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 Project Description  
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File Name ..... FRC Test line Hydro model.SPF

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 Analysis Options  
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Flow Units ..... cfs  
 Subbasin Hydrograph Method. Rational  
 Time of Concentration..... FAA  
 Return Period..... 10 years  
 Link Routing Method ..... Kinematic wave  
 Storage Node Exfiltration.. None  
 Starting Date ..... MAY-01-2019 00:00:00  
 Ending Date ..... MAY-01-2019 04:00:00  
 Report Time Step ..... 00:00:10

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 Element Count  
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Number of subbasins ..... 23  
 Number of nodes ..... 40  
 Number of links ..... 39

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 Subbasin Summary  
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Subbasin ID	Total Area acres	Flow Length ft	Average Slope %
Sub_1-1	4.93	663.40	0.7500
Sub_2-1	2.33	318.50	0.4700
Sub_2-10	0.33	98.40	0.7600
Sub_2-11	0.33	100.70	0.7000
Sub_2-12	0.41	257.20	0.4700
Sub_2-13	0.33	100.80	0.6400
Sub_2-14	0.33	102.40	0.5900
Sub_2-15	0.38	109.80	0.5000
Sub_2-16	0.37	102.90	0.6300
Sub_2-17	0.34	88.10	0.5700
Sub_2-18	0.72	450.20	0.3900
Sub_2-19	0.40	105.40	0.5700
Sub_2-2	1.44	349.50	0.7400
Sub_2-20	0.44	106.80	0.4700
Sub_2-21	0.42	108.40	0.9200
Sub_2-22	1.18	390.20	0.3600
Sub_2-3	0.62	155.50	0.4500
Sub_2-4	0.46	113.70	0.8800
Sub_2-5	0.32	94.30	0.5800
Sub_2-6	0.32	95.50	0.6300
Sub_2-7	4.98	693.00	0.5400
Sub_2-8	0.79	405.10	0.4300
Sub_2-9	0.33	96.50	0.7800

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Node Summary

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Node ID	Element Type	Invert Elevation ft	Maximum Elev. ft	Ponded Area ft <sup>2</sup>	External Inflow
Inlet_1-1	JUNCTION	8.80	12.26	10.00	
Inlet_2-1	JUNCTION	11.10	15.80	10.00	
Inlet_2-10	JUNCTION	12.58	14.75	10.00	
Inlet_2-11	JUNCTION	12.33	14.50	10.00	
Inlet_2-12	JUNCTION	7.90	13.74	10.00	
Inlet_2-13	JUNCTION	12.08	14.25	10.00	
Inlet_2-14	JUNCTION	11.83	14.00	10.00	
Inlet_2-15	JUNCTION	11.53	13.70	10.00	
Inlet_2-16	JUNCTION	11.43	13.60	10.00	
Inlet_2-17	JUNCTION	11.08	13.25	10.00	
Inlet_2-18	JUNCTION	7.00	12.36	10.00	
Inlet_2-19	JUNCTION	10.53	12.70	10.00	
Inlet_2-2	JUNCTION	10.60	15.75	10.00	
Inlet_2-20	JUNCTION	10.33	12.50	10.00	
Inlet_2-21	JUNCTION	9.83	12.00	10.00	
Inlet_2-22	JUNCTION	6.40	11.15	10.00	
Inlet_2-3	JUNCTION	14.33	16.50	10.00	← Highest inlet grate elevation in the SD system
Inlet_2-4	JUNCTION	13.83	16.00	10.00	
Inlet_2-5	JUNCTION	13.53	15.70	10.00	
Inlet_2-6	JUNCTION	13.23	15.40	10.00	
Inlet_2-7	JUNCTION	9.30	14.03	10.00	
Inlet_2-8	JUNCTION	8.60	14.39	10.00	
Inlet_2-9	JUNCTION	12.83	15.00	10.00	
Jun_2-12A	JUNCTION	7.72	10.23	10.00	
Jun_2-12B	JUNCTION	7.54	10.05	10.00	
Jun_2-12C	JUNCTION	7.36	9.86	10.00	
Jun_2-12D	JUNCTION	7.18	9.68	10.00	
Jun_2-18A	JUNCTION	6.82	9.33	10.00	
Jun_2-18B	JUNCTION	6.64	9.15	10.00	
Jun_2-18C	JUNCTION	6.47	8.97	10.00	
Jun_2-2A	JUNCTION	10.35	12.03	10.00	
Jun_2-2B	JUNCTION	9.53	11.21	10.00	
Jun_2-2C	JUNCTION	9.13	10.81	10.00	
Jun_2-2D	JUNCTION	8.74	10.41	10.00	
Jun_2-8A	JUNCTION	8.43	10.94	10.00	
Jun_2-8B	JUNCTION	8.17	10.67	10.00	
Outfall_1	JUNCTION	5.17	9.67	10.00	
Outfall_2	JUNCTION	6.38	10.30	10.00	
Proposed_Junction	JUNCTION	5.00	10.30	10.00	
Prop_Outlet	OUTFALL	4.36	7.36	0.00	← Lowest ground elevation in the watershed (above outfall)

The highest ground elevation within the watershed is about 17.6 ft.

