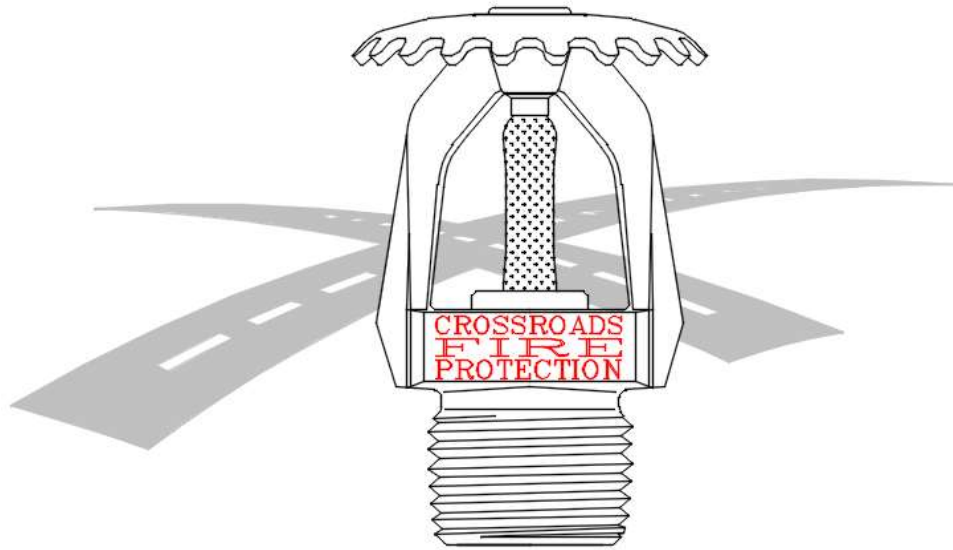




Crossroads Fire Protection
809 South Market Street
Benson, NC 27504
919-207-3855

Job Name : Antioch Baptist Church
Drawing : FP3
Location : 6670 OLD US 421, LILLINGTON, NC 27546
Remote Area : 1
Contract : CC-11974
Data File : Antioch Uprights Calc 1.WXF

HYDRAULIC CALCULATIONS
for

JOB NAME Antioch Baptist Church
Location 6670 OLD US 421, LILLINGTON, NC 27546
Drawing # FP3
Contract # CC-11974
Date 07-09-2026

DESIGN

Remote area # 1
Remote area location MOST REMOTE
Occupancy classification MULTIPURPOSE
Density .1 - Gpm/SqFt
Area of application 1557 - SqFt
Coverage/sprinkler 225 - SqFt
Type of sprinkler calculated
Sprinklers calculated 10
In-rack demand - GPM
Hose streams 100 - GPM
Total water required (including hose streams) 332.158 - GPM @ 68.4782 - Psi
Type of system WET GRID
Volume of system (dry or pre-action) - Gal

WATER SUPPLY INFORMATION

Test date 06-17-2026
Location TEST
Source of info DREW KING

CONTRACTOR INFO Crossroads Fire Protection
Address 809 South Market Street / Benson, NC 27504
Phone # 919-207-3855
Name of designer CFP
Authority having jurisdiction HARNETT COUTNY
NOTES:

text1(35) - invisible

Water Supply Curve

Crossroads Fire Protection
Antioch Baptist Church

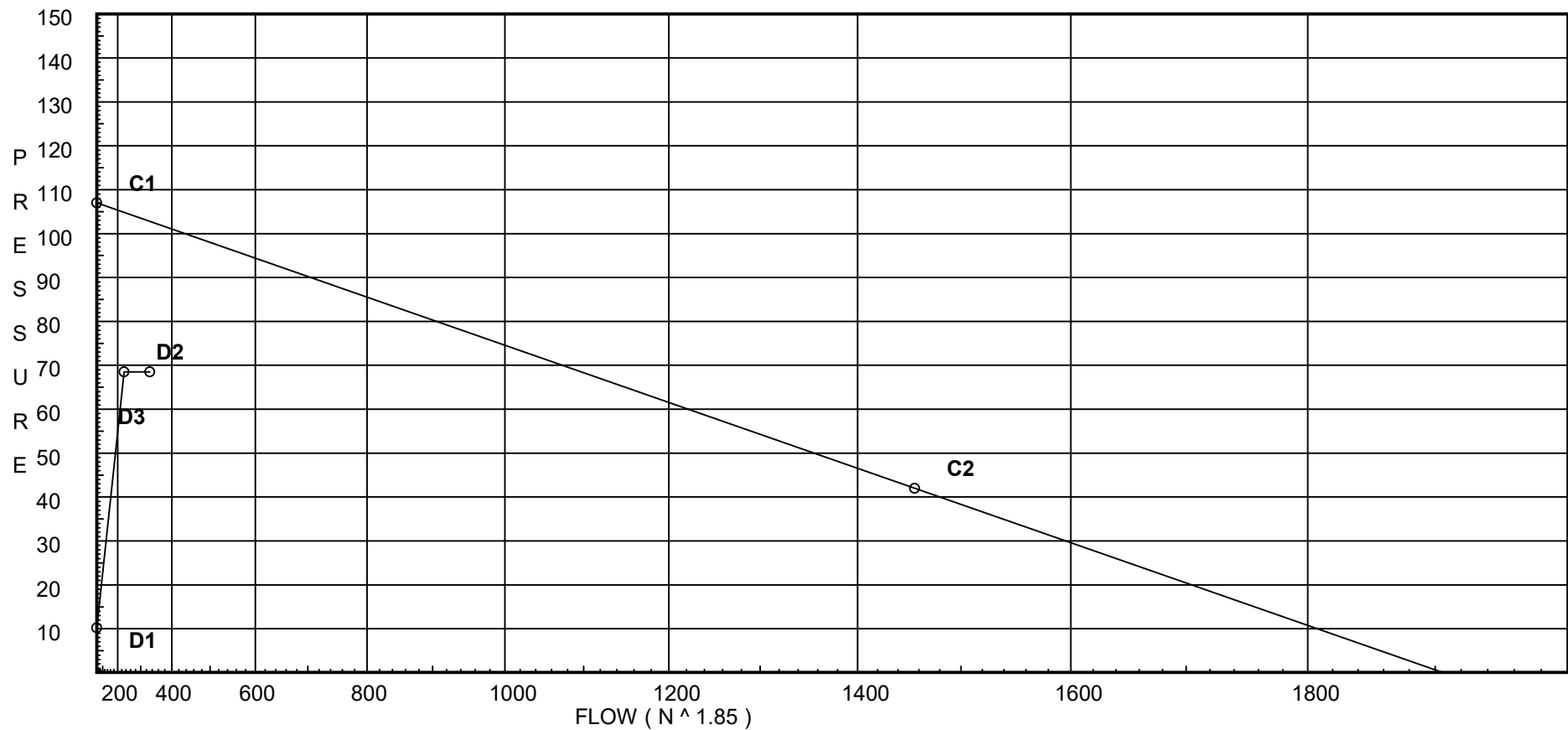
Page 2
Date 07-09-2026

City Water Supply:

