Kilkenny Heights II - Gutter Flow Analysis

Structure	Incremental AC to Inlet	Total AC to Inlet	Q_{10}	Longitudinal Slope (S)	Cross Slope (Sx)	Pavement Roughness (n)	Width of Flow (T)	Depth of Flow (d)	Total Area of Flow	Area Bypass	AC Bypass
CB1	0.175	0.175	1.30	0.023	0.03125	0.015	5.03	0.16	0.396	0.212	0.093
CB3	0.058	0.151	1.12	0.023	0.03125	0.015	4.77	0.15	0.355	0.182	0.077
CB7	0.161	0.238	1.77	Sag	0.03125		5.96	0.19			
CB2	0.183	0.183	1.36	0.023	0.03125	0.015	5.12	0.16	0.409	0.221	0.099
CB2A	0.058	0.157	1.16	0.023	0.03125	0.015	4.83	0.15	0.365	0.189	0.081
CB4	0.123	0.204	1.52	0.023	0.03125	0.015	5.34	0.17	0.445	0.248	0.114
CB5	0.073	0.186	1.39	0.023	0.03125	0.015	5.16	0.16	0.415	0.226	0.101
CB6	0.089	0.191	1.42	Sag	0.03125		5.14	0.16			
A	Area			acres	Taken from Pipe Sizing Chart						
C	Runoff Coefficient				Taken from Pipe Sizing Chart						
Tc	Time of Concentration		5	min.	Assumed						
i_{10}	Rainfall Intensity		7.43	in/hr	Taken from NOAA Table						
Q_{10}	Flow Rate (10-year storm)			cfs	Q=A x C x i_{10}						
Wg	Width of Grate		1.3541	ft	Type C CB Grate Inlet						
P	Weir perimeter of Grate		7.33	ft	Type C Double Type II CB Grate Inlet						
C_{FS}	Safety Factor for Clogging		1		Type C CB with 0% clogging						
C_w	Weir Coefficient		3								
$T=\{Q_{10}(n)/[0.56(Sx^{1.67})(S^{0.5})]\}^{0.3745}$				Gutter flow width on decline							
$T=[Q_{10}(C_{FS})/C_w/P]^{0.667}/S_x$				Gutter flow width in sag							