



Hydraulic Calculations by HydraCALC

Hydratec Incorporated
64 Haverhill Road
Route 111
Windham, NH 03087
603-434-0502

Job Name : BLDG B ALT K25 SYS 3
Drawing : HIGH PILED STORAGE
Location : NY312 & PUGSLEY RD, BREWSTER, NY 10509
Remote Area : SYSTEM 3
Contract : 5031092
Data File : Lincoln Equities - BLDG B ALTERNATE SYS 3 K25 3INCH BL 8.23



Hydraulic Design Information Sheet

Name - BLDG B ALT K25 SYS 3 Date - 8.23.23
Location - NY312 & PUGSLEY RD, BREWSTER, NY 10509
Building - HIGH PILED STORAGE System No. - SYSTEM 3
Contractor - SA COMUNALE Contract No. - 5031092
Calculated By - JUSTIN BEOUGHER Drawing No. - PG.5
Construction: () Combustible (X) Non-Combustible Ceiling Height - 45-6
Occupancy - ESFR

S (X) NFPA 13 () Lt. Haz. Ord.Haz.Gp. () 1 () 2 () 3 () Ex.Haz.
Y () Figure Curve

S Other
T Specific Ruling Made By Date

E
M Number of ESFR Sprinklers - 12 System Type Sprinkler/Nozzle
End Head Pressure (PSI) - 45 (X) Wet Make TYCO
D ESFR K-Factor - 25.2 () Dry Model K25
E Elevation at Highest Outlet - 44'-10 () Deluge Size 1"
S Hose Allowance - Inside - 100 () Preaction K-Factor 22.4
I Rack Sprinkler Allowance - NA () Other Temp.Rat.165
G Hose Allowance - Outside - 150

N
Note

Calculation Flow Required - 2288.20 Press Required - 134.911
Summary C-Factor Used: 120 Overhead 150 Underground

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - Cap. -
T Time of Test - Rated Cap.- 2000 Elev.-
E Static Press - @ Press - 149
R Residual Press - Elev. - 2 Well
Flow - Proof Flow
S Elevation -

U
P Location - PUMP
P WATER STORAGE TANK
L Source of Information -
Y

C Commodity GROUP A CARTONED UNEXP. Class 1-4 Location
O Storage Ht. 40 FT Area Aisle W.
M Storage Method: Solid Piled % Palletized % Rack
M
S R () Single Row () Conven. Pallet () Auto. Storage () Encap.
T A () Double Row () Slave Pallet () Solid Shelf () Non
O C () Mult. Row () Open Shelf

R K Flue Spacing Clearance:Storage to Ceiling
A Longitudinal Transverse

G
E Horizontal Barriers Provided:

