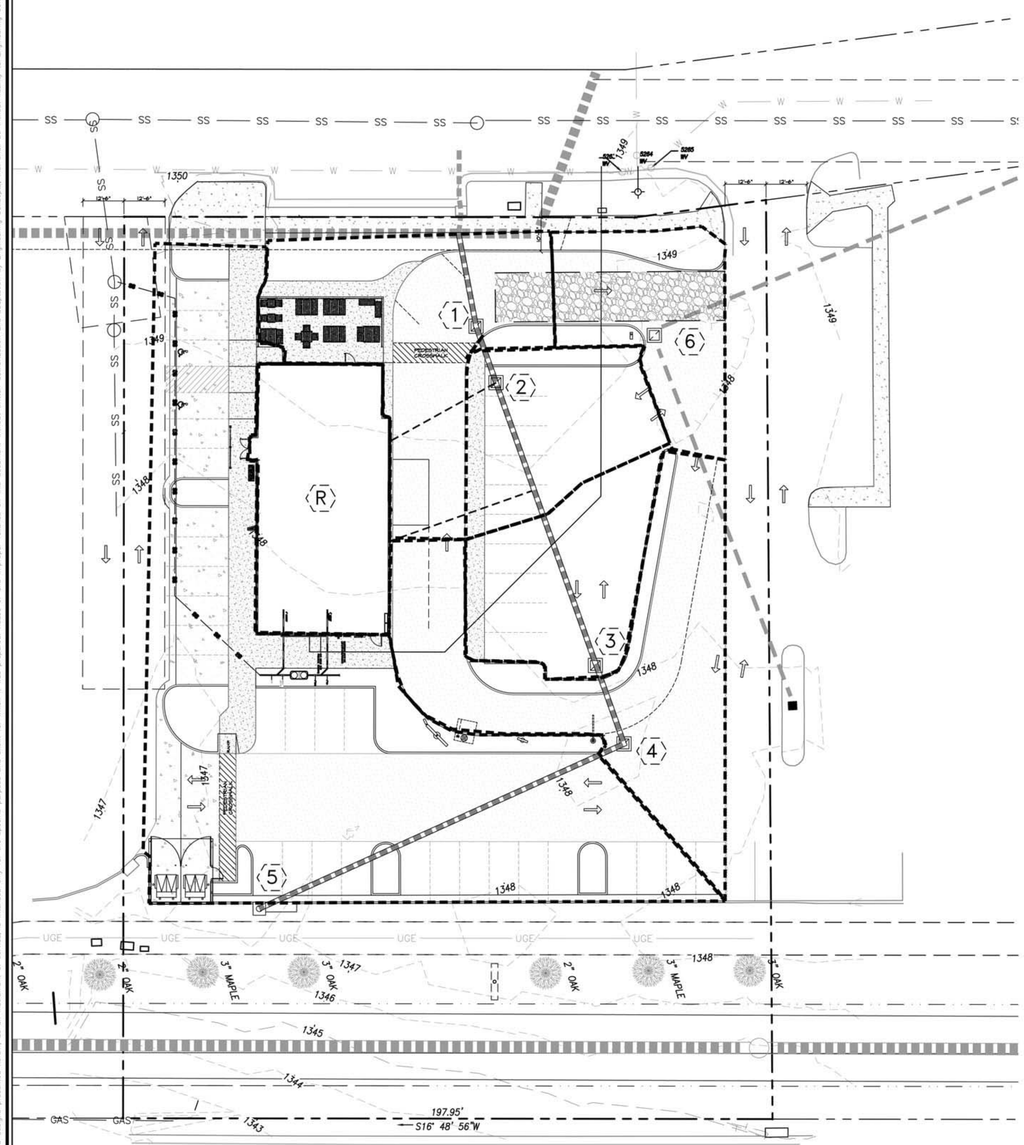


1	0.11 AC	5	0.33 AC
2	0.06 AC	6	0.06 AC
3	0.06 AC	R	0.08 AC
4	0.13 AC		

$C_{impervious}$ =	0.90	
$C_{pervious}$ =	0.33	
I_2 =	5.34	
I_{10} =	6.22	(Worse case Tc = 5 min. Botetourt County)

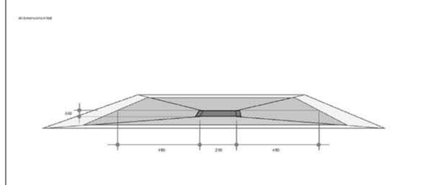
Structure	$A_{impervious}$	$A_{pervious}$	A_{total}	$C_{weighted}$	Q_2	Q_{10}
1	0.11	0.00	0.11	0.90	0.5	0.6
2	0.06	0.00	0.06	0.90	0.3	0.3
3	0.06	0.00	0.06	0.90	0.3	0.3
4	0.13	0.00	0.13	0.90	0.6	0.7
5	0.33	0.00	0.33	0.90	1.6	1.8
6	0.06	0.00	0.06	0.90	0.3	0.3
R	0.08	0.00	0.08	0.90	0.4	0.4

