ENGINEERING REPORT ADDENDUM

EASTON CROSSING
SPORT HILL ROAD, SILVER HILL ROAD,
CEDAR HILL ROAD, AND WESTPORT ROAD
EASTON, CONNECTICUT

October 31, 2014

MMI #2683-01-27

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I. NARRATIVE

The revised material and additional computations included within this Engineering Report Addendum are in direct response to comments raised in the review of the site plans for the Easton Crossing residential project. The stormwater management computations were updated to reflect additional impervious coverage due to an assumed larger building footprint, paved front walkways, and possible miscellaneous impervious surfaces on each lot. The impervious area of each lot was increased by 1,500 square feet. The previous submitted storm drainage computations, water quality computations, and hydrologic analysis were revised considering the new impervious area and revised proposed flows. Additional documentation and calculations are provided herein in response to the recently received comment letters from various reviewers and from the consultant for the Town of Easton Planning and Zoning and Conservation Commissions, GHD, Inc., in a letter dated October 17, 2014. Response letters are being submitted along with this Engineering Report Addendum to address the comments. All computations provided in the appendix of this addendum supersede those included in the previously submitted Engineering Report dated August 4, 2014.

Attachments

2683-01-27-n314-rpt

STORMWATER MANAGEMENT BASIN DESIGN SUMMARY

Stormwater Management Basin Design Summary

- **Basin 140**

The basin has a contributing watershed area of about 5.16 acres and is located to collect stormwater runoff from the eastern portion of Stonegate Lane including the proposed roadway, driveways, homes, and a portion of Sport Hill Road. The impervious coverage was increased to represent the largest proposed home, plus a walkway and 500 square feet of possible miscellaneous coverage. Outlet protection in the form of a riprap splash pad is utilized at the pond inlet to reduce inflow velocities to nonerosive velocities. A sediment forebay preceding the main body of the basin was sized to contain more than 10 percent of the contributing Water Quality Volume (WQV). The outlet control structure used to drain the basin has a 4" low flow orifice and a V-notch weir. The low flow orifice and V-notch weir will control the outflow for all storm events, with a discharge of 0 cubic feet per second (cfs) during the 2-year storm and a maximum discharge of 7 cfs during the 100-year storm event. The freeboard provided during the 100-year storm event is 1.52 feet to the top of the proposed berm. Outflow is piped to a riprap splash pad through an 18" reinforced concrete pipe. An emergency riprap spillway has been provided in addition to the overflow weir in the outlet structure to avoid potential erosion of the embankment if the low flow orifice, V-notch weir, and overflow weir of the outlet structure fail or become blocked.

Based upon field testing data (See Test Pit #111), it does not appear that there is significant groundwater support for the basin; however, the basin is proposed to be lined with impervious material and, therefore, a permanent pool is likely to exist with a maximum depth of 2 feet. The estimated contributing WQV to the basin is 0.127 acre-feet. The basin provides a combined volume below the low flow orifice and the sediment forebay of 0.187 acre-feet. Therefore, the provided volume exceeds the required Connecticut Department of Energy & Environmental Protection (CT DEEP) WQV.

The basin's side slopes do not exceed 3:1 and should be seeded above the permanent pool with New England Conservation/Wildlife Mix. A planting plan for the detention/water quality basin is provided on Sheet D-4. In addition, the basin should be inspected by a soil scientist or wetland scientist during construction to verify soil moisture conditions and help locate plantings within the basin. This basin is categorized as a Pocket Pond.

- **Basin 150**

The basin has a contributing watershed area of about 11.0 acres and is located to collect stormwater runoff from Boxwood Court including the proposed roadway, driveways, and homes. The impervious coverage was increased to represent the largest proposed home, plus a walkway and 500 square feet of possible miscellaneous coverage. Outlet protection in the form of a riprap splash pad is utilized at the pond inlet to reduce inflow velocities to nonerosive velocities. A sediment forebay, used to enhance the removal of suspended solids, precedes the main body of the basin and contains more than 10 percent of the WQV. The outlet control structure used to drain the basin has a V-notch weir only. The V-notch weir will control the outflow for all storm events, with a discharge of 0 cfs during the 2-year storm and a maximum discharge of 8 cfs during the 100-year storm event. The freeboard provided during the 100-year storm event is 1.17 feet to the top of the proposed berm. Outflow is piped to a riprap splash pad through a 24" reinforced concrete pipe. The basin is separated in two tiers with the first tier primarily used for water quality and connected to the second tier by a grassed channel. An emergency riprap spillway has been provided for each tier at the same elevation, in addition to the overflow weir in the outlet structure.

Based upon soil testing (See Test Pit #929) in the first basin tier, groundwater was encountered at a depth of 86" (approximately 7 feet) corresponding to an approximate elevation of 399.0, which is 1 foot below the proposed basin bottom. The first tier of the basin will be lined with impervious material; therefore, a permanent pool will likely exist with a uniform depth of up to 5 feet. The estimated contributing WQV to the basin is 0.230 acre-feet. The basin provides a combined volume below the V-notch weir invert and the sediment forebay of 0.318 acre-feet. Therefore, the provided volume exceeds the required CT DEEP WQV. Test Pit #930 performed in the second basin tier indicated no presence of water or bedrock. Therefore, this tier will not have a liner along its bottom, and the water will be allowed to exfiltrate over a period of time. The basin is classified as a Micropool Extended Detention Pond based on the contributing area of 11.0 acres.

The basin's side slopes do not exceed 3:1 and should be seeded above the permanent pool with New England Conservation/Wildlife Mix. A planting plan for the detention/water quality basin is provided on Sheet D-4. In addition, the basin should be inspected by a soil scientist or wetland scientist during construction to verify soil moisture conditions and help locate plantings within the basin.

- **Basin 210**

The basin has a contributing watershed area of approximately 11.20 acres and is located to collect stormwater runoff from Bradford Place including the proposed roadway, driveways, and homes. The impervious coverage was increased to represent the largest proposed home, plus a walkway and 500 square feet of possible miscellaneous coverage. Outlet protection in the form of a riprap splash pad is utilized at the pond inlet to reduce inflow velocities to nonerosive velocities. A sediment forebay preceding the main body of the basin was sized to contain more than 10 percent of the contributing WQV. The outlet control structure used to drain the basin has a 4" low flow orifice and a V-notch weir. The low flow orifice and V-notch weir will control the outflow for all storm events, with a discharge of 0 cfs during the 2-year storm and a maximum discharge of 6 cfs during the 100-year storm event. The freeboard provided during the 100-year storm event is 1.05 feet to the top of the proposed berm. Outflow is piped to a riprap splash pad through a 15" reinforced concrete pipe. An emergency riprap spillway has been provided in addition to the overflow weir in the outlet structure to avoid potential erosion of the embankment if the low flow orifice, V-notch weir, and overflow weir of the outlet structure fail or become blocked.

Based upon field testing data (See Test Pit #418), it does not appear that there is significant groundwater support for the basin; however, the basin is proposed to be lined with impervious material and, therefore, a permanent pool is likely to exist with a maximum depth of 1 foot. The basin is categorized as a Micropool Extended Detention Pond. Micropools will be graded in the basin at the sediment forebay and toward the outlet structure. The estimated contributing WQV to the basin is 0.164 acre-feet. The basin provides a combined volume below the low flow orifice and the sediment forebay of 0.198 acre-feet, therefore exceeding the required CT DEEP WQV.

The basin's side slopes do not exceed 3:1 and should be seeded above the permanent pool with New England Conservation/Wildlife Mix. A planting plan for the detention/water quality basin is provided on Sheet D-4. In addition, the basin should be inspected by a soil scientist or wetland scientist during construction to verify soil moisture conditions and help locate plantings within the basin.

- **Basin 220**

The basin has a contributing watershed area of 11.38 acres and is located centrally on the site to collect stormwater runoff from Stonegate Place including the proposed roadways, driveways, and homes. The impervious coverage was increased to represent the largest proposed home, plus a walkway and 500 square feet of possible miscellaneous coverage. Outlet protection in the form of a riprap splash pad is utilized at the three pond inlets to reduce inflow velocities to nonerosive velocities. Two forebays are installed within the basin and are sized with a combined volume that exceeds the minimum 10 percent of the contributing WQV. The outlet control structure used to drain the basin has a 4" low flow orifice and a V-notch weir. The low flow orifice and V-notch weir will control the outflow for all storm events, with a discharge of 0 cfs during the 2-year storm and a maximum discharge of 7 cfs during the 100-year storm event. The freeboard provided during the 100-year storm event is 1.04 feet to the top of the proposed berm. Outflow is piped to a riprap splash pad through an 18" reinforced concrete pipe. An emergency riprap spillway has been provided in addition to the overflow weir in the outlet structure to avoid potential erosion of the embankment if the low flow orifice, V-notch weir, and overflow weir of the outlet structure fail or become blocked.

Test Pit #235 performed in the basin indicated no presence of water or bedrock. An impermeable liner is proposed to hold the WQV forming a permanent pool with a depth of 1 foot. Currently, the combined volume of the permanent pool and the sediment forebays exceeds the required CT DEEP WQV. Based on the drainage area and the impermeable liner provided, this basin can be classified as a Micropool Extended Detention Pond.

The basin's side slopes do not exceed 3:1 and should be seeded above the permanent pool with New England Conservation/Wildlife Mix. A planting plan for the detention/water quality basin is provided on Sheet D-4. In addition, the basin should be inspected by a soil scientist or wetland scientist during construction to verify soil moisture conditions and help locate plantings within the basin.

- **Basin 230**

The basin has a contributing watershed area of 4.72 acres and is located to collect stormwater runoff from Bridle Bend including proposed roadways, driveways, and homes. The impervious coverage was increased to represent the largest proposed home, plus a walkway and 500 square feet of possible miscellaneous coverage. Outlet protection in the form of a riprap splash pad is utilized at the pond inlet to reduce inflow velocities to nonerosive velocities. A sediment forebay, used to enhance the removal of suspended solids, precedes the main body of the basin. The outlet control structure used to drain the basin has a 4" low flow orifice and a V-notch weir. The low flow orifice and V-notch weir will control the outflow for all storm events, with a discharge of 0 cfs during the 2-year storm and a maximum discharge of 9 cfs during the 100-year storm event. The freeboard provided during the 100-year storm event is 1.08 feet to the top of the proposed berm. Outflow is piped to a riprap splash pad through a 15" reinforced concrete pipe. An emergency riprap spillway has been provided in addition to the overflow weir in the outlet structure to avoid potential erosion of the embankment if the low flow orifice, V-notch weir, and overflow weir of the outlet structure fail or become blocked.

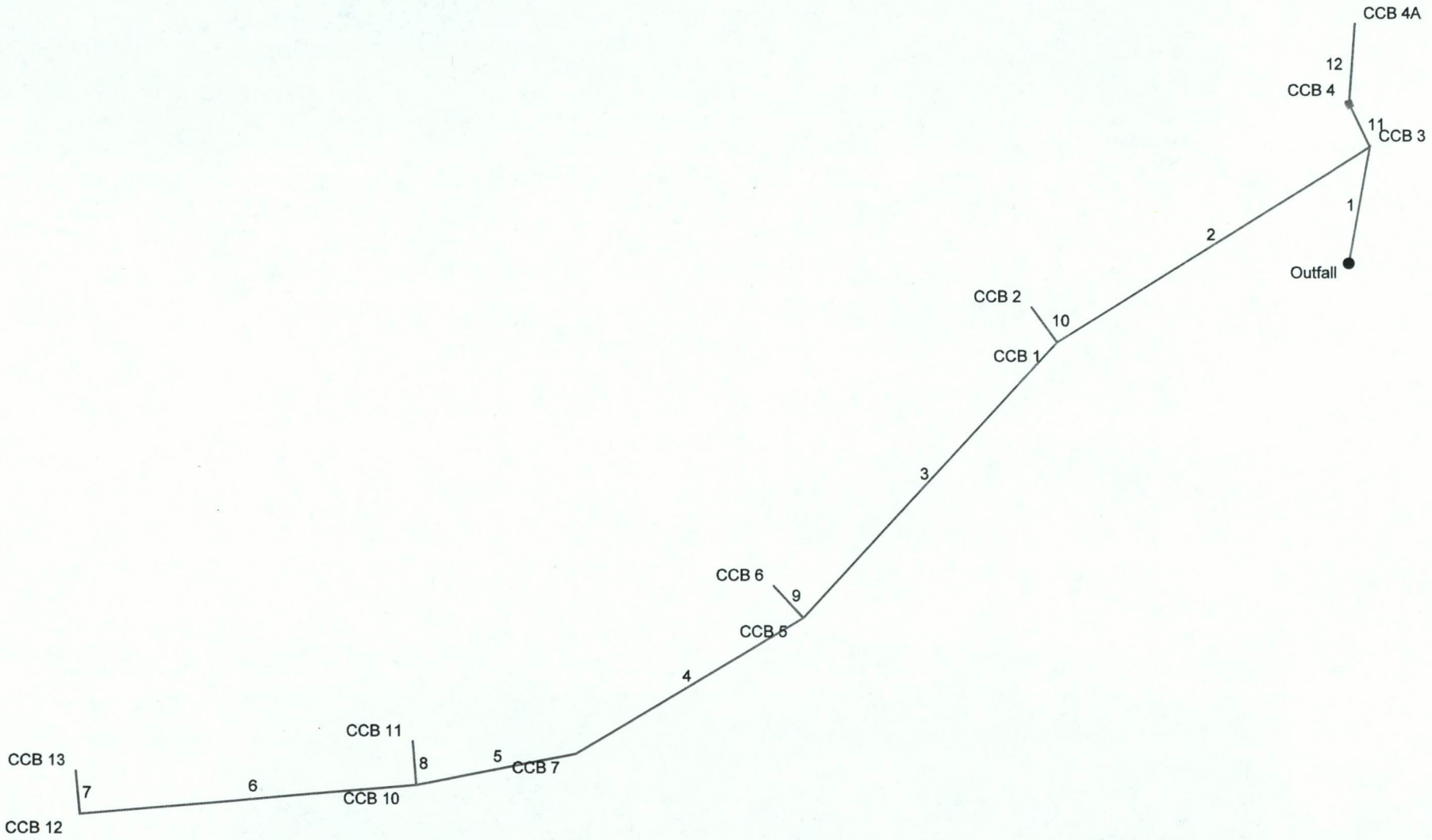
Based upon field testing data (See Test Pit #234), it does not appear that there is significant groundwater support for the basin; however, the basin is proposed to be lined with impervious material and, therefore, a permanent pool is likely to exist with a maximum depth of 3 feet. The estimated contributing WQV to the basin is 0.112 acre-feet. The basin provides a combined volume below the low flow orifice and the sediment forebay of 0.127 acre-feet, thus exceeding the required CT DEEP WQV.

The basin's side slopes do not exceed 3:1 and should be seeded above the permanent pool with New England Conservation/Wildlife Mix. A planting plan for the detention/water quality basin is provided on Sheet D-4. In addition, the basin should be inspected by a soil scientist or wetland scientist during construction to verify soil moisture conditions and help locate plantings within the basin. This basin is classified as a Pocket Pond.

2683-01-27-n314-1-rpt

REVISED STORM DRAINAGE COMPUTATIONS

System 140 - Stonegate Lane



Project File: 100-yr System 140.stm	Number of lines: 12	Date: 10/30/2014

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	61	-79	Comb	0.00	0.05	0.90	5.0	407.00	3.79	409.30	18	Cir	0.013	1.50	415.17	CCB 3-OUTFALL
2	1	189	-133	Comb	0.00	0.07	0.74	5.0	410.30	1.43	413.00	15	Cir	0.013	1.50	417.55	CCB 1-CCB 3
3	2	191	-15	Comb	0.00	0.05	0.76	5.0	413.20	2.20	417.40	15	Cir	0.013	1.50	421.41	CCB 5-CCB 1
4	3	136	16	Comb	0.00	0.10	0.61	5.0	417.80	5.75	425.60	15	Cir	0.013	0.59	429.48	CCB 7-CCB 5
5	4	83	20	Comb	0.00	0.43	0.36	5.0	426.20	7.11	432.10	15	Cir	0.013	1.50	435.91	CCB 10-CCB 7
6	5	171	6	Comb	0.00	0.66	0.47	5.0	432.30	5.28	441.30	15	Cir	0.013	1.50	445.61	CCB 12-CCB 10
7	6	22	90	Comb	0.00	0.12	0.75	5.0	441.50	0.90	441.70	15	Cir	0.013	1.00	445.62	CCB 13- CCB 12
8	5	22	96	Comb	0.00	0.21	0.73	5.0	432.30	0.89	432.50	15	Cir	0.013	1.00	435.90	CCB 11-CCB 10
9	3	22	95	Comb	0.00	0.08	0.73	16.0	417.80	0.90	418.00	15	Cir	0.013	1.00	421.39	CCB 6-CCB 5
10	2	22	87	Comb	0.00	0.38	0.52	5.0	413.20	0.90	413.40	15	Cir	0.013	1.00	417.09	CCB 2-CCB 1
11	1	24	-37	Comb	0.00	2.08	0.36	12.0	410.30	2.88	411.00	15	Cir	0.013	0.85	415.65	CCB 4-CCB 3
12	11	41	31	Comb	0.00	0.45	0.90	5.0	411.20	1.70	411.90	15	Cir	0.013	1.00	417.60	CCB 4A- CCB 4

System 140 - Stonegate Lane | Number of lines: 12 | Date: 10/30/2014

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)	
1	End	61	0.05	4.68	0.90	0.05	2.31	5.0	17.3	5.3	12.38	20.45	7.26	18	3.79	407.00	409.30	408.47	410.63	408.44	415.17	CCB 3-OUTFALL
2	1	189	0.07	2.10	0.74	0.05	1.12	5.0	16.8	5.4	6.04	7.72	6.37	15	1.43	410.30	413.00	411.13	413.99	415.17	417.55	CCB 1-CCB 3
3	2	191	0.05	1.65	0.76	0.04	0.87	5.0	16.3	5.5	4.76	9.57	5.46	15	2.20	413.20	417.40	413.99	418.28	417.55	421.41	CCB 5-CCB 1
4	3	136	0.10	1.52	0.61	0.06	0.77	5.0	6.0	7.5	5.77	15.49	8.67	15	5.75	417.80	425.60	418.33	426.57	421.41	429.48	CCB 7-CCB 5
5	4	83	0.43	1.42	0.36	0.15	0.71	5.0	5.8	7.5	5.35	17.21	8.90	15	7.11	426.20	432.10	426.68	433.04	429.48	435.91	CCB 10-CCB 7
6	5	171	0.66	0.78	0.47	0.31	0.40	5.0	5.2	7.7	3.10	14.83	4.22	15	5.28	432.30	441.30	433.04	442.01	435.91	445.61	CCB 12-CCB 10
7	6	22	0.12	0.12	0.75	0.09	0.09	5.0	5.0	7.8	0.70	6.13	2.12	15	0.90	441.50	441.70	442.01	442.03	445.61	445.62	CCB 13- CCB 12
8	5	22	0.21	0.21	0.73	0.15	0.15	5.0	5.0	7.8	1.19	6.10	2.39	15	0.89	432.30	432.50	433.04	432.93	435.91	435.90	CCB 11-CCB 10
9	3	22	0.08	0.08	0.73	0.06	0.06	16.0	16.0	5.5	0.32	6.13	1.48	15	0.90	417.80	418.00	418.28	418.22	421.41	421.39	CCB 6-CCB 5
10	2	22	0.38	0.38	0.52	0.20	0.20	5.0	5.0	7.8	1.54	6.13	2.66	15	0.90	413.20	413.40	413.99	413.89	417.55	417.09	CCB 2-CCB 1
11	1	24	2.08	2.53	0.36	0.75	1.15	12.0	12.0	6.2	7.12	10.96	7.94	15	2.88	410.30	411.00	411.03	412.07	415.17	415.65	CCB 4-CCB 3
12	11	41	0.45	0.45	0.90	0.41	0.41	5.0	5.0	7.8	3.16	8.41	3.91	15	1.70	411.20	411.90	412.07	412.61	415.65	417.60	CCB 4A- CCB 4

System 140 - Stonegate Lane | Number of lines: 12 | Run Date: 10/30/2014

NOTES:Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	CCB 3	0.35	5.53	2.53	3.35	Comb	4.0	5.46	0.00	4.62	1.35	0.100	2.53	0.020	0.020	0.013	0.17	8.46	0.17	8.46	0.0	Off
2	CCB 1	0.40	0.52	0.52	0.40	Comb	4.0	2.73	0.00	2.31	1.35	0.010	2.53	0.020	0.020	0.013	0.13	6.51	0.13	6.51	0.0	1
3	CCB 5	0.30	0.86	0.64	0.52	Comb	4.0	2.73	0.00	2.31	1.35	0.045	2.53	0.020	0.020	0.013	0.11	5.36	0.11	5.36	0.0	2
4	CCB 7	0.48	1.31	0.92	0.86	Comb	4.0	2.73	0.00	2.31	1.35	0.080	2.53	0.020	0.020	0.013	0.11	5.66	0.11	5.66	0.0	3
5	CCB 10	1.21	1.28	1.17	1.31	Comb	4.0	2.73	0.00	2.31	1.35	0.080	2.53	0.020	0.020	0.013	0.13	6.41	0.13	6.41	0.0	4
6	CCB 12	2.42	0.00	1.14	1.28	Comb	4.0	2.73	0.00	2.31	1.35	0.070	2.53	0.020	0.020	0.013	0.13	6.51	0.13	6.51	0.0	5
7	CCB 13	0.70	0.00	0.45	0.25	Comb	4.0	2.73	0.00	2.31	1.35	0.070	2.53	0.020	0.020	0.013	0.08	4.11	0.08	4.11	0.0	8
8	CCB 11	1.19	0.25	0.80	0.65	Comb	4.0	2.73	0.00	2.31	1.35	0.080	2.53	0.020	0.020	0.013	0.10	5.21	0.10	5.21	0.0	9
9	CCB 6	0.32	0.65	0.56	0.41	Comb	4.0	2.73	0.00	2.31	1.35	0.045	2.53	0.020	0.020	0.013	0.10	5.01	0.10	5.01	0.0	10
10	CCB 2	1.54	0.41	0.90	1.05	Comb	4.0	2.73	0.00	2.31	1.35	0.010	2.53	0.020	0.020	0.013	0.17	8.61	0.17	8.61	0.0	11
11	CCB 4	4.62	2.79	2.28	5.13	Comb	4.0	2.73	0.00	2.31	1.35	0.020	2.53	0.020	0.020	0.013	0.25	12.46	0.25	12.46	0.0	1
12	CCB 4A	3.16	0.00	1.42	1.74	Comb	4.0	2.73	0.00	2.31	1.35	0.100	2.53	0.020	0.020	0.013	0.13	6.71	0.13	6.71	0.0	11

System 140 - Stonegate Lane | Number of lines: 12 | Run Date: 10/30/2014

NOTES: Inlet N-Values = 0.016; Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

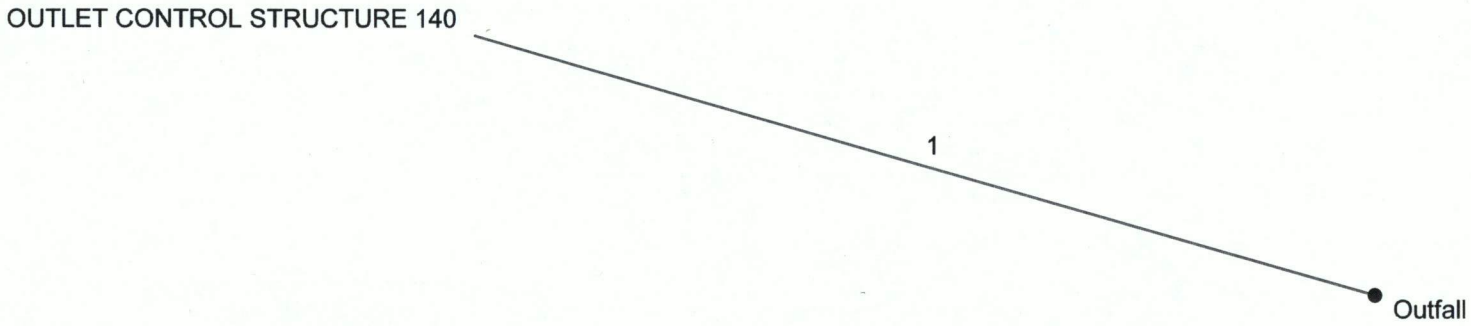
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
1	18	12.38	407.00	408.47	1.47	1.65	7.04	0.87	409.34	0.000	61	409.30	410.63 j	1.33**	1.65	7.48	0.87	411.50	0.000	0.000	n/a	1.50	1.30
2	15	6.04	410.30	411.13	0.83*	0.87	6.96	0.52	411.65	0.000	189	413.00	413.99	0.99**	1.04	5.78	0.52	414.51	0.000	0.000	n/a	1.50	n/a
3	15	4.76	413.20	413.99	0.79	0.82	5.80	0.41	414.40	0.000	191	417.40	418.28	0.88**	0.93	5.13	0.41	418.69	0.000	0.000	n/a	1.50	n/a
4	15	5.77	417.80	418.33	0.53*	0.49	11.70	0.49	418.82	0.000	136	425.60	426.57	0.97**	1.02	5.64	0.49	427.07	0.000	0.000	n/a	0.59	n/a
5	15	5.35	426.20	426.68	0.48*	0.43	12.38	0.46	427.14	0.000	83	432.10	433.04	0.94**	0.99	5.42	0.46	433.49	0.000	0.000	n/a	1.50	n/a
6	15	3.10	432.30	433.04	0.74	0.72	4.12	0.29	433.33	0.000	171	441.30	442.01 j	0.71**	0.72	4.32	0.29	442.30	0.000	0.000	n/a	1.50	n/a
7	15	0.70	441.50	442.01	0.51	0.26	1.50	0.12	442.12	0.000	22	441.70	442.03 j	0.33**	0.26	2.74	0.12	442.14	0.000	0.000	n/a	1.00	n/a
8	15	1.19	432.30	433.04	0.74	0.37	1.59	0.16	433.19	0.000	22	432.50	432.93	0.43**	0.37	3.19	0.16	433.09	0.000	0.000	n/a	1.00	0.16
9	15	0.32	417.80	418.28	0.48	0.15	0.74	0.08	418.36	0.000	22	418.00	418.22	0.22**	0.15	2.22	0.08	418.30	0.000	0.000	n/a	1.00	0.08
10	15	1.54	413.20	413.99	0.79	0.45	1.88	0.18	414.18	0.000	22	413.40	413.89	0.49**	0.45	3.44	0.18	414.08	0.000	0.000	n/a	1.00	0.18
11	15	7.12	410.30	411.03	0.73*	0.75	9.50	0.63	411.67	0.000	24	411.00	412.07	1.07**	1.12	6.38	0.63	412.70	0.000	0.000	n/a	0.85	n/a
12	15	3.16	411.20	412.07	0.87	0.73	3.48	0.29	412.36	0.000	41	411.90	412.61 j	0.71**	0.73	4.35	0.29	412.91	0.000	0.000	n/a	1.00	n/a

System 140 - Stonegate Lane | Number of lines: 12 | Run Date: 10/30/2014

Notes: * depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Basin 140 - Outlet



Project File: 100-yr System 140 Outlet.stm	Number of lines: 1	Date: 10/31/2014

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	99	-164	MH	7.00	0.00	0.00	0.0	402.00	1.01	403.00	18	Cir	0.013	1.00	409.00	OCS 140-Outfall

Basin 140 - Outlet | Number of lines: 1 | Date: 10/31/2014

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)	
1	End	99	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	7.00	10.55	5.92	18	1.01	402.00	403.00	402.89	404.02	403.71	409.00	OCS 140-Outfall

Basin 140 - Outlet

Number of lines: 1

Run Date: 10/31/2014

NOTES:Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	OUTLET CONTR	7.00*	0.00	0.00	7.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off

Basin 140 - Outlet | Number of lines: 1 | Run Date: 10/31/2014

NOTES: Inlet N-Values = 0.016; Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

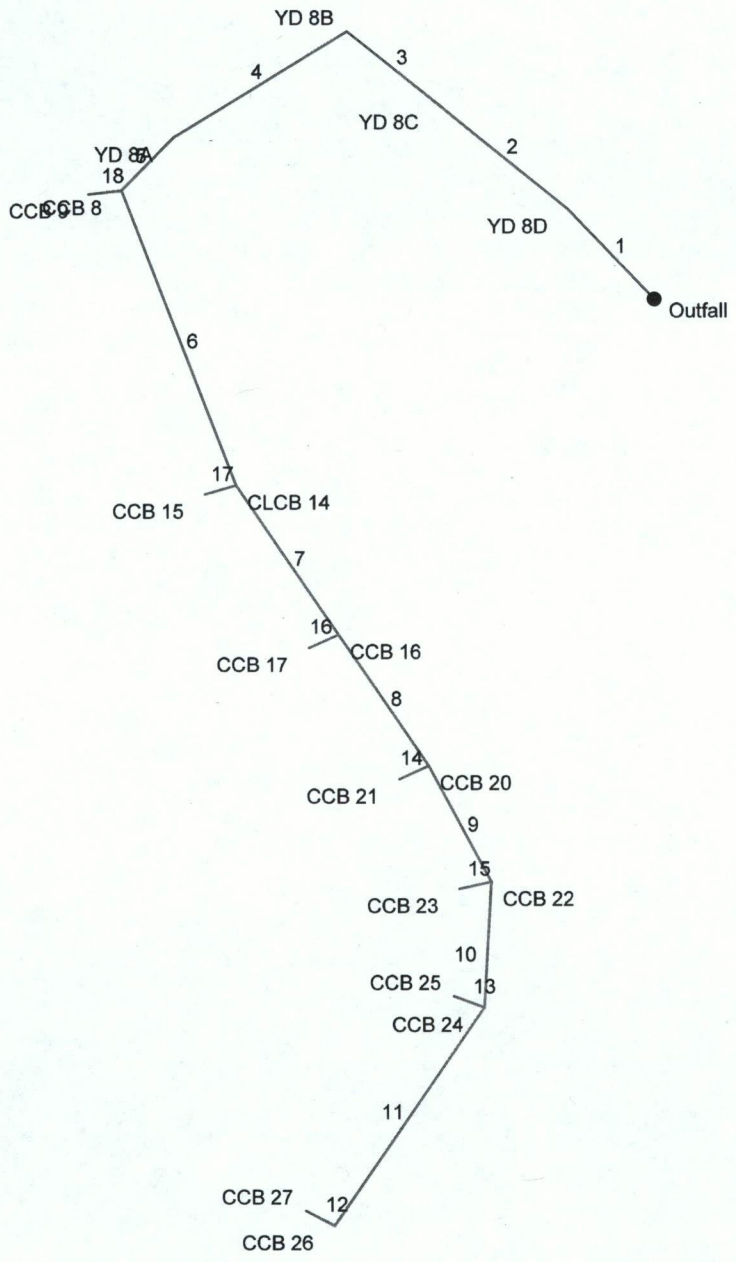
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	18	7.00	402.00	402.89	0.89	1.10	6.39	0.46	403.35	0.000	99	403.00	404.02	1.02**	1.28	5.45	0.46	404.49	0.000	0.000	n/a	1.00	n/a

Basin 140 - Outlet | Number of lines: 1 | Run Date: 10/31/2014

Notes: ; ** Critical depth. ; c = cir e = ellip b = box

System 150 - Boxwood Court



Project File: 100-yr System 150.stm	Number of lines: 18	Date: 10/30/2014

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	85	-134	DrGrt	0.00	0.62	0.34	10.0	405.00	2.93	407.50	18	Cir	0.013	0.50	412.30	YD 8D-OUTFALL
2	1	113	-7	DrGrt	0.00	0.28	0.28	10.0	407.50	2.66	410.50	18	Cir	0.013	0.50	414.00	YD 8C-YD 8D
3	2	81	-1	DrGrt	0.00	0.12	0.29	10.0	410.50	6.57	415.80	18	Cir	0.013	1.43	422.30	YD 8B-YD 8C
4	3	139	-70	DrGrt	0.00	0.12	0.69	5.0	415.80	6.63	425.00	18	Cir	0.013	0.50	431.30	YD-8A-YD 8B
5	4	51	-14	Comb	0.00	0.24	0.56	5.0	425.00	7.47	428.80	18	Cir	0.013	1.39	432.80	CCB 8-YD 8A
6	5	216	-65	Grate	0.00	0.14	0.59	5.0	429.10	4.99	439.90	15	Cir	0.013	1.50	444.00	CLCB 14-CCB 8
7	6	124	-13	Comb	0.00	0.06	0.67	5.0	439.90	2.34	442.80	15	Cir	0.013	1.50	446.50	CCB 16- CLCB 14
8	7	109	0	Comb	0.00	0.05	0.66	5.0	442.80	1.83	444.80	15	Cir	0.013	1.50	448.70	CCB 20-CCB 16
9	8	90	6	Comb	0.00	0.07	0.57	5.0	444.80	3.00	447.50	15	Cir	0.013	1.50	451.00	CCB 22-CCB 20
10	9	86	32	Comb	0.00	0.30	0.46	5.0	447.50	4.86	451.70	15	Cir	0.013	1.50	455.20	CCB 24-CCB 22
11	10	181	31	Comb	0.00	0.44	0.50	5.0	451.70	5.91	462.40	15	Cir	0.013	1.49	465.90	CCB 26-CCB 24
12	11	22	83	Comb	0.00	0.20	0.87	5.0	462.40	0.91	462.60	15	Cir	0.013	1.00	465.90	CCB 27-CCB 26
13	10	22	107	Comb	0.00	0.18	0.65	5.0	451.70	0.90	451.90	15	Cir	0.013	1.00	455.20	CCB 25- CCB 24
14	8	22	100	Comb	0.00	0.48	0.51	5.0	444.80	1.82	445.20	15	Cir	0.013	1.00	448.70	CCB 21- CCB 20
15	9	22	106	Comb	0.00	0.53	0.42	9.0	447.30	0.90	447.50	15	Cir	0.013	1.00	451.00	CCB 23-CCB 22
16	7	22	100	Comb	0.00	0.48	0.51	5.0	442.80	0.91	443.00	15	Cir	0.013	1.00	446.50	CCB 17- CCB 16
17	6	22	95	Comb	0.00	0.44	0.56	5.0	440.00	0.91	440.20	15	Cir	0.013	1.00	444.00	CCB 15-CLCB 14
18	5	23	40	Comb	0.00	1.03	0.39	5.0	429.10	0.87	429.30	15	Cir	0.013	1.00	432.80	CCB 9-CCB 8