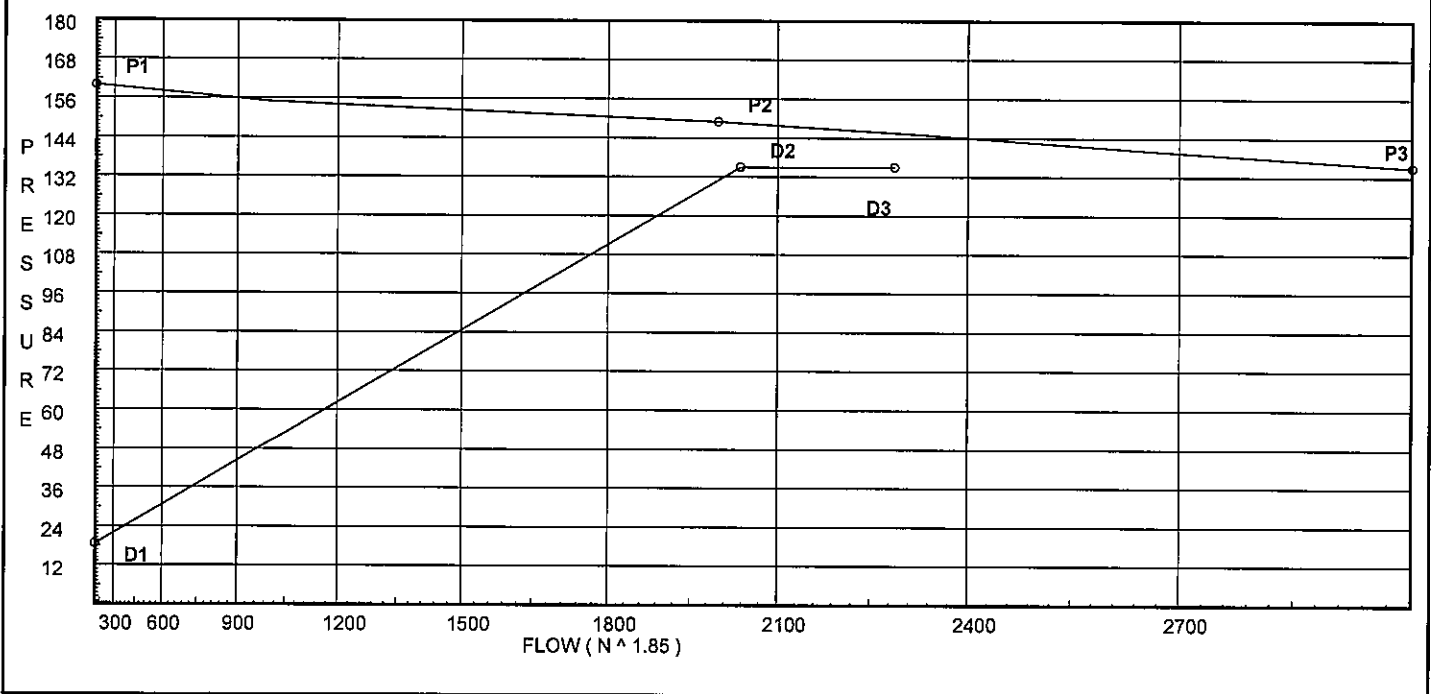
Water Supply Curve C

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Pump Data:
P1 - Pump Churn Pressure : 160
P2 - Pump Rated Pressure : 149
P2 - Pump Rated Flow : 2000
P3 - Pump Pressure @ Max Flow : 135
P3 - Pump Max Flow : 3000

Demand:
D1 - Elevation : 18.623
D2 - System Flow : 2038.21
D2 - System Pressure : 134.911
Hose (Demand) : 250
D3 - System Demand : 2288.21
Safety Margin : 10.657



Fittings Used Summary

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Fitting Legend		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
Abbrev.	Name																				
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
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
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
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
V	90° Ell Firelock #001	0	0	0	0	0	3.5	4.3	5	0	6.8	8.5	10	13	4.5	5.1	0	0	0	0	0
X	90° Tee-Branch Firelock 002	0	0	0	0	0	8.5	10.8	13	0	16	21	25	33	9.3	11	0	0	0	0	0

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>
PO	See Information on Pump Curve			145.568	2288.21	134.911

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>
R13	45.0		48.54		
1	45.0	25.2	45.26	169.53	
2	45.0	25.2	45.0	169.05	
3	45.0	25.2	45.0	169.05	
4	45.0	25.2	45.25	169.51	
R14	45.0		48.75		
5	45.0	25.2	45.42	169.84	
6	45.0	25.2	45.16	169.35	
7	45.0	25.2	45.16	169.35	
8	45.0	25.2	45.41	169.81	
R15	45.0		49.51		
9	45.0	25.2	46.03	170.97	
10	45.0	25.2	45.75	170.45	
11	45.0	25.2	45.75	170.44	
12	45.0	25.2	45.97	170.87	
R16	45.0		56.74		
R17	45.0		58.26		
R18	45.0		59.52		
R19	45.0		60.57		
R20	45.0		61.42		
R21	45.0		62.12		
R22	45.0		62.67		
R23	45.0		63.11		
R24	45.0		63.43		
R25	45.0		63.67		
R26	45.0		63.84		
R27	45.0		63.96		
13	45.0		52.49		
14	45.0		52.75		
15	45.0		53.69		
16	45.0		55.72		
17	45.0		57.4		
18	45.0		58.77		
19	45.0		59.89		
20	45.0		60.8		
21	45.0		61.52		
22	45.0		62.07		
23	45.0		62.48		
24	45.0		62.77		

