

... Fire Protection by Computer Design

EASTERN FIRE PROTECTION
170 KITTY HAWK AVE
AUBURN, ME 04210
207-784-1507

Job Name : 62 INDIA ST.
Drawing : 3 OF 3
Location : 4TH FLOOR CONCEALED SPACE
Remote Area : 1
Contract : 5583
Data File : 62 INDIA ST. 4TH FL. KFR-CCS 56 CALC..WXF

HYDRAULIC CALCULATIONS
for

Project name: 62 INDIA ST.
Location: 4TH FLOOR CONCEALED SPACE
Drawing no: 3 OF 3
Date: 6/7/17

Design

Remote area number: 1
Remote area location: 4TH FLOOR CONCEALED SPACE
Occupancy classification: LIGHT HAZZARD
Density: .1 - Gpm/SqFt
Area of application: 1,008 - SqFt
Coverage per sprinkler: 225 - SqFt
Type of sprinklers calculated: RELIABLE KFR-CCS 5.6 K 1/2" 200* UPRIGHT
No. of sprinklers calculated: 6
In-rack demand: - GPM
Hose streams: 250 - GPM
Total water required (including hose streams): 256.214 - GPM @ 84.084 - Psi
Type of system: WET
Volume of dry or preaction system: - Gal

Water supply information

Date:
Location:
Source:

Name of contractor: EASTERN FIRE PROTECTION
Address: 170 KITTY HAWK AVE / / AUBURN, ME 04210
Phone number: 207-784-1507
Name of designer:
Authority having jurisdiction:
Notes: (Include peaking information or gridded systems here.)

Water Supply Curve C

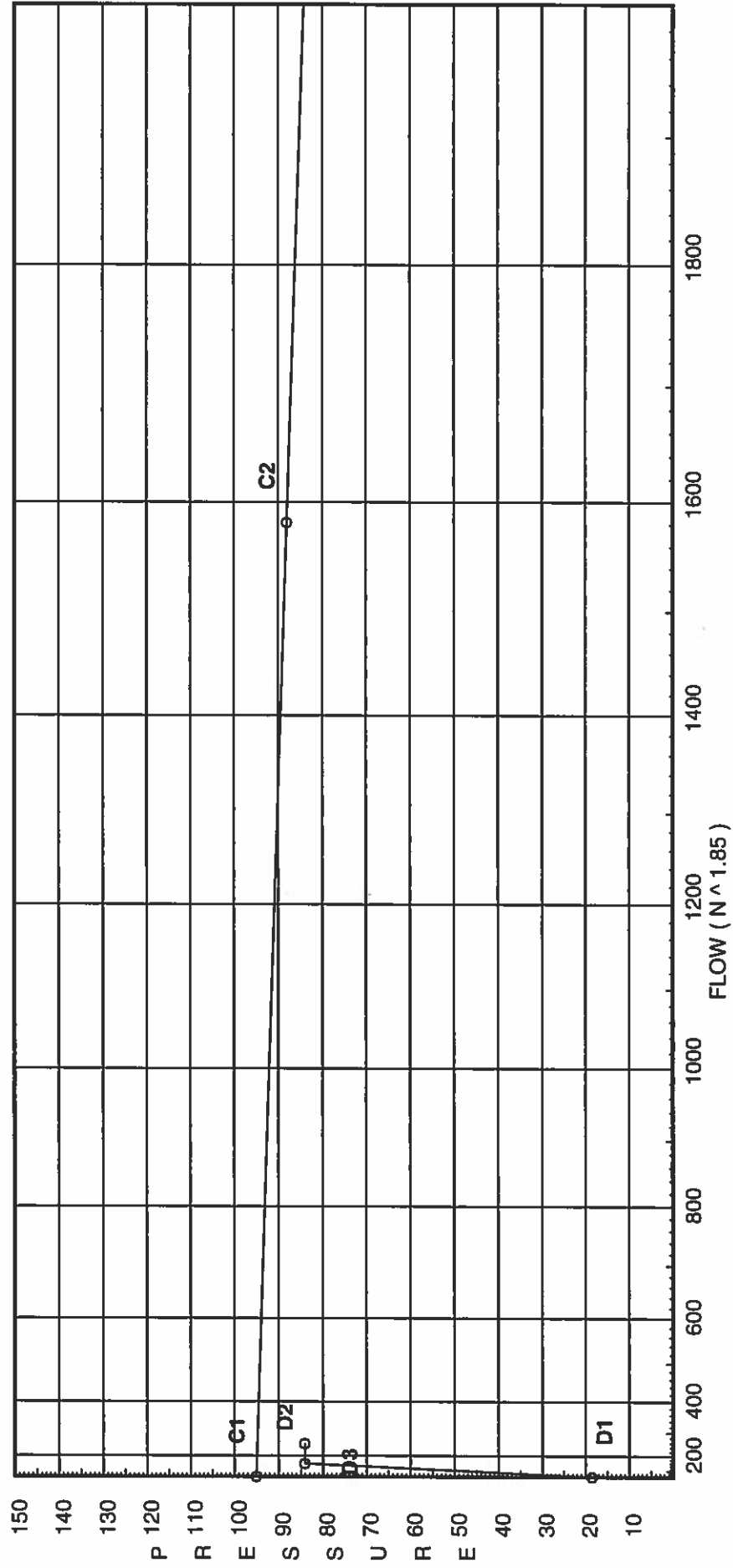
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City Water Supply:

