

Project Description

File Name OWDP_Route4_HydraulicModel.SPF
Description
Wastewater from Family Student Housing
Complex to OWDP site

Project Options

Flow Units GPM
Elevation Type Elevation
Hydrology Method EPA SWMM
EPA SWMM Infiltration Method SCS Curve Number
Link Routing Method Hydrodynamic
Enable Overflow Ponding at Nodes YES
Skip Steady State Analysis Time Periods NO

Analysis Options

Start Analysis On Oct 21, 2013 00:00:00
End Analysis On Oct 23, 2013 00:00:00
Start Reporting On Oct 21, 2013 00:00:00
Antecedent Dry Days 0 days
Runoff (Dry Weather) Time Step 0 00:05:00 days hh:mm:ss
Runoff (Wet Weather) Time Step 0 00:05:00 days hh:mm:ss
Reporting Time Step 0 00:05:00 days hh:mm:ss
Routing Time Step 1 seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins.....	0
Nodes.....	16
<i>Junctions</i>	14
<i>Outfalls</i>	1
<i>Flow Diversions</i>	0
<i>Inlets</i>	0
<i>Storage Nodes</i>	1
Links.....	17
<i>Channels</i>	0
<i>Pipes</i>	15
<i>Pumps</i>	2
<i>Orifices</i>	0
<i>Weirs</i>	0
<i>Outlets</i>	0
Pollutants	0
Land Uses	0

Node Summary

SN	Element ID	Element Type	Invert Elevation	Ground/Rim (Max) Elevation	Initial Water Elevation	Surcharge Elevation	Ponded Area	Peak Inflow	Max HGL Elevation Attained	Max Surcharge Depth Attained	Min Freeboard Attained	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
			(ft)	(ft)	(ft)	(ft)	(ft ²)	(gpm)	(ft)	(ft)	(ft)	(days hh:mm)	(ac-in)	(min)
1	Manhole	Junction	6928.37	6928.70	6928.37	6928.70	0.00	127.80	6928.56	0.00	0.14	0 00:00	0.00	0.00
2	Structure - (165)	Junction	6924.87	6925.20	6924.87	6925.20	0.00	127.80	6925.20	0.00	0.00	0 18:03	0.61	715.00
3	Structure - (167)	Junction	6926.87	6927.20	6926.87	20000.00	0.00	149.87	6939.69	12.49	0.00	0 00:00	0.00	0.00
4	Structure - (168)	Junction	6928.87	6929.20	6928.87	20000.00	0.00	138.70	6932.70	3.50	0.00	0 00:00	0.00	0.00
5	Structure - (169)	Junction	6927.87	6928.20	6927.87	20000.00	0.00	135.86	6931.42	3.22	0.00	0 00:00	0.00	0.00
6	Structure - (170)	Junction	6925.04	6925.37	6925.04	20000.00	0.00	141.25	6933.34	7.97	0.00	0 00:00	0.00	0.00
7	Structure - (171)	Junction	6925.57	6925.90	6925.57	20000.00	0.00	130.01	6928.88	2.98	0.00	0 00:00	0.00	0.00
8	Structure - (172)	Junction	6925.00	6925.33	6925.00	20000.00	0.00	122.69	6928.22	2.89	0.00	0 00:00	0.00	0.00
9	Structure - (173)	Junction	6923.68	6924.01	6923.68	10000.00	0.00	114.56	6923.87	0.00	0.14	0 00:00	0.00	0.00
10	Structure - (174)	Junction	6916.90	6917.23	6916.90	10000.00	0.00	115.06	6917.10	0.00	0.14	0 00:00	0.00	0.00
11	Structure - (175)	Junction	6908.95	6909.28	6908.95	10000.00	0.00	117.30	6913.36	4.08	0.00	0 00:00	0.00	0.00
12	Structure - (176)	Junction	6904.27	6904.60	6904.27	10000.00	0.00	115.27	6917.63	13.03	0.00	0 00:00	0.00	0.00
13	Structure - (177)	Junction	6904.95	6905.28	6904.95	10000.00	0.00	107.85	6912.22	6.93	0.00	0 00:00	0.00	0.00
14	Structure - (178)	Junction	6902.95	6903.28	6902.95	10000.00	0.00	107.67	6911.64	8.35	0.00	0 00:00	0.00	0.00
15	ValveVaultBox	Outfall	6904.94					107.68	6905.17					
16	SepticTank	Storage Node	6918.70	6924.37	6924.37		0.00	98.02	6924.37				0.00	0.00