Flow Summary - NFPA

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NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
25	45.0		62.94		
26	45.0		63.03		
27	45.0		63.05		
28	45.0		64.42		
29	45.0		64.45		
30	45.0		64.57		
31	45.0		64.83		
32	45.0		65.14		
33	45.0		65.5		
34	45.0		65.91		
35	45.0		66.38		
36	45.0		66.89		
37	45.0		67.46		
38	45.0		68.09		
39	45.0		68.77		
40	45.0		69.52		
41	45.0		70.34		
42	45.0		71.24		
FMJ	45.0		72.98		
TR1	45.0		82.59		
BR1	2.0		104.56	100.0	
FLG	2.0		105.1		
UG7	-5.0		115.33		
UG8	-5.0		118.67		
UG9	-5.0		122.03		
UG10	-5.0		129.07		
UG11	-5.0		130.77		
NL	-5.0		131.01		
UG12	-5.0		131.58		
UG13	-5.0		129.21		
UG14	-5.0		125.07		
UG15	-5.0		116.19	150.0	
UG16	-5.0		111.22		
UG6	-5.0		136.18		
PUMP	2.0		133.56		
PO	2.0		134.91		

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	*****
R13 to 1	45 45		-346.09 -346.09	3 3.26	0.0 0.0 0.0	32.333 0.0 32.333	120 -0.1016	48.540 0.0 -3.285		Vel = 13.30	
1 to 2	45 45	25.20	169.52 -176.57	3 3.26	0.0 0.0 0.0	8.708 0.0 8.708	120 -0.0292	45.255 0.0 -0.254		Vel = 6.79	
2 to 3	45 45	25.20	169.05 -7.52	3 3.26	0.0 0.0 0.0	8.708 0.0 8.708	120 -0.0001	45.001 0.0 -0.001		Vel = 0.29	
3 to 4	45 45	25.20	169.05 161.53	3 3.26	0.0 0.0 0.0	10.000 0.0 10.000	120 0.0248	45.000 0.0 0.248		Vel = 6.21	
4 to R28	45 45	25.20	169.51 331.04	3 3.26	0.0 0.0 0.0	165.917 0.0 165.917	120 0.0936	45.248 0.0 15.522		Vel = 12.72	
R28			0.0 331.04					60.770		K Factor = 42.47	
R14 to 5	45 45		-348.47 -348.47	3 3.26	0.0 0.0 0.0	32.333 0.0 32.333	120 -0.1029	48.749 0.0 -3.326		Vel = 13.39	
5 to 6	45 45	25.20	169.84 -178.63	3 3.26	0.0 0.0 0.0	8.708 0.0 8.708	120 -0.0299	45.423 0.0 -0.260		Vel = 6.87	
6 to 7	45 45	25.20	169.35 -9.28	3 3.26	0.0 0.0 0.0	8.708 0.0 8.708	120 -0.0001	45.163 0.0 -0.001		Vel = 0.36	
7 to 8	45 45	25.20	169.35 160.07	3 3.26	0.0 0.0 0.0	10.000 0.0 10.000	120 0.0244	45.162 0.0 0.244		Vel = 6.15	
8 to R29	45 45	25.20	169.81 329.88	3 3.26	0.0 0.0 0.0	165.917 0.0 165.917	120 0.0930	45.406 0.0 15.422		Vel = 12.68	
R29			0.0 329.88					60.828		K Factor = 42.30	
R15 to 9	45 45		-357.05 -357.05	3 3.26	0.0 0.0 0.0	32.333 0.0 32.333	120 -0.1076	49.508 0.0 -3.479		Vel = 13.72	
9 to 10	45 45	25.20	170.97 -186.08	3 3.26	0.0 0.0 0.0	8.708 0.0 8.708	120 -0.0323	46.029 0.0 -0.281		Vel = 7.15	
10 to 11	45 45	25.20	170.45 -15.63	3 3.26	0.0 0.0 0.0	8.708 0.0 8.708	120 -0.0002	45.748 0.0 -0.002		Vel = 0.60	
11 to 12	45 45	25.20	170.44 154.81	3 3.26	0.0 0.0 0.0	10.000 0.0 10.000	120 0.0229	45.746 0.0 0.229		Vel = 5.95	
12 to R30	45 45	25.20	170.87 325.68	3 3.26	0.0 0.0 0.0	165.917 0.0 165.917	120 0.0908	45.975 0.0 15.060		Vel = 12.52	