System 150 - Boxwood Court | Number of lines: 18 | Date: 10/30/2014

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)	
1	End	85	0.62	5.78	0.34	0.21	2.75	10.0	11.0	6.4	17.44	17.98	9.87	18	2.93	405.00	407.50	406.65	409.00	407.24	412.30	YD 8D-OUTFALL
2	1	113	0.28	5.16	0.28	0.08	2.54	10.0	10.8	6.4	16.20	17.11	9.17	18	2.66	407.50	410.50	409.76	412.45	412.30	414.00	YD 8C-YD 8D
3	2	81	0.12	4.88	0.29	0.03	2.46	10.0	10.7	6.4	15.77	26.92	9.02	18	6.57	410.50	415.80	413.10	417.22	414.00	422.30	YD 8B-YD 8C
4	3	139	0.12	4.76	0.69	0.08	2.42	5.0	10.4	6.5	15.67	27.04	9.06	18	6.63	415.80	425.00	417.22	426.42	422.30	431.30	YD-8A-YD 8B
5	4	51	0.24	4.64	0.56	0.13	2.34	5.0	10.3	6.5	15.18	28.70	8.79	18	7.47	425.00	428.80	426.42	430.21	431.30	432.80	CCB 8-YD 8A
6	5	216	0.14	3.37	0.59	0.08	1.80	5.0	10.0	6.6	11.84	14.43	10.00	15	4.99	429.10	439.90	430.21	441.11	432.80	444.00	CLCB 14-CCB 8
7	6	124	0.06	2.79	0.67	0.04	1.47	5.0	9.7	6.6	9.75	9.88	8.08	15	2.34	439.90	442.80	441.11	443.98	444.00	446.50	CCB 16- CLCB 14
8	7	109	0.05	2.25	0.66	0.03	1.19	5.0	9.4	6.7	7.94	8.75	6.75	15	1.83	442.80	444.80	443.98	445.91	446.50	448.70	CCB 20-CCB 16
9	8	90	0.07	1.72	0.57	0.04	0.91	5.0	9.2	6.7	6.14	11.18	5.58	15	3.00	444.80	447.50	445.91	448.50	448.70	451.00	CCB 22-CCB 20
10	9	86	0.30	1.12	0.46	0.14	0.65	5.0	5.9	7.5	4.88	14.24	4.92	15	4.86	447.50	451.70	448.50	452.60	451.00	455.20	CCB 24-CCB 22
11	10	181	0.44	0.64	0.50	0.22	0.39	5.0	5.1	7.8	3.05	15.70	3.77	15	5.91	451.70	462.40	452.60	463.10	455.20	465.90	CCB 26-CCB 24
12	11	22	0.20	0.20	0.87	0.17	0.17	5.0	5.0	7.8	1.36	6.16	2.61	15	0.91	462.40	462.60	463.10	463.06	465.90	465.90	CCB 27-CCB 26
13	10	22	0.18	0.18	0.65	0.12	0.12	5.0	5.0	7.8	0.91	6.13	1.96	15	0.90	451.70	451.90	452.60	452.27	455.20	455.20	CCB 25- CCB 24
14	8	22	0.48	0.48	0.51	0.24	0.24	5.0	5.0	7.8	1.91	8.71	2.66	15	1.82	444.80	445.20	445.91	445.75	448.70	448.70	CCB 21- CCB 20
15	9	22	0.53	0.53	0.42	0.22	0.22	9.0	9.0	6.8	1.51	6.12	2.33	15	0.90	447.30	447.50	448.50	447.99	451.00	451.00	CCB 23-CCB 22
16	7	22	0.48	0.48	0.51	0.24	0.24	5.0	5.0	7.8	1.91	6.16	2.63	15	0.91	442.80	443.00	443.98	443.55	446.50	446.50	CCB 17- CCB 16
17	6	22	0.44	0.44	0.56	0.25	0.25	5.0	5.0	7.8	1.92	6.16	2.67	15	0.91	440.00	440.20	441.11	440.75	444.00	444.00	CCB 15-CLCB 14
18	5	23	1.03	1.03	0.39	0.40	0.40	5.0	5.0	7.8	3.13	6.02	3.53	15	0.87	429.10	429.30	430.21	430.01	432.80	432.80	CCB 9-CCB 8

System 150 - Boxwood Court | Number of lines: 18 | Run Date: 10/30/2014

NOTES:Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	YD 8D	1.38	1.02	0.68	1.72	DrGrt	0.0	0.00	0.00	1.23	1.23	0.050	2.00	0.050	0.050	0.013	0.12	6.84	0.12	6.84	0.0	Off
2	YD 8C	0.51	0.97	0.46	1.02	DrGrt	0.0	0.00	0.00	1.23	1.23	0.050	2.00	0.050	0.050	0.013	0.10	6.04	0.10	6.04	0.0	1
3	YD 8B	0.23	1.19	0.44	0.97	DrGrt	0.0	0.00	0.00	1.23	1.23	0.050	2.00	0.050	0.050	0.013	0.10	6.04	0.10	6.04	0.0	2
4	YD 8A	0.65	1.32	0.78	1.19	DrGrt	0.0	0.00	0.00	1.23	1.23	0.100	2.00	0.100	0.100	0.013	0.11	4.22	0.11	4.22	0.0	3
5	CCB 8	1.05	1.29	1.01	1.32	Comb	4.0	2.31	0.00	2.31	1.35	0.030	2.53	0.020	0.020	0.013	0.15	7.51	0.15	7.51	0.0	4
6	CLCB 14	0.64	1.60	0.96	1.29	Grate	0.0	0.00	0.00	2.31	1.35	0.020	2.53	0.020	0.020	0.013	0.16	7.96	0.16	7.96	0.0	5
7	CCB 16	0.31	2.37	1.09	1.60	Comb	4.0	2.31	0.00	2.31	1.35	0.020	2.53	0.020	0.020	0.013	0.17	8.51	0.17	8.51	0.0	6
8	CCB 20	0.26	3.49	1.38	2.37	Comb	4.0	2.31	0.00	2.31	1.35	0.020	2.53	0.020	0.020	0.013	0.19	9.66	0.19	9.66	0.0	7
9	CCB 22	0.31	1.02	0.69	0.64	Comb	4.0	2.31	0.00	2.31	1.35	0.042	2.53	0.020	0.020	0.013	0.11	5.71	0.11	5.71	0.0	8
10	CCB 24	1.08	0.90	0.96	1.02	Comb	4.0	2.31	0.00	2.31	1.35	0.065	2.53	0.020	0.020	0.013	0.12	6.11	0.12	6.11	0.0	9
11	CCB 26	1.71	0.00	0.82	0.90	Comb	4.0	2.31	0.00	2.31	1.35	0.030	2.53	0.020	0.020	0.013	0.13	6.71	0.13	6.71	0.0	10
12	CCB 27	1.36	0.00	0.68	0.68	Comb	4.0	2.31	0.00	2.31	1.35	0.030	2.53	0.020	0.020	0.013	0.12	6.11	0.12	6.11	0.0	13
13	CCB 25	0.91	0.68	0.81	0.78	Comb	4.0	2.31	0.00	2.31	1.35	0.065	2.53	0.020	0.020	0.013	0.11	5.61	0.11	5.61	0.0	15
14	CCB 21	1.91	1.26	1.22	1.95	Comb	4.0	2.31	0.00	2.31	1.35	0.020	2.53	0.020	0.020	0.013	0.18	9.06	0.18	9.06	0.0	16
15	CCB 23	1.51	0.78	1.03	1.26	Comb	4.0	2.31	0.00	2.31	1.35	0.042	2.53	0.020	0.020	0.013	0.14	7.01	0.14	7.01	0.0	14
16	CCB 17	1.91	1.95	1.40	2.45	Comb	4.0	2.31	0.00	2.31	1.35	0.020	2.53	0.020	0.020	0.013	0.20	9.76	0.20	9.76	0.0	17
17	CCB 15	1.92	2.45	1.52	2.85	Comb	4.0	2.31	0.00	2.31	1.35	0.020	2.53	0.020	0.020	0.013	0.20	10.21	0.20	10.21	0.0	8
18	CCB 9	3.13	0.00	1.24	1.89	Comb	4.0	2.31	0.00	2.31	1.35	0.030	2.53	0.020	0.020	0.013	0.17	8.36	0.17	8.36	0.0	Off

System 150 - Boxwood Court | Number of lines: 18 | Run Date: 10/30/2014

NOTES: Inlet N-Values = 0.016; Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

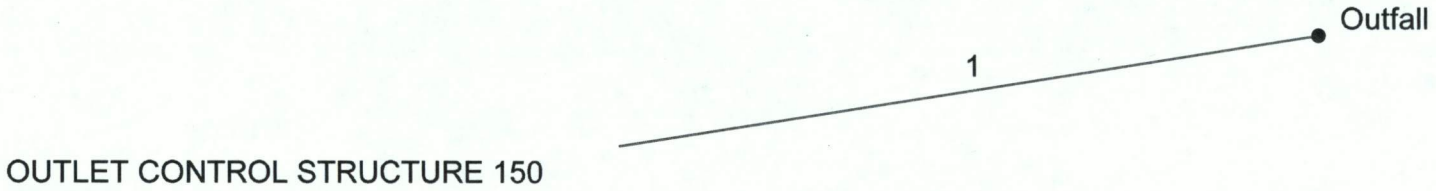
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
1	18	17.44	405.00	406.65	1.50	1.77	9.87	1.52	408.17	2.760	85	407.50	409.00	1.50	1.77	9.87	1.51	410.51	2.752	2.756	2.349	0.50	0.76
2	18	16.20	407.50	409.76	1.50	1.77	9.17	1.31	411.07	2.382	113	410.50	412.45	1.50	1.77	9.17	1.31	413.75	2.381	2.382	2.690	0.50	0.65
3	18	15.77	410.50	413.10	1.50	1.73	8.93	1.24	414.34	2.257	81	415.80	417.22 j	1.42**	1.73	9.11	1.29	418.51	1.952	2.105	n/a	1.43	n/a
4	18	15.67	415.80	417.22	1.42	1.73	9.05	1.28	418.50	0.000	139	425.00	426.42 j	1.42**	1.73	9.06	1.28	427.70	0.000	0.000	n/a	0.50	n/a
5	18	15.18	425.00	426.42	1.42	1.72	8.78	1.21	427.63	0.000	51	428.80	430.21 j	1.41**	1.72	8.81	1.21	431.42	0.000	0.000	n/a	1.39	1.68
6	15	11.84	429.10	430.21	1.11	1.15	10.28	1.47	431.68	0.000	216	439.90	441.11	1.21**	1.22	9.72	1.47	442.58	0.000	0.000	n/a	1.50	n/a
7	15	9.75	439.90	441.11	1.21	1.20	8.01	1.03	442.14	0.000	124	442.80	443.98 j	1.18**	1.20	8.14	1.03	445.01	0.000	0.000	n/a	1.50	1.54
8	15	7.94	442.80	443.98	1.18	1.15	6.62	0.74	444.71	0.000	109	444.80	445.91 j	1.11**	1.15	6.89	0.74	446.65	0.000	0.000	n/a	1.50	1.11
9	15	6.14	444.80	445.91	1.11	1.05	5.32	0.53	446.44	0.000	90	447.50	448.50 j	1.00**	1.05	5.83	0.53	449.03	0.000	0.000	n/a	1.50	0.79
10	15	4.88	447.50	448.50	1.00	0.94	4.64	0.42	448.92	0.000	86	451.70	452.60 j	0.90**	0.94	5.19	0.42	453.01	0.000	0.000	n/a	1.50	n/a
11	15	3.05	451.70	452.60	0.90	0.71	3.25	0.29	452.88	0.000	181	462.40	463.10 j	0.70**	0.71	4.30	0.29	463.39	0.000	0.000	n/a	1.49	0.43
12	15	1.36	462.40	463.10	0.70	0.41	1.91	0.17	463.27	0.000	22	462.60	463.06 j	0.46**	0.41	3.31	0.17	463.23	0.000	0.000	n/a	1.00	0.17
13	15	0.91	451.70	452.60	0.90	0.31	0.97	0.14	452.73	0.000	22	451.90	452.27	0.37**	0.31	2.95	0.14	452.41	0.000	0.000	n/a	1.00	0.14
14	15	1.91	444.80	445.91	1.11	0.52	1.66	0.21	446.12	0.000	22	445.20	445.75	0.55**	0.52	3.67	0.21	445.96	0.000	0.000	n/a	1.00	0.21
15	15	1.51	447.30	448.50	1.20	0.44	1.24	0.18	448.68	0.000	22	447.50	447.99	0.49**	0.44	3.42	0.18	448.17	0.000	0.000	n/a	1.00	0.18
16	15	1.91	442.80	443.98	1.18	0.52	1.59	0.21	444.19	0.000	22	443.00	443.55	0.55**	0.52	3.67	0.21	443.76	0.000	0.000	n/a	1.00	0.21
17	15	1.92	440.00	441.11	1.11	0.52	1.66	0.21	441.33	0.000	22	440.20	440.75	0.55**	0.52	3.68	0.21	440.96	0.000	0.000	n/a	1.00	0.21
18	15	3.13	429.10	430.21	1.11	0.72	2.72	0.29	430.50	0.000	23	429.30	430.01	0.71**	0.72	4.34	0.29	430.30	0.000	0.000	n/a	1.00	n/a

System 150 - Boxwood Court | Number of lines: 18 | Run Date: 10/30/2014

Notes: ; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Basin 150 - Outlet



Project File: 100-yr System 150 Outlet.stm	Number of lines: 1	Date: 10/31/2014

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	65	171	MH	6.00	0.00	0.00	0.0	399.50	0.77	400.00	24	Cir	0.013	1.00	407.00	OCS 150-Outfall

Basin 150 - Outlet | Number of lines: 1 | Date: 10/31/2014

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)	
1	End	65	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	6.00	19.84	4.66	24	0.77	399.50	400.00	400.35	400.87	401.75	407.00	OCS 150-Outfall

Basin 150 - Outlet

Number of lines: 1

Run Date: 10/31/2014

NOTES:Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	OUTLET CONTR	6.00*	0.00	0.00	6.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off

Basin 150 - Outlet | Number of lines: 1 | Run Date: 10/31/2014

NOTES: Inlet N-Values = 0.016; Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

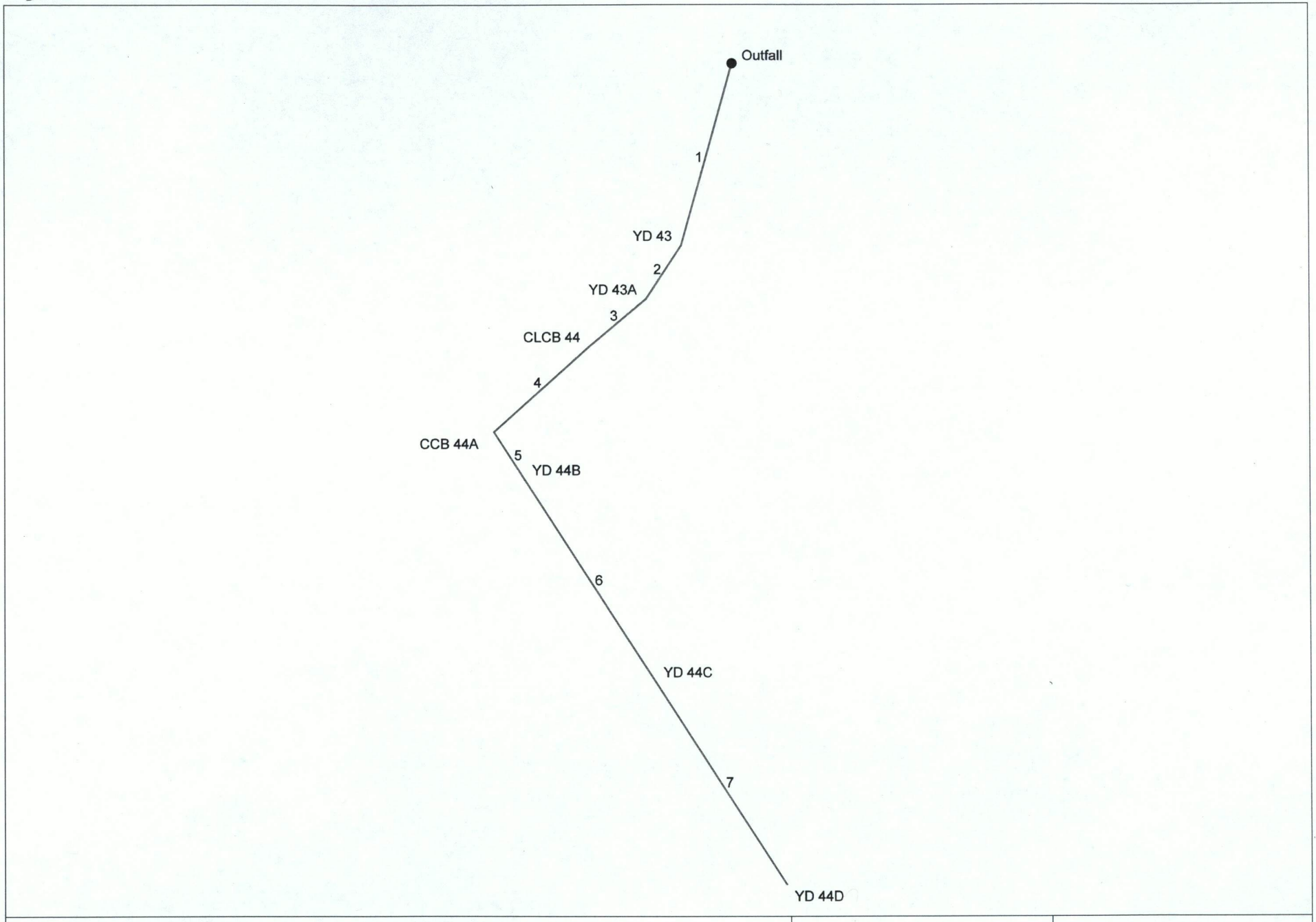
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	24	6.00	399.50	400.35	0.85	1.27	4.72	0.33	400.68	0.000	65	400.00	400.87	0.87**	1.30	4.61	0.33	401.20	0.000	0.000	n/a	1.00	0.33

Basin 150 - Outlet | Number of lines: 1 | Run Date: 10/31/2014

Notes: ; ** Critical depth. ; c = cir e = ellip b = box

System 210 - Bradford Place



Project File: 100-yr System 210.stm	Number of lines: 7	Date: 10/30/2014

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	143	106	DrGrt	0.00	0.27	0.49	5.0	402.00	6.97	412.00	15	Cir	0.013	0.53	416.50	YD 43-Outfall
2	1	49	18	DrGrt	0.00	0.16	0.42	5.0	413.20	3.70	415.00	15	Cir	0.013	0.51	419.70	YD 43A-YD 43
3	2	56	17	Comb	0.00	0.09	0.90	5.0	415.00	7.36	419.14	15	Cir	0.013	0.50	423.10	CLCB 44- YD 43A
4	3	97	-2	Comb	0.00	0.15	0.73	10.0	418.50	0.82	419.30	15	Cir	0.013	1.48	422.50	CCB 44A-CLCB 44
5	4	43	-81	DrGrt	0.00	0.91	0.36	5.0	419.30	0.93	419.70	15	Cir	0.013	0.50	423.54	YD 44B-CCB 44A
6	5	182	0	DrGrt	0.00	0.18	0.65	5.0	419.70	6.75	432.00	15	Cir	0.013	0.50	436.00	YD 44C-YD 44B
7	6	182	0	DrGrt	0.00	0.52	0.57	5.0	432.00	7.41	445.50	15	Cir	0.013	1.00	448.50	YD 44D-YD 44C

System 210 - Bradford Place | Number of lines: 7 | Date: 10/30/2014

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)	
1	End	143	0.27	2.28	0.49	0.13	1.13	5.0	10.6	6.4	7.27	17.05	6.99	15	6.97	402.00	412.00	402.92	413.08	403.44	416.50	YD 43-Outfall
2	1	49	0.16	2.01	0.42	0.07	1.00	5.0	10.5	6.4	6.44	12.42	8.10	15	3.70	413.20	415.00	413.84	416.02	416.50	419.70	YD 43A-YD 43
3	2	56	0.09	1.85	0.90	0.08	0.93	5.0	10.4	6.5	6.04	17.52	5.70	15	7.36	415.00	419.14	416.02	420.13	419.70	423.10	CLCB 44- YD 43A
4	3	97	0.15	1.76	0.73	0.11	0.85	10.0	10.0	6.6	5.57	5.86	4.54	15	0.82	418.50	419.30	420.39	421.12	423.10	422.50	CCB 44A-CLCB 4
5	4	43	0.91	1.61	0.36	0.33	0.74	5.0	6.7	7.3	5.42	6.24	4.41	15	0.93	419.30	419.70	421.59	421.89	422.50	423.54	YD 44B-CCB 44A
6	5	182	0.18	0.70	0.65	0.12	0.41	5.0	5.9	7.5	3.12	16.78	3.44	15	6.75	419.70	432.00	422.04	432.71	423.54	436.00	YD 44C-YD 44B
7	6	182	0.52	0.52	0.57	0.30	0.30	5.0	5.0	7.8	2.31	17.57	3.56	15	7.41	432.00	445.50	432.71	446.11	436.00	448.50	YD 44D-YD 44C

System 210 - Bradford Place | Number of lines: 7 | Run Date: 10/30/2014

NOTES:Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	YD 43	1.03	0.37	0.32	1.08	DrGrt	0.0	0.00	0.00	1.23	1.23	0.090	2.00	0.020	0.020	0.013	0.07	9.10	0.07	9.10	0.0	Off
2	YD 43A	0.52	0.00	0.15	0.37	DrGrt	0.0	0.00	0.00	1.23	1.23	0.090	2.00	0.020	0.020	0.013	0.05	7.10	0.05	7.10	0.0	1
3	CLCB 44	0.63	0.00	0.63	0.00	Comb	4.0	2.73	3.12	2.31	1.35	Sag	2.00	0.020	0.020	0.013	0.13	6.43	0.13	6.43	0.0	Off
4	CCB 44A	0.72	4.17	4.89	0.00	Comb	4.0	5.46	6.24	4.62	1.35	Sag	2.00	0.020	0.020	0.013	0.36	17.77	0.36	17.77	0.0	Off
5	YD 44B	2.55	2.27	0.65	4.17	DrGrt	0.0	0.00	0.00	1.23	1.23	0.020	2.00	0.020	0.020	0.013	0.16	18.10	0.16	18.10	0.0	4
6	YD 44C	0.91	1.90	0.54	2.27	DrGrt	0.0	0.00	0.00	1.23	1.23	0.090	2.00	0.020	0.020	0.013	0.09	11.10	0.09	11.10	0.0	5
7	YD 44D	2.31	0.00	0.41	1.90	DrGrt	0.0	0.00	0.00	1.23	1.23	0.030	2.00	0.020	0.020	0.013	0.11	13.10	0.11	13.10	0.0	6

System 210 - Bradford Place | Number of lines: 7 | Run Date: 10/30/2014

NOTES: Inlet N-Values = 0.016; Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

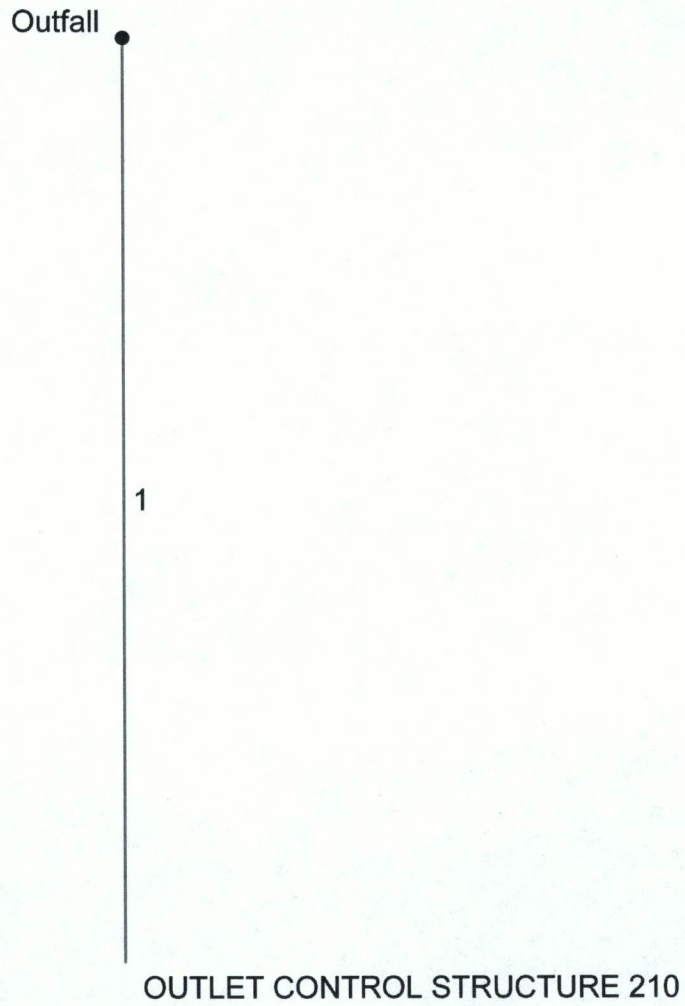
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	15	7.27	402.00	402.92	0.92	0.97	7.51	0.65	403.57	0.000	143	412.00	413.08	1.08**	1.12	6.47	0.65	413.73	0.000	0.000	n/a	0.53	n/a
2	15	6.44	413.20	413.84	0.64*	0.63	10.21	0.56	414.40	0.000	49	415.00	416.02	1.02**	1.07	6.00	0.56	416.58	0.000	0.000	n/a	0.51	0.28
3	15	6.04	415.00	416.02	1.02	1.04	5.62	0.52	416.54	0.000	56	419.14	420.13 j	0.99**	1.04	5.78	0.52	420.65	0.000	0.000	n/a	0.50	n/a
4	15	5.57	418.50	420.39	1.25	1.23	4.54	0.32	420.71	0.745	97	419.30	421.12	1.25	1.23	4.54	0.32	421.44	0.745	0.745	0.723	1.48	0.47
5	15	5.42	419.30	421.59	1.25	1.23	4.41	0.30	421.89	0.704	43	419.70	421.89	1.25	1.23	4.41	0.30	422.19	0.703	0.704	0.301	0.50	0.15
6	15	3.12	419.70	422.04	1.25	0.72	2.54	0.10	422.14	0.234	182	432.00	432.71 j	0.71**	0.72	4.33	0.29	433.00	0.612	0.423	n/a	0.50	n/a
7	15	2.31	432.00	432.71	0.71	0.59	3.21	0.24	432.95	0.000	182	445.50	446.11 j	0.61**	0.59	3.91	0.24	446.34	0.000	0.000	n/a	1.00	0.24

System 210 - Bradford Place | Number of lines: 7 | Run Date: 10/30/2014

Notes: * depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Basin 210 - Outlet



Project File: 100-yr System 210 Outlet.stm	Number of lines: 1	Date: 10/31/2014

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	80	90	None	6.00	0.00	0.00	0.0	395.20	2.25	397.00	15	Cir	0.013	1.00	403.00	OCS 210-Outfall

Basin 210 - Outlet | Number of lines: 1 | Date: 10/31/2014

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)	
1	End	80	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	6.00	9.69	7.03	15	2.25	395.20	397.00	395.91	397.99	396.64	403.00	OCS 210-Outfall

Basin 210 - Outlet | Number of lines: 1 | Run Date: 10/31/2014

NOTES:Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	OUTLET CONTR	6.00*	0.00	0.00	6.00	None	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off

Basin 210 - Outlet

Number of lines: 1

Run Date: 10/31/2014

NOTES: Inlet N-Values = 0.016; Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
1	15	6.00	395.20	395.91	0.71	0.72	8.31	0.52	396.43	0.000	80	397.00	397.99	0.99**	1.04	5.76	0.52	398.51	0.000	0.000	n/a	1.00	0.52

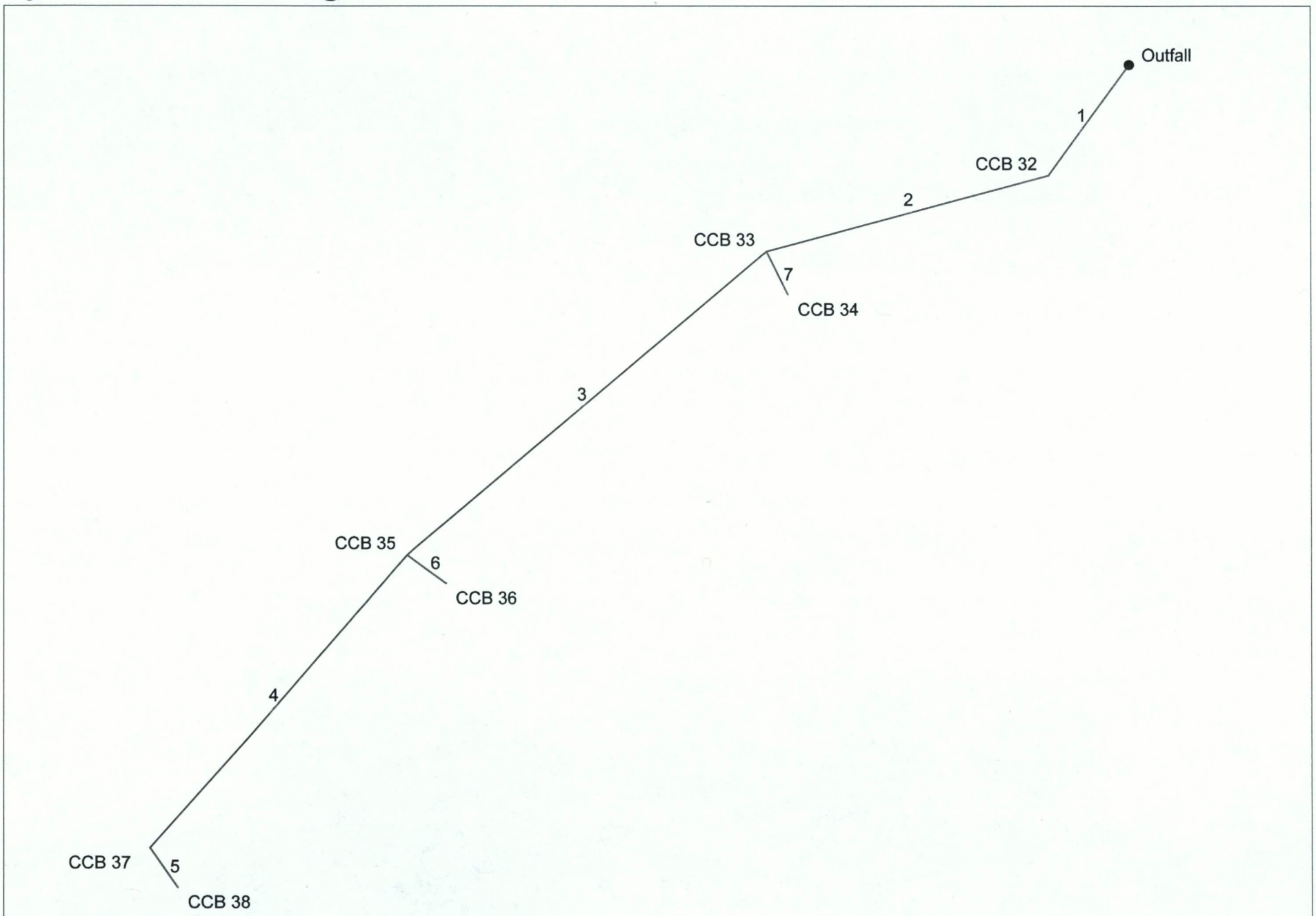
Basin 210 - Outlet

Number of lines: 1

Run Date: 10/31/2014

Notes: ; ** Critical depth. ; c = cir e = ellip b = box

System 220A - Stonegate Lane



Project File: 100-yr System 220A-rev.stm	Number of lines: 7	Date: 10/30/2014

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	63	126	Comb	0.00	0.04	0.90	5.0	444.00	1.11	444.70	18	Cir	0.013	1.02	451.93	CCB 32-Outfall
2	1	135	39	Comb	0.00	0.13	0.78	5.0	444.90	0.97	446.20	18	Cir	0.013	1.50	450.51	CCB 33-CCB 32
3	2	218	-25	Comb	0.00	0.07	0.74	5.0	446.40	1.10	448.80	15	Cir	0.013	1.50	454.27	CCB 35-CCB 33
4	3	180	-9	Comb	0.00	0.08	0.73	5.0	450.40	4.73	458.90	15	Cir	0.013	1.46	462.88	CCB 37-CCB 35
5	4	22	-75	Comb	0.00	0.15	0.79	5.0	459.30	0.90	459.50	15	Cir	0.013	1.00	462.87	CCB 38-CCB 37
6	3	22	-104	Comb	0.00	0.07	0.74	5.0	450.40	0.90	450.60	15	Cir	0.013	1.00	454.30	CCB 36-CCB 35
7	2	22	-101	Comb	0.00	1.52	0.51	10.0	446.40	0.90	446.60	15	Cir	0.013	1.00	450.50	CCB 34-CCB 33

