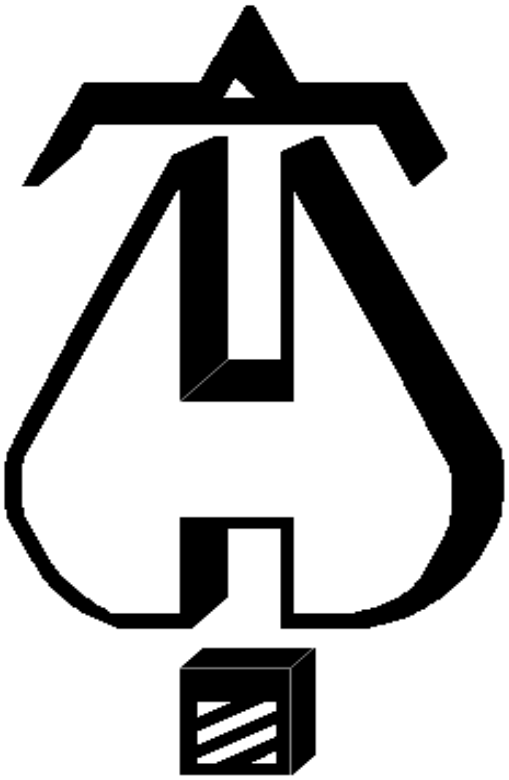


. . . Fire Protection by Computer Design

HIGH TECH FIRE PROTECTION
84 HACKETT MILLS ROAD
P.O. BOX 156
POLAND, ME 04274
207-998-2551

Job Name	:	NOKIAN TYRES WALTON STREET GRID 1
Drawing	:	Unit C
Location	:	135 Walton Street Portland
Remote Area	:	Grid #1
Contract	:	041415-2
Data File	:	Grid 1 looped.WXF

Hydraulic Design Information Sheet

Name - Nokian Tyre Warehouse Date - 9-15-15
Location - 135 Walton Street Portland
Building - Unit C System No. - Grid #1
Contractor - High Tech Fire Protection Contract No. - 041415-2
Calculated By - Ed Poulin Drawing No. - FP-01
Construction: ( ) Combustible (X) Non-Combustible Ceiling Height - 28'
Occupancy - Chapter 18 Tire Storage up to 25' with ESFR

SYSTEM DESIGN

(X) NFPA 13 ( ) Lt. Haz. Ord.Haz.Gp. ( ) 1 ( ) 2 ( ) 3 ( ) Ex.Haz.
( ) NFPA 231 ( ) NFPA 231C ( ) Figure Curve
Other Chapter 18
Specific Ruling Made By Date

Area of Sprinkler Operation - 898	System Type	Sprinkler/Nozzle	
Density - .001	(X) Wet	Make VIKING	
Area Per Sprinkler - 100	( ) Dry	Model VK510	
Elevation at Highest Outlet - 26.5	( ) Deluge	Size 1"	
Hose Allowance - Inside - N/A	( ) Preaction	K-Factor 25.2	
Rack Sprinkler Allowance - N/A	( ) Other	Temp.Rat.165	
Hose Allowance - Outside - 250	HEAD SPEC FOR ESFR		

Note

Calculation Summary: Flow Required - 1427 Press Required - 73; C-Factor Used: 120 Overhead 140 Underground

WATER SUPPLY

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - 9-11-15		Cap. -
Time of Test - 9:00 AM	Rated Cap.-	Elev.-
Static Press - 84	@ Press -	
Residual Press - 80	Elev. -	Well
Flow - 1403		Proof Flow
Elevation - 0		

Location - ACROSS THE STREET FROM SITE ON CANCO ST.

Source of Information - PORTLAND WATER DISTRICT

COMMODITY

Commodity TIRES Class Location
Storage Ht. UP TO 25 Area Aisle W.
Storage Method: Solid Piled 20 % Palletized 80 % Rack

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

STORAGE

Flue Spacing Clearance:Storage to Ceiling 36"
Longitudinal Transverse

Horizontal Barriers Provided:

Water Supply Curve (C)