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	*****
R30			0.0 325.68						61.035		K Factor = 41.69	
R16 to R31	45 45		104.36 104.36	2.5 2.635		0.0 0.0 0.0	226.958 0.0 226.958	120 0.0312	56.738 0.0 7.074		Vel = 6.14	
R31			0.0 104.36						63.812		K Factor = 13.06	
R17 to R32	45 45		95.59 95.59	2.5 2.635		0.0 0.0 0.0	226.958 0.0 226.958	120 0.0265	58.260 0.0 6.014		Vel = 5.62	
R32			0.0 95.59						64.274		K Factor = 11.92	
R18 to R33	45 45		88.61 88.61	2.5 2.635		0.0 0.0 0.0	226.958 0.0 226.958	120 0.0230	59.522 0.0 5.226		Vel = 5.21	
R33			0.0 88.61						64.748		K Factor = 11.01	
R19 to R34	45 45		83.43 83.43	2.5 2.635		0.0 0.0 0.0	226.958 0.0 226.958	120 0.0206	60.565 0.0 4.676		Vel = 4.91	
R34			0.0 83.43						65.241		K Factor = 10.33	
R20 to R35	45 45		80.06 80.06	2.5 2.635		0.0 0.0 0.0	226.958 0.0 226.958	120 0.0191	61.422 0.0 4.332		Vel = 4.71	
R35			0.0 80.06						65.754		K Factor = 9.87	
R21 to R36	45 45		78.48 78.48	2.5 2.635		0.0 0.0 0.0	226.958 0.0 226.958	120 0.0184	62.118 0.0 4.175		Vel = 4.62	
R36			0.0 78.48						66.293		K Factor = 9.64	
R22 to R37	45 45		78.60 78.6	2.5 2.635		0.0 0.0 0.0	226.958 0.0 226.958	120 0.0184	62.674 0.0 4.187		Vel = 4.62	
R37			0.0 78.60						66.861		K Factor = 9.61	
R23 to R38	45 45		80.29 80.29	2.5 2.635		0.0 0.0 0.0	226.958 0.0 226.958	120 0.0192	63.107 0.0 4.356		Vel = 4.72	
R38			0.0 80.29						67.463		K Factor = 9.78	
R24 to R39	45 45		83.36 83.36	2.5 2.635		0.0 0.0 0.0	226.958 0.0 226.958	120 0.0206	63.435 0.0 4.668		Vel = 4.90	
			0.0									