C1 - Static Pressure : 95
C2 - Residual Pressure: 88
C2 - Residual Flow : 1582

Demand:

D1 - Elevation : 18.506
D2 - System Flow : 156.214
D2 - System Pressure : 84.084
Hose (Demand) : 100
D3 - System Demand : 256.214
Safety Margin : 10.675



Fittings Used Summary

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Fitting Legend Abbrev. Name	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	
B	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0	
E	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61	
Fsp	Fitting generates a Fixed Loss Based on Flow																				
G	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13	
I	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	20	23	25	33	36	40	
J	0	0	4.5	6	8	8.5	10.8	13	17	16	21	25	33	41	50	65	78	88	98	120	
N*	7	7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0	
O*	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0	
S	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65	71	81	91	101	121	
T	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121	

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 NFFPA.

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>
TEST	95.0	88	1582.0	94.759	256.21	84.084

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>
SPRG	0.0	5.6	16.14	22.5	
401	77.23	5.51	16.65	22.5	K=K @ LIN1
402	77.23	5.51	17.89	23.32	K=K @ LIN1
403	77.23	5.51	22.5	26.16	K=K @ LIN1
405	77.23	5.51	23.47	26.72	K=K @ LIN1
406	77.23	5.51	25.26	27.71	K=K @ LIN1
505	76.02		28.51		
407	77.23	5.51	29.23	29.81	K=K @ LIN1
408	76.23		35.71		
404	76.02		36.26		
409	76.02		42.26		
411	76.02		42.69		
412	76.02		49.11		
413	76.02		56.08		
114	44.44		70.12		
TOR1	44.44		71.14		
HDR1	37.5		74.64		
BASE	34.5		84.0		
TEST	34.5		84.08	100.0	

