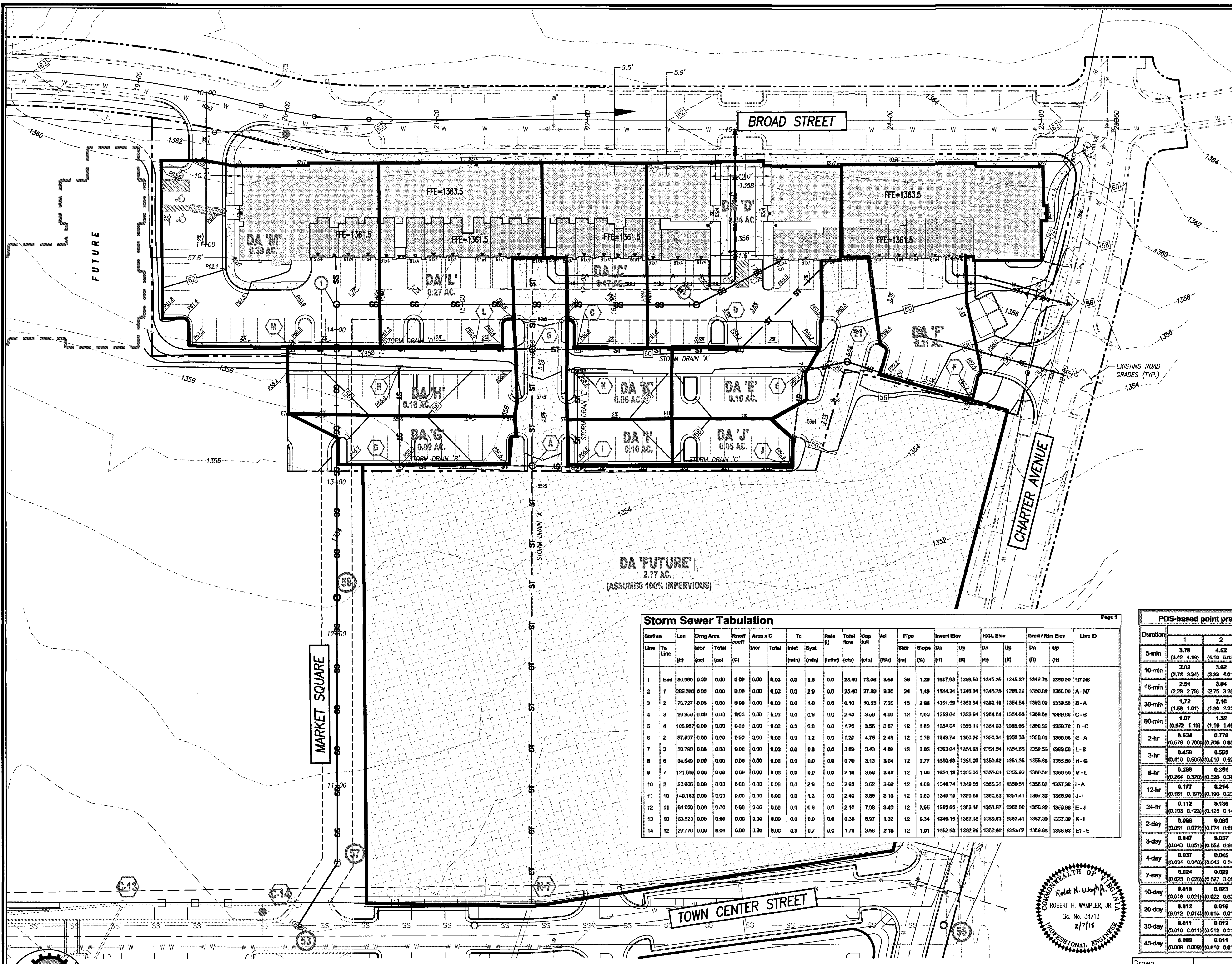
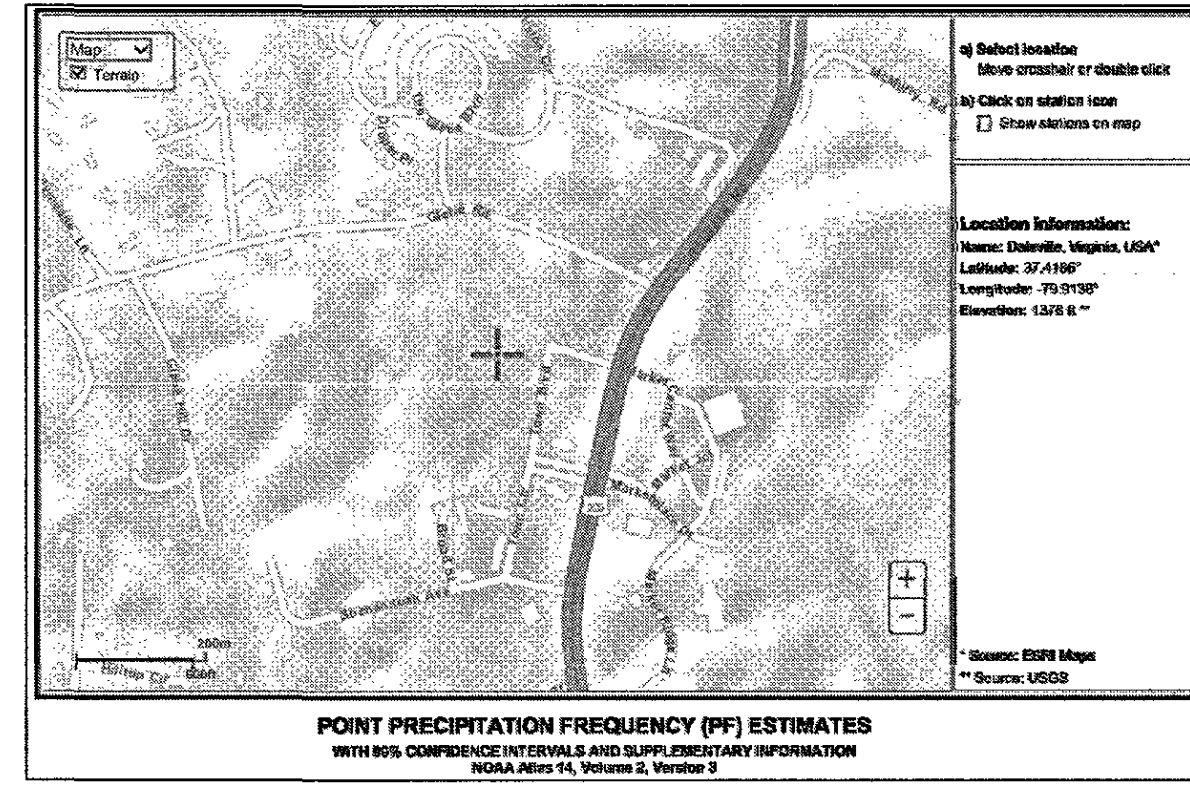