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	*****
R39			83.36					68.103		K Factor = 10.10	
R25 to R40	45 45		87.58	2.5	0.0	226.958	120	63.673			
					0.0	0.0		0.0			
			87.58	2.635	0.0	226.958	0.0225	5.115		Vel = 5.15	
R40			0.0								
			87.58					68.788		K Factor = 10.56	
R26 to R41	45 45		92.72	2.5	0.0	226.958	120	63.841			
					0.0	0.0		0.0			
			92.72	2.635	0.0	226.958	0.0250	5.685		Vel = 5.46	
R41			0.0								
			92.72					69.526		K Factor = 11.12	
R27 to R42	45 45		98.54	2.5	0.0	226.958	120	63.964			
					0.0	0.0		0.0			
			98.54	2.635	0.0	226.958	0.0280	6.362		Vel = 5.80	
R42			0.0								
			98.54					70.326		K Factor = 11.75	
13 to R13	45 45		-346.09	3	X T	17.471 20.159	120	52.489			
						37.630		0.0			
			-346.09	3.26		0.0	38.880	-0.1016	-3.949	Vel = 13.30	
R13			0.0								
			-346.09					48.540		K Factor = -49.68	
14 to R14	45 45		-348.47	3	X T	17.471 20.159	120	52.749			
						37.630		0.0			
			-348.47	3.26		0.0	38.880	-0.1029	-4.000	Vel = 13.39	
R14			0.0								
			-348.47					48.749		K Factor = -49.91	
15 to R15	45 45		-357.05	3	X T	17.471 20.159	120	53.692			
						37.630		0.0			
			-357.05	3.26		0.0	38.880	-0.1076	-4.184	Vel = 13.72	
R15			0.0								
			-357.05					49.508		K Factor = -50.74	
16 to R16	45 45		104.36	2.5	X T	14.827 16.474	120	55.723			
						31.301		0.0			
			104.36	2.635		0.0	32.551	0.0312	1.015	Vel = 6.14	
R16			0.0								
			104.36					56.738		K Factor = 13.85	
17 to R17	45 45		95.59	2.5	X T	14.827 16.474	120	57.397			
						31.301		0.0			
			95.59	2.635		0.0	32.551	0.0265	0.863	Vel = 5.62	
R17			0.0								
			95.59					58.260		K Factor = 12.52	
18 to R18	45 45		88.61	2.5	X T	14.827 16.474	120	58.772			
						31.301		0.0			
			88.61	2.635		0.0	32.551	0.0230	0.750	Vel = 5.21	
R18			0.0								
			88.61					59.522		K Factor = 11.49	

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	*****
19 to R19	45 45		83.43 83.43	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 0.0206	59.895 0.0 0.670		Vel = 4.91	
R19			0.0 83.43						60.565		K Factor = 10.72	
20 to R20	45 45		80.06 80.06	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 0.0191	60.800 0.0 0.622		Vel = 4.71	
R20			0.0 80.06						61.422		K Factor = 10.22	
21 to R21	45 45		78.48 78.48	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 0.0184	61.519 0.0 0.599		Vel = 4.62	
R21			0.0 78.48						62.118		K Factor = 9.96	
22 to R22	45 45		78.60 78.6	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 0.0185	62.073 0.0 0.601		Vel = 4.62	
R22			0.0 78.60						62.674		K Factor = 9.93	
23 to R23	45 45		80.29 80.29	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 0.0192	62.482 0.0 0.625		Vel = 4.72	
R23			0.0 80.29						63.107		K Factor = 10.11	
24 to R24	45 45		83.36 83.36	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 0.0206	62.765 0.0 0.670		Vel = 4.90	
R24			0.0 83.36						63.435		K Factor = 10.47	
25 to R25	45 45		87.58 87.58	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 0.0225	62.939 0.0 0.734		Vel = 5.15	
R25			0.0 87.58						63.673		K Factor = 10.98	
26 to R26	45 45		92.72 92.72	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 0.0250	63.026 0.0 0.815		Vel = 5.46	
R26			0.0 92.72						63.841		K Factor = 11.60	
27 to R27	45 45		98.54 98.54	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 0.0280	63.052 0.0 0.912		Vel = 5.80	
R27			0.0 98.54						63.964		K Factor = 12.32	
28 to R28	45 45		-331.04 -331.04	3 3.26	X T	17.471 20.159 0.0	1.333 37.630 38.963	120 -0.0936	64.415 0.0 -3.645		Vel = 12.72	