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 Link Summary  
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Link ID	From Node	To Node	Element Type	Length ft	Slope %	Manning's Roughness
Link_1-1	Inlet_1-1	Outfall_1	CONDUIT	723.0	0.5021	0.0130
Link_2-1	Inlet_2-1	Inlet_2-2	CONDUIT	207.0	0.2415	0.0130
Link_2-10	Inlet_2-10	Jun_2-8B	CONDUIT	121.5	3.6296	0.0130
Link_2-11	Inlet_2-11	Inlet_2-12	CONDUIT	123.1	3.5987	0.0130
Link_2-12B	Jun_2-12B	Jun_2-12C	CONDUIT	82.3	0.2187	0.0130
Link_2-12C	Jun_2-12C	Jun_2-12D	CONDUIT	82.2	0.2190	0.0130
Link_2-12D	Jun_2-12D	Inlet_2-18	CONDUIT	79.9	0.2253	0.0130
Link_2-13	Inlet_2-13	Jun_2-12A	CONDUIT	122.4	3.5621	0.0130
Link_2-14	Inlet_2-14	Jun_2-12B	CONDUIT	126.1	3.4021	0.0130
Link_2-15	Inlet_2-15	Jun_2-12C	CONDUIT	120.2	3.4692	0.0130
Link_2-16	Inlet_2-16	Jun_2-12D	CONDUIT	113.8	3.7346	0.0130
Link_2-17	Inlet_2-17	Inlet_2-18	CONDUIT	129.1	3.1603	0.0130
Link_2-18	Inlet_2-18	Jun_2-18A	CONDUIT	107.9	0.1668	0.0130
Link_2-18A	Jun_2-18A	Jun_2-18B	CONDUIT	110.5	0.1629	0.0130
Link_2-18B	Jun_2-18B	Jun_2-18C	CONDUIT	108.2	0.1571	0.0130
Link_2-18C	Jun_2-18C	Inlet_2-22	CONDUIT	42.7	0.1639	0.0130
Link_2-19	Inlet_2-19	Jun_2-18A	CONDUIT	129.1	2.8737	0.0130
Link_2-2	Inlet_2-2	Jun_2-2A	CONDUIT	50.8	0.4921	0.0130
Link_2-20	Inlet_2-20	Jun_2-18B	CONDUIT	124.2	2.9710	0.0130
Link_2-21	Inlet_2-21	Jun_2-18C	CONDUIT	116.4	2.8866	0.0130
Link_2-22	Inlet_2-22	Outfall_2	CONDUIT	105.0	0.0190	0.0130
Link_2-2A	Jun_2-2A	Jun_2-2B	CONDUIT	169.2	0.4846	0.0130
Link_2-2B	Jun_2-2B	Jun_2-2C	CONDUIT	82.8	0.4831	0.0130
Link_2-2C	Jun_2-2C	Jun_2-2D	CONDUIT	81.3	0.4797	0.0130
Link_2-2D	Jun_2-2D	Inlet_2-8	CONDUIT	28.9	0.4844	0.0130
Link_2-3	Inlet_2-3	Jun_2-2A	CONDUIT	140.9	2.9454	0.0130
Link_2-4	Inlet_2-4	Jun_2-2B	CONDUIT	128.5	3.3463	0.0130
Link_2-5	Inlet_2-5	Jun_2-2C	CONDUIT	127.4	3.4537	0.0130
Link_2-6	Inlet_2-6	Jun_2-2D	CONDUIT	127.1	3.5321	0.0130
Link_2-7	Inlet_2-7	Inlet_2-8	CONDUIT	104.0	0.6731	0.0130
Link_2-8	Inlet_2-8	Jun_2-8A	CONDUIT	51.4	0.3307	0.0130
Link_2-8A	Jun_2-8A	Jun_2-8B	CONDUIT	80.0	0.3250	0.0130
Link_2-8B	Jun_2-8B	Inlet_2-12	CONDUIT	80.7	0.3346	0.0130
Link_2-9	Inlet_2-9	Jun_2-8A	CONDUIT	123.5	3.5628	0.0130
Link-12	Inlet_2-12	Jun_2-12A	CONDUIT	79.2	0.2273	0.0130
Link-12A	Jun_2-12A	Jun_2-12B	CONDUIT	82.5	0.2182	0.0130
Prop_Link-OF1	Outfall_1	Proposed_Junction	CONDUIT	19.4	0.8763	0.0130
Prop_Link-OF2	Outfall_2	Proposed_Junction	CONDUIT	22.2	6.2050	0.0130
Prop_Outlet_Link	Proposed_Junction	Prop_Outlet	CONDUIT	5.0	12.8000	0.0130

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Cross Section Summary

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Link ID	Shape	Depth/ Diameter ft	width ft	No. of Barrels	Cross Sectional Area ft <sup>2</sup>	Full Flow Hydraulic Radius ft	Design Flow Capacity cfs
Link_1-1	CIRCULAR	2.33	2.33	1	4.28	0.58	24.18
Link_2-1	CIRCULAR	1.67	1.67	1	2.18	0.42	6.84
Link_2-10	CIRCULAR	0.50	0.50	1	0.20	0.13	1.07
Link_2-11	CIRCULAR	0.50	0.50	1	0.20	0.13	1.06
Link_2-12B	CIRCULAR	2.50	2.50	1	4.91	0.63	19.18
Link_2-12C	CIRCULAR	2.50	2.50	1	4.91	0.63	19.19
Link_2-12D	CIRCULAR	2.50	2.50	1	4.91	0.63	19.47
Link_2-13	CIRCULAR	0.50	0.50	1	0.20	0.13	1.06
Link_2-14	CIRCULAR	0.50	0.50	1	0.20	0.13	1.03
Link_2-15	CIRCULAR	0.50	0.50	1	0.20	0.13	1.05
Link_2-16	CIRCULAR	0.50	0.50	1	0.20	0.13	1.08
Link_2-17	CIRCULAR	0.50	0.50	1	0.20	0.13	1.00
Link_2-18	CIRCULAR	2.50	2.50	1	4.91	0.63	16.75
Link_2-18A	CIRCULAR	2.50	2.50	1	4.91	0.63	16.55
Link_2-18B	CIRCULAR	2.50	2.50	1	4.91	0.63	16.26
Link_2-18C	CIRCULAR	2.50	2.50	1	4.91	0.63	16.61
Link_2-19	CIRCULAR	0.50	0.50	1	0.20	0.13	0.95
Link_2-2	CIRCULAR	1.67	1.67	1	2.18	0.42	9.76
Link_2-20	CIRCULAR	0.50	0.50	1	0.20	0.13	0.97
Link_2-21	CIRCULAR	0.50	0.50	1	0.20	0.13	0.95
Link_2-22	CIRCULAR	3.00	3.00	1	7.07	0.75	9.21
Link_2-2A	CIRCULAR	1.67	1.67	1	2.18	0.42	9.68
Link_2-2B	CIRCULAR	1.67	1.67	1	2.18	0.42	9.67
Link_2-2C	CIRCULAR	1.67	1.67	1	2.18	0.42	9.64
Link_2-2D	CIRCULAR	1.67	1.67	1	2.18	0.42	9.68
Link_2-3	CIRCULAR	0.50	0.50	1	0.20	0.13	0.96
Link_2-4	CIRCULAR	0.50	0.50	1	0.20	0.13	1.03
Link_2-5	CIRCULAR	0.50	0.50	1	0.20	0.13	1.04
Link_2-6	CIRCULAR	0.50	0.50	1	0.20	0.13	1.05
Link_2-7	CIRCULAR	1.67	1.67	1	2.18	0.42	11.41
Link_2-8	CIRCULAR	2.50	2.50	1	4.91	0.63	23.59
Link_2-8A	CIRCULAR	2.50	2.50	1	4.91	0.63	23.38
Link_2-8B	CIRCULAR	2.50	2.50	1	4.91	0.63	23.73
Link_2-9	CIRCULAR	0.50	0.50	1	0.20	0.13	1.06
Link-12	CIRCULAR	2.50	2.50	1	4.91	0.63	19.55
Link-12A	CIRCULAR	2.50	2.50	1	4.91	0.63	19.16
Prop_Link-OF1	CIRCULAR	2.33	2.33	1	4.28	0.58	31.94
Prop_Link-OF2	CIRCULAR	3.00	3.00	1	7.07	0.75	166.15
Prop_Outlet_Link	CIRCULAR	3.00	3.00	1	7.07	0.75	238.63