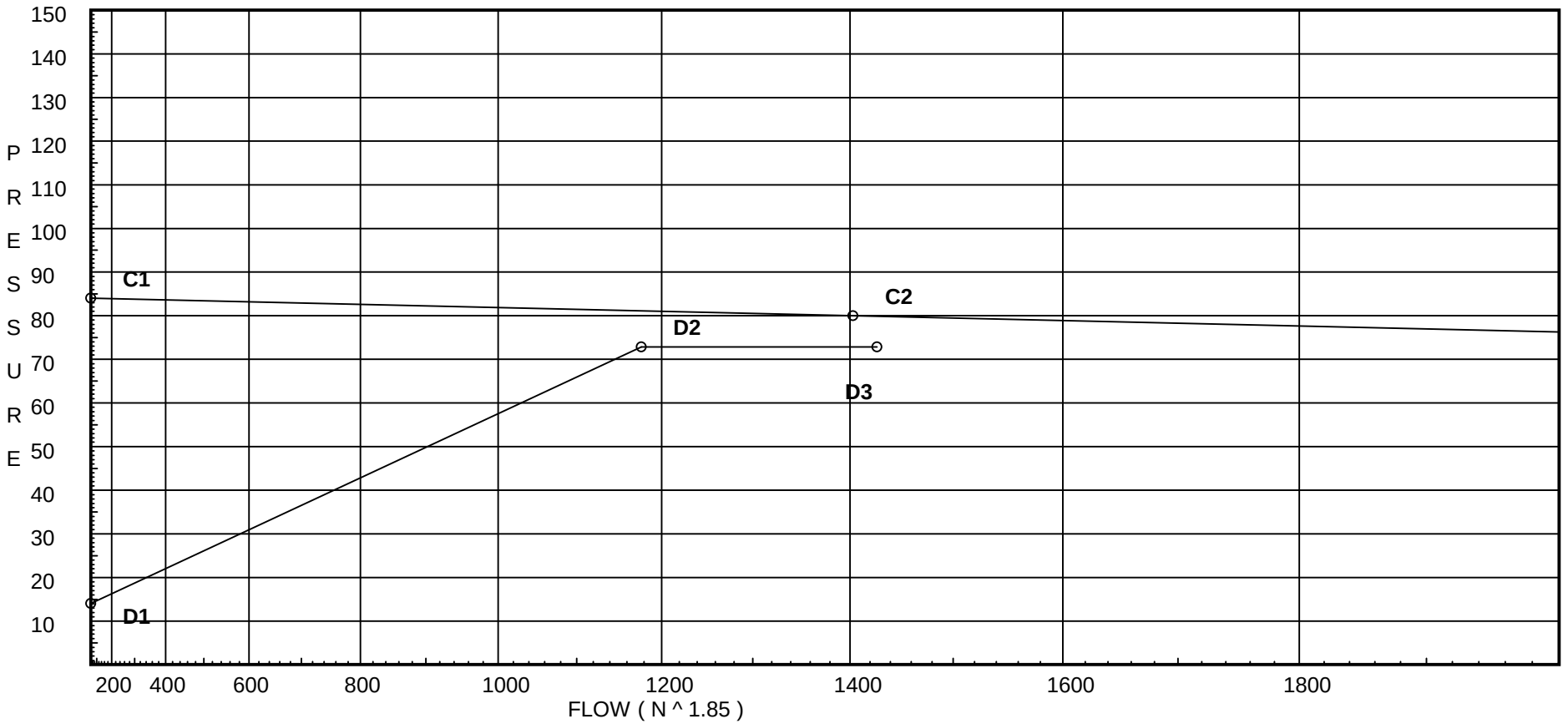
HIGH TECH FIRE PROTECTION
NOKIAN TYRES WALTON STREET GRID 1

Date 9-11-15

City Water Supply:
- C1 - Static Pressure : 84
- C2 - Residual Pressure: 80
- C2 - Residual Flow : 1403

Demand:

D1 - Elevation	:	14.076
D2 - System Flow	:	1176.78
D2 - System Pressure	:	72.821
Hose (Demand)	:	250
D3 - System Demand	:	1426.78
Safety Margin	:	7.053



Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
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
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
G	NFPA 13 Gate Valve	0	0	0	0	1	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
V	90' Ell Firelock #001	0	0	0	0	0	3.5	4.3	5	0	6.8	8.5	10	13	0	0	0	0	0	0	0
X	90'Tee-BranchFirelock002	0	0	0	0	0	8.5	10.8	13	0	16	21	25	33	0	0	0	0	0	0	0
Zia	Wilkins 350	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.