Final Calculations : Hazen-Williams

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftns Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
R28			0.0 -331.04					60.770		K Factor = -42.47	
29 to R29	45 45		-329.88 -329.88	3 3.26	X T	17.471 20.159 37.630	120 -0.0929	64.449 0.0 -3.621		Vel = 12.68	
R29			0.0 -329.88					60.828		K Factor = -42.30	
30 to R30	45 45		-325.68 -325.68	3 3.26	X T	17.471 20.159 37.630	120 -0.0908	64.572 0.0 -3.537		Vel = 12.52	
R30			0.0 -325.68					61.035		K Factor = -41.69	
31 to R31	45 45		-104.36 -104.36	2.5 2.635	X T	14.827 16.474 31.301	120 -0.0312	64.829 0.0 -1.017		Vel = 6.14	
R31			0.0 -104.36					63.812		K Factor = -13.06	
32 to R32	45 45		-95.59 -95.59	2.5 2.635	X T	14.827 16.474 31.301	120 -0.0265	65.138 0.0 -0.864		Vel = 5.62	
R32			0.0 -95.59					64.274		K Factor = -11.92	
33 to R33	45 45		-88.61 -88.61	2.5 2.635	X T	14.827 16.474 31.301	120 -0.0230	65.500 0.0 -0.752		Vel = 5.21	
R33			0.0 -88.61					64.748		K Factor = -11.01	
34 to R34	45 45		-83.43 -83.43	2.5 2.635	X T	14.827 16.474 31.301	120 -0.0206	65.913 0.0 -0.672		Vel = 4.91	
R34			0.0 -83.43					65.241		K Factor = -10.33	
35 to R35	45 45		-80.06 -80.06	2.5 2.635	X T	14.827 16.474 31.301	120 -0.0191	66.377 0.0 -0.623		Vel = 4.71	
R35			0.0 -80.06					65.754		K Factor = -9.87	
36 to R36	45 45		-78.48 -78.48	2.5 2.635	X T	14.827 16.474 31.301	120 -0.0184	66.894 0.0 -0.601		Vel = 4.62	
R36			0.0 -78.48					66.293		K Factor = -9.64	
37 to R37	45 45		-78.60 -78.6	2.5 2.635	X T	14.827 16.474 31.301	120 -0.0184	67.463 0.0 -0.602		Vel = 4.62	
			0.0								

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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	*****
R37			-78.60						66.861		K Factor = -9.61	
38 to R38	45 45		-80.29 -80.29	2.5 2.635	X T	14.827 16.474 0.0	1.333 31.301 32.634	120 -0.0192	68.089 0.0 -0.626		Vel = 4.72	
R38			0.0 -80.29						67.463		K Factor = -9.78	
39 to R39	45 45		-83.36 -83.36	2.5 2.635	X T	14.827 16.474 0.0	1.333 31.301 32.634	120 -0.0206	68.774 0.0 -0.671		Vel = 4.90	
R39			0.0 -83.36						68.103		K Factor = -10.10	
40 to R40	45 45		-87.58 -87.58	2.5 2.635	X T	14.827 16.474 0.0	1.333 31.301 32.634	120 -0.0225	69.523 0.0 -0.735		Vel = 5.15	
R40			0.0 -87.58						68.788		K Factor = -10.56	
41 to R41	45 45		-92.72 -92.72	2.5 2.635	X T	14.827 16.474 0.0	1.333 31.301 32.634	120 -0.0250	70.343 0.0 -0.817		Vel = 5.46	
R41			0.0 -92.72						69.526		K Factor = -11.12	
42 to R42	45 45		-98.54 -98.54	2.5 2.635	X T	14.827 16.474 0.0	1.333 31.301 32.634	120 -0.0280	71.240 0.0 -0.914		Vel = 5.80	
R42			0.0 -98.54						70.326		K Factor = -11.75	
13 to 14	45 45		346.09 346.09	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0276	52.489 0.0 0.260		Vel = 7.79	
14 to 15	45 45		348.47 694.56	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.1001	52.749 0.0 0.943		Vel = 15.63	
15 to 16	45 45		357.05 1051.61	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.2157	53.692 0.0 2.031		Vel = 23.67	
16 to 17	45 45		-104.36 947.25	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.1778	55.723 0.0 1.674		Vel = 21.32	
17 to 18	45 45		-95.59 851.66	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.1460	57.397 0.0 1.375		Vel = 19.17	
18 to 19	45 45		-88.60 763.06	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.1193	58.772 0.0 1.123		Vel = 17.18	
19 to 20	45 45		-83.43 679.63	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0961	59.895 0.0 0.905		Vel = 15.30	

