51	0.51	16.26	16.26	4.917	2.52	12	0.0051	403.56	403.43	2.76	3.51	0.12	
4	15	CI 544	545	FES 546	44	0.550	0.53	0.29	0.80	16.19	16.38	4.905	3.94	12	0.0130	403.43	402.86	4.40	5.60	0.13	
5	OS-1A+18+19	FES 548	549	FES 550	50	0.399	28.02	11.18	11.18	20.01	20.01	4.570	51.09	42	0.0040	404.50	404.30	68.91	7.17	0.12	
6	24 + OS-9A	CI 556	557	CI 558	26	0.514	1.73	0.89	0.89	16.79	16.79	4.867	4.33	12	0.0191	412.90	412.40	5.33	6.79	0.06	
6	25	CI 558	559	FES 560	163	0.549	0.41	0.23	1.11	13.45	16.85	4.862	5.42	18	0.0025	412.40	412.00	5.69	3.22	0.84	
7	28	AD 562	563	CI 568	143	0.364	2.92	1.06	1.06	17.53	17.53	4.799	5.10	15	0.0072	414.70	413.67	5.94	4.84	0.49	
7	26	CI 564	565	CI 566	26	0.627	0.86	0.54	0.54	16.61	16.61	4.884	2.63	12	0.0085	416.40	416.18	3.56	4.53	0.10	
7	27	CI 566	567	CI 568	88	0.581	0.50	0.29	0.83	18.36	18.36	4.722	3.92	12	0.0240	416.18	414.07	5.98	7.61	0.19	
7	29 + OS-6A	CI 568	569	CI 570	39	0.488	1.81	0.88	2.78	23.18	23.18	4.277	11.87	18	0.0136	413.67	413.14	13.27	7.51	0.09	
7	31	AD 572	573	CI 574	66	0.328	2.37	0.78	0.78	14.17	14.17	5.181	4.03	12	0.0140	414.75	413.83	4.57	5.82	0.19	
7	32 + OS-9B	CI 574	575	CI 576	26	0.567	2.38	1.35	2.13	17.62	17.62	4.791	10.19	15	0.0310	413.83	413.02	12.32	10.04	0.04	
7	33	CI 576	577	CI 570	85	0.606	0.75	0.45	2.58	14.30	17.66	4.787	12.36	24	0.0030	413.02	412.77	13.42	4.27	0.33	
7	30	CI 570	571	FES 578	174	0.542	0.53	0.29	3.06	15.85	23.27	4.268	13.07	24	0.0044	412.77	412.00	16.25	5.18	0.56	
8	34	AD 580	581	CI 582	132	0.531	0.58	0.31	0.31	9.86	9.86	5.960	1.84	12	0.0060	414.85	414.06	2.99	3.81	0.58	
8	35	CI 582	583	CI 584	57	0.603	0.91	0.55	0.86	19.96	19.96	4.574	3.92	15	0.0040	414.06	413.83	4.42	3.61	0.26	
8	36	CI 584	585	FES 586	172	0.620	0.70	0.43	1.29	14.02	20.22	4.507	5.82	15	0.0106	413.83	412.01	7.20	5.87	0.49	
9	38	AD #592	593	CI 594	173	0.492	1.23	0.61	0.61	13.59	13.59	5.285	3.20	12	0.0090	416.75	415.19	3.66	4.66	0.62	
9	39	CI 594	595	CI 596	26	0.614	0.89	0.55	1.15	15.74	15.74	4.964	5.72	15	0.0112	415.19	414.90	7.40	6.04	0.07	
9	40	CI 596	597	FES 598	164	0.603	0.69	0.42	1.57	15.59	15.81	4.947	7.76	18	0.0055	414.90	414.00	8.44	4.78	0.57	
10	43	AD 600	601	MH 602	137	0.364	1.29	0.47	0.47	16.17	16.17	4.925	2.31	12	0.0045	416.25	415.63	2.59	3.30	0.69	
10		MH 602	603	CI 604	25				0.47			16.86	4.861	2.28	12	0.0100	415.63	415.38	3.86	4.92	0.08
10	44	CI 604	605	CI 606	26	0.607	0.93	0.56	1.03	14.03	16.95	4.853	5.02	18	0.0030	415.02	414.94	6.23	3.53	0.12	
10	45	CI 606	607	FES 608	164	0.590	1.02	0.60	1.64	17.30	17.30	4.820	7.88	18	0.0057	414.94	414.00	8.62	4.88	0.56	
11	41	CI 610	611	CI 612	26	0.604	0.87	0.53	0.53	13.82	13.82	5.243	2.76	12	0.0220	415.24	414.67	5.72	7.29	0.06	
11	42	CI 612	613	FES 614	154	0.641	0.79	0.51	1.03	11.86	13.88	5.233	5.40	18	0.0043	414.67	414.00	7.49	4.24	0.60	
12	50B	FES 624	625	CI 626	18	0.417	0.16	0.07	0.07	11.10	11.10	5.729	0.38	12	0.0222	412.50	412.10	5.75	7.32	0.04	
12	50A + OS-6B	CI 626	627	CI 628	41	0.385	1.99	0.77	0.83	19.91	19.91	4.579	3.81	12	0.0122	412.10	411.60	4.26	5.43	0.13	
12	52A	CI 628	629	FES 630	18	0.572	0.48	0.27	1.11	13.79	20.04	4.567	5.06	18	0.0025	411.60	411.56	5.69	3.22	0.09	
13	OS-10	FES 632	633	FES 634	68	0.430	0.52	0.22	0.22	10.73	10.73	5.794	1.30	12	0.0070	404.50	404.02	3.23	4.11	0.28	
14	51A + OS-2	FES 636	637	FES 638	151	0.441	2.52	1.11	1.11	15.29	15.29	5.006	5.56	15	0.0072	420.30	419.21	5.94	4.84	0.52	

14" x 23" Elliptical RCP Req'd

SEE SHEET DATED 10/22/2018