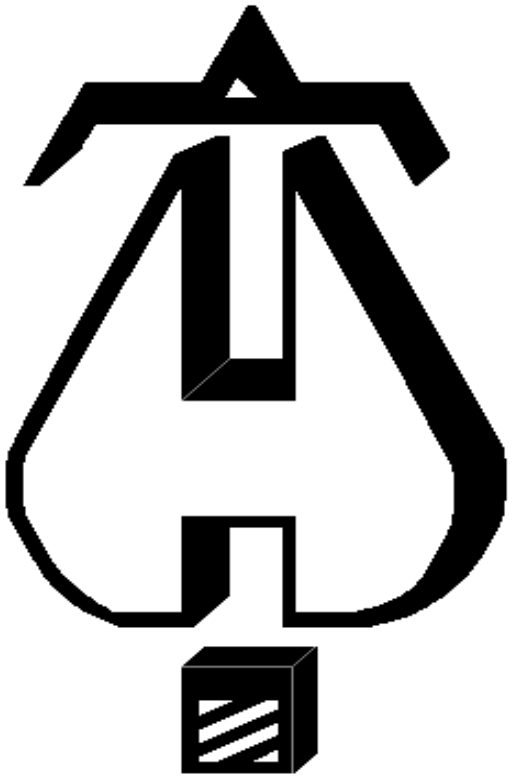


. . . Fire Protection by Computer Design

Residential Fire Protection
64 Daggett Hill Rd.
Greene, ME 04236
946-3473

Job Name	:	200 Kennebec Street
Building	:	Metal Building
Location	:	New 2017 Warehouse-Retail Space
System	:	Wet
Contract	:	C17005
Data File	:	200 Kennebec Strret-Retail Space-Hyd Calc.WXF

Hydraulic Design Information Sheet

Name - 200 Kennebec Street Bldg — Date - 3/29/2017
Location - New 2017 Warehouse-Retail Space
Building - Metal Building — System No. - Wet
Contractor - Residential Fire Protection — Contract No. - C17005
Calculated By - T. Pray — Drawing No. - 1 OF 1
Construction: ( ) Combustible (X) Non-Combustible — Ceiling Height - Sloped
Occupancy - Retail Space and Storage Warehouse

SYSTEM DESIGN

(X) NFPA 13 ( ) Lt. Haz. Ord.Haz.Gp. ( ) 1 (X) 2 ( ) 3 ( ) Ex.Haz.
( ) NFPA 231 ( ) NFPA 231C ( ) Figure Curve
Other
Specific Ruling — Made By — Date

Area of Sprinkler Operation	- 1057	System Type	Sprinkler/Nozzle
Density	- .2	(X) Wet	Make Viking
Area Per Sprinkler	- 130	( ) Dry	Model VK300
Elevation at Highest Outlet	- 11.0'	( ) Deluge	Size 1/2"
Hose Allowance - Inside	-	( ) Preaction	K-Factor 5.6
Rack Sprinkler Allowance	-	( ) Other	Temp.Rat.155
Hose Allowance - Outside	- 250		

Note

Calculation Summary — Flow Required - 521.31 Press Required - 67.57 At Test; C-Factor Used: 120 Overhead 140 Underground

WATER SUPPLY

Water Flow Test:		Pump Data:		Tank or Reservoir:
Date of Test	- 11/2/2016			Cap. -
Time of Test	- N/A	Rated Cap.-		Elev.-
Static Press	- 102	@ Press	-	
Residual Press	- 50	Elev.	-	Well
Flow	- 1016			Proof Flow
Elevation	- 1			

Location - Hydrants are located on Kennebec Street, See plot plan for more informatiuon
Source of Information - Portland Water District

COMMODITY STORAGE

Commodity — Class — Location
Storage Ht. — 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	

STORAGE

Flue Spacing — Clearance:Storage to Ceiling
Longitudinal — Transverse

Horizontal Barriers Provided:

Water Supply Curve (C)