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*****
Runoff Quantity Continuity      Volume      Depth
*****                          acre-ft     inches
-----                          -
Total Precipitation .....      0.581      0.310
Continuity Error (%) .....      0.105

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*****
Flow Routing Continuity        Volume      volume
*****                          acre-ft     Mgallons
-----                          -
External Inflow .....          0.000      0.000
External Outflow .....         0.515      0.168
Initial Stored volume .....     0.000      0.000
Final Stored volume .....       0.000      0.000
Continuity Error (%) .....      0.010

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*****
Runoff Coefficient Computations Report
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Subbasin Sub_1-1
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Concrete/Asphalt	4.66	-	0.95
Natural_Landscape	0.27	-	0.35
Composite Area & Weighted Runoff Coeff.	4.93		0.92

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Subbasin Sub_2-1
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Concrete/Asphalt	1.29	-	0.95
Natural_Landscape	1.04	-	0.35
Composite Area & Weighted Runoff Coeff.	2.33		0.68

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Subbasin Sub_2-10
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.33	-	0.95
Composite Area & Weighted Runoff Coeff.	0.33		0.95

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Subbasin Sub_2-11
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.33	-	0.95
Composite Area & Weighted Runoff Coeff.	0.33		0.95

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 Subbasin Sub\_2-12  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.41	-	0.95
Composite Area & Weighted Runoff Coeff.	0.41		0.95

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 Subbasin Sub\_2-13  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.33	-	0.95
Composite Area & Weighted Runoff Coeff.	0.33		0.95

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 Subbasin Sub\_2-14  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.33	-	0.95
Composite Area & Weighted Runoff Coeff.	0.33		0.95

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 Subbasin Sub\_2-15  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.38	-	0.95
Composite Area & Weighted Runoff Coeff.	0.38		0.95

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 Subbasin Sub\_2-16  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.37	-	0.95
Composite Area & Weighted Runoff Coeff.	0.37		0.95

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 Subbasin Sub\_2-17  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.34	-	0.95
Composite Area & Weighted Runoff Coeff.	0.34		0.95

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 Subbasin Sub\_2-18  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.72	-	0.95
Composite Area & Weighted Runoff Coeff.	0.72		0.95

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 Subbasin Sub\_2-19  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.40	-	0.95
Composite Area & Weighted Runoff Coeff.	0.40		0.95

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 Subbasin Sub\_2-2  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	1.44	-	0.95
Composite Area & Weighted Runoff Coeff.	1.44		0.95

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 Subbasin Sub\_2-20  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.44	-	0.95
Composite Area & Weighted Runoff Coeff.	0.44		0.95

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 Subbasin Sub\_2-21  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.42	-	0.95
Composite Area & Weighted Runoff Coeff.	0.42		0.95

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 Subbasin Sub\_2-22  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	1.18	-	0.95
Composite Area & Weighted Runoff Coeff.	1.18		0.95

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 Subbasin Sub\_2-3  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.62	-	0.95
Composite Area & Weighted Runoff Coeff.	0.62		0.95

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 Subbasin Sub\_2-4  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.46	-	0.95
Composite Area & Weighted Runoff Coeff.	0.46		0.95

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 Subbasin Sub\_2-5  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.32	-	0.95
Composite Area & Weighted Runoff Coeff.	0.32		0.95

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 Subbasin Sub\_2-6  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.32	-	0.95
Composite Area & Weighted Runoff Coeff.	0.32		0.95

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 Subbasin Sub\_2-7  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	4.98	-	0.95
Composite Area & Weighted Runoff Coeff.	4.98		0.95

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 Subbasin Sub\_2-8  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.79	-	0.95
Composite Area & Weighted Runoff Coeff.	0.79		0.95



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 Subbasin Sub\_2-9  
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Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.33	-	0.95
Composite Area & Weighted Runoff Coeff.	0.33		0.95

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 FAA (Federal Aviation Agency) Time of Concentration Computations Report  
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$$T_c = (1.8 * (1.1 - C) * (L^{0.5}) * (S^{-0.333}))$$

where:

- Tc = Time of Concentration (min)
- C = Runoff Coefficient
- L = Flow Length (ft)
- S = Slope (%)

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 Subbasin Sub\_1-1  
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Runoff Coefficient: 0.92  
 Flow Length (ft): 663.40  
 Slope (%): 0.75  
 Computed TOC (minutes): 9.18

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 Subbasin Sub\_2-1  
 -----

Runoff Coefficient: 0.68  
 Flow Length (ft): 318.50  
 Slope (%): 0.47  
 Computed TOC (minutes): 17.35

