Hydraulic Calculations by HydraCALC

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

Job Name	:	BLDG B ALT K25 SYS 16
Drawing	:	HIGH PILED STORAGE
Location	:	NY312 & PUGSLEY RD, BREWSTER, NY 10509
Remote Area	:	SYSTEM 16
Contract	:	5031092
Data File	:	Lincoln Equities - BLDG B ALTERNATE SYS 16 K22 8.23.23.WXF

8/24/23

Computer Programs by Hydratec Inc. Revision: 50.54.2

Hydraulic Design Information Sheet

Name - BLDG B ALT K22 SYS 16 — Date - 8.23.23
Location - NY312 & PUGSLEY RD, BREWSTER, NY 10509
Building - HIGH PILED STORAGE — System No. - SYSTEM 16
Contractor - SA COMUNALE — Contract No. - 5031092
Calculated By - JUSTIN BEOUGHER — Drawing No. - PG.19
Construction: ( ) Combustible (X) Non-Combustible — Ceiling Height - 45'-6
Occupancy - ESFR

SYSTEM DESIGN

(X) NFPA 13 ( ) Lt. Haz. Ord.Haz.Gp. ( ) 1 ( ) 2 ( ) 3 ( ) Ex.Haz.
( ) Figure Curve
Other
Specific Ruling — Made By — Date

Number of ESFR Sprinklers	- 12	System Type	Sprinkler/Nozzle
End Head Pressure (PSI)	- 40	(X) Wet	Make RELIABLE
ESFR K-Factor	- 22.4	( ) Dry	Model P22
Elevation at Highest Outlet	- 43'-10½	( ) Deluge	Size 1"
Hose Allowance - Inside	- 100	( ) Preaction	K-Factor 22.4
Rack Sprinkler Allowance	- NA	( ) Other	Temp.Rat.165
Hose Allowance - Outside	- 150		

Note

Calculation Summary — Flow Required - 1956.84 Press Required - 111.458
C-Factor Used: 120 Overhead 150 Underground

WATER SUPPLY

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

Location - PUMP
WATER STORAGE TANK
Source of Information -

COMMODITY STORAGE

Commodity GROUP A CARTONED UNEXP. Class 1-4 Location
Storage Ht. 40 FT Area Aisle W.
Storage Method: Solid Piled % Palletized % Rack

( ) Single Row	( ) Conven. Pallet	( ) Auto. Storage	( ) Encap.
( ) Double Row	( ) Slave Pallet	( ) Solid Shelf	( ) Non
( ) Mult. Row		( ) Open Shelf	

RACK STORAGE

Flue Spacing — Clearance:Storage to Ceiling
Longitudinal — Transverse

Horizontal Barriers Provided:

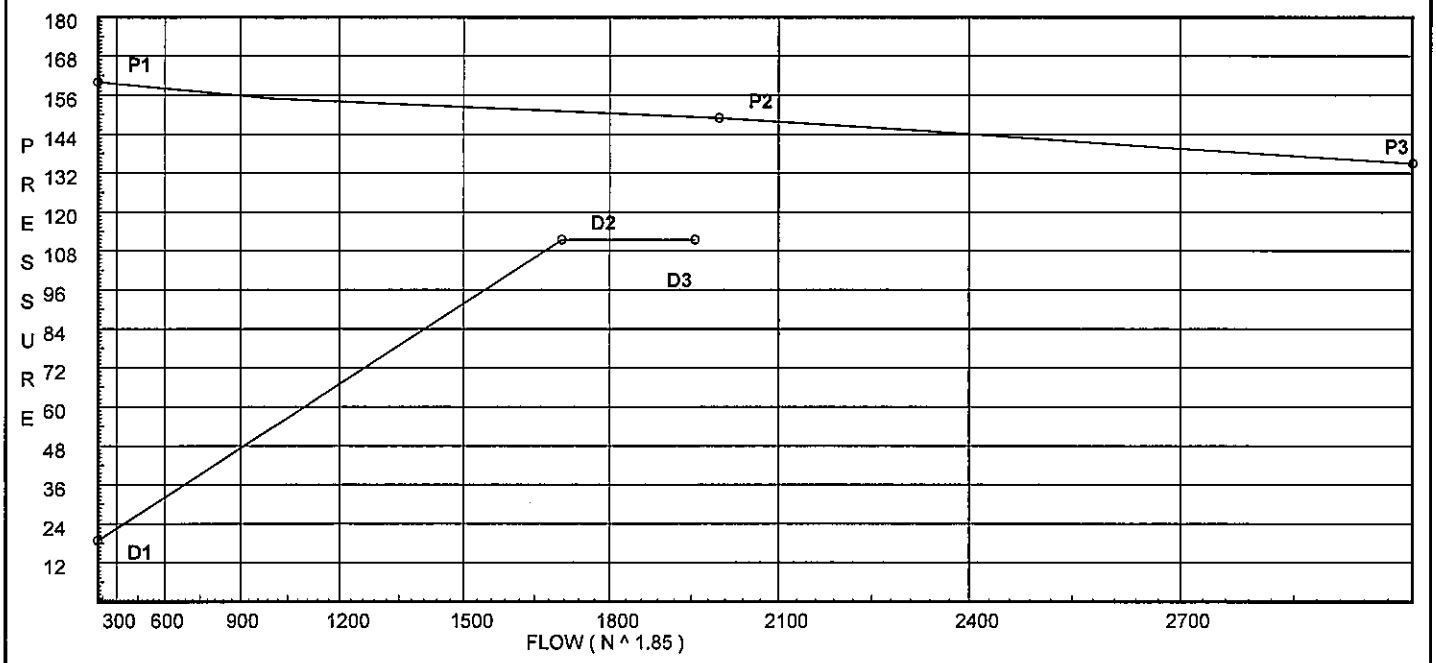
Water Supply Curve C

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	: 1706.84
D2 - System Pressure	: 111.458
Hose (Demand)	: 250
D3 - System Demand	: 1956.84
Safety Margin	: 37.871



Fittings Used Summary

Fitting Legend Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	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
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.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
PO	See Information on Pump Curve			149.329	1956.84	111.458

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
6	45.5		63.1		
R13	45.5		62.36		
1	45.5		62.99		
2	45.5		63.11		
3	45.5		63.22		
4	45.5		63.33		
R14	45.5		62.35		
5	45.5		62.99		
7	45.5		63.21		
8	45.5		63.33		
R15	45.5		62.32		
9	45.5		62.97		
10	45.5		63.08		
11	45.5		63.2		
12	45.5		63.31		
R16	45.5		62.25		
R17	45.5		55.42		
H1	45.5	22.4	40.53	142.6	
H2	45.5	22.4	40.0	141.67	
H3	45.5	22.4	40.0	141.67	
H4	45.5	22.4	40.5	142.55	
R18	45.5		55.44		
H5	45.5	22.4	40.55	142.65	
H6	45.5	22.4	40.03	141.72	
H7	45.5	22.4	40.03	141.72	
H8	45.5	22.4	40.53	142.6	
R19	45.5		55.63		
H9	45.5	22.4	40.69	142.89	
H10	45.5	22.4	40.16	141.96	
H11	45.5	22.4	40.17	141.96	
H12	45.5	22.4	40.66	142.84	
R20	45.5		63.04		
R21	45.5		63.6		
R22	45.5		64.07		
R23	45.5		64.46		
R24	45.5		64.8		
R25	45.5		65.06		
R26	45.5		65.26		
R27	45.5		65.41		

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
R28	45.5		65.52		
13	45.5		61.99		
14	45.5		61.98		
15	45.5		61.94		
16	45.5		61.86		
17	45.5		61.73		
18	45.5		61.73		
19	45.5		61.95		
20	45.5		62.67		
21	45.5		63.27		
22	45.5		63.75		
23	45.5		64.13		
24	45.5		64.44		
25	45.5		64.66		
26	45.5		64.81		
27	45.5		64.89		
28	45.5		64.92		
29	45.5		64.92		
30	45.5		64.93		
31	45.5		64.93		
32	45.5		64.95		
33	45.5		64.97		
34	45.5		65.06		
35	45.5		65.25		
36	45.5		65.59		
37	45.5		65.95		
38	45.5		66.35		
39	45.5		66.81		
40	45.5		67.31		
41	45.5		67.84		
42	45.5		68.43		
43	45.5		69.06		
44	45.5		69.75		
FMJ	45.5		71.0		
TR2	45.5		77.43		
BR2	2.0		98.96	100.0	
FLG	2.0		99.36		
UG7	-5.0		106.26		
UG8	-5.0		105.71		
UG9	-5.0		105.15	150.0	
UG10	-5.0		104.65		
UG11	-5.0		108.09		
NL	-5.0		108.57		
UG12	-5.0		109.72		
UG13	-5.0		109.42		
UG14	-5.0		108.89		
UG15	-5.0		107.76		
UG16	-5.0		106.95		
UG6	-5.0		113.17		

NODE ANALYSIS (cont.)

Node Tag	*Elevation*	*Node Type*	*Pressure at Node*	*Discharge at Node*	*Notes*
PUMP	2.0		110.45		
PO	2.0		111.46		