System 220A - Stonegate Lane | Number of lines: 7 | Date: 10/30/2014

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)	
1	End	63	0.04	2.06	0.90	0.04	1.19	5.0	10.6	6.4	7.67	11.05	4.34	18	1.11	444.00	444.70	446.97	447.31	444.71	451.93	CCB 32-Outfall
2	1	135	0.13	2.02	0.78	0.10	1.16	5.0	10.1	6.5	7.56	10.32	4.28	18	0.97	444.90	446.20	447.61	448.31	451.93	450.51	CCB 33-CCB 32
3	2	218	0.07	0.37	0.74	0.05	0.28	5.0	5.7	7.6	2.13	6.78	2.77	15	1.10	446.40	448.80	448.73	449.38	450.51	454.27	CCB 35-CCB 33
4	3	180	0.08	0.23	0.73	0.06	0.18	5.0	5.1	7.8	1.37	14.04	5.29	15	4.73	450.40	458.90	450.66	459.36	454.27	462.88	CCB 37-CCB 35
5	4	22	0.15	0.15	0.79	0.12	0.12	5.0	5.0	7.8	0.92	6.12	3.28	15	0.90	459.30	459.50	459.63	459.88	462.88	462.87	CCB 38-CCB 37
6	3	22	0.07	0.07	0.74	0.05	0.05	5.0	5.0	7.8	0.40	6.12	2.59	15	0.90	450.40	450.60	450.62	450.85	454.27	454.30	CCB 36-CCB 35
7	2	22	1.52	1.52	0.51	0.78	0.78	10.0	10.0	6.6	5.08	6.12	4.14	15	0.90	446.40	446.60	448.73	448.87	450.51	450.50	CCB 34-CCB 33

System 220A - Stonegate Lane | Number of lines: 7 | Run Date: 10/30/2014

NOTES:Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	CCB 32	0.28	0.00	0.21	0.07	Comb	4.0	2.73	0.00	2.31	1.35	0.025	2.53	0.020	0.020	0.013	0.07	3.50	0.07	3.50	0.0	2
2	CCB 33	0.79	0.26	1.05	0.00	Comb	4.0	5.46	6.24	4.62	1.35	Sag	2.53	0.020	0.020	0.013	0.14	6.83	0.14	6.83	0.0	Off
3	CCB 35	0.40	0.14	0.36	0.19	Comb	4.0	2.73	0.00	2.31	1.35	0.040	2.53	0.020	0.020	0.013	0.08	4.16	0.08	4.16	0.0	2
4	CCB 37	0.46	0.00	0.31	0.14	Comb	4.0	2.73	0.00	2.31	1.35	0.050	2.53	0.020	0.020	0.013	0.07	3.70	0.07	3.70	0.0	3
5	CCB 38	0.92	0.00	0.54	0.38	Comb	4.0	2.73	0.00	2.31	1.35	0.050	2.53	0.020	0.020	0.013	0.10	4.81	0.10	4.81	0.0	6
6	CCB 36	0.40	0.38	0.48	0.31	Comb	4.0	2.73	0.00	2.31	1.35	0.040	2.53	0.020	0.020	0.013	0.10	4.76	0.10	4.76	0.0	7
7	CCB 34	5.08	0.31	5.39	0.00	Comb	4.0	5.46	6.24	4.62	1.35	Sag	2.53	0.020	0.020	0.013	0.38	18.92	0.38	18.92	0.0	Off

System 220A - Stonegate Lane | Number of lines: 7 | Run Date: 10/30/2014

NOTES: Inlet N-Values = 0.016; Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

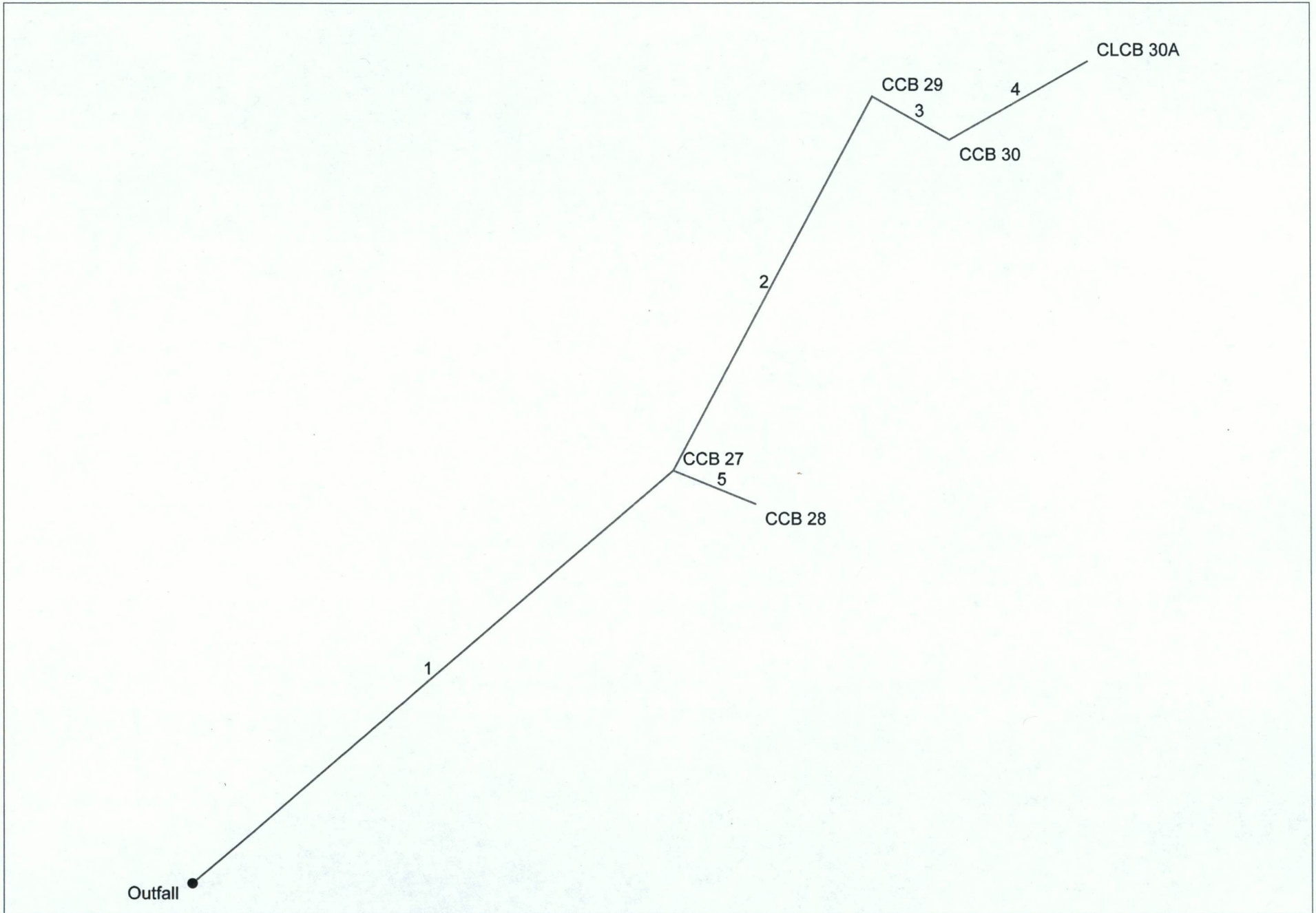
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	18	7.67	444.00	446.97	1.50	1.77	4.34	0.29	447.26	0.534	63	444.70	447.31	1.50	1.77	4.34	0.29	447.60	0.534	0.534	0.337	1.02	0.30
2	18	7.56	444.90	447.61	1.50	1.77	4.28	0.28	447.89	0.519	135	446.20	448.31	1.50	1.77	4.28	0.28	448.59	0.519	0.519	0.698	1.50	0.43
3	15	2.13	446.40	448.73	1.25	0.56	1.74	0.05	448.78	0.109	218	448.80	449.38 j	0.58**	0.56	3.81	0.23	449.61	0.558	0.333	n/a	1.50	0.34
4	15	1.37	450.40	450.66	0.26*	0.19	7.26	0.17	450.84	0.000	180	458.90	459.36	0.46**	0.41	3.32	0.17	459.53	0.000	0.000	n/a	1.46	0.25
5	15	0.92	459.30	459.63	0.33*	0.26	3.59	0.14	459.76	0.000	22	459.50	459.88	0.38**	0.31	2.96	0.14	460.01	0.000	0.000	n/a	1.00	0.14
6	15	0.40	450.40	450.62	0.22*	0.14	2.82	0.09	450.70	0.000	22	450.60	450.85	0.25**	0.17	2.36	0.09	450.93	0.000	0.000	n/a	1.00	n/a
7	15	5.08	446.40	448.73	1.25	1.23	4.14	0.27	449.00	0.619	22	446.60	448.87	1.25	1.23	4.14	0.27	449.14	0.619	0.619	0.138	1.00	0.27

System 220A - Stonegate Lane | Number of lines: 7 | Run Date: 10/30/2014

Notes: * depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

System 220B - Stonegate Lane



Project File: 100-yr System 220B-rev.stm	Number of lines: 5	Date: 10/30/2014

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	159	-41	Comb	0.00	0.06	0.75	5.0	444.00	0.50	444.80	18	Cir	0.013	1.37	450.98	CCB 27-Outfall
2	1	107	-21	Comb	0.00	0.04	0.73	5.0	445.00	0.56	445.60	18	Cir	0.013	1.50	449.92	CCB 29-CCB 27
3	2	22	92	Comb	0.00	0.03	0.90	5.0	445.80	0.90	446.00	18	Cir	0.013	1.32	449.92	CCB 30- CCB 29
4	3	40	-59	DrGrt	0.00	6.39	0.24	32.0	446.20	0.50	446.40	18	Cir	0.013	1.00	450.20	CLCB 30A-CCB 30
5	1	22	63	Grate	0.00	0.06	0.75	5.0	445.90	0.90	446.10	15	Cir	0.013	1.00	450.96	CCB 28-CCB 27

System 220B - Stonegate Lane | Number of lines: 5 | Date: 10/30/2014

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)	
1	End	159	0.06	6.58	0.75	0.05	1.68	5.0	32.8	3.9	6.56	7.44	3.71	18	0.50	444.00	444.80	446.97	447.59	444.44	450.98	CCB 27-Outfall
2	1	107	0.04	6.46	0.73	0.03	1.59	5.0	32.3	3.9	6.26	7.87	3.54	18	0.56	445.00	445.60	447.88	448.26	450.98	449.92	CCB 29-CCB 27
3	2	22	0.03	6.42	0.90	0.03	1.56	5.0	32.2	3.9	6.16	9.96	3.48	18	0.90	445.80	446.00	448.56	448.63	449.92	449.92	CCB 30- CCB 29
4	3	40	6.39	6.39	0.24	1.53	1.53	32.0	32.0	4.0	6.07	7.46	3.44	18	0.50	446.20	446.40	448.88	449.02	449.92	450.20	CLCB 30A-CCB 3
5	1	22	0.06	0.06	0.75	0.05	0.05	5.0	5.0	7.8	0.35	6.11	0.29	15	0.90	445.90	446.10	447.88	447.89	450.98	450.96	CCB 28-CCB 27

System 220B - Stonegate Lane | Number of lines: 5 | Run Date: 10/30/2014

NOTES:Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	CCB 27	0.35	0.05	0.28	0.13	Comb	4.0	2.73	0.00	2.31	1.35	0.010	2.53	0.020	0.020	0.013	0.10	4.81	0.10	4.81	0.0	Off
2	CCB 29	0.23	0.00	0.17	0.05	Comb	4.0	2.73	0.00	2.31	1.35	0.010	2.53	0.020	0.020	0.013	0.08	3.85	0.08	3.85	0.0	1
3	CCB 30	0.21	0.00	0.16	0.05	Comb	4.0	2.73	0.00	2.31	1.35	0.010	2.53	0.020	0.020	0.013	0.08	3.75	0.08	3.75	0.0	5
4	CLCB 30A	6.07	0.00	1.02	5.05	DrGrt	0.0	0.00	0.00	2.31	1.35	0.020	2.53	0.020	0.020	0.013	0.17	19.63	0.17	19.63	0.0	Off
5	CCB 28	0.35	0.05	0.26	0.13	Grate	0.0	0.00	0.00	2.31	1.35	0.010	2.53	0.020	0.020	0.013	0.10	4.76	0.10	4.76	0.0	Off

System 220B - Stonegate Lane | Number of lines: 5 | Run Date: 10/30/2014

NOTES: Inlet N-Values = 0.016; Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

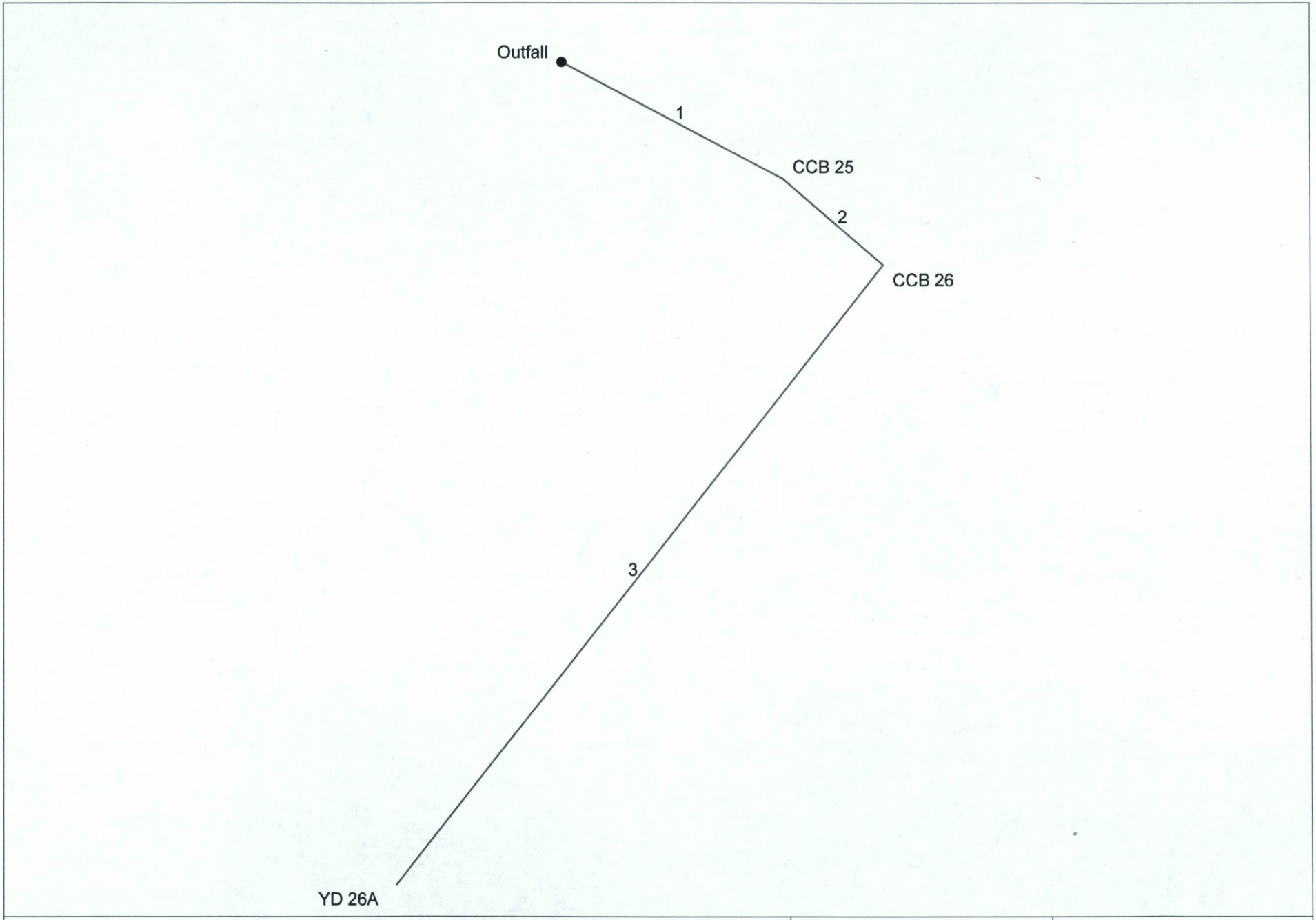
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	18	6.56	444.00	446.97	1.50	1.77	3.71	0.21	447.18	0.390	159	444.80	447.59	1.50	1.77	3.71	0.21	447.81	0.390	0.390	0.621	1.37	0.29
2	18	6.26	445.00	447.88	1.50	1.77	3.54	0.20	448.08	0.356	107	445.60	448.26	1.50	1.77	3.54	0.20	448.46	0.355	0.355	0.380	1.50	0.29
3	18	6.16	445.80	448.56	1.50	1.77	3.48	0.19	448.75	0.344	22	446.00	448.63	1.50	1.77	3.48	0.19	448.82	0.344	0.344	0.076	1.32	0.25
4	18	6.07	446.20	448.88	1.50	1.77	3.44	0.18	449.07	0.334	40	446.40	449.02	1.50	1.77	3.43	0.18	449.20	0.334	0.334	0.133	1.00	0.18
5	15	0.35	445.90	447.88	1.25	1.23	0.29	0.00	447.89	0.003	22	446.10	447.89	1.25	1.23	0.29	0.00	447.89	0.003	0.003	0.001	1.00	0.00

System 220B - Stonegate Lane | Number of lines: 5 | Run Date: 10/30/2014

; c = cir e = ellip b = box

System 220C - Stonegate Lane



Project File: 100-yr System 220C-rev.stm	Number of lines: 3	Date: 10/30/2014

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	42	28	Comb	0.00	0.09	0.90	5.0	444.00	4.06	445.70	15	Cir	0.013	0.50	452.69	CCB 25-Outfall
2	1	22	13	Comb	0.00	0.10	0.82	5.0	445.90	0.90	446.10	15	Cir	0.013	1.50	452.69	CCB 26-CCB 25
3	2	132	87	DrGrt	0.00	1.91	0.39	15.0	446.30	0.53	447.00	15	Cir	0.013	1.00	450.20	YD 26A-CCB 26

System 220C - Stonegate Lane | Number of lines: 3 | Date: 10/30/2014

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)	
1	End	42	0.09	2.10	0.90	0.08	0.91	5.0	15.7	5.6	5.05	13.01	4.12	15	4.06	444.00	445.70	446.97	447.23	444.44	452.69	CCB 25-Outfall
2	1	22	0.10	2.01	0.82	0.08	0.83	5.0	15.6	5.6	4.62	6.13	3.76	15	0.90	445.90	446.10	447.36	447.47	452.69	452.69	CCB 26-CCB 25
3	2	132	1.91	1.91	0.39	0.74	0.74	15.0	15.0	5.7	4.23	4.70	3.45	15	0.53	446.30	447.00	447.80	448.37	452.69	450.20	YD 26A-CCB 26

System 220C - Stonegate Lane | Number of lines: 3 | Run Date: 10/30/2014

NOTES:Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	CCB 25	0.63	0.00	0.39	0.24	Comb	4.0	2.73	0.00	2.31	1.35	0.010	2.53	0.020	0.020	0.013	0.11	5.66	0.11	5.66	0.0	Off
2	CCB 26	0.64	0.00	0.50	0.14	Comb	4.0	2.73	0.00	0.95	2.00	0.010	2.53	0.020	0.020	0.013	0.11	5.66	0.11	5.66	0.0	Off
3	YD 26A	4.23	0.00	4.23	0.00	DrGrt	0.0	0.00	1.51	1.23	1.23	Sag	2.00	0.130	0.130	0.013	0.43	8.68	0.43	8.68	0.0	Off

System 220C - Stonegate Lane | Number of lines: 3 | Run Date: 10/30/2014

NOTES: Inlet N-Values = 0.016; Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

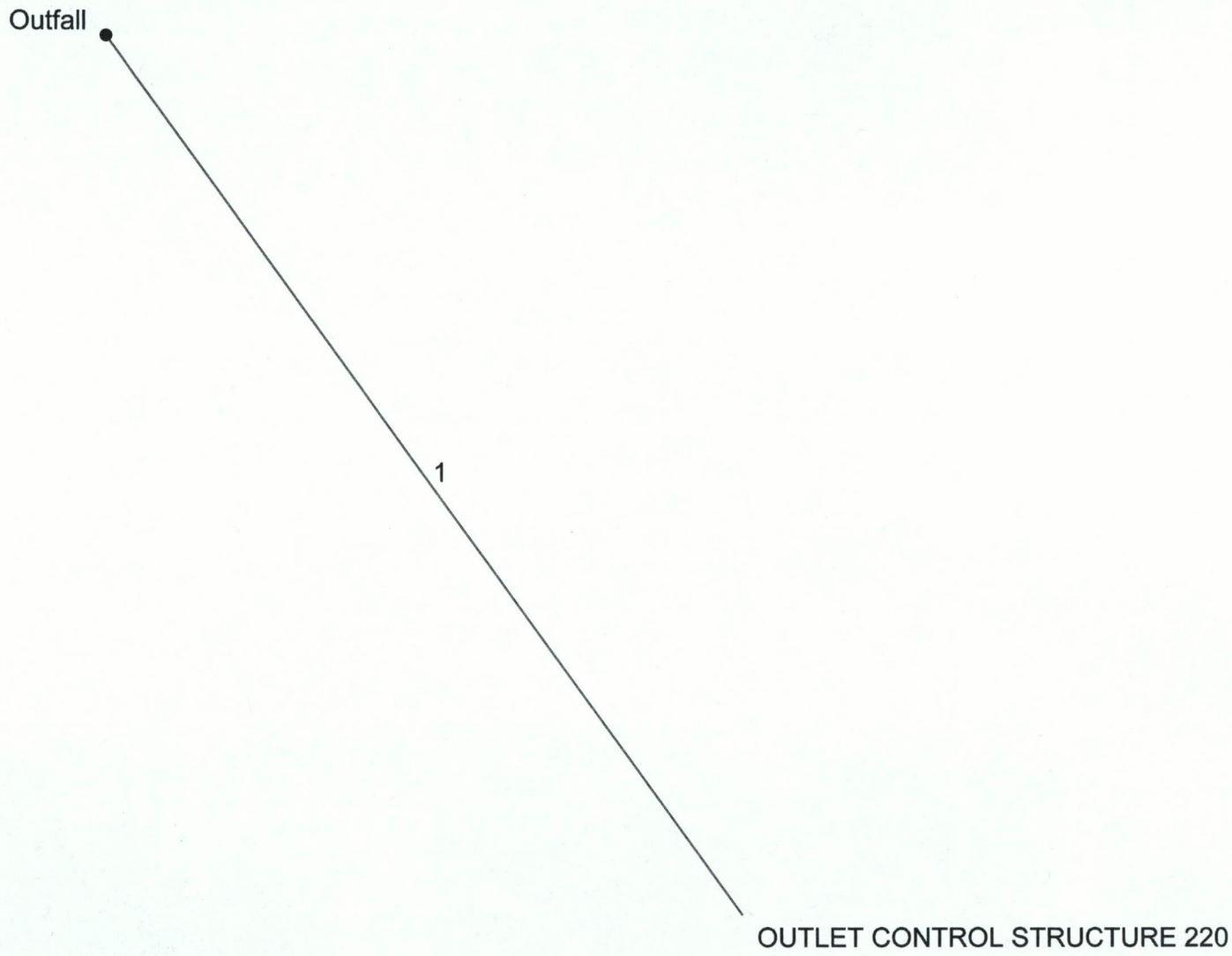
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	15	5.05	444.00	446.97	1.25	1.23	4.12	0.26	447.23	0.613	42	445.70	447.23	1.25	1.23	4.12	0.26	447.49	0.613	0.613	0.257	0.50	0.13
2	15	4.62	445.90	447.36	1.25	1.23	3.76	0.22	447.58	0.511	22	446.10	447.47	1.25	1.23	3.76	0.22	447.69	0.511	0.511	0.113	1.50	0.33
3	15	4.23	446.30	447.80	1.25	1.23	3.45	0.18	447.99	0.429	132	447.00	448.37	1.25	1.23	3.45	0.18	448.55	0.429	0.429	0.567	1.00	0.18

System 220C - Stonegate Lane | Number of lines: 3 | Run Date: 10/30/2014

; c = cir e = ellip b = box

Basin 220 - Outlet



Project File: 100-yr System 220 Outlet.stm	Number of lines: 1	Date: 10/30/2014

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	103	54	MH	6.00	0.00	0.00	0.0	441.40	0.58	442.00	24	Cir	0.013	1.00	447.00	OCS 220-Outfall

Basin 220 - Outlet | Number of lines: 1 | Date: 10/30/2014

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)	
1	End	103	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	6.00	17.27	4.80	24	0.58	441.40	442.00	442.21	442.87	441.50	447.00	OCS 220-Outfall

Basin 220 - Outlet | Number of lines: 1 | Run Date: 10/30/2014

NOTES:Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	OUTLET CONTR	6.00*	0.00	0.00	6.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off

Basin 220 - Outlet | Number of lines: 1 | Run Date: 10/30/2014

NOTES: Inlet N-Values = 0.016; Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

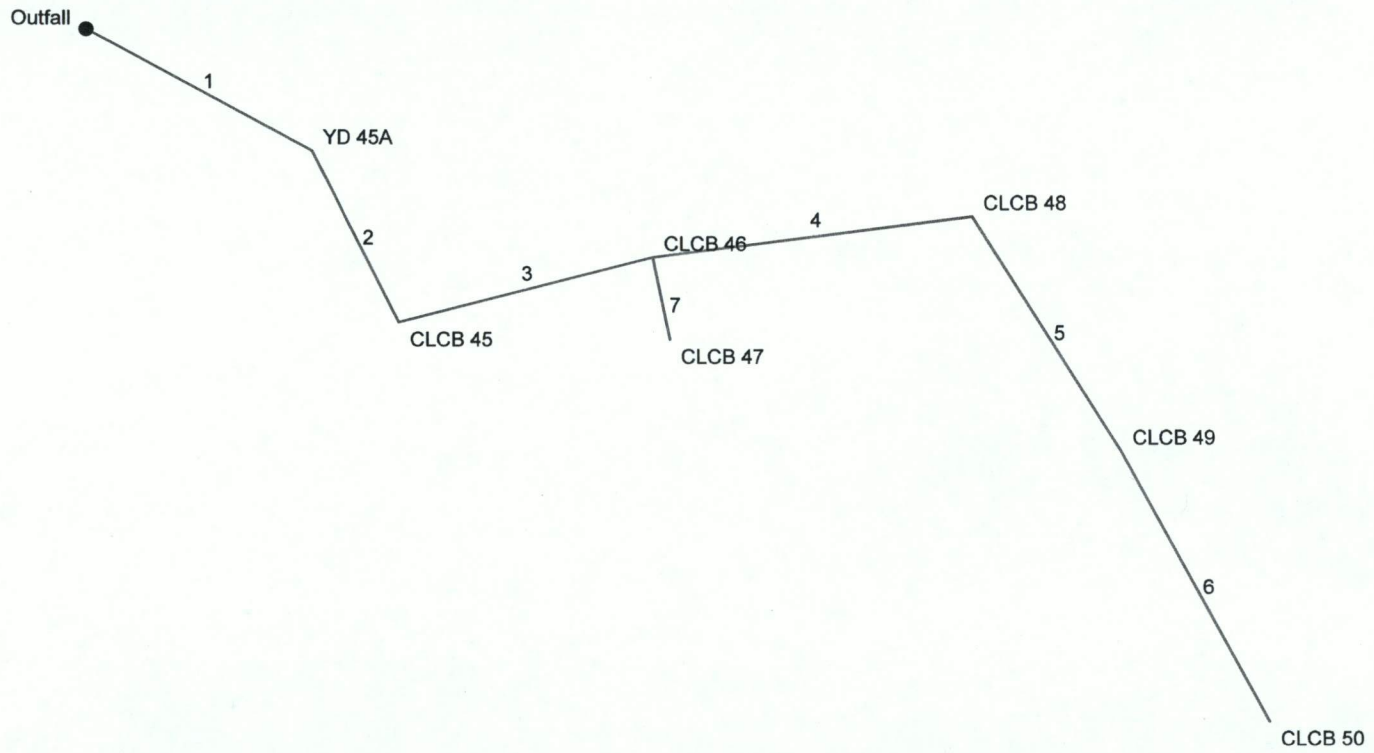
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	24	6.00	441.40	442.21	0.81	1.20	5.00	0.33	442.54	0.000	103	442.00	442.87	0.87**	1.30	4.61	0.33	443.20	0.000	0.000	n/a	1.00	0.33

Basin 220 - Outlet | Number of lines: 1 | Run Date: 10/30/2014

Notes: ; ** Critical depth. ; c = cir e = ellip b = box

System 230 - Bridle Bend



Project File: 100-yr System 230.stm	Number of lines: 7	Date: 10/30/2014

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	111	28	DrGrt	0.00	0.09	0.30	5.0	406.00	6.78	413.50	18	Cir	0.013	0.94	419.24	YD 45A-Outfall
2	1	83	35	Grate	0.00	0.39	0.55	5.0	415.20	8.82	422.50	15	Cir	0.013	1.47	430.60	CLCB 45-YD 45A
3	2	113	-77	Grate	0.00	0.30	0.57	5.0	422.50	1.33	424.00	15	Cir	0.013	1.50	427.00	CLCB 46-CLCB 45
4	3	139	7	Grate	0.00	0.26	0.69	5.0	424.00	1.01	425.40	15	Cir	0.013	1.38	430.80	CLCB 48-CLCB 46
5	4	119	65	Grate	0.00	0.56	0.63	5.0	427.80	4.36	433.00	15	Cir	0.013	0.50	438.00	CLCB 49-CLCB 48
6	5	133	4	Grate	0.00	0.38	0.80	5.0	433.00	4.36	438.80	15	Cir	0.013	1.00	444.30	CLCB 50- CLCB 49
7	3	36	93	Grate	0.00	0.91	0.28	14.0	424.00	0.83	424.30	15	Cir	0.013	1.00	427.30	CLCB 47- CLCB 46

System 230 - Bridle Bend | Number of lines: 7 | Date: 10/30/2014

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)	
1	End	111	0.09	2.89	0.30	0.03	1.50	5.0	14.7	5.7	8.61	27.33	8.99	18	6.78	406.00	413.50	406.64	414.64	407.44	419.24	YD 45A-Outfall
2	1	83	0.39	2.80	0.55	0.21	1.48	5.0	14.5	5.7	8.48	19.18	11.20	15	8.82	415.20	422.50	415.78	423.64	419.24	430.60	CLCB 45-YD 45A
3	2	113	0.30	2.41	0.57	0.17	1.26	5.0	14.3	5.8	7.31	7.45	6.37	15	1.33	422.50	424.00	423.64	425.08	430.60	427.00	CLCB 46-CLCB 4
4	3	139	0.26	1.20	0.69	0.18	0.84	5.0	5.9	7.5	6.29	6.49	5.75	15	1.01	424.00	425.40	425.08	426.41	427.00	430.80	CLCB 48-CLCB 4
5	4	119	0.56	0.94	0.63	0.35	0.66	5.0	5.7	7.6	4.99	13.48	7.70	15	4.36	427.80	433.00	428.33	433.90	430.80	438.00	CLCB 49-CLCB 4
6	5	133	0.38	0.38	0.80	0.30	0.30	5.0	5.0	7.8	2.37	13.48	3.22	15	4.36	433.00	438.80	433.90	439.42	438.00	444.30	CLCB 50- CLCB 4
7	3	36	0.91	0.91	0.28	0.25	0.25	14.0	14.0	5.8	1.49	5.89	2.36	15	0.83	424.00	424.30	425.08	424.78	427.00	427.30	CLCB 47- CLCB 4