C1 - Static Pressure : 107
C2 - Residual Pressure: 42
C2 - Residual Flow : 1456

Demand:

D1 - Elevation : 10.212
D2 - System Flow : 232.158
D2 - System Pressure : 68.478
Hose (Demand) : 100
D3 - System Demand : 332.158
Safety Margin : 34.300



Fittings Used Summary

Crossroads Fire Protection
Antioch Baptist Church

Page 3
Date 07-09-2026

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
B	NFPA 13 Butterfly Valve	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E	NFPA 13 90' Standard Elbow	0	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
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

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.

Flow Summary - NFPA

Crossroads Fire Protection
Antioch Baptist Church

Page 4
Date 07-09-2026

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	107.0	42	1456.0	102.778	332.16	68.478

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>	
101	18.625		20.44			
H1	22.417	5.6	17.28	23.28	0.1	225
H2	24.58	5.6	16.14	22.5	0.1	225
H3	24.58	5.6	16.14	22.5	0.1	225
H4	22.417	5.6	17.31	23.3	0.1	225
102	18.625		20.65			
H5	22.417	5.6	17.47	23.41	0.1	225
H6	24.58	5.6	16.34	22.64	0.1	225
H7	24.58	5.6	16.34	22.64	0.1	225
H8	22.417	5.6	17.51	23.43	0.1	225
103	18.625		21.42			
H9	22.417	5.6	19.2	24.54	0.1	225
H10	24.58	5.6	18.26	23.93	0.1	225
104	18.625		22.69			
105	18.625		23.81			
106	18.625		24.71			
107	18.625		25.29			
108	18.625		25.5			
201	18.625		20.57			
202	18.625		20.8			
203	18.625		21.63			
204	18.625		22.87			
205	18.625		24.27			
206	18.625		25.93			
207	18.625		28.04			
208	18.625		30.95			
M2	9.625		46.78			
TOR	9.625		47.33			
BOR	1.0		56.64			
BF	1.0		64.86			
RI	1.0		65.05			
UG1	-1.0		68.86			
TEST	1.0		68.48	100.0		

Final Calculations : Hazen-Williams

Crossroads Fire Protection
Antioch Baptist Church

Page 5
Date 07-09-2026

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	*****
101 to H1	18.625 22.417		-44.94 -44.94	1.5 1.682	E T 4.95 9.9	11.208 14.850 26.058	120 -0.0584	20.440 -1.642 -1.522		Vel = 6.49	
H1 to H2	22.417 24.580	5.60	23.28 -21.66	1.5 1.682		12.958 12.958	120 -0.0151	17.276 -0.937 -0.196		Vel = 3.13	
H2 to H3	24.580 24.580	5.60	22.50 0.84	1.5 1.682		13.333 13.333	120 0.0001	16.143 0.0 0.001		Vel = 0.12	
H3 to H4	24.580 22.417	5.60	22.50 23.34	1.5 1.682		12.958 12.958	120 0.0174	16.144 0.937 0.225		Vel = 3.37	
H4 to 201	22.417 18.625	5.60	23.29 46.63	1.5 1.682	E T 4.95 9.9	11.167 14.850 26.017	120 0.0625	17.306 1.642 1.626		Vel = 6.73	
201			0.0 46.63					20.574		K Factor = 10.28	
102 to H5	18.625 22.417		-45.12 -45.12	1.5 1.682	E T 4.95 9.9	11.208 14.850 26.058	120 -0.0588	20.648 -1.642 -1.533		Vel = 6.51	
H5 to H6	22.417 24.580	5.60	23.41 -21.71	1.5 1.682		12.958 12.958	120 -0.0152	17.473 -0.937 -0.197		Vel = 3.13	
H6 to H7	24.580 24.580	5.60	22.63 0.92	1.5 1.682		13.333 13.333	120 0.0001	16.339 0.0 0.001		Vel = 0.13	
H7 to H8	24.580 22.417	5.60	22.64 23.56	1.5 1.682		12.958 12.958	120 0.0177	16.340 0.937 0.229		Vel = 3.40	
H8 to 202	22.417 18.625	5.60	23.43 46.99	1.5 1.682	E T 4.95 9.9	11.167 14.850 26.017	120 0.0634	17.506 1.642 1.650		Vel = 6.78	
202			0.0 46.99					20.798		K Factor = 10.30	
103 to H9	18.625 22.417		-26.50 -26.5	1.5 1.682	E T 4.95 9.9	11.208 14.850 26.058	120 -0.0220	21.419 -1.642 -0.573		Vel = 3.83	
H9 to H10	22.417 24.580	5.60	24.54 -1.96	1.5 1.682		12.958 12.958	120 -0.0002	19.204 -0.937 -0.002		Vel = 0.28	
H10 to 203	24.580 18.625	5.60	23.94 21.98	1.5 1.682	E T 4.95 9.9	35.458 14.850 50.308	120 0.0155	18.265 2.579 0.782		Vel = 3.17	
203			0.0 21.98					21.626		K Factor = 4.73	
104 to 204	18.625 18.625		7.37 7.37	1.5 1.682	2E 2T 9.9 19.799	61.625 29.699 91.324	120 0.0021	22.686 0.0 0.188		Vel = 1.06	

