



## Hydraulic Calculations by HydraCALC

IMPACT FIRE SERVICES  
131 INTERNATIONAL DR  
MORRISVILLE, NC 27560  
919-663-0400

Job Name : LILLINGTON STORAGE  
Drawing : FP1  
Location : 1781 N MAIN ST, LILLINGTON, NC 27546  
Remote Area : 1  
Contract : 2C-29389308  
Data File : REMOTE\_AREA\_1.WXF

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**HYDRAULIC CALCULATIONS**  
*for*

**JOB NAME** LILLINGTON STORAGE  
**Location** 1781 N MAIN ST, LILLINGTON, NC 27546  
**Drawing #** FP1  
**Contract #** 2C-29389308  
**Date** 11/28/2023

**DESIGN**

**Remote area #** 1  
**Remote area location** NE  
**Occupancy classification** STORAGE  
**Density** .20 - Gpm/SqFt  
**Area of application** 996 - SqFt  
**Coverage/sprinkler** VARIOUS - SqFt  
**Type of sprinkler calculated** 5.6 K  
**# Sprinklers calculated** 12  
**In-rack demand** - GPM  
**Hose streams** 250 - GPM  
**Total water required (including hose streams)** 545.726 - GPM @ 52.4589 - Psi  
**Type of system** WET  
**Volume of system (dry or pre-action)** - Gal

**WATER SUPPLY INFORMATION**

**Test date** 10/24/2023  
**Location** 1781 N MAIN ST, LILLINGTON, NC  
**Source of info** HYDRANT FLOW TEST REPORT

**CONTRACTOR INFO** IMPACT FIRE SERVICES  
**Address** 131 INTERNATIONAL DR / MORRISVILLE, NC 27560  
**Phone #** 919-663-0400  
**Name of designer** IVB  
**Authority having jurisdiction**  
**NOTES:**

text1(35) - invisible

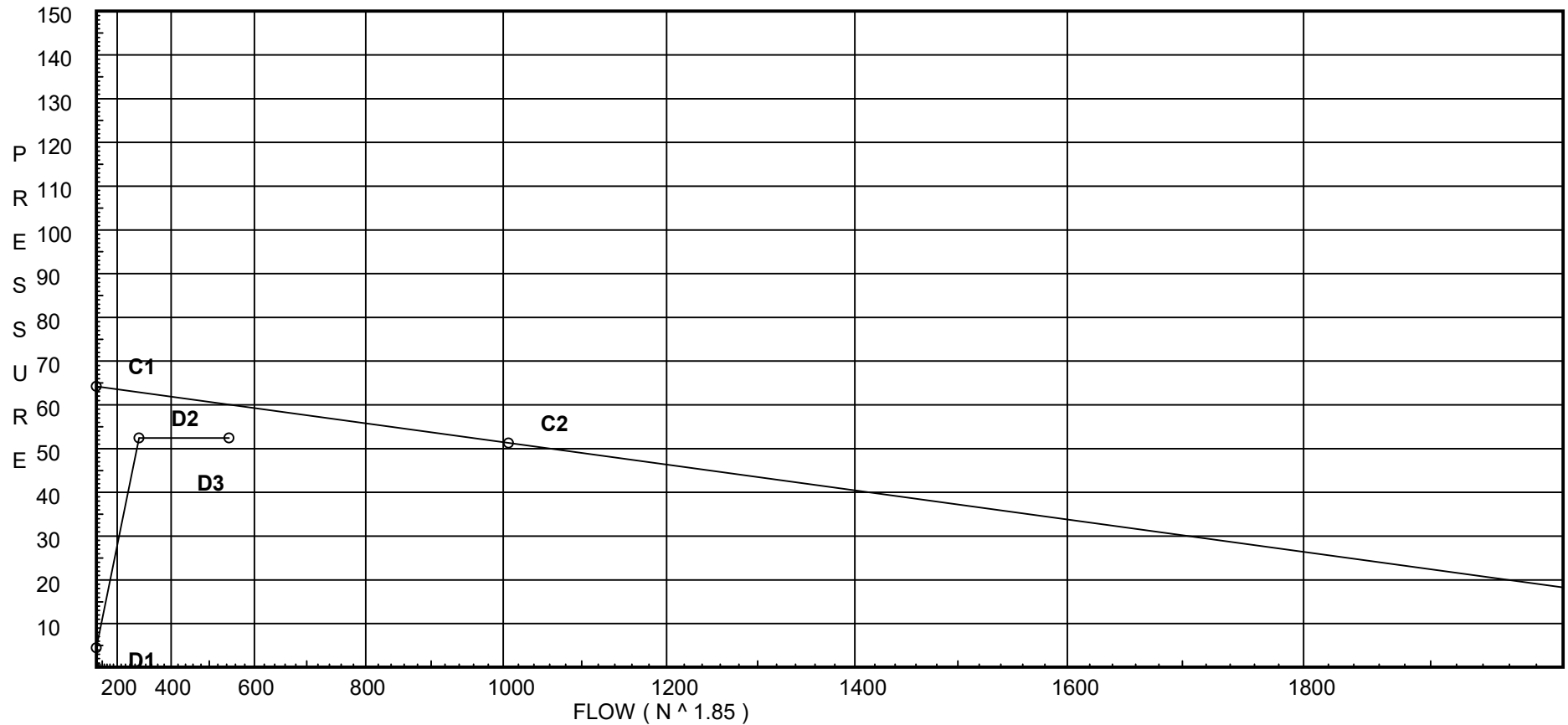
# Water Supply Curve

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City Water Supply:  
C1 - Static Pressure : 64.2  
C2 - Residual Pressure: 51.3  
C2 - Residual Flow : 1007

Demand:  
D1 - Elevation : 4.439  
D2 - System Flow : 295.726  
D2 - System Pressure : 52.459  
Hose ( Demand ) : 250  
D3 - System Demand : 545.726  
Safety Margin : 7.588



# Fittings Used Summary

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LILLINGTON STORAGE

## 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	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
Zig	Wilkins 375DA	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.