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	25.5	25.2	15.1	na	97.91	0.001	100	15.0
A1	22.0		20.39	na				
2	25.5		15.18	na				
3	25.5	25.2	15.0	na	97.6	0.001	100	15.0
4	25.5	25.2	15.0	na	97.6	0.001	100	15.0
5	25.5	25.2	15.1	na	97.91	0.001	100	15.0
6	25.5		15.53	na				
10	25.5	25.2	15.16	na	98.11	0.001	100	15.0
A3	22.0		20.45	na				
11	25.5		15.24	na				
12	25.5	25.2	15.06	na	97.8	0.001	100	15.0
13	25.5	25.2	15.06	na	97.8	0.001	100	15.0
14	25.5	25.2	15.16	na	98.13	0.001	100	15.0
15	25.5		15.6	na				
20	25.5	25.2	15.29	na	98.55	0.001	100	15.0
A5	22.0		20.47	na				
21	25.5		15.38	na				
22	25.5	25.2	15.21	na	98.29	0.001	100	15.0
23	25.5	25.2	15.21	na	98.29	0.001	100	15.0
24	25.5	25.2	15.36	na	98.78	0.001	100	15.0
25	25.5		15.81	na				
A7	22.0		20.68	na				
30	25.5		18.93	na				
31	25.5		18.68	na				
A9	22.0		20.92	na				
40	25.5		19.29	na				
41	25.5		19.17	na				
A11	22.0		21.15	na				
50	25.5		19.59	na				
51	25.5		19.55	na				
A13	22.0		21.5	na				
60	25.5		20.01	na				
61	25.5		20.04	na				
A15	22.0		21.79	na				
70	25.5		20.4	na				
71	25.5		20.54	na				
A17	22.0		22.06	na				
80	25.5		20.79	na				
81	25.5		21.04	na				
A19	22.0		22.59	na				
90	25.5		21.3	na				
91	25.5		21.53	na				
CD	22.0		20.46	na				
CC	14.8		23.91	na				
CB	14.8		24.32	na				
CA	14.8		24.99	na				
C30	14.8		25.11	na				
C31	23.5		21.41	na				
C32	23.5		21.55	na				
C33	24.0		21.58	na				
B24	24.0		21.58	na				
C34	24.0		21.65	na				
C35	22.0		22.56	na				
A2	22.0		18.91	na				
A4	22.0		19.0	na				
A6	22.0		19.31	na				
A8	22.0		20.06	na				
A10	22.0		20.62	na				
A12	22.0		21.04	na				
A14	22.0		21.57	na				
A16	22.0		22.13	na				
A18	22.0		22.7	na				

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
A22	22.0		23.08	na				
A21	22.0		22.57	na				
A20	22.0		23.18	na				
TOR	22.0		25.47	na				
BOR	6.0		34.16	na				
BASE	0.0		43.68	na				
H1	0.0		60.83	na				
H2	0.0		62.45	na				
HOSE	0.0		66.36	na	250.0			
TEST	-7.0		72.82	na				

The maximum velocity is 15.36 and it occurs in the pipe between nodes HOSE and TEST

