

Carolina Fire Protection, Inc.
4055 Hodges Chapel Road
P.O. Box 250 (28335)
Dunn, NC 28334
910-892-1700

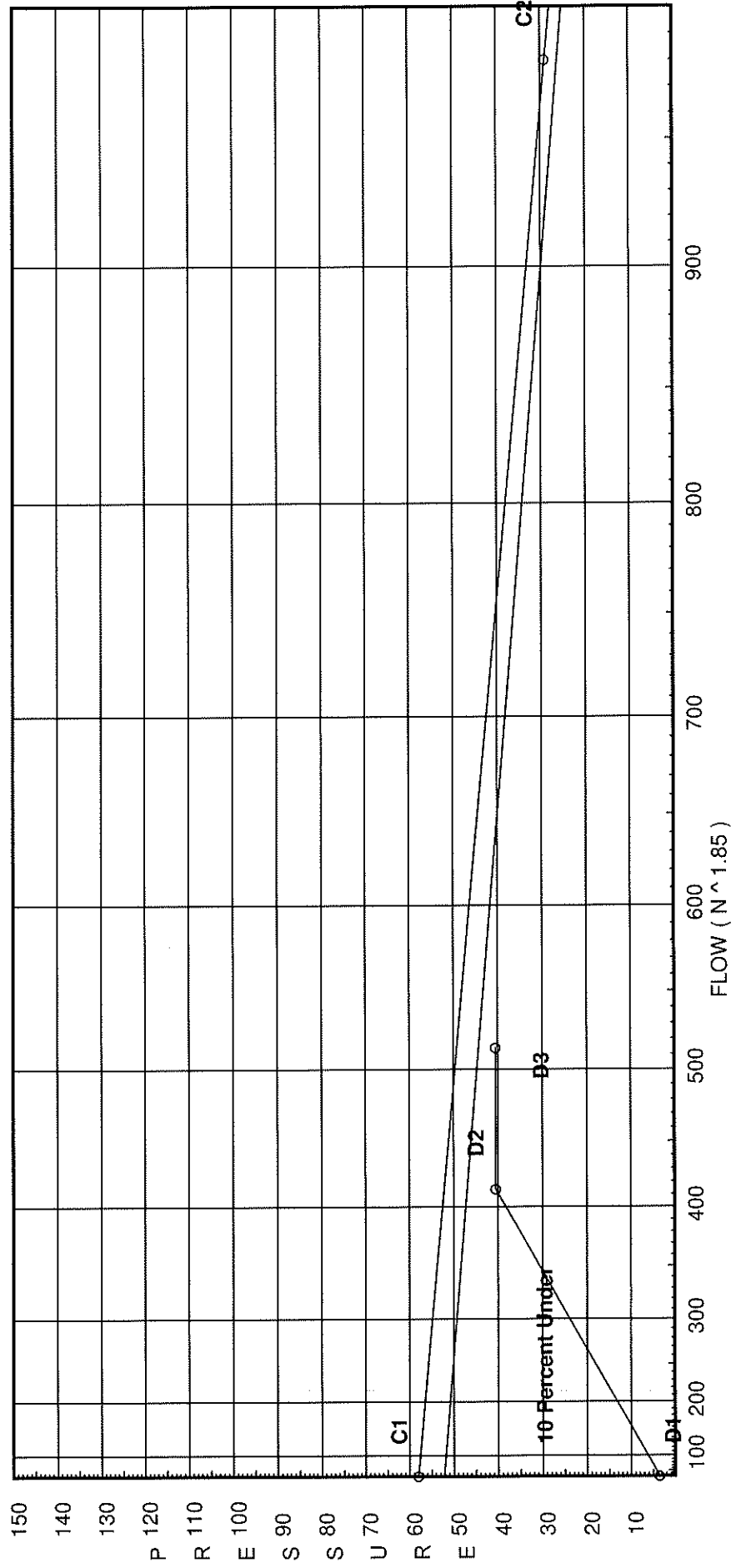
Job Name : Angier Black River FD Existing
Building : Existing Fit up
Location : Angier, NC
System : 1
Contract : 21G592
Data File : EXISTING AREA EXTRA LINE.wxtmp
Date/Time : 08/24/2021 - 08:57 AM