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	45.500		60.34	2.5		0.0	56.333	120	62.355	
to						0.0	0.0		0.0	
1	45.500		60.34	2.635		0.0	56.333	0.0113	0.638	Vel = 3.55
1	45.500		0.0	2.5		0.0	10.000	120	62.993	
to						0.0	0.0		0.0	
2	45.500		60.34	2.635		0.0	10.000	0.0113	0.113	Vel = 3.55
2	45.500		0.0	2.5		0.0	10.000	120	63.106	
to						0.0	0.0		0.0	
3	45.500		60.34	2.635		0.0	10.000	0.0113	0.113	Vel = 3.55
3	45.500		0.0	2.5		0.0	10.000	120	63.219	
to						0.0	0.0		0.0	
4	45.500		60.34	2.635		0.0	10.000	0.0113	0.113	Vel = 3.55
4	45.500		0.0	2.5		0.0	108.291	120	63.332	
to						0.0	0.0		0.0	
R29	45.500		60.34	2.635		0.0	108.291	0.0113	1.225	Vel = 3.55
			0.0							
R29			60.34						64.557	K Factor = 7.51
R14	45.500		60.49	2.5		0.0	56.333	120	62.347	
to						0.0	0.0		0.0	
5	45.500		60.49	2.635		0.0	56.333	0.0114	0.640	Vel = 3.56
5	45.500		0.0	2.5		0.0	10.000	120	62.987	
to						0.0	0.0		0.0	
6	45.500		60.49	2.635		0.0	10.000	0.0113	0.113	Vel = 3.56
6	45.500		0.0	2.5		0.0	10.000	120	63.100	
to						0.0	0.0		0.0	
7	45.500		60.49	2.635		0.0	10.000	0.0114	0.114	Vel = 3.56
7	45.500		0.0	2.5		0.0	10.000	120	63.214	
to						0.0	0.0		0.0	
8	45.500		60.49	2.635		0.0	10.000	0.0114	0.114	Vel = 3.56
8	45.500		0.0	2.5		0.0	108.291	120	63.328	
to						0.0	0.0		0.0	
R30	45.500		60.49	2.635		0.0	108.291	0.0114	1.230	Vel = 3.56
			0.0							
R30			60.49						64.558	K Factor = 7.53
R15	45.500		60.98	2.5		0.0	56.333	120	62.315	
to						0.0	0.0		0.0	
9	45.500		60.98	2.635		0.0	56.333	0.0115	0.650	Vel = 3.59
9	45.500		0.0	2.5		0.0	10.000	120	62.965	
to						0.0	0.0		0.0	
10	45.500		60.98	2.635		0.0	10.000	0.0115	0.115	Vel = 3.59
10	45.500		0.0	2.5		0.0	10.000	120	63.080	
to						0.0	0.0		0.0	
11	45.500		60.98	2.635		0.0	10.000	0.0116	0.116	Vel = 3.59
11	45.500		0.0	2.5		0.0	10.000	120	63.196	
to						0.0	0.0		0.0	
12	45.500		60.98	2.635		0.0	10.000	0.0115	0.115	Vel = 3.59
12	45.500		0.0	2.5		0.0	108.291	120	63.311	
to						0.0	0.0		0.0	
R31	45.500		60.98	2.635		0.0	108.291	0.0115	1.250	Vel = 3.59

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	******
			0.0									
R31			60.98						64.561	K Factor = 7.59		
R16	45.500		62.00	2.5		0.0	194.625	120	62.248			
to						0.0	0.0		0.0			
R32	45.500		62.0	2.635		0.0	194.625	0.0119	2.315	Vel = 3.65		
			0.0									
R32			62.00						64.563	K Factor = 7.72		
R17	45.500		-281.29	2.5		0.0	76.333	120	55.424			
to						0.0	0.0		0.0			
H1	45.500		-281.29	2.635		0.0	76.333	-0.1951	-14.896	Vel = 16.55		
H1	45.500	22.40	142.61	2.5		0.0	10.000	120	40.528			
to						0.0	0.0		0.0			
H2	45.500		-138.68	2.635		0.0	10.000	-0.0528	-0.528	Vel = 8.16		
H2	45.500	22.40	141.67	2.5		0.0	10.000	120	40.000			
to						0.0	0.0		0.0			
H3	45.500		2.99	2.635		0.0	10.000	0	0.0	Vel = 0.18		
H3	45.500	22.40	141.67	2.5		0.0	8.708	120	40.000			
to						0.0	0.0		0.0			
H4	45.500		144.66	2.635		0.0	8.708	0.0571	0.497	Vel = 8.51		
H4	45.500	22.40	142.54	2.5		0.0	88.291	120	40.497			
to						0.0	0.0		0.0			
R33	45.500		287.2	2.635		0.0	88.291	0.2028	17.907	Vel = 16.90		
			0.0									
R33			287.20						58.404	K Factor = 37.58		
R18	45.500		-281.12	2.5		0.0	76.333	120	55.435			
to						0.0	0.0		0.0			
H5	45.500		-281.12	2.635		0.0	76.333	-0.1949	-14.880	Vel = 16.54		
H5	45.500	22.40	142.65	2.5		0.0	10.000	120	40.555			
to						0.0	0.0		0.0			
H6	45.500		-138.47	2.635		0.0	10.000	-0.0526	-0.526	Vel = 8.15		
H6	45.500	22.40	141.72	2.5		0.0	10.000	120	40.029			
to						0.0	0.0		0.0			
H7	45.500		3.25	2.635		0.0	10.000	0	0.0	Vel = 0.19		
H7	45.500	22.40	141.72	2.5		0.0	8.708	120	40.029			
to						0.0	0.0		0.0			
H8	45.500		144.97	2.635		0.0	8.708	0.0573	0.499	Vel = 8.53		
H8	45.500	22.40	142.61	2.5		0.0	88.291	120	40.528			
to						0.0	0.0		0.0			
R34	45.500		287.58	2.635		0.0	88.291	0.2033	17.950	Vel = 16.92		
			0.0									
R34			287.58						58.478	K Factor = 37.61		
R19	45.500		-281.73	2.5		0.0	76.333	120	55.633			
to						0.0	0.0		0.0			
H9	45.500		-281.73	2.635		0.0	76.333	-0.1957	-14.940	Vel = 16.58		
H9	45.500	22.40	142.90	2.5		0.0	10.000	120	40.693			
to						0.0	0.0		0.0			
H10	45.500		-138.83	2.635		0.0	10.000	-0.0528	-0.528	Vel = 8.17		