# 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	64.2	51.3	1007.0	60.047	545.73	52.459

## 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>
S1	12.25		29.43			
S2	12.25		29.42			
S3	12.25		29.41			
S4	12.25		29.38			
S5	12.25		29.32			
S6	12.25		29.23			
S7	12.25		29.12			
S8	12.25		28.98			
S9	12.25		28.82			
S10	12.25		28.65			
S11	12.25		28.45			
S12	12.25		28.24			
S13	12.25		28.1			
S14	12.25		27.94			
S15	12.25		27.74			
S16	12.25		27.48			
S17	12.25		27.23			
S18	12.25		27.0			
S19	12.25		26.76			
S20	12.25		26.52			
S21	12.25		26.28			
S22	12.25		26.02			
F1	12.25	5.6	24.27	27.59	0.2	109
F2	12.25	5.6	24.26	27.58	0.2	120
S23	12.25		25.85			
F3	12.25	5.6	18.9	24.35	0.2	109
F4	12.25	5.6	18.4	24.02	0.2	120
F5	12.25	5.6	18.29	23.95	0.2	85
F6	12.25	5.6	18.3	23.95	0.2	75
F7	12.25	5.6	18.45	24.05	0.2	75
S24	12.25		25.8			
F8	12.25	5.6	18.87	24.33	0.2	109
F9	12.25	5.6	18.37	24.0	0.2	120
F10	12.25	5.6	18.27	23.93	0.2	96
F11	12.25	5.6	18.27	23.93	0.2	76.6
F12	12.25	5.6	18.42	24.04	0.2	76.6
S27	12.25		25.81			
S25	12.25		25.81			
S26	12.25		25.81			
P1	12.25		31.98			
G1	12.25		31.98			
P2	12.25		31.6			

**NODE ANALYSIS (cont.)**

<b>Node Tag</b>	<b>Elevation</b>	<b>Node Type</b>	<b>Pressure at Node</b>	<b>Discharge at Node</b>	<b>Notes</b>
P3	12.25		31.24		
P4	12.25		30.93		
P5	12.25		30.51		
P6	12.25		30.13		
P7	12.25		29.8		
P8	12.25		29.5		
P9	12.25		29.22		
P10	12.25		28.97		
P11	12.25		28.75		
P12	12.25		28.54		
P13	12.25		28.42		
P14	12.25		28.31		
P15	12.25		27.51		
P16	12.25		27.34		
P17	12.25		27.16		
P18	12.25		26.98		
P19	12.25		26.79		
P20	12.25		26.6		
P21	12.25		26.43		
P22	12.25		26.26		
P23	12.25		26.14		
P24	12.25		26.11		
P25	12.25		26.1		
P26	12.25		26.1		
P27	12.25		26.1		
TOR1	12.25		33.05		
BOR1	2.25		39.05		
FLG	1.5		40.0		
HOSE	-2.0		41.64		
UGL1	-2.0		41.81		
BF	-13.0		46.72		
UGL2	-13.0		58.88		
UGL3	-10.0		57.65		
TEST	2.0		52.46	250.0	

# 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	*****
S1 to P1	12.250 12.250		22.46 22.46	1.5 1.682	E 3T	4.95 29.699	123.167 34.649 157.816	120 0.0162	29.428 0.0 2.554		Vel = 3.24	
P1			0.0 22.46						31.982		K Factor = 3.97	
S2 to P2	12.250 12.250		20.60 20.6	1.5 1.682	E 3T	4.95 29.699	123.167 34.649 157.816	120 0.0138	29.424 0.0 2.176		Vel = 2.97	
P2			0.0 20.60						31.600		K Factor = 3.66	
S3 to P3	12.250 12.250		18.75 18.75	1.5 1.682	E 3T	4.95 29.699	123.167 34.649 157.816	120 0.0116	29.410 0.0 1.828		Vel = 2.71	
P3			0.0 18.75						31.238		K Factor = 3.35	
S4 to P4	12.250 12.250		16.87 16.87	1.5 1.682	4T	39.599	123.167 39.599 162.766	120 0.0095	29.384 0.0 1.551		Vel = 2.44	
P4			0.0 16.87						30.935		K Factor = 3.03	
S5 to P5	12.250 12.250		14.60 14.6	1.5 1.682	4T	39.599	123.167 39.599 162.766	120 0.0073	29.319 0.0 1.187		Vel = 2.11	
P5			0.0 14.60						30.506		K Factor = 2.64	
S6 to P6	12.250 12.250		12.58 12.58	1.5 1.682	4T	39.599	123.167 39.599 162.766	120 0.0055	29.229 0.0 0.901		Vel = 1.82	
P6			0.0 12.58						30.130		K Factor = 2.29	
S7 to P7	12.250 12.250		10.80 10.8	1.5 1.682	4T	39.599	123.167 39.599 162.766	120 0.0042	29.115 0.0 0.680		Vel = 1.56	
P7			0.0 10.80						29.795		K Factor = 1.98	
S8 to P8	12.250 12.250		9.30 9.3	1.5 1.682	4T	39.599	123.167 39.599 162.766	120 0.0032	28.979 0.0 0.516		Vel = 1.34	
P8			0.0 9.30						29.495		K Factor = 1.71	
S9 to P9	12.250 12.250		8.11 8.11	1.5 1.682	4T	39.599	123.167 39.599 162.766	120 0.0025	28.823 0.0 0.400		Vel = 1.17	
P9			0.0 8.11						29.223		K Factor = 1.50	
S10 to P10	12.250 12.250		7.28 7.28	1.5 1.682	4T	39.599	123.167 39.599 162.766	120 0.0020	28.647 0.0 0.328		Vel = 1.05	

# 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	*****
P10			0.0 7.28						28.975		K Factor = 1.35	
S11 to P11	12.250 12.250		6.86	1.5	4T	39.599	123.167 39.599 162.766	120	28.453 0.0 0.294		Vel = 0.99	
P11			0.0 6.86						28.747		K Factor = 1.28	
S12 to P12	12.250 12.250		6.89	1.5	4T	39.599	123.167 39.599 162.766	120	28.242 0.0 0.295		Vel = 0.99	
P12			0.0 6.89						28.537		K Factor = 1.29	
S13 to P13	12.250 12.250		7.30	1.5	E 3T	4.95 29.699	123.167 34.649 157.816	120	28.100 0.0 0.319		Vel = 1.05	
P13			0.0 7.30						28.419		K Factor = 1.37	
S14 to P14	12.250 12.250		7.89	1.5	E 3T	4.95 29.699	123.167 34.649 157.816	120	27.937 0.0 0.369		Vel = 1.14	
P14			0.0 7.89						28.306		K Factor = 1.48	
S15 to P15	12.250 12.250		-5.51	1.5	4T	39.599	148.250 39.599 187.849	120	27.736 0.0 -0.226		Vel = 0.80	
P15			0.0 -5.51						27.510		K Factor = -1.05	
S16 to P16	12.250 12.250		-4.20	1.5	4T	39.599	148.250 39.599 187.849	120	27.479 0.0 -0.137		Vel = 0.61	
P16			0.0 -4.20						27.342		K Factor = -0.80	
S17 to P17	12.250 12.250		-2.92	1.5	4T	39.599	148.250 39.599 187.849	120	27.233 0.0 -0.070		Vel = 0.42	
P17			0.0 -2.92						27.163		K Factor = -0.56	
S18 to P18	12.250 12.250		-1.41	1.5	4T	39.599	148.250 39.599 187.849	120	26.996 0.0 -0.018		Vel = 0.20	
P18			0.0 -1.41						26.978		K Factor = -0.27	
S19 to P19	12.250 12.250		1.71	1.5	4T	39.599	148.250 39.599 187.849	120	26.763 0.0 0.026		Vel = 0.25	
P19			0.0 1.71						26.789		K Factor = 0.33	