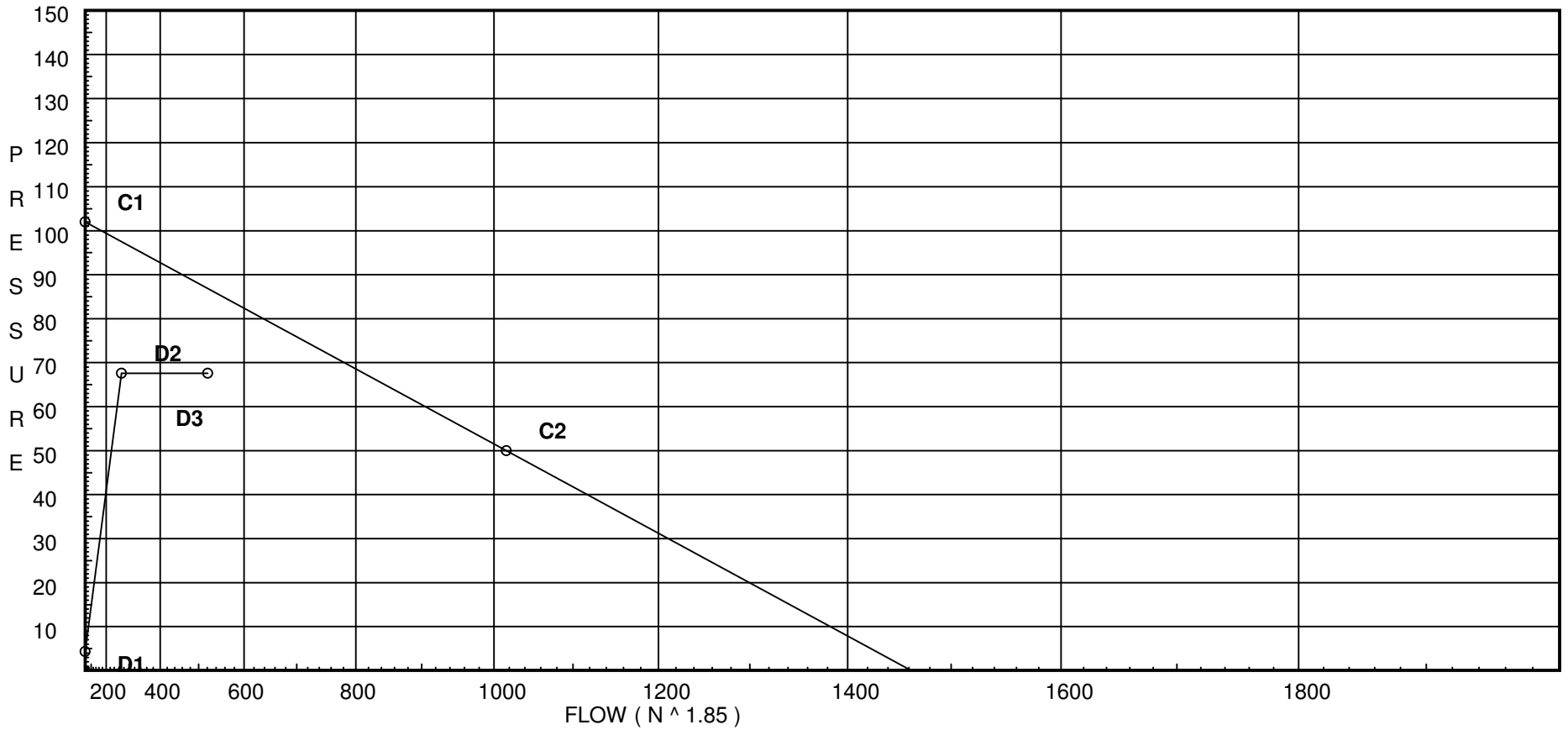
Residential Fire Protection
200 Kennebec Street

Date 3/8/2017

City Water Supply:
- C1 - Static Pressure : 102
- C2 - Residual Pressure: 50
- C2 - Residual Flow : 1016

Demand:

D1 - Elevation	:	4.331
D2 - System Flow	:	271.307
D2 - System Pressure	:	67.577
Hose (Adj City)	:	_____
Hose (Demand)	:	250
D3 - System Demand	:	521.307
Safety Margin	:	19.292