System 230 - Bridle Bend | Number of lines: 7 | Run Date: 10/30/2014

NOTES:Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	YD 45A	0.21	0.87	0.27	0.80	DrGrt	0.0	0.00	0.00	1.23	1.23	0.120	2.00	0.020	0.020	0.013	0.06	8.10	0.06	8.10	0.0	Off
2	CLCB 45	1.67	0.00	0.81	0.87	Grate	0.0	0.00	0.00	2.31	1.35	0.040	2.53	0.020	0.020	0.013	0.13	6.26	0.13	6.26	0.0	1
3	CLCB 46	1.33	2.19	3.53	0.00	Grate	0.0	0.00	3.12	2.31	1.35	Sag	5.00	0.050	0.020	0.013	0.41	13.20	0.41	13.20	0.0	Off
4	CLCB 48	1.40	2.50	1.71	2.19	Grate	0.0	0.00	0.00	2.31	1.35	0.037	5.00	0.050	0.020	0.024	0.31	7.85	0.31	7.85	0.0	3
5	CLCB 49	2.75	1.33	1.58	2.50	Grate	0.0	0.00	0.00	2.31	1.35	0.055	2.53	0.020	0.020	0.013	0.17	8.26	0.17	8.26	0.0	4
6	CLCB 50	2.37	0.00	1.04	1.33	Grate	0.0	0.00	0.00	2.31	1.35	0.037	2.53	0.020	0.020	0.013	0.15	7.26	0.15	7.26	0.0	5
7	CLCB 47	1.49	0.00	1.49	0.00	Grate	0.0	0.00	3.12	2.31	1.35	Sag	5.00	0.050	0.020	0.013	0.25	4.95	0.25	4.95	0.0	Off

System 230 - Bridle Bend | Number of lines: 7 | Run Date: 10/30/2014

NOTES: Inlet N-Values = 0.016; Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

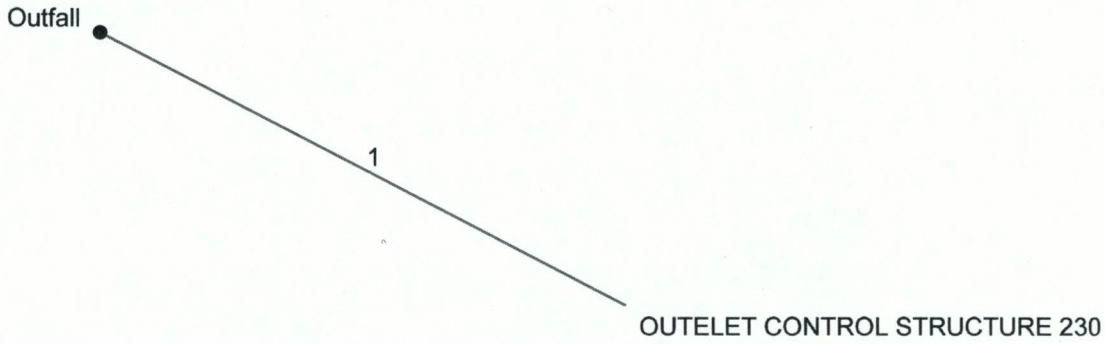
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	18	8.61	406.00	406.64	0.64	0.72	11.97	0.56	407.20	0.000	111	413.50	414.64	1.14**	1.43	6.00	0.56	415.19	0.000	0.000	n/a	0.94	n/a
2	15	8.48	415.20	415.78	0.58*	0.56	15.15	0.82	416.60	0.000	83	422.50	423.64	1.14**	1.17	7.24	0.82	424.45	0.000	0.000	n/a	1.47	n/a
3	15	7.31	422.50	423.64	1.14	1.13	6.24	0.66	424.29	0.000	113	424.00	425.08 j	1.08**	1.13	6.50	0.66	425.73	0.000	0.000	n/a	1.50	n/a
4	15	6.29	424.00	425.08	1.08	1.06	5.59	0.54	425.62	0.000	139	425.40	426.41 j	1.01**	1.06	5.91	0.54	426.95	0.000	0.000	n/a	1.38	0.75
5	15	4.99	427.80	428.33	0.53*	0.49	10.16	0.43	428.75	0.000	119	433.00	433.90	0.90**	0.95	5.24	0.43	434.33	0.000	0.000	n/a	0.50	n/a
6	15	2.37	433.00	433.90	0.90	0.60	2.49	0.24	434.15	0.000	133	438.80	439.42 j	0.62**	0.60	3.94	0.24	439.66	0.000	0.000	n/a	1.00	n/a
7	15	1.49	424.00	425.08	1.08	0.44	1.32	0.18	425.26	0.000	36	424.30	424.78	0.48**	0.44	3.40	0.18	424.96	0.000	0.000	n/a	1.00	n/a

System 230 - Bridle Bend | Number of lines: 7 | Run Date: 10/30/2014

Notes: * depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Basin 230 - Outlet



Project File: 100-yr System 230 Outlet.stm	Number of lines: 1	Date: 10/31/2014

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	60	28	None	8.00	0.00	0.00	0.0	397.50	0.83	398.00	15	Cir	0.013	1.00	405.00	OCS 230-Outfall

Basin 230 - Outlet | Number of lines: 1 | Date: 10/31/2014

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)	
1	End	60	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	8.00	5.89	6.72	15	0.83	397.50	398.00	398.61	399.57	399.00	405.00	OCS 230-Outfall

Basin 230 - Outlet

Number of lines: 1

Run Date: 10/31/2014

NOTES:Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	OUTELET CONT	8.00*	0.00	0.00	8.00	None	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off

Basin 230 - Outlet | Number of lines: 1 | Run Date: 10/31/2014

NOTES: Inlet N-Values = 0.016; Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

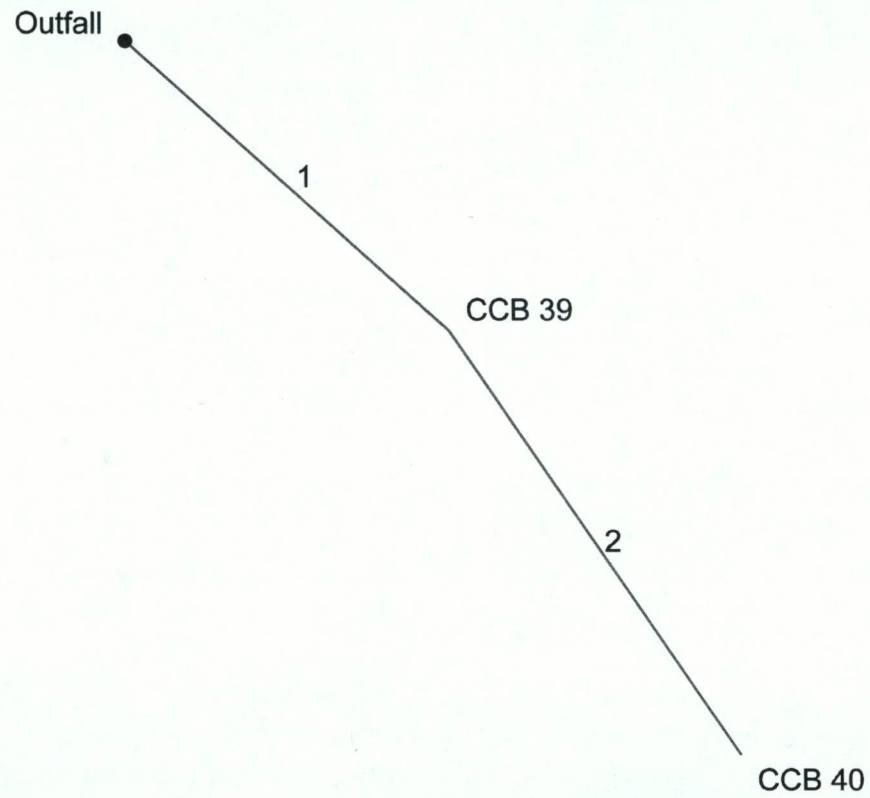
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	15	8.00	397.50	398.61	1.11	1.16	6.93	0.75	399.36	1.363	60	398.00	399.57	1.25	1.23	6.52	0.66	400.23	1.535	1.449	0.869	1.00	0.66

Basin 230 - Outlet | Number of lines: 1 | Run Date: 10/31/2014

; c = cir e = ellip b = box

System 310 - Stonegate Lane



Project File: 100-yr System 310.stm	Number of lines: 2	Date: 10/30/2014

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	19	41	Comb	0.00	0.20	0.49	5.0	458.00	2.66	458.50	15	Cir	0.013	0.50	462.00	CCB 39-Outfall
2	1	22	14	Comb	0.00	0.78	0.44	5.0	458.50	0.90	458.70	15	Cir	0.013	1.00	462.00	CCB 40-CCB 39

System 310 - Stonegate Lane | Number of lines: 2 | Date: 10/30/2014

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)	
1	End	19	0.20	0.98	0.49	0.10	0.44	5.0	5.1	7.8	3.43	10.52	3.89	15	2.66	458.00	458.50	458.99	459.25	466.00	462.00	CCB 39-Outfall
2	1	22	0.78	0.78	0.44	0.34	0.34	5.0	5.0	7.8	2.67	6.14	3.80	15	0.90	458.50	458.70	459.25	459.36	462.00	462.00	CCB 40-CCB 39

System 310 - Stonegate Lane | Number of lines: 2 | Run Date: 10/30/2014

NOTES:Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	CCB 39	0.76	0.00	0.46	0.30	Comb	4.0	2.73	0.00	2.31	1.35	0.030	2.53	0.020	0.020	0.013	0.10	4.96	0.10	4.96	0.0	Off
2	CCB 40	2.67	0.00	1.15	1.52	Comb	4.0	2.73	0.00	2.31	1.35	0.030	2.53	0.020	0.020	0.013	0.16	7.91	0.16	7.91	0.0	Off

System 310 - Stonegate Lane | Number of lines: 2 | Run Date: 10/30/2014

NOTES: Inlet N-Values = 0.016; Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

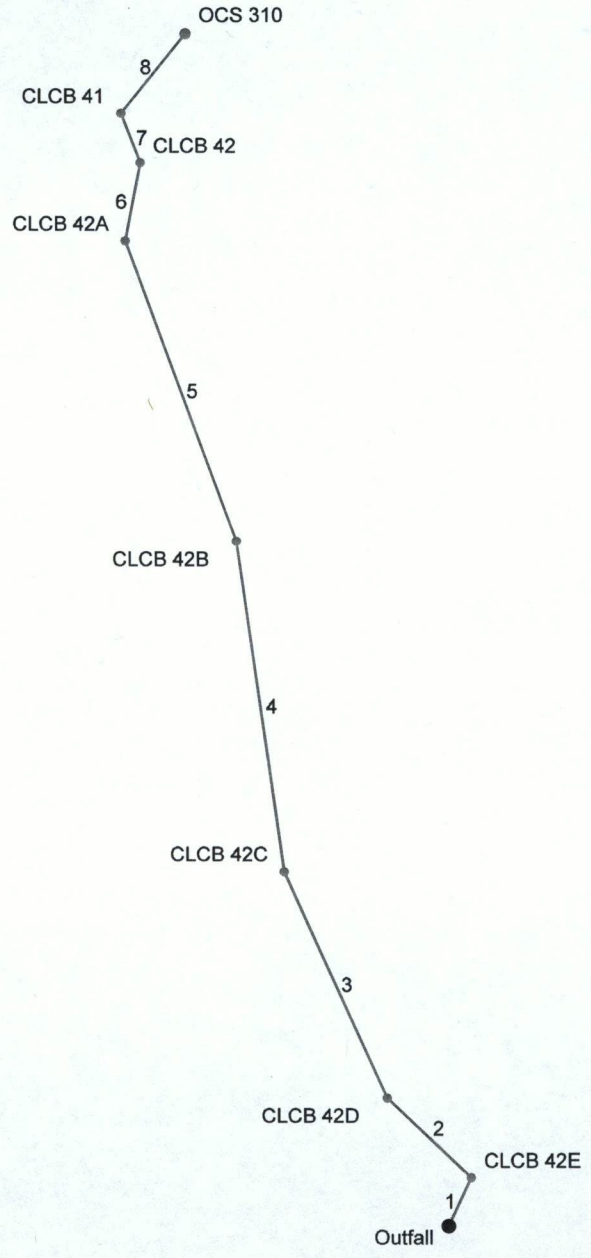
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
1	15	3.43	458.00	458.99	0.99	0.76	3.29	0.31	459.30	0.000	19	458.50	459.25 j	0.75**	0.76	4.49	0.31	459.56	0.000	0.000	n/a	0.50	0.16
2	15	2.67	458.50	459.25	0.75	0.65	3.50	0.26	459.51	0.000	22	458.70	459.36 j	0.66**	0.65	4.11	0.26	459.62	0.000	0.000	n/a	1.00	0.26

System 310 - Stonegate Lane | Number of lines: 2 | Run Date: 10/30/2014

Notes: ; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

System 310 Out - Cedar Hill Rd



Project File: 100-yr System 310 Outlet.stm	Number of lines: 8	Date: 10/30/2014

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	24	-65	Grate	0.00	0.02	0.90	5.0	434.39	3.79	435.30	15	Cir	0.013	1.43	438.50	OUT-CLCB42E
2	1	52	-71	Grate	0.00	0.39	0.40	9.0	435.65	1.83	436.60	15	Cir	0.013	0.64	439.40	CLCB42E-CLCB42D
3	2	112	22	Grate	0.00	0.49	0.30	14.0	436.60	7.68	445.20	15	Cir	0.013	0.50	450.20	CLCB42D-CLCB42C
4	3	150	16	Grate	0.00	0.35	0.68	5.0	445.40	5.20	453.20	15	Cir	0.013	0.50	458.70	CLCB42C-CLCB42B
5	4	144	-12	Comb	0.00	0.14	0.41	5.0	453.40	1.04	454.90	15	Cir	0.013	0.86	460.20	CLCB42B-CLCB42A
6	5	36	31	Comb	0.00	0.88	0.31	5.0	455.10	1.11	455.50	15	Cir	0.013	0.88	459.50	CLCB42A-CLCB42
7	6	24	-32	Comb	0.09	0.07	0.51	5.0	455.70	1.25	456.00	15	Cir	0.013	1.33	459.50	CLCB42-CLCB41
8	7	46	60	MH	3.37	0.00	0.00	0.0	456.20	1.74	457.00	15	Cir	0.013	1.00	464.00	CLCB41-OCS310

System 310 Out - Cedar Hill Rd | Number of lines: 8 | Date: 10/30/2014

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)	
1	End	24	0.02	2.34	0.90	0.02	0.92	5.0	14.4	5.8	8.80	12.57	7.47	15	3.79	434.39	435.30	435.53	436.45	435.64	438.50	OUT-CLCB42E
2	1	52	0.39	2.32	0.40	0.16	0.91	9.0	14.3	5.8	8.71	8.73	7.75	15	1.83	435.65	436.60	436.67	437.74	438.50	439.40	CLCB42E-CLCB4
3	2	112	0.49	1.93	0.30	0.15	0.75	14.0	14.0	5.8	7.84	17.89	6.74	15	7.68	436.60	445.20	437.74	446.31	439.40	450.20	CLCB42D-CLCB4
4	3	150	0.35	1.44	0.68	0.24	0.60	5.0	5.6	7.6	8.06	14.73	7.71	15	5.20	445.40	453.20	446.31	454.32	450.20	458.70	CLCB42C-CLCB4
5	4	144	0.14	1.09	0.41	0.06	0.37	5.0	5.2	7.7	6.29	6.59	6.01	15	1.04	453.40	454.90	454.38	455.91	458.70	460.20	CLCB42B-CLCB4
6	5	36	0.88	0.95	0.31	0.27	0.31	5.0	5.1	7.8	5.86	6.81	5.96	15	1.11	455.10	455.50	455.99	456.48	460.20	459.50	CLCB42A-CLCB4
7	6	24	0.07	0.07	0.51	0.04	0.04	5.0	5.0	7.8	3.74	7.22	4.64	15	1.25	455.70	456.00	456.48	456.78	459.50	459.50	CLCB42-CLCB41
8	7	46	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.37	8.52	5.25	15	1.74	456.20	457.00	456.78	457.74	459.50	464.00	CLCB41-OCS310

System 310 Out - Cedar Hill Rd

Number of lines: 8

Run Date: 10/30/2014

NOTES:Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	CLCB 42E	0.14	0.45	0.51	0.08	Grate	0.0	0.00	0.00	3.15	1.64	0.067	2.53	0.031	0.031	0.013	0.09	2.94	0.09	2.94	0.0	Off
2	CLCB 42D	1.06	0.48	1.08	0.45	Grate	0.0	0.00	0.00	3.15	1.64	0.040	2.53	0.031	0.031	0.013	0.14	4.62	0.14	4.62	0.0	1
3	CLCB 42C	0.86	0.78	1.16	0.48	Grate	0.0	0.00	0.00	3.15	1.64	0.050	2.53	0.031	0.031	0.013	0.14	4.55	0.14	4.55	0.0	2
4	CLCB 42B	1.85	0.30	1.38	0.78	Grate	0.0	0.00	0.00	3.15	1.64	0.015	2.53	0.031	0.031	0.013	0.20	6.29	0.20	6.29	0.0	3
5	CLCB 42A	0.45	0.69	0.84	0.30	Comb	4.0	2.73	0.00	3.15	1.64	0.010	2.53	0.031	0.031	0.013	0.17	5.36	0.17	5.36	0.0	4
6	CLCB 42	2.13	0.03	1.47	0.69	Comb	4.0	2.73	0.00	3.15	1.64	0.067	2.53	0.031	0.031	0.013	0.15	4.78	0.15	4.78	0.0	5
7	CLCB 41	0.37*	0.00	0.34	0.03	Comb	4.0	2.73	0.00	3.15	1.64	0.067	2.53	0.031	0.031	0.013	0.08	2.45	0.08	2.45	0.0	6
8	OCS 310	3.37*	0.00	0.00	3.37	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off

System 310 Out - Cedar Hill Rd | Number of lines: 8 | Run Date: 10/30/2014

NOTES: Inlet N-Values = 0.016; Intensity = 106.59 / (Inlet time + 17.00) ^ 0.85; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	15	8.80	434.39	435.53	1.14	1.17	7.49	0.86	436.39	0.000	24	435.30	436.45	1.15**	1.18	7.46	0.86	437.31	0.000	0.000	n/a	1.43	1.24
2	15	8.71	435.65	436.67	1.02*	1.07	8.11	0.85	437.52	0.000	52	436.60	437.74	1.14**	1.18	7.40	0.85	438.60	0.000	0.000	n/a	0.64	n/a
3	15	7.84	436.60	437.74	1.14	1.15	6.66	0.72	438.47	0.000	112	445.20	446.31 j	1.11**	1.15	6.82	0.72	447.03	0.000	0.000	n/a	0.50	n/a
4	15	8.06	445.40	446.31	0.91	0.95	8.46	0.75	447.06	0.000	150	453.20	454.32	1.12**	1.16	6.97	0.75	455.07	0.000	0.000	n/a	0.50	n/a
5	15	6.29	453.40	454.38	0.98*	1.03	6.11	0.54	454.92	0.000	144	454.90	455.91	1.01**	1.06	5.91	0.54	456.46	0.000	0.000	n/a	0.86	0.47
6	15	5.86	455.10	455.99	0.89*	0.94	6.24	0.50	456.50	0.000	36	455.50	456.48	0.98**	1.03	5.68	0.50	456.98	0.000	0.000	n/a	0.88	n/a
7	15	3.74	455.70	456.48	0.78	0.80	4.65	0.33	456.81	0.000	24	456.00	456.78	0.78**	0.81	4.64	0.33	457.12	0.000	0.000	n/a	1.33	0.44
8	15	3.37	456.20	456.78	0.58	0.56	6.04	0.31	457.09	0.000	46	457.00	457.74	0.74**	0.76	4.46	0.31	458.05	0.000	0.000	n/a	1.00	n/a

System 310 Out - Cedar Hill Rd | Number of lines: 8 | Run Date: 10/30/2014

Notes: * Normal depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Outlet Protection Calculations

Project:	Easton Crossing	By:	KPG	Date:	10/30/14
Location:	Easton, Connecticut	Checked:	FAB	Date:	10/30/14
Outlet I.D.	**FES 140 IN**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

Flared End Sectoin outlet to Storm Water Basin 140

Design Criteria (100-yr Storm Event):

Q (cfs) =	12.38	R_p (ft)=	1.5
D (in) =	18	S_p (ft) =	1.5
V (fps) =	7.26	Tw (ft)=	1.47

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter in inches (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise in feet (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections in feet (ft)
T_w= Tailwater depth in feet (ft)

Based on **Table 11-13.1** use Type 'B' ---> TW≥ 0.5 Rp

Rip Rap Stone Size:

Velocity	Rip Rap Specification	D_{50} Stone Size
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

$F(ft)=0.5(R_p)$	=	n/a
$C(ft)=3.0(S_p)+6.0(F)$	=	n/a
$B(ft)=2.0(S_p)+6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	23 ft
$W1 = 3.0(S_p)$ min.	=	5 ft
$W2 = 3.0(S_p)+0.7(L_a)$ mir	=	14 ft
d (Depth of Stone)	=	12 inches

Outlet Protection Calculations

Project:	Easton Crossing	By:	KPG	Date:	10/30/14
Location:	Easton, Connecticut	Checked:	FAB	Date:	10/30/14
Outlet I.D.	**FES 140 OUT**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

Flared End Sectoin outlet from Storm Water Basin 140

Design Criteria (100-yr Storm Event):

Q (cfs) =	7	R_p (ft)=	1.5
D (in) =	18	S_p (ft) =	1.5
V (fps) =	5.92	Tw (ft)=	0.89

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter in inches (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise in feet (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections in feet (ft)
T_w= Tailwater depth in feet (ft)

Based on **Table 11-13.1** use Type 'B' ---> TW≥ 0.5 Rp

Rip Rap Stone Size:

Velocity	Rip Rap Specification	D_{50} Stone Size
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

F(ft)=0.5(R_p)	=	n/a
C(ft)=3.0(S_p)+6.0(F)	=	n/a
B(ft)=2.0(S_p)+6.0(F)	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	14 ft
W1 = 3.0(S_p) min.	=	5 ft
W2 = 3.0(S_p)+0.7(L_a) mir	=	10 ft
d (Depth of Stone)	=	12 inches

Outlet Protection Calculations

Project:	Easton Crossing	By:	KPG	Date:	10/30/14
Location:	Easton, Connecticut	Checked:	FAB	Date:	10/30/14
Outlet I.D.	**FES 150 IN**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

Flared End Sectoin outlet to Storm Water Basin 150

Design Criteria (100-yr Storm Event):

Q (cfs) =	17.44	R_p (ft)=	1.5
D (in) =	18	S_p (ft) =	1.5
V (fps) =	9.87	Tw (ft)=	1.65

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter in inches (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise in feet (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections in feet (ft)
T_w= Tailwater depth in feet (ft)

Based on **Table 11-13.1** use Type 'B' ---> TW≥ 0.5 Rp

Rip Rap Stone Size:

Velocity	Rip Rap Specification	D_{50} Stone Size
8-10 fps	Intermediate	8 inches

Preformed Scour Hole Dimensions:

$F(ft)=0.5(R_p)$	=	n/a
$C(ft)=3.0(S_p)+6.0(F)$	=	n/a
$B(ft)=2.0(S_p)+6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	31 ft
W1 = $3.0(S_p)$ min.	=	5 ft
W2 = $3.0(S_p)+0.7(L_a)$ mir	=	17 ft
d (Depth of Stone)	=	18 inches

Outlet Protection Calculations

Project:	Easton Crossing	By:	KPG	Date:	10/30/14
Location:	Easton, Connecticut	Checked:	FAB	Date:	10/30/14
Outlet I.D.	**FES 150 OUT**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

Flared End Sectoin outlet from Storm Water Basin 150

Design Criteria (100-yr Storm Event):

Q (cfs) =	6	R_p (ft)=	2
D (in) =	24	S_p (ft) =	2
V (fps) =	4.66	Tw (ft)=	0.85

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter in inches (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise in feet (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections in feet (ft)
T_w= Tailwater depth in feet (ft)

Based on **Table 11-12.1** use Type 'A' ---> TW< 0.5 Rp

Rip Rap Stone Size:

Velocity	Rip Rap Specification	D_{50} Stone Size
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

$F(ft)=0.5(R_p)$	=	n/a
$C(ft)=3.0(S_p)+6.0(F)$	=	n/a
$B(ft)=2.0(S_p)+6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	11 ft
W1 = $3.0(S_p)$ min.	=	6 ft
W2 = $3.0(S_p)+0.7(L_a)$ mir	=	14 ft
d (Depth of Stone)	=	12 inches

Outlet Protection Calculations

Project:	Easton Crossing	By:	KPG	Date:	10/30/14
Location:	Easton, Connecticut	Checked:	FAB	Date:	10/30/14
Outlet I.D.	**FES 210 IN**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

Flared End Sectoin outlet to Storm Water Basin 210

Design Criteria (100-yr Storm Event):

Q (cfs) =	7.27	R_p (ft)=	1.25
D (in) =	15	S_p (ft) =	1.25
V (fps) =	6.99	Tw (ft)=	0.92

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter in inches (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise in feet (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections in feet (ft)
T_w= Tailwater depth in feet (ft)

Based on **Table 11-13.1** use Type 'B' ---> TW≥ 0.5 Rp

Rip Rap Stone Size:

Velocity	Rip Rap Specification	D_{50} Stone Size
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

$F(ft)=0.5(R_p)$	=	n/a
$C(ft)=3.0(S_p)+6.0(F)$	=	n/a
$B(ft)=2.0(S_p)+6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	15 ft
W1 = $3.0(S_p)$ min.	=	4 ft
W2 = $3.0(S_p)+0.7(L_a)$ mir	=	10 ft
d (Depth of Stone)	=	12 inches

Outlet Protection Calculations

Project:	Easton Crossing	By:	KPG	Date:	10/30/14
Location:	Easton, Connecticut	Checked:	FAB	Date:	10/30/14
Outlet I.D.	**FES 210 OUT**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

Flared End Sectoin outlet from Storm Water Basin 210

Design Criteria (100-yr Storm Event):

Q (cfs) =	6	R_p (ft)=	1.25
D (in) =	15	S_p (ft) =	1.25
V (fps) =	7.03	Tw (ft)=	0.71

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter in inches (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise in feet (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections in feet (ft)
T_w= Tailwater depth in feet (ft)

Based on **Table 11-13.1** use Type 'B' ---> TW≥ 0.5 Rp

Rip Rap Stone Size:

Velocity	Rip Rap Specification	D_{50} Stone Size
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

$F(ft)=0.5(R_p)$	=	n/a
$C(ft)=3.0(S_p)+6.0(F)$	=	n/a
$B(ft)=2.0(S_p)+6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	13 ft
$W1 = 3.0(S_p)$ min.	=	4 ft
$W2 = 3.0(S_p)+0.7(L_a)$ mir	=	9 ft
d (Depth of Stone)	=	12 inches

Outlet Protection Calculations

Project:	Easton Crossing	By:	KPG	Date:	10/30/14
Location:	Easton, Connecticut	Checked:	FAB	Date:	10/30/14
Outlet I.D.	**FES 220A IN**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

Flared End Sectoin outlet to Storm Water Basin 220

Design Criteria (100-yr Storm Event):

Q (cfs) =	7.67	R_p (ft)=	1.5
D (in) =	18	S_p (ft) =	1.5
V (fps) =	4.34	Tw (ft)=	2.97

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter in inches (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise in feet (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections in feet (ft)
T_w= Tailwater depth in feet (ft)

Based on **Table 11-13.1** use Type 'B' ---> TW≥ 0.5 Rp

Rip Rap Stone Size:

Velocity	Rip Rap Specification	D_{50} Stone Size
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

$F(ft)=0.5(R_p)$	=	n/a
$C(ft)=3.0(S_p)+6.0(F)$	=	n/a
$B(ft)=2.0(S_p)+6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	15 ft
$W1 = 3.0(S_p)$ min.	=	5 ft
$W2 = 3.0(S_p)+0.7(L_a)$ mir	=	11 ft
d (Depth of Stone)	=	12 inches

Outlet Protection Calculations

Project:	Easton Crossing	By:	KPG	Date:	10/30/14
Location:	Easton, Connecticut	Checked:	FAB	Date:	10/30/14
Outlet I.D.	**FES 220B IN**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

Flared End Sectoin outlet to Storm Water Basin 220

Design Criteria (100-yr Storm Event):

Q (cfs) =	6.56	R_p (ft)=	1.5
D (in) =	18	S_p (ft) =	1.5
V (fps) =	3.71	Tw (ft)=	2.97

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter in inches (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise in feet (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections in feet (ft)
T_w= Tailwater depth in feet (ft)

Based on **Table 11-13.1** use Type 'B' ---> TW≥ 0.5 Rp

Rip Rap Stone Size:

Velocity	Rip Rap Specification	D_{50} Stone Size
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

$F(ft)=0.5(R_p)$	=	n/a
$C(ft)=3.0(S_p)+6.0(F)$	=	n/a
$B(ft)=2.0(S_p)+6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	13 ft
W1 = $3.0(S_p)$ min.	=	5 ft
W2 = $3.0(S_p)+0.7(L_a)$ mir	=	10 ft
d (Depth of Stone)	=	12 inches

Outlet Protection Calculations

Project:	Easton Crossing	By:	KPG	Date:	10/30/14
Location:	Easton, Connecticut	Checked:	FAB	Date:	10/30/14
Outlet I.D.	**FES 220C IN**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

Flared End Sectoin outlet to Storm Water Basin 220

Design Criteria (100-yr Storm Event):

Q (cfs) =	5.05	R_p (ft)=	1.25
D (in) =	15	S_p (ft) =	1.25
V (fps) =	4.12	Tw (ft)=	2.97

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter in inches (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise in feet (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections in feet (ft)
T_w= Tailwater depth in feet (ft)

Based on **Table 11-13.1** use Type 'B' ---> TW≥ 0.5 Rp

Rip Rap Stone Size:

Velocity	Rip Rap Specification	D_{50} Stone Size
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

$F(ft)=0.5(R_p)$	=	n/a
$C(ft)=3.0(S_p)+6.0(F)$	=	n/a
$B(ft)=2.0(S_p)+6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	11 ft
W1 = $3.0(S_p)$ min.	=	4 ft
W2 = $3.0(S_p)+0.7(L_a)$ mir	=	8 ft
d (Depth of Stone)	=	12 inches

Outlet Protection Calculations

Project:	Easton Crossing	By:	KPG	Date:	10/30/14
Location:	Easton, Connecticut	Checked:	FAB	Date:	10/30/14
Outlet I.D.	**FES 220 OUT**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

Flared End Sectoin outlet from Storm Water Basin 220

Design Criteria (100-yr Storm Event):

Q (cfs) =	6	R_p (ft)=	2
D (in) =	24	S_p (ft) =	2
V (fps) =	4.8	Tw (ft)=	0.81

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter in inches (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise in feet (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections in feet (ft)
T_w= Tailwater depth in feet (ft)

Based on **Table 11-12.1** use Type 'A' ---> TW< 0.5 Rp

Rip Rap Stone Size:

Velocity	Rip Rap Specification	D_{50} Stone Size
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

$F(ft)=0.5(R_p)$	=	n/a
$C(ft)=3.0(S_p)+6.0(F)$	=	n/a
$B(ft)=2.0(S_p)+6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	11 ft
W1 = $3.0(S_p)$ min.	=	6 ft
W2 = $3.0(S_p)+0.7(L_a)$ mir	=	14 ft
d (Depth of Stone)	=	12 inches

Outlet Protection Calculations

Project:	Easton Crossing	By:	KPG	Date:	10/30/14
Location:	Easton, Connecticut	Checked:	FAB	Date:	10/30/14
Outlet I.D.	**FES 230 IN**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

Flared End Sectoin outlet to Storm Water Basin 220

Design Criteria (100-yr Storm Event):

Q (cfs) =	8.61	R_p (ft)=	1.5
D (in) =	18	S_p (ft) =	1.5
V (fps) =	8.99	Tw (ft)=	0.64

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter in inches (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise in feet (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections in feet (ft)
T_w= Tailwater depth in feet (ft)

Based on **Table 11-12.1** use Type 'A' ---> TW< 0.5 Rp

Rip Rap Stone Size:

Velocity	Rip Rap Specification	D_{50} Stone Size
8-10 fps	Intermediate	8 inches

Preformed Scour Hole Dimensions:

$F(ft)=0.5(R_p)$	=	n/a
$C(ft)=3.0(S_p)+6.0(F)$	=	n/a
$B(ft)=2.0(S_p)+6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	14 ft
W1 = $3.0(S_p)$ min.	=	5 ft
W2 = $3.0(S_p)+0.7(L_a)$ mir	=	14 ft
d (Depth of Stone)	=	18 inches

Outlet Protection Calculations

Project:	Easton Crossing	By:	KPG	Date:	10/30/14
Location:	Easton, Connecticut	Checked:	FAB	Date:	10/30/14
Outlet I.D.	**FES 230 OUT**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

Flared End Sectoin outlet from Storm Water Basin 230

Design Criteria (100-yr Storm Event):

Q (cfs) =	8	R_p (ft)=	1.25
D (in) =	15	S_p (ft) =	1.25
V (fps) =	6.72	Tw (ft)=	1.11

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter in inches (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise in feet (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections in feet (ft)
T_w= Tailwater depth in feet (ft)

Based on **Table 11-13.1** use Type 'B' ---> TW≥ 0.5 Rp

Rip Rap Stone Size:

Velocity	Rip Rap Specification	D_{50} Stone Size
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

$F(ft)=0.5(R_p)$	=	n/a
$C(ft)=3.0(S_p)+6.0(F)$	=	n/a
$B(ft)=2.0(S_p)+6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	17 ft
$W1 = 3.0(S_p)$ min.	=	4 ft
$W2 = 3.0(S_p)+0.7(L_a)$ mir	=	11 ft
d (Depth of Stone)	=	12 inches

REVISED WATER QUALITY COMPUTATIONS

STORMWATER QUALITY CALCULATIONS:
Water Quality Volume

Basin ID	Total Area (ac.)	Impervious Area (ac.)	Percent Impervious	Volumetric Runoff Coeff., R	WQV (ac-ft)	Total Volume Required (ac-ft)	Total Volume Provided (ac-ft)*
DET 140	5.16	1.40	27%	0.29	0.127	**0.127**	*0.187*
DET 150	11.00	2.45	22%	0.25	0.230	**0.230**	*0.318*
DET 210	11.20	1.56	14%	0.18	0.164	**0.164**	*0.198*
DET 220	11.38	1.81	16%	0.19	0.183	**0.183**	*0.231*
DET 230	4.72	1.23	26%	0.28	0.112	**0.112**	*0.127*

* Combined Permanent Pool + Sediment Forebay Volumes

$$\mathbf{WQV} = \frac{(1.0 \text{ inches}) \times A \times R}{12}$$

Where: WQV = Water Quality Volume in acre-feet

A = Contributing Area in acres

R = 0.05 + 0.009 (I)

I = Site Imperviousness as percent

STORMWATER QUALITY CALCULATIONS
Total Storage Volume Provided

Detention Basin 140:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
403.0	2,295	0.0	0.000	**0.000**
404.0	3,100	2,697.5	0.062	**0.062**
405.0	3,974	3,537.0	0.081	**0.143**

Detention Basin 150:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
400.0	950	0.0	0.000	**0.000**
401.0	1,450	1,200.0	0.028	**0.028**
402.0	2,125	1,787.5	0.041	**0.069**
403.0	2,900	2,512.5	0.058	**0.126**
404.0	3,725	3,312.5	0.076	**0.202**
405.0	4,625	4,175.0	0.096	**0.298**

Detention Basin 210:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
397.0	6,600	0.0	0.000	**0.000**
398.0	7,650	7,125.0	0.164	**0.164**

Retention Basin 210-A:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
417.0	575	0.0	0.000	**0.000**
418.0	1,550	1,062.5	0.024	**0.024**
419.0	1,700	1,625.0	0.037	**0.062**
420.0	1,875	1,787.5	0.041	**0.103**
421.0	2,025	1,950.0	0.045	**0.147**
422.0	2,225	2,125.0	0.049	**0.196**

STORMWATER QUALITY CALCULATIONS
Total Storage Volume Provided

Detention Basin 220:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
442.0	6,000	0.0	0.000	**0.000**
443.0	6,975	6,487.5	0.149	**0.149**

Detention Basin 230:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
398.0	600	0.0	0.000	**0.000**
399.0	1,300	950.0	0.022	**0.022**
400.0	1,950	1,625.0	0.037	**0.059**
401.0	2,825	2,387.5	0.055	**0.114**

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JOB Easton Crossing, CT (2683-01-27)
SHEET NO. 1 OF 1
CALCULATED BY FAB DATE 10/31/14
CHECKED BY EAH DATE 10/31/14
SCALE Sediment Forebay Sizing

- Forebays sized to contain at least 10% of the WQV.

