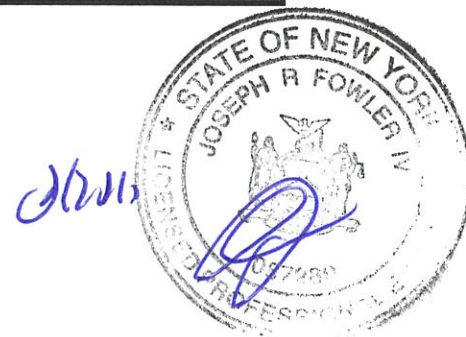




Hydraulic Calculations by HydraCALC

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

Job Name : BLDG B ALT K25 SYS 4
Drawing : HIGH PILED STORAGE
Location : NY312 & PUGSLEY RD, BREWSTER, NY 10509
Remote Area : SYSTEM 4
Contract : 5031092
Data File : Lincoln Equities - BLDG B ALTERNATE SYS 4 K25 8.23.23.WXF



Hydraulic Design Information Sheet

Name - BLDG B ALT K25 SYS 4 Date - 8.23.23
Location - NY312 & PUGSLEY RD, BREWSTER, NY 10509
Building - HIGH PILED STORAGE System No. - SYSTEM 4
Contractor - SA COMUNALE Contract No. - 5031092
Calculated By - JUSTIN BEOUGHER Drawing No. - PG.13
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 - 2290.41 Press Required - 140.270
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 R () Double Row () Slave Pallet () Solid Shelf () Non
O A () Mult. Row () Open Shelf

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

G
E Horizontal Barriers Provided:

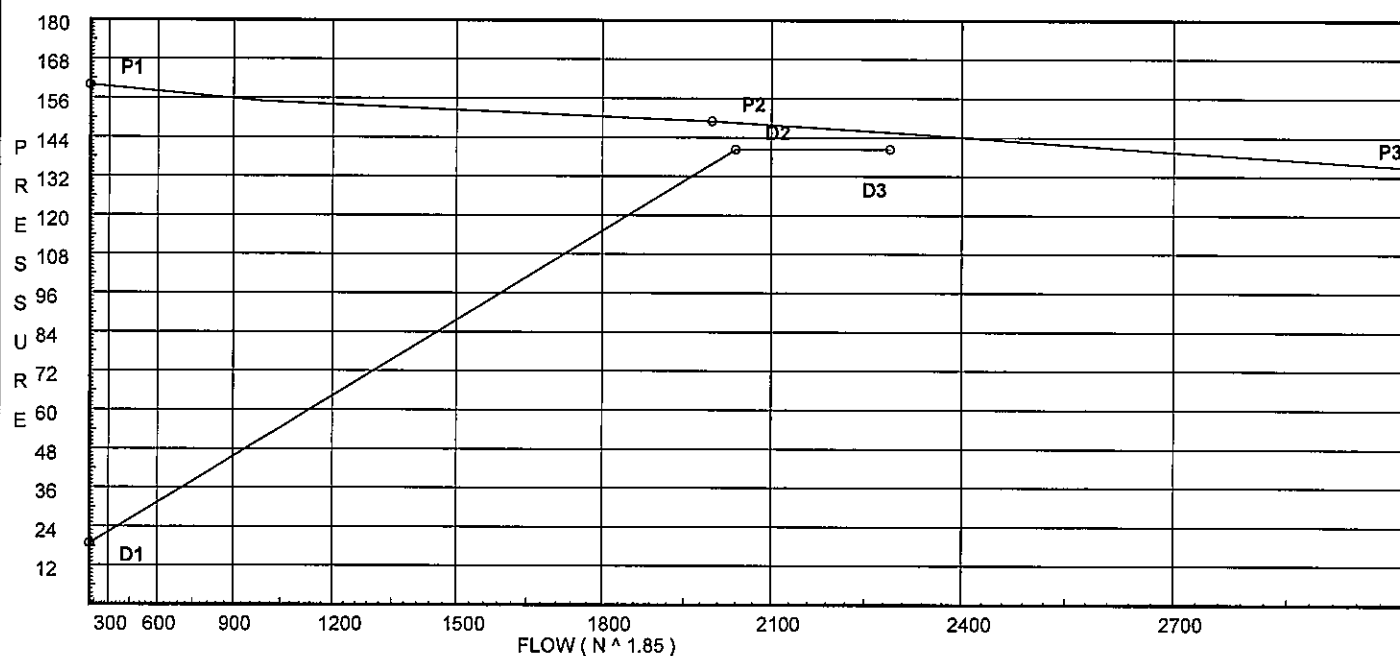
Water Supply Curve C

Hydratec Incorporated
BLDG B ALT K25 SYS 4

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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 : 18.840
D2 - System Flow : 2040.41
D2 - System Pressure : 140.270
Hose (Demand) : 250
D3 - System Demand : 2290.41
Safety Margin : 5.271