Final Calculations : Hazen-Williams

Crossroads Fire Protection
Antioch Baptist Church

Page 6
Date 07-09-2026

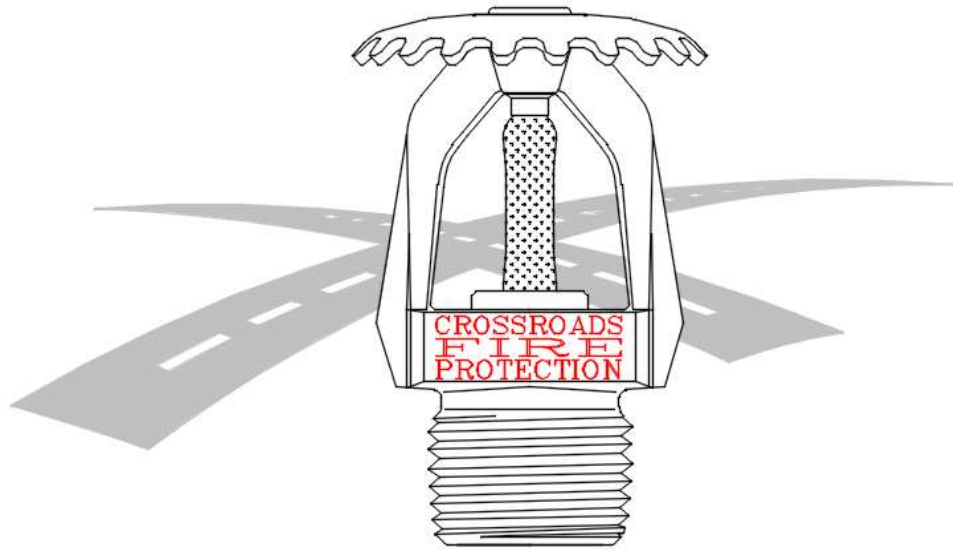
Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
204			0.0 7.37					22.874		K Factor = 1.54	
105 to 205	18.625 18.625		12.01 12.01	1.5 1.682	2E 2T 9.9 19.799	61.625 29.699 91.324	120 0.0051	23.809 0.0 0.464		Vel = 1.73	
205			0.0 12.01					24.273		K Factor = 2.44	
106 to 206	18.625 18.625		20.26 20.26	1.5 1.682	2E 2T 9.9 19.799	61.625 29.699 91.324	120 0.0134	24.714 0.0 1.221		Vel = 2.93	
206			0.0 20.26					25.935		K Factor = 3.98	
107 to 207	18.625 18.625		31.45 31.45	1.5 1.682	2E 2T 9.9 19.799	61.625 29.699 91.324	120 0.0302	25.290 0.0 2.755		Vel = 4.54	
207			0.0 31.45					28.045		K Factor = 5.94	
108 to 208	18.625 18.625		45.47 45.47	1.5 1.682	2E 2T 9.9 19.799	61.625 29.699 91.324	120 0.0597	25.503 0.0 5.449		Vel = 6.57	
208			0.0 45.47					30.952		K Factor = 8.17	
101 to 102	18.625 18.625		44.94 44.94	2 2.157		12.000 12.000	120 0.0173	20.440 0.0 0.208		Vel = 3.95	
102 to 103	18.625 18.625		45.12 90.06	2 2.157		12.250 12.250	120 0.0629	20.648 0.0 0.771		Vel = 7.91	
103 to 104	18.625 18.625		26.50 116.56	2 2.157		12.500 12.500	120 0.1014	21.419 0.0 1.267		Vel = 10.23	
104 to 105	18.625 18.625		-7.37 109.19	2 2.157		12.500 12.500	120 0.0898	22.686 0.0 1.123		Vel = 9.59	
105 to 106	18.625 18.625		-12.01 97.18	2 2.157		12.500 12.500	120 0.0724	23.809 0.0 0.905		Vel = 8.53	
106 to 107	18.625 18.625		-20.25 76.93	2 2.157		12.250 12.250	120 0.0470	24.714 0.0 0.576		Vel = 6.75	
107 to 108	18.625 18.625		-31.46 45.47	2 2.157		12.000 12.000	120 0.0177	25.290 0.0 0.213		Vel = 3.99	
108			0.0 45.47					25.503		K Factor = 9.00	
201 to 202	18.625 18.625		46.63 46.63	2 2.157		12.000 12.000	120 0.0187	20.574 0.0 0.224		Vel = 4.09	

Final Calculations : Hazen-Williams

Crossroads Fire Protection
Antioch Baptist Church

Page 7
Date 07-09-2026

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	*****
202 to 203	18.625 18.625		47.00 93.63	2 2.157			12.250 12.250	120 0.0676	20.798 0.0 0.828		Vel = 8.22	
203 to 204	18.625 18.625		21.97 115.6	2 2.157			12.500 12.500	120 0.0998	21.626 0.0 1.248		Vel = 10.15	
204 to 205	18.625 18.625		7.37 122.97	2 2.157			12.500 12.500	120 0.1119	22.874 0.0 1.399		Vel = 10.80	
205 to 206	18.625 18.625		12.00 134.97	2 2.157			12.500 12.500	120 0.1330	24.273 0.0 1.662		Vel = 11.85	
206 to 207	18.625 18.625		20.26 155.23	2 2.157			12.250 12.250	120 0.1722	25.935 0.0 2.110		Vel = 13.63	
207 to 208	18.625 18.625		31.45 186.68	2 2.157			12.000 12.000	120 0.2422	28.045 0.0 2.907		Vel = 16.39	
208 to M2	18.625 9.625		45.48 232.16	2 2.157	2E	12.307	20.580 12.307 32.887	120 0.3627	30.952 3.898 11.927		Vel = 20.38	
M2 to TOR	9.625 9.625		0.0 232.16	3 3.26	E	9.408	2.000 9.408 11.408	120 0.0485	46.777 0.0 0.553		Vel = 8.92	
TOR to BOR	9.625 1		0.0 232.16	3 3.26	B S Fsp E	13.44 21.503 0.0 9.408	8.625 44.351 52.976	120 0.0486	47.330 6.735 2.572		* * Fixed Loss = 3 Vel = 8.92	
BOR to BF	1 1		0.0 232.16	4 4.26	E	13.167	4.042 13.167 17.209	120 0.0132	56.637 8.000 0.227		* * Fixed Loss = 8 Vel = 5.23	
BF to RI	1 1		0.0 232.16	4 4.1	E	14.534	1.000 14.534 15.534	140 0.0119	64.864 0.0 0.185		Vel = 5.64	
RI to UG1	1 -1		0.0 232.16	4 4.1	E T G	14.534 29.067 2.907	200.000 46.508 246.508	140 0.0119	65.049 0.866 2.945		Vel = 5.64	
UG1 to TEST	-1 1		0.0 232.16	8 8.27	E G	28.468 6.326	1200.000 34.794 1234.794	140 0.0004	68.860 -0.866 0.484		Vel = 1.39	
TEST			100.00 332.16						68.478		Qa = 100.00 K Factor = 40.14	