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	97.91	2.635		0.0	3.000	15.097		K Factor = 25.20
to		120.0		0.0	0.0	0.0		
2	97.91	0.0277		0.0	3.000	0.083		Vel = 5.76
	0.0							
	97.91					15.180		K Factor = 25.13
A1	-202.40	2.635	1X	14.827	3.500	20.390		
to		120.0	1T	16.474	31.301	-1.516		
2	-202.4	-0.1061		0.0	34.801	-3.694		Vel = 11.91
2	97.92	2.635		0.0	5.700	15.180		
to		120.0		0.0	0.0	0.0		
3	-104.48	-0.0312		0.0	5.700	-0.178		Vel = 6.15
3	97.60	2.635		0.0	8.500	15.002		K Factor = 25.20
to		120.0		0.0	0.0	0.0		
4	-6.88	-0.0002		0.0	8.500	-0.002		Vel = 0.40
4	97.60	2.635	1X	14.827	7.400	15.000		K Factor = 25.20
to		120.0		0.0	14.827	0.0		
6	90.72	0.0241		0.0	22.227	0.535		Vel = 5.34
	0.0							
	90.72					15.535		K Factor = 23.02
5	97.91	2.635	1X	14.827	1.000	15.096		K Factor = 25.20
to		120.0		0.0	14.827	0.0		
6	97.91	0.0277		0.0	15.827	0.439		Vel = 5.76
6	90.72	2.635	1T	16.474	3.500	15.535		
to		120.0		0.0	16.474	1.516		
A2	188.63	0.0932		0.0	19.974	1.861		Vel = 11.10
	0.0							
	188.63					18.912		K Factor = 43.38
10	98.11	2.635		0.0	3.000	15.157		K Factor = 25.20
to		120.0		0.0	0.0	0.0		
11	98.11	0.0277		0.0	3.000	0.083		Vel = 5.77
	0.0							
	98.11					15.240		K Factor = 25.13
A3	-202.35	2.635	1X	14.827	3.500	20.449		
to		120.0	1T	16.474	31.301	-1.516		
11	-202.35	-0.1061		0.0	34.801	-3.693		Vel = 11.91
11	98.11	2.635		0.0	5.700	15.240		
to		120.0		0.0	0.0	0.0		
12	-104.24	-0.0311		0.0	5.700	-0.177		Vel = 6.13
12	97.80	2.635		0.0	8.500	15.063		K Factor = 25.20
to		120.0		0.0	0.0	0.0		
13	-6.44	-0.0001		0.0	8.500	-0.001		Vel = 0.38
13	97.80	2.635	1X	14.827	7.400	15.062		K Factor = 25.20
to		120.0		0.0	14.827	0.0		
15	91.36	0.0243		0.0	22.227	0.541		Vel = 5.38
	0.0							
	91.36					15.603		K Factor = 23.13
14	98.13	2.635	1X	14.827	1.000	15.163		K Factor = 25.20
to		120.0		0.0	14.827	0.0		
15	98.13	0.0278		0.0	15.827	0.440		Vel = 5.77

Hyd. Ref. Point	Qa / Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
15	91.36	2.635	1T	16.474	3.500	15.603		
to		120.0		0.0	16.474	1.516		
A4	189.49	0.0940		0.0	19.974	1.877		Vel = 11.15
	0.0							
	189.49					18.996		K Factor = 43.48
20	98.55	2.635		0.0	3.000	15.294		K Factor = 25.20
to		120.0		0.0	0.0	0.0		
21	98.55	0.0280		0.0	3.000	0.084		Vel = 5.80
	0.0							
	98.55					15.378		K Factor = 25.13
A5	-198.87	2.635	1X	14.827	3.500	20.470		
to		120.0	1T	16.474	31.301	-1.516		
21	-198.87	-0.1028		0.0	34.801	-3.576		Vel = 11.70
21	98.55	2.635		0.0	5.700	15.378		
to		120.0		0.0	0.0	0.0		
22	-100.32	-0.0289		0.0	5.700	-0.165		Vel = 5.90
22	98.29	2.635		0.0	8.500	15.213		K Factor = 25.20
to		120.0		0.0	0.0	0.0		
23	-2.03	0.0		0.0	8.500	0.0		Vel = 0.12
23	98.29	2.635	1X	14.827	7.400	15.213		K Factor = 25.20
to		120.0		0.0	14.827	0.0		
25	96.26	0.0268		0.0	22.227	0.596		Vel = 5.66
	0.0							
	96.26					15.809		K Factor = 24.21
24	98.78	2.635	1X	14.827	1.000	15.364		K Factor = 25.20
to		120.0		0.0	14.827	0.0		
25	98.78	0.0281		0.0	15.827	0.445		Vel = 5.81
25	96.26	2.635	1T	16.474	3.500	15.809		
to		120.0		0.0	16.474	1.516		
A6	195.04	0.0991		0.0	19.974	1.980		Vel = 11.47
	0.0							
	195.04					19.305		K Factor = 44.39
A7	-45.83	2.635	1X	14.827	3.500	20.679		
to		120.0	1T	16.474	31.301	-1.516		
30	-45.83	-0.0068		0.0	34.801	-0.236		Vel = 2.70
30	0.0	2.635	1X	14.827	21.500	18.927		
to		120.0		0.0	14.827	0.0		
31	-45.83	-0.0068		0.0	36.327	-0.247		Vel = 2.70
31	0.0	2.635	1T	16.474	3.500	18.680		
to		120.0		0.0	16.474	1.516		
A8	-45.83	-0.0068		0.0	19.974	-0.136		Vel = 2.70
	0.0							
	-45.83					20.060		K Factor = -10.23
A9	-30.54	2.635	1X	14.827	3.500	20.918		
to		120.0	1T	16.474	31.301	-1.516		
40	-30.54	-0.0032		0.0	34.801	-0.112		Vel = 1.80
40	0.0	2.635	1X	14.827	21.500	19.290		
to		120.0		0.0	14.827	0.0		
41	-30.54	-0.0032		0.0	36.327	-0.117		Vel = 1.80