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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 21	45 45		-80.06 599.57	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0764	60.800 0.0 0.719		Vel = 13.50	
21 to 22	45 45		-78.49 521.08	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0588	61.519 0.0 0.554		Vel = 11.73	
22 to 23	45 45		-78.60 442.48	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0434	62.073 0.0 0.409		Vel = 9.96	
23 to 24	45 45		-80.29 362.19	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0301	62.482 0.0 0.283		Vel = 8.15	
24 to 25	45 45		-83.36 278.83	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0185	62.765 0.0 0.174		Vel = 6.28	
25 to 26	45 45		-87.57 191.26	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0092	62.939 0.0 0.087		Vel = 4.31	
26 to 27	45 45		-92.72 98.54	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0028	63.026 0.0 0.026		Vel = 2.22	
27			0.0 98.54						63.052		K Factor = 12.41	
28 to 29	45 45		331.04 331.04	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0036	64.415 0.0 0.034		Vel = 3.35	
29 to 30	45 45		329.88 660.92	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0131	64.449 0.0 0.123		Vel = 6.68	
30 to 31	45 45		325.68 986.6	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0273	64.572 0.0 0.257		Vel = 9.97	
31 to 32	45 45		104.36 1090.96	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0328	64.829 0.0 0.309		Vel = 11.03	
32 to 33	45 45		95.59 1186.55	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0384	65.138 0.0 0.362		Vel = 11.99	
33 to 34	45 45		88.60 1275.15	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0439	65.500 0.0 0.413		Vel = 12.89	
34 to 35	45 45		83.43 1358.58	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0493	65.913 0.0 0.464		Vel = 13.73	
35 to 36	45 45		80.06 1438.64	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0549	66.377 0.0 0.517		Vel = 14.54	

