



Hydraulic Calculations by HydraCALC

CAROLINA FIRE PROTECTION
4055 HODGES CHAPEL ROAD
DUNN, NC 28334
910-892-1700

Job Name : BAUCOM BUSINESS PLAZA STORAGE
Drawing : FP-101
Location : 11132 US 401 N FUQUAY VARINA, NC 27526
Remote Area : 3
Contract :
Data File : BAUCOM BUSINESS PLAZA STORAGE Area 3.WXF

HYDRAULIC CALCULATIONS
for

JOB NAME BAUCOM BUSINESS PLAZA STORAGE
Location 11132 US 401 N FUQUAY VARINA, NC 27526
Drawing # FP-101
Contract #
Date 10-02-24

DESIGN

Remote area # 3
Remote area location LOWER LEVEL
Occupancy classification OH-2 (STORAGE)
Density 0.2 - Gpm/SqFt
Area of application 900 - SqFt
Coverage/sprinkler 125 - SqFt
Type of sprinkler calculated VICTAULIC (V2704) 1/2" 155 QR BR UPR
Sprinklers calculated 16
In-rack demand N/A - GPM
Hose streams 250 - GPM
Total water required (including hose streams) 570.33 - GPM @ 97.46 - Psi
Type of system WET
Volume of system (dry or pre-action) - Gal

WATER SUPPLY INFORMATION

Test date 10-05-23
Location 11132 US 401 N, FUQUAY-VARINA, NC
Source of info ENGINEERING PLANNING AND MANAGEMENT

CONTRACTOR INFO CAROLINA FIRE PROTECTION
Address 4055 HODGES CHAPEL ROAD / DUNN, NC 28334
Phone # 910-892-1700
Name of designer IFPDC-GB
Authority having jurisdiction

NOTES:

SAFETY MARGIN 9.09 PSI

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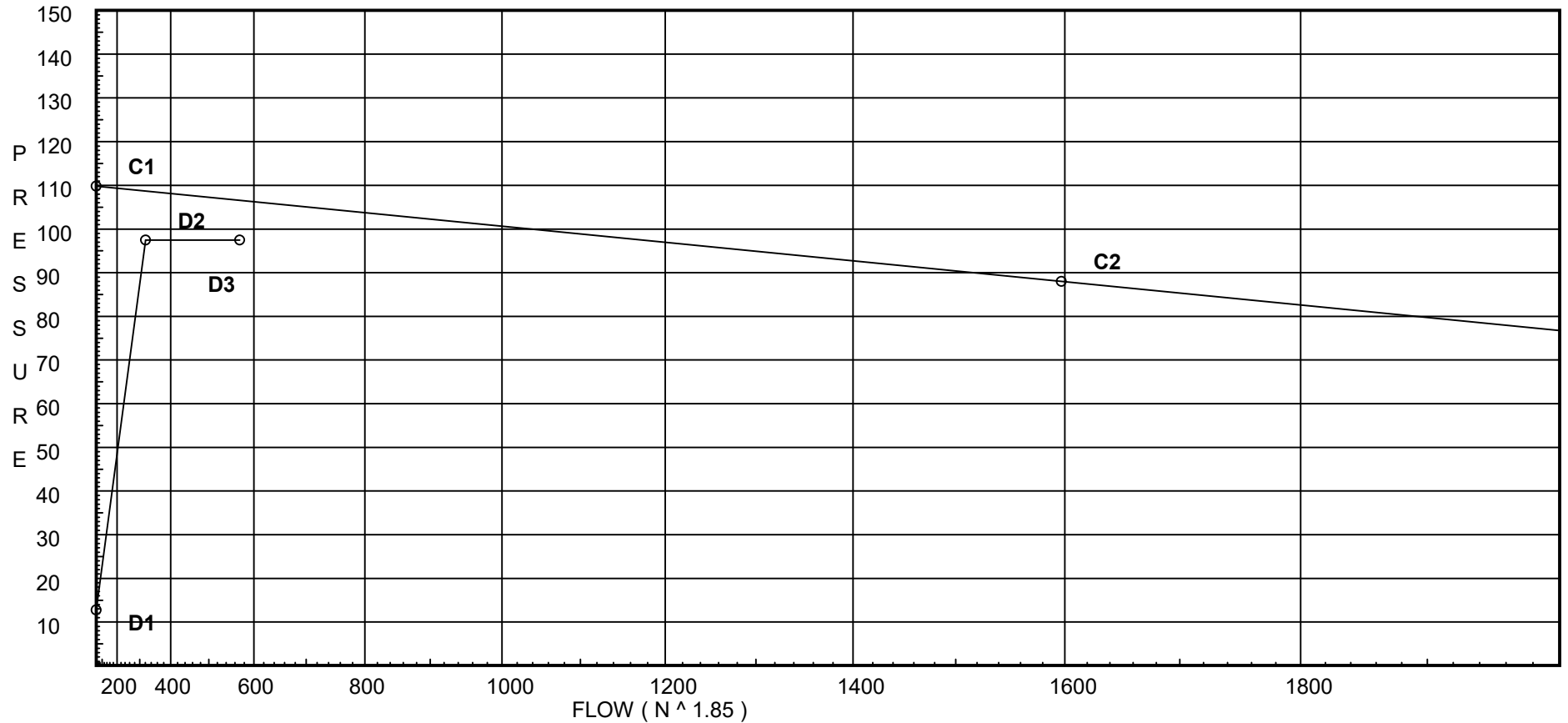
Water Supply Curve