Hyd. Ref. Point	Qa / Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
41	0.0	2.635	1T	16.474	3.500	19.173		
to		120.0		0.0	16.474	1.516		
A10	-30.54	-0.0032		0.0	19.974	-0.064		Vel = 1.80
	0.0							
	-30.54					20.625		K Factor = -6.72
A11	-17.88	2.635	1X	14.827	3.500	21.151		
to		120.0	1T	16.474	31.301	-1.516		
50	-17.88	-0.0012		0.0	34.801	-0.041		Vel = 1.05
50	0.0	2.635	1X	14.827	21.500	19.594		
to		120.0		0.0	14.827	0.0		
51	-17.88	-0.0012		0.0	36.327	-0.044		Vel = 1.05
51	0.0	2.635	1T	16.474	3.500	19.550		
to		120.0		0.0	16.474	1.516		
A12	-17.88	-0.0012		0.0	19.974	-0.024		Vel = 1.05
	0.0							
	-17.88					21.042		K Factor = -3.90
A13	14.52	2.635	1X	14.827	3.500	21.497		
to		120.0	1T	16.474	31.301	-1.516		
60	14.52	0.0008		0.0	34.801	0.029		Vel = 0.85
60	0.0	2.635	1X	14.827	21.500	20.010		
to		120.0		0.0	14.827	0.0		
61	14.52	0.0008		0.0	36.327	0.029		Vel = 0.85
61	0.0	2.635	1T	16.474	3.500	20.039		
to		120.0		0.0	16.474	1.516		
A14	14.52	0.0008		0.0	19.974	0.016		Vel = 0.85
	0.0							
	14.52					21.571		K Factor = 3.13
A15	33.19	2.635	1X	14.827	3.500	21.788		
to		120.0	1T	16.474	31.301	-1.516		
70	33.19	0.0038		0.0	34.801	0.131		Vel = 1.95
70	0.0	2.635	1X	14.827	21.500	20.403		
to		120.0		0.0	14.827	0.0		
71	33.19	0.0037		0.0	36.327	0.136		Vel = 1.95
71	0.0	2.635	1T	16.474	3.500	20.539		
to		120.0		0.0	16.474	1.516		
A16	33.19	0.0038		0.0	19.974	0.075		Vel = 1.95
	0.0							
	33.19					22.130		K Factor = 7.06
A17	46.68	2.635	1X	14.827	3.500	22.059		
to		120.0	1T	16.474	31.301	-1.516		
80	46.68	0.0070		0.0	34.801	0.245		Vel = 2.75
80	0.0	2.635	1X	14.827	21.500	20.788		
to		120.0		0.0	14.827	0.0		
81	46.68	0.0070		0.0	36.327	0.255		Vel = 2.75
81	0.0	2.635	1T	16.474	3.500	21.043		
to		120.0		0.0	16.474	1.516		
A18	46.68	0.0071		0.0	19.974	0.141		Vel = 2.75