Crossroads Fire Protection
809 South Market Street
Benson, NC 27504
919-207-3855

Job Name : Antioch Baptist Church
Drawing : FP2
Location : 6670 OLD US 421, LILLINGTON, NC 27546
Remote Area : 2
Contract : CC-11974
Data File : Antioch Under Mezz Calc 2 ReDesign.WXF

HYDRAULIC CALCULATIONS
for

JOB NAME Antioch Baptist Church
Location 6670 OLD US 421, LILLINGTON, NC 27546
Drawing # FP2
Contract # CC-11974
Date 07-09-2026

DESIGN

Remote area # 2
Remote area location UNDER MEZZ. MOST DEMANDING
Occupancy classification MULTIPURPOSE
Density .1 - Gpm/SqFt
Area of application 1132 - SqFt
Coverage/sprinkler 225 - SqFt
Type of sprinkler calculated SSP QR
Sprinklers calculated 13
In-rack demand - GPM
Hose streams 100 - GPM
Total water required (including hose streams) 420.799 - GPM @ 88.0206 - Psi
Type of system WET TREE
Volume of system (dry or pre-action) - Gal

WATER SUPPLY INFORMATION

Test date 06-17-2026
Location TEST
Source of info DREW KING

CONTRACTOR INFO Crossroads Fire Protection
Address 809 South Market Street / Benson, NC 27504
Phone # 919-207-3855
Name of designer CFP
Authority having jurisdiction HARNETT COUNTY

NOTES:

Equivalent of 12' of pipe added for Flex Pipe per NFPA 13.

text1(35) - invisible

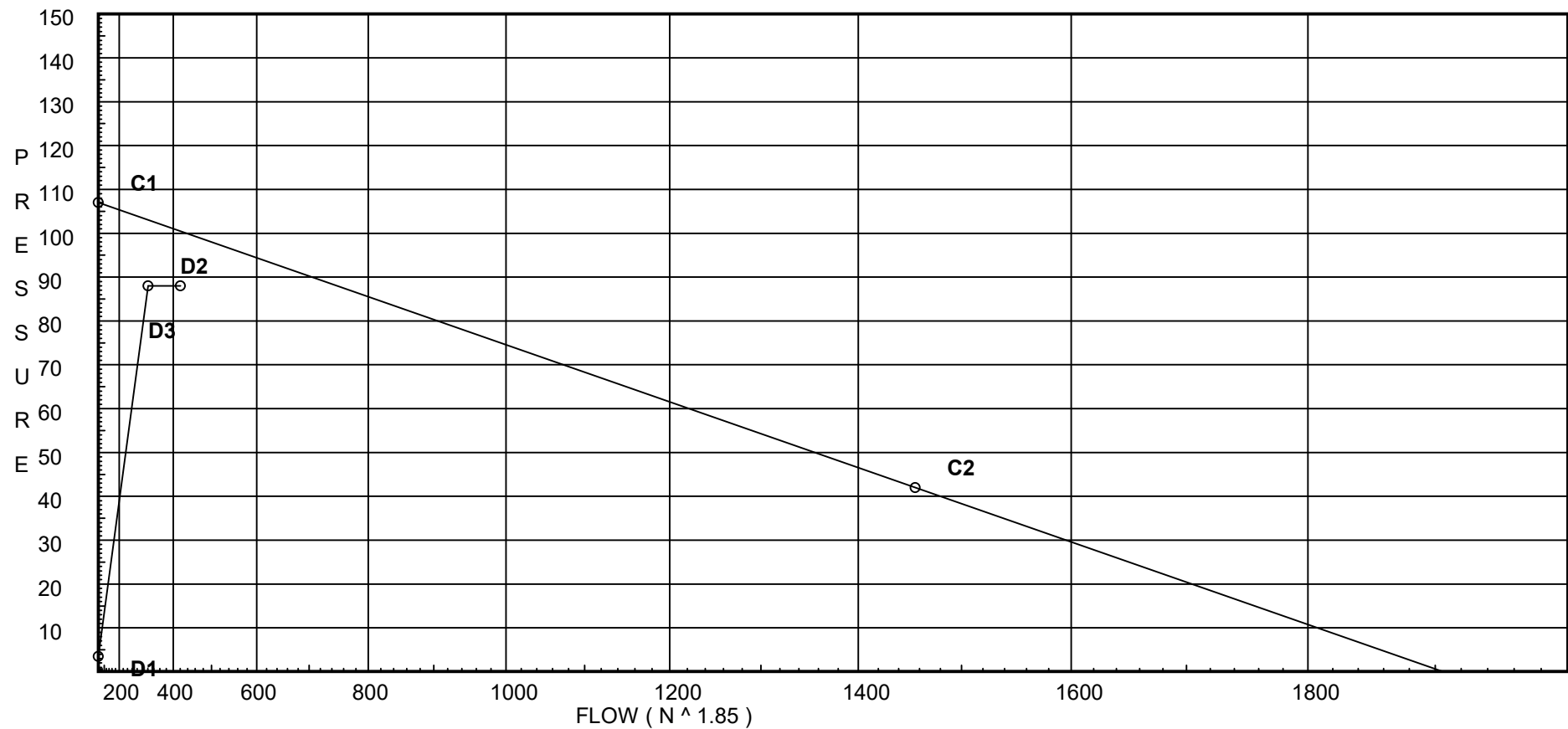
Water Supply Curve

Crossroads Fire Protection
Antioch Baptist Church

Page 2
Date 07-09-2026

City Water Supply:
C1 - Static Pressure : 107
C2 - Residual Pressure: 42
C2 - Residual Flow : 1456

Demand:
D1 - Elevation : 3.465
D2 - System Flow : 320.799
D2 - System Pressure : 88.021
Hose (Demand) : 100
D3 - System Demand : 420.799
Safety Margin : 12.439



Fittings Used Summary

Crossroads Fire Protection
Antioch Baptist Church

Page 3
Date 07-09-2026

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
B	NFPA 13 Butterfly Valve	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E	NFPA 13 90' Standard Elbow	0	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
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

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.