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 Subbasin Sub\_2-10  
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Runoff Coefficient: 0.95  
 Flow Length (ft): 98.40  
 Slope (%): 0.76  
 Computed TOC (minutes): 2.93

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 Subbasin Sub\_2-11  
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Runoff Coefficient: 0.95  
 Flow Length (ft): 100.70  
 Slope (%): 0.70  
 Computed TOC (minutes): 3.05

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Subbasin Sub\_2-12  
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Runoff Coefficient: 0.95  
Flow Length (ft): 257.20  
Slope (%): 0.47  
Computed TOC (minutes): 5.57

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Subbasin Sub\_2-13  
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Runoff Coefficient: 0.95  
Flow Length (ft): 100.80  
Slope (%): 0.64  
Computed TOC (minutes): 3.15

-----  
Subbasin Sub\_2-14  
-----

Runoff Coefficient: 0.95  
Flow Length (ft): 102.40  
Slope (%): 0.59  
Computed TOC (minutes): 3.26

-----  
Subbasin Sub\_2-15  
-----

Runoff Coefficient: 0.95  
Flow Length (ft): 109.80  
Slope (%): 0.50  
Computed TOC (minutes): 3.56

-----  
Subbasin Sub\_2-16  
-----

Runoff Coefficient: 0.95  
Flow Length (ft): 102.90  
Slope (%): 0.63  
Computed TOC (minutes): 3.19

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Subbasin Sub\_2-17  
-----

Runoff Coefficient: 0.95  
Flow Length (ft): 88.10  
Slope (%): 0.57  
Computed TOC (minutes): 3.06

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Subbasin Sub\_2-18  
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Runoff Coefficient: 0.95  
Flow Length (ft): 450.20  
Slope (%): 0.39  
Computed TOC (minutes): 7.84

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Subbasin Sub\_2-19  
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Runoff Coefficient: 0.95  
Flow Length (ft): 105.40  
Slope (%): 0.57  
Computed TOC (minutes): 3.34

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Subbasin Sub\_2-2  
-----

Runoff Coefficient: 0.95  
Flow Length (ft): 349.50  
Slope (%): 0.74  
Computed TOC (minutes): 5.58

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Subbasin Sub\_2-20  
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Runoff Coefficient: 0.95  
Flow Length (ft): 106.80  
Slope (%): 0.47  
Computed TOC (minutes): 3.59

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Subbasin Sub\_2-21  
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Runoff Coefficient: 0.95  
Flow Length (ft): 108.40  
Slope (%): 0.92  
Computed TOC (minutes): 2.89

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Subbasin Sub\_2-22  
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Runoff Coefficient: 0.95  
Flow Length (ft): 390.20  
Slope (%): 0.36  
Computed TOC (minutes): 7.49

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Subbasin Sub\_2-3  
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Runoff Coefficient: 0.95  
Flow Length (ft): 155.50  
Slope (%): 0.45  
Computed TOC (minutes): 4.39

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Subbasin Sub\_2-4  
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Runoff Coefficient: 0.95  
Flow Length (ft): 113.70  
Slope (%): 0.88  
Computed TOC (minutes): 3.00

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Subbasin Sub\_2-5  
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Runoff Coefficient: 0.95  
Flow Length (ft): 94.30  
Slope (%): 0.58  
Computed TOC (minutes): 3.14

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Subbasin Sub\_2-6  
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Runoff Coefficient: 0.95  
Flow Length (ft): 95.50  
Slope (%): 0.63  
Computed TOC (minutes): 3.08

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Subbasin Sub\_2-7  
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Runoff Coefficient: 0.95  
Flow Length (ft): 693.00  
Slope (%): 0.54  
Computed TOC (minutes): 8.73

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Subbasin Sub\_2-8  
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Runoff Coefficient: 0.95  
Flow Length (ft): 405.10  
Slope (%): 0.43  
Computed TOC (minutes): 7.20

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 Subbasin Sub\_2-9  
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Runoff Coefficient: 0.95  
 Flow Length (ft): 96.50  
 Slope (%): 0.78  
 Computed TOC (minutes): 2.88

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 Subbasin Runoff Summary  
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Subbasin ID	Accumulated Precip in	Rainfall Intensity in/hr	Total Runoff in	Peak Runoff cfs	Weighted Runoff Coeff	Time of Concentration days	hh:mm:ss
Sub_1-1	0.33	2.18	0.31	9.88	0.920	0	00:09:10
Sub_2-1	0.45	1.56	0.31	2.47	0.680	0	00:17:21
Sub_2-10	0.24	2.93	0.23	0.92	0.950	0	00:05:00
Sub_2-11	0.24	2.93	0.23	0.92	0.950	0	00:05:00
Sub_2-12	0.25	2.78	0.24	1.08	0.950	0	00:05:34
Sub_2-13	0.24	2.93	0.23	0.92	0.950	0	00:05:00
Sub_2-14	0.24	2.93	0.23	0.92	0.950	0	00:05:00
Sub_2-15	0.24	2.93	0.23	1.06	0.950	0	00:05:00
Sub_2-16	0.24	2.93	0.23	1.03	0.950	0	00:05:00
Sub_2-17	0.24	2.93	0.23	0.95	0.950	0	00:05:00
Sub_2-18	0.31	2.35	0.29	1.61	0.950	0	00:07:50
Sub_2-19	0.24	2.93	0.23	1.11	0.950	0	00:05:00
Sub_2-2	0.25	2.78	0.24	3.80	0.950	0	00:05:34
Sub_2-20	0.24	2.93	0.23	1.22	0.950	0	00:05:00
Sub_2-21	0.24	2.93	0.23	1.17	0.950	0	00:05:00
Sub_2-22	0.30	2.41	0.29	2.70	0.950	0	00:07:29
Sub_2-3	0.24	2.93	0.23	1.73	0.950	0	00:05:00
Sub_2-4	0.24	2.93	0.23	1.28	0.950	0	00:05:00
Sub_2-5	0.24	2.93	0.23	0.89	0.950	0	00:05:00
Sub_2-6	0.24	2.93	0.23	0.89	0.950	0	00:05:00
Sub_2-7	0.32	2.23	0.31	10.56	0.950	0	00:08:43
Sub_2-8	0.29	2.45	0.28	1.84	0.950	0	00:07:12
Sub_2-9	0.24	2.93	0.23	0.92	0.950	0	00:05:00