# 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	*****
S20 to P20	12.250 12.250		3.13 3.13	1.5 1.682	4T	39.599	148.250 39.599 187.849	120 0.0004	26.525 0.0 0.079			Vel = 0.45
P20			0.0 3.13						26.604		K Factor = 0.61	
S21 to P21	12.250 12.250		4.40 4.4	1.5 1.682	4T	39.599	148.250 39.599 187.849	120 0.0008	26.278 0.0 0.149			Vel = 0.64
P21			0.0 4.40						26.427		K Factor = 0.86	
S22 to F1	12.250 12.250		-33.13 -33.13	1.5 1.682	2T	19.799	32.917 19.799 52.716	120 -0.0332	26.019 0.0 -1.751			Vel = 4.78
F1 to F2	12.250 12.250	5.60	27.59 -5.54	1.5 1.682			8.500 8.500	120 -0.0012	24.268 0.0 -0.010			Vel = 0.80
F2 to P22	12.250 12.250	5.60	27.58 22.04	1.5 1.682	2T	19.799	108.333 19.799 128.132	120 0.0156	24.258 0.0 2.002			Vel = 3.18
P22			0.0 22.04						26.260		K Factor = 4.30	
S23 to F3	12.250 12.250		-69.77 -69.77	1.5 1.682	2T	19.799	32.917 19.799 52.716	120 -0.1317	25.847 0.0 -6.944			Vel = 10.07
F3 to F4	12.250 12.250	5.60	24.35 -45.42	1.5 1.682			8.500 8.500	120 -0.0595	18.903 0.0 -0.506			Vel = 6.56
F4 to F5	12.250 12.250	5.60	24.02 -21.4	1.5 1.682			6.917 6.917	120 -0.0149	18.397 0.0 -0.103			Vel = 3.09
F5 to F6	12.250 12.250	5.60	23.95 2.55	1.5 1.682			8.250 8.250	120 0.0004	18.294 0.0 0.003			Vel = 0.37
F6 to F7	12.250 12.250	5.60	23.95 26.5	1.5 1.682			7.000 7.000	120 0.0219	18.297 0.0 0.153			Vel = 3.83
F7 to P23	12.250 12.250	5.60	24.06 50.56	1.5 1.682	2T	19.799	86.167 19.799 105.966	120 0.0726	18.450 0.0 7.692			Vel = 7.30
P23			0.0 50.56						26.142		K Factor = 9.89	
S24 to F8	12.250 12.250		-69.70 -69.7	1.5 1.682	2T	19.799	32.917 19.799 52.716	120 -0.1315	25.804 0.0 -6.932			Vel = 10.06
F8 to F9	12.250 12.250	5.60	24.33 -45.37	1.5 1.682			8.500 8.500	120 -0.0594	18.872 0.0 -0.505			Vel = 6.55

# 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	*****
F9 to F10	12.250 12.250	5.60	24.00 -21.37	1.5 1.682			6.917 6.917	120 -0.0147	18.367 0.0 -0.102			Vel = 3.09
F10 to F11	12.250 12.250	5.60	23.93 2.56	1.5 1.682			8.250 8.250	120 0.0004	18.265 0.0 0.003			Vel = 0.37
F11 to F12	12.250 12.250	5.60	23.93 26.49	1.5 1.682			7.000 7.000	120 0.0219	18.268 0.0 0.153			Vel = 3.82
F12 to P24	12.250 12.250	5.60	24.04 50.53	1.5 1.682	2T	19.799	86.167 19.799 105.966	120 0.0725	18.421 0.0 7.684			Vel = 7.30
P24			0.0 50.53						26.105			K Factor = 9.89
S27 to P27	12.250 12.250		7.11 7.11	1.5 1.682			150.000 150.000	120 0.0019	25.810 0.0 0.289			Vel = 1.03
P27			0.0 7.11						26.099			K Factor = 1.39
S1 to S2	12.250 12.250		-22.46 -22.46	3 3.26			7.000 7.000	120 -0.0006	29.428 0.0 -0.004			Vel = 0.86
S2 to S3	12.250 12.250		-20.60 -43.06	3 3.26			6.375 6.375	120 -0.0022	29.424 0.0 -0.014			Vel = 1.66
S3 to S4	12.250 12.250		-18.75 -61.81	3 3.26			6.167 6.167	120 -0.0042	29.410 0.0 -0.026			Vel = 2.38
S4 to S5	12.250 12.250		-16.87 -78.68	3 3.26			10.000 10.000	120 -0.0065	29.384 0.0 -0.065			Vel = 3.02
S5 to S6	12.250 12.250		-14.61 -93.29	3 3.26			10.000 10.000	120 -0.0090	29.319 0.0 -0.090			Vel = 3.59
S6 to S7	12.250 12.250		-12.57 -105.86	3 3.26			10.000 10.000	120 -0.0114	29.229 0.0 -0.114			Vel = 4.07
S7 to S8	12.250 12.250		-10.81 -116.67	3 3.26			10.000 10.000	120 -0.0136	29.115 0.0 -0.136			Vel = 4.48
S8 to S9	12.250 12.250		-9.30 -125.97	3 3.26			10.000 10.000	120 -0.0156	28.979 0.0 -0.156			Vel = 4.84
S9 to S10	12.250 12.250		-8.12 -134.09	3 3.26			10.000 10.000	120 -0.0176	28.823 0.0 -0.176			Vel = 5.15
S10 to S11	12.250 12.250		-7.28 -141.37	3 3.26			10.000 10.000	120 -0.0194	28.647 0.0 -0.194			Vel = 5.43