- DET 140: WQV = 0.119 ac-ft

  10% = 0.012 ac-ft, provided = 0.044 ac-ft @ 405.5

- DET 150: WQV = 0.194 ac-ft

  10% = 0.02 ac-ft, provided = 0.020 ac-ft @ 405.5

- DET 210: WQV = 0.140 ac-ft

  10% = 0.014 ac-ft, provided = 0.034 ac-ft @ 399.5

- DET 220: WQV = 0.165 ac-ft

  10% = 0.017 ac-ft, provided = 0.082 ac-ft @ 443.5

- DET 230: WQV = 0.093 ac-ft

  10% = 0.009 ac-ft, provided = 0.013 ac-ft @ 401.5

STORMWATER QUALITY CALCULATIONS
Total Storage Volume Provided

Forebay 140:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
404.0	925	0.0	0.000	**0.000**
405.0	1,400	1,162.5	0.027	**0.027**
405.5	1,675	768.8	0.018	**0.044**
406.0	1,950	906.3	0.021	**0.065**

Forebay 150:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
404.0	275	0.0	0.000	**0.000**
405.0	650	462.5	0.011	**0.011**
405.5	900	387.5	0.009	**0.020**
406.0	1,150	512.5	0.012	**0.031**

Forebay 210:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
398.0	425	0.0	0.000	**0.000**
399.0	1,150	787.5	0.018	**0.018**
399.5	1,563	678.1	0.016	**0.034**
400.0	1,975	884.4	0.020	**0.054**

STORMWATER QUALITY CALCULATIONS
Total Storage Volume Provided

Forebay 220:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
442.0	1,575	0.0	0.000	**0.000**
443.0	2,625	2,100.0	0.048	**0.048**
443.5	3,188	1,453.1	0.033	**0.082**
444.0	3,750	1,734.4	0.040	**0.121**

Forebay 230:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
400.0	150	0.0	0.000	**0.000**
401.0	425	287.5	0.007	**0.007**
401.5	625	262.5	0.006	**0.013**
402.0	825	362.5	0.008	**0.021**

STORMWATER QUALITY CALCULATIONS:
Groundwater Recharge Volume

Area ID	Total Site Area (ac.)	Pr Impervious Area (ac.)	Percent Impervious	Recharge Depth[1.], D (in.)	GRV (ac-ft)	Total Volume Provided[2.] (ac-ft)
Total Site	124.70	9.52	8%	0.165	0.131	*0.658*

1. - A weighted recharge value was computed for the entire site.

2. - Groundwater recharge volume is provided within the perforated plastic chambers attached to the proposed rooftop areas.

Each building rooftop will discharge to 6 chambers surrounded by stone, providing 597.36 cf of storage volume (99.56 cf each chamber)

$$\mathbf{GRV} = \frac{D \times A \times I}{12}$$

Where: GRV = Groundwater Recharge Volume in acre-feet
D = Depth of Runoff to be Recharged in inches
A = Contributing Area in acres
I = Site Imperviousness as decimal

Weighted Recharge Value (D)

A soil = 6.01 acres
B soil = 68.87 acres
C soil = 9.85 acres
D soil = 39.97 acres

$$\text{D Comp} = \frac{(6.01 \times 0.40) + (68.87 \times 0.25) + (9.85 \times 0.10) + (39.97 \times 0)}{124.70}$$

D Comp = 0.165

Technical Information

CULTEC Recharger® V8HD

The Recharger® V8HD is a 32" (813 mm) tall, high capacity chamber. The Recharger® V8HD has the side portal internal manifold feature. HVLV™ Feed Connectors are inserted into the side portals to create the internal manifold.

The Recharger V8 SHD Starter and EHD End sections are **shorter** in length than the Recharger V8 IHD Intermediate section. These differences must be considered during product specification, calculation and design.

Recharger V8SHD Starter

Recharger V8IHD Intermediate

Recharger V8EHD End

	Recharger V8SHD Starter or V8EHD End Section	Recharger V8IHD Intermediate Section
Size (L x W x H)	5.08' x 60" x 32"	8' x 60" x 32"
	1.55 m x 1524 mm x 813 mm	2.44 m x 1524 mm x 813 mm
Installed Length	4.58'	7.5'
	1.40 m	2.29 m
Length Adjustment per Run	-5.83'	-5.83'
	-1.78 m	-1.78 m
Chamber Storage	8.68 ft^3/ft	8.68 ft^3/ft
	0.81 m^3/m	0.81 m^3/m
	39.78 ft^3/unit	65.09 ft^3/unit
	1.13 m^3/unit	1.84 m^3/unit
Min. Installed Storage	13.27 ft^3/ft	13.27 ft^3/ft
	1.23 m^3/m	1.23 m^3/m
	60.84 ft^3/unit	99.56 ft^3/unit
	1.72 m^3/unit	2.82 m^3/unit
Min. Area Required	25.21 ft^2	41.25 ft^2
	2.34 m^2	3.83 m^2
Min. Center to Center Spacing	5.5'	5.5'
	1.68 m	1.68 m
Max. Allowable Cover	8'	8'
	2.44 m	2.44 m
Max. Inlet Opening in Endwall	24"	n/a
	600 mm	n/a
Side Portal Dimensions (H x W)	16" x 21"	10.5" x 12"
	406 mm x 533 mm	267 mm x 305 mm
Max. Allowable Pipe Size in Side Portal	12"	10"
	300 mm	250 mm
Compatible Feed Connector	HVLV F-110x4 Feed Connector	HVLV FC-24 Feed Connector

Recharger V8SHD Starter or V8EHD End	Stone Foundation Depth 6" 152 mm	12" 305 mm	18" 457 mm
Chamber and Stone Storage Per Chamber	60.84 ft^3	65.88 ft^3	70.92 ft^3
	1.72 m^3	1.87 m^3	2.01 m^3
Min. Effective Depth	3.67'	4.17'	4.67'
	1.12 m	1.27 m	1.42 m
Stone Required Per Chamber	1.95 yd^3	2.42 yd^3	2.88 yd^3
	1.49 m^3	1.85 m^3	2.20 m^3

Recharger V8IHD Intermediate	Stone Foundation Depth 6" 152 mm	12" 305 mm	18" 457 mm
Chamber and Stone Storage Per Chamber	99.56 ft^3	107.81 ft^3	116.06 ft^3
	2.82 m^3	3.05 m^3	3.29 m^3
Min. Effective Depth	3.67'	4.17'	4.67'
	1.12 m	1.27 m	1.42 m
Stone Required Per Chamber	3.19 yd^3	3.95 yd^3	4.72 yd^3
	2.44 m^3	3.02 m^3	3.61 m^3

Includes 6" (152 mm) stone above crown of chamber and typical stone surround. Stone void calculated at 40%.

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JOB Easton Crossing - Easton (2683-01-27)
SHEET NO. 1 OF 1
CALCULATED BY FAB DATE Rev 10/31/14
CHECKED BY EAH DATE 10/31/14
SCALE WQV Retention Computations

- WQV retention computations were performed in response to SWGP requirement to retain the WQV (1" runoff) for new development sites.
  - WQV = 0.815 ac-ft
  - Recharger units from buildings (6 units/bld)

    48 lots ⇒ $48 \times 597.36\ ft^3/bld = 28,673\ ft^3 \approx 0.658$ ac-ft
  - Retention Area 210-A

    Volume = 0.196 ac-ft @ elev. 422.0
  - Retention Area 310

    Volume = 0.023 ac-ft
- Provided retention = 0.877 ac-ft > 0.815 ac-ft OK //

REVISED TR-20 INPUT COMPUTATIONS

Worksheet 2: Runoff curve number and runoff

Project: Easton Crossing (2683-01-27) By: FAB Date: Rev 10/31/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 10 - Proposed Conditions

** Adjusted for roofdrain leaders connected to infiltration galleries capable of storing 1.0" of runoff. See attached calculations.*

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
A	WOODS (GOOD)	30			2.72	81.50
A	OPEN SPACE / LAWN AREA (GOOD)	39			1.43	55.92
B	WOODS (GOOD)	55			4.55	250.06
B	OPEN SPACE / LAWN AREA (GOOD)	61			3.05	185.88
B	ROW CROPS (SR+CR) - GOOD	75			0.41	30.95
B	GRAVEL	85			0.01	1.05
C	OPEN SPACE / LAWN AREA (GOOD)	74			1.05	77.99
D	WOODS (GOOD)	77			5.86	451.31
D	OPEN SPACE / LAWN AREA (GOOD)	80			0.40	32.20
N/A	EXISTING BUILDING	98			0.23	22.78
N/A	EXISTING PAVED / IMPERVIOUS	98			1.76	172.54
W	WATER	98			2.29	224.53
N/A	PROPOSED PAVED / IMPERVIOUS	98			0.10	9.38
N/A	PROPOSED IMPERVIOUS (BUILDING) *	90			0.08	7.23
	Totals =				23.95	1603.32
					(0.03742	sq mi)

[1.] Use only one CN value source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{1603.32}{23.95}$ Use CN = **67**

Worksheet 2: Runoff curve number and runoff

Project: Easton Crossing (2683-01-27) By: FAB Date: Rev 10/31/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 11 - Proposed Conditions

** Adjusted for roofdrain leaders connected to infiltration galleries capable of storing 1.0" of runoff. See attached calculations.*

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	WOODS (GOOD)	55			1.78	98.04
B	OPEN SPACE / LAWN AREA (GOOD)	61			2.41	147.02
B	PASTURE, GRASSLAND	61			0.95	57.83
B	FALLOW - BARE SOIL	83			1.89	156.47
C	WOODS (GOOD)	70			0.80	55.86
C	OPEN SPACE / LAWN AREA (GOOD)	74			0.47	34.42
C	PASTURE, GRASSLAND	74			0.01	0.69
C	FALLOW - BARE SOIL	88			0.90	79.53
D	WOODS (GOOD)	77			1.48	113.99
D	OPEN SPACE / LAWN AREA (GOOD)	80			0.06	4.98
D	FALLOW - BARE SOIL	90			0.25	22.91
N/A	EXISTING BUILDING	98			0.09	8.73
N/A	EXISTING PAVED / IMPERVIOUS	98			0.38	37.14
N/A	PROPOSED PAVED / IMPERVIOUS	98			0.04	3.44
N/A	PROPOSED IMPERVIOUS (BUILDING) *	90			0.08	7.23
				Totals =	11.58	828.29
					(0.01810	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{828.29}{11.58}$$ Use CN = **72**

Worksheet 2: Runoff curve number and runoff

Project: Easton Crossing (2683-01-27) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 12 - Proposed Conditions

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area (Acres / Sq. Ft. / %)	Product of CN x Area
A	WOODS (GOOD)	30			3.51	105.41
A	OPEN SPACE / LAWN AREA (GOOD)	39			0.80	31.31
A	GRAVEL ROAD	76			0.03	2.38
B	WOODS (GOOD)	55			85.29	4,691.18
B	MEADOW	58			2.62	152.04
B	OPEN SPACE / LAWN AREA (GOOD)	61			18.92	1,154.10
B	ROW CROPS (SR+CR) - GOOD	75			0.91	68.56
B	FALLOW - BARE SOIL	83			0.22	18.11
B	GRAVEL ROAD	85			1.19	101.06
C	WOODS (GOOD)	70			9.57	669.78
C	OPEN SPACE / LAWN AREA (GOOD)	74			2.39	177.01
D	WOODS (GOOD)	77			27.88	2,146.49
D	OPEN SPACE / LAWN AREA (GOOD)	80			9.52	761.60
D	ROW CROPS (SR+CR) - GOOD	85			0.61	51.70
N/A	EXISTING BUILDING	98			5.40	529.31
N/A	EXISTING PAVED / IMPERVIOUS	98			14.53	1,423.80
W	WATER	98			3.55	347.45
				Totals =	186.94	12431.29
					(0.29210	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{12431.29}{186.94}$$ Use CN = **66**

Worksheet 2: Runoff curve number and runoff

Project: Easton Crossing (2683-01-27) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 13 - Proposed Conditions

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	WOODS (GOOD)	55			45.72	2,514.87
B	ORCHARD (GOOD)	58			6.37	369.19
B	OPEN SPACE / LAWN AREA (GOOD)	61			5.36	326.90
B	ROW CROPS (SR+CR) - GOOD	75			5.66	424.21
B	GRAVEL ROAD	85			0.07	6.08
C	WOODS (GOOD)	70			1.59	111.08
C	ORCHARD (GOOD)	72			1.18	85.05
C	OPEN SPACE / LAWN AREA (GOOD)	74			0.23	17.00
C	ROW CROPS (SR+CR) - GOOD	82			0.26	21.32
D	WOODS (GOOD)	77			14.53	1,118.43
D	OPEN SPACE / LAWN AREA (GOOD)	80			2.43	194.55
D	ROW CROPS (SR+CR) - GOOD	85			0.41	35.21
D	GRAVEL ROAD	91			0.16	14.58
N/A	EXISTING BUILDING	98			1.55	151.97
N/A	EXISTING PAVED / IMPERVIOUS	98			8.84	866.16
W	EXISTING POND	98			1.28	125.53
				Totals =	95.64	6382.11
					(0.14943	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{6382.11}{95.64} \quad \text{Use CN} = \boxed{67}$$

Worksheet 2: Runoff curve number and runoff

Project: Easton Crossing (2683-01-27) By: FAB Date: Rev 10/31/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 14 - Proposed Conditions

** Adjusted for roofdrain leaders connected to infiltration galleries capable of storing 1.0" of runoff. See attached calculations.*

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres / Sq. Ft. / %	Product of CN x Area
B	WOODS (GOOD)	55			0.17	9.34
B	OPEN SPACE / LAWN AREA (GOOD)	61			2.74	167.39
B	PASTURE, GRASSLAND	61			0.28	16.95
B	FALLOW - BARE SOIL	83			0.16	13.07
B	GRAVEL	85			0.02	1.78
C	WOODS (GOOD)	70			0.02	1.62
C	OPEN SPACE / LAWN AREA (GOOD)	74			0.32	23.47
C	PASTURE, GRASSLAND	74			0.01	0.91
C	FALLOW - BARE SOIL	88			0.02	1.55
D	OPEN SPACE / LAWN AREA (GOOD)	80			0.02	1.41
N/A	EXISTING BUILDING	98			0.04	3.72
N/A	EXISTING PAVED / IMPERVIOUS	98			0.26	25.26
N/A	PROPOSED PAVED / IMPERVIOUS	98			0.86	84.39
N/A	PROPOSED IMPERVIOUS (BUILDING) *	90			0.24	21.69
				Totals =	5.16	372.57
					(0.00806	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{372.57}{5.16}$$ Use CN = **72**

Worksheet 2: Runoff curve number and runoff

Project: Easton Crossing (2683-01-27) By: FAB Date: Rev 10/31/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 15 - Proposed Conditions

** Adjusted for roofdrain leaders connected to infiltration galleries capable of storing 1.0" of runoff. See attached calculations.*

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area (Acres / Sq. Ft. / %)	Product of CN x Area
A	WOODS (GOOD)	30			1.00	29.92
A	OPEN SPACE / LAWN AREA (GOOD)	39			1.52	59.27
A	GRAVEL	76			0.03	2.28
B	WOODS (GOOD)	55			0.57	31.60
B	OPEN SPACE / LAWN AREA (GOOD)	61			5.31	324.16
B	GRAVEL	85			0.08	6.71
D	OPEN SPACE / LAWN AREA (GOOD)	80			0.02	1.37
D	GRAVEL	91			0.02	1.43
N/A	PROPOSED PAVED / IMPERVIOUS	98			1.33	130.27
N/A	PROPOSED IMPERVIOUS (BUILDING) *	90			1.12	101.24
[1.] Use only one CN value source per line.				Totals =	11.00	688.24
					(0.01719 sq mi)	

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{688.24}{11.00}$ Use CN = **63**

Worksheet 2: Runoff curve number and runoff

Project: Easton Crossing (2683-01-27) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 20 - Proposed Conditions

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	WOODS (GOOD)	55			5.84	320.95
B	MEADOW	58			0.67	38.65
B	OPEN SPACE / LAWN AREA (GOOD)	61			2.31	140.71
B	FALLOW - BARE SOIL	83			1.15	95.55
B	GRAVEL	85			0.04	3.51
C	WOODS (GOOD)	70			2.90	203.12
C	MEADOW	71			0.78	55.28
C	OPEN SPACE / LAWN AREA (GOOD)	74			3.07	226.99
C	FALLOW - BARE SOIL	88			2.59	227.59
D	WOODS (GOOD)	77			16.96	1,305.91
D	MEADOW	78			0.08	6.09
D	OPEN SPACE / LAWN AREA (GOOD)	80			0.67	53.38
D	FALLOW - BARE SOIL	90			0.12	10.75
N/A	EXISTING BUILDING	98			0.37	36.47
N/A	EXISTING PAVED / IMPERVIOUS	98			0.68	66.65
N/A	PROPOSED PAVED / IMPERVIOUS	98			0.06	5.67
				Totals =	38.27	2797.28
					(0.05980	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{2797.28}{38.27}$$ Use CN = **73**

Worksheet 2: Runoff curve number and runoff

Project: Easton Crossing (2683-01-27) By: FAB Date: Rev 10/31/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 21 - Proposed Conditions

** Adjusted for roofdrain leaders connected to infiltration galleries capable of storing 1.0" of runoff. See attached calculations.*

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	WOODS (GOOD)	55			3.61	198.81
B	OPEN SPACE / LAWN AREA (GOOD)	61			4.21	256.80
B	GRAVEL	85			0.09	7.43
D	WOODS (GOOD)	77			1.58	121.52
D	OPEN SPACE / LAWN AREA (GOOD)	80			0.14	11.37
N/A	PROPOSED PAVED / IMPERVIOUS	98			0.84	82.47
N/A	PROPOSED IMPERVIOUS (BUILDING) *	90			0.72	65.08
[1.] Use only one CN value source per line.				Totals =	11.20	743.48
					(0.01750	sq mi)

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{743.48}{11.20}$ Use CN = **66**

Worksheet 2: Runoff curve number and runoff

Project: Easton Crossing (2683-01-27) By: FAB Date: Rev 10/31/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 22 - Proposed Conditions

** Adjusted for roofdrain leaders connected to infiltration galleries capable of storing 1.0" of runoff. See attached calculations.*

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	CN Value [1.] Figure 2-3	CN Value [1.] Figure 2-4	Area (Acres) Sq. Ft. %	Product of CN x Area
B	WOODS (GOOD)	55			4.92	270.53
B	OPEN SPACE / LAWN AREA (GOOD)	61			4.44	270.89
B	GRAVEL	85			0.05	4.66
D	OPEN SPACE / LAWN AREA (GOOD)	80			0.15	12.23
N/A	PROPOSED PAVED / IMPERVIOUS	98			1.25	122.23
N/A	PROPOSED IMPERVIOUS (BUILDING) *	90			0.56	50.62
				Totals =	11.38	731.16

(0.01778 sq mi)

[1.] Use only one CN value source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{731.16}{11.38}$ Use CN = **64**

Worksheet 2: Runoff curve number and runoff

Project: Easton Crossing (2683-01-27) By: FAB Date: Rev 10/31/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 23 - Proposed Conditions

** Adjusted for roofdrain leaders connected to infiltration galleries capable of storing 1.0" of runoff. See attached calculations.*

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	WOODS (GOOD)	55			0.40	22.20
B	OPEN SPACE / LAWN AREA (GOOD)	61			1.71	104.11
B	GRAVEL	85			0.07	5.96
D	WOODS (GOOD)	77			0.82	63.23
D	OPEN SPACE / LAWN AREA (GOOD)	80			0.50	39.71
N/A	PROPOSED PAVED / IMPERVIOUS	98			0.66	64.96
N/A	PROPOSED IMPERVIOUS (BUILDING) *	90			0.56	50.62
[1.] Use only one CN value source per line.				Totals =	4.72	350.79
					(0.00738 sq mi)	

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{350.79}{4.72}$ Use CN = **74**

Worksheet 2: Runoff curve number and runoff

Project: Easton Crossing (2683-01-27) By: FAB Date: Rev 10/31/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 24 - Proposed Conditions

** Adjusted for roofdrain leaders connected to infiltration galleries capable of storing 1.0" of runoff. See attached calculations.*

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	WOODS (GOOD)	55			1.45	79.82
B	OPEN SPACE / LAWN AREA (GOOD)	61			0.80	49.08
D	WOODS (GOOD)	77			0.79	61.08
D	OPEN SPACE / LAWN AREA (GOOD)	80			0.15	11.67
N/A	EXISTING BUILDING	98			0.03	3.41
N/A	EXISTING PAVED / IMPERVIOUS	98			0.05	5.25
N/A	PROPOSED IMPERVIOUS (BUILDING) *	90			0.08	7.23
Totals =					3.36	217.54
					(0.00526	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{217.54}{3.36} \quad \text{Use CN} = \boxed{65}$$

Worksheet 2: Runoff curve number and runoff

Project: Easton Crossing (2683-01-27) By: FAB Date: Rev 10/31/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 30 - Proposed Conditions

** Adjusted for roofdrain leaders connected to infiltration galleries capable of storing 1.0" of runoff. See attached calculations.*

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
A	WOODS (GOOD)	30			1.49	44.80
B	WOODS (GOOD)	55			32.18	1,770.06
B	ORCHARD OR TREE FARM	58			5.20	301.82
B	OPEN SPACE / LAWN AREA (GOOD)	61			8.12	495.27
B	ROW CROPS (SR+CR) - GOOD	75			0.49	36.44
B	FALLOW - BARE SOIL	83			0.48	39.95
B	GRAVEL ROAD	85			0.38	32.56
C	WOODS (GOOD)	70			0.84	58.96
C	OPEN SPACE / LAWN AREA (GOOD)	74			0.27	19.90
C	FALLOW - BARE SOIL	88			0.01	1.30
D	WOODS (GOOD)	77			23.42	1,802.99
D	OPEN SPACE / LAWN AREA (GOOD)	80			2.45	195.72
D	GRAVEL ROAD	91			0.11	10.44
N/A	EXISTING BUILDING	98			1.00	98.19
N/A	EXISTING PAVED / IMPERVIOUS	98			4.46	437.46
W	EXISTING POND	98			0.54	53.34
N/A	PROPOSED IMPERVIOUS (BUILDING) *	90			0.40	36.16
N/A	PROPOSED PAVED / IMPERVIOUS	98			0.25	24.88
				Totals =	82.12	5460.22
					(0.12831	sq mi)

[1.] Use only one CN value source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{5460.22}{82.12}$$ Use CN = **66**

Worksheet 2: Runoff curve number and runoff

Project: Easton Crossing (2683-01-27) By: FAB Date: 10/31/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 31 - Proposed Conditions

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B	OPEN SPACE / LAWN AREA (GOOD)	61			0.79	48.22
N/A	PROPOSED PAVED / IMPERVIOUS	98			0.29	28.14

[1.] Use only one CN value source per line.

Totals = 1.08 76.36
(0.00168 sq mi)

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{76.36}{1.08}$ Use CN = 71

Worksheet 2: Runoff curve number and runoff

Project: Easton Crossing (2683-01-27) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 40 - Proposed Conditions

1.) Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area (Acres) Sq. Ft. %	Product of CN x Area
B	WOODS (GOOD)	55			0.20	11.23
B	OPEN SPACE / LAWN AREA (GOOD)	61			0.15	8.96
Totals =					0.35	20.19
					(0.00055	sq mi)

[1.] Use only one CN value source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{20.19}{0.35}$ Use CN = **58**

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Easton Crossing (2683-01-26) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 10 - Proposed Conditions
Circle one: ***Tc*** T_t Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B				
1. Surface description (Table 3-1)			FRST				
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400				
3. Flow Length, L (< 300ft)	ft.		50.0				
4. Two-year 24-hr rainfall, P_2	in.		3.30				
5. Land slope, s	ft./ft.		0.110				
6. $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.102	=	0.102		

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C							
7. Surface description			FRST							
8. Manning's roughness coeff., n			0.100							
9. Paved or unpaved			UNPVD							
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40							
11. Flow Length, L	ft.		335.0							
12. Watercourse slope, s	ft./ft.		0.0400							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.62							
14. $T_t = \frac{L}{3600 * V}$	hr.		0.058	+		+		+	=	0.058

Channel flow

		Segment ID	C-D							
15. Channel Bottom width, b	ft.		5.00							
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		3.00							
17. Depth of flow, d	ft.		1.00							
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		8.00							
19. Wetted perimeter, P_w	ft.		11.32							
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.71							
21. Channel slope, s	ft./ft.		0.0400							
22. Manning's roughness coeff., n			0.040							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		5.91							
24. Flow length, L	ft.		90.0							
25. $T_t = \frac{L}{3600 * V}$	hr.		0.004	+	0.000	+	0.000	+	0.000	= 0.004
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	0.164

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Easton Crossing (2683-01-26) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 11 - Proposed Conditions
Circle one: ***Tc*** T_t Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)	ft.		65.0		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.009		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.337	=	0.337

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D					
7. Surface description			FRST		FRST					
8. Manning's roughness coeff., n			0.100		0.100					
9. Paved or unpaved			UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40					
11. Flow Length, L	ft.		330.0		260.0					
12. Watercourse slope, s	ft./ft.		0.0100		0.0231					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		0.81		1.23					
14. $T_t = \frac{L}{3600 * V}$	hr.		0.113	+	0.059	+		+	0.000	= 0.172

Channel flow

		Segment ID								
15. Channel Bottom width, b	ft.									
16. Horizontal side slope component, z (z horiz:1 vert)	ft.									
17. Depth of flow, d	ft.									
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$									
19. Wetted perimeter, P_w	ft.									
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.									
21. Channel slope, s	ft./ft.									
22. Manning's roughness coeff., n										
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.									
24. Flow length, L	ft.									
25. $T_t = \frac{L}{3600 * V}$	hr.					+		+		= 0.000
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)	hr.									0.509

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Easton Crossing (2683-01-26) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 12 - Proposed Conditions
Circle one: ***Tc*** T_t Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)		ft.	100.0		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.015		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.395	=	0.395

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E				
7. Surface description			FRST		FRST		FRST				
8. Manning's roughness coeff., n			0.100		0.100		0.100				
9. Paved or unpaved			UNPVD		UNPVD		UNPVD				
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40		0.40				
11. Flow Length, L		ft.	170.0		175.0		530.0				
12. Watercourse slope, s		ft./ft.	0.0200		0.0570		0.0120				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.14		1.93		0.89				
14. $T_t = \frac{L}{3600 * V}$		hr.	0.041	+	0.025	+	0.166	+	0.000	=	0.233

Channel flow

		Segment ID	E-F		F-G						
15. Channel Bottom width, b		ft.	3.00		5.00						
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		3.00		3.00						
17. Depth of flow, d		ft.	1.00		1.50						
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		6.00		14.25		0.00		0.00		
19. Wetted perimeter, P_w		ft.	9.32		14.49		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.64		0.98		0.00		0.00		
21. Channel slope, s		ft./ft.	0.0052		0.0080						
22. Manning's roughness coeff., n			0.040		0.040						
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	2.00		3.30		0.00		0.00		
24. Flow length, L		ft.	1935.0		1305.0						
25. $T_t = \frac{L}{3600 * V}$		hr.	0.269	+	0.110	+	0.000	+	0.000	=	0.379

26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25) hr. 1.007

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Easton Crossing (2683-01-26) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 13 - Proposed Conditions
Circle one: ***Tc*** T_t Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)		ft.	100.0		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.020		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.352	=	0.352

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D					
7. Surface description			FRST		FRST					
8. Manning's roughness coeff., n			0.100		0.100					
9. Paved or unpaved			UNPVD		UNPVD					
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40					
11. Flow Length, L		ft.	65.0		470.0					
12. Watercourse slope, s		ft./ft.	0.1539		0.0128					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	3.17		0.91					
14. $T_t = \frac{L}{3600 * V}$		hr.	0.006	+	0.143	+	0.000	+	0.000	= 0.149

Channel flow

		Segment ID	D-E		E-F		F-G		
15. Channel Bottom width, b		ft.	4.00		6.00		30" RCP		
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		3.00		3.00		---		
17. Depth of flow, d		ft.	0.50		1.00		FULL		
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		2.75		9.00		4.91		0.00
19. Wetted perimeter, P_w		ft.	7.16		12.32		7.85		0.00
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.38		0.73		0.63		0.00
21. Channel slope, s		ft./ft.	0.0050		0.0050		0.005		
22. Manning's roughness coeff., n			0.040		0.040		0.012		
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	1.39		2.14		6.42		0.00
24. Flow length, L		ft.	250.0		1450.0		1015.0		
25. $T_t = \frac{L}{3600 * V}$		hr.	0.050	+	0.189	+	0.044	+	0.000 = 0.282

26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25) hr. 0.783

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Easton Crossing (2683-01-26) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 14 - Proposed Conditions
Circle one: ***Tc*** T_t Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)		ft.	100.0		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.045		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.255	=	0.255

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E			
7. Surface description			FRST		GRSS		BIT			
8. Manning's roughness coeff., n			0.100		0.080		0.015			
9. Paved or unpaved			UNPVD		UNPVD		PVD			
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40		0.20			
11. Flow Length, L		ft.	30.0		35.0		100.0			
12. Watercourse slope, s		ft./ft.	0.0450		0.0200		0.0240			
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.72		1.43		5.26			
14. $T_t = \frac{L}{3600 * V}$		hr.	0.005	+	0.007	+	0.005	+	=	0.017

Channel flow

		Segment ID	E-F							
15. Channel Bottom width, b		ft.	15" CPP							
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		---							
17. Depth of flow, d		ft.	FULL							
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		1.23							
19. Wetted perimeter, P_w		ft.	3.93							
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.31							
21. Channel slope, s		ft./ft.	0.050							
22. Manning's roughness coeff., n			0.012							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	12.80							
24. Flow length, L		ft.	885.0							
25. $T_t = \frac{L}{3600 * V}$		hr.	0.019	+				+	=	0.019
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	0.291

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Easton Crossing (2683-01-26) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 15 - Proposed Conditions
Circle one: ***Tc*** T_t Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			GRSS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.300		
3. Flow Length, L (< 300ft)		ft.	40.0		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.020		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.135	=	0.135

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C							
7. Surface description			GRSS							
8. Manning's roughness coeff., n			0.080							
9. Paved or unpaved			UNPVD							
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40							
11. Flow Length, L		ft.	250.0							
12. Watercourse slope, s		ft./ft.	0.0760							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	2.79							
14. $T_t = \frac{L}{3600 * V}$		hr.	0.025	+		+		+	=	0.025

Channel flow

		Segment ID	F-G							
15. Channel Bottom width, b		ft.	15" CPP							
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		---							
17. Depth of flow, d		ft.	FULL							
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		1.23							
19. Wetted perimeter, P_w		ft.	3.93							
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.31							
21. Channel slope, s		ft./ft.	0.040							
22. Manning's roughness coeff., n			0.012							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	11.45							
24. Flow length, L		ft.	760.0							
25. $T_t = \frac{L}{3600 * V}$		hr.	0.018	+		+		+	=	0.018
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	0.178

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Easton Crossing (2683-01-26) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 20 - Proposed Conditions
Circle one: ***Tc*** T_t Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)		ft.	100.0		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.007		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.536	=	0.536

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C	C-D	D-E		
7. Surface description			FRST	FRST	FRST		
8. Manning's roughness coeff., n			0.100	0.100	0.100		
9. Paved or unpaved			UNPVD	UNPVD	UNPVD		
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40	0.40	0.40		
11. Flow Length, L		ft.	335.0	320.0	145.0		
12. Watercourse slope, s		ft./ft.	0.0319	0.0875	0.0414		
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.45	2.39	1.09		
14. $T_t = \frac{L}{3600 * V}$		hr.	0.064	+ 0.037	+ 0.037	+	= 0.138

Channel flow

		Segment ID	E-F				
15. Channel Bottom width, b		ft.	3.00				
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		3.00				
17. Depth of flow, d		ft.	1.00				
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		6.00				
19. Wetted perimeter, P_w		ft.	9.32				
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.64				
21. Channel slope, s		ft./ft.	0.0050				
22. Manning's roughness coeff., n			0.040				
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	1.96				
24. Flow length, L		ft.	130.0				
25. $T_t = \frac{L}{3600 * V}$		hr.	0.018	+	+ 0.000	+ 0.000	= 0.018
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)						hr.	0.693

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Easton Crossing (2683-01-26) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 21 - Proposed Conditions
Circle one: ***Tc*** T_t Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			GRSS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.300		
3. Flow Length, L (< 300ft)		ft.	90.0		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.050		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.178	=	0.178

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E		E-F		
7. Surface description			GRSS		FRST		FRST		GRSS		
8. Manning's roughness coeff., n			0.080		0.100		0.100		0.080		
9. Paved or unpaved			UNPVD		UNPVD		UNPVD		UNPVD		
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40		0.40		0.40		
11. Flow Length, L		ft.	205.0		360.0		350.0		45.0		
12. Watercourse slope, s		ft./ft.	0.0350		0.0690		0.0083		0.3000		
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.89		2.12		0.74		5.54		
14. $T_t = \frac{L}{3600 * V}$		hr.	0.030	+	0.047	+	0.132	+	0.002	=	0.211

Channel flow

		Segment ID									
15. Channel Bottom width, b		ft.									
16. Horizontal side slope component, z (z horiz:1 vert)	ft.										
17. Depth of flow, d		ft.									
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$										
19. Wetted perimeter, P_w		ft.									
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.									
21. Channel slope, s		ft./ft.									
22. Manning's roughness coeff., n											
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.									
24. Flow length, L		ft.									
25. $T_t = \frac{L}{3600 * V}$		hr.		+	0.000	+	0.000	+	0.000	=	0.000
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)											0.389
										hr.	