Water Supply Curve

Carolina Fire Protection, Inc.
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City Water Supply:
 C1 - Static Pressure : 58
 C2 - Residual Pressure: 29
 C2 - Residual Flow : 980

Demand:
 D1 - Elevation : 3.465
 D2 - System Flow : 414.02
 D2 - System Pressure : 40.533
 Hose (Demand) : 100
 D3 - System Demand : 514.02
 Safety Margin : 8.678



Flow Summary - NFPA

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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	58.0	29	980.0	49.211	514.02	40.533

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>
1A	9.0		17.88			
2A	9.0		17.88			
3A	9.0		17.88			
4A	9.0		17.88			
5A	9.0		17.88			
6A	9.0		17.88			
7A	9.0		17.88			
8A	9.0		17.88			
9A	9.0		17.88			
10A	9.0		17.88			
11A	9.0		17.88			
12A	9.0		17.88			
13A	9.0		17.88			
14A	9.0		17.88			
15A	9.0		17.88			
16A	9.0		17.88			
17A	9.0		17.88			
18A	9.0	5.6	7.0	14.82	0.1	140
19A	9.0	5.6	7.55	15.38	0.1	140
21A	9.0	5.6	7.95	15.79	0.1	50
22A	9.0	5.6	8.97	16.77	0.1	125
23A	9.0	5.6	10.0	17.71	0.1	125
24A	9.0		15.99			
25A	9.0		16.74			
26A	9.0	5.6	7.33	15.16	0.1	140
27A	9.0	5.6	7.9	15.74	0.1	140
28A	9.0	5.6	8.33	16.16	0.1	100
29A	9.0	5.6	9.39	17.16	0.1	115
30A	9.0	5.6	11.5	18.99	0.1	115
31A	9.0		16.7			
32A	9.0		10.81			
33A	9.0	5.6	7.64	15.48	0.1	100
36A	9.0	5.6	10.14	17.83	0.1	80
37A	9.0	5.6	8.23	16.06	0.1	100
38A	9.0	5.6	8.62	16.45	0.1	100
39A	9.0	5.6	9.38	17.15	0.1	105
40A	9.0	5.6	11.03	18.6	0.1	105
41A	9.0	5.6	7.6	15.44	0.1	100
42A	9.0	5.6	7.96	15.8	0.1	100
43A	9.0	5.6	8.26	16.09	0.1	100
44A	9.0	5.6	8.88	16.68	0.1	100
45A	9.0	5.6	9.72	17.46	0.1	100

Flow Summary - NFPA

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NODE ANALYSIS (cont.)

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
M1	10.0		17.44		
M2	10.0		17.44		
M3	10.0		17.44		
M4	10.0		17.44		
M5	10.0		17.44		
M7	10.0		17.44		
M8	10.0		17.44		
M9	10.0		17.44		
M6	10.0		17.44		
M10	10.0		17.44		
M11	10.0		17.44		
M12	10.0		17.44		
E	10.0		17.45		
M13	10.0		17.47		
M14	10.0		17.54		
M14A	10.0		17.7		
M15	10.0		19.98		
F1	18.0		23.17		
F2	18.0		23.16		
F3	18.0		23.15		
F4	18.0		23.12		
F5	18.0		23.08		
F6	18.0		23.05		
F7	18.0		23.05		
N1	18.0		23.43		
N2	18.0		23.43		
N3	18.0		23.43		
M16	18.0		23.44		
N4	18.0		23.3		
N5	18.0		22.94		
N6	18.0		22.57		
BASR	1.0		39.19	100.0	
TEST	1.0		40.53		