Fittings Used Summary

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BLDG B ALT K25 SYS 4

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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-BranchFirelock002	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

Hydratec Incorporated
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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			145.541	2290.41	140.27

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	45.5		74.91		
1	45.5	25.2	45.69	170.33	
2	45.5	25.2	45.0	169.05	
3	45.5	25.2	45.0	169.05	
4	45.5	25.2	45.73	170.42	
R14	45.5		74.96		
5	45.5	25.2	45.78	170.5	
6	45.5	25.2	45.09	169.22	
7	45.5	25.2	45.09	169.22	
8	45.5	25.2	45.83	170.6	
R15	45.5		75.13		
9	45.5	25.2	46.1	171.09	
10	45.5	25.2	45.42	169.84	
11	45.5	25.2	45.42	169.84	
12	45.5	25.2	46.18	171.26	
R16	45.5		83.63		
R17	45.5		84.11		
R18	45.5		84.6		
R19	45.5		85.1		
R20	45.5		85.62		
R21	45.5		86.16		
R22	45.5		86.72		
R23	45.5		87.31		
R24	45.5		87.96		
R25	45.5		88.65		
R26	45.5		89.39		
R27	45.5		90.17		
R28	45.5		91.02		
13	45.5		84.06		
14	45.5		84.1		
15	45.5		84.23		
16	45.5		84.5		
17	45.5		84.83		
18	45.5		85.21		
19	45.5		85.63		
20	45.5		86.09		
21	45.5		86.6		
22	45.5		87.16		
23	45.5		87.76		

Flow Summary - NFPA

Hydratec Incorporated
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NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
24	45.5		88.46		
25	45.5		89.21		
26	45.5		90.02		
27	45.5		90.9		
28	45.5		91.86		
29	45.5		74.23		
30	45.5		74.48		
31	45.5		75.37		
32	45.5		77.26		
33	45.5		78.84		
34	45.5		80.16		
35	45.5		81.25		
36	45.5		82.15		
37	45.5		82.89		
38	45.5		83.49		
39	45.5		83.98		
40	45.5		84.36		
41	45.5		84.62		
42	45.5		84.79		
43	45.5		84.87		
44	45.5		84.89		
FMJ	45.5		93.59		
TR3	45.5		96.47		
BR3	2.0		118.66	100.0	
FLG	2.0		119.2		
UG7	-5.0		131.03		
UG8	-5.0		132.24		
UG9	-5.0		133.46		
UG10	-5.0		136.01		
UG11	-5.0		136.63		
NL	-5.0		136.72		
UG12	-5.0		136.92		
UG13	-5.0		132.71		
UG14	-5.0		125.32	150.0	
UG15	-5.0		127.78		
UG16	-5.0		129.54		
UG6	-5.0		141.53		
PUMP	2.0		138.92		
PO	2.0		140.27		