# 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	*****
S11 to S12	12.250 12.250		-6.86 -148.23	3 3.26			10.000 10.000	120 -0.0211	28.453 0.0 -0.211		Vel = 5.70	
S12 to S13	12.250 12.250		-6.89 -155.12	3 3.26			6.167 6.167	120 -0.0230	28.242 0.0 -0.142		Vel = 5.96	
S13 to S14	12.250 12.250		-7.29 -162.41	3 3.26			6.500 6.500	120 -0.0251	28.100 0.0 -0.163		Vel = 6.24	
S14 to S15	12.250 12.250		-7.90 -170.31	3 3.26			7.333 7.333	120 -0.0274	27.937 0.0 -0.201		Vel = 6.55	
S15 to S16	12.250 12.250		5.52 -164.79	3 3.26			10.000 10.000	120 -0.0257	27.736 0.0 -0.257		Vel = 6.33	
S16 to S17	12.250 12.250		4.20 -160.59	3 3.26			10.000 10.000	120 -0.0246	27.479 0.0 -0.246		Vel = 6.17	
S17 to S18	12.250 12.250		2.92 -157.67	3 3.26			10.000 10.000	120 -0.0237	27.233 0.0 -0.237		Vel = 6.06	
S18 to S19	12.250 12.250		1.42 -156.25	3 3.26			10.000 10.000	120 -0.0233	26.996 0.0 -0.233		Vel = 6.01	
S19 to S20	12.250 12.250		-1.71 -157.96	3 3.26			10.000 10.000	120 -0.0238	26.763 0.0 -0.238		Vel = 6.07	
S20 to S21	12.250 12.250		-3.13 -161.09	3 3.26			10.000 10.000	120 -0.0247	26.525 0.0 -0.247		Vel = 6.19	
S21 to S22	12.250 12.250		-4.40 -165.49	3 3.26			10.000 10.000	120 -0.0259	26.278 0.0 -0.259		Vel = 6.36	
S22 to S23	12.250 12.250		33.13 -132.36	3 3.26			10.000 10.000	120 -0.0172	26.019 0.0 -0.172		Vel = 5.09	
S23 to S24	12.250 12.250		69.77 -62.59	3 3.26			10.000 10.000	120 -0.0043	25.847 0.0 -0.043		Vel = 2.41	
S24 to S25	12.250 12.250		69.70 7.11	3 3.26	E	9.408	5.917 9.408	120	25.804 0.0		Vel = 0.27	
S25 to S26	12.250 12.250		0.0 7.11	3 3.26	2E	18.815	6.542 18.815	120	25.805 0.0		Vel = 0.27	
S26 to S27	12.250 12.250		0.0 7.11	3 3.26	T	20.159	20.000 20.159	120	25.807 0.0		Vel = 0.27	

# 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	*****
S27			0.0 7.11						25.810		K Factor = 1.40	
P1 to G1	12.250 12.250		22.46 22.46	3 3.26			1.167 1.167	120 0.0009	31.982 0.0 0.001		Vel = 0.86	
G1 to P2	12.250 12.250		-295.72 -273.26	3 3.26			5.833 5.833	120 -0.0657	31.983 0.0 -0.383		Vel = 10.50	
P2 to P3	12.250 12.250		20.60 -252.66	3 3.26			6.375 6.375	120 -0.0568	31.600 0.0 -0.362		Vel = 9.71	
P3 to P4	12.250 12.250		18.75 -233.91	3 3.26			6.167 6.167	120 -0.0491	31.238 0.0 -0.303		Vel = 8.99	
P4 to P5	12.250 12.250		16.87 -217.04	3 3.26			10.000 10.000	120 -0.0429	30.935 0.0 -0.429		Vel = 8.34	
P5 to P6	12.250 12.250		14.60 -202.44	3 3.26			10.000 10.000	120 -0.0376	30.506 0.0 -0.376		Vel = 7.78	
P6 to P7	12.250 12.250		12.58 -189.86	3 3.26			10.000 10.000	120 -0.0335	30.130 0.0 -0.335		Vel = 7.30	
P7 to P8	12.250 12.250		10.80 -179.06	3 3.26			10.000 10.000	120 -0.0300	29.795 0.0 -0.300		Vel = 6.88	
P8 to P9	12.250 12.250		9.30 -169.76	3 3.26			10.000 10.000	120 -0.0272	29.495 0.0 -0.272		Vel = 6.53	
P9 to P10	12.250 12.250		8.12 -161.64	3 3.26			10.000 10.000	120 -0.0248	29.223 0.0 -0.248		Vel = 6.21	
P10 to P11	12.250 12.250		7.28 -154.36	3 3.26			10.000 10.000	120 -0.0228	28.975 0.0 -0.228		Vel = 5.93	
P11 to P12	12.250 12.250		6.86 -147.5	3 3.26			10.000 10.000	120 -0.0210	28.747 0.0 -0.210		Vel = 5.67	
P12 to P13	12.250 12.250		6.89 -140.61	3 3.26			6.167 6.167	120 -0.0191	28.537 0.0 -0.118		Vel = 5.40	
P13 to P14	12.250 12.250		7.30 -133.31	3 3.26			6.500 6.500	120 -0.0174	28.419 0.0 -0.113		Vel = 5.12	
P14 to P15	12.250 12.250		7.89 -125.42	3 3.26	2E	18.815	32.417 18.815 51.232	120 -0.0155	28.306 0.0 -0.796		Vel = 4.82	
P15 to P16	12.250 12.250		-5.51 -130.93	3 3.26			10.000 10.000	120 -0.0168	27.510 0.0 -0.168		Vel = 5.03	