10-year Event Results — HGLs highlighted in cyan are at or below the elevation of the inlet grate or junction manhole lid and are OK. HGLs and depths highlighted in yellow are above these elevations. Slightly above makes sense (it has been reported) and is OK, but some results are ridiculous, especially considering how flat this site is. Even 0.5' above most inlets is unreported and may even be impossible. My interpretation of the topo survey is that ponded water would crest over the sub-watershed or watershed boundary at well less than one foot. Not only that, it is physically impossible to stack water tens to hundreds of feet above the inlets. :-)

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Node Depth Summary  
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Node ID	Average Depth Attained ft	Maximum Depth Attained ft	Maximum HGL Attained ft	Time of Max Occurrence days hh:mm	Total Flooded Volume acre-in	Total Time Flooded minutes	Retention Time hh:mm:ss
Inlet_1-1	0.05	1.04	9.84	0 00:09	0	0	0:00:00
Inlet_2-1	0.07	0.69	11.79	0 00:17	0	0	0:00:00
Inlet_2-10	0.01	0.36	12.94	0 00:05	0	0	0:00:00
Inlet_2-11	0.01	0.36	12.69	0 00:05	0	0	0:00:00
Inlet_2-12	0.16	6.12	14.02	0 00:08	0.00	1	0:00:00 ← HGL = 0.28' above inlet (OK)
Inlet_2-13	0.01	0.36	12.44	0 00:05	0	0	0:00:00
Inlet_2-14	0.01	0.37	12.20	0 00:05	0	0	0:00:00
Inlet_2-15	0.01	2.17	13.70	0 00:05	0.00	0	0:00:00 ← HGL = inlet (OK)
Inlet_2-16	0.01	0.39	11.82	0 00:05	0	0	0:00:00
Inlet_2-17	0.01	0.39	11.47	0 00:05	0	0	0:00:00
Inlet_2-18	3.96	162.63	169.63	0 00:12	0.43	10	0:00:00 ← HGL = 157.27' (!!!) above inlet (NG)
Inlet_2-19	0.03	2.88	13.41	0 00:05	0.00	2	0:00:00 ← HGL = 0.71' above inlet (probably NG)
Inlet_2-2	0.08	0.78	11.38	0 00:05	0	0	0:00:00
Inlet_2-20	0.05	3.80	14.13	0 00:06	0.00	4	0:00:00 ← HGL = 1.63' above inlet (probably NG)
Inlet_2-21	0.04	3.36	13.19	0 00:06	0.00	3	0:00:00 ← HGL = 1.19' above inlet (probably NG)
Inlet_2-22	39.56	624.57	630.97	0 00:18	1.71	28	0:00:00 ← HGL = 619.82' (!!!) above inlet (NG)
Inlet_2-3	0.42	12.28	26.61	0 00:07	0.03	8	0:00:00 ← HGL = 10.11' (!!) above inlet (NG)
Inlet_2-4	0.05	3.68	17.51	0 00:06	0.00	3	0:00:00 ← HGL = 1.51' above inlet (probably NG)
Inlet_2-5	0.01	0.36	13.89	0 00:05	0	0	0:00:00
Inlet_2-6	0.01	0.35	13.58	0 00:05	0	0	0:00:00
Inlet_2-7	0.06	1.27	10.57	0 00:08	0	0	0:00:00
Inlet_2-8	0.12	1.61	10.21	0 00:07	0	0	0:00:00
Inlet_2-9	0.01	0.36	13.19	0 00:05	0	0	0:00:00
Jun_2-12A	0.27	16.64	24.36	0 00:09	0.04	4	0:00:00 ← HGL = 14.13' (!!) above MH lid (NG)
Jun_2-12B	0.25	10.45	17.99	0 00:10	0.02	4	0:00:00 ← HGL = 7.94' (!) above MH lid (NG)
Jun_2-12C	0.29	11.61	18.97	0 00:11	0.03	5	0:00:00 ← HGL = 9.11' (!) above MH lid (NG)
Jun_2-12D	0.22	6.51	13.69	0 00:09	0.01	5	0:00:00 ← HGL = 4.01' (!) above MH lid (NG)
Jun_2-18A	1.10	30.96	37.78	0 00:16	0.08	11	0:00:00 ← HGL = 28.45' (!!) above MH lid (NG)
Jun_2-18B	1.39	39.18	45.82	0 00:16	0.10	12	0:00:00 ← HGL = 36.67' (!!) above MH lid (NG)
Jun_2-18C	0.35	9.61	16.08	0 00:08	0.02	7	0:00:00 ← HGL = 7.11' (!) above MH lid (NG)
Jun_2-2A	0.08	0.88	11.23	0 00:05	0	0	0:00:00
Jun_2-2B	0.08	0.97	10.50	0 00:06	0	0	0:00:00
Jun_2-2C	0.08	1.04	10.17	0 00:06	0	0	0:00:00
Jun_2-2D	0.09	1.11	9.85	0 00:06	0	0	0:00:00
Jun_2-8A	0.12	1.65	10.08	0 00:07	0	0	0:00:00
Jun_2-8B	0.12	1.66	9.83	0 00:07	0	0	0:00:00
Outfall_1	0.06	1.00	6.17	0 00:10	0	0	0:00:00
Outfall_2	0.43	3.00	9.38	0 00:05	0	0	0:00:00
Proposed_Junction	0.09	0.86	5.86	0 00:10	0	0	0:00:00
Prop_Outlet	0.07	0.56	4.92	0 00:10	0	0	0:00:00