Final Calculations : Hazen-Williams

Hydratec Incorporated
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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	*****
R13 to 1	45.500 45.500		-342.68 -342.68	2.5 2.635		0.0 0.0 0.0	103.917 0.0 103.917	120 -0.2812	74.908 0.0 -29.221		Vel = 20.16	
1 to 2	45.500 45.500	25.20	170.33 -172.35	2.5 2.635		0.0 0.0 0.0	8.708 0.0 8.708	120 -0.0789	45.687 0.0 -0.687		Vel = 10.14	
2 to 3	45.500 45.500	25.20	169.05 -3.3	2.5 2.635		0.0 0.0 0.0	8.708 0.0 8.708	120 0	45.000 0.0 0.0		Vel = 0.19	
3 to 4	45.500 45.500	25.20	169.04 165.74	2.5 2.635		0.0 0.0 0.0	10.000 0.0 10.000	120 0.0734	45.000 0.0 0.734		Vel = 9.75	
4 to R29	45.500 45.500	25.20	170.42 336.16	2.5 2.635		0.0 0.0 0.0	72.375 0.0 72.375	120 0.2714	45.734 0.0 19.640		Vel = 19.78	
R29			0.0 336.16						65.374		K Factor = 41.58	
R14 to 5	45.500 45.500		-342.43 -342.43	2.5 2.635		0.0 0.0 0.0	103.917 0.0 103.917	120 -0.2808	74.957 0.0 -29.181		Vel = 20.15	
5 to 6	45.500 45.500	25.20	170.50 -171.93	2.5 2.635		0.0 0.0 0.0	8.708 0.0 8.708	120 -0.0785	45.776 0.0 -0.684		Vel = 10.12	
6 to 7	45.500 45.500	25.20	169.22 -2.71	2.5 2.635		0.0 0.0 0.0	8.708 0.0 8.708	120 0	45.092 0.0 0.0		Vel = 0.16	
7 to 8	45.500 45.500	25.20	169.21 166.5	2.5 2.635		0.0 0.0 0.0	10.000 0.0 10.000	120 0.0740	45.092 0.0 0.740		Vel = 9.80	
8 to R30	45.500 45.500	25.20	170.61 337.11	2.5 2.635		0.0 0.0 0.0	72.375 0.0 72.375	120 0.2728	45.832 0.0 19.742		Vel = 19.83	
R30			0.0 337.11						65.574		K Factor = 41.63	
R15 to 9	45.500 45.500		-341.52 -341.52	2.5 2.635		0.0 0.0 0.0	103.917 0.0 103.917	120 -0.2794	75.132 0.0 -29.037		Vel = 20.09	
9 to 10	45.500 45.500	25.20	171.09 -170.43	2.5 2.635		0.0 0.0 0.0	8.708 0.0 8.708	120 -0.0773	46.095 0.0 -0.673		Vel = 10.03	
10 to 11	45.500 45.500	25.20	169.84 -0.59	2.5 2.635		0.0 0.0 0.0	8.708 0.0 8.708	120 0	45.422 0.0 0.0		Vel = 0.03	
11 to 12	45.500 45.500	25.20	169.84 169.25	2.5 2.635		0.0 0.0 0.0	10.000 0.0 10.000	120 0.0763	45.422 0.0 0.763		Vel = 9.96	
12 to R31	45.500 45.500	25.20	171.26 340.51	2.5 2.635		0.0 0.0 0.0	72.375 0.0 72.375	120 0.2779	46.185 0.0 20.113		Vel = 20.03	

Final Calculations : Hazen-Williams

Hydratec Incorporated
BLDG B ALT K25 SYS 4

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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	*****
R31			0.0 340.51					66.298		K Factor = 41.82	
R16 to R32	45.500 45.500		-96.16 -96.16	2.5 2.635	0.0 0.0	205.041 0.0	120 -0.0268	83.633 0.0		Vel = 5.66	
R32			0.0 -96.16					78.139		K Factor = -10.88	
R17 to R33	45.500 45.500		-86.78 -86.78	2.5 2.635	0.0 0.0	205.041 0.0	120 -0.0222	84.110 -4.544		Vel = 5.11	
R33			0.0 -86.78					79.566		K Factor = -9.73	
R18 to R34	45.500 45.500		-79.14 -79.14	2.5 2.635	0.0 0.0	205.041 0.0	120 -0.0187	84.598 -3.831		Vel = 4.66	
R34			0.0 -79.14					80.767		K Factor = -8.81	
R19 to R35	45.500 45.500		-73.27 -73.27	2.5 2.635	0.0 0.0	205.041 0.0	120 -0.0162	85.100 -3.323		Vel = 4.31	
R35			0.0 -73.27					81.777		K Factor = -8.10	
R20 to R36	45.500 45.500		-69.23 -69.23	2.5 2.635	0.0 0.0	205.041 0.0	120 -0.0146	85.619 -2.992		Vel = 4.07	
R36			0.0 -69.23					82.627		K Factor = -7.62	
R21 to R37	45.500 45.500		-67.04 -67.04	2.5 2.635	0.0 0.0	205.041 0.0	120 -0.0137	86.158 -2.818		Vel = 3.94	
R37			0.0 -67.04					83.340		K Factor = -7.34	
R22 to R38	45.500 45.500		-66.65 -66.65	2.5 2.635	0.0 0.0	205.041 0.0	120 -0.0136	86.719 -2.788		Vel = 3.92	
R38			0.0 -66.65					83.931		K Factor = -7.28	
R23 to R39	45.500 45.500		-67.68 -67.68	2.5 2.635	0.0 0.0	205.041 0.0	120 -0.0140	87.310 -2.869		Vel = 3.98	
R39			0.0 -67.68					84.441		K Factor = -7.37	
R24 to R40	45.500 45.500		-70.71 -70.71	2.5 2.635	0.0 0.0	205.041 0.0	120 -0.0152	87.964 -3.111		Vel = 4.16	
			0.0								