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City Water Supply:
C1 - Static Pressure : 109.8
C2 - Residual Pressure: 88
C2 - Residual Flow : 1597

Demand:
D1 - Elevation : 12.776
D2 - System Flow : 320.33
D2 - System Pressure : 97.463
Hose (Demand) : 250
D3 - System Demand : 570.33
Safety Margin : 9.092



Fittings Used Summary

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Fitting Legend

Abbrev.	Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
Bvca	B Fly Vic 705						6	6	7		8	12	14	16	18	19					
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Zcj	Colt C500 Horz OSY	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

Diameter Units Inches
Length Units Feet
Flow Units US Gallons per Minute
Pressure Units Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	109.8	88	1597.0	106.555	570.33	97.463

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>	
`	0.0		23.61			
300	8.5	5.6	19.93	25.0	0.2	125
301	8.5	5.6	21.9	26.2	0.2	125
302	8.5	5.6	29.3	30.31	0.2	125
304	8.5	5.6	48.31	38.92	0.2	125
303	8.5		51.56			
305	8.08		57.83			
306	8.08		57.91			
109	8.08		63.33			
110	23.17		64.1			
TSR	23.17		64.25			
BSR	11.0		70.77			
RE	7.0		72.57			
UG1	-1.0		76.4	250.0		
PIT	-1.0		79.31			
CON	-1.0		88.59			
TEST	-21.0		97.46			
307	8.5	5.6	19.93	25.0	0.2	125
308	8.5	5.6	21.9	26.21	0.2	125
309	8.5	5.6	29.31	30.32	0.2	125
311	8.5	5.6	48.32	38.93	0.2	125
310	8.5		51.57			
312	8.08		57.84			
108	8.08		58.56			
124	8.08		63.15			
313	8.5	5.6	49.15	39.26	0.2	125
315	8.5	5.6	51.46	40.17	0.2	125
314	8.5		54.91			