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	45.500	22.40	141.96	2.5		0.0	10.000	120	40.165	
to						0.0	0.0		0.0	
H11	45.500		3.13	2.635		0.0	10.000	0	0.0	Vel = 0.18
H11	45.500	22.40	141.96	2.5		0.0	8.708	120	40.165	
to						0.0	0.0		0.0	
H12	45.500		145.09	2.635		0.0	8.708	0.0573	0.499	Vel = 8.54
H12	45.500	22.40	142.84	2.5		0.0	88.291	120	40.664	
to						0.0	0.0		0.0	
R35	45.500		287.93	2.635		0.0	88.291	0.2038	17.992	Vel = 16.94
			0.0							
R35			287.93						58.656	K Factor = 37.60
R20	45.500		60.09	2.5		0.0	194.625	120	63.038	
to						0.0	0.0		0.0	
R36	45.500		60.09	2.635		0.0	194.625	0.0112	2.185	Vel = 3.54
			0.0							
R36			60.09						65.223	K Factor = 7.44
R21	45.500		57.51	2.5		0.0	194.625	120	63.602	
to						0.0	0.0		0.0	
R37	45.500		57.51	2.635		0.0	194.625	0.0103	2.014	Vel = 3.38
			0.0							
R37			57.51						65.616	K Factor = 7.10
R22	45.500		56.55	2.5		0.0	194.625	120	64.072	
to						0.0	0.0		0.0	
R38	45.500		56.55	2.635		0.0	194.625	0.0100	1.953	Vel = 3.33
			0.0							
R38			56.55						66.025	K Factor = 6.96
R23	45.500		57.45	2.5		0.0	194.625	120	64.464	
to						0.0	0.0		0.0	
R39	45.500		57.45	2.635		0.0	194.625	0.0103	2.011	Vel = 3.38
			0.0							
R39			57.45						66.475	K Factor = 7.05
R24	45.500		59.59	2.5		0.0	194.625	120	64.798	
to						0.0	0.0		0.0	
R40	45.500		59.59	2.635		0.0	194.625	0.0111	2.151	Vel = 3.51
			0.0							
R40			59.59						66.949	K Factor = 7.28
R25	45.500		63.03	2.5		0.0	194.625	120	65.061	
to						0.0	0.0		0.0	
R41	45.500		63.03	2.635		0.0	194.625	0.0123	2.387	Vel = 3.71
			0.0							
R41			63.03						67.448	K Factor = 7.67
R26	45.500		67.57	2.5		0.0	194.625	120	65.262	
to						0.0	0.0		0.0	
R42	45.500		67.57	2.635		0.0	194.625	0.0139	2.714	Vel = 3.98
			0.0							
R42			67.57						67.976	K Factor = 8.20

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 ******
R27	45.500		72.96	2.5		0.0	194.625	120	65.412	
to						0.0	0.0		0.0	
R43	45.500		72.96	2.635		0.0	194.625	0.0161	3.129	Vel = 4.29
			0.0							
R43			72.96						68.541	K Factor = 8.81
R28	45.500		78.98	2.5		0.0	194.625	120	65.524	
to						0.0	0.0		0.0	
R44	45.500		78.98	2.635		0.0	194.625	0.0186	3.624	Vel = 4.65
			0.0							
R44			78.98						69.148	K Factor = 9.50
13	45.500		60.34	2.5	X	14.827	1.000	120	61.990	
to					T	16.474	31.301		0.0	
R13	45.500		60.34	2.635		0.0	32.301	0.0113	0.365	Vel = 3.55
			0.0							
R13			60.34						62.355	K Factor = 7.64
14	45.500		60.49	2.5	X	14.827	1.000	120	61.980	
to					T	16.474	31.301		0.0	
R14	45.500		60.49	2.635		0.0	32.301	0.0114	0.367	Vel = 3.56
			0.0							
R14			60.49						62.347	K Factor = 7.66
15	45.500		60.98	2.5	X	14.827	1.000	120	61.943	
to					T	16.474	31.301		0.0	
R15	45.500		60.98	2.635		0.0	32.301	0.0115	0.372	Vel = 3.59
			0.0							
R15			60.98						62.315	K Factor = 7.72
16	45.500		62.00	2.5	X	14.827	1.000	120	61.864	
to					T	16.474	31.301		0.0	
R16	45.500		62.0	2.635		0.0	32.301	0.0119	0.384	Vel = 3.65
			0.0							
R16			62.00						62.248	K Factor = 7.86
17	45.500		-281.29	2.5	X	14.827	1.000	120	61.728	
to					T	16.474	31.301		0.0	
R17	45.500		-281.29	2.635		0.0	32.301	-0.1952	-6.304	Vel = 16.55
			0.0							
R17			-281.29						55.424	K Factor = -37.78
18	45.500		-281.12	2.5	X	14.827	1.000	120	61.732	
to					T	16.474	31.301		0.0	
R18	45.500		-281.12	2.635		0.0	32.301	-0.1949	-6.297	Vel = 16.54
			0.0							
R18			-281.12						55.435	K Factor = -37.76
19	45.500		-281.73	2.5	X	14.827	1.000	120	61.955	
to					T	16.474	31.301		0.0	
R19	45.500		-281.73	2.635		0.0	32.301	-0.1957	-6.322	Vel = 16.58
			0.0							
R19			-281.73						55.633	K Factor = -37.77
20	45.500		60.09	2.5	X	14.827	1.000	120	62.675	
to					T	16.474	31.301		0.0	
R20	45.500		60.09	2.635		0.0	32.301	0.0112	0.363	Vel = 3.54