Final Calculations : Hazen-Williams

Hydratec Incorporated
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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	*****
R40			-70.71						84.853		K Factor = -7.68	
R25 to R41	45.500		-75.13	2.5		0.0	205.041	120	88.655			
						0.0	0.0		0.0			
R41	45.500		-75.13	2.635		0.0	205.041	-0.0170	-3.480		Vel = 4.42	
			0.0									
R41			-75.13						85.175		K Factor = -8.14	
R26 to R42	45.500		-80.69	2.5		0.0	205.041	120	89.388			
						0.0	0.0		0.0			
R42	45.500		-80.69	2.635		0.0	205.041	-0.0194	-3.970		Vel = 4.75	
			0.0									
R42			-80.69						85.418		K Factor = -8.73	
R27 to R43	45.500		-87.12	2.5		0.0	205.041	120	90.174			
						0.0	0.0		0.0			
R43	45.500		-87.12	2.635		0.0	205.041	-0.0223	-4.576		Vel = 5.13	
			0.0									
R43			-87.12						85.598		K Factor = -9.42	
R28 to R44	45.500		-94.17	2.5		0.0	205.041	120	91.020			
						0.0	0.0		0.0			
R44	45.500		-94.17	2.635		0.0	205.041	-0.0258	-5.285		Vel = 5.54	
			0.0									
R44			-94.17						85.735		K Factor = -10.17	
13 to R13	45.500		-342.68	2.5	X T	14.827 16.474	1.250 31.301	120	84.061			
						0.0	32.551		0.0			
R13	45.500		-342.68	2.635		0.0	32.551	-0.2812	-9.153		Vel = 20.16	
			0.0									
R13			-342.68						74.908		K Factor = -39.59	
14 to R14	45.500		-342.43	2.5	X T	14.827 16.474	1.250 31.301	120	84.097			
						0.0	32.551		0.0			
R14	45.500		-342.43	2.635		0.0	32.551	-0.2808	-9.140		Vel = 20.15	
			0.0									
R14			-342.43						74.957		K Factor = -39.55	
15 to R15	45.500		-341.52	2.5	X T	14.827 16.474	1.250 31.301	120	84.228			
						0.0	32.551		0.0			
R15	45.500		-341.52	2.635		0.0	32.551	-0.2794	-9.096		Vel = 20.09	
			0.0									
R15			-341.52						75.132		K Factor = -39.40	
16 to R16	45.500		-96.16	2.5	X T	14.827 16.474	1.250 31.301	120	84.505			
						0.0	32.551		0.0			
R16	45.500		-96.16	2.635		0.0	32.551	-0.0268	-0.872		Vel = 5.66	
			0.0									
R16			-96.16						83.633		K Factor = -10.51	
17 to R17	45.500		-86.78	2.5	X T	14.827 16.474	1.250 31.301	120	84.831			
						0.0	32.551		0.0			
R17	45.500		-86.78	2.635		0.0	32.551	-0.0221	-0.721		Vel = 5.11	
			0.0									
R17			-86.78						84.110		K Factor = -9.46	