Final Calculations : Hazen-Williams

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
300 to 301	8.5 8.5	5.60	25.00 25.0	1 1.049			10.000 10.000	120 0.1966	19.930 0.0 1.966			Vel = 9.28
301 to 302	8.5 8.5	5.60	26.20 51.2	1 1.049			10.000 10.000	120 0.7408	21.896 0.0 7.408			Vel = 19.01
302 to 303	8.5 8.5	5.60	30.32 81.52	1 1.049	T	5.0	7.710 5.000 12.710	120 1.7511	29.304 0.0 22.256			Vel = 30.26
303			0.0 81.52						51.560			K Factor = 11.35
304 to 303	8.5 8.5	5.60	38.92 38.92	1 1.049	T	5.0	2.290 5.000 7.290	120 0.4460	48.309 0.0 3.251			Vel = 14.45
303 to 305	8.5 8.08		81.52 120.44	1.25 1.38	T	6.0	0.420 6.000 6.420	120 0.9481	51.560 0.182 6.087			Vel = 25.83
305 to 306	8.08 8.08		-31.64 88.8	3 3.26			10.000 10.000	120 0.0082	57.829 0.0 0.082			Vel = 3.41
306 to 109	8.08 8.08		79.43 168.23	3 3.26	2T	40.319	162.200 40.319 202.519	120 0.0267	57.911 0.0 5.416			Vel = 6.47
109 to 110	8.08 23.17		152.10 320.33	3 3.26	2E T	18.815 20.159	44.080 38.974 83.054	120 0.0880	63.327 -6.535 7.311			Vel = 12.31
110 to TSR	23.17 23.17		0.0 320.33	3 3.26			1.670 1.670	120 0.0880	64.103 0.0 0.147			Vel = 12.31
TSR to BSR	23.17 11		0.0 320.33	4 4.26	Bvca S	10.534 28.968	12.625 39.502 52.127	120 0.0239	64.250 5.271 1.247			Vel = 7.21
BSR to RE	11 7		0.0 320.33	6 6.357	E	17.603	4.000 17.603 21.603	120 0.0034	70.768 1.732 0.074			Vel = 3.24
RE to UG1	7 -1		0.0 320.33	6 6.28	E T G	22.063 47.277 4.728	60.000 74.068 134.068	140 0.0027	72.574 3.465 0.364			Vel = 3.32
UG1 to PIT	-1 -1	H250	250.00 570.33	6 6.09	E 2F	21.583 21.583	317.000 43.166 360.166	150 0.0081	76.403 0.0 2.908			Vel = 6.28
PIT to CON	-1 -1		0.0 570.33	6 6.28	2E T 2G Zcj	44.125 47.277 9.455 0.0	100.000 100.857 200.857	140 0.0079	79.311 7.695 1.587		** Fixed Loss = 7.695	Vel = 5.91
CON to TEST	-1 -21		0.0 570.33	12 12.46	T 3F	98.292 63.89	580.000 162.182 742.182	140 0.0003	88.593 8.662 0.208			Vel = 1.50

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****	
			0.0										
TEST			570.33							97.463	K Factor = 57.77		
307 to 308	8.5 8.5	5.60	25.00 25.0	1 1.049			10.000 10.000	120 0.1967	19.934 0.0 1.967	Vel = 9.28			
308 to 309	8.5 8.5	5.60	26.21 51.21	1 1.049			10.000 10.000	120 0.7409	21.901 0.0 7.409	Vel = 19.01			
309 to 310	8.5 8.5	5.60	30.32 81.53	1 1.049	T	5.0	7.710 5.000 12.710	120 1.7515	29.310 0.0 22.261	Vel = 30.27			
			0.0										
310			81.53							51.571	K Factor = 11.35		
311 to 310	8.5 8.5	5.60	38.93 38.93	1 1.049	T	5.0	2.290 5.000 7.290	120 0.4461	48.319 0.0 3.252	Vel = 14.45			
310 to 312	8.5 8.08		81.53 120.46	1.25 1.38	T	6.0	0.420 6.000 6.420	120 0.9484	51.571 0.182 6.089	Vel = 25.84			
312 to 108	8.08 8.08		31.64 152.1	3 3.26	T	20.159	12.300 20.159 32.459	120 0.0222	57.842 0.0 0.720	Vel = 5.85			
108 to 124	8.08 8.08		0.0 152.1	3 3.26	T	20.159	186.770 20.159 206.929	120 0.0222	58.562 0.0 4.592	Vel = 5.85			
124 to 109	8.08 8.08		0.0 152.1	3 3.26			7.790 7.790	120 0.0222	63.154 0.0 0.173	Vel = 5.85			
			0.0										
109			152.10							63.327	K Factor = 19.11		
313 to 314	8.5 8.5	5.60	39.26 39.26	1 1.049	T	5.0	7.710 5.000 12.710	120 0.4532	49.151 0.0 5.760	Vel = 14.57			
			0.0										
314			39.26							54.911	K Factor = 5.30		
315 to 314	8.5 8.5	5.60	40.17 40.17	1 1.049	T	5.0	2.290 5.000 7.290	120 0.4728	51.464 0.0 3.447	Vel = 14.91			
314 to 306	8.5 8.08		39.26 79.43	1.25 1.38	T	6.0	0.420 6.000 6.420	120 0.4389	54.911 0.182 2.818	Vel = 17.04			
			0.0										
306			79.43							57.911	K Factor = 10.44		
305 to 312	8.08 8.08		31.65 31.65	3 3.26			10.040 10.040	120 0.0013	57.829 0.0 0.013	Vel = 1.22			
			0.0										

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Node1	Elev1	K	Qa	Nom	Fitting		Pipe	CFact	Pt			
to					or		Ftngs		Pe	*****	Notes	*****
Node2	Elev2	Fact	Qt	Act	Equiv	Len	Total	Pf/Ft	Pf			
312			31.65						57.842		K Factor =	4.16