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	******
			0.0									
R20			60.09						63.038	K Factor = 7.57		
21	45.500		57.51	2.5	X	14.827	1.000	120	63.267			
to					T	16.474	31.301		0.0			
R21	45.500		57.51	2.635		0.0	32.301	0.0104	0.335	Vel = 3.38		
			0.0									
R21			57.51						63.602	K Factor = 7.21		
22	45.500		56.55	2.5	X	14.827	1.000	120	63.748			
to					T	16.474	31.301		0.0			
R22	45.500		56.55	2.635		0.0	32.301	0.0100	0.324	Vel = 3.33		
			0.0									
R22			56.55						64.072	K Factor = 7.06		
23	45.500		57.45	2.5	X	14.827	1.000	120	64.130			
to					T	16.474	31.301		0.0			
R23	45.500		57.45	2.635		0.0	32.301	0.0103	0.334	Vel = 3.38		
			0.0									
R23			57.45						64.464	K Factor = 7.16		
24	45.500		59.59	2.5	X	14.827	1.000	120	64.441			
to					T	16.474	31.301		0.0			
R24	45.500		59.59	2.635		0.0	32.301	0.0111	0.357	Vel = 3.51		
			0.0									
R24			59.59						64.798	K Factor = 7.40		
25	45.500		63.03	2.5	X	14.827	1.000	120	64.665			
to					T	16.474	31.301		0.0			
R25	45.500		63.03	2.635		0.0	32.301	0.0123	0.396	Vel = 3.71		
			0.0									
R25			63.03						65.061	K Factor = 7.81		
26	45.500		67.57	2.5	X	14.827	1.000	120	64.811			
to					T	16.474	31.301		0.0			
R26	45.500		67.57	2.635		0.0	32.301	0.0140	0.451	Vel = 3.98		
			0.0									
R26			67.57						65.262	K Factor = 8.36		
27	45.500		72.96	2.5	X	14.827	1.000	120	64.892			
to					T	16.474	31.301		0.0			
R27	45.500		72.96	2.635		0.0	32.301	0.0161	0.520	Vel = 4.29		
			0.0									
R27			72.96						65.412	K Factor = 9.02		
28	45.500		78.98	2.5	X	14.827	1.000	120	64.923			
to					T	16.474	31.301		0.0			
R28	45.500		78.98	2.635		0.0	32.301	0.0186	0.601	Vel = 4.65		
			0.0									
R28			78.98						65.524	K Factor = 9.76		
29	45.500		-60.34	2.5	X	14.827	1.083	120	64.924			
to					T	16.474	31.301		0.0			
R29	45.500		-60.34	2.635		0.0	32.384	-0.0113	-0.367	Vel = 3.55		
			0.0									