NAD83 (2011)
VIRGINIA SOUTH ZONE
GRID NORTH



Cipervious =	0.90				
Copenious =	0.33				
I ₂ =	4.52				
I ₁₀ =	6.10				
(Worse case Tc = 5 min. Botetourt County)					

Structure	Amperious	Apervious	A _{total}	C _{weighted}	Q ₂	Q ₁₀
DA 'C'	0.17	0.00	0.17	0.90	0.7	0.9
DA 'D'	0.29	0.05	0.34	0.82	1.3	1.7
DA 'E'	0.06	0.04	0.10	0.67	0.3	0.4
DA 'F'	0.31	0.00	0.31	0.90	1.3	1.7
DA 'G'	0.08	0.01	0.09	0.84	0.3	0.5
DA 'H'	0.10	0.06	0.16	0.69	0.5	0.7
DA 'I'	0.04	0.01	0.05	0.79	0.2	0.2
DA 'J'	0.05	0.00	0.05	0.90	0.2	0.3
DA 'K'	0.05	0.03	0.08	0.69	0.2	0.3
DA 'L'	0.26	0.01	0.27	0.88	1.1	1.4
DA 'M'	0.37	0.02	0.39	0.87	1.5	2.1
FUTURE	2.77	0.02	2.79	0.90	11.3	15.2