Link Summary

SN Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (gpm)	Design Flow Capacity (gpm)	Peak Flow/Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/Total Depth Ratio	Total Time Reported Surcharged Condition (min)
1	Pipe - (142)	Pipe Manhole	Structure - (165)	50.00	6928.37	6924.87	7.0000	4.000	0.0150	127.80	195.86	0.65	5.21	0.26	0.79	0.00 Calculated
2	Pipe - (143)	Pipe Structure - (165)	SepticTank	50.00	6924.87	6924.00	1.7400	4.000	0.0150	98.02	97.56	1.00	2.75	0.30	0.89	0.00 > CAPACITY
3	Pipe - (144)	Pipe SepticTank	Structure - (167)	50.00	6923.37	6926.87	-7.0000	4.000	0.0150	0.00	195.84	0.00	0.00	0.17	1.00	1.00 SURCHARGED
4	Pipe - (145)	Pipe Structure - (167)	Structure - (168)	50.00	6926.87	6928.87	-4.0000	4.000	0.0150	138.70	148.06	0.94	5.33	0.33	1.00	462.00 SURCHARGED
5	Pipe - (146)	Pipe Structure - (168)	Structure - (169)	50.00	6928.87	6927.87	2.0000	4.000	0.0150	135.86	104.69	1.30	4.36	0.33	1.00	319.00 SURCHARGED
6	Pipe - (147)	Pipe Structure - (169)	Structure - (170)	47.06	6927.87	6925.04	6.0000	4.000	0.0150	141.25	181.33	0.78	5.26	0.33	1.00	458.00 SURCHARGED
7	Pipe - (148)	Pipe Structure - (170)	Structure - (171)	52.30	6925.04	6925.57	-1.0000	4.000	0.0150	130.01	74.03	1.76	4.49	0.33	1.00	985.00 SURCHARGED
8	Pipe - (149)	Pipe Structure - (171)	Structure - (172)	56.62	6925.57	6925.00	1.0000	4.000	0.0150	122.69	74.03	1.66	4.33	0.33	1.00	934.00 SURCHARGED
9	Pipe - (150)	Pipe Structure - (172)	Structure - (173)	100.00	6925.00	6923.68	1.3200	4.000	0.0150	114.56	85.03	1.35	3.87	0.26	0.79	0.00 > CAPACITY
10	Pipe - (151)	Pipe Structure - (173)	Structure - (174)	100.00	6923.68	6916.90	6.7800	4.000	0.0150	115.06	192.82	0.60	5.60	0.19	0.57	0.00 Calculated
11	Pipe - (152)	Pipe Structure - (174)	Structure - (175)	100.00	6916.90	6908.95	7.9500	4.000	0.0150	117.30	208.75	0.56	5.82	0.27	0.80	0.00 Calculated
12	Pipe - (153)	Pipe Structure - (175)	Structure - (176)	100.00	6908.95	6904.27	4.6700	4.000	0.0150	115.27	160.01	0.72	4.76	0.33	1.00	942.00 SURCHARGED
13	Pipe - (154)	Pipe Structure - (176)	Structure - (177)	100.00	6904.27	6904.95	-0.6800	4.000	0.0150	107.85	61.08	1.77	3.23	0.33	1.00	2677.00 SURCHARGED
14	Pipe - (155)	Pipe Structure - (177)	Structure - (178)	100.00	6904.95	6902.95	2.0000	4.000	0.0150	107.67	104.69	1.03	3.43	0.33	1.00	2677.00 SURCHARGED
15	Pipe - (156)	Pipe Structure - (178)	ValveVaultBox	66.08	6902.95	6904.94	-3.0000	4.000	0.0150	107.68	128.22	0.84	3.03	0.28	0.85	0.00 Calculated
16	Pump-1	Pump SepticTank	Structure - (167)		6918.70	6926.87				62.00						
17	Pump-2	Pump SepticTank	Structure - (167)		6918.70	6926.87				87.87						

Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft ²)	Minimum Pipe Cover (in)
1	Manhole	6928.37	6928.70	0.33	6928.37	0.00	6928.70	0.00	0.00	0.00
2	Structure - (165)	6924.87	6925.20	0.33	6924.87	0.00	6925.20	0.00	0.00	0.00
3	Structure - (167)	6926.87	6927.20	0.33	6926.87	0.00	20000.00	13072.80	0.00	0.00
4	Structure - (168)	6928.87	6929.20	0.33	6928.87	0.00	20000.00	13070.80	0.00	0.00
5	Structure - (169)	6927.87	6928.20	0.33	6927.87	0.00	20000.00	13071.80	0.00	0.00
6	Structure - (170)	6925.04	6925.37	0.33	6925.04	0.00	20000.00	13074.63	0.00	0.00
7	Structure - (171)	6925.57	6925.90	0.33	6925.57	0.00	20000.00	13074.10	0.00	0.00
8	Structure - (172)	6925.00	6925.33	0.33	6925.00	0.00	20000.00	13074.67	0.00	0.00
9	Structure - (173)	6923.68	6924.01	0.33	6923.68	0.00	10000.00	3075.99	0.00	0.00
10	Structure - (174)	6916.90	6917.23	0.33	6916.90	0.00	10000.00	3082.77	0.00	0.00
11	Structure - (175)	6908.95	6909.28	0.33	6908.95	0.00	10000.00	3090.73	0.00	0.00
12	Structure - (176)	6904.27	6904.60	0.33	6904.27	0.00	10000.00	3095.40	0.00	0.00
13	Structure - (177)	6904.95	6905.28	0.33	6904.95	0.00	10000.00	3094.72	0.00	0.00
14	Structure - (178)	6902.95	6903.28	0.33	6902.95	0.00	10000.00	3096.72	0.00	0.00

Junction Results

SN Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Max HGL Depth Attained	Max Surchage Depth Attained	Min Freeboard Attained	Average HGL Elevation Attained	Average HGL Depth Attained	Time of Max HGL Occurrence	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
	(gpm)	(gpm)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(days hh:mm)	(days hh:mm)	(ac-in)	(min)
1 Manhole	127.80	127.80	6928.56	0.19	0.00	0.14	6928.51	0.14	0 18:03	0 00:00	0.00	0.00
2 Structure - (165)	127.80	0.00	6925.20	0.33	0.00	0.00	6925.09	0.22	0 05:01	0 18:03	0.61	715.00
3 Structure - (167)	149.87	0.00	6939.69	12.82	12.49	0.00	6929.80	2.93	0 00:00	0 00:00	0.00	0.00
4 Structure - (168)	138.70	0.00	6932.70	3.83	3.50	0.00	6929.40	0.53	0 00:03	0 00:00	0.00	0.00
5 Structure - (169)	135.86	0.00	6931.42	3.55	3.22	0.00	6928.31	0.44	0 00:03	0 00:00	0.00	0.00
6 Structure - (170)	141.25	0.00	6933.34	8.30	7.97	0.00	6926.76	1.72	0 00:01	0 00:00	0.00	0.00
7 Structure - (171)	130.01	0.00	6928.88	3.31	2.98	0.00	6926.21	0.64	0 00:03	0 00:00	0.00	0.00
8 Structure - (172)	122.69	0.00	6928.22	3.22	2.89	0.00	6925.48	0.48	0 00:03	0 00:00	0.00	0.00
9 Structure - (173)	114.56	0.00	6923.87	0.19	0.00	0.14	6923.82	0.14	0 00:04	0 00:00	0.00	0.00
10 Structure - (174)	115.06	0.00	6917.10	0.20	0.00	0.14	6917.03	0.13	0 05:17	0 00:00	0.00	0.00
11 Structure - (175)	117.30	0.00	6913.36	4.41	4.08	0.00	6909.89	0.94	0 05:17	0 00:00	0.00	0.00
12 Structure - (176)	115.27	0.00	6917.63	13.36	13.03	0.00	6907.78	3.51	0 00:05	0 00:00	0.00	0.00
13 Structure - (177)	107.85	0.00	6912.22	7.27	6.93	0.00	6906.83	1.88	0 00:07	0 00:00	0.00	0.00
14 Structure - (178)	107.67	0.00	6911.64	8.69	8.35	0.00	6905.87	2.92	0 00:07	0 00:00	0.00	0.00