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 ******
R29			-60.34						64.557	K Factor = -7.51
30	45.500		-60.49	2.5	X	14.827	1.083	120	64.926	
to					T	16.474	31.301		0.0	
R30	45.500		-60.49	2.635		0.0	32.384	-0.0114	-0.368	Vel = 3.56
			0.0							
R30			-60.49						64.558	K Factor = -7.53
31	45.500		-60.98	2.5	X	14.827	1.083	120	64.934	
to					T	16.474	31.301		0.0	
R31	45.500		-60.98	2.635		0.0	32.384	-0.0115	-0.373	Vel = 3.59
			0.0							
R31			-60.98						64.561	K Factor = -7.59
32	45.500		-62.00	2.5	X	14.827	1.083	120	64.948	
to					T	16.474	31.301		0.0	
R32	45.500		-62.0	2.635		0.0	32.384	-0.0119	-0.385	Vel = 3.65
			0.0							
R32			-62.00						64.563	K Factor = -7.72
33	45.500		-287.20	2.5	X	14.827	1.083	120	64.972	
to					T	16.474	31.301		0.0	
R33	45.500		-287.2	2.635		0.0	32.384	-0.2028	-6.568	Vel = 16.90
			0.0							
R33			-287.20						58.404	K Factor = -37.58
34	45.500		-287.58	2.5	X	14.827	1.083	120	65.061	
to					T	16.474	31.301		0.0	
R34	45.500		-287.58	2.635		0.0	32.384	-0.2033	-6.583	Vel = 16.92
			0.0							
R34			-287.58						58.478	K Factor = -37.61
35	45.500		-287.93	2.5	X	14.827	1.083	120	65.254	
to					T	16.474	31.301		0.0	
R35	45.500		-287.93	2.635		0.0	32.384	-0.2037	-6.598	Vel = 16.94
			0.0							
R35			-287.93						58.656	K Factor = -37.60
36	45.500		-60.09	2.5	X	14.827	1.083	120	65.586	
to					T	16.474	31.301		0.0	
R36	45.500		-60.09	2.635		0.0	32.384	-0.0112	-0.363	Vel = 3.54
			0.0							
R36			-60.09						65.223	K Factor = -7.44
37	45.500		-57.51	2.5	X	14.827	1.083	120	65.952	
to					T	16.474	31.301		0.0	
R37	45.500		-57.51	2.635		0.0	32.384	-0.0104	-0.336	Vel = 3.38
			0.0							
R37			-57.51						65.616	K Factor = -7.10
38	45.500		-56.55	2.5	X	14.827	1.083	120	66.350	
to					T	16.474	31.301		0.0	
R38	45.500		-56.55	2.635		0.0	32.384	-0.0100	-0.325	Vel = 3.33
			0.0							
R38			-56.55						66.025	K Factor = -6.96

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 ******
39	45.500		-57.45	2.5	X	14.827	1.083	120	66.810	
to					T	16.474	31.301		0.0	
R39	45.500		-57.45	2.635		0.0	32.384	-0.0103	-0.335	Vel = 3.38
			0.0							
R39			-57.45						66.475	K Factor = -7.05
40	45.500		-59.59	2.5	X	14.827	1.083	120	67.307	
to					T	16.474	31.301		0.0	
R40	45.500		-59.59	2.635		0.0	32.384	-0.0111	-0.358	Vel = 3.51
			0.0							
R40			-59.59						66.949	K Factor = -7.28
41	45.500		-63.03	2.5	X	14.827	1.083	120	67.845	
to					T	16.474	31.301		0.0	
R41	45.500		-63.03	2.635		0.0	32.384	-0.0123	-0.397	Vel = 3.71
			0.0							
R41			-63.03						67.448	K Factor = -7.67
42	45.500		-67.57	2.5	X	14.827	1.083	120	68.428	
to					T	16.474	31.301		0.0	
R42	45.500		-67.57	2.635		0.0	32.384	-0.0140	-0.452	Vel = 3.98
			0.0							
R42			-67.57						67.976	K Factor = -8.20
43	45.500		-72.96	2.5	X	14.827	1.083	120	69.061	
to					T	16.474	31.301		0.0	
R43	45.500		-72.96	2.635		0.0	32.384	-0.0161	-0.520	Vel = 4.29
			0.0							
R43			-72.96						68.541	K Factor = -8.81
44	45.500		-78.98	2.5	X	14.827	1.083	120	69.750	
to					T	16.474	31.301		0.0	
R44	45.500		-78.98	2.635		0.0	32.384	-0.0186	-0.602	Vel = 4.65
			0.0							
R44			-78.98						69.148	K Factor = -9.50
13	45.500		-60.34	4		0.0	9.417	120	61.990	
to						0.0	0.0		0.0	
14	45.500		-60.34	4.26		0.0	9.417	-0.0011	-0.010	Vel = 1.36
14	45.500		-60.49	4		0.0	9.417	120	61.980	
to						0.0	0.0		0.0	
15	45.500		-120.83	4.26		0.0	9.417	-0.0039	-0.037	Vel = 2.72
15	45.500		-60.98	4		0.0	9.417	120	61.943	
to						0.0	0.0		0.0	
16	45.500		-181.81	4.26		0.0	9.417	-0.0084	-0.079	Vel = 4.09
16	45.500		-62.00	4		0.0	9.417	120	61.864	
to						0.0	0.0		0.0	
17	45.500		-243.81	4.26		0.0	9.417	-0.0144	-0.136	Vel = 5.49
17	45.500		281.28	4		0.0	9.417	120	61.728	
to						0.0	0.0		0.0	
18	45.500		37.47	4.26		0.0	9.417	0.0004	0.004	Vel = 0.84
18	45.500		281.12	4		0.0	9.417	120	61.732	
to						0.0	0.0		0.0	
19	45.500		318.59	4.26		0.0	9.417	0.0237	0.223	Vel = 7.17