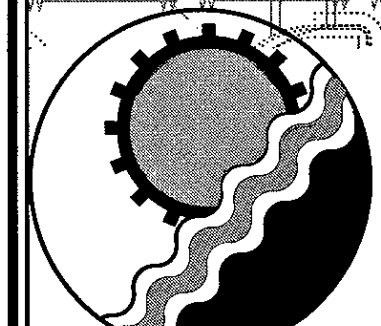


Storm Sewer Tabulation

Page 1

Station	Len	Drng Area	Rnooff	Area x C	Tc	Rain (l)	Total flow	Cap fall	Vol	Pipe	Invert Elev	HGL Elev	Gnd / Rim Elev	Line ID						
Line To Line		Incr (ac)	Total (ac)	(C)	Incr	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)			
1	End	50.000	0.00	0.00	0.00	0.0	3.5	0.0	25.40	73.06	3.56	36	1.20	1337.90	1338.50	1345.25	1345.32	1349.70	1350.00	M7-N6
2	1	289.000	0.00	0.00	0.00	0.0	2.9	0.0	25.40	27.59	9.30	24	1.49	1344.24	1348.54	1345.75	1350.31	1350.00	1356.00	A - M7
3	2	76.727	0.00	0.00	0.00	0.0	1.0	0.0	6.10	10.53	7.35	15	2.98	1351.50	1353.54	1352.18	1354.54	1356.00	1359.58	B - A
4	3	29.959	0.00	0.00	0.00	0.0	0.8	0.0	2.85	3.68	4.00	12	1.00	1353.94	1358.94	1354.64	1358.94	1369.58	1369.90	C - B
5	4	108.957	0.00	0.00	0.00	0.0	0.0	0.0	1.70	3.56	3.87	12	1.00	1354.04	1356.11	1354.68	1356.68	1360.90	1369.70	D - C
6	2	87.807	0.00	0.00	0.00	0.0	1.2	0.0	1.20	4.75	2.46	12	1.78	1348.74	1350.30	1350.31	1350.78	1356.00	1355.50	G - A
7	3	36.789	0.00	0.00	0.00	0.0	0.8	0.0	3.80	3.43	4.82	12	0.83	1353.64	1354.00	1354.54	1354.85	1359.58	1369.50	L - B
8	6	64.546	0.00	0.00	0.00	0.0	0.0	0.0	0.70	3.13	3.04	12	0.77	1350.50	1351.00	1350.82	1351.35	1355.50	1365.50	H - G
9	7	121.000	0.00	0.00	0.00	0.0	0.0	0.0	2.10	3.56	3.43	12	1.00	1354.10	1355.31	1355.04	1356.93	1360.50	1360.50	M - L
10	2	30.008	0.00	0.00	0.00	0.0	2.8	0.0	2.90	3.62	3.69	12	1.03	1348.74	1349.05	1350.31	1350.51	1356.00	1357.30	I - A
11	10	140.183	0.00	0.00	0.00	0.0	1.3	0.0	2.40	3.56	3.19	12	1.00	1348.15	1350.65	1350.85	1351.41	1357.30	1368.90	J - I
12	11	64.000	0.00	0.00	0.00	0.0	0.9	0.0	2.10	7.08	3.40	12	3.95	1350.65	1353.18	1351.67	1353.80	1356.90	1359.50	E - J
13	10	63.523	0.00	0.00	0.00	0.0	0.0	0.0	0.30	8.97	1.32	12	8.34	1349.15	1353.16	1353.63	1353.41	1357.30	1357.30	K - I
14	12	29.770	0.00	0.00	0.00	0.0	0.7	0.0	1.70	3.56	2.16	12	1.01	1352.50	1352.80	1353.80	1353.67	1359.90	1356.63	E1 - E