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Easton Crossing (2683-01-26) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 22 - Proposed Conditions
Circle one: ***Tc*** T_t Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)		ft.	100.0		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.018		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.368	=	0.368

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C	C-D				
7. Surface description			FRST	GRSS				
8. Manning's roughness coeff., n			0.100	0.080				
9. Paved or unpaved			UNPVD	UNPVD				
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40	0.40				
11. Flow Length, L		ft.	555.0	10.0				
12. Watercourse slope, s		ft./ft.	0.0125	0.0125				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	0.90	1.13				
14. $T_t = \frac{L}{3600 * V}$		hr.	0.170	+ 0.002	+	+	=	0.173

Channel flow

		Segment ID	D-E					
15. Channel Bottom width, b		ft.	15" RCP					
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		---					
17. Depth of flow, d		ft.	FULL					
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		1.23					
19. Wetted perimeter, P_w		ft.	3.93					
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.31					
21. Channel slope, s		ft./ft.	0.010					
22. Manning's roughness coeff., n			0.012					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	5.72					
24. Flow length, L		ft.	325.0					
25. $T_t = \frac{L}{3600 * V}$		hr.	0.016	+	+	+	=	0.016
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)							hr.	0.556

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Easton Crossing (2683-01-26) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 23 - Proposed Conditions
Circle one: ***Tc*** T_t Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)		ft.	55.0		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.025		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.200	=	0.200

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E			
7. Surface description			FRST		GRSS		BIT			
8. Manning's roughness coeff., n			0.100		0.080		0.015			
9. Paved or unpaved			UNPVD		UNPVD		PVD			
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40		0.20			
11. Flow Length, L		ft.	110.0		90.0		40.0			
12. Watercourse slope, s		ft./ft.	0.0455		0.0400		0.0400			
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.72		2.02		6.79			
14. $T_t = \frac{L}{3600 * V}$		hr.	0.018	+	0.012	+	0.002	+	=	0.032

Channel flow

		Segment ID	E-F							
15. Channel Bottom width, b		ft.	15" RCP							
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		---							
17. Depth of flow, d		ft.	FULL							
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		1.23							
19. Wetted perimeter, P_w		ft.	3.93							
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.31							
21. Channel slope, s		ft./ft.	0.100							
22. Manning's roughness coeff., n			0.012							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	18.10							
24. Flow length, L		ft.	305.0							
25. $T_t = \frac{L}{3600 * V}$		hr.	0.005	+		+	0.000	+	0.000	= 0.005
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										0.236
									hr.	

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Easton Crossing (2683-01-26) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 24 - Proposed Conditions
Circle one: ***Tc*** T_t Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			GRSS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.300		
3. Flow Length, L (< 300ft)		ft.	65.0		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.020		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.198	=	0.198

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E			
7. Surface description			GRSS		FRST		FRST			
8. Manning's roughness coeff., n			0.080		0.100		0.100			
9. Paved or unpaved			UNPVD		UNPVD		UNPVD			
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40		0.40			
11. Flow Length, L		ft.	50.0		150.0		270.0			
12. Watercourse slope, s		ft./ft.	0.0200		0.0200		0.0741			
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.43		1.14		2.20			
14. $T_t = \frac{L}{3600 * V}$		hr.	0.010	+	0.036	+	0.034		=	0.080

Channel flow

		Segment ID	E-F							
15. Channel Bottom width, b		ft.	1.00							
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		2.00							
17. Depth of flow, d		ft.	1.00							
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		3.00							
19. Wetted perimeter, P_w		ft.	5.47							
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.55							
21. Channel slope, s		ft./ft.	0.0100							
22. Manning's roughness coeff., n			0.040							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	2.50							
24. Flow length, L		ft.	135.0							
25. $T_t = \frac{L}{3600 * V}$		hr.	0.015	+		+	0.000	+	0.000	= 0.015
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	0.294

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Easton Crossing (2683-01-26) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 30 - Proposed Conditions
Circle one: ***Tc*** T_t Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)		ft.	100.0		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.015		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.395	=	0.395

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C	C-D			
7. Surface description			FRST	FRST			
8. Manning's roughness coeff., n			0.100	0.100			
9. Paved or unpaved			UNPVD	UNPVD			
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40	0.40			
11. Flow Length, L		ft.	540.0	410.0			
12. Watercourse slope, s		ft./ft.	0.0417	0.0080			
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.65	0.72			
14. $T_t = \frac{L}{3600 * V}$		hr.	0.091	+ 0.157	+	+ 0.000	= 0.248

Channel flow

		Segment ID	D-E	E-F			
15. Channel Bottom width, b		ft.	3.00	18" RCP			
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		2.00	---			
17. Depth of flow, d		ft.	0.50	FULL			
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		2.00	1.77		0.00	
19. Wetted perimeter, P_w		ft.	5.24	4.71		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.38	0.38		0.00	
21. Channel slope, s		ft./ft.	0.0367	0.042			
22. Manning's roughness coeff., n			0.040	0.012			
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	3.76	13.25		0.00	
24. Flow length, L		ft.	545.0	1085.0			
25. $T_t = \frac{L}{3600 * V}$		hr.	0.040	+ 0.023	+	+ 0.000	= 0.063
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)						hr.	0.707

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Easton Crossing (2683-01-27) By: FAB Date: 10/31/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 31 - Proposed Conditions
Circle one: ***Tc*** T_t Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			GRSS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.300		
3. Flow Length, L (< 300ft)	ft.		30.0		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.025		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.098	=	0.098

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C	C-D				
7. Surface description			GRSS	BIT				
8. Manning's roughness coeff., n			0.080	0.015				
9. Paved or unpaved			UNPVD	PVD				
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40	0.20				
11. Flow Length, L	ft.		80.0	175.0				
12. Watercourse slope, s	ft./ft.		0.0250	0.1000				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.60	10.74				
14. $T_t = \frac{L}{3600 * V}$	hr.		0.014	+ 0.005	+	+	=	0.018

Channel flow

		Segment ID	F-G				
15. Channel Bottom width, b	ft.		15" RCP				
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		---				
17. Depth of flow, d	ft.		FULL				
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		1.23			0.00	
19. Wetted perimeter, P_w	ft.		3.93			0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.31			0.00	
21. Channel slope, s	ft./ft.		0.020				
22. Manning's roughness coeff., n			0.012				
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		8.09			0.00	
24. Flow length, L	ft.		45.0				
25. $T_t = \frac{L}{3600 * V}$	hr.		0.002	+	+	+ 0.000	= 0.002
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)						hr.	0.118

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: Easton Crossing (2683-01-26) By: FAB Date: 08/04/14
Location: Easton, CT Checked: Date:
Circle one: Present ***Developed*** Watershed: WS 40 - Proposed Conditions
Circle one: ***Tc*** T_t Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			FRST		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)	ft.		15.0		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.050		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.054	=	0.054

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C				
7. Surface description			FRST				
8. Manning's roughness coeff., n			0.100				
9. Paved or unpaved			UNPVD				
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40				
11. Flow Length, L	ft.		135.0				
12. Watercourse slope, s	ft./ft.		0.0500				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.81				
14. $T_t = \frac{L}{3600 * V}$	hr.		0.021	+	+	+ 0.000	= 0.021

Channel flow

		Segment ID					
15. Channel Bottom width, b	ft.						
16. Horizontal side slope component, z (z horiz:1 vert)	ft.						
17. Depth of flow, d	ft.						
18. Cross sectional flow area, A (assume trapazoidal)	ft.^{2}						
19. Wetted perimeter, P_w	ft.						
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.						
21. Channel slope, s	ft./ft.						
22. Manning's roughness coeff., n							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.						
24. Flow length, L	ft.						
25. $T_t = \frac{L}{3600 * V}$	hr.			+	+	+	= 0.000
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)							0.074 hr.

TC MIN = 0.10 HRS.

Detention Basin 140: 2.0'w by 2.5'h V-notch Weir w/ 4.0" Orifice at Elev. 405.0

Elevation (ft)	H_{OR} (ft)	Q_{OR} (cfs)	H_V (ft)	Q_V (cfs)	H_{OV} (ft)	Q_{OV} (cfs)	Q_{TOT} (cfs)
405.0	0.00	0.00	0.0	0.00	0.0	0.00	**0.00**
406.0	0.83	0.38	0.0	0.00	0.0	0.00	**0.38**
407.0	1.83	0.57	0.5	0.18	0.0	0.00	**0.75**
408.0	2.83	0.71	1.5	2.76	0.0	0.00	**3.46**
409.0	3.83	0.82	2.5	9.88	0.0	0.00	**10.70**
410.0	4.83	0.92	3.5	22.92	1.0	24.78	**48.62**

Detention Basin 150: 2.5'w by 2.0'h V-notch Weir

Elevation (ft)	H_{OR} (ft)	Q_{OR} (cfs)	H_V (ft)	Q_V (cfs)	H_{OV} (ft)	Q_{OV} (cfs)	Q_{TOT} (cfs)
401.0	0.00	0.00	0.0	0.00	0.0	0.00	**0.00**
402.0	0.00	0.00	0.0	0.00	0.0	0.00	**0.00**
403.0	0.00	0.00	0.0	0.00	0.0	0.00	**0.00**
404.0	0.00	0.00	0.0	0.00	0.0	0.00	**0.00**
405.0	0.00	0.00	0.0	0.00	0.0	0.00	**0.00**
406.0	0.00	0.00	1.0	1.56	0.0	0.00	**1.56**
407.0	0.00	0.00	2.0	8.84	0.0	0.00	**8.84**
408.0	0.00	0.00	3.0	24.36	1.0	24.78	**49.14**

Detention Basin 210: 1.5'w by 2.0'h V-notch Weir w/ 4.0" Orifice at Elev. 398.0

Elevation (ft)	H_{OR} (ft)	Q_{OR} (cfs)	H_V (ft)	Q_V (cfs)	H_{OV} (ft)	Q_{OV} (cfs)	Q_{TOT} (cfs)
398.0	0.00	0.00	0.0	0.00	0.0	0.00	**0.00**
399.0	0.83	0.38	0.0	0.00	0.0	0.00	**0.38**
400.0	1.83	0.57	0.0	0.00	0.0	0.00	**0.57**
401.0	2.83	0.71	0.0	0.00	0.0	0.00	**0.71**
402.0	3.83	0.82	1.0	0.94	0.0	0.00	**1.76**
403.0	4.83	0.92	2.0	5.30	0.0	0.00	**6.23**
404.0	5.83	1.01	3.0	14.61	1.0	24.78	**40.41**

Detention Basin 220: 1.75'w by 2.0'h V-notch Weir w/ 4.0" Orifice at Elev. 443.0

Elevation (ft)	H_{OR} (ft)	Q_{OR} (cfs)	H_V (ft)	Q_V (cfs)	H_{OV} (ft)	Q_{OV} (cfs)	Q_{TOT} (cfs)
443.0	0.00	0.00	0.00	0.00	0.0	0.00	**0.00**
444.0	0.83	0.38	0.00	0.00	0.0	0.00	**0.38**
445.0	1.83	0.57	0.00	0.00	0.0	0.00	**0.57**
446.0	2.83	0.71	1.00	1.09	0.0	0.00	**1.80**
447.0	3.83	0.82	2.00	6.19	0.0	0.00	**7.01**
448.0	4.83	0.92	3.00	17.05	1.0	24.78	**42.75**

Detention Basin 230: 1.75'w by 2.5'h V-notch Weir w/ 4.0" Orifice at Elev. 401.0

Elevation (ft)	H_{OR} (ft)	Q_{OR} (cfs)	H_V (ft)	Q_V (cfs)	H_{OV} (ft)	Q_{OV} (cfs)	Q_{TOT} (cfs)
401.0	0.00	0.00	0.0	0.00	0.0	0.00	**0.00**
402.0	0.83	0.38	0.0	0.00	0.0	0.00	**0.38**
403.0	1.83	0.57	0.5	0.15	0.0	0.00	**0.72**
404.0	2.83	0.71	1.5	2.41	0.0	0.00	**3.12**
405.0	3.83	0.82	2.5	8.65	0.0	0.00	**9.47**
406.0	4.83	0.92	3.5	20.05	1.0	24.78	**45.76**

Detention Basin 310: 15.0" Outlet pipe at Elev. 568.5

Elevation (ft)	H_{OR} (ft)	Q_{OR} (cfs)	H_V (ft)	Q_V (cfs)	H_{OV} (ft)	Q_{OV} (cfs)	Q_{TOT} (cfs)
567.0	0.00	0.00	0.0	0.00	0.0	0.00	**0.00**
567.5	0.00	0.00	0.0	0.00	0.0	0.00	**0.00**
568.0	0.00	0.00	0.0	0.00	0.0	0.00	**0.00**
568.5	0.00	0.00	0.0	0.00	0.0	0.00	**0.00**
569.5	0.38	3.62	0.0	0.00	0.0	0.00	**3.62**
570.0	0.88	5.53	0.0	0.00	0.0	0.00	**5.53**
570.17	1.05	6.05	0.0	0.00	0.0	0.00	**6.05**
570.67	1.55	7.36	0.0	0.00	0.0	0.00	**7.36**

Detention Basin 140:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
405.0	5,400.0	0.0	0.000	**0.000**
406.0	7,325.0	6,362.5	0.146	**0.146**
407.0	8,750.0	8,037.5	0.185	**0.331**
408.0	10,075.0	9,412.5	0.216	**0.547**
409.0	11,550.0	10,812.5	0.248	**0.795**
410.0	13,075.0	12,312.5	0.283	**1.078**

Detention Basin 150:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
401.0	2,900.0	0.0	0.000	**0.000**
402.0	3,725.0	3,312.5	0.076	**0.076**
403.0	4,625.0	4,175.0	0.096	**0.172**
404.0	5,625.0	5,125.0	0.118	**0.290**
405.0	12,000.0	8,812.5	0.202	**0.492**
406.0	16,575.0	14,287.5	0.328	**0.820**
407.0	21,300.0	18,937.5	0.435	**1.255**
408.0	25,450.0	23,375.0	0.537	**1.791**

Detention Basin 210:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
398.0	8,075.0	0.0	0.000	**0.000**
399.0	9,875.0	8,975.0	0.206	**0.206**
400.0	11,875.0	10,875.0	0.250	**0.456**
401.0	13,925.0	12,900.0	0.296	**0.752**
402.0	15,675.0	14,800.0	0.340	**1.092**
403.0	17,500.0	16,587.5	0.381	**1.472**
404.0	19,375.0	18,437.5	0.423	**1.896**

Detention Basin 220:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
443.0	9,625.0	0.0	0.000	**0.000**
444.0	11,975.0	10,800.0	0.248	**0.248**
445.0	14,650.0	13,312.5	0.306	**0.554**
446.0	16,050.0	15,350.0	0.352	**0.906**
447.0	17,600.0	16,825.0	0.386	**1.292**
448.0	19,175.0	18,387.5	0.422	**1.714**

Detention Basin 230:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
401.0	3,250.0	0.0	0.000	**0.000**
402.0	4,550.0	3,900.0	0.090	**0.090**
403.0	6,050.0	5,300.0	0.122	**0.211**
404.0	7,575.0	6,812.5	0.156	**0.368**
405.0	9,375.0	8,475.0	0.195	**0.562**
406.0	11,450.0	10,412.5	0.239	**0.801**

Detention Basin 310:

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft) *
567.0	---	---	---	**0.000**
567.5	---	---	---	**0.0024**
568.0	---	---	---	**0.0062**
568.5	---	---	---	**0.0098**
569.5	---	---	---	**0.0167**
570.0	---	---	---	**0.0196**
570.17	---	---	---	**0.0204**
570.67	---	---	---	**0.0229**

* See attached spreadsheet for Cultec Recharger V8HD system

PROJECT INFORMATION:

Easton Crossing - Easton, CT (2683-01-27)

System Information:

40	stone void (%)		
530	sq. ft. area	49.24	m^2 area
42	ft. of chambers	12.80	m of chambers
0	ft. of feed connectors *(exposed)*	0.00	m of feed connectors *(exposed)*

INCREMENTAL STORAGE FOR CULTEC RECHARGER V8HD SYSTEM

TOP OF SYSTEM	Elevation				Chamber Volume		HVLV F-110X4 Feed Connector Volume		Stone Volume		Cumulative Storage Volume		Total Cumulative Storage Volume	
	Cumulative Elevation				per inch	per 25.4 mm	per inch	per 25.4 mm	per inch	per 25.4 mm	per inch	per 25.4 mm	per inch	per 25.4 mm
	inches	mm	inches	mm	ft^3	m^3	ft^3	m^3	ft^3	m^3	ft^3	m^3	ft^3	m^3
STONE ABOVE	44	1118	6	152					17.67	0.50	17.67	0.50	996.04	28.21
	43	1092	5	127					17.67	0.50	17.67	0.50	978.38	27.71
	42	1067	4	102					17.67	0.50	17.67	0.50	960.71	27.21
	41	1041	3	76					17.67	0.50	17.67	0.50	943.04	26.71
	40	1016	2	51					17.67	0.50	17.67	0.50	925.38	26.21
	39	991	1	25					17.67	0.50	17.67	0.50	907.71	25.71
CHAMBER HEIGHT	38	965	32	813	0.25	0.01			17.57	0.50	17.82	0.50	890.04	25.21
	37	940	31	787	1.13	0.03			17.21	0.49	18.35	0.52	872.23	24.70
	36	914	30	762	1.68	0.05			16.99	0.48	18.67	0.53	853.88	24.18
	35	889	29	737	3.53	0.10			16.26	0.46	19.78	0.56	835.20	23.65
	34	864	28	711	5.42	0.15			15.50	0.44	20.92	0.59	815.42	23.09
	33	838	27	686	6.68	0.19			15.00	0.42	21.67	0.61	794.50	22.50
	32	813	26	660	7.69	0.22			14.59	0.41	22.28	0.63	772.83	21.89
	31	787	25	635	8.57	0.24			14.24	0.40	22.81	0.65	750.55	21.26
	30	762	24	610	9.32	0.26			13.94	0.39	23.26	0.66	727.74	20.61
	29	737	23	584	10.00	0.28			13.67	0.39	23.66	0.67	704.48	19.95
	28	711	22	559	10.58	0.30			13.43	0.38	24.02	0.68	680.82	19.28
	27	686	21	533	11.13	0.32			13.21	0.37	24.34	0.69	656.80	18.60
	26	660	20	508	11.63	0.33			13.01	0.37	24.65	0.70	632.46	17.91
	25	635	19	483	12.05	0.34			12.85	0.36	24.90	0.71	607.81	17.21
	24	610	18	457	12.52	0.35	0.00	0.00	12.66	0.36	25.18	0.71	582.91	16.51
	23	584	17	432	12.89	0.37	0.00	0.00	12.51	0.35	25.40	0.72	557.73	15.80
	22	559	16	406	13.23	0.37	0.00	0.00	12.37	0.35	25.60	0.73	532.33	15.08
	21	533	15	381	13.57	0.38	0.00	0.00	12.24	0.35	25.81	0.73	506.73	14.35
	20	508	14	356	13.82	0.39	0.00	0.00	12.14	0.34	25.96	0.74	480.92	13.62
	19	483	13	330	14.11	0.40	0.00	0.00	12.02	0.34	26.13	0.74	454.96	12.88
	18	457	12	305	14.45	0.41	0.00	0.00	11.89	0.34	26.34	0.75	428.83	12.14
	17	432	11	279	14.70	0.42	0.00	0.00	11.79	0.33	26.49	0.75	402.49	11.40
	16	406	10	254	14.78	0.42	0.00	0.00	11.75	0.33	26.54	0.75	376.01	10.65
	15	381	9	229	15.41	0.44	0.00	0.00	11.50	0.33	26.92	0.76	349.47	9.90
	14	356	8	203	15.50	0.44	0.00	0.00	11.47	0.32	26.97	0.76	322.56	9.13
	13	330	7	178	15.54	0.44	0.00	0.00	11.45	0.32	26.99	0.76	295.59	8.37
	12	305	6	152	15.58	0.44	0.00	0.00	11.43	0.32	27.02	0.77	268.60	7.61
	11	279	5	127	15.62	0.44	0.00	0.00	11.42	0.32	27.04	0.77	241.58	6.84
	10	254	4	102	15.62	0.44	0.00	0.00	11.42	0.32	27.04	0.77	214.54	6.08
	9	229	3	76	15.67	0.44	0.00	0.00	11.40	0.32	27.07	0.77	187.50	5.31
	8	203	2	51	15.75	0.45	0.00	0.00	11.37	0.32	27.12	0.77	160.43	4.54
	7	178	1	25	16.09	0.46	0.00	0.00	11.23	0.32	27.32	0.77	133.32	3.78
STONE BASE	6	152	6	152					17.67	0.50	17.67	0.50	106.00	3.00
	5	127	5	127					17.67	0.50	17.67	0.50	88.33	2.50
	4	102	4	102					17.67	0.50	17.67	0.50	70.67	2.00
	3	76	3	76					17.67	0.50	17.67	0.50	53.00	1.50
	2	51	2	51					17.67	0.50	17.67	0.50	35.33	1.00
	1	25	1	25					17.67	0.50	17.67	0.50	17.67	0.50
	0	0	0	0					0.00	0.00	0.00	0.00	0.00	0.00
BOTTOM OF SYSTEM					Chamber Volume		HVLV F-110X4 Feed Connector Volume		Stone Volume		Cumulative Storage Volume		Total Cumulative Storage Volume	
					364.52 ft^3	10.32 m^3	0.00 ft^3	0.00 m^3	631.53 ft^3	17.88 m^3	996.04 ft^3	28.21 m^3	996.04 ft^3	28.21 m^3

CULTEC, Inc.
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REVISED TR-20 SUMMARY TABLE

TR-20 Peak Flowrate (cfs) Summary
Existing vs. Proposed Conditions

Study Area	2yr Storm		10yr Storm		25yr Storm		50yr Storm		100yr Storm	
	Ex	Pr	Ex	Pr	Ex	Pr	Ex	Pr	Ex	Pr
B	43	43	74	73	81	81	157	153	258	253
C	9	9	42	34	60	49	78	64	110	86
D	28	26	78	75	102	98	126	122	155	151
E	0	0	1	0	2	0	2	0	3	0

Study Area:	Description:
B	Southeast - 36" RCP under Sport Hill Road - Existing pond outfall
C	Northwest - Existing channel at the northwest corner of the property
D	Southwest - Existing pond adjacent to Bibbins Road
E	West - Western most property boundary

JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

Engineering, Planning,
Landscape Architecture
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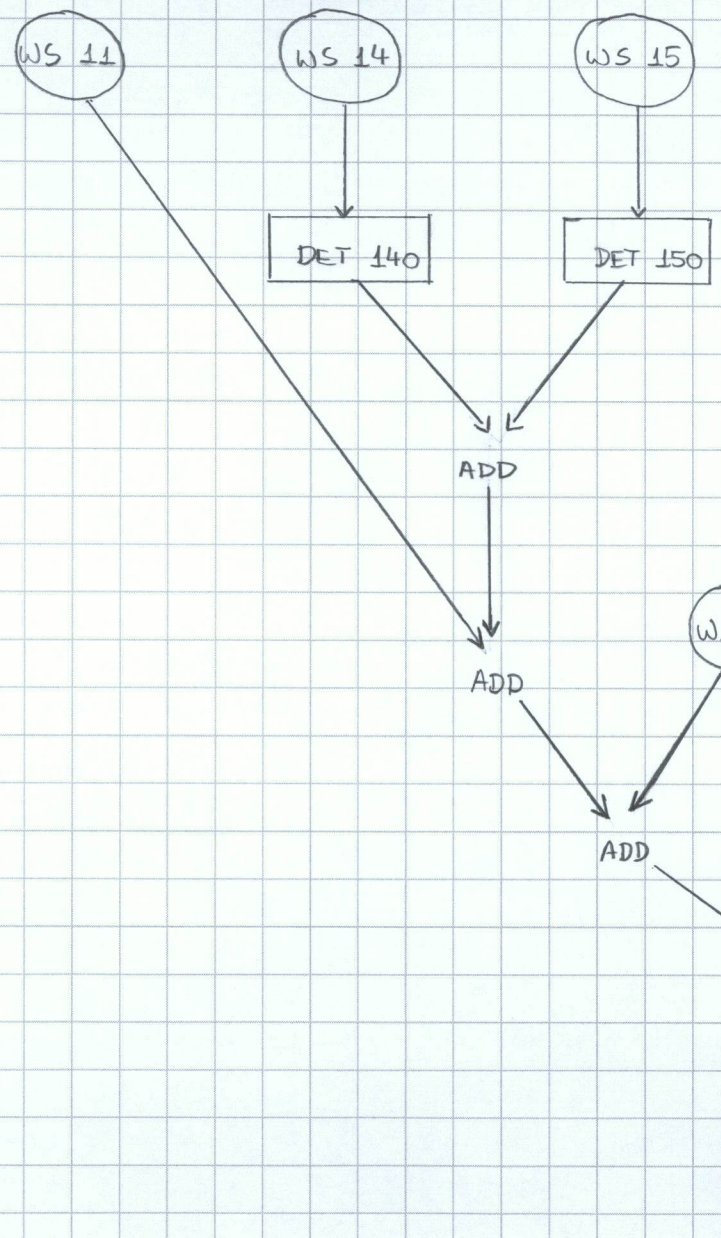
• Flow Chart to Analysis Point B



2-year flows (cfs):

		Inflow	Outflow
DET 140	____	4	0
DET 150	____	4	0

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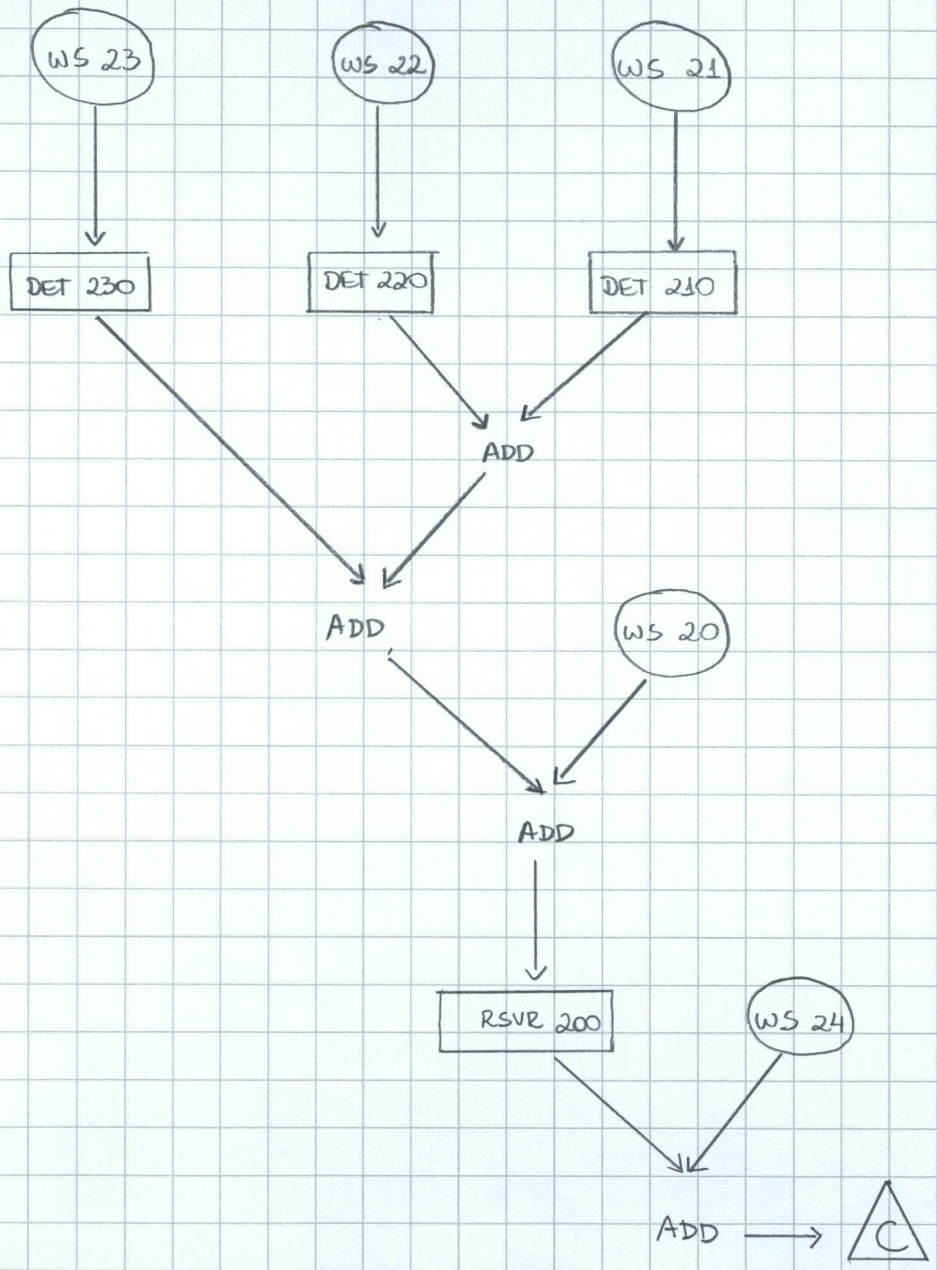
JOB _____ SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