# Final Calculations : Hazen-Williams

IMPACT FIRE SERVICES  
LILLINGTON STORAGE

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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	*****
P16 to P17	12.250 12.250		-4.21 -135.14	3 3.26			10.000 10.000	120 -0.0179	27.342 0.0 -0.179		Vel = 5.19	
P17 to P18	12.250 12.250		-2.92 -138.06	3 3.26			10.000 10.000	120 -0.0185	27.163 0.0 -0.185		Vel = 5.31	
P18 to P19	12.250 12.250		-1.42 -139.48	3 3.26			10.000 10.000	120 -0.0189	26.978 0.0 -0.189		Vel = 5.36	
P19 to P20	12.250 12.250		1.72 -137.76	3 3.26			10.000 10.000	120 -0.0185	26.789 0.0 -0.185		Vel = 5.30	
P20 to P21	12.250 12.250		3.12 -134.64	3 3.26			10.000 10.000	120 -0.0177	26.604 0.0 -0.177		Vel = 5.18	
P21 to P22	12.250 12.250		4.40 -130.24	3 3.26			10.000 10.000	120 -0.0167	26.427 0.0 -0.167		Vel = 5.01	
P22 to P23	12.250 12.250		22.04 -108.2	3 3.26			10.000 10.000	120 -0.0118	26.260 0.0 -0.118		Vel = 4.16	
P23 to P24	12.250 12.250		50.56 -57.64	3 3.26			10.000 10.000	120 -0.0037	26.142 0.0 -0.037		Vel = 2.22	
P24 to P25	12.250 12.250		50.53 -7.11	3 3.26	E	9.408	5.917 9.408 15.325	120 -0.0001	26.105 0.0 -0.001		Vel = 0.27	
P25 to P26	12.250 12.250		0.0 -7.11	3 3.26	2E	18.815	3.042 18.815 21.857	120 -0.0001	26.104 0.0 -0.002		Vel = 0.27	
P26 to P27	12.250 12.250		0.0 -7.11	3 3.26	T	20.159	20.000 20.159 40.159	120 -0.0001	26.102 0.0 -0.003		Vel = 0.27	
P27			0.0 -7.11						26.099		K Factor = -1.39	
G1 to TOR1	12.250 12.250		295.73 295.73	4 4.26	E	13.167	38.417 13.167 51.584	120 0.0206	31.983 0.0 1.064		Vel = 6.66	
TOR1 to BOR1	12.250 2.250		0.0 295.73	4 4.26	B S T	15.8 28.968 26.334	9.750 71.102 80.852	120 0.0206	33.047 4.331 1.668		Vel = 6.66	
BOR1 to FLG	2.250 1.500		0.0 295.73	4 4.26	T	26.334	4.125 26.334 30.459	120 0.0207	39.046 0.325 0.629		Vel = 6.66	
FLG to HOSE	1.500 -2		0.0 295.73	8 8.27	2E 2T	56.936 110.709	40.500 167.645 208.145	140 0.0006	40.000 1.516 0.127		Vel = 1.77	
HOSE to UGL1	-2 -2		0.0 295.73	8 8.27			273.000 273.000	140 0.0006	41.643 0.0 0.168		Vel = 1.77	

# Final Calculations : Hazen-Williams

IMPACT FIRE SERVICES  
LILLINGTON STORAGE

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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	*****
UGL1 to BF	-2 -13		0.0 295.73	10 10.28	4F T	66.296 75.336	520.000 141.632 661.632	140 0.0002	41.811 4.764 0.141		Vel = 1.14	
BF to UGL2	-13 -13		0.0 295.73	10 10.28	4E Zig T G	132.591 0.0 75.336 7.534	10.000 215.461 225.461	140 0.0002	46.716 12.117 0.048		** Fixed Loss = 12.117 Vel = 1.14	
UGL2 to UGL3	-13 -10		0.0 295.73	12 12.34	T	93.767	646.000 93.767 739.767	140 0.0001	58.881 -1.299 0.064		Vel = 0.79	
UGL3 to TEST	-10 2		0.0 295.73	16 16.41			464.000 464.000	140 0	57.646 -5.197 0.010		Vel = 0.45	
TEST			250.00 545.73						52.459		Qa = 250.00 K Factor = 75.35	



## Hydraulic Calculations by HydraCALC

IMPACT FIRE SERVICES  
131 INTERNATIONAL DR  
MORRISVILLE, NC 27560  
919-663-0400

Job Name : LILLINGTON STORAGE  
Drawing : FP1  
Location : 1781 N MAIN ST, LILLINGTON, NC 27546  
Remote Area : 2  
Contract : 2C-29389308  
Data File : REMOTE\_AREA\_2.WXF

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**HYDRAULIC CALCULATIONS**  
*for*

**JOB NAME** LILLINGTON STORAGE  
**Location** 1781 N MAIN ST, LILLINGTON, NC 27546  
**Drawing #** FP1  
**Contract #** 2C-29389308  
**Date** 11/28/2023

**DESIGN**

**Remote area #** 2  
**Remote area location** NW  
**Occupancy classification** STORAGE  
**Density** .20 - Gpm/SqFt  
**Area of application** 2016 - SqFt  
**Coverage/sprinkler** VARIOUS - SqFt  
**Type of sprinkler calculated** 5.6 K  
**# Sprinklers calculated** 21  
**In-rack demand** - GPM  
**Hose streams** 250 - GPM  
**Total water required (including hose streams)** 702.493 - GPM @ 46.9677 - Psi  
**Type of system** DRY  
**Volume of system (dry or pre-action)** - Gal

**WATER SUPPLY INFORMATION**

**Test date** 10/24/2023  
**Location** 1781 N MAIN ST, LILLINGTON, NC  
**Source of info** HYDRANT FLOW TEST REPORT

**CONTRACTOR INFO**

IMPACT FIRE SERVICES  
**Address** 131 INTERNATIONAL DR / MORRISVILLE, NC 27560  
**Phone #** 919-663-0400  
**Name of designer** IVB  
**Authority having jurisdiction**

