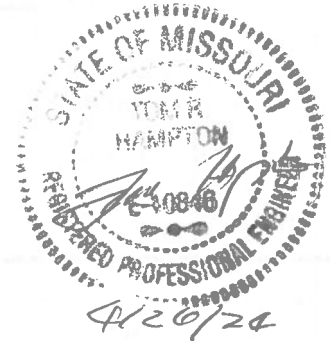
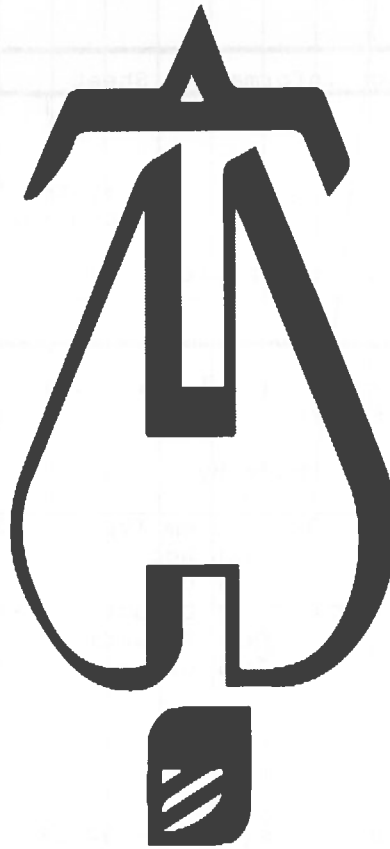




Hydraulic Calculations by HydraCALC

ADVANTAGE FIRE PROTECTION
404B N.W. 11TH ST
BLUE SPRINGS, MO 64015
816-224-3400

Job Name : LOT 1
Drawing : NE MAGUIRE BLVD.
Location : LEE'S SUMMIT, MO
Remote Area : AREA #2
Contract : J-2351
Data File : 4-19-2024 reliable Extended coverage AREA#2.WXF

Hydraulic Design Information Sheet

Name - LOT 1 Date - 4-4-2024
Location - LEE'S SUMMIT, MO
Building - NE MAGUIRE BLVD.
Contractor -
Calculated By - DANIAL LOGSTON
Construction: () Combustible (X) Non-Combustible
Occupancy - WAREHOUSE

System No. - AREA #2
Contract No. - J-2351
Drawing No. - 4 OF 4
Ceiling Height - 28-0

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

M Area of Sprinkler Operation - 1894.226 System Type Sprinkler/Nozzle
Density - .2 (X) Wet Make RELIABLE
D Area Per Sprinkler - 400 () Dry Model R6553
E Elevation at Highest Outlet - 126.958 () Deluge Size 3/4"
S Hose Allowance - Inside - () Preaction K-Factor 14
I Rack Sprinkler Allowance - () Other Temp.Rat.212
G Hose Allowance - Outside - 250
N

Note

Calculation Flow Required - 745.764 Press Required - 94.282
Summary C-Factor Used: 120 Overhead 140 Underground

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 8-10-2023 Cap. -
T Time of Test - 10:20AM Rated Cap.-
E Static Press - 105 @ Press -
R Residual Press - 76 Elev. -
Flow - 2300 Well
S Elevation - 95 Proof Flow

Location -

Source of Information - LS WATER DEPT

C Commodity Class Location
O Storage Ht. Area Aisle W.
M Storage Method: Solid Piled % Palletized % Rack
M
S () Single Row () Conven. Pallet () Auto. Storage () Encap.
R () Double Row () Slave Pallet () Solid Shelf () Non
T () Mult. Row () Open Shelf
O
C

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

E Horizontal Barriers Provided:

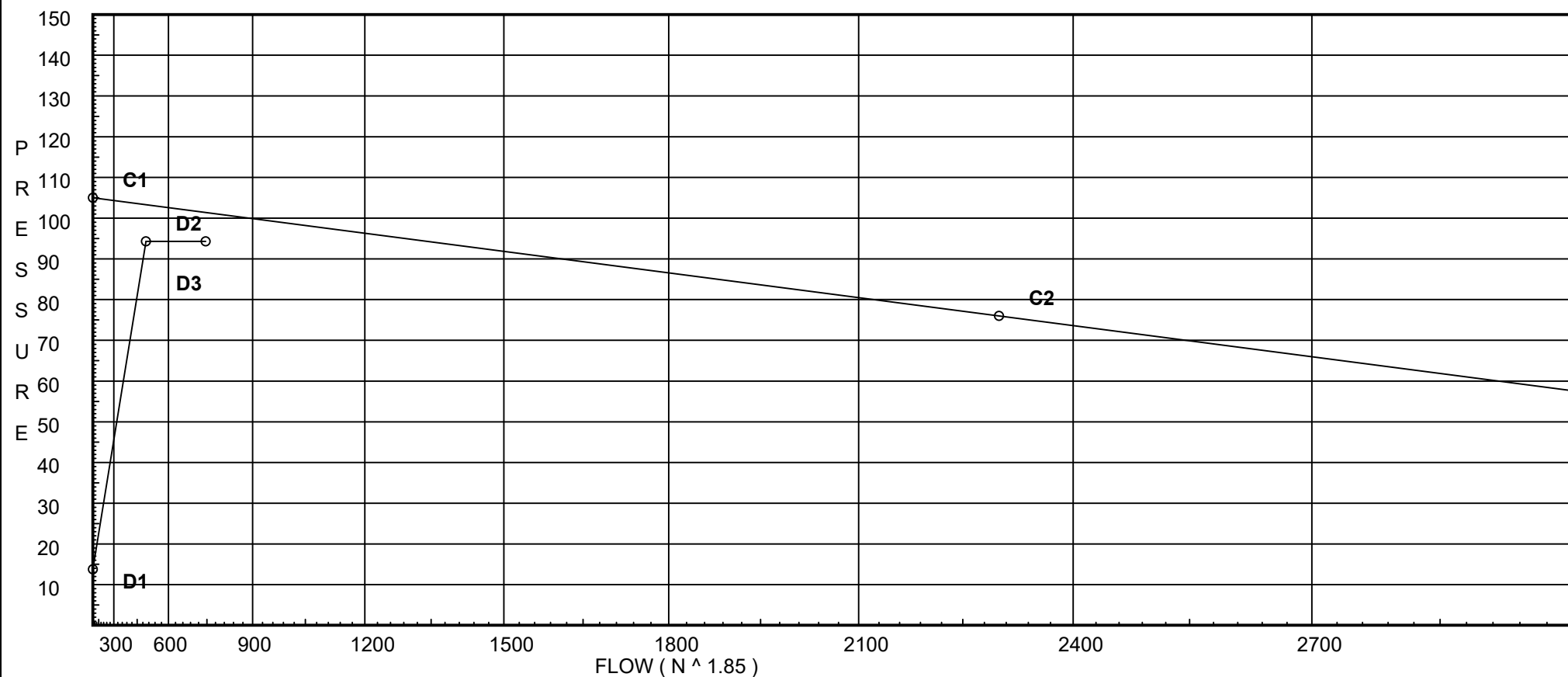
Water Supply Curve

ADVANTAGE FIRE PROTECTION
LOT 1

Page 2
Date 4-4-2024

City Water Supply:
C1 - Static Pressure : 105
C2 - Residual Pressure: 76
C2 - Residual Flow : 2300

Demand:
D1 - Elevation : 13.751
D2 - System Flow : 495.764
D2 - System Pressure : 94.282
Hose (Demand) : 250
D3 - System Demand : 745.764
Safety Margin : 7.108



Fittings Used Summary

ADVANTAGE FIRE PROTECTION
LOT 1

Page 3
Date 4-4-2024

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
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
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
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
Zce	Colt C300 Vert Butt	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.

Flow Summary - NFPA

ADVANTAGE FIRE PROTECTION
LOT 1

Page 4
Date 4-4-2024

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	105.0	76	2300.0	101.39	745.76	94.282

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>	
15	126.75	14	32.7	80.06	0.2	400
16	125.917	14	33.99	81.62	0.2	400
17	125.084	14	37.75	86.02	0.2	400
18	124.542		47.79			
19	126.75	14	32.92	80.33	0.2	400
20	126.75	14	33.85	81.46	0.2	400
21	125.084	14	37.98	86.28	0.2	400
22	124.542		48.05			
B1	122.667		54.4			
B2	122.667		54.67			
B3	122.667		73.45			
TOR2	122.667		77.38			
BOR2	101.833		86.9			
UNG	101.0		87.69			
UNG1	95.0		94.06			
TEST	95.0		94.28	250.0		

Final Calculations : Hazen-Williams

ADVANTAGE FIRE PROTECTION
LOT 1