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 ******
19	45.500		281.73	4		0.0	9.417	120	61.955	
to						0.0	0.0		0.0	
20	45.500		600.32	4.26		0.0	9.417	0.0765	0.720	Vel = 13.51
20	45.500		-60.10	4		0.0	9.417	120	62.675	
to						0.0	0.0		0.0	
21	45.500		540.22	4.26		0.0	9.417	0.0629	0.592	Vel = 12.16
21	45.500		-57.51	4		0.0	9.417	120	63.267	
to						0.0	0.0		0.0	
22	45.500		482.71	4.26		0.0	9.417	0.0511	0.481	Vel = 10.87
22	45.500		-56.55	4		0.0	9.417	120	63.748	
to						0.0	0.0		0.0	
23	45.500		426.16	4.26		0.0	9.417	0.0406	0.382	Vel = 9.59
23	45.500		-57.45	4		0.0	10.000	120	64.130	
to						0.0	0.0		0.0	
24	45.500		368.71	4.26		0.0	10.000	0.0311	0.311	Vel = 8.30
24	45.500		-59.59	4		0.0	10.000	120	64.441	
to						0.0	0.0		0.0	
25	45.500		309.12	4.26		0.0	10.000	0.0224	0.224	Vel = 6.96
25	45.500		-63.03	4		0.0	10.000	120	64.665	
to						0.0	0.0		0.0	
26	45.500		246.09	4.26		0.0	10.000	0.0146	0.146	Vel = 5.54
26	45.500		-67.57	4		0.0	10.000	120	64.811	
to						0.0	0.0		0.0	
27	45.500		178.52	4.26		0.0	10.000	0.0081	0.081	Vel = 4.02
27	45.500		-72.97	4		0.0	10.000	120	64.892	
to						0.0	0.0		0.0	
28	45.500		105.55	4.26		0.0	10.000	0.0031	0.031	Vel = 2.38
			0.0							
28			105.55						64.923	K Factor = 13.10
28	45.500		26.57	6		0.0	9.417	120	64.923	
to						0.0	0.0		0.0	
29	45.500		26.57	6.357		0.0	9.417	0.0001	0.001	Vel = 0.27
29	45.500		60.34	6		0.0	9.417	120	64.924	
to						0.0	0.0		0.0	
30	45.500		86.91	6.357		0.0	9.417	0.0002	0.002	Vel = 0.88
30	45.500		60.49	6		0.0	9.417	120	64.926	
to						0.0	0.0		0.0	
31	45.500		147.4	6.357		0.0	9.417	0.0008	0.008	Vel = 1.49
31	45.500		60.98	6		0.0	9.417	120	64.934	
to						0.0	0.0		0.0	
32	45.500		208.38	6.357		0.0	9.417	0.0015	0.014	Vel = 2.11
32	45.500		62.00	6		0.0	9.417	120	64.948	
to						0.0	0.0		0.0	
33	45.500		270.38	6.357		0.0	9.417	0.0025	0.024	Vel = 2.73
33	45.500		287.21	6		0.0	9.417	120	64.972	
to						0.0	0.0		0.0	
34	45.500		557.59	6.357		0.0	9.417	0.0095	0.089	Vel = 5.64

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	******
34	45.500		287.57	6		0.0	9.417	120	65.061			
to						0.0	0.0		0.0			
35	45.500		845.16	6.357		0.0	9.417	0.0205	0.193	Vel = 8.54		
35	45.500		287.94	6		0.0	9.417	120	65.254			
to						0.0	0.0		0.0			
36	45.500		1133.1	6.357		0.0	9.417	0.0353	0.332	Vel = 11.45		
36	45.500		60.09	6		0.0	9.417	120	65.586			
to						0.0	0.0		0.0			
37	45.500		1193.19	6.357		0.0	9.417	0.0389	0.366	Vel = 12.06		
37	45.500		57.51	6		0.0	9.417	120	65.952			
to						0.0	0.0		0.0			
38	45.500		1250.7	6.357		0.0	9.417	0.0423	0.398	Vel = 12.64		
38	45.500		56.55	6		0.0	10.000	120	66.350			
to						0.0	0.0		0.0			
39	45.500		1307.25	6.357		0.0	10.000	0.0460	0.460	Vel = 13.21		
39	45.500		57.46	6		0.0	10.000	120	66.810			
to						0.0	0.0		0.0			
40	45.500		1364.71	6.357		0.0	10.000	0.0497	0.497	Vel = 13.80		
40	45.500		59.58	6		0.0	10.000	120	67.307			
to						0.0	0.0		0.0			
41	45.500		1424.29	6.357		0.0	10.000	0.0538	0.538	Vel = 14.40		
41	45.500		63.04	6		0.0	10.000	120	67.845			
to						0.0	0.0		0.0			
42	45.500		1487.33	6.357		0.0	10.000	0.0583	0.583	Vel = 15.03		
42	45.500		67.57	6		0.0	10.000	120	68.428			
to						0.0	0.0		0.0			
43	45.500		1554.9	6.357		0.0	10.000	0.0633	0.633	Vel = 15.72		
43	45.500		72.96	6		0.0	10.000	120	69.061			
to						0.0	0.0		0.0			
44	45.500		1627.86	6.357		0.0	10.000	0.0689	0.689	Vel = 16.46		
44	45.500		78.98	6	V	12.573	4.000	120	69.750			
to						0.0	12.573		0.0			
FMJ	45.500		1706.84	6.357		0.0	16.573	0.0752	1.247	Vel = 17.25		
			0.0									
FMJ			1706.84						70.997	K Factor = 202.57		
FMJ	45.500		1706.84	6	2V	25.147	60.375	120	70.997			
to						0.0	25.147		0.0			
TR2	45.500		1706.84	6.357		0.0	85.522	0.0752	6.434	Vel = 17.25		
TR2	45.500		0.0	8	T	41.108	38.875	120	77.431			
to						0.0	41.108		19.840	* * Fixed Loss = 1		
BR2	2		1706.84	8.249		0.0	79.983	0.0211	1.691	Vel = 10.25		
BR2	2	H100	100.00	8	L	19.632	2.000	150	98.962			
to						0.0	19.632		0.0			
FLG	2		1806.84	7.98		0.0	21.632	0.0183	0.396	Vel = 11.59		
FLG	2		0.0	8	L	19.632	51.125	150	99.358			
to					T	52.855	72.487		3.032			
UG10	-5		1806.84	7.98		0.0	123.612	0.0183	2.259	Vel = 11.59		