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	*****
10			0.0 0.0						17.442		K Factor = 0	
11A to 11	9 10		0.0	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0	17.876 -0.433 -0.001		Vel = 0	
11			0.0 0.0						17.442		K Factor = 0	
12A to 12	9 10		0.0	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0	17.876 -0.433 -0.001		Vel = 0	
12			0.0 0.0						17.442		K Factor = 0	
13A to 13	9 10		0.0	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0	17.876 -0.433 -0.001		Vel = 0	
13			0.0 0.0						17.442		K Factor = 0	
14A to 14	9 10		0.0	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0	17.876 -0.433 -0.001		Vel = 0	
14			0.0 0.0						17.442		K Factor = 0	
15A to 15	9 10		0.0	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0	17.876 -0.433 -0.001		Vel = 0	
15			0.0 0.0						17.442		K Factor = 0	
16A to 16	9 10		0.0	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0	17.876 -0.433 -0.001		Vel = 0	
16			0.0 0.0						17.442		K Factor = 0	
17A to 17	9 10		0.0	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0	17.876 -0.433 -0.001		Vel = 0	
17			0.0 0.0						17.442		K Factor = 0	
18A to 18	9 10	5.60	14.82	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0.0747	7.000 -0.433 2.779		Vel = 5.50	
18			0.0 14.82						9.346		K Factor = 4.85	
19A to 19	9 10	5.60	15.38	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0.0801	7.547 -0.433 2.979		Vel = 5.71	
19			0.0 15.38						10.093		K Factor = 4.84	

Final Calculations : Hazen-Williams

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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 18.99						15.466		K Factor = 4.83	
31A to 31	9 10		0.0	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0	16.702 -0.433 0.0		Vel = 0	
			0.0 0.0						16.269		K Factor = 0	
32A to 32	9 10		0.0	1	Vcfi T E	29.2 5.0 2.0	3.000 36.200 39.200	120 0	10.812 -0.433 0.0		Vel = 0	
			0.0 0.0						10.379		K Factor = 0	
33A to 33	9 10	5.60	15.48	1	Vcfi T E	29.2 5.0 2.0	3.000 36.200 39.200	120 0.0810	7.638 -0.433 3.174		Vel = 5.75	
			0.0 15.48						10.379		K Factor = 4.80	
36A to 36	9 10	5.60	17.83	1	T E	5.0 2.0	3.000 5.000 8.000	120 0.1052	10.140 -0.433 0.842		Vel = 6.62	
			0.0 17.83						10.549		K Factor = 5.49	
37A to 37	9 10	5.60	16.06	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0.0867	8.225 -0.433 3.226		Vel = 5.96	
			0.0 16.06						11.018		K Factor = 4.84	
38A to 38	9 10	5.60	16.45	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0.0906	8.625 -0.433 3.370		Vel = 6.11	
			0.0 16.45						11.562		K Factor = 4.84	
39A to 39	9 10	5.60	17.15	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0.0979	9.378 -0.433 3.642		Vel = 6.37	
			0.0 17.15						12.587		K Factor = 4.83	
40A to 40	9 10	5.60	18.60	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0.1138	11.033 -0.433 4.232		Vel = 6.90	
			0.0 18.60						14.832		K Factor = 4.83	
41A to 41	9 10	5.60	15.44	1	Vcfi T E	29.2 5.0 2.0	1.000 36.200 37.200	120 0.0806	7.603 -0.433 3.000		Vel = 5.73	
			0.0 15.44						10.170		K Factor = 4.84	