Final Calculations : Hazen-Williams

Hydratec Incorporated
BLDG B ALT K25 SYS 4

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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	*****
18 to R18	45.500 45.500		-79.14 -79.14	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 -0.0187	85.206 0.0 -0.608		Vel = 4.66	
R18			0.0 -79.14						84.598		K Factor = -8.60	
19 to R19	45.500 45.500		-73.27 -73.27	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 -0.0162	85.627 0.0 -0.527		Vel = 4.31	
R19			0.0 -73.27						85.100		K Factor = -7.94	
20 to R20	45.500 45.500		-69.23 -69.23	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 -0.0146	86.094 0.0 -0.475		Vel = 4.07	
R20			0.0 -69.23						85.619		K Factor = -7.48	
21 to R21	45.500 45.500		-67.04 -67.04	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 -0.0137	86.605 0.0 -0.447		Vel = 3.94	
R21			0.0 -67.04						86.158		K Factor = -7.22	
22 to R22	45.500 45.500		-66.65 -66.65	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 -0.0136	87.162 0.0 -0.443		Vel = 3.92	
R22			0.0 -66.65						86.719		K Factor = -7.16	
23 to R23	45.500 45.500		-67.68 -67.68	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 -0.0140	87.765 0.0 -0.455		Vel = 3.98	
R23			0.0 -67.68						87.310		K Factor = -7.24	
24 to R24	45.500 45.500		-70.71 -70.71	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 -0.0152	88.458 0.0 -0.494		Vel = 4.16	
R24			0.0 -70.71						87.964		K Factor = -7.54	
25 to R25	45.500 45.500		-75.13 -75.13	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 -0.0170	89.207 0.0 -0.552		Vel = 4.42	
R25			0.0 -75.13						88.655		K Factor = -7.98	
26 to R26	45.500 45.500		-80.69 -80.69	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 -0.0194	90.019 0.0 -0.631		Vel = 4.75	
R26			0.0 -80.69						89.388		K Factor = -8.53	
27 to R27	45.500 45.500		-87.12 -87.12	2.5 2.635	X T	14.827 16.474 0.0	1.250 31.301 32.551	120 -0.0223	90.900 0.0 -0.726		Vel = 5.13	