Pipe Input

SN Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Pipe Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow Gate	Flap	No. of Barrels
1 Pipe - (142)	50.00	6928.37	0.00	6924.87	0.00	3.50	7.0000	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1
2 Pipe - (143)	50.00	6924.87	0.00	6924.00	5.30	0.87	1.7400	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1
3 Pipe - (144)	50.00	6923.37	4.67	6926.87	0.00	-3.50	-7.0000	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1
4 Pipe - (145)	50.00	6926.87	0.00	6928.87	0.00	-2.00	-4.0000	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1
5 Pipe - (146)	50.00	6928.87	0.00	6927.87	0.00	1.00	2.0000	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1
6 Pipe - (147)	47.06	6927.87	0.00	6925.04	0.00	2.82	6.0000	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1
7 Pipe - (148)	52.30	6925.04	0.00	6925.57	0.00	-0.52	-1.0000	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1
8 Pipe - (149)	56.62	6925.57	0.00	6925.00	0.00	0.57	1.0000	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1
9 Pipe - (150)	100.00	6925.00	0.00	6923.68	0.00	1.32	1.3200	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1
10 Pipe - (151)	100.00	6923.68	0.00	6916.90	0.00	6.78	6.7800	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1
11 Pipe - (152)	100.00	6916.90	0.00	6908.95	0.00	7.95	7.9500	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1
12 Pipe - (153)	100.00	6908.95	0.00	6904.27	0.00	4.67	4.6700	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1
13 Pipe - (154)	100.00	6904.27	0.00	6904.95	0.00	-0.68	-0.6800	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1
14 Pipe - (155)	100.00	6904.95	0.00	6902.95	0.00	2.00	2.0000	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1
15 Pipe - (156)	66.08	6902.95	0.00	6904.94	0.00	-1.98	-3.0000	CIRCULAR	3.960	3.960	0.0150	0.5000	0.5000	0.0000	0.00	Yes	1

Pipe Results

SN Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
	(gpm)	(days hh:mm)	(gpm)		(ft/sec)	(min)	(ft)		(min)		
1 Pipe - (142)	127.80	0 18:03	195.86	0.65	5.21	0.16	0.26	0.79	0.00	1.49	Calculated
2 Pipe - (143)	98.02	0 17:01	97.56	1.00	2.75	0.30	0.30	0.89	0.00	1.03	> CAPACITY
3 Pipe - (144)	0.00	0 00:00	195.84	0.00	0.00		0.17	1.00	1.00	0.00	SURCHARGED
4 Pipe - (145)	138.70	0 00:00	148.06	0.94	5.33	0.16	0.33	1.00	462.00	0.45	SURCHARGED
5 Pipe - (146)	135.86	0 00:01	104.69	1.30	4.36	0.19	0.33	1.00	319.00	1.19	SURCHARGED
6 Pipe - (147)	141.25	0 00:01	181.33	0.78	5.26	0.15	0.33	1.00	458.00	0.57	SURCHARGED
7 Pipe - (148)	130.01	0 00:02	74.03	1.76	4.49	0.19	0.33	1.00	985.00	0.29	SURCHARGED
8 Pipe - (149)	122.69	0 00:03	74.03	1.66	4.33	0.22	0.33	1.00	934.00	0.52	SURCHARGED
9 Pipe - (150)	114.56	0 00:03	85.03	1.35	3.87	0.43	0.26	0.79	0.00	1.23	> CAPACITY
10 Pipe - (151)	115.06	0 00:04	192.82	0.60	5.60	0.30	0.19	0.57	0.00	2.47	Calculated
11 Pipe - (152)	117.30	0 00:04	208.75	0.56	5.82	0.29	0.27	0.80	0.00	1.87	Calculated
12 Pipe - (153)	115.27	0 00:05	160.01	0.72	4.76	0.35	0.33	1.00	942.00	0.44	SURCHARGED
13 Pipe - (154)	107.85	0 00:06	61.08	1.77	3.23	0.52	0.33	1.00	2677.00	0.01	SURCHARGED
14 Pipe - (155)	107.67	0 05:17	104.69	1.03	3.43	0.49	0.33	1.00	2677.00	0.01	SURCHARGED
15 Pipe - (156)	107.68	0 05:17	128.22	0.84	3.03	0.36	0.28	0.85	0.00	0.71	Calculated

Storage Nodes

Storage Node : SepticTank

Input Data

Invert Elevation (ft)	6918.70
Max (Rim) Elevation (ft)	6924.37
Max (Rim) Offset (ft)	5.67
Initial Water Elevation (ft)	6924.37
Initial Water Depth (ft)	5.67
Ponded Area (ft ²)	0.00
Evaporation Loss	0.00

Output Summary Results

Peak Inflow (gpm)	98.02
Peak Lateral Inflow (gpm)	0.00
Peak Outflow (gpm)	149.87
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	6924.37
Max HGL Depth Attained (ft)	5.67
Average HGL Elevation Attained (ft)	6920.45
Average HGL Depth Attained (ft)	1.75
Time of Max HGL Occurrence (days hh:mm)	0 00:00
Total Exfiltration Volume (1000-ft ³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00