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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	*****
36 to 37	45 45		78.48 1517.12	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0604	66.894 0.0 0.569		Vel = 15.34	
37 to 38	45 45		78.61 1595.73	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0665	67.463 0.0 0.626		Vel = 16.13	
38 to 39	45 45		80.29 1676.02	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0727	68.089 0.0 0.685		Vel = 16.94	
39 to 40	45 45		83.36 1759.38	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0795	68.774 0.0 0.749		Vel = 17.78	
40 to 41	45 45		87.57 1846.95	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0871	69.523 0.0 0.820		Vel = 18.67	
41 to 42	45 45		92.72 1939.67	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0953	70.343 0.0 0.897		Vel = 19.61	
42 to FMJ	45 45		98.54 2038.21	6 6.357	V	12.573 0.0 0.0	4.125 12.573 16.698	120 0.1044	71.240 0.0 1.744		Vel = 20.60	
FMJ			0.0 2038.21						72.984		K Factor = 238.58	
FMJ to TR1	45 45		2038.21	6 6.357	2V	25.147 0.0 0.0	66.792 25.147 91.939	120 0.1045	72.984 0.0 9.604		Vel = 20.60	
TR1 to BR1	45 2		0.0 2038.21	8 8.249	T	41.108 0.0 0.0	38.875 41.108 79.983	120 0.0294	82.588 19.623 2.349		** Fixed Loss = 1 Vel = 12.24	
BR1 to FLG	2 2	H100	100.00 2138.21	8 7.98	L	19.632 0.0 0.0	2.000 19.632 21.632	150 0.0250	104.560 0.0 0.540		Vel = 13.72	
FLG to UG16	2 -5		0.0 2138.21	8 7.98	L T	19.632 52.855 0.0	51.125 72.487 123.612	150 0.0250	105.100 3.032 3.085		Vel = 13.72	
UG16			0.0 2138.21						111.217		K Factor = 202.75	
UG7 to UG8	-5 -5		1061.02	8 7.98	G	6.041 0.0 0.0	483.333 6.040 489.373	150 0.0068	115.331 0.0 3.341		Vel = 6.81	
UG8 to UG9	-5 -5		0.0 1061.02	8 7.98	G	6.041 0.0 0.0	486.000 6.040 492.040	150 0.0068	118.672 0.0 3.359		Vel = 6.81	
UG9 to UG10	-5 -5		0.0 1061.02	8 7.98	6F 2G	81.548 12.081 0.0	937.542 93.630 1031.172	150 0.0068	122.031 0.0 7.039		Vel = 6.81	

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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	*****
UG10 to UG11	-5 -5		0.0 1061.02	8 7.98	G	6.041 0.0	242.917 6.040	150 0.0068	129.070 0.0			
UG11 to NL	-5 -5		0.0 1061.02	12 11.65	G	8.05 0.0	213.250 8.049	150 0.0011	130.770 0.239	Vel = 6.81		
NL to UG12	-5 -5		0.0 1061.02	12 11.65	2F	34.882 0.0	489.875 34.883	150 0.0011	131.009 0.568	Vel = 3.19		
UG12 to UG13	-5 -5		-2288.20 -1227.18	8 7.98	F G	13.591 6.041	245.208 19.632	150 -0.0089	131.577 -2.367	Vel = 3.19		
UG13 to UG14	-5 -5		0.0 -1227.18	8 7.98	G	6.041 0.0	457.500 6.040	150 -0.0089	129.210 -4.141	Vel = 7.87		
UG14 to UG15	-5 -5		0.0 -1227.18	8 7.98	2F G	27.183 6.041	960.000 33.222	150 -0.0089	125.069 -8.875	Vel = 7.87		
UG15 to UG16	-5 -5	H150	150.00 -1077.18	8 7.98	4F G	54.365 6.041	648.583 60.405	150 -0.0070	116.194 -4.977	Vel = 7.87		
UG16 to UG7	-5 -5		2138.20 1061.02	8 7.98	G	6.041 0.0	596.667 6.040	150 0.0068	111.217 4.114	Vel = 6.91		
UG7			0.0 1061.02							Vel = 6.81		
UG12 to UG6	-5 -5		2288.21 2288.21	12 11.65	6F 3G T	104.647 24.149 80.498	817.042 209.294 1026.336	150 0.0045	131.577 0.0 4.599	K Factor = 98.80		
UG6 to PUMP	-5 2		0.0 2288.21	12 11.65	2L	48.299 0.0	45.500 93.798	150 0.0045	136.176 -3.032 0.421	Vel = 6.89		
PUMP to PO	2 2		0.0 2288.21	10 10.42	2V S B	10.89 66.551 22.99	15.000 100.431 115.431	120 0.0117	133.565 0.0 1.346	Vel = 6.89		
PO			0.0 2288.21							Vel = 8.61		
									134.911	K Factor = 197.00		