Inlet Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. — Tuesday, Oct 12 2021

Inlet 4 (Worst Case)

Drop Grate Inlet		Calculations	
Location	= Sag	Compute by:	Known Q
Curb Length (ft)	= -0-	Q (cfs)	= 0.70
Throat Height (in)	= -0-		
Grate Area (sqft)	= 2.33	**Highlighted**	
Grate Width (ft)	= 2.50	Q Total (cfs)	= 0.70
Grate Length (ft)	= 2.20	Q Capt (cfs)	= 0.70
		Q Bypass (cfs)	= -0-
Gutter		Depth at Inlet (in)	= 1.02
Slope, Sw (ft/ft)	= 0.020	Efficiency (%)	= 100
Slope, Sx (ft/ft)	= 0.020	Gutter Spread (ft)	= 11.00
Local Depr (in)	= -0-	Gutter Vel (ft/s)	= 2.89
Gutter Width (ft)	= 2.00	Bypass Spread (ft)	= -0-
Gutter Slope (%)	= -0-	Bypass Depth (in)	= -0-
Gutter n-value	= -0-		

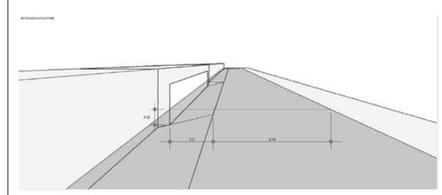


Inlet Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. — Tuesday, Oct 12 2021

Inlet 5

Curb Inlet		Calculations	
Location	= Sag	Compute by:	Known Q
Curb Length (ft)	= 10.00	Q (cfs)	= 1.80
Throat Height (in)	= 6.00		
Grate Area (sqft)	= -0-	**Highlighted**	
Grate Width (ft)	= -0-	Q Total (cfs)	= 1.80
Grate Length (ft)	= -0-	Q Capt (cfs)	= 1.80
		Q Bypass (cfs)	= -0-
Gutter		Depth at Inlet (in)	= 3.79
Slope, Sw (ft/ft)	= 0.020	Efficiency (%)	= 100
Slope, Sx (ft/ft)	= 0.020	Gutter Spread (ft)	= 7.45
Local Depr (in)	= 2.00	Gutter Vel (ft/s)	= 2.89
Gutter Width (ft)	= 2.00	Bypass Spread (ft)	= -0-
Gutter Slope (%)	= -0-	Bypass Depth (in)	= -0-
Gutter n-value	= -0-		



Storm Sewer Tabulation

Page 1

Station Line	Station To Line	Len (ft)	Drng Area Incr (ac)	Drng Area Total (ac)	Rnoff coeff (C)	Area x C Incr	Area x C Total	Tc Inlet (min)	Tc Syst (min)	Rain (I) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe Size (in)	Pipe Slope (%)	Invert Elev Dn (ft)	Invert Elev Up (ft)	HGL Elev Dn (ft)	HGL Elev Up (ft)	Grnd / Rim Elev Dn (ft)	Grnd / Rim Elev Up (ft)	Line ID
1	End	28.600	0.00	0.00	0.00	0.00	0.00	0.0	1.7	0.0	4.33	7.04	3.53	15	1.01	f137.85	f138.14	f139.49	f139.60	f149.00	f147.70	
2	1	18.300	0.00	0.00	0.00	0.00	0.00	0.0	1.6	0.0	3.71	6.94	3.02	15	0.98	f138.24	f138.42	f139.70	f139.75	f147.70	f147.80	
3	2	36.787	0.00	0.00	0.00	0.00	0.00	0.0	1.5	0.0	3.37	3.87	4.29	12	1.01	f138.52	f138.89	f139.82	f140.10	f147.80	f147.80	
4	3	110.800	0.00	0.00	0.00	0.00	0.00	0.0	0.9	0.0	2.58	3.86	3.88	12	1.00	f138.99	f140.16	f140.24	f140.85	f147.80	f147.20	
5	4	122.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.85	3.86	3.89	12	1.00	f140.20	f141.46	f140.86	f142.06	f147.20	f145.50	

DQ — Number of lines: 5 — Run Date: 10/12/2021

NOTES:Intensity = 88.24 / (Inlet time + 15.50) ^ 0.83; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewers v3.00

ENGINEERING CONCEPTS, INC.
94 Greenfield Street
Daleville, Virginia 24083
540.473.1253

No.	Description	Date

DAIRY QUEEN
DALEVILLE TOWN CENTER

STORMWATER DETAILS & CALCULATIONS

COMMONWEALTH OF VIRGINIA
ROBERT H. WAMPLER, JR.
Lic. No. 34713
10/8/21
PROFESSIONAL ENGINEER

0 1 2
GRAPHIC SCALE

PROJECT: 21055

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