Flow Summary - NFPA

Crossroads Fire Protection
Antioch Baptist Church

Page 4
Date 07-09-2026

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	107.0	42	1456.0	100.46	420.8	88.021

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>	
H21	9.0	5.6	16.14	22.5	0.1	225
H22	9.0	5.6	17.5	23.43	0.1	225
H23	8.666	5.6	22.15	26.35	0.1	225
H24	9.0	5.6	16.31	22.62	0.1	225
H25	9.0	5.6	18.75	24.25	0.1	225
H26	8.666	5.6	23.28	27.02	0.1	225
H27	9.0	5.6	17.7	23.56	0.1	225
H28	9.0	5.6	19.18	24.53	0.1	225
H29	9.0	5.6	23.62	27.22	0.1	225
H30	9.0	5.6	17.42	23.37	0.1	225
H31	9.0	5.6	17.63	23.52	0.1	225
H32	9.0	5.6	18.75	24.25	0.1	225
H33	8.666	5.6	25.33	28.18	0.1	225
21	9.625		19.17			
22	9.625		20.79			
24	9.625		19.37			
25	9.625		21.33			
27	9.625		21.02			
28	9.625		22.78			
30	9.625		21.04			
32	9.625		21.34			
L1	8.666		23.64			
23	8.666		23.77			
L2	8.666		23.95			
26	8.666		24.99			
L3	8.666		25.85			
L4	8.666		26.19			
29	8.666		26.3			
M1	8.666		27.28			
33	9.625		26.97			
M2	9.625		58.57			
TOR	9.625		58.85			
BOR	1.0		70.26			
BF	1.0		81.45			
RI	1.0		81.78			
UG1	-1.0		88.01			
TEST	1.0		88.02	100.0		

Final Calculations : Hazen-Williams

Crossroads Fire Protection
Antioch Baptist Church

Page 5
Date 07-09-2026

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	*****
H21 to 21	9 9.625	5.60	22.50 22.5	1 1.049	E T Eql	2.0 5.0 12.0	1.375 19.000 20.375	120 0.1618	16.143 -0.271 3.297		Vel = 8.35	
21			0.0 22.50						19.169		K Factor = 5.14	
H22 to 22	9 9.625	5.60	23.43 23.43	1 1.049	E T Eql	2.0 5.0 12.0	1.375 19.000 20.375	120 0.1744	17.505 -0.271 3.554		Vel = 8.70	
22			0.0 23.43						20.788		K Factor = 5.14	
H23 to 23	8.666 8.666	5.60	26.35 26.35	1 1.049	E T	2.0 5.0	0.500 7.000 7.500	120 0.2167	22.148 0.0 1.625		Vel = 9.78	
23			0.0 26.35						23.773		K Factor = 5.40	
H24 to 24	9 9.625	5.60	22.62 22.62	1 1.049	E T Eql	2.0 5.0 12.0	1.375 19.000 20.375	120 0.1634	16.315 -0.271 3.330		Vel = 8.40	
24			0.0 22.62						19.374		K Factor = 5.14	
H25 to 25	9 9.625	5.60	24.25 24.25	1 1.049	E Eql	2.0 12.0	1.375 14.000 15.375	120 0.1858	18.748 -0.271 2.857		Vel = 9.00	
25			0.0 24.25						21.334		K Factor = 5.25	
H26 to 26	8.666 8.666	5.60	27.02 27.02	1 1.049	E T	2.0 5.0	0.500 7.000 7.500	120 0.2271	23.283 0.0 1.703		Vel = 10.03	
26			0.0 27.02						24.986		K Factor = 5.41	
H27 to 27	9 9.625	5.60	23.56 23.56	1 1.049	E T Eql	2.0 5.0 12.0	1.375 19.000 20.375	120 0.1762	17.698 -0.271 3.590		Vel = 8.75	
27			0.0 23.56						21.017		K Factor = 5.14	
H28 to 28	9 9.625	5.60	24.53 24.53	1 1.049	E T Eql	2.0 5.0 12.0	1.375 19.000 20.375	120 0.1898	19.182 -0.271 3.868		Vel = 9.11	
28			0.0 24.53						22.779		K Factor = 5.14	
H29 to 29	9 8.666	5.60	27.22 27.22	1 1.049	E T	2.0 5.0	4.000 7.000 11.000	120 0.2301	23.625 0.145 2.531		Vel = 10.10	
29			0.0 27.22						26.301		K Factor = 5.31	
H30 to 30	9 9.625	5.60	23.37 23.37	1 1.049	E T Eql	2.0 5.0 12.0	3.375 19.000 22.375	120 0.1736	17.421 -0.271 3.885		Vel = 8.68	

Final Calculations : Hazen-Williams

Crossroads Fire Protection
Antioch Baptist Church

Page 6
Date 07-09-2026

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	*****
30			0.0 23.37						21.035		K Factor = 5.10	
H31 to 30	9 9.625	5.60	23.52 23.52	1 1.049	E T Eql	2.0 5.0 12.0	1.917 19.000 20.917	120 0.1756	17.633 -0.271 3.673		Vel = 8.73	
30			0.0 23.52						21.035		K Factor = 5.13	
H32 to 32	9 9.625	5.60	24.25 24.25	1 1.049	E Eql	2.0 12.0	1.375 14.000 15.375	120 0.1859	18.752 -0.271 2.858		Vel = 9.00	
32			0.0 24.25						21.339		K Factor = 5.25	
H33 to 33	8.666 9.625	5.60	28.18 28.18	1 1.049	E T	2.0 5.0	1.375 7.000 8.375	120 0.2454	25.330 -0.415 2.055		Vel = 10.46	
33			0.0 28.18						26.970		K Factor = 5.43	
21 to 22	9.625 9.625		22.50 22.5	1 1.049			10.000 10.000	120 0.1619	19.169 0.0 1.619		Vel = 8.35	
22 to L1	9.625 8.666		23.43 45.93	1.25 1.38	E T	3.0 6.0	6.290 9.000 15.290	120 0.1593	20.788 0.415 2.436		Vel = 9.85	
L1			0.0 45.93						23.639		K Factor = 9.45	
24 to 25	9.625 9.625		22.62 22.62	1 1.049			12.000 12.000	120 0.1633	19.374 0.0 1.960		Vel = 8.40	
25 to L2	9.625 8.666		24.25 46.87	1.25 1.38	E T	3.0 6.0	4.290 9.000 13.290	120 0.1655	21.334 0.415 2.199		Vel = 10.05	
L2			0.0 46.87						23.948		K Factor = 9.58	
27 to 28	9.625 9.625		23.56 23.56	1 1.049			10.000 10.000	120 0.1762	21.017 0.0 1.762		Vel = 8.75	
28 to L3	9.625 8.666		24.53 48.09	1.25 1.38	E T	3.0 6.0	6.290 9.000 15.290	120 0.1734	22.779 0.415 2.652		Vel = 10.32	
L3			0.0 48.09						25.846		K Factor = 9.46	
30 to 32	9.625 9.625		46.89 46.89	1.25 1.38			1.833 1.833	120 0.1658	21.035 0.0 0.304		Vel = 10.06	
32 to L4	9.625 8.666		24.25 71.14	1.5 1.61	E T	4.0 8.0	14.250 12.000 26.250	120 0.1690	21.339 0.415 4.435		Vel = 11.21	