Final Calculations : Hazen-Williams

Hydratec Incorporated
BLDG B ALT K25 SYS 4

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftns Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
R27			0.0 -87.12						90.174		K Factor = -9.17	
28 to R28	45.500 45.500		-94.17 -94.17	2.5 2.635	X T	14.827 16.474	1.250 31.301	120 -0.0258	91.859 0.0			
						0.0	32.551		-0.839		Vel = 5.54	
R28			0.0 -94.17						91.020		K Factor = -9.87	
29 to R29	45.500 45.500		-336.16 -336.16	2.5 2.635	X T	14.827 16.474	1.333 31.301	120 -0.2714	74.230 0.0			
						0.0	32.634		-8.856		Vel = 19.78	
R29			0.0 -336.16						65.374		K Factor = -41.58	
30 to R30	45.500 45.500		-337.11 -337.11	2.5 2.635	X T	14.827 16.474	1.333 31.301	120 -0.2728	74.476 0.0			
						0.0	32.634		-8.902		Vel = 19.83	
R30			0.0 -337.11						65.574		K Factor = -41.63	
31 to R31	45.500 45.500		-340.51 -340.51	2.5 2.635	X T	14.827 16.474	1.333 31.301	120 -0.2779	75.367 0.0			
						0.0	32.634		-9.069		Vel = 20.03	
R31			0.0 -340.51						66.298		K Factor = -41.82	
32 to R32	45.500 45.500		96.16 96.16	2.5 2.635	X T	14.827 16.474	1.333 31.301	120 0.0268	77.265 0.0			
						0.0	32.634		0.874		Vel = 5.66	
R32			0.0 96.16						78.139		K Factor = 10.88	
33 to R33	45.500 45.500		86.78 86.78	2.5 2.635	X T	14.827 16.474	1.333 31.301	120 0.0222	78.843 0.0			
						0.0	32.634		0.723		Vel = 5.11	
R33			0.0 86.78						79.566		K Factor = 9.73	
34 to R34	45.500 45.500		79.14 79.14	2.5 2.635	X T	14.827 16.474	1.333 31.301	120 0.0187	80.157 0.0			
						0.0	32.634		0.610		Vel = 4.66	
R34			0.0 79.14						80.767		K Factor = 8.81	
35 to R35	45.500 45.500		73.27 73.27	2.5 2.635	X T	14.827 16.474	1.333 31.301	120 0.0162	81.248 0.0			
						0.0	32.634		0.529		Vel = 4.31	
R35			0.0 73.27						81.777		K Factor = 8.10	
36 to R36	45.500 45.500		69.23 69.23	2.5 2.635	X T	14.827 16.474	1.333 31.301	120 0.0146	82.151 0.0			
						0.0	32.634		0.476		Vel = 4.07	
			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	*****
R36			69.23						82.627		K Factor = 7.62	
37 to R37	45.500 45.500		67.04 67.04	2.5 2.635	X T	14.827 16.474 0.0	1.333 31.301 32.634	120 0.0138	82.891 0.0 0.449		Vel = 3.94	
R37			0.0 67.04						83.340		K Factor = 7.34	
38 to R38	45.500 45.500		66.65 66.65	2.5 2.635	X T	14.827 16.474 0.0	1.333 31.301 32.634	120 0.0136	83.487 0.0 0.444		Vel = 3.92	
R38			0.0 66.65						83.931		K Factor = 7.28	
39 to R39	45.500 45.500		67.68 67.68	2.5 2.635	X T	14.827 16.474 0.0	1.333 31.301 32.634	120 0.0140	83.984 0.0 0.457		Vel = 3.98	
R39			0.0 67.68						84.441		K Factor = 7.37	
40 to R40	45.500 45.500		70.71 70.71	2.5 2.635	X T	14.827 16.474 0.0	1.333 31.301 32.634	120 0.0152	84.358 0.0 0.495		Vel = 4.16	
R40			0.0 70.71						84.853		K Factor = 7.68	
41 to R41	45.500 45.500		75.13 75.13	2.5 2.635	X T	14.827 16.474 0.0	1.333 31.301 32.634	120 0.0170	84.621 0.0 0.554		Vel = 4.42	
R41			0.0 75.13						85.175		K Factor = 8.14	
42 to R42	45.500 45.500		80.69 80.69	2.5 2.635	X T	14.827 16.474 0.0	1.333 31.301 32.634	120 0.0194	84.786 0.0 0.632		Vel = 4.75	
R42			0.0 80.69						85.418		K Factor = 8.73	
43 to R43	45.500 45.500		87.12 87.12	2.5 2.635	X T	14.827 16.474 0.0	1.333 31.301 32.634	120 0.0223	84.869 0.0 0.729		Vel = 5.13	
R43			0.0 87.12						85.598		K Factor = 9.42	
44 to R44	45.500 45.500		94.17 94.17	2.5 2.635	X T	14.827 16.474 0.0	1.333 31.301 32.634	120 0.0258	84.894 0.0 0.841		Vel = 5.54	
R44			0.0 94.17						85.735		K Factor = 10.17	
13 to 14	45.500 45.500		342.68 342.68	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0038	84.061 0.0 0.036		Vel = 3.46	
14 to 15	45.500 45.500		342.44 685.12	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0139	84.097 0.0 0.131		Vel = 6.93	

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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	*****
15 to 16	45.500 45.500		341.51 1026.63	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0294	84.228 0.0 0.277		Vel = 10.38	
16 to 17	45.500 45.500		96.17 1122.8	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0346	84.505 0.0 0.326		Vel = 11.35	
17 to 18	45.500 45.500		86.78 1209.58	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0398	84.831 0.0 0.375		Vel = 12.23	
18 to 19	45.500 45.500		79.14 1288.72	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0447	85.206 0.0 0.421		Vel = 13.03	
19 to 20	45.500 45.500		73.27 1361.99	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0496	85.627 0.0 0.467		Vel = 13.77	
20 to 21	45.500 45.500		69.23 1431.22	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0543	86.094 0.0 0.511		Vel = 14.47	
21 to 22	45.500 45.500		67.04 1498.26	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0591	86.605 0.0 0.557		Vel = 15.15	
22 to 23	45.500 45.500		66.65 1564.91	6 6.357		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0640	87.162 0.0 0.603		Vel = 15.82	
23 to 24	45.500 45.500		67.68 1632.59	6 6.357		0.0 0.0 0.0	10.000 0.0 10.000	120 0.0693	87.765 0.0 0.693		Vel = 16.50	
24 to 25	45.500 45.500		70.71 1703.3	6 6.357		0.0 0.0 0.0	10.000 0.0 10.000	120 0.0749	88.458 0.0 0.749		Vel = 17.22	
25 to 26	45.500 45.500		75.14 1778.44	6 6.357		0.0 0.0 0.0	10.000 0.0 10.000	120 0.0812	89.207 0.0 0.812		Vel = 17.98	
26 to 27	45.500 45.500		80.68 1859.12	6 6.357		0.0 0.0 0.0	10.000 0.0 10.000	120 0.0881	90.019 0.0 0.881		Vel = 18.79	
27 to 28	45.500 45.500		87.12 1946.24	6 6.357		0.0 0.0 0.0	10.000 0.0 10.000	120 0.0959	90.900 0.0 0.959		Vel = 19.67	
28 to FMJ	45.500 45.500		94.17 2040.41	6 6.357	V	12.573 0.0 0.0	4.000 12.573 16.573	120 0.1047	91.859 0.0 1.735		Vel = 20.63	
FMJ			0.0 2040.41						93.594		K Factor = 210.91	
29 to 30	45.500 45.500		336.16 336.16	4 4.26		0.0 0.0 0.0	9.417 0.0 9.417	120 0.0261	74.230 0.0 0.246		Vel = 7.57	