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Node Flow Summary  
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Node ID	Element Type	Maximum Lateral Inflow cfs	Peak Inflow cfs	Time of Peak Inflow Occurrence days	Time of Peak Inflow Occurrence hh:mm	Maximum Flooding overflow cfs	Time of Peak Flooding occurrence days	Time of Peak Flooding occurrence hh:mm
Inlet_1-1	JUNCTION	9.88	9.88	0	00:09	0.00		
Inlet_2-1	JUNCTION	2.47	2.47	0	00:17	0.00		
Inlet_2-10	JUNCTION	0.92	0.92	0	00:05	0.00		
Inlet_2-11	JUNCTION	0.92	0.92	0	00:05	0.00		
Inlet_2-12	JUNCTION	1.08	19.66	0	00:07	0.11	0	00:07
Inlet_2-13	JUNCTION	0.92	0.92	0	00:05	0.00		
Inlet_2-14	JUNCTION	0.92	0.92	0	00:05	0.00		
Inlet_2-15	JUNCTION	1.06	1.06	0	00:05	0.01	0	00:05
Inlet_2-16	JUNCTION	1.03	1.03	0	00:05	0.00		
Inlet_2-17	JUNCTION	0.95	0.95	0	00:05	0.00		
Inlet_2-18	JUNCTION	1.61	23.12	0	00:06	6.34	0	00:06
Inlet_2-19	JUNCTION	1.11	1.11	0	00:05	0.16	0	00:05
Inlet_2-2	JUNCTION	3.80	4.39	0	00:05	0.00		
Inlet_2-20	JUNCTION	1.22	1.22	0	00:05	0.26	0	00:05
Inlet_2-21	JUNCTION	1.17	1.17	0	00:05	0.21	0	00:05
Inlet_2-22	JUNCTION	2.70	20.14	0	00:06	10.73	0	00:06
Inlet_2-3	JUNCTION	1.73	1.73	0	00:05	0.76	0	00:05
Inlet_2-4	JUNCTION	1.28	1.28	0	00:05	0.25	0	00:05
Inlet_2-5	JUNCTION	0.89	0.89	0	00:05	0.00		
Inlet_2-6	JUNCTION	0.89	0.89	0	00:05	0.00		
Inlet_2-7	JUNCTION	10.56	10.56	0	00:08	0.00		
Inlet_2-8	JUNCTION	1.84	17.64	0	00:07	0.00		
Inlet_2-9	JUNCTION	0.92	0.92	0	00:05	0.00		
Jun_2-12A	JUNCTION	0.00	21.45	0	00:08	2.29	0	00:08
Jun_2-12B	JUNCTION	0.00	21.29	0	00:07	2.08	0	00:07
Jun_2-12C	JUNCTION	0.00	21.39	0	00:07	2.08	0	00:07
Jun_2-12D	JUNCTION	0.00	21.40	0	00:06	1.87	0	00:06
Jun_2-18A	JUNCTION	0.00	19.02	0	00:05	2.38	0	00:05
Jun_2-18B	JUNCTION	0.00	18.84	0	00:06	2.42	0	00:06
Jun_2-18C	JUNCTION	0.00	18.50	0	00:06	1.73	0	00:06
Jun_2-2A	JUNCTION	0.00	5.30	0	00:05	0.00		
Jun_2-2B	JUNCTION	0.00	6.21	0	00:06	0.00		
Jun_2-2C	JUNCTION	0.00	6.88	0	00:06	0.00		
Jun_2-2D	JUNCTION	0.00	7.53	0	00:06	0.00		
Jun_2-8A	JUNCTION	0.00	18.08	0	00:07	0.00		
Jun_2-8B	JUNCTION	0.00	18.55	0	00:07	0.00		
Outfall_1	JUNCTION	0.00	9.21	0	00:10	0.00		
Outfall_2	JUNCTION	0.00	9.95	0	00:33	0.00		
Proposed_Junction	JUNCTION	0.00	18.42	0	00:10	0.00		
Prop_Outlet	OUTFALL	0.00	18.42	0	00:10	0.00		

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 Outfall Loading Summary  
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Outfall Node ID	Flow Frequency (%)	Average Flow cfs	Peak Inflow cfs
Prop_Outlet	51.40	3.03	18.42
System	51.40	3.03	18.42