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
G	Generic Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
I	90' Grvd-Vic Elbow #10	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	20	23	25	33	36	40
L	Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T	90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	11.0	5.6	21.56	na	26.0	0.2	130	7.0
2	11.0	5.6	21.76	na	26.12	0.2	130	7.0
3	11.0	5.6	22.49	na	26.56	0.2	130	7.0
4	11.0	5.6	24.05	na	27.46	0.2	130	7.0
5	11.0	5.6	26.77	na	28.97	0.2	130	7.0
6	11.0	5.6	21.9	na	26.21	0.2	130	7.0
7	11.0	5.6	22.11	na	26.33	0.2	130	7.0
8	11.0	5.6	22.85	na	26.77	0.2	130	7.0
9	11.0	5.6	24.43	na	27.68	0.2	130	7.0
10	11.0	5.6	27.19	na	29.2	0.2	130	7.0
50	11.0		42.16	na				
51	11.0		42.81	na				
TOR	11.0		53.67	na				
BOR	1.0		67.33	na				
TEST	1.0		67.58	na	250.0			

The maximum velocity is 19.66 and it occurs in the pipe between nodes 10 and 51

Final Calculations - Hazen-Williams

Residential Fire Protection
200 Kennebec Street

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
1	26.00	1.682		0.0	9.500	21.556		K Factor = 5.60
to		120		0.0	0.0	0.0		
2	26.0	0.0213		0.0	9.500	0.202		Vel = 3.75
2	26.12	1.682		0.0	9.500	21.758		K Factor = 5.60
to		120		0.0	0.0	0.0		
3	52.12	0.0767		0.0	9.500	0.729		Vel = 7.53
3	26.56	1.682		0.0	9.500	22.487		K Factor = 5.60
to		120		0.0	0.0	0.0		
4	78.68	0.1645		0.0	9.500	1.563		Vel = 11.36
4	27.46	1.682		0.0	9.500	24.050		K Factor = 5.60
to		120		0.0	0.0	0.0		
5	106.14	0.2863		0.0	9.500	2.720		Vel = 15.33
5	28.97	1.682	1T	9.9	24.500	26.770		K Factor = 5.60
to		120		0.0	9.900	0.0		
50	135.11	0.4474		0.0	34.400	15.389		Vel = 19.51
	0.0							
	135.11					42.159		K Factor = 20.81
6	26.21	1.682		0.0	9.500	21.904		K Factor = 5.60
to		120		0.0	0.0	0.0		
7	26.21	0.0215		0.0	9.500	0.204		Vel = 3.78
7	26.33	1.682		0.0	9.500	22.108		K Factor = 5.60
to		120		0.0	0.0	0.0		
8	52.54	0.0780		0.0	9.500	0.741		Vel = 7.59
8	26.77	1.682		0.0	9.500	22.849		K Factor = 5.60
to		120		0.0	0.0	0.0		
9	79.31	0.1669		0.0	9.500	1.586		Vel = 11.45
9	27.68	1.682		0.0	9.500	24.435		K Factor = 5.60
to		120		0.0	0.0	0.0		
10	106.99	0.2905		0.0	9.500	2.760		Vel = 15.45
10	29.20	1.682	1T	9.9	24.500	27.195		K Factor = 5.60
to		120		0.0	9.900	0.0		
51	136.19	0.4540		0.0	34.400	15.618		Vel = 19.66
	0.0							
	136.19					42.813		K Factor = 20.81
50	135.11	2.635		0.0	13.000	42.159		
to		120		0.0	0.0	0.0		
51	135.11	0.0503		0.0	13.000	0.654		Vel = 7.95
51	136.20	2.635	2I	16.474	43.000	42.813		
to		120		0.0	16.474	0.0		
TOR	271.31	0.1825		0.0	59.474	10.856		Vel = 15.96
TOR	0.0	2.635	1Z	8.237	10.000	53.669		
to		120		0.0	8.237	10.331		* Fixed loss = 6
BOR	271.31	0.1825		0.0	18.237	3.329		Vel = 15.96
BOR	0.0	6.16	2L	25.822	40.000	67.329		
to		140	1G	4.304	73.163	0.0		
TEST	271.31	0.0022	1T	43.037	113.163	0.248		Vel = 2.92
	250.00							Qa = 250.00
	521.31					67.577		K Factor = 63.42

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*******	Notes	******