



## Appendix I: Cross-Line Hydraulic Analysis Calculations



JOB:		Carolina Crossroads	
SUBJECT:		Culvert Summary	
CALC'D BY:	JMB	DATE:	12-Mar-19
CHEK'D BY:	GPP	DATE:	12-Mar-19

7  
SHEET  
OF  
8

## CULVERT SUMMARY SHEET - EXISTING\_POST-CONSTRUCTION FLOWS

SITE DATA			RUNOFF Rational Method Q = C*I*A*C <sub>f</sub> - (C <sub>f10</sub> = 1.0, C <sub>f25</sub> = 1.1, C <sub>f50</sub> = 1.2, C <sub>f100</sub> = 1.25) Q <sub>500</sub> = Q <sub>100</sub> * 1.7												PIPE DATA							RESULTS								NOTES	
Culvert ID	Alignment	Station	Runoff Coefficient 'C'	Drainage Area 'A' (ac)	Time of Conc. T <sub>c</sub> ' (min)	Rainfall Intensity 10% annual chance (in/hr)	Rainfall Intensity 4% ann. chance (in/hr)	Rainfall Intensity 2% ann. chance (in/hr)	Rainfall Intensity 1% ann chance (in/hr)	Total Runoff 10% ann. chance (cfs)	Total Runoff 4% an. chance (cfs)	Total Runoff 2% ann. chance (cfs)	Total Runoff 1% ann. chance (cfs)	Total Runoff 0.2% ann chance (cfs)	Material	Number of Barrels	Span and Rise	Pipe Diameter (in)	Pipe Length (ft)	Invert Up	Invert Down	Pipe Slope (ft/ft)	10-yr storm HW Elev (ft)	10-yr storm HW / D	25-yr storm HW Elev (ft)	25-yr storm HW / D	50-yr storm HW Elev (ft)	50-yr storm HW / D	100-yr storm HW Elev (ft)	Flood / Overtop Frequency (-yr storm)	Hydraulic Notes
EC-2601	I26RA1P	377+00	81	236.0	33	SCS (>100 AC)				633	831	1002	1191	2025	RCBC	2	6' x 6'	72	1202	209.00	190.71	0.015	210.83	0.31	210.90	0.32	210.95	0.32	211.01	<10	HW/D < 1.2. Potential roadway flooding for the 100-yr storm.
EP-2801	I26RA1P	407+60	0.53	22.8	19	4.83	5.48	6.00	6.45	58	73	87	97	166	RCP	1	36	36	230	169.51	167.08	0.011	174.16	1.55	175.72	2.07	177.52	2.67	179.02	500	HW/D > 1.2 for the 50-yr storm, but there is no flooding potential for the 100-yr storm.
EC-2901	I26RA1P	429+45	N/A	1095.0	USGS Regression Equation					554	743	912	1070	1460	RCBC	1	10' x 10'	120	176	177.74	176.67	0.006	184.35	0.66	186.59	0.88	188.61	1.09	190.54	>500	HW/D > 1.2 for the 50-yr storm, but there is no flooding potential for the 100-yr storm.