Final Calculations : Hazen-Williams

Crossroads Fire Protection
Antioch Baptist Church

Page 7
Date 07-09-2026

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	*****
L4			0.0 71.14						26.189		K Factor = 13.90	
L1 to 23	8.666 8.666		45.93 45.93	2 2.157			7.417 7.417	120 0.0181	23.639 0.0 0.134		Vel = 4.03	
23 to L2	8.666 8.666		26.35 72.28	2 2.157			4.167 4.167	120 0.0420	23.773 0.0 0.175		Vel = 6.35	
L2 to 26	8.666 8.666		46.87 119.15	2 2.157			9.833 9.833	120 0.1056	23.948 0.0 1.038		Vel = 10.46	
26 to L3	8.666 8.666		27.02 146.17	2 2.157			5.580 5.580	120 0.1541	24.986 0.0 0.860		Vel = 12.83	
L3 to M1	8.666 8.666		48.09 194.26	2 2.157			5.500 5.500	120 0.2607	25.846 0.0 1.434		Vel = 17.06	
M1			0.0 194.26						27.280		K Factor = 37.19	
L4 to 29	8.666 8.666		71.14 71.14	2 2.157			2.750 2.750	120 0.0407	26.189 0.0 0.112		Vel = 6.25	
29 to M1	8.666 8.666		27.22 98.36	2 2.157	T	12.307	0.917 12.307 13.224	120 0.0740	26.301 0.0 0.979		Vel = 8.64	
M1 to 33	8.666 9.625		194.26 292.62	2.5 2.635			0.500 0.500	120 0.2100	27.280 -0.415 0.105		Vel = 17.22	
33 to M2	9.625 9.625		28.18 320.8	2.5 2.635	2E T	16.474 16.474	94.042 32.948 126.990	120 0.2489	26.970 0.0 31.605		Vel = 18.87	
M2 to TOR	9.625 9.625		0.0 320.8	3 3.26			3.083 3.083	120 0.0882	58.575 0.0 0.272		Vel = 12.33	
TOR to BOR	9.625 1		0.0 320.8	3 3.26	B S Fsp E	13.44 21.503 0.0 9.408	8.625 44.351 52.976	120 0.0883	58.847 6.735 4.677		** Fixed Loss = 3 Vel = 12.33	
BOR to BF	1 1		0.0 320.8	3 3.26	E	9.408	4.042 9.408 13.450	120 0.0883	70.259 10.000 1.187		** Fixed Loss = 10 Vel = 12.33	
BF to RI	1 1		0.0 320.8	4 4.1	E	14.534	1.000 14.534 15.534	140 0.0217	81.446 0.0 0.337		Vel = 7.80	
RI to UG1	1 -1		0.0 320.8	4 4.1	E T G	14.534 29.067 2.907	200.000 46.508 246.508	140 0.0217	81.783 0.866 5.357		Vel = 7.80	
UG1 to TEST	-1 1		0.0 320.8	8 8.27	E G	28.468 6.326	1200.000 34.794 1234.794	140 0.0007	88.006 -0.866 0.881		Vel = 1.92	

Final Calculations : Hazen-Williams

Crossroads Fire Protection
Antioch Baptist Church

Page 8
Date 07-09-2026

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	*****
			100.00							Qa = 100.00		
TEST			420.80							88.021	K Factor = 44.85	

FIRE HYDRANT FLOW TEST RESULTS

TEST LOCATION

Address: 6677 Old US 421, Lillington

Proposed Tap Location: _____

Requested Flow Location: nearest hydrant to the proposed point of connection

APPLICANT

Name: Crossroads Fire Protection

Address: 809 S Market Street, Benson, NC 27504

Contact Person: Dennis Nelson Phone: 919.207.3855 Fax: 919.207.3856

TESTING AGENT

Firm Name: Andrew King Engineering, PLLC

Address: 5917 Shedd Drive, Raleigh, North Carolina 27603

Phone: (919) 906-5236 Email: Drew@AndrewKingEngineering.com

SYSTEM ANALYSIS

Main Size: 8"

Elevation of Test Location: 334' +/-

Nearest Elevated Tank: WC Tank 1

Time of Test: 9:10 AM

Tank Elevation: 599.8' (19.3')

Pressure Zone: 610' (29.5')