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 Link Flow Summary  
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Link ID	Element Type	Time of Peak Flow Occurrence days hh:mm	Maximum Velocity Attained ft/sec	Length Factor	Peak Flow during Analysis cfs	Design Flow Capacity cfs	Ratio of Maximum /Design Flow	Ratio of Maximum Flow Depth	Total Time Surcharged minutes	Reported Condition
Link_1-1	CONDUIT	0 00:10	10.35	1.00	9.21	24.18	0.38	0.42	0	Calculated
Link_2-1	CONDUIT	0 00:18	4.20	1.00	2.43	6.84	0.36	0.41	0	Calculated
Link_2-10	CONDUIT	0 00:05	9.03	1.00	0.90	1.07	0.84	0.70	0	Calculated
Link_2-11	CONDUIT	0 00:05	9.10	1.00	0.90	1.06	0.85	0.70	0	Calculated
Link_2-12B	CONDUIT	0 00:07	5.05	1.00	20.70	19.18	1.08	1.00	4	SURCHARGED
Link_2-12C	CONDUIT	0 00:11	5.14	1.00	20.69	19.19	1.08	1.00	5	SURCHARGED
Link_2-12D	CONDUIT	0 00:06	5.08	1.00	21.06	19.47	1.08	1.00	5	SURCHARGED
Link_2-13	CONDUIT	0 00:05	9.04	1.00	0.90	1.06	0.85	0.71	0	Calculated
Link_2-14	CONDUIT	0 00:05	8.98	1.00	0.90	1.03	0.87	0.72	0	Calculated
Link_2-15	CONDUIT	0 00:05	9.22	1.00	1.10	1.05	1.05	0.89	0	> CAPACITY
Link_2-16	CONDUIT	0 00:05	9.29	1.00	1.01	1.08	0.93	0.76	0	Calculated
Link_2-17	CONDUIT	0 00:05	8.88	1.00	0.93	1.00	0.93	0.76	0	Calculated
Link_2-18	CONDUIT	0 00:16	5.24	1.00	18.11	16.75	1.08	1.00	10	SURCHARGED
Link_2-18A	CONDUIT	0 00:16	5.17	1.00	17.88	16.55	1.08	1.00	11	SURCHARGED
Link_2-18B	CONDUIT	0 00:17	5.17	1.00	17.57	16.26	1.08	1.00	12	SURCHARGED
Link_2-18C	CONDUIT	0 00:13	4.34	1.00	17.96	16.61	1.08	1.00	7	SURCHARGED
Link_2-19	CONDUIT	0 00:06	8.97	1.00	1.03	0.95	1.08	1.00	2	SURCHARGED
Link_2-2	CONDUIT	0 00:05	4.36	1.00	4.34	9.76	0.44	0.47	0	Calculated
Link_2-20	CONDUIT	0 00:07	9.17	1.00	1.04	0.97	1.08	1.00	3	SURCHARGED
Link_2-21	CONDUIT	0 00:04	8.88	1.00	1.03	0.95	1.08	1.00	3	SURCHARGED
Link_2-22	CONDUIT	0 00:33	2.39	1.00	9.95	9.21	1.08	1.00	28	SURCHARGED
Link_2-2A	CONDUIT	0 00:06	4.57	1.00	5.18	9.68	0.53	0.52	0	Calculated
Link_2-2B	CONDUIT	0 00:06	4.72	1.00	6.19	9.67	0.64	0.58	0	Calculated
Link_2-2C	CONDUIT	0 00:06	4.82	1.00	6.87	9.64	0.71	0.62	0	Calculated
Link_2-2D	CONDUIT	0 00:06	4.91	1.00	7.53	9.68	0.78	0.66	0	Calculated
Link_2-3	CONDUIT	0 00:03	13.17	1.00	1.03	0.96	1.07	1.00	7	SURCHARGED
Link_2-4	CONDUIT	0 00:04	9.67	1.00	1.11	1.03	1.08	1.00	3	SURCHARGED
Link_2-5	CONDUIT	0 00:05	8.99	1.00	0.87	1.04	0.84	0.70	0	Calculated
Link_2-6	CONDUIT	0 00:05	9.05	1.00	0.87	1.05	0.83	0.69	0	Calculated
Link_2-7	CONDUIT	0 00:09	7.63	1.00	10.46	11.41	0.92	0.75	0	Calculated
Link_2-8	CONDUIT	0 00:08	5.28	1.00	17.62	23.59	0.75	0.64	0	Calculated
Link_2-8A	CONDUIT	0 00:08	5.27	1.00	18.07	23.38	0.77	0.66	0	Calculated
Link_2-8B	CONDUIT	0 00:07	5.36	1.00	18.53	23.73	0.78	0.66	0	Calculated
Link_2-9	CONDUIT	0 00:05	9.08	1.00	0.90	1.06	0.85	0.71	0	Calculated
Link-12	CONDUIT	0 00:08	4.72	1.00	21.13	19.55	1.08	0.95	0	> CAPACITY
Link-12A	CONDUIT	0 00:10	4.96	1.00	20.73	19.16	1.08	1.00	3	SURCHARGED