**NOTES:**

text1(35) - invisible



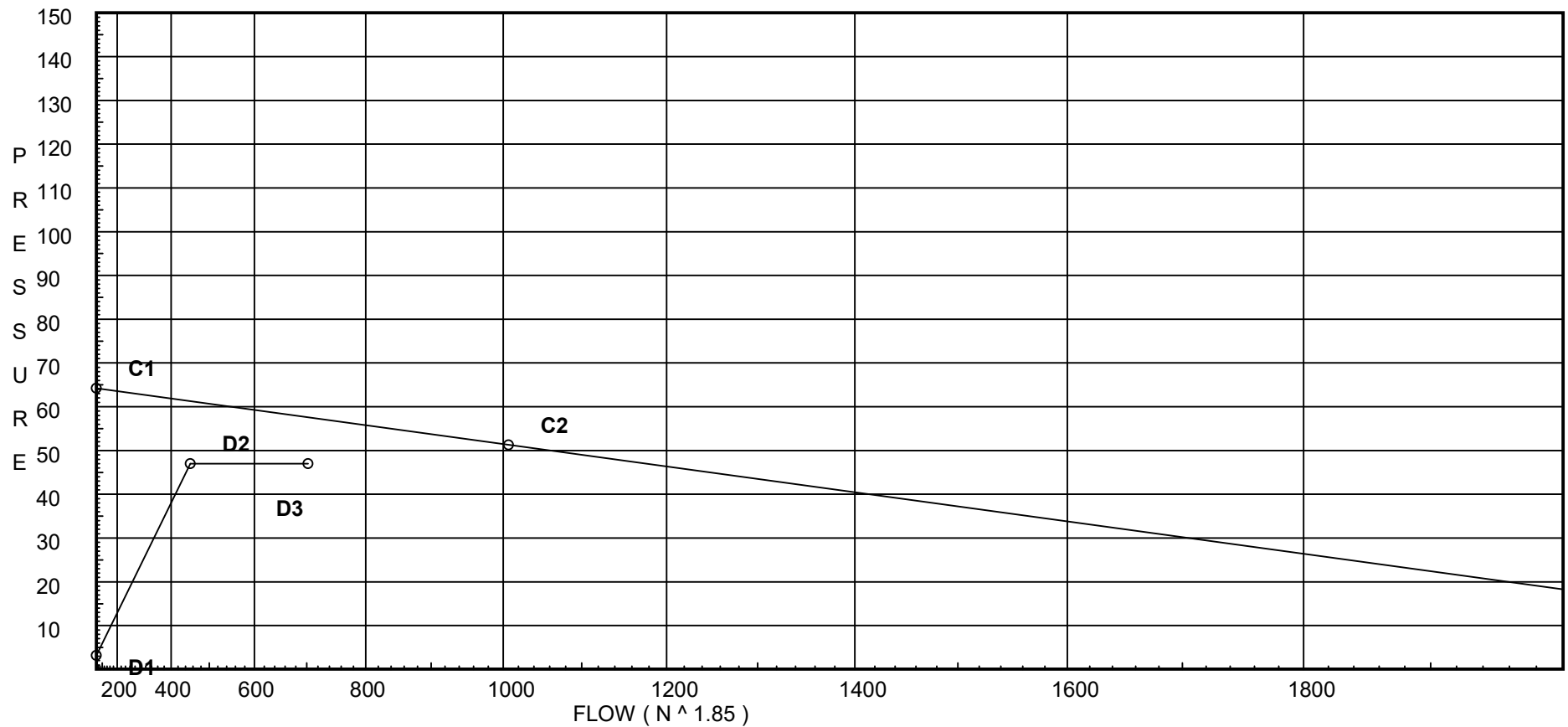
# Water Supply Curve

IMPACT FIRE SERVICES  
LILLINGTON STORAGE

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City Water Supply:  
C1 - Static Pressure : 64.2  
C2 - Residual Pressure: 51.3  
C2 - Residual Flow : 1007

Demand:  
D1 - Elevation : 3.176  
D2 - System Flow : 452.493  
D2 - System Pressure : 46.968  
Hose ( Demand ) : 250  
D3 - System Demand : 702.493  
Safety Margin : 10.606



# Fittings Used Summary

IMPACT FIRE SERVICES  
LILLINGTON STORAGE

## 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
Dge	Dry Gem DPV-1							2.2	4.9		8.9		22								
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
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
Zig	Wilkins 375DA	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**

<b>Node at Source</b>	<b>Static Pressure</b>	<b>Residual Pressure</b>	<b>Flow</b>	<b>Available Pressure</b>	<b>Total Demand</b>	<b>Required Pressure</b>
TEST	64.2	51.3	1007.0	57.574	702.49	46.968

**NODE ANALYSIS**

<b>Node Tag</b>	<b>Elevation</b>	<b>Node Type</b>	<b>Pressure at Node</b>	<b>Discharge at Node</b>	<b>Notes</b>
1	9.0	5.6	13.95	20.92	0.2 83
2	9.0	5.6	14.28	21.16	0.2 83
3	9.0	5.6	15.36	21.95	0.2 83
4	9.167	5.6	14.52	21.34	0.2 106.6
5	9.167	5.6	14.52	21.34	0.2 106.6
6	9.333	5.6	14.5	21.32	0.2 106.6
7	9.333	5.6	14.49	21.32	0.2 106.6
8	9.5	5.6	14.5	21.33	0.2 106.6
9	9.5	5.6	14.5	21.32	0.2 106.6
10	9.667	5.6	14.56	21.37	0.2 106.6
11	9.667	5.6	14.55	21.36	0.2 106.6
12	9.833	5.6	14.66	21.44	0.2 106.6
13	9.833	5.6	14.66	21.44	0.2 106.6
14	10.0	5.6	14.83	21.57	0.2 106.6
15	10.0	5.6	14.83	21.57	0.2 106.6
16	10.167	5.6	15.05	21.73	0.2 106.6
17	10.167	5.6	15.05	21.72	0.2 106.6
18	10.333	5.6	15.36	21.95	0.2 106.6
19	10.333	5.6	15.35	21.94	0.2 106.6
20	10.5	5.6	15.73	22.21	0.2 106.6
21	10.5	5.6	15.72	22.21	0.2 106.6
H1	7.917		15.34		
H2	7.917		15.69		
H3	7.917		16.37		
H4	8.083		15.51		
H5	8.083		15.95		
H6	8.25		15.48		
H7	8.25		15.92		
H8	8.417		15.49		
H9	8.417		15.92		
H10	8.583		15.54		
H11	8.583		15.98		
H12	8.75		15.65		
H13	8.75		16.09		
H14	8.917		15.83		
H15	8.917		16.27		
H16	9.083		16.06		
H17	9.083		16.51		
H18	9.25		16.37		
H19	9.25		16.83		
H20	9.417		16.75		
H21	9.417		17.22		

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**NODE ANALYSIS (cont.)**

<b>Node Tag</b>	<b>Elevation</b>	<b>Node Type</b>	<b>Pressure at Node</b>	<b>Discharge at Node</b>	<b>Notes</b>
M1	7.917		17.5		
M2	8.083		17.45		
M3	8.25		17.42		
M4	8.417		17.43		
M5	8.583		17.49		
M6	8.75		17.6		
M7	8.917		17.81		
M8	9.083		18.06		
M9	9.25		18.41		
M10	9.417		18.84		
M11	12.0		22.87		
TOR	12.0		25.13		
BOR	2.25		32.41		
FLG	1.5		34.05		
HOSE	-2.0		35.84		
UGL1	-2.0		36.21		
BF	-13.0		41.28		
UGL2	-13.0		53.3		
UGL3	-10.0		52.14		
TEST	2.0		46.97	250.0	