Final Calculations : Hazen-Williams

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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	*****
M1			0.0 0.0					17.442		K Factor = 0	
3 to M2	10 10		0.0 0.0	1 1.049	T	5.0 3.500 5.000 8.500	120 0	17.442 0.0 0.0		Vel = 0	
M2			0.0 0.0					17.442		K Factor = 0	
4 to 5	10 10		0.0 0.0	1 1.049		1.000 1.000	120 0	17.442 0.0 0.0		Vel = 0	
5 to M3	10 10		0.0 0.0	1.25 1.38	T	6.0 5.500 6.000 11.500	120 0	17.442 0.0 0.0		Vel = 0	
M3			0.0 0.0					17.442		K Factor = 0	
6 to M4	10 10		0.0 0.0	1 1.049	T	5.0 3.500 5.000 8.500	120 0	17.442 0.0 0.0		Vel = 0	
M4			0.0 0.0					17.442		K Factor = 0	
7 to M5	10 10		0.0 0.0	1 1.049	T	5.0 5.500 5.000 10.500	120 0	17.442 0.0 0.0		Vel = 0	
M5			0.0 0.0					17.442		K Factor = 0	
8 to M5	10 10		0.0 0.0	1 1.049	T	5.0 6.500 5.000 11.500	120 0	17.442 0.0 0.0		Vel = 0	
M5			0.0 0.0					17.442		K Factor = 0	
9 to 10	10 10		0.0 0.0	1 1.049		10.000 10.000	120 0	17.442 0.0 0.0		Vel = 0	
10 to 11	10 10		0.0 0.0	1.25 1.38		12.000 12.000	120 0	17.442 0.0 0.0		Vel = 0	
11 to M7	10 10		0.0 0.0	1.5 1.61	T	8.0 3.000 8.000 11.000	120 0	17.442 0.0 0.0		Vel = 0	
M7			0.0 0.0					17.442		K Factor = 0	
12 to 13	10 10		0.0 0.0	1 1.049		10.000 10.000	120 0	17.442 0.0 0.0		Vel = 0	
13 to 14	10 10		0.0 0.0	1.25 1.38		12.000 12.000	120 0	17.442 0.0 0.0		Vel = 0	

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	*****
D to C	10 10		16.38 16.38	1 1.049			7.000 7.000	120 0.0900	11.464 0.0 0.630		Vel = 6.08	
C to E	10 10		32.44 48.82	1.5 1.682	E 2T	4.95 19.799	54.000 24.749 78.749	120 0.0681	12.094 0.0 5.359		Vel = 7.05	
E			0.0 48.82						17.453		K Factor = 11.69	
26 to 27	10 10		15.16 15.16	1 1.049			10.000 10.000	120 0.0779	9.801 0.0 0.779		Vel = 5.63	
27 to 28	10 10		15.75 30.91	1.25 1.38			7.500 7.500	120 0.0767	10.580 0.0 0.575		Vel = 6.63	
28 to 29	10 10		16.16 47.07	1.25 1.38			8.667 8.667	120 0.1667	11.155 0.0 1.445		Vel = 10.10	
29 to 30	10 10		17.15 64.22	1.5 1.61			20.500 20.500	120 0.1398	12.600 0.0 2.866		Vel = 10.12	
30 to 31	10 10		18.99 83.21	2 2.067			12.000 12.000	120 0.0669	15.466 0.0 0.803		Vel = 7.96	
31 to M13	10 10		0.0 83.21	2 2.067	T	10.0	8.000 10.000 18.000	120 0.0669	16.269 0.0 1.204		Vel = 7.96	
M13			0.0 83.21						17.473		K Factor = 19.91	
32 to 33	10 10		0.0 0.0	1 1.049			10.000 10.000	120 0	10.379 0.0 0.0		Vel = 0	
33 to 36	10 10		15.48 15.48	1.25 1.38			8.000 8.000	120 0.0213	10.379 0.0 0.170		Vel = 3.32	
36 to 37	10 10		17.83 33.31	1.25 1.38			5.333 5.333	120 0.0879	10.549 0.0 0.469		Vel = 7.15	
37 to 38	10 10		16.06 49.37	1.5 1.61			6.333 6.333	120 0.0859	11.018 0.0 0.544		Vel = 7.78	
38 to 39	10 10		16.45 65.82	1.5 1.61			7.000 7.000	120 0.1464	11.562 0.0 1.025		Vel = 10.37	
39 to 40	10 10		17.14 82.96	1.5 1.61			10.000 10.000	120 0.2245	12.587 0.0 2.245		Vel = 13.07	
40 to M14	10 10		18.60 101.56	2 2.067	T	10.0	18.000 10.000 28.000	120 0.0967	14.832 0.0 2.708		Vel = 9.71	