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 ******
			0.0							
UG10			1806.84						104.649	K Factor = 176.62
UG7	-5		-403.27	8	G	6.041	483.333	150	106.265	
to						0.0	6.040		0.0	
UG8	-5		-403.27	7.98		0.0	489.373	-0.0011	-0.558	Vel = 2.59
UG8	-5		0.0	8	G	6.041	486.000	150	105.707	
to						0.0	6.040		0.0	
UG9	-5		-403.27	7.98		0.0	492.040	-0.0011	-0.561	Vel = 2.59
UG9	-5	H150	150.00	8	6F	81.548	937.542	150	105.146	
to					2G	12.081	93.630		0.0	
UG10	-5		-253.27	7.98		0.0	1031.172	-0.0005	-0.497	Vel = 1.62
UG10	-5		1806.85	8	G	6.041	242.917	150	104.649	
to						0.0	6.040		0.0	
UG11	-5		1553.58	7.98		0.0	248.957	0.0138	3.441	Vel = 9.97
UG11	-5		0.0	12	G	8.05	213.250	150	108.090	
to						0.0	8.049		0.0	
NL	-5		1553.58	11.65		0.0	221.299	0.0022	0.484	Vel = 4.68
NL	-5		0.0	12	2F	34.882	489.875	150	108.574	
to						0.0	34.883		0.0	
UG12	-5		1553.58	11.65		0.0	524.758	0.0022	1.149	Vel = 4.68
UG12	-5		-1956.85	8	F	13.591	245.208	150	109.723	
to					G	6.041	19.632		0.0	
UG13	-5		-403.27	7.98		0.0	264.840	-0.0011	-0.302	Vel = 2.59
UG13	-5		0.0	8	G	6.041	457.500	150	109.421	
to						0.0	6.040		0.0	
UG14	-5		-403.27	7.98		0.0	463.540	-0.0011	-0.528	Vel = 2.59
UG14	-5		0.0	8	2F	27.183	960.000	150	108.893	
to					G	6.041	33.222		0.0	
UG15	-5		-403.27	7.98		0.0	993.222	-0.0011	-1.133	Vel = 2.59
UG15	-5		0.0	8	4F	54.365	648.583	150	107.760	
to					G	6.041	60.405		0.0	
UG16	-5		-403.27	7.98		0.0	708.988	-0.0011	-0.808	Vel = 2.59
UG16	-5		0.0	8	G	6.041	596.667	150	106.952	
to						0.0	6.040		0.0	
UG7	-5		-403.27	7.98		0.0	602.707	-0.0011	-0.687	Vel = 2.59
			0.0							
UG7			-403.27						106.265	K Factor = -39.12
UG12	-5		1956.84	12	6F	104.647	817.042	150	109.723	
to					3G	24.149	209.294		0.0	
UG6	-5		1956.84	11.65	T	80.498	1026.336	0.0034	3.444	Vel = 5.89
UG6	-5		0.0	12	2L	48.299	45.500	150	113.167	
to						0.0	48.298		-3.032	
PUMP	2		1956.84	11.65		0.0	93.798	0.0034	0.315	Vel = 5.89
PUMP	2		0.0	10	2V	10.89	15.000	120	110.450	
to					S	66.551	100.431		0.0	
PO	2		1956.84	10.42	B	22.99	115.431	0.0087	1.008	Vel = 7.36

Final Calculations : Hazen-Williams

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	******
			0.0									
PO			1956.84						111.458	K Factor = 185.35		