# Final Calculations : Hazen-Williams

IMPACT FIRE SERVICES  
LILLINGTON STORAGE

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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	*****
1 to H1	9 7.917	5.60	20.92 20.92	1 1.049	T 3.568	1.083 3.568 4.651	100 0.1982	13.953 0.469 0.922		Vel = 7.77	
H1			0.0 20.92					15.344		K Factor = 5.34	
2 to H2	9 7.917	5.60	21.16 21.16	1 1.049	T 3.568	1.083 3.568 4.651	100 0.2023	14.277 0.469 0.941		Vel = 7.86	
H2			0.0 21.16					15.687		K Factor = 5.34	
3 to H3	9 7.917	5.60	21.95 21.95	1 1.049	E 1.427	1.083 1.427 2.510	100 0.2163	15.357 0.469 0.543		Vel = 8.15	
H3			0.0 21.95					16.369		K Factor = 5.43	
4 to H4	9.167 8.083	5.60	21.34 21.34	1 1.049	E 1.427	1.083 1.427 2.510	100 0.2060	14.523 0.469 0.517		Vel = 7.92	
H4			0.0 21.34					15.509		K Factor = 5.42	
5 to H5	9.167 8.083	5.60	21.34 21.34	1 1.049	T 3.568	1.083 3.568 4.651	100 0.2055	14.520 0.469 0.956		Vel = 7.92	
H5			0.0 21.34					15.945		K Factor = 5.34	
6 to H6	9.333 8.250	5.60	21.32 21.32	1 1.049	E 1.427	1.083 1.427 2.510	100 0.2052	14.498 0.469 0.515		Vel = 7.91	
H6			0.0 21.32					15.482		K Factor = 5.42	
7 to H7	9.333 8.250	5.60	21.32 21.32	1 1.049	T 3.568	1.083 3.568 4.651	100 0.2053	14.494 0.469 0.955		Vel = 7.91	
H7			0.0 21.32					15.918		K Factor = 5.34	
8 to H8	9.500 8.417	5.60	21.33 21.33	1 1.049	E 1.427	1.083 1.427 2.510	100 0.2056	14.504 0.469 0.516		Vel = 7.92	
H8			0.0 21.33					15.489		K Factor = 5.42	
9 to H9	9.500 8.417	5.60	21.32 21.32	1 1.049	T 3.568	1.083 3.568 4.651	100 0.2053	14.501 0.469 0.955		Vel = 7.91	
H9			0.0 21.32					15.925		K Factor = 5.34	
10 to H10	9.667 8.583	5.60	21.37 21.37	1 1.049	E 1.427	1.083 1.427 2.510	100 0.2060	14.558 0.469 0.517		Vel = 7.93	

# Final Calculations : Hazen-Williams

IMPACT FIRE SERVICES  
LILLINGTON STORAGE

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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	*****
H10			0.0 21.37						15.544		K Factor = 5.42	
11 to H11	9.667 8.583	5.60	21.36	1	T	3.568	1.083 3.568 4.651	100	14.554 0.469 0.959		Vel = 7.93	
H11			0.0 21.36						15.982		K Factor = 5.34	
12 to H12	9.833 8.750	5.60	21.44	1	E	1.427	1.083 1.427 2.510	100	14.658 0.469 0.521		Vel = 7.96	
H12			0.0 21.44						15.648		K Factor = 5.42	
13 to H13	9.833 8.750	5.60	21.44	1	T	3.568	1.083 3.568 4.651	100	14.655 0.469 0.964		Vel = 7.96	
H13			0.0 21.44						16.088		K Factor = 5.35	
14 to H14	10 8.917	5.60	21.57	1	E	1.427	1.083 1.427 2.510	100	14.833 0.469 0.526		Vel = 8.01	
H14			0.0 21.57						15.828		K Factor = 5.42	
15 to H15	10 8.917	5.60	21.57	1	T	3.568	1.083 3.568 4.651	100	14.830 0.469 0.975		Vel = 8.01	
H15			0.0 21.57						16.274		K Factor = 5.35	
16 to H16	10.167 9.083	5.60	21.73	1	E	1.427	1.083 1.427 2.510	100	15.053 0.469 0.534		Vel = 8.07	
H16			0.0 21.73						16.056		K Factor = 5.42	
17 to H17	10.167 9.083	5.60	21.72	1	T	3.568	1.083 3.568 4.651	100	15.049 0.469 0.989		Vel = 8.06	
H17			0.0 21.72						16.507		K Factor = 5.35	
18 to H18	10.333 9.250	5.60	21.95	1	E	1.427	1.083 1.427 2.510	100	15.358 0.469 0.544		Vel = 8.15	
H18			0.0 21.95						16.371		K Factor = 5.42	
19 to H19	10.333 9.250	5.60	21.94	1	T	3.568	1.083 3.568 4.651	100	15.355 0.469 1.006		Vel = 8.14	
H19			0.0 21.94						16.830		K Factor = 5.35	

# Final Calculations : Hazen-Williams

IMPACT FIRE SERVICES  
LILLINGTON STORAGE

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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	*****
20 to H20	10.500 9.417	5.60	22.21 22.21	1 1.049	E 1.427	1.083 1.427 2.510	100 0.2211	15.727 0.469 0.555		Vel = 8.24	
H20			0.0 22.21					16.751		K Factor = 5.43	
21 to H21	10.500 9.417	5.60	22.21 22.21	1 1.049	T 3.568	1.083 3.568 4.651	100 0.2212	15.723 0.469 1.029		Vel = 8.24	
H21			0.0 22.21					17.221		K Factor = 5.35	
H1 to H2	7.917 7.917		20.92 20.92	1.25 1.442		8.167 8.167	100 0.0420	15.344 0.0 0.343		Vel = 4.11	
H2 to M1	7.917 7.917		21.16 42.08	1.25 1.442	T 5.304	6.542 5.304 11.846	100 0.1533	15.687 0.0 1.816		Vel = 8.27	
M1			0.0 42.08					17.503		K Factor = 10.06	
H3 to M1	7.917 7.917		21.95 21.95	1 1.049	T 3.568	1.667 3.568 5.235	100 0.2166	16.369 0.0 1.134		Vel = 8.15	
M1			0.0 21.95					17.503		K Factor = 5.25	
H4 to H5	8.083 8.083		21.34 21.34	1.25 1.442		10.000 10.000	100 0.0436	15.509 0.0 0.436		Vel = 4.19	
H5 to M2	8.083 8.083		21.34 42.68	1.25 1.442	T 5.304	4.250 5.304 9.554	100 0.1574	15.945 0.0 1.504		Vel = 8.38	
M2			0.0 42.68					17.449		K Factor = 10.22	
H6 to H7	8.250 8.250		21.32 21.32	1.25 1.442		10.000 10.000	100 0.0436	15.482 0.0 0.436		Vel = 4.19	
H7 to M3	8.250 8.250		21.32 42.64	1.25 1.442	T 5.304	4.250 5.304 9.554	100 0.1571	15.918 0.0 1.501		Vel = 8.38	
M3			0.0 42.64					17.419		K Factor = 10.22	
H8 to H9	8.417 8.417		21.33 21.33	1.25 1.442		10.000 10.000	100 0.0436	15.489 0.0 0.436		Vel = 4.19	
H9 to M4	8.417 8.417		21.32 42.65	1.25 1.442	T 5.304	4.250 5.304 9.554	100 0.1571	15.925 0.0 1.501		Vel = 8.38	
M4			0.0 42.65					17.426		K Factor = 10.22	