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour) ¹									
Duration	Average recurrence interval (years)								
	1	2	5	10	25	50	100	200	500
5-min	3.78 (3.42 4.19)	4.52 (4.10 5.02)	5.45 (4.91 6.04)	6.10 (5.48 6.76)	6.91 (6.17 7.64)	7.48 (6.64 8.29)	8.04 (7.07 8.94)	8.56 (7.46 9.55)	9.19 (7.90 10.3)
10-min	3.02 (2.73 3.34)	3.62 (3.28 4.01)	4.36 (3.93 4.84)	4.88 (4.39 5.40)	5.50 (4.91 6.09)	5.96 (5.29 6.61)	6.38 (5.62 7.10)	6.79 (5.91 7.57)	7.27 (6.25 8.18)
15-min	2.51 (2.28 2.79)	3.04 (2.75 3.36)	3.68 (3.31 4.08)	4.11 (3.70 4.55)	4.65 (4.15 5.14)	5.03 (4.45 5.55)	5.38 (4.73 5.98)	5.71 (4.97 6.37)	6.10 (5.24 6.87)
30-min	1.72 (1.58 1.91)	2.10 (1.90 2.32)	2.61 (2.35 2.90)	2.98 (2.68 3.30)	3.44 (3.08 3.81)	3.79 (3.36 4.20)	4.12 (3.62 4.58)	4.44 (3.87 4.96)	4.86 (4.17 5.46)
60-min	1.07 (0.972 1.19)	1.32 (1.19 1.46)	1.68 (1.51 1.86)	1.94 (1.74 2.15)	2.29 (2.05 2.54)	2.57 (2.28 2.85)	2.84 (2.50 3.16)	3.12 (2.71 3.48)	3.48 (2.99 3.92)
2-hr	0.634 (0.576 0.700)	0.778 (0.706 0.866)	0.995 (0.902 1.10)	1.16 (1.05 1.28)	1.38 (1.24 1.52)	1.55 (1.39 1.72)	1.73 (1.53 1.92)	1.92 (1.68 2.13)	2.16 (1.87 2.43)
3-hr	0.458 (0.416 0.505)	0.580 (0.510 0.620)	0.713 (0.648 0.789)	0.831 (0.753 0.919)	0.980 (0.881 1.09)	1.12 (0.986 1.24)	1.25 (1.11 1.38)	1.38 (1.21 1.54)	1.57 (1.35 1.76)
6-hr	0.288 (0.264 0.320)	0.351 (0.320 0.389)	0.442 (0.402 0.491)	0.515 (0.466 0.571)	0.617 (0.555 0.685)	0.702 (0.624 0.790)	0.792 (0.696 0.882)	0.888 (0.769 0.992)	1.02 (0.869 1.16)
12-hr	0.177 (0.161 0.197)	0.214 (0.195 0.239)	0.270 (0.245 0.301)	0.316 (0.286 0.352)	0.383 (0.342 0.427)	0.446 (0.388 0.490)	0.503 (0.437 0.562)	0.571 (0.487 0.642)	0.672 (0.559 0.764)
24-hr	0.112 (0.103 0.123)	0.136 (0.125 0.146)	0.172 (0.158 0.186)	0.203 (0.186 0.221)	0.247 (0.224 0.269)	0.284 (0.258 0.310)	0.324 (0.290 0.353)	0.369 (0.327 0.402)	0.434 (0.379 0.475)
2-day	0.066 (0.061 0.072)	0.080 (0.074 0.087)	0.101 (0.093 0.110)	0.118 (0.108 0.128)	0.143 (0.130 0.155)	0.163 (0.148 0.177)	0.185 (0.167 0.201)	0.209 (0.187 0.229)	0.244 (0.215 0.267)
3-day	0.047 (0.043 0.051)	0.057 (0.052 0.062)	0.071 (0.066 0.076)	0.083 (0.077 0.089)	0.101 (0.092 0.109)	0.115 (0.104 0.125)	0.130 (0.117 0.141)	0.146 (0.131 0.159)	0.170 (0.150 0.186)
4-day	0.037 (0.034 0.040)	0.045 (0.042 0.049)	0.057 (0.052 0.061)	0.066 (0.061 0.072)	0.079 (0.073 0.086)	0.090 (0.082 0.098)	0.102 (0.093 0.111)	0.115 (0.104 0.125)	0.133 (0.116 0.146)
7-day	0.024 (0.023 0.026)	0.029 (0.027 0.032)	0.037 (0.034 0.040)	0.042 (0.039 0.046)	0.050 (0.046 0.054)	0.057 (0.052 0.062)	0.064 (0.058 0.069)	0.071 (0.064 0.077)	0.081 (0.073 0.088)
10-day	0.019 (0.018 0.021)	0.023 (0.022 0.025)	0.029 (0.027 0.031)	0.033 (0.031 0.035)	0.038 (0.036 0.041)	0.043 (0.039 0.046)	0.047 (0.043 0.051)	0.052 (0.047 0.056)	0.058 (0.053 0.063)
20-day	0.013 (0.012 0.014)	0.016 (0.015 0.016)	0.019 (0.017 0.020)	0.021 (0.020 0.022)	0.024 (0.023 0.026)	0.027 (0.025 0.029)	0.029 (0.028 0.031)	0.032 (0.030 0.034)	0.036 (0.033 0.039)
30-day	0.011 (0.010 0.011)	0.013 (0.012 0.013)	0.015 (0.014 0.016)	0.017 (0.016 0.018)	0.019 (0.018 0.020)	0.021 (0.019 0.022)	0.022 (0.021 0.023)	0.024 (0.022 0.025)	0.026 (0.025 0.029)
45-day	0.009 (0.009 0.009)	0.011 (0.010 0.011)	0.012 (0.012 0.013)	0.014 (0.013 0.014)	0.015 (0.014 0.016)	0.016 (0.015 0.017)	0.018 (0.016 0.018)	0.020 (0.017 0.020)	0.021 (0.020 0.022)



ENGINEERING CONCEPTS, INC.
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COMMONWEALTH OF VIRGINIA
ROBERT H. WAMPLER, JR.
Lic. No. 34713
2/7/18
PROFESSIONAL ENGINEER

Drawn	ECI	DRAINAGE MAP DTC MULTIFAMILY - PHASE 2 DALEVILLE TOWN CENTER BOTETOURT COUNTY, VIRGINIA	1" = 30'
Designed	ECI		DATE: FEB 7, 2018
Checked	ECI		PROJECT: 17055
Approved	ECI		C16
	ECI		