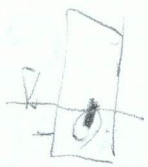
• Flow Chart to Analysis Point C



2-year flows (cfs):

	Inflow	Outflow
DET 210	5	0
DET 220	3	0
DET 230	4	0

REVISED TR-20 COMPUTER MODELS AND RESULTS



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**********80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY**********

```
JOB TR-20                                                SUMMARY   NOPLOTS
TITLE     SADDLE RIDGE SUBDIVISION - EASTON, CT (2683-01-27):  PR COND WITH DET
TITLE     MILONE & MACBROOM INC., CHESHIRE, CT                       REV 10/31/14
  5 RAINFL 3              0.25
  8          0.0          0.0025       0.005        0.0075       0.010
  8          0.0125       0.015        0.0175       0.020        0.023
  8          0.026        0.0285       0.031        0.034        0.037
  8          0.040        0.043        0.0465       0.050        0.0535
  8          0.057        0.0605       0.064        0.068        0.072
  8          0.076        0.080        0.084        0.089        0.094
  8          0.100        0.107        0.115        0.122        0.130
  8          0.139        0.148        0.157        0.167        0.178
  8          0.189        0.202        0.216        0.231        0.250
  8          0.271        0.298        0.345        0.500        0.655
  8          0.702        0.729        0.751        0.769        0.785
  8          0.798        0.811        0.823        0.834        0.844
  8          0.853        0.862        0.870        0.878        0.886
  8          0.893        0.900        0.906        0.911        0.916
  8          0.920        0.924        0.928        0.932        0.936
  8          0.940        0.944        0.9475       0.951        0.954
  8          0.957        0.960        0.963        0.966        0.969
  8          0.972        0.975        0.978        0.981        0.9835
  8          0.986        0.9885       0.991        0.9935       0.996
  8          0.998        1.000        1.000        1.000        1.000
  9 ENDTBL
  3 STRUCT      10
  8                       387.6        0.00         0.000                RESV 100
  8                       389.0        10.30        0.001                EXIST.
  8                       389.7        20.50        0.007                POND
  8                       390.0        25.00        0.342
  8                       391.0        40.00        3.013
  8                       392.0        53.00        6.496
  8                       393.0        64.00        10.845
  8                       394.0        73.00        16.305
  8                       395.0        80.00        22.864
  8                       395.3        82.00        25.031
  8                       396.0        200.79       30.497
  8                       396.5        347.65       34.759
  9 ENDTBL
  3 STRUCT      14
  8                       405.0        0.00         0.000                DET 140
  8                       406.0        0.38         0.146                2.0 x
  8                       407.0        0.75         0.331                2.5 V
  8                       408.0        3.46         0.547                4" OR
  8                       409.0        10.70        0.795                @405.0
  8                       410.0        48.62        1.078
```

1

**********80-80 LIST OF INPUT DATA (CONTINUED)**********

```
  9 ENDTBL
  3 STRUCT      15
  8                       401.0        0.00         0.000                DET 150
  8                       402.0        0.0001       0.076                2.5 x
  8                       403.0        0.0002       0.172                2.0 V
  8                       404.0        0.0003       0.290                NO OR
  8                       405.0        0.0004       0.492
  8                       406.0        1.56         0.820
  8                       407.0        8.84         1.255
  8                       408.0        49.14        1.791
  9 ENDTBL
  3 STRUCT      20
  8                       390.0        0.00         0.000                RESV 200
  8                       390.5        3.79         0.818                EXIST.
  8                       391.0        16.69        1.952                POND
  8                       391.5        78.44        3.404
  8                       392.0        277.33       5.172
  9 ENDTBL
  3 STRUCT      21
  8                       398.0        0.00         0.000                DET 210
  8                       399.0        0.38         0.206                1.5 x
```

```
                                                    SRPRCD30
  8                        400.0       0.57         0.456                  2.0 V
  8                        401.0       0.71         0.752                  4" OR
  8                        402.0       1.76         1.092                  @398.0
  8                        403.0       6.23         1.472
  8                        404.0       40.41        1.896
  9 ENDTBL
  3 STRUCT       22
  8                        443.0       0.00         0.000                  DET 220
  8                        444.0       0.38         0.248                  1.75 x
  8                        445.0       0.57         0.554                  2.0 V
  8                        446.0       1.80         0.906                  4" OR
  8                        447.0       7.01         1.292                  @443.0
  8                        448.0       42.75        1.714
  9 ENDTBL
  3 STRUCT       23
  8                        401.0       0.00         0.000                  DET 230
  8                        402.0       0.38         0.090                  1.75 x
  8                        403.0       0.72         0.211                  2.5 V
  8                        404.0       3.12         0.368                  4" OR
  8                        405.0       9.47         0.562                  @401.0
  8                        406.0       45.76        0.801
  9 ENDTBL
  3 STRUCT       31
  8                        567.0       0.00         0.000                  DET 310
  8                        567.5       0.0001       0.0024                 15" OUT
1
```

```
**********80-80 LIST OF INPUT DATA (CONTINUED)**********
  8                        568.0       0.0002       0.0062                 @568.5
  8                        568.5       0.0003       0.0098
  8                        569.5       3.62         0.0167
  8                        570.0       5.53         0.0196
  8                        570.17      6.05         0.0204
  8                        570.67      7.36         0.0229
  9 ENDTBL
  6 RUNOFF 1 001       1 0.01810      72.0         0.509                  WS 11
  6 RUNOFF 1 002       2 0.00806      72.0         0.291                  WS 14
  6 RESVOR 2    14 2   3                                                  DET 140
  6 RUNOFF 1 003       4 0.01719      63.0         0.178                  WS 15
  6 RESVOR 2    15 4   5                                                  DET 150
  6 ADDHYD 4 004   3 5 6
  6 ADDHYD 4 005   1 6 4
  6 RUNOFF 1 006       5 0.03742      67.0         0.164                  WS 10
  6 ADDHYD 4 007   4 5 6
  6 RUNOFF 1 008       7 0.29210      66.0         1.007                  WS 12
  6 RUNOFF 1 009       1 0.14943      67.0         0.783                  WS 13
  6 ADDHYD 4 010   7 1 2
  6 ADDHYD 4 011   6 2 3
  6 RESVOR 2    10 3   4                                  1 1             RV100/B
  6 RUNOFF 1 012       5 0.00738      74.0         0.236                  WS 23
  6 RESVOR 2    23 5   6                                                  DET 230
  6 RUNOFF 1 013       7 0.01778      64.0         0.556                  WS 22
  6 RESVOR 2    22 7   1                                                  DET 220
  6 RUNOFF 1 014       2 0.01750      66.0         0.389                  WS 21
  6 RESVOR 2    21 2   3                                                  DET 210
  6 ADDHYD 4 015   1 3 4
  6 ADDHYD 4 016   6 4 5
  6 RUNOFF 1 017       6 0.05980      73.0         0.693                  WS 20
  6 ADDHYD 4 018   5 6 7
  6 RESVOR 2    20 7   1                                                  RV200
  6 RUNOFF 1 019       2 0.00526      65.0         0.294                  WS 24
  6 ADDHYD 4 020   1 2 4                                  1 1             POA C
  6 RUNOFF 1 021       5 0.12831      66.0         0.707                  WS 30
  6 RUNOFF 1 022       6 0.00168      71.0         0.118                  WS 31
  6 RESVOR 2    31 6   7                                                  DET 310
  6 ADDHYD 4 023   5 7 1                                  1 1             POA D
  6 RUNOFF 1 024       2 0.00055      58.0         0.100      1 1         WS 40/E
    ENDATA
  7 INCREM 6           0.10
  7 COMPUT 7 001   024   0.0          3.3          1.0        3 2  01  02
    ENDCMP 1
  7 COMPUT 7 001   024   0.0          5.0          1.0        3 2  01  10
    ENDCMP 1
  7 COMPUT 7 001   024   0.0          5.7          1.0        3 2  01  25
1
```

```
**********80-80 LIST OF INPUT DATA (CONTINUED)**********

   ENDCMP 1
 7 COMPUT 7 001   024   0.0          6.4          1.0        3 2  01  50
   ENDCMP 1
 7 COMPUT 7 001   024   0.0          7.2          1.0        3 2  01  99
   ENDCMP 1
   ENDJOB 2

**********END OF 80-80 LIST**********
1
 TR20 ------------------------------------------------------------------------
        SADDLE RIDGE SUBDIVISION - EASTON, CT (2683-01-27):  PR COND W VERSION
 10/30/** MILONE & MACBROOM INC., CHESHIRE, CT                    REV 110/01/90
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 EXECUTIVE CONTROL INCREM    MAIN TIME INCREMENT =   .10 HOURS


 EXECUTIVE CONTROL COMPUT    FROM XSECTION   1  TO XSECTION  24
    STARTING TIME =   .00         RAIN DEPTH =  3.30       RAIN DURATION=  1.00
    ANT. MOIST. COND. = 2         MAIN TIME INCREMENT =   .10 HOURS
    ALTERNATE NO.= 1              STORM NO.= 2             RAIN TABLE NO.= 3

 *** WARNING - XSECTION   2, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                           ( 13. % OF MAX. HYDROGRAPH COORDINATE)
                           MAIN TIME INCREMENT TOO SMALL.                ***

 *** WARNING - XSECTION   3, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                           ( 11. % OF MAX. HYDROGRAPH COORDINATE)
                           MAIN TIME INCREMENT TOO SMALL.                ***


 OPERATION RESVOR   STRUCTURE 10

    PEAK TIME(HRS)              PEAK DISCHARGE(CFS)          PEAK ELEVATION(FEET)
       13.58                          42.7                         391.21
       17.60                          14.6                         389.30
       17.80                          12.8                         389.17
       18.00                          11.5                         389.08
       18.20                          10.8                         389.03
       18.40                          10.3                         389.00
       18.60                          10.1                         388.97
       18.80                           9.9                         388.95
       19.00                           9.8                         388.93
       19.20                           9.6                         388.90

                 HYDROGRAPH POINTS FOR   ALTERNATE = 1,   STORM = 2
     HRS      MAIN TIME INCREMENT =  .10 hr,      DRAINAGE AREA =    .52 SQ.MI.
    11.60 CFS        0       1       2       9      15      21      22      25
    12.40 CFS       27      29      31      34      36      38      40      41
    13.20 CFS       42      42      43      43      43      43      43      42
    14.00 CFS       42      42      41      41      40      40      39      39
    14.80 CFS       38      37      37      36      35      35      34      33
    15.60 CFS       33      32      31      31      30      29      29      28
    16.40 CFS       28      27      27      26      26      25      24      23
    17.20 CFS       22      21      17       7      15       8      13       8
    18.00 CFS       12       8      11       8      10       8      10       8
    18.80 CFS       10       8      10       8      10       8       9       8
    19.60 CFS        9       7       9       7       8       7       8       7
    20.40 CFS        8       7       7       6       7       6       7       6
    21.20 CFS        7       7       7       7       7       7       7       7
    22.00 CFS        7       7       7       6       7       6       6       6
    22.80 CFS        6       6       6       6       6       6       6       6
    23.60 CFS        6       6       6       5       6       5       5       4
1
 TR20 ------------------------------------------------------------------------
        SADDLE RIDGE SUBDIVISION - EASTON, CT (2683-01-27):  PR COND W VERSION
 10/30/** MILONE & MACBROOM INC., CHESHIRE, CT                    REV 110/01/90
 17:08:21                          PASS   1                          PAGE   2

    24.40 CFS        4       3       3       2       2       1       1       1
    25.20 CFS        1       1       1       0

    RUNOFF ABOVE BASEFLOW OF    .00 CFS
                   .71 WATERSHED INCHES;     238 CFS-HRS;      19.7 ACRE-FEET.
```

```
 *** WARNING - XSECTION  12, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                           ( 12. % OF MAX. HYDROGRAPH COORDINATE)
                           MAIN TIME INCREMENT TOO SMALL.                    ***

 *** MESSAGE - NO PEAK FOUND, MAX DISCHARGE      1 CFS.                      ***

 *** WARNING - STRUCTURE 23, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                           ( 78. % OF MAX. HYDROGRAPH COORDINATE)
                           MAIN TIME INCREMENT TOO SMALL.                    ***

 *** WARNING - XSECTION  13, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                           ( 15. % OF MAX. HYDROGRAPH COORDINATE)
                           MAIN TIME INCREMENT TOO SMALL.                    ***

 *** WARNING - XSECTION  14, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                           ( 11. % OF MAX. HYDROGRAPH COORDINATE)
                           MAIN TIME INCREMENT TOO SMALL.                    ***

 *** MESSAGE - NO PEAK FOUND, MAX DISCHARGE      1 CFS.                      ***

 *** WARNING - XSECTION  15, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                           ( 56. % OF MAX. HYDROGRAPH COORDINATE)
                           MAIN TIME INCREMENT TOO SMALL.                    ***

 *** WARNING - XSECTION  16, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                           ( 34. % OF MAX. HYDROGRAPH COORDINATE)
                           MAIN TIME INCREMENT TOO SMALL.                    ***

 *** WARNING - XSECTION  19, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                           ( 31. % OF MAX. HYDROGRAPH COORDINATE)
                           MAIN TIME INCREMENT TOO SMALL.                    ***


 OPERATION ADDHYD   XSECTION  20

    PEAK TIME(HRS)              PEAK DISCHARGE(CFS)          PEAK ELEVATION(FEET)
       13.40                          8.8                        (NULL)
                  HYDROGRAPH POINTS FOR   ALTERNATE = 1,   STORM = 2
     HRS      MAIN TIME INCREMENT =  .10 hr,      DRAINAGE AREA =    .11 SQ.MI.
    11.90 CFS          0       1       1       2       3       3       4       4
    12.70 CFS          5       6       7       8       8       9       9       9
    13.50 CFS          9       9       9       8       8       8       8       8
    14.30 CFS          7       7       7       7       7       7       6       6
    15.10 CFS          6       6       6       6       6       6       5       5
1
 TR20 ---------------------------------------------------------------------------
        SADDLE RIDGE SUBDIVISION - EASTON, CT (2683-01-27):  PR COND W VERSION
 10/30/** MILONE & MACBROOM INC., CHESHIRE, CT                    REV 110/01/90
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    15.90 CFS          5       5       5       5       5       5       5       5
    16.70 CFS          4       4       4       4       4       4       4       4
    17.50 CFS          4       4       4       4       4       4       4       4
    18.30 CFS          4       4       4       3       3       3       3       3
    19.10 CFS          3       3       3       3       3       3       3       3
    19.90 CFS          3       3       3       3       3       3       3       3
    20.70 CFS          3       3       3       3       3       3       3       3
    21.50 CFS          3       3       3       3       3       3       3       2
    22.30 CFS          2       2       2       2       2       2       2       2
    23.10 CFS          2       2       2       2       2       2       2       2
    23.90 CFS          2       2       2       2       2       2       2       2
    24.70 CFS          2       2       2       2       2       2       2       2
    25.50 CFS          2       2       2       2       1       1       1       1
    26.30 CFS          1       1       1       1       1       1       1       1
    27.10 CFS          1       1       1       1       1       1       1       1
    27.90 CFS          1       1       1       1       1       1       1       1
    28.70 CFS          1       1       1       1       1       1       1       1
    29.50 CFS          1       1       1       1       1       1       1       1
    30.30 CFS          1       1       1       1       1       1       1       1
    31.10 CFS          1       1       1       1       1       0

    RUNOFF ABOVE BASEFLOW OF    .00 CFS
                  .90 WATERSHED INCHES;      62 CFS-HRS;       5.2 ACRE-FEET.

 *** MESSAGE - NO PEAK FOUND, MAX DISCHARGE      1 CFS.                      ***

 *** WARNING - XSECTION  22, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                           ( 45. % OF MAX. HYDROGRAPH COORDINATE)
```

MAIN TIME INCREMENT TOO SMALL. ***

*** MESSAGE - NO PEAK FOUND, MAX DISCHARGE 1 CFS. ***

*** WARNING - STRUCTURE 31, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(58. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

OPERATION ADDHYD XSECTION 23

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.59	26.1	(NULL)
18.96	2.2	(NULL)
21.96	1.7	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 2
MAIN TIME INCREMENT = .10 hr, DRAINAGE AREA = .13 SQ.MI.

HRS								
11.80	CFS	0	1	3	7	12	17	22	25
12.60	CFS	26	25	23	20	17	15	13	12
13.40	CFS	11	10	9	9	8	8	7	7
14.20	CFS	7	6	6	6	6	6	6	5
15.00	CFS	5	5	5	5	5	5	4	4

1
TR20 ---
SADDLE RIDGE SUBDIVISION - EASTON, CT (2683-01-27): PR COND W VERSION
10/30/** MILONE & MACBROOM INC., CHESHIRE, CT REV 110/01/90
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15.80	CFS	4	4	4	4	4	4	4	4
16.60	CFS	4	4	4	4	3	3	3	3
17.40	CFS	3	3	3	3	2	2	2	2
18.20	CFS	2	2	2	2	2	2	2	2
19.00	CFS	2	2	2	2	2	2	2	2
19.80	CFS	2	2	2	2	2	2	2	2
20.60	CFS	2	2	2	2	2	2	2	2
21.40	CFS	2	2	2	2	2	2	2	2
22.20	CFS	2	2	2	2	2	1	1	1
23.00	CFS	1	1	1	1	1	1	1	1
23.80	CFS	1	1	1	1	1	1	1	1
24.60	CFS	0							

RUNOFF ABOVE BASEFLOW OF .00 CFS
.69 WATERSHED INCHES; 58 CFS-HRS; 4.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 24

RUNOFF ABOVE BASEFLOW OF .00 CFS
.00 WATERSHED INCHES; 0 CFS-HRS; .0 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 1

EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO XSECTION 24
STARTING TIME = .00 RAIN DEPTH = 5.00 RAIN DURATION= 1.00
ANT. MOIST. COND. = 2 MAIN TIME INCREMENT = .10 HOURS
ALTERNATE NO.= 1 STORM NO.=10 RAIN TABLE NO.= 3

*** WARNING - STRUCTURE 14, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(27. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - STRUCTURE 15, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(41. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - XSECTION 4, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(18. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

OPERATION RESVOR STRUCTURE 10

1
TR20 ---
SADDLE RIDGE SUBDIVISION - EASTON, CT (2683-01-27): PR COND W VERSION
10/30/** MILONE & MACBROOM INC., CHESHIRE, CT REV 110/01/90
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PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
14.00	73.2	394.03
22.48	13.5	389.22
22.85	12.5	389.15

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM =10

HRS	MAIN TIME INCREMENT = .10 hr,			DRAINAGE AREA =			.52 SQ.MI.
10.40 CFS	0	1	1	1	2	2	3	4
11.20 CFS	5	7	9	11	14	19	21	23
12.00 CFS	26	29	33	39	44	50	55	59
12.80 CFS	62	65	67	69	70	71	72	72
13.60 CFS	73	73	73	73	73	73	73	73
14.40 CFS	73	73	72	72	72	72	71	71
15.20 CFS	71	70	70	70	69	69	68	68
16.00 CFS	67	67	67	66	66	65	65	64
16.80 CFS	64	63	63	62	61	61	60	59
17.60 CFS	58	58	57	56	56	55	54	53
18.40 CFS	52	51	50	50	49	48	47	46
19.20 CFS	45	44	43	43	42	41	40	40
20.00 CFS	39	37	36	36	35	34	33	32
20.80 CFS	31	30	30	29	28	28	27	26
21.60 CFS	26	25	25	24	23	22	21	14
22.40 CFS	13	13	13	13	12	12	12	12
23.20 CFS	12	12	12	12	12	12	12	11
24.00 CFS	11	10	10	9	8	7	5	5
24.80 CFS	4	3	2	2	2	1	1	1
25.60 CFS	1	1	1	1	1	1	0	

RUNOFF ABOVE BASEFLOW OF .00 CFS
1.75 WATERSHED INCHES; 590 CFS-HRS; 48.8 ACRE-FEET.

*** WARNING - STRUCTURE 23, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(17. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - STRUCTURE 22, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(37. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - STRUCTURE 21, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(41. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - XSECTION 15, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(19. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - XSECTION 16, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(12. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

1

*** WARNING - XSECTION 19, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(12. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

OPERATION ADDHYD XSECTION 20

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.93	33.9	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM =10

HRS	MAIN TIME INCREMENT = .10 hr,			DRAINAGE AREA =			.11 SQ.MI.
11.10 CFS	0	1	1	1	1	1	1	2
11.90 CFS	3	4	5	7	10	13	16	19
12.70 CFS	27	32	34	33	32	30	28	25
13.50 CFS	23	21	20	18	17	17	16	16
14.30 CFS	16	15	15	15	14	14	14	13
15.10 CFS	13	13	12	12	12	11	11	11
15.90 CFS	11	11	10	10	10	10	10	9
16.70 CFS	9	9	9	9	9	8	8	8
17.50 CFS	8	8	8	7	7	7	7	7
18.30 CFS	7	6	6	6	6	6	6	6
19.10 CFS	6	6	6	6	5	5	5	5

19.90 CFS	5	5	5	5	5	5	5	5
20.70 CFS	5	5	4	4	4	4	4	4
21.50 CFS	4	4	4	4	4	4	4	4
22.30 CFS	4	4	4	4	4	4	4	4
23.10 CFS	4	4	4	4	4	4	4	4
23.90 CFS	4	4	4	3	3	3	3	3
24.70 CFS	3	3	3	3	3	3	3	3
25.50 CFS	3	3	3	3	3	3	2	2
26.30 CFS	2	2	2	2	2	2	2	2
27.10 CFS	2	2	2	2	2	2	2	2
27.90 CFS	2	2	2	2	2	2	2	2
28.70 CFS	2	2	2	2	2	2	2	2
29.50 CFS	1	1	1	1	1	1	1	1
30.30 CFS	1	1	1	1	1	1	1	1
31.10 CFS	1	1	1	1	1	1	1	1
31.90 CFS	1	1	1	1	1	1	1	1
32.70 CFS	1	1	1	1	1	1	1	1
33.50 CFS	1	1	1	1	1	1	1	1
34.30 CFS	1	1	1	1	1	1	1	1
35.10 CFS	1	1	1	1	1	1	1	1
35.90 CFS	1	1	1	1	1	1	1	1
36.70 CFS	1	1	1	1	1	1	1	1
37.50 CFS	1	1	1	1	1	1	1	1
38.30 CFS	1	1	1	1	1	1	1	1
39.10 CFS	1	1	1	1	1	1	1	0

1

RUNOFF ABOVE BASEFLOW OF .00 CFS
2.03 WATERSHED INCHES; 141 CFS-HRS; 11.7 ACRE-FEET.

*** WARNING - XSECTION 22, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(26. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - STRUCTURE 31, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(21. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

OPERATION ADDHYD XSECTION 23

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.54	74.9	(NULL)
21.95	3.4	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM =10
MAIN TIME INCREMENT = .10 hr, DRAINAGE AREA = .13 SQ.MI.

HRS								
10.90 CFS	0	1	1	1	2	2	3	4
11.70 CFS	5	7	12	20	31	44	58	69
12.50 CFS	75	74	68	60	51	43	37	33
13.30 CFS	29	26	23	21	20	18	17	16
14.10 CFS	15	14	14	13	13	13	12	12
14.90 CFS	11	11	11	10	10	10	10	9
15.70 CFS	9	9	9	9	9	9	8	8
16.50 CFS	8	8	8	7	7	7	7	6
17.30 CFS	6	6	6	5	5	5	5	5
18.10 CFS	5	5	4	4	4	4	4	4
18.90 CFS	4	4	4	4	4	4	4	4
19.70 CFS	4	4	4	4	4	4	3	3
20.50 CFS	3	3	3	3	3	3	3	3
21.30 CFS	3	3	3	3	3	3	3	3
22.10 CFS	3	3	3	3	3	3	3	3
22.90 CFS	3	3	3	3	3	3	3	3
23.70 CFS	3	3	3	3	2	2	2	2
24.50 CFS	1	1	1	0				

RUNOFF ABOVE BASEFLOW OF .00 CFS
1.73 WATERSHED INCHES; 145 CFS-HRS; 12.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 24

RUNOFF ABOVE BASEFLOW OF .00 CFS
.00 WATERSHED INCHES; 0 CFS-HRS; .0 ACRE-FEET.

1

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 2

EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO XSECTION 24
STARTING TIME = .00 RAIN DEPTH = 5.70 RAIN DURATION= 1.00
ANT. MOIST. COND. = 2 MAIN TIME INCREMENT = .10 HOURS
ALTERNATE NO.= 1 STORM NO.=25 RAIN TABLE NO.= 3

*** WARNING - STRUCTURE 14, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(17. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - STRUCTURE 15, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(20. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

OPERATION RESVOR STRUCTURE 10

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
14.22	80.9	395.13
24.37	10.4	389.01
24.56	7.7	388.65
24.77	5.3	388.32
24.98	3.6	388.09
25.19	2.6	387.95
25.39	2.0	387.87
25.59	1.6	387.81
25.80	1.3	387.78
26.00	1.1	387.75

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM =25
MAIN TIME INCREMENT = .10 hr, DRAINAGE AREA = .52 SQ.MI.

HRS								
9.90	CFS	0	1	1	1	1	2	3	3
10.70	CFS	4	5	7	8	10	12	14	17
11.50	CFS	20	21	22	23	26	29	33	39
12.30	CFS	45	52	57	63	67	70	73	75
13.10	CFS	76	77	78	79	79	80	80	81
13.90	CFS	81	81	81	81	81	81	81	81
14.70	CFS	81	80	80	80	80	80	80	79
15.50	CFS	79	79	79	78	78	78	77	77
16.30	CFS	77	77	76	76	76	75	75	75
17.10	CFS	74	74	74	73	73	72	72	71
17.90	CFS	70	70	69	68	68	67	67	66
18.70	CFS	66	65	64	64	63	62	61	60
19.50	CFS	60	59	58	57	56	56	55	54
20.30	CFS	53	53	51	50	49	48	48	47

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21.10	CFS	46	45	44	43	42	42	41	40
21.90	CFS	39	38	37	36	35	35	34	33
22.70	CFS	32	31	31	30	29	29	28	27
23.50	CFS	27	26	26	25	24	23	22	21
24.30	CFS	10	10	7	7	5	5	3	4
25.10	CFS	2	3	1	2	1	2	0	1
25.90	CFS	0	1	0	1	0	1	0	1
26.70	CFS	0	1	0	1	0	1	0	1
27.50	CFS	0	1	0	1	0			

RUNOFF ABOVE BASEFLOW OF .00 CFS
2.25 WATERSHED INCHES; 759 CFS-HRS; 62.7 ACRE-FEET.

*** WARNING - STRUCTURE 23, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(10. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - STRUCTURE 22, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(21. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - STRUCTURE 21, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(25. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - XSECTION 15, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(11. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

OPERATION ADDHYD XSECTION 20

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.85	49.0	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM =25

HRS	MAIN TIME INCREMENT = .10 hr,			DRAINAGE AREA = .11 SQ.MI.				
10.60 CFS	0	1	1	1	1	1	1	1
11.40 CFS	1	2	2	2	3	4	6	8
12.20 CFS	11	15	19	28	39	46	49	49
13.00 CFS	46	43	40	37	33	31	28	26
13.80 CFS	24	22	21	20	19	18	17	17
14.60 CFS	17	17	16	16	16	15	15	15
15.40 CFS	15	14	14	14	13	13	13	13
16.20 CFS	12	12	12	12	12	11	11	11
17.00 CFS	11	11	10	10	10	10	10	9
17.80 CFS	9	9	9	9	8	8	8	8
18.60 CFS	8	8	7	7	7	7	7	7
19.40 CFS	7	7	7	7	6	6	6	6
20.20 CFS	6	6	6	6	6	6	6	5
21.00 CFS	5	5	5	5	5	5	5	5

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TR20 ----------
SADDLE RIDGE SUBDIVISION - EASTON, CT (2683-01-27): PR COND W VERSION
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21.80 CFS	5	5	5	5	5	5	5	5
22.60 CFS	5	5	5	4	4	4	4	4
23.40 CFS	4	4	4	4	4	4	4	4
24.20 CFS	4	4	4	4	4	4	3	3
25.00 CFS	3	3	3	3	3	3	3	3
25.80 CFS	3	3	3	3	3	3	3	3
26.60 CFS	2	2	2	2	2	2	2	2
27.40 CFS	2	2	2	2	2	2	2	2
28.20 CFS	2	2	2	2	2	2	2	2
29.00 CFS	2	2	2	2	2	2	2	2
29.80 CFS	2	2	2	1	1	1	1	1
30.60 CFS	1	1	1	1	1	1	1	1
31.40 CFS	1	1	1	1	1	1	1	1
32.20 CFS	1	1	1	1	1	1	1	1
33.00 CFS	1	1	1	1	1	1	1	1
33.80 CFS	1	1	1	1	1	1	1	1
34.60 CFS	1	1	1	1	1	1	1	1
35.40 CFS	1	1	1	1	1	1	1	1
36.20 CFS	1	1	1	1	1	1	1	1
37.00 CFS	1	1	1	1	1	1	1	1
37.80 CFS	1	1	1	1	1	1	1	1
38.60 CFS	1	1	1	1	1	1	1	1
39.40 CFS	1	1	1	1	1	1	1	1
40.20 CFS	1	1	1	1	1	0		

RUNOFF ABOVE BASEFLOW OF .00 CFS
2.56 WATERSHED INCHES; 178 CFS-HRS; 14.7 ACRE-FEET.

*** WARNING - XSECTION 22, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(21. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - STRUCTURE 31, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(21. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

OPERATION ADDHYD XSECTION 23

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.53	97.7	(NULL)
21.96	4.1	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM =25

HRS	MAIN TIME INCREMENT = .10 hr,				DRAINAGE AREA =		.13 SQ.MI.	
10.40 CFS	0	1	1	1	1	2	2	3
11.20 CFS	3	4	5	5	7	8	11	18
12.00 CFS	28	43	60	78	91	97	96	88
12.80 CFS	77	65	56	48	41	36	32	29
13.60 CFS	27	24	23	21	20	19	18	17
14.40 CFS	16	16	15	15	15	14	14	13

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TR20 ----------

SADDLE RIDGE SUBDIVISION - EASTON, CT (2683-01-27): PR COND W VERSION
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15.20 CFS	13	12	12	12	12	11	11	11
16.00 CFS	11	11	10	10	10	10	10	9
16.80 CFS	9	9	9	8	8	7	7	7
17.60 CFS	7	6	6	6	6	6	6	5
18.40 CFS	5	5	5	5	5	5	5	5
19.20 CFS	5	5	5	5	5	5	5	5
20.00 CFS	4	4	4	4	4	4	4	4
20.80 CFS	4	4	4	4	4	4	4	4
21.60 CFS	4	4	4	4	4	4	4	4
22.40 CFS	4	4	4	4	4	4	4	3
23.20 CFS	3	3	3	3	3	3	3	3
24.00 CFS	3	3	3	2	2	1	1	1
24.80 CFS	1	0						

RUNOFF ABOVE BASEFLOW OF .00 CFS
2.22 WATERSHED INCHES; 186 CFS-HRS; 15.4 ACRE-FEET.