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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	*****
H10 to H11	8.583 8.583		21.37	1.25			10.000	100	15.544 0.0			
			21.37	1.442			10.000	0.0438	0.438	Vel =	4.20	
H11 to M5	8.583 8.583		21.36	1.25	T	5.304	4.250 5.304 9.554	100	15.982 0.0			
			42.73	1.442			9.554	0.1576	1.506	Vel =	8.39	
M5			0.0 42.73						17.488	K Factor =	10.22	
H12 to H13	8.750 8.750		21.44	1.25			10.000	100	15.648 0.0			
			21.44	1.442			10.000	0.0440	0.440	Vel =	4.21	
H13 to M6	8.750 8.750		21.44	1.25	T	5.304	4.250 5.304 9.554	100	16.088 0.0			
			42.88	1.442			9.554	0.1588	1.517	Vel =	8.42	
M6			0.0 42.88						17.605	K Factor =	10.22	
H14 to H15	8.917 8.917		21.57	1.25			10.000	100	15.828 0.0			
			21.57	1.442			10.000	0.0446	0.446	Vel =	4.24	
H15 to M7	8.917 8.917		21.56	1.25	T	5.304	4.250 5.304 9.554	100	16.274 0.0			
			43.13	1.442			9.554	0.1605	1.533	Vel =	8.47	
M7			0.0 43.13						17.807	K Factor =	10.22	
H16 to H17	9.083 9.083		21.73	1.25			10.000	100	16.056 0.0			
			21.73	1.442			10.000	0.0451	0.451	Vel =	4.27	
H17 to M8	9.083 9.083		21.72	1.25	T	5.304	4.250 5.304 9.554	100	16.507 0.0			
			43.45	1.442			9.554	0.1627	1.554	Vel =	8.54	
M8			0.0 43.45						18.061	K Factor =	10.22	
H18 to H19	9.250 9.250		21.95	1.25			10.000	100	16.371 0.0			
			21.95	1.442			10.000	0.0459	0.459	Vel =	4.31	
H19 to M9	9.250 9.250		21.94	1.25	T	5.304	4.250 5.304 9.554	100	16.830 0.0			
			43.89	1.442			9.554	0.1658	1.584	Vel =	8.62	
M9			0.0 43.89						18.414	K Factor =	10.23	
H20 to H21	9.417 9.417		22.21	1.25			10.000	100	16.751 0.0			
			22.21	1.442			10.000	0.0470	0.470	Vel =	4.36	
H21 to M10	9.417 9.417		22.20	1.25	T	5.304	4.250 5.304 9.554	100	17.221 0.0			
			44.41	1.442			9.554	0.1695	1.619	Vel =	8.72	
			0.0									



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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	*****
M10			44.41						18.840		K Factor = 10.23	
M1 to M2	7.917 8.083		64.02	4			10.375	100	17.503 -0.072		Vel = 1.44	
M2 to M3	8.083 8.250		42.68	4			9.708	100	17.449 -0.072		Vel = 2.40	
M3 to M4	8.250 8.417		42.64	4			9.792	100	17.419 -0.072		Vel = 3.36	
M4 to M5	8.417 8.583		42.66	4			10.292	100	17.426 -0.072		Vel = 4.32	
M5 to M6	8.583 8.750		192.0	4.26			10.292	0.0130	0.134		Vel = 5.28	
M6 to M7	8.750 8.917		42.73	4			10.000	100	17.488 -0.072		Vel = 6.25	
M7 to M8	8.917 9.083		234.73	4.26			10.000	0.0189	0.189		Vel = 7.22	
M8 to M9	9.083 9.250		43.45	4			10.000	100	18.061 -0.072		Vel = 8.20	
M9 to M10	9.250 9.417		364.19	4.26			10.000	0.0425	0.425		Vel = 9.19	
M10 to M11	9.417 12		43.89	4			9.500	100	18.414 -0.072		Vel = 10.19	
M11 to TOR	12 12		408.08	4.26			9.500	0.0524	0.498		Vel = 10.19	
TOR to BOR	12 2.250		44.41	4	T E	18.795 9.397	7.375 28.192	100	22.867 0.0		Vel = 10.19	
BOR to FLG	2.250 1.500		452.49	4.26	B T Dge	11.277 18.795 8.364	9.750 38.435 48.185	100	25.126 4.223 3.060		Vel = 10.19	
FLG to HOSE	1.500 -2		0.0	4	T	26.334	2.625 26.334 28.959	120	32.409 0.325 1.312		Vel = 10.19	
HOSE to UGL1	-2 -2		452.49	8.27	2E 2T	56.936 110.709	40.500 167.645 208.145	140	34.046 1.516 0.280		Vel = 2.70	
UGL1 to BF	-2 -13		0.0	8			273.000	140	35.842 0.0 0.368		Vel = 2.70	
			452.49	10.28	4F T	66.296 75.336	520.000 141.632 661.632	140	36.210 4.764 0.309		Vel = 1.75	

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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	*****
BF to UGL2	-13 -13		0.0 452.49	10 10.28	4E Zig T G	132.591 0.0 75.336 7.534	10.000 215.461 225.461	140 0.0005	41.283 11.912 0.105		** Fixed Loss = 11.912 Vel = 1.75	
UGL2 to UGL3	-13 -10		0.0 452.49	12 12.34	T	93.767	646.000 93.767 739.767	140 0.0002	53.300 -1.299 0.142		Vel = 1.21	
UGL3 to TEST	-10 2		0.0 452.49	16 16.41			464.000 464.000	140 0	52.143 -5.197 0.022		Vel = 0.69	
TEST			250.00 702.49						46.968		Qa = 250.00 K Factor = 102.50	