<div><div><div>STV</div><div>100 Years</div></div><div>STV Incorporated 454 South Anderson Road, Suite 3, BTC 517 Rock Hill, SC 29732 (803) 980-4970 803 980 4970     <a href="http://www.stvinc.com">www.stvinc.com</a></div></div>															<div>JOB: Carolina Crossroads</div> <div>SUBJECT: Culvert Summary</div> <div>CALC'D BY: JMB     DATE: 12-Mar-19</div> <div>CHEK'D BY: GPP     DATE: 12-Mar-19</div>										<div>8</div> <div>SHEET</div> <div>OF</div> <div>8</div>						
CULVERT SUMMARY SHEET - EXISTING_POST-CONSTRUCTION FLOWS																															
SITE DATA			RUNOFF Rational Method Q = C*A*C <sub>f</sub> - (C <sub>f10</sub> = 1.0, C <sub>f25</sub> = 1.1, C <sub>f50</sub> = 1.2, C <sub>f100</sub> = 1.25) Q <sub>500</sub> = Q <sub>100</sub> * 1.7												PIPE DATA								RESULTS								NOTES
Culvert ID	Alignment	Station	Runoff Coefficient 'C'	Drainage Area 'A' (ac)	Time of Conc. T <sub>c</sub> (min)	Rainfall Intensity 10% annual chance (in/hr)	Rainfall Intensity 4% ann. chance (in/hr)	Rainfall Intensity 2% ann. chance (in/hr)	Rainfall Intensity 1% ann chance (in/hr)	Total Runoff 10% ann. chance (cfs)	Total Runoff 4% an. chance (cfs)	Total Runoff 2% ann. chance (cfs)	Total Runoff 1% ann. chance (cfs)	Total Runoff 0.2% ann chance (cfs)	Material	Number of Barrels	Span and Rise	Pipe Diameter (in)	Pipe Length (ft)	Invert Up	Invert Down	Pipe Slope (ft/ft)	10-yr storm HW Elev (ft)	10-yr storm HW / D	25-yr storm HW Elev (ft)	25-yr storm HW / D	50-yr storm HW Elev (ft)	50-yr storm HW / D	100-yr storm HW Elev (ft)	Flood / Overtop Frequency (-yr storm)	Hydraulic Notes
EP-4802	126P	21+40	0.65	34.0	23	4.74	5.38	5.89	6.33	105	131	156	175	298	RCP	1	36	36	212	179.25	171.30	0.037	189.79	3.51	190.04	3.60	190.07	3.61	190.08	25	HW/D > 1.2. Potential roadway flooding for the 100-yr storm.
EC-4901	126P	29+85	83	139.4	33	SCS (>100 AC)				401	521	624	737	1253	RCBC	1	5' x 5'	60	126	178.98	178.12	0.007	193.30	2.86	201.32	4.47	209.94	6.19	221.18	50	HW/D > 1.2. Potential roadway flooding for the 100-yr storm.
EP-4902	126P	34+90	0.65	14.0	10	6.25	7.14	7.86	8.57	57	71	86	97	166	RCP	1	24	24	138	189.90	184.96	0.036	195.04	2.57	195.06	2.58	195.07	2.58	195.08	<10	HW/D > 1.2. Potential roadway flooding for the 100-yr storm.
EC-4903	126P	34+30	82	153.4	38	SCS (>100 AC)				389	507	609	722	1227	RCBC	1	8' x 7'	84	76	172.00	171.00	0.013	179.07	1.01	180.65	1.24	182.17	1.45	184.10	500	HW/D > 1.2 for the 50-yr storm, but there is no flooding potential for the 100-yr storm.
EC-5101	126P	58+25	60	178.0	31	SCS (>100 AC)				191	290	407	525	893	RCBC	1	8' x 6'	72	464	170.64	162.68	0.017	175.01	0.73	176.42	0.96	178.11	1.25	180.08	500	HW/D > 1.2 for the 50-yr storm, but there is no flooding potential for the 100-yr storm.
EP-5102	126P	63+20	0.70	82.3	26	4.49	5.09	5.56	5.98	259	323	384	431	732	RCP	1	60"	60	393	174.73	167.89	0.017	184.91	2.04	186.31	2.32	186.35	2.32	186.38	25	HW/D > 1.2. Potential roadway flooding for the 100-yr storm.
EP-5201	126P	68+75	0.70	46.5	26	4.49	5.09	5.56	5.98	146	182	217	243	414	RCP	1	30	30	345	166.21	158.89	0.021	186.31	8.04	186.34	8.05	186.36	8.06	186.38	<10	HW/D > 1.2. Potential roadway flooding for the 100-yr storm.
EP-5301	126P	85+50	0.80	94.4	26	4.49	5.09	5.56	5.98	337	420	501	561	953	RCP	1	48	48	352	170.00	159.00	0.031	190.09	5.02	190.14	5.04	190.19	5.05	190.22	<10	HW/D > 1.2. Potential roadway flooding for the 100-yr storm.