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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	*****
30 to 31	45.500 45.500		337.11 673.27	4 4.26	0.0 0.0	9.417 0.0	120 0.0946	74.476 0.0			
					0.0	9.417	0.0946	0.891	Vel =	15.16	
31 to 32	45.500 45.500		340.51 1013.78	4 4.26	0.0 0.0	9.417 0.0	120 0.2016	75.367 0.0			
					0.0	9.417	0.2016	1.898	Vel =	22.82	
32 to 33	45.500 45.500		-96.17 917.61	4 4.26	0.0 0.0	9.417 0.0	120 0.1676	77.265 0.0			
					0.0	9.417	0.1676	1.578	Vel =	20.66	
33 to 34	45.500 45.500		-86.78 830.83	4 4.26	0.0 0.0	9.417 0.0	120 0.1395	78.843 0.0			
					0.0	9.417	0.1395	1.314	Vel =	18.70	
34 to 35	45.500 45.500		-79.14 751.69	4 4.26	0.0 0.0	9.417 0.0	120 0.1159	80.157 0.0			
					0.0	9.417	0.1159	1.091	Vel =	16.92	
35 to 36	45.500 45.500		-73.27 678.42	4 4.26	0.0 0.0	9.417 0.0	120 0.0959	81.248 0.0			
					0.0	9.417	0.0959	0.903	Vel =	15.27	
36 to 37	45.500 45.500		-69.23 609.19	4 4.26	0.0 0.0	9.417 0.0	120 0.0786	82.151 0.0			
					0.0	9.417	0.0786	0.740	Vel =	13.71	
37 to 38	45.500 45.500		-67.04 542.15	4 4.26	0.0 0.0	9.417 0.0	120 0.0633	82.891 0.0			
					0.0	9.417	0.0633	0.596	Vel =	12.20	
38 to 39	45.500 45.500		-66.65 475.5	4 4.26	0.0 0.0	10.000 0.0	120 0.0497	83.487 0.0			
					0.0	10.000	0.0497	0.497	Vel =	10.70	
39 to 40	45.500 45.500		-67.68 407.82	4 4.26	0.0 0.0	10.000 0.0	120 0.0374	83.984 0.0			
					0.0	10.000	0.0374	0.374	Vel =	9.18	
40 to 41	45.500 45.500		-70.72 337.1	4 4.26	0.0 0.0	10.000 0.0	120 0.0263	84.358 0.0			
					0.0	10.000	0.0263	0.263	Vel =	7.59	
41 to 42	45.500 45.500		-75.13 261.97	4 4.26	0.0 0.0	10.000 0.0	120 0.0165	84.621 0.0			
					0.0	10.000	0.0165	0.165	Vel =	5.90	
42 to 43	45.500 45.500		-80.68 181.29	4 4.26	0.0 0.0	10.000 0.0	120 0.0083	84.786 0.0			
					0.0	10.000	0.0083	0.083	Vel =	4.08	
43 to 44	45.500 45.500		-87.12 94.17	4 4.26	0.0 0.0	10.000 0.0	120 0.0025	84.869 0.0			
					0.0	10.000	0.0025	0.025	Vel =	2.12	
44			0.0 94.17					84.894	K Factor =	10.22	
FMJ to TR3	45.500 45.500		2040.41 2040.41	8 8.249	2V 0.0	30.537 0.0	120 0.0294	93.594 0.0			
					0.0	97.662	0.0294	2.874	Vel =	12.25	