OPERATION RUNOFF XSECTION 24

RUNOFF ABOVE BASEFLOW OF .00 CFS
.00 WATERSHED INCHES; 0 CFS-HRS; .0 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 3

EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO XSECTION 24
STARTING TIME = .00 RAIN DEPTH = 6.40 RAIN DURATION= 1.00
ANT. MOIST. COND. = 2 MAIN TIME INCREMENT = .10 HOURS
ALTERNATE NO.= 1 STORM NO.=50 RAIN TABLE NO.= 3

*** WARNING - STRUCTURE 14, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(11. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - STRUCTURE 15, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(11. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

OPERATION RESVOR STRUCTURE 10

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TR20 ----------

SADDLE RIDGE SUBDIVISION - EASTON, CT (2683-01-27): PR COND W VERSION
10/30/** MILONE & MACBROOM INC., CHESHIRE, CT REV 110/01/90
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PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.62	153.1	395.72
25.20	6.3	388.46
25.40	5.3	388.32
25.60	4.6	388.22
25.80	4.0	388.15
26.00	3.6	388.09
26.20	3.2	388.04
26.40	2.9	388.00
26.60	2.7	387.96
26.80	2.4	387.93

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM =50

HRS	MAIN TIME INCREMENT = .10 hr,				DRAINAGE AREA =		.52 SQ.MI.	
9.50 CFS	0	1	1	1	2	2	3	4
10.30 CFS	5	6	7	8	9	11	13	15
11.10 CFS	17	20	21	21	22	23	25	26
11.90 CFS	29	33	39	45	52	58	64	69

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12.70 CFS	73	76	79	81	88	116	134	145
13.50 CFS	151	153	152	149	145	140	135	129
14.30 CFS	124	118	113	108	104	99	95	91
15.10 CFS	88	84	82	82	82	81	81	81
15.90 CFS	81	81	80	80	80	80	80	79
16.70 CFS	79	79	78	78	78	77	77	77
17.50 CFS	76	76	76	75	75	74	74	74
18.30 CFS	73	73	72	72	71	70	70	69
19.10 CFS	69	68	67	67	66	66	65	65
19.90 CFS	64	63	62	62	61	60	59	58
20.70 CFS	58	57	56	55	55	54	53	52
21.50 CFS	51	50	49	49	48	47	46	45
22.30 CFS	44	44	43	42	41	41	40	39
23.10 CFS	38	37	36	35	35	34	33	32
23.90 CFS	31	31	30	29	29	28	27	26
24.70 CFS	25	24	22	8	-1	6	-1	5
25.50 CFS	-1	5	-1	4	-1	4	-1	3
26.30 CFS	-1	3	-1	3	-1	2	0	2
27.10 CFS	0	2	0	2	0	2	0	2
27.90 CFS	0	1	0	1	0	1	0	1
28.70 CFS	0	1	0	1	0	1	0	1
29.50 CFS	0	1	0	1	0	1	0	1
30.30 CFS	0	1	0					

RUNOFF ABOVE BASEFLOW OF .00 CFS
2.78 WATERSHED INCHES; 938 CFS-HRS; 77.6 ACRE-FEET.

*** WARNING - STRUCTURE 22, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(11. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

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TR20 ----------
SADDLE RIDGE SUBDIVISION - EASTON, CT (2683-01-27): PR COND W VERSION
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*** WARNING - STRUCTURE 21, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(14. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

OPERATION ADDHYD XSECTION 20

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)
12.81 64.1 (NULL)
HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM =50
HRS MAIN TIME INCREMENT = .10 hr, DRAINAGE AREA = .11 SQ.MI.

10.10 CFS	0	1	1	1	1	1	1	1
10.90 CFS	1	1	2	2	2	2	2	3
11.70 CFS	3	4	5	8	11	16	21	32
12.50 CFS	46	56	62	64	63	60	56	52
13.30 CFS	47	43	40	37	34	31	29	27
14.10 CFS	26	24	23	22	21	20	20	19
14.90 CFS	18	18	17	17	17	17	16	16
15.70 CFS	16	16	15	15	15	14	14	14
16.50 CFS	14	13	13	13	13	12	12	12
17.30 CFS	12	11	11	11	11	10	10	10
18.10 CFS	10	9	9	9	9	9	9	8
18.90 CFS	8	8	8	8	8	8	8	8
19.70 CFS	7	7	7	7	7	7	7	7
20.50 CFS	7	6	6	6	6	6	6	6
21.30 CFS	6	6	6	6	6	6	6	6
22.10 CFS	6	5	5	5	5	5	5	5
22.90 CFS	5	5	5	5	5	5	5	5
23.70 CFS	5	5	5	5	4	4	4	4
24.50 CFS	4	4	4	4	4	4	4	3
25.30 CFS	3	3	3	3	3	3	3	3
26.10 CFS	3	3	3	3	3	3	3	3
26.90 CFS	2	2	2	2	2	2	2	2
27.70 CFS	2	2	2	2	2	2	2	2
28.50 CFS	2	2	2	2	2	2	2	2
29.30 CFS	2	2	2	2	2	2	2	2
30.10 CFS	2	2	2	1	1	1	1	1
30.90 CFS	1	1	1	1	1	1	1	1
31.70 CFS	1	1	1	1	1	1	1	1
32.50 CFS	1	1	1	1	1	1	1	1
33.30 CFS	1	1	1	1	1	1	1	1
34.10 CFS	1	1	1	1	1	1	1	1

34.90 CFS	1	1	1	1	1	1	1	1
35.70 CFS	1	1	1	1	1	1	1	1
36.50 CFS	1	1	1	1	1	1	1	1
37.30 CFS	1	1	1	1	1	1	1	1
38.10 CFS	1	1	1	1	1	1	1	1
38.90 CFS	1	1	1	1	1	1	1	1
39.70 CFS	1	1	1	1	1	1	1	1

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40.50 CFS	1	1	1	1	1	1	1	0

RUNOFF ABOVE BASEFLOW OF .00 CFS
3.11 WATERSHED INCHES; 216 CFS-HRS; 17.9 ACRE-FEET.

*** WARNING - XSECTION 22, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(17. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - STRUCTURE 31, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(17. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

OPERATION ADDHYD XSECTION 23

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.52	121.7	(NULL)
21.95	4.8	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM =50
MAIN TIME INCREMENT = .10 hr, DRAINAGE AREA = .13 SQ.MI.

HRS								
10.00 CFS	0	1	1	1	1	2	2	2
10.80 CFS	3	3	4	5	5	6	7	8
11.60 CFS	10	12	16	24	37	56	77	99
12.40 CFS	114	121	119	108	94	80	68	58
13.20 CFS	50	44	39	35	32	29	27	25
14.00 CFS	24	22	21	20	20	19	18	18
14.80 CFS	17	17	16	16	15	15	14	14
15.60 CFS	14	13	13	13	13	13	12	12
16.40 CFS	12	12	11	11	11	11	10	10
17.20 CFS	9	9	8	8	8	7	7	7
18.00 CFS	7	7	7	6	6	6	6	6
18.80 CFS	6	6	6	6	6	6	6	6
19.60 CFS	6	6	6	5	5	5	5	5
20.40 CFS	5	5	5	5	5	5	5	5
21.20 CFS	5	5	5	5	5	5	5	5
22.00 CFS	5	5	5	5	5	4	4	4
22.80 CFS	4	4	4	4	4	4	4	4
23.60 CFS	4	4	4	4	4	3	3	3
24.40 CFS	2	2	1	1	1	0		

RUNOFF ABOVE BASEFLOW OF .00 CFS
2.74 WATERSHED INCHES; 230 CFS-HRS; 19.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 24

*** MESSAGE - NO PEAK FOUND, MAX DISCHARGE 1 CFS. ***

1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)

*** WARNING - XSECTION 24, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(84. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM =50
MAIN TIME INCREMENT = .10 hr, DRAINAGE AREA = .00 SQ.MI.

HRS			
12.00 CFS	0	1	1	0

RUNOFF ABOVE BASEFLOW OF .00 CFS
2.01 WATERSHED INCHES; 1 CFS-HRS; .1 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 4

EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO XSECTION 24
STARTING TIME = .00 RAIN DEPTH = 7.20 RAIN DURATION= 1.00
ANT. MOIST. COND. = 2 MAIN TIME INCREMENT = .10 HOURS
ALTERNATE NO.= 1 STORM NO.=99 RAIN TABLE NO.= 3

OPERATION RESVOR STRUCTURE 10

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.33	252.8	396.18
25.60	2.3	387.91
25.80	1.9	387.86
26.00	1.7	387.82
26.20	1.5	387.80
26.40	1.3	387.78
26.60	1.2	387.76
26.80	1.1	387.75

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM =99
MAIN TIME INCREMENT = .10 hr, DRAINAGE AREA = .52 SQ.MI.

HRS								
9.00	CFS	0	1	1	1	2	2	3	3
9.80	CFS	4	5	6	7	9	10	11	13
10.60	CFS	14	16	18	21	21	21	22	23
11.40	CFS	24	25	26	28	30	33	39	44
12.20	CFS	51	58	65	71	75	79	86	145
13.00	CFS	187	222	245	252	250	242	231	218
13.80	CFS	204	194	185	176	167	158	150	142
14.60	CFS	135	129	122	117	111	107	102	98
15.40	CFS	94	90	87	84	82	82	82	82
16.20	CFS	81	81	81	81	81	81	80	80
17.00	CFS	80	80	79	79	79	78	78	78
17.80	CFS	77	77	77	76	76	76	75	75

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TR20 ----------
SADDLE RIDGE SUBDIVISION - EASTON, CT (2683-01-27): PR COND W VERSION
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18.60	CFS	74	74	74	73	73	72	72	71
19.40	CFS	71	70	69	69	68	68	67	67
20.20	CFS	66	66	65	64	64	63	62	61
21.00	CFS	61	60	59	58	58	57	56	56
21.80	CFS	55	54	54	53	52	51	50	50
22.60	CFS	49	48	47	46	45	45	44	43
23.40	CFS	43	42	41	41	40	39	38	37
24.20	CFS	36	35	34	33	32	31	30	29
25.00	CFS	28	27	26	24	21	1	2	0
25.80	CFS	2	0	2	0	1	0	1	0
26.60	CFS	1	0	1	0	1	0	1	0
27.40	CFS	1	0	1	0	1	0	1	0
28.20	CFS	1	0	1	0	1	0	1	0

RUNOFF ABOVE BASEFLOW OF .00 CFS
3.40 WATERSHED INCHES; 1146 CFS-HRS; 94.7 ACRE-FEET.

OPERATION ADDHYD XSECTION 20

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.79	86.1	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM =99
MAIN TIME INCREMENT = .10 hr, DRAINAGE AREA = .11 SQ.MI.

HRS								
9.70	CFS	0	1	1	1	1	1	1	1
10.50	CFS	1	1	2	2	2	2	2	2
11.30	CFS	3	3	3	4	4	5	8	12
12.10	CFS	16	22	34	52	66	76	82	86
12.90	CFS	81	77	72	66	61	55	51	47
13.70	CFS	43	40	37	34	32	30	29	27
14.50	CFS	26	25	24	23	22	21	21	20
15.30	CFS	19	19	18	17	17	17	17	17
16.10	CFS	16	16	16	16	16	15	15	15
16.90	CFS	15	14	14	14	13	13	13	12
17.70	CFS	12	12	11	11	11	11	10	10
18.50	CFS	10	10	10	10	9	9	9	9
19.30	CFS	9	9	9	8	8	8	8	8

20.10 CFS	8	8	8	7	7	7	7	7
20.90 CFS	7	7	7	7	7	7	7	7
21.70 CFS	6	6	6	6	6	6	6	6
22.50 CFS	6	6	6	6	6	6	6	6
23.30 CFS	6	6	5	5	5	5	5	5
24.10 CFS	5	5	5	5	5	4	4	4
24.90 CFS	4	4	4	4	4	3	3	3
25.70 CFS	3	3	3	3	3	3	3	3
26.50 CFS	3	3	3	3	3	3	3	2
27.30 CFS	2	2	2	2	2	2	2	2
28.10 CFS	2	2	2	2	2	2	2	2
28.90 CFS	2	2	2	2	2	2	2	2
29.70 CFS	2	2	2	2	2	2	2	2

30.50 CFS	2	2	2	1	1	1	1	1
31.30 CFS	1	1	1	1	1	1	1	1
32.10 CFS	1	1	1	1	1	1	1	1
32.90 CFS	1	1	1	1	1	1	1	1
33.70 CFS	1	1	1	1	1	1	1	1
34.50 CFS	1	1	1	1	1	1	1	1
35.30 CFS	1	1	1	1	1	1	1	1
36.10 CFS	1	1	1	1	1	1	1	1
36.90 CFS	1	1	1	1	1	1	1	1
37.70 CFS	1	1	1	1	1	1	1	1
38.50 CFS	1	1	1	1	1	1	1	1
39.30 CFS	1	1	1	1	1	1	1	1
40.10 CFS	1	1	1	1	1	1	1	1
40.90 CFS	1	1	1	1	1	1	1	1
41.70 CFS	0							

RUNOFF ABOVE BASEFLOW OF .00 CFS
3.77 WATERSHED INCHES; 262 CFS-HRS; 21.7 ACRE-FEET.

*** WARNING - XSECTION 22, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(14. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

*** WARNING - STRUCTURE 31, HYDROGRAPH VOLUME TRUNCATED AT 0 CFS
(15. % OF MAX. HYDROGRAPH COORDINATE)
MAIN TIME INCREMENT TOO SMALL. ***

OPERATION ADDHYD XSECTION 23

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.51	151.0	(NULL)
21.92	5.7	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM =99
MAIN TIME INCREMENT = .10 hr, DRAINAGE AREA = .13 SQ.MI.

HRS								
9.50 CFS	0	1	1	1	1	2	2	2
10.30 CFS	2	3	3	4	4	5	6	6
11.10 CFS	7	8	9	10	12	14	17	22
11.90 CFS	32	49	71	98	124	143	151	146
12.70 CFS	133	115	97	82	70	61	53	47
13.50 CFS	42	38	35	32	30	28	27	25
14.30 CFS	24	23	23	22	21	21	20	19
15.10 CFS	19	18	17	17	17	16	16	16
15.90 CFS	15	15	15	15	14	14	14	14
16.70 CFS	13	13	12	12	11	11	10	10
17.50 CFS	10	9	9	8	8	8	8	8
18.30 CFS	8	8	8	8	8	8	7	7
19.10 CFS	7	7	7	7	7	7	7	7
19.90 CFS	6	6	6	6	6	6	6	6
20.70 CFS	6	6	6	6	6	6	6	6

21.50 CFS	6	6	6	6	6	6	6	6
22.30 CFS	6	5	5	5	5	5	5	5
23.10 CFS	5	5	5	5	5	5	5	5
23.90 CFS	4	4	4	4	3	3	2	1

```
                                                SRPRCD30
   24.70 CFS         1       1       1       0

   RUNOFF ABOVE BASEFLOW OF    .00 CFS
                3.37 WATERSHED INCHES;     282 CFS-HRS;      23.3 ACRE-FEET.


OPERATION RUNOFF   XSECTION  24

*** MESSAGE - NO PEAK FOUND, MAX DISCHARGE      1 CFS.                      ***

   PEAK TIME(HRS)              PEAK DISCHARGE(CFS)          PEAK ELEVATION(FEET)

*** WARNING - XSECTION  24, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                          ( 40. % OF MAX. HYDROGRAPH COORDINATE)
                          MAIN TIME INCREMENT TOO SMALL.                    ***
                    HYDROGRAPH POINTS FOR   ALTERNATE = 1,   STORM =99
    HRS       MAIN TIME INCREMENT =  .10 hr,      DRAINAGE AREA =    .00 SQ.MI.
   11.90 CFS         0       1       1       1       1       0

   RUNOFF ABOVE BASEFLOW OF    .00 CFS
                2.54 WATERSHED INCHES;       1 CFS-HRS;        .1 ACRE-FEET.


 EXECUTIVE CONTROL ENDCMP    COMPUTATIONS COMPLETED FOR PASS   5
1
 TR20 ------------------------------------------------------------------------
        SADDLE RIDGE SUBDIVISION - EASTON, CT (2683-01-27):  PR COND W VERSION
 10/30/** MILONE & MACBROOM INC., CHESHIRE, CT                    REV 110/01/90
 17:08:21                                                          PAGE  19


                           SUMMARY TABLE 1
                           ---------------
   SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
   A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH   T-TRUNCATED HYDROGRAPH   R-RISING TRUNCATED HYDROGRAPH

XSECTION/  STANDARD                                        PEAK DISCHARGE
STRUCTURE   CONTROL    DRAINAGE   RUNOFF   ------------------------------------
   ID       OPERATION    AREA     AMOUNT   ELEVATION   TIME      RATE     RATE
                        (SQ MI)    (IN)      (FT)      (HR)      (CFS)    (CSM)

RAINFALL OF   3.30 inches AND  24.00 hr DURATION, BEGINS AT    .0 hrs.
RAINTABLE NUMBER  3,    AMC 2
MAIN TIME INCREMENT   .10 HOURS

   ALTERNATE    1   STORM    2
   --------------------------
XSECTION   1  RUNOFF      .02      .99        ---      12.43        7    350.0
XSECTION   2  RUNOFF      .01      .99        ---      12.30T       4T   400.0
STRUCTURE 14  RESVOR      .01      .00        ---        .00        0      .0
XSECTION   3  RUNOFF      .02      .56        ---      12.26T       4T   200.0
STRUCTURE 15  RESVOR      .02      .00        ---        .00        0      .0

XSECTION   4  ADDHYD      .03      .00        ---        .00        0      .0
XSECTION   5  ADDHYD      .04      .61        ---      12.43        7    175.0
XSECTION   6  RUNOFF      .04      .74        ---      12.25       14    350.0
XSECTION   7  ADDHYD      .08      .67        ---      12.27       20    250.0
XSECTION   8  RUNOFF      .29      .69        ---      12.80       49    169.0

XSECTION   9  RUNOFF      .15      .74        ---      12.64       31    206.7
XSECTION  10  ADDHYD      .44      .71        ---      12.74       79    179.5
XSECTION  11  ADDHYD      .52      .70        ---      12.70       88    169.2
STRUCTURE 10  RESVOR      .52      .71     391.21      13.58       43     82.7
XSECTION  12  RUNOFF      .01     1.10        ---      12.27T       4T   400.0

STRUCTURE 23  RESVOR      .01     1.10     402.75      13.30R       1R   100.0
XSECTION  13  RUNOFF      .02      .61        ---      12.51T       3T   150.0
STRUCTURE 22  RESVOR      .02      .00        ---        .00        0      .0
XSECTION  14  RUNOFF      .02      .69        ---      12.38T       5T   250.0
STRUCTURE 21  RESVOR      .02      .00        ---        .00        0      .0

XSECTION  15  ADDHYD      .04      .64        ---      16.80R       1R    25.0
XSECTION  16  ADDHYD      .04      .72        ---      14.30F       1F    25.0
XSECTION  17  RUNOFF      .06     1.05        ---      12.54       21    350.0
XSECTION  18  ADDHYD      .10      .91        ---      12.54       22    220.0
STRUCTURE 20  RESVOR      .10      .91     390.68      13.42        8     80.0

XSECTION  19  RUNOFF      .01      .65        ---      12.32T       1T   100.0
```

XSECTION	20	ADDHYD	.11	.90	---	13.40	9	81.8
XSECTION	21	RUNOFF	.13	.69	---	12.59	26	200.0

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SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 1 STORM 2							
XSECTION 22	RUNOFF	.00	.93	---	12.20R	1R********	
STRUCTURE 31	RESVOR	.00	.82	568.72	12.20R	1R********	
XSECTION 23	ADDHYD	.13	.69	---	12.59	26	200.0
XSECTION 24	RUNOFF	.00	.00	---	.00	0 ********	
RAINFALL OF 5.00 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.							
ALTERNATE 1 STORM 10							
XSECTION 1	RUNOFF	.02	2.20	---	12.40	16	800.0
XSECTION 2	RUNOFF	.01	2.20	---	12.29	8	800.0
STRUCTURE 14	RESVOR	.01	2.19	407.41	12.95T	2T	200.0
XSECTION 3	RUNOFF	.02	1.50	---	12.25	13	650.0
STRUCTURE 15	RESVOR	.02	.96	405.79	14.80F	1F	50.0
XSECTION 4	ADDHYD	.03	1.35	---	13.30T	3T	100.0
XSECTION 5	ADDHYD	.04	1.71	---	12.43	17	425.0
XSECTION 6	RUNOFF	.04	1.80	---	12.24	35	875.0
XSECTION 7	ADDHYD	.08	1.75	---	12.26	50	625.0
XSECTION 8	RUNOFF	.29	1.73	---	12.73	141	486.2
XSECTION 9	RUNOFF	.15	1.80	---	12.58	86	573.3
XSECTION 10	ADDHYD	.44	1.75	---	12.67	224	509.1
XSECTION 11	ADDHYD	.52	1.75	---	12.63	247	475.0
STRUCTURE 10	RESVOR	.52	1.75	394.03	14.00	73	140.4
XSECTION 12	RUNOFF	.01	2.36	---	12.26	9	900.0
STRUCTURE 23	RESVOR	.01	2.35	403.94	12.64T	3T	300.0
XSECTION 13	RUNOFF	.02	1.58	---	12.46	10	500.0
STRUCTURE 22	RESVOR	.02	1.55	445.64	15.00F	1F	50.0
XSECTION 14	RUNOFF	.02	1.73	---	12.35	13	650.0
STRUCTURE 21	RESVOR	.02	1.70	401.47	15.50F	1F	50.0
XSECTION 15	ADDHYD	.04	1.63	---	15.20F	3F	75.0
XSECTION 16	ADDHYD	.04	1.74	---	13.19T	4T	100.0

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SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)

ALTERNATE 1 STORM 10

XSECTION	17	RUNOFF	.06	2.28	---	12.51	48	800.0
XSECTION	18	ADDHYD	.10	2.05	---	12.52	52	520.0
STRUCTURE	20	RESVOR	.10	2.05	391.13	12.94	33	330.0
XSECTION	19	RUNOFF	.01	1.65	---	12.30T	4T	400.0
XSECTION	20	ADDHYD	.11	2.03	---	12.93	34	309.1
XSECTION	21	RUNOFF	.13	1.73	---	12.54	74	569.2
XSECTION	22	RUNOFF	.00	2.10	---	12.19T	2T	********
STRUCTURE	31	RESVOR	.00	2.00	569.01	12.21T	2T	********
XSECTION	23	ADDHYD	.13	1.73	---	12.54	75	576.9
XSECTION	24	RUNOFF	.00	.00	---	.00	0	********

RAINFALL OF 5.70 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 1 STORM 25

XSECTION	1	RUNOFF	.02	2.75	---	12.40	20	1000.0
XSECTION	2	RUNOFF	.01	2.75	---	12.28	11	1100.0
STRUCTURE	14	RESVOR	.01	2.74	407.81	12.80T	3T	300.0
XSECTION	3	RUNOFF	.02	1.97	---	12.25	17	850.0
STRUCTURE	15	RESVOR	.02	1.43	406.12	13.43T	2T	100.0
XSECTION	4	ADDHYD	.03	1.85	---	13.11	5	166.7
XSECTION	5	ADDHYD	.04	2.22	---	12.44	23	575.0
XSECTION	6	RUNOFF	.04	2.30	---	12.23	44	1100.0
XSECTION	7	ADDHYD	.08	2.26	---	12.26	64	800.0
XSECTION	8	RUNOFF	.29	2.22	---	12.72	186	641.4
XSECTION	9	RUNOFF	.15	2.30	---	12.58	111	740.0
XSECTION	10	ADDHYD	.44	2.25	---	12.66	292	663.6
XSECTION	11	ADDHYD	.52	2.25	---	12.63	324	623.1
STRUCTURE	10	RESVOR	.52	2.25	395.13	14.22	81	155.8
XSECTION	12	RUNOFF	.01	2.93	---	12.26	11	1100.0
STRUCTURE	23	RESVOR	.01	2.93	404.28	12.54T	5T	500.0

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SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)

ALTERNATE 1 STORM 25

XSECTION	13	RUNOFF	.02	2.05	---	12.44	14	700.0
STRUCTURE	22	RESVOR	.02	2.02	446.12	13.90T	2T	100.0
XSECTION	14	RUNOFF	.02	2.22	---	12.35	17	850.0
STRUCTURE	21	RESVOR	.02	2.19	402.05	14.50T	2T	100.0
XSECTION	15	ADDHYD	.04	2.10	---	14.14T	4T	100.0
XSECTION	16	ADDHYD	.04	2.24	---	12.70	7	175.0
XSECTION	17	RUNOFF	.06	2.84	---	12.50	60	1000.0
XSECTION	18	ADDHYD	.10	2.59	---	12.51	66	660.0
STRUCTURE	20	RESVOR	.10	2.58	391.25	12.86	47	470.0
XSECTION	19	RUNOFF	.01	2.13	---	12.29	5	500.0
XSECTION	20	ADDHYD	.11	2.56	---	12.85	49	445.5
XSECTION	21	RUNOFF	.13	2.22	---	12.53	97	746.2
XSECTION	22	RUNOFF	.00	2.63	---	12.19T	2T	********
STRUCTURE	31	RESVOR	.00	2.54	569.14	12.21T	2T	********
XSECTION	23	ADDHYD	.13	2.22	---	12.53	98	753.8
XSECTION	24	RUNOFF	.00	.00	---	.00	0	********

RAINFALL OF 6.40 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 1 STORM 50

XSECTION	1	RUNOFF	.02	3.32	---	12.39	24	1200.0
XSECTION	2	RUNOFF	.01	3.32	---	12.28	13	1300.0
STRUCTURE	14	RESVOR	.01	3.31	408.16	12.69T	5T	500.0
XSECTION	3	RUNOFF	.02	2.45	---	12.24	21	1050.0
STRUCTURE	15	RESVOR	.02	1.91	406.41	12.83T	5T	250.0
XSECTION	4	ADDHYD	.03	2.36	---	12.73	9	300.0
XSECTION	5	ADDHYD	.04	2.76	---	12.46	30	750.0
XSECTION	6	RUNOFF	.04	2.83	---	12.23	54	1350.0
XSECTION	7	ADDHYD	.08	2.79	---	12.27	79	987.5
XSECTION	8	RUNOFF	.29	2.74	---	12.71	233	803.4

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SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID		STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 1 STORM 50								
XSECTION	9	RUNOFF	.15	2.83	---	12.57	138	920.0
XSECTION	10	ADDHYD	.44	2.77	---	12.65	365	829.5
XSECTION	11	ADDHYD	.52	2.77	---	12.62	408	784.6
STRUCTURE	10	RESVOR	.52	2.78	395.72	13.62	153	294.2
XSECTION	12	RUNOFF	.01	3.52	---	12.26	13	1300.0
STRUCTURE	23	RESVOR	.01	3.51	404.58	12.50	7	700.0
XSECTION	13	RUNOFF	.02	2.55	---	12.43	17	850.0
STRUCTURE	22	RESVOR	.02	2.51	446.49	13.38T	4T	200.0
XSECTION	14	RUNOFF	.02	2.74	---	12.34	21	1050.0
STRUCTURE	21	RESVOR	.02	2.70	402.43	13.41T	4T	200.0
XSECTION	15	ADDHYD	.04	2.61	---	13.39	8	200.0
XSECTION	16	ADDHYD	.04	2.75	---	13.05	11	275.0
XSECTION	17	RUNOFF	.06	3.42	---	12.50	72	1200.0
XSECTION	18	ADDHYD	.10	3.14	---	12.51	81	810.0
STRUCTURE	20	RESVOR	.10	3.13	391.37	12.82	62	620.0
XSECTION	19	RUNOFF	.01	2.64	---	12.29	7	700.0
XSECTION	20	ADDHYD	.11	3.11	---	12.81	64	581.8
XSECTION	21	RUNOFF	.13	2.74	---	12.52	121	930.8
XSECTION	22	RUNOFF	.00	3.22	---	12.18T	3T	********
STRUCTURE	31	RESVOR	.00	3.11	569.27	12.21T	3T	********
XSECTION	23	ADDHYD	.13	2.74	---	12.52	122	938.5
XSECTION	24	RUNOFF	.00	2.01	---	12.20R	1R	********

RAINFALL OF 7.20 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 1 STORM 99

XSECTION	1	RUNOFF	.02	4.00	---	12.39	29	1450.0
XSECTION	2	RUNOFF	.01	4.00	---	12.28	15	1500.0
STRUCTURE	14	RESVOR	.01	3.99	408.48	12.60	7	700.0
XSECTION	3	RUNOFF	.02	3.05	---	12.24	27	1350.0

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SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 1 STORM 99							
STRUCTURE 15	RESVOR	.02	2.51	406.83	12.64	8	400.0
XSECTION 4	ADDHYD	.03	2.98	---	12.62	15	500.0
XSECTION 5	ADDHYD	.04	3.41	---	12.46	42	1050.0
XSECTION 6	RUNOFF	.04	3.46	---	12.22	66	1650.0
XSECTION 7	ADDHYD	.08	3.42	---	12.27	99	1237.5
XSECTION 8	RUNOFF	.29	3.36	---	12.71	287	989.7
XSECTION 9	RUNOFF	.15	3.46	---	12.56	171	1140.0
XSECTION 10	ADDHYD	.44	3.39	---	12.64	451	1025.0
XSECTION 11	ADDHYD	.52	3.40	---	12.61	506	973.1
STRUCTURE 10	RESVOR	.52	3.40	396.18	13.33	253	486.5
XSECTION 12	RUNOFF	.01	4.21	---	12.26	15	1500.0
STRUCTURE 23	RESVOR	.01	4.21	404.92	12.47	9	900.0
XSECTION 13	RUNOFF	.02	3.15	---	12.43	22	1100.0
STRUCTURE 22	RESVOR	.02	3.11	446.96	13.16	7	350.0
XSECTION 14	RUNOFF	.02	3.36	---	12.33	26	1300.0
STRUCTURE 21	RESVOR	.02	3.31	402.95	13.08	6	300.0
XSECTION 15	ADDHYD	.04	3.21	---	13.13	13	325.0
XSECTION 16	ADDHYD	.04	3.38	---	12.87	18	450.0
XSECTION 17	RUNOFF	.06	4.11	---	12.49	87	1450.0
XSECTION 18	ADDHYD	.10	3.80	---	12.52	100	1000.0
STRUCTURE 20	RESVOR	.10	3.80	391.51	12.80	84	840.0
XSECTION 19	RUNOFF	.01	3.25	---	12.29	8	800.0
XSECTION 20	ADDHYD	.11	3.77	---	12.79	86	781.8
XSECTION 21	RUNOFF	.13	3.36	---	12.52	150	1153.8
XSECTION 22	RUNOFF	.00	3.85	---	12.18T	3T	********
STRUCTURE 31	RESVOR	.00	3.77	569.42	12.21T	3T	********
XSECTION 23	ADDHYD	.13	3.37	---	12.51	151	1161.5
XSECTION 24	RUNOFF	.00	2.54	---	12.20R	1R	********

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SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 2	10	25	50	99
STRUCTURE 31	.00					
ALTERNATE 1		0	2	2	3	3
STRUCTURE 23	.01					
ALTERNATE 1		0	3	5	7	9
STRUCTURE 22	.02					
ALTERNATE 1		0	1	2	4	7
STRUCTURE 21	.02					
ALTERNATE 1		0	1	2	4	6

STRUCTURE 20	.10					
ALTERNATE	1	8	33	47	62	84
STRUCTURE 15	.02					
ALTERNATE	1	0	1	2	5	8
STRUCTURE 14	.01					
ALTERNATE	1	0	2	3	5	7
STRUCTURE 10	.52					
ALTERNATE	1	43	73	81	153	253
XSECTION 1	.02					
ALTERNATE	1	7	16	20	24	29
XSECTION 2	.01					
ALTERNATE	1	4	8	11	13	15
XSECTION 3	.02					
ALTERNATE	1	4	13	17	21	27
XSECTION 4	.03					
ALTERNATE	1	0	3	5	9	15
XSECTION 5	.04					
ALTERNATE	1	7	17	23	30	42
XSECTION 6	.04					
ALTERNATE	1	14	35	44	54	66

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES

XSECTION/ STRUCTURE ID		DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 2	10	25	50	99
XSECTION 7		.08					
ALTERNATE	1		20	50	64	79	99
XSECTION 8		.29					
ALTERNATE	1		49	141	186	233	287
XSECTION 9		.15					
ALTERNATE	1		31	86	111	138	171
XSECTION 10		.44					
ALTERNATE	1		79	224	292	365	451
XSECTION 11		.52					
ALTERNATE	1		88	247	324	408	506
XSECTION 12		.01					
ALTERNATE	1		4	9	11	13	15

XSECTION	13	.02					
ALTERNATE	1		3	10	14	17	22
XSECTION	14	.02					
ALTERNATE	1		5	13	17	21	26
XSECTION	15	.04					
ALTERNATE	1		0	3	4	8	13
XSECTION	16	.04					
ALTERNATE	1		1	4	7	11	18
XSECTION	17	.06					
ALTERNATE	1		21	48	60	72	87
XSECTION	18	.10					
ALTERNATE	1		22	52	66	81	100
XSECTION	19	.01					
ALTERNATE	1		1	4	5	7	8
XSECTION	20	.11					

1
TR20 ----------

SADDLE RIDGE SUBDIVISION - EASTON, CT (2683-01-27): PR COND W VERSION
10/30/** MILONE & MACBROOM INC., CHESHIRE, CT REV 110/01/90
17:08:21 PAGE 27

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES

XSECTION/ STRUCTURE ID		DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 2	10	25	50	99
XSECTION	20	.11					
ALTERNATE	1		9	34	49	64	86
XSECTION	21	.13					
ALTERNATE	1		26	74	97	121	150
XSECTION	22	.00					
ALTERNATE	1		0	2	2	3	3
XSECTION	23	.13					
ALTERNATE	1		26	75	98	122	151
XSECTION	24	.00					
ALTERNATE	1		0	0	0	0	0

END OF 1 JOBS IN THIS RUN
1

```
                                                    SRPRCD30
                SCS  TR-20,  VERSION 10/01/90
                                  FILES

INPUT  = srprcd30.in
OUTPUT = srprcd30.out                                , DATED 10/30/**,17:08:21

         FILES GENERATED - DATED 10/30/**,17:08:21

                           NONE!

           *** TR-20 RUN COMPLETED ***
```