Theoretical Pressure: 115.1 psi

Calculated by: Drew King

Witnessed by: James Lowery

RESULTS

Static Pressure: 107 psi

3.05" Pitotless Nozzle Reading: 15 psi

Residual Pressure: 42 psi

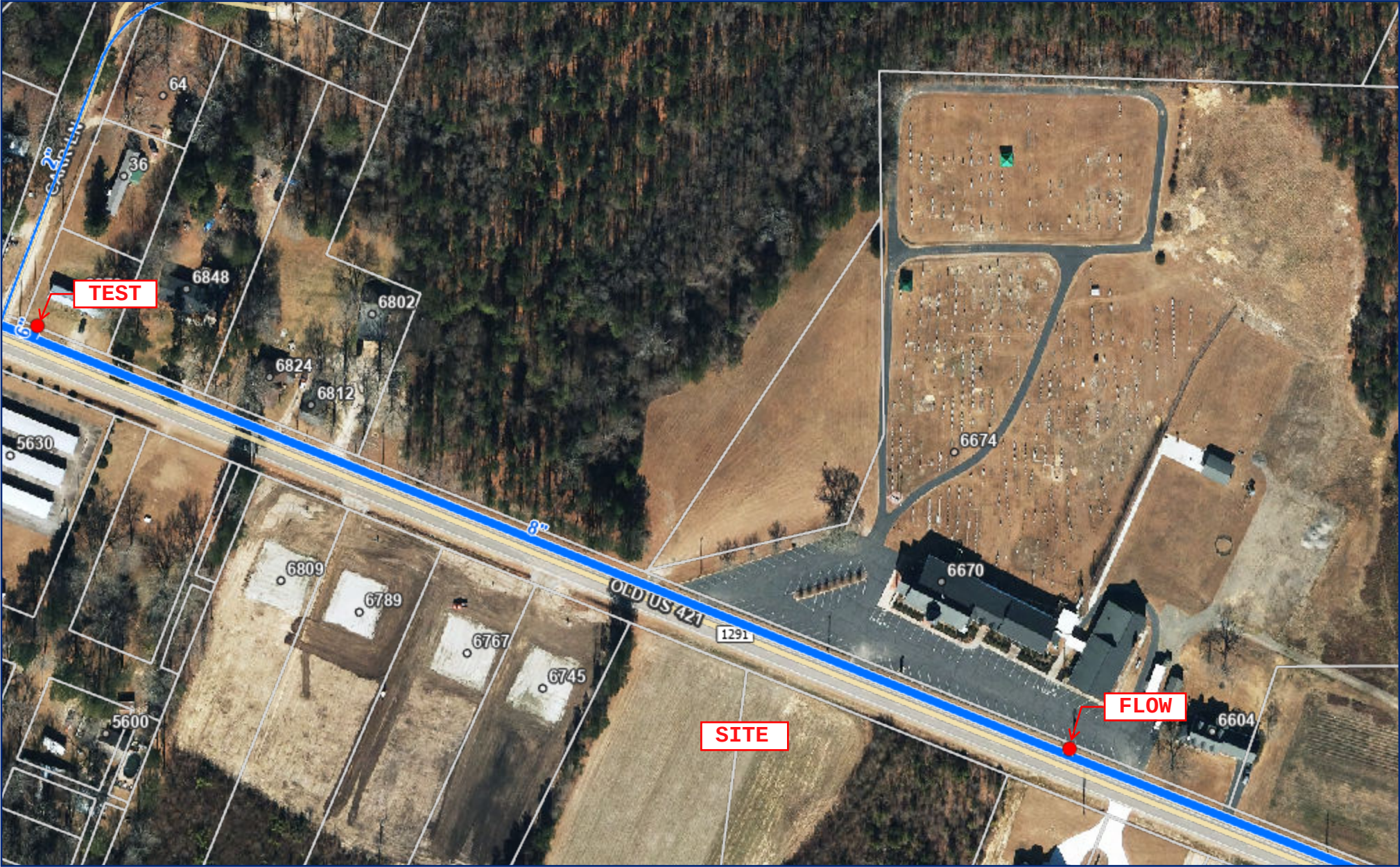
Volume: 1,456 gpm

Disclaimer: These results are an instantaneous snap-shot of the system. It is recommended that the designer allow adequate safety to include low tank level.

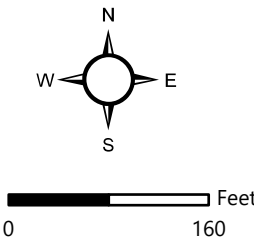
Comments: Flowed (1) BigBoy Hose Monster. C = 1.35

Completed by: Drew King

Date: 6/17/2026



County Boundary	2 - 5	Road Centerlines
Address Numbers	6 - 36	Parcels
	Fire Hydrants	



Hydrant Flow Test Report

Test Date 6/17/2026

Test Time 9:10 AM

Location

6677 Old US 421
Lillington, NC

Tested by

Andrew King Engineering, PLLC
5917 Shedd Drive
Raleigh, NC 27603
Drew@AndrewKingEngineering.com
919-906-5236

Notes

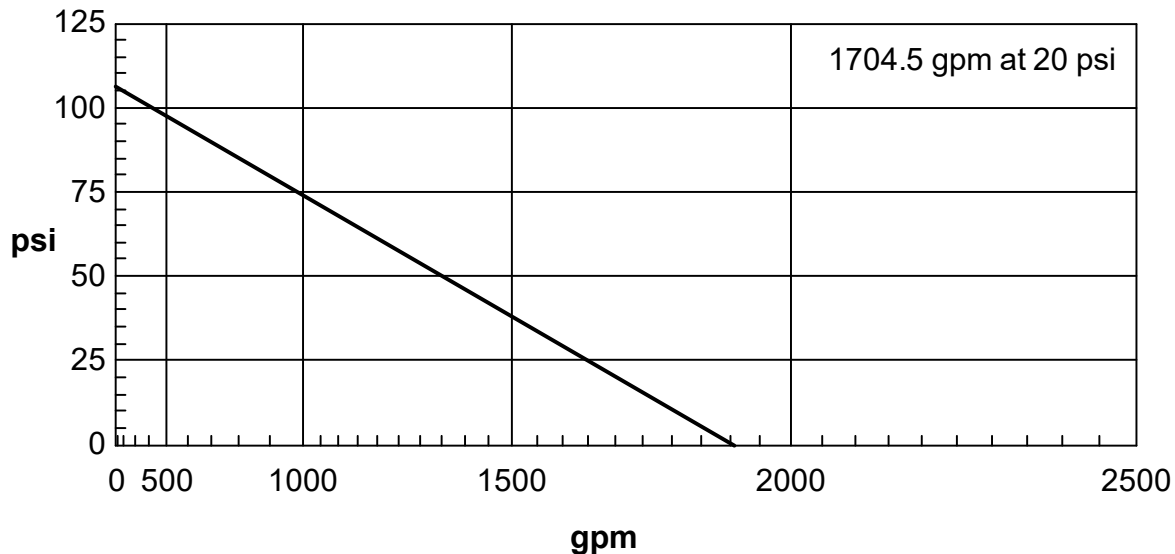
Read Hydrant

107 psi **static pressure**
42 psi **residual pressure**
334 ft **hydrant elevation**

Flow Hydrant(s)

Outlet	Elev	Size	C	Pitot Pressure	Flow
#1	331	3.05	1.35	15	1456 gpm

Flow Graph





THIS DEVICE IS FM APPROVED

The pressure vs. flow rate data developed within this flow chart is based on the average K-factor measured during laboratory testing. This data has been determined to be within the acceptable limitations for accuracy. It is the user's responsibility to verify that the correct chart and column is being used.

GET THE MOST OUT OF YOUR HOSE MONSTER® HARDWARE

FIRE PUMP TESTING SOFTWARE

Professional-grade software that helps you work better! Keep your reports clean, your results accurate, and your process streamlined with Hose Monster's FPT Software.