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
	0.0							
	46.68					22.700		K Factor = 9.80
A19	44.39	2.635	1X	14.827	3.500	22.592		
to		120.0	1T	16.474	31.301	-1.516		
90	44.39	0.0064		0.0	34.801	0.223		Vel = 2.61
90	0.0	2.635	1X	14.827	21.500	21.299		
to		120.0		0.0	14.827	0.0		
91	44.39	0.0064		0.0	36.327	0.233		Vel = 2.61
91	0.0	2.635	1T	16.474	3.500	21.532		
to		120.0		0.0	16.474	1.516		
A20	44.39	0.0064		0.0	19.974	0.128		Vel = 2.61
	0.0							
	44.39					23.176		K Factor = 9.22
A1	202.40	4.26		0.0	6.750	20.390		
to		120.0		0.0	0.0	0.0		
CD	202.4	0.0102		0.0	6.750	0.069		Vel = 4.56
CD	-316.99	4.26		0.0	2.750	20.459		
to		120.0		0.0	0.0	0.0		
A3	-114.59	-0.0036		0.0	2.750	-0.010		Vel = 2.58
A3	202.35	4.26		0.0	9.500	20.449		
to		120.0		0.0	0.0	0.0		
A5	87.76	0.0022		0.0	9.500	0.021		Vel = 1.98
A5	198.87	4.26		0.0	10.750	20.470		
to		120.0		0.0	0.0	0.0		
A7	286.63	0.0194		0.0	10.750	0.209		Vel = 6.45
A7	45.83	4.26		0.0	9.300	20.679		
to		120.0		0.0	0.0	0.0		
A9	332.46	0.0257		0.0	9.300	0.239		Vel = 7.48
A9	30.55	4.26		0.0	7.750	20.918		
to		120.0		0.0	0.0	0.0		
A11	363.01	0.0301		0.0	7.750	0.233		Vel = 8.17
A11	17.88	4.26		0.0	10.500	21.151		
to		120.0		0.0	0.0	0.0		
A13	380.89	0.0330		0.0	10.500	0.346		Vel = 8.57
A13	-14.52	4.26		0.0	9.500	21.497		
to		120.0		0.0	0.0	0.0		
A15	366.37	0.0306		0.0	9.500	0.291		Vel = 8.25
A15	-33.19	4.26		0.0	10.500	21.788		
to		120.0		0.0	0.0	0.0		
A17	333.18	0.0258		0.0	10.500	0.271		Vel = 7.50
A17	-46.68	4.26	1X	21.067	5.400	22.059		
to		120.0		0.0	21.067	0.0		
A21	286.5	0.0195		0.0	26.467	0.515		Vel = 6.45
	0.0							
	286.50					22.574		K Factor = 60.30
A19	-44.39	4.26	1T	26.334	2.750	22.592		
to		120.0		0.0	26.334	0.0		
A21	-44.39	-0.0006		0.0	29.084	-0.018		Vel = 1.00

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
	0.0							
	-44.39					22.574		K Factor = -9.34
CD	316.99	4.26	1V	8.954	5.300	20.459		
to		120.0		0.0	8.954	3.118		
CC	316.99	0.0235		0.0	14.254	0.335		Vel = 7.14
CC	0.0	4.26	1V	8.954	8.400	23.912		
to		120.0		0.0	8.954	0.0		
CB	316.99	0.0235		0.0	17.354	0.407		Vel = 7.14
CB	0.0	4.26	1X	21.067	7.500	24.319		
to		120.0		0.0	21.067	0.0		
CA	316.99	0.0235		0.0	28.567	0.670		Vel = 7.14
CA	0.0	6.357	1V	12.573	23.500	24.989		
to		120.0		0.0	12.573	0.0		
C30	316.99	0.0034		0.0	36.073	0.121		Vel = 3.20
C30	0.0	6.357	1V	12.573	8.900	25.110		
to		120.0		0.0	12.573	-3.768		
C31	316.99	0.0033		0.0	21.473	0.071		Vel = 3.20
C31	0.0	6.357	1X	31.433	9.000	21.413		
to		120.0		0.0	31.433	0.0		
C32	316.99	0.0033		0.0	40.433	0.135		Vel = 3.20
C32	0.0	6.357	1X	31.433	43.000	21.548		
to		120.0		0.0	31.433	-0.217		
C33	316.99	0.0033		0.0	74.433	0.249		Vel = 3.20
C33	0.0	6.357		0.0	1.200	21.580		
to		120.0		0.0	0.0	0.0		
B24	316.99	0.0033		0.0	1.200	0.004		Vel = 3.20
B24	0.0	6.357	1V	12.573	6.500	21.584		
to		120.0		0.0	12.573	0.0		
C34	316.99	0.0034		0.0	19.073	0.064		Vel = 3.20
C34	0.0	6.357	1V	12.573	0.100	21.648		
to		120.0		0.0	12.573	0.866		
C35	316.99	0.0034		0.0	12.673	0.043		Vel = 3.20
C35	0.0	6.357		0.0	5.100	22.557		
to		120.0		0.0	0.0	0.0		
A21	316.99	0.0033		0.0	5.100	0.017		Vel = 3.20
	0.0							
	316.99					22.574		K Factor = 66.72
A2	188.63	4.26		0.0	9.400	18.912		
to		120.0		0.0	0.0	0.0		
A4	188.63	0.0089		0.0	9.400	0.084		Vel = 4.25
A4	189.49	4.26		0.0	9.500	18.996		
to		120.0		0.0	0.0	0.0		
A6	378.12	0.0325		0.0	9.500	0.309		Vel = 8.51
A6	195.04	4.26		0.0	10.750	19.305		
to		120.0		0.0	0.0	0.0		
A8	573.16	0.0702		0.0	10.750	0.755		Vel = 12.90
A8	-45.83	4.26		0.0	9.400	20.060		
to		120.0		0.0	0.0	0.0		
A10	527.33	0.0601		0.0	9.400	0.565		Vel = 11.87