Final Calculations : Hazen-Williams

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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 0.0					17.442		K Factor = 0	
M6 to M10	10 10		0.0 0.0	3 3.26		40.500 40.500	120 0	17.442 0.0 0.0		Vel = 0	
M10 to M11	10 10		0.0 0.0	3 3.26	E 9.408	25.000 9.408 34.408	120 0	17.442 0.0 0.0		Vel = 0	
M11 to M12	10 10		0.0 0.0	4 4.26	E 13.167	0.500 13.167 13.667	120 0	17.442 0.0 0.0		Vel = 0	
M12 to E	10 10		80.47 80.47	4 4.26		5.500 5.500	120 0.0020	17.442 0.0 0.011		Vel = 1.81	
E to M13	10 10		48.82 129.29	4 4.26		4.500 4.500	120 0.0044	17.453 0.0 0.020		Vel = 2.91	
M13 to M14	10 10		83.22 212.51	4 4.26		6.000 6.000	120 0.0112	17.473 0.0 0.067		Vel = 4.78	
M14 to M14A	10 10		101.56 314.07	4 4.26		7.000 7.000	120 0.0230	17.540 0.0 0.161		Vel = 7.07	
M14A to M15	10 10		99.95 414.02	4 4.26	E 13.167	46.000 13.167 59.167	120 0.0385	17.701 0.0 2.275		Vel = 9.32	
M15 to N7	10 0		0.0 414.02	4 4.26	3E 39.501	111.000 39.501 150.501	120 0.0385	19.976 4.331 5.788		Vel = 9.32	
N7			0.0 414.02					30.095		K Factor = 75.47	
F1 to N1	18 18		14.49 14.49	2 2.157	2T 24.613	98.000 24.613 122.613	120 0.0021	23.166 0.0 0.263		Vel = 1.27	
N1			0.0 14.49					23.429		K Factor = 2.99	
F2 to N2	18 18		14.62 14.62	2 2.157	2T 24.613	98.000 24.613 122.613	120 0.0022	23.163 0.0 0.267		Vel = 1.28	
N2			0.0 14.62					23.430		K Factor = 3.02	
F3 to N3	18 18		15.08 15.08	2 2.157	2T 24.613	98.000 24.613 122.613	120 0.0023	23.150 0.0 0.283		Vel = 1.32	
N3			0.0 15.08					23.433		K Factor = 3.12	
F4 to N4	18 18		11.60 11.6	2 2.157	2T 24.613	98.000 24.613 122.613	120 0.0014	23.123 0.0 0.174		Vel = 1.02	

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	*****
N4 to N5	18 18		11.60 -358.23	4 4.26			12.000 12.000	120 -0.0294	23.297 0.0 -0.353		Vel = 8.06	
N5 to N6	18 18		-10.20 -368.43	4 4.26			12.000 12.000	120 -0.0310	22.944 0.0 -0.372		Vel = 8.29	
N6 to N7	18 0		-20.09 -388.52	4 4.26			8.000 8.000	120 -0.0341	22.572 7.796 -0.273		Vel = 8.75	
N7			0.0 -388.52						30.095		K Factor = -70.82	
M16 to BASR	18 1		414.02 414.02	4 4.26	2E T Zac	26.334 26.334 10.534 0.0	54.000 63.202 117.202	120 0.0384	23.438 11.247 4.506		** Fixed Loss = 3.884 Vel = 9.32	
BASR to TEST	1 1	H100	100.00 514.02	6 6.16	2E T G	40.168 43.037 4.304	100.000 87.509 187.509	140 0.0072	39.191 0.0 1.342		Vel = 5.53	
TEST			0.0 514.02						40.533		K Factor = 80.74	