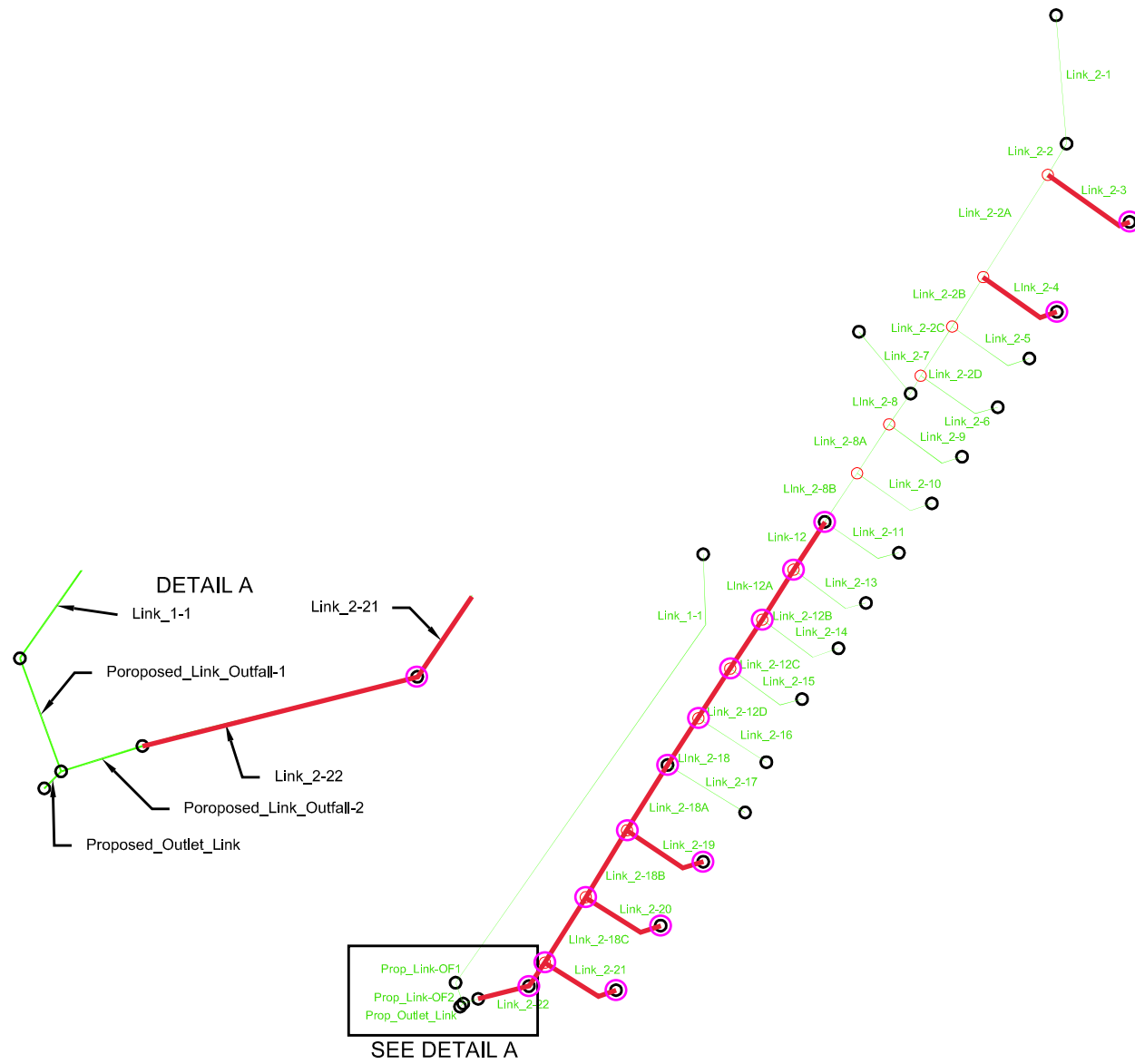


Prop_Link-OF1	CONDUIT	0	00:10	6.46	1.00	9.21	31.94	0.29	0.37	0	Calculated
Prop_Link-OF2	CONDUIT	0	00:33	13.12	1.00	9.89	166.15	0.06	0.17	0	Calculated
Prop_Outlet_Link	CONDUIT	0	00:10	20.04	1.00	18.42	238.63	0.08	0.19	0	Calculated

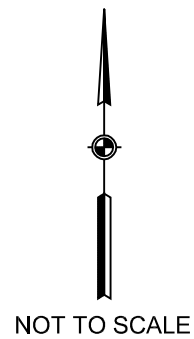
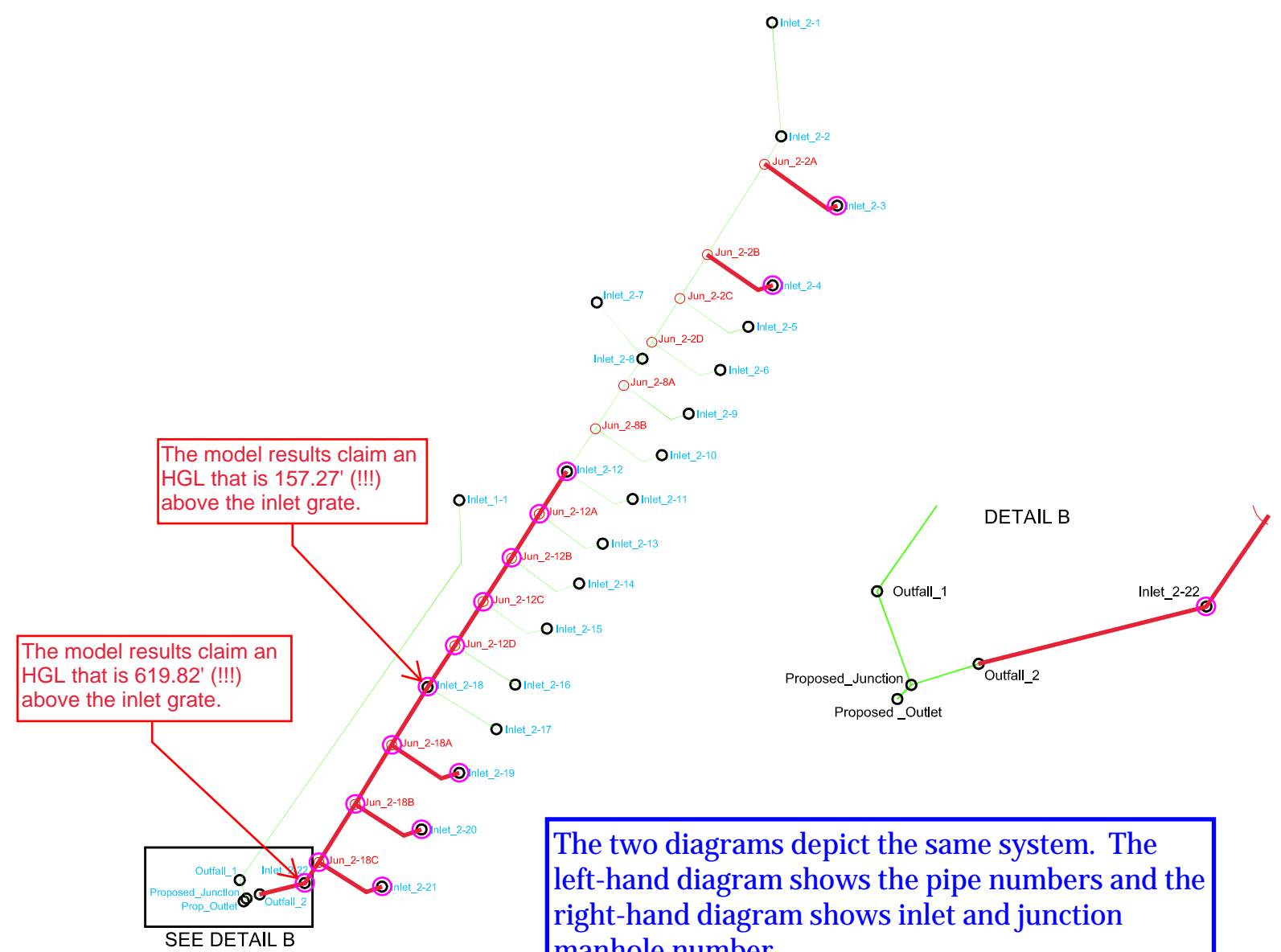
\*\*\*\*\*  
Highest Flow Instability Indexes  
\*\*\*\*\*  
All links are stable.

Analysis began on: Tue Sep 22 10:50:13 2020  
Analysis ended on: Tue Sep 22 10:50:15 2020  
Total elapsed time: 00:00:02

## DRAINAGE PIPE NETWORK



## DRAINAGE INLETS AND PIPE JUNCTIONS



NOT TO SCALE

The two diagrams depict the same system. The left-hand diagram shows the pipe numbers and the right-hand diagram shows inlet and junction manhole number.

Red lines are pipes listed as SURCHARGED in the model results.

Magenta circles are inlets and junctions with a Maximum HGL Attained that is above the elevation of the inlet grate or manhole lid. I noted the two most ridiculous results.