Final Calculations - Hazen-Williams - 2007

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
SPRG to LIN1	0 0	5.60	22.50 22.5	1 1.101	O	5.0 0.0 0.0	1.000 5.000 6.000	150 0.0847	16.143 0.0 0.508			Vel = 7.58
LIN1			0.0 22.50						16.651		K Factor = 5.51	
401 to 402	77.230 77.230	5.51	22.50 22.5	1 1.101		0.0 0.0 0.0	14.625 0.0 14.625	150 0.0846	16.651 0.0 1.237		K = K @ LIN1	Vel = 7.58
402 to 403	77.230 77.230	5.51	23.32 45.82	1 1.101		0.0 0.0 0.0	14.625 0.0 14.625	150 0.3154	17.888 0.0 4.613		K = K @ LIN1	Vel = 15.44
403 to 404	77.230 76.020	5.51	26.16 71.98	1.5 1.598	4N O	36.0 8.0 0.0	67.698 44.000 111.698	150 0.1185	22.501 0.524 13.237		K = K @ LIN1	Vel = 11.51
404			0.0 71.98						36.262		K Factor = 11.95	
405 to 406	77.230 77.230	5.51	26.72 26.72	1 1.101		0.0 0.0 0.0	15.340 0.0 15.340	150 0.1162	23.475 0.0 1.783		K = K @ LIN1	Vel = 9.00
406 to 505	77.230 76.020	5.51	27.71 54.43	1 1.101		0.0 0.0 0.0	6.290 0.0 6.290	150 0.4335	25.258 0.524 2.727		K = K @ LIN1	Vel = 18.34
505 to 407	76.020 77.230		0.0 54.43	1.25 1.394		0.0 0.0 0.0	9.040 0.0 9.040	150 0.1375	28.509 -0.524 1.243			Vel = 11.44
407 to 408	77.230 76.230	5.51	29.81 84.24	1.5 1.598	O	8.0 0.0 0.0	30.125 8.000 38.125	150 0.1585	29.228 0.433 6.044		K = K @ LIN1	Vel = 13.48
408 to 404	76.230 76.020		0.0 84.24	2 2.003		0.0 0.0 0.0	8.830 0.0 8.830	150 0.0528	35.705 0.091 0.466			Vel = 8.58
404 to 409	76.020 76.020		71.97 156.21	2 2.003	N O	11.0 10.0 0.0	15.250 21.000 36.250	150 0.1654	36.262 0.0 5.996			Vel = 15.91
409 to 411	76.020 76.020		0.0 156.21	2.5 2.635		0.0 0.0 0.0	6.625 0.0 6.625	120 0.0658	42.258 0.0 0.436			Vel = 9.19
411 to 412	76.020 76.020		0.0 156.21	2.5 2.635	O 2N	12.0 24.0 0.0	111.580 36.000 147.580	150 0.0435	42.694 0.0 6.420			Vel = 9.19
412 to 413	76.020 76.020		0.0 156.21	2.5 2.635	B I S T Fsp	9.61 8.237 19.22 16.474 0.0	6.790 53.541 60.331	120 0.0657	49.114 3.000 3.966		** Fixed Loss = 3	Vel = 9.19
413 to 114	76.020 44.440		0.0 156.21	4 4.26	T	26.334 0.0 0.0	31.590 26.334 57.924	120 0.0064	56.080 13.677 0.368			Vel = 3.52

Final Calculations - Hazen-Williams

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv. Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
114 to TOR1	44.440 44.440		0.0 156.21	4 4.26	B 3I J	15.8 27.651 21.067	95.360 64.518 159.878	120 0.0 0.0063	70.125 0.0 1.013	Vel = 3.52	
TOR1 to HDR1	44.440 37.500		0.0 156.21	4 4.26	B S T	15.8 28.968 26.334	6.940 71.102 78.042	120 3.006 0.0063	71.138 3.006 0.494	Vel = 3.52	
HDR1 to BASE	37.500 34.500		0.0 156.21	4 4.26		0.0 0.0 0.0	9.250 0.0 9.250	120 9.299 0.0064	74.638 9.299 0.059	** Fixed Loss = 8 Vel = 3.52	
BASE to TEST	34.500 34.500		0.0 156.21	6 6.16	E T 2G	20.084 43.037 8.607	40.000 71.728 111.728	140 0.0 0.0008	83.996 0.0 0.088	Vel = 1.68	
TEST			100.00 256.21						84.084	Qa = 100.00 K Factor = 27.94	