LEARN MORE AT
[HOSEMONSTER.COM/RESOURCES](https://www.hosemonster.com/resources)

PSI	GPM	PSI	GPM
5	856	31	2093
6	938	32	2127
7	1013	33	2160
8	1083	34	2192
9	1149	35	2224
10	1211	36	2256
11	1270	37	2287
12	1303	38	2318
13	1356	39	2323
14	1407	40	2353
15	1456	41	2382
16	1504	42	2411
17	1550	43	2439
18	1595	44	2468
19	1639	45	2495
20	1682	46	2523
21	1723	47	2550
22	1764	48	2577
23	1803	49	2604
24	1842	50	2630
25	1880	51	2657
26	1917	52	2683
27	1954	53	2708
28	1990	54	2734
29	2025	55	2759
30	2059		

COEFFICIENT AND K-FACTOR TABLE FOR VARIOUS FLOW DEVICES

PITOTLESS NOZZLE™	K-FACTOR	COEFFICIENT	ORIFICE DIAMETER	psi RANGE	FLOW RANGE (GPM)
2" Pitotless Nozzle + Little Hose Monster	156.0	1.31	2"	10-70	493-1305
2" Pitotless Nozzle + 2 1/2" Hose Monster	164.8	1.38	2"	10-70	521-1379
2" Pitotless Nozzle + Open Atmosphere	167.2	1.40	2"	10-70	529-1399
1 3/4" Pitotless Nozzle + Little Hose Monster	104.7	1.15	1.75"	10-80	331-936
1 3/4" Pitotless Nozzle + 2 1/2" Hose Monster	106.6	1.17	1.75"	10-80	337-953
1 3/4" Pitotless Nozzle + Open Atmosphere	109.7	1.20	1.75"	10-80	347-981
1 1/8" Pitotless Nozzle + Little Hose Monster	37.2	0.98	1.125"	10-80	83-333
1 1/8" Pitotless Nozzle + 2 1/2" Hose Monster	37.4	0.99	1.125"	10-80	84-335
1 1/8" Pitotless Nozzle + Open Atmosphere	37.0	0.98	1.125"	10-80	83-331
1" Pitotless Nozzle + Little Hose Monster	27.2	0.91	1"	3-80	47-243
1" Pitotless Nozzle + 2 1/2" Hose Monster	27.6	0.93	1"	3-80	48-247
1" Pitotless Nozzle + Open Atmosphere	27.7	0.93	1"	3-80	48-248

IN-LINE PITOTLESS NOZZLE™	K-FACTOR	COEFFICIENT	ORIFICE DIAMETER	psi RANGE	FLOW RANGE (GPM)
2" In-line Pitotless Nozzle	165.3	1.38	2"	10-75	523-1432
1 3/4" In-line Pitotless Nozzle	109.9	1.20	1.75"	5-80	246-983
1 1/8" In-line Pitotless Nozzle	38.4	1.02	1.125"	5-70	86-321
1 1/2" In-line Pitotless Nozzle	31.7	1.06	1.0"	2-90	45-301

BIGBOY HOSE MONSTER™	K-FACTOR	COEFFICIENT	ORIFICE DIAMETER	psi RANGE	FLOW RANGE (GPM)
5-11psi (BigBoy Hose Monster)	382.9	1.38	3.05"	5-11	856-1270
12-38psi (BigBoy Hose Monster)	376.0	1.35	3.05"	12-38	1303-2318
39-55psi (BigBoy Hose Monster)	372.0	1.34	3.05"	39-55	2323-2759

NOTE: Due to the shape and size of the BigBoy Pitotless Nozzle, the BigBoy Hose Monster uses three different K-factors over its operating range.

2 1/2" Hose Monster®	K-FACTOR	COEFFICIENT	ORIFICE DIAMETER	psi RANGE	FLOW RANGE (GPM)
2 1/2" Hose Monster	168.67	0.906	2.5"	10-70	533-1411
1 3/4" Nozzle Insert	89.04	0.975	1.75"	10-70	282-745
1 1/8" Nozzle Insert	37.36	0.990	1.25"	10-70	118-313
4" & 4 1/2" Hose Monster®	K-FACTOR	COEFFICIENT	CONNECTION DIAMETER	psi RANGE	FLOW RANGE (GPM)
4 1/2" Hose Monster	331.07	0.548	4.5"	10-70	1047-2770
4" Hose Monster	339.65	0.712	4"	10-70	1074-2842

USING SOFTWARE

Use the table to the right if you are using software that requires the coefficient input to be less than '1.0.' Notice that the orifice diameter must be changed from its true diameter in order to accommodate the lower coefficient. This is necessary only for the 2" Pitotless Nozzle and the 3/4" Pitotless Nozzle.

DEVICE	COEFFICIENT	ORIFICE DIAMETER
--------	-------------	------------------

2" Pitotless Nozzle + Little Hose Monster	0.99	2.30"
2" Pitotless Nozzle + 2 1/2" Hose Monster	0.99	2.36"
2" Pitotless Nozzle + Open Atmosphere	0.99	2.38"
1 3/4" Pitotless Nozzle + Little Hose Monster	0.99	1.88"
1 3/4" Pitotless Nozzle + 2 1/2" Hose Monster	0.99	1.90"
1 3/4" Pitotless Nozzle + Open Atmosphere	0.99	1.93"

NOTE: If your software uses the Theoretical Discharge Formula, found in NFPA 291, 4.7.3, the coefficient of discharge can be used to produce flow rates that will match our flow charts.

A HAND-HELD PITOT DIRECTLY AT A HYDRANT OUTLET

OUTLET TYPE	COEFFICIENT
Outlet smooth and rounded	0.9
Outlet square and sharp	0.8
Outlet square and projecting into barrel	0.7
If a stream straightener is used	0.95

CLASSIFYING AND MARKING OF HYDRANTS

Rated Capacity at 20psi	Class	Marking Color of Hydrant Tops and Nozzles
≥1500 GPM	AA	Light Blue
1000-1499 GPM	A	Green
500-999 GPM	B	Orange
≤499 GPM	C	Red

The above are the NFPA hydrant classifications and color marking for various rated capacities. Source NFPA 291, Chapter 5 2019

6677 Old US 421, Lillington flow test - Wednesday, June 17, 2026

AKE1-Pressure/psig Min: -0.2 Max: 111.4