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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	*****
TR3 to BR3	45.500 2		0.0 2040.41	8 8.249	T 0.0 0.0	41.108 41.108 79.983	120 0.0294	96.468 19.840 2.353		** Fixed Loss = 1 Vel = 12.25	
BR3 to FLG	2 2	H100	100.00 2140.41	8 7.98	L 0.0 0.0	19.632 19.632 21.632	150 0.0250	118.661 0.0 0.541		Vel = 13.73	
FLG to UG14	2 -5		0.0 2140.41	8 7.98	L T 0.0	19.632 52.855 123.612	150 0.0250	119.202 3.032 3.091		Vel = 13.73	
UG14			0.0 2140.41					125.325		K Factor = 191.20	
UG7 to UG8	-5 -5		613.26 613.26	8 7.98	G 0.0 0.0	483.333 6.040 489.373	150 0.0025	131.032 0.0 1.211		Vel = 3.93	
UG8 to UG9	-5 -5		0.0 613.26	8 7.98	G 0.0 0.0	486.000 6.040 492.040	150 0.0025	132.243 0.0 1.219		Vel = 3.93	
UG9 to UG10	-5 -5		0.0 613.26	8 7.98	6F 2G 0.0	81.548 12.081 1031.172	150 0.0025	133.462 0.0 2.553		Vel = 3.93	
UG10 to UG11	-5 -5		0.0 613.26	8 7.98	G 0.0 0.0	242.917 6.040 248.957	150 0.0025	136.015 0.0 0.616		Vel = 3.93	
UG11 to NL	-5 -5		0.0 613.26	12 11.65	G 0.0 0.0	213.250 8.049 221.299	150 0.0004	136.631 0.0 0.087		Vel = 1.85	
NL to UG12	-5 -5		0.0 613.26	12 11.65	2F 0.0 0.0	34.882 34.883 524.758	150 0.0004	136.718 0.0 0.206		Vel = 1.85	
UG12 to UG13	-5 -5		-2290.41 -1677.15	8 7.98	F G 0.0	13.591 6.041 264.840	150 -0.0159	136.924 0.0 -4.218		Vel = 10.76	
UG13 to UG14	-5 -5		0.0 -1677.15	8 7.98	G 0.0 0.0	457.500 6.040 463.540	150 -0.0159	132.706 0.0 -7.381		Vel = 10.76	
UG14 to UG15	-5 -5	H150	2290.41 613.26	8 7.98	2F G 0.0	27.183 6.041 993.222	150 0.0025	125.325 0.0 2.459		Vel = 3.93	
UG15 to UG16	-5 -5		0.0 613.26	8 7.98	4F G 0.0	54.365 6.041 708.988	150 0.0025	127.784 0.0 1.755		Vel = 3.93	
UG16 to UG7	-5 -5		0.0 613.26	8 7.98	G 0.0 0.0	596.667 6.040 602.707	150 0.0025	129.539 0.0 1.493		Vel = 3.93	
UG7			0.0 613.26					131.032		K Factor = 53.57	

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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	*****
UG12 to UG6	-5 -5		2290.41	12	6F 3G	104.647 24.149	817.042 209.294	150	136.924 0.0			
UG6 to PUMP	-5 2		2290.41	11.65	T	80.498	1026.336	0.0045	4.608	Vel =	6.89	
UG6 to PUMP	-5 2		0.0	12	2L	48.299 0.0	45.500 48.298	150	141.532 -3.032			
PUMP to PO	2 2		2290.41	11.65		0.0	93.798	0.0045	0.421	Vel =	6.89	
PUMP to PO	2 2		0.0	10	2V S	10.89 66.551	15.000 100.431	120	138.921 0.0			
PO			2290.41	10.42	B	22.99	115.431	0.0117	1.349	Vel =	8.62	
PO			0.0 2290.41						140.270	K Factor =	193.39	