Final Calculations - Hazen-Williams

HIGH TECH FIRE PROTECTION
NOKIAN TYRES WALTON STREET GRID 1

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
A10	-30.55	4.26		0.0	7.750	20.625		
to		120.0		0.0	0.0	0.0		
A12	496.78	0.0538		0.0	7.750	0.417		Vel = 11.18
A12	-17.88	4.26		0.0	10.500	21.042		
to		120.0		0.0	0.0	0.0		
A14	478.9	0.0504		0.0	10.500	0.529		Vel = 10.78
A14	14.52	4.26		0.0	10.500	21.571		
to		120.0		0.0	0.0	0.0		
A16	493.42	0.0532		0.0	10.500	0.559		Vel = 11.11
A16	33.19	4.26		0.0	9.500	22.130		
to		120.0		0.0	0.0	0.0		
A18	526.61	0.0600		0.0	9.500	0.570		Vel = 11.85
A18	46.68	4.26		0.0	5.400	22.700		
to		120.0		0.0	0.0	0.0		
A22	573.29	0.0702		0.0	5.400	0.379		Vel = 12.90
A22	559.10	6.357		0.0	2.750	23.079		
to		120.0		0.0	0.0	0.0		
A20	1132.39	0.0353		0.0	2.750	0.097		Vel = 11.45
	0.0							
	1132.39					23.176		K Factor = 235.22
A21	559.10	6.357	1X	31.433	21.500	22.574		
to		120.0		0.0	31.433	0.0		
A22	559.1	0.0095		0.0	52.933	0.505		Vel = 5.65
	0.0							
	559.10					23.079		K Factor = 116.38
A20	1176.78	6.357	1V	12.573	16.800	23.176		
to		120.0	1X	31.433	44.006	0.0		
TOR	1176.78	0.0378		0.0	60.806	2.299		Vel = 11.90
TOR	0.0	6.065	1Fsp	0.0	16.000	25.475		
to		120.0		0.0	0.0	7.930		* Fixed loss = 1
BOR	1176.78	0.0475		0.0	16.000	0.760		Vel = 13.07
BOR	0.0	6.357	1Zia	0.0	2.000	34.165		
to		120.0		0.0	0.0	9.440		* Fixed loss = 6.842
BASE	1176.78	0.0380		0.0	2.000	0.076		Vel = 11.90
BASE	0.0	6.16	1G	4.304	430.000	43.681		
to		140.0	2E	40.168	87.509	0.0		
H1	1176.78	0.0331	1T	43.037	517.509	17.149		Vel = 12.67
H1	0.0	8.27	1T	55.354	150.000	60.830		
to		140.0		0.0	55.354	0.0		
H2	1176.78	0.0079		0.0	205.354	1.621		Vel = 7.03
H2	0.0	8.27	1T	55.354	440.000	62.451		
to		140.0		0.0	55.354	0.0		
HOSE	1176.78	0.0079		0.0	495.354	3.911		Vel = 7.03
HOSE	250.00	6.16	1G	4.304	5.000	66.362		Qa = 250
to		140.0	1E	20.084	67.425	3.032		
TEST	1426.78	0.0473	1T	43.037	72.425	3.427		Vel = 15.36
	0.0							
	1426.78					72.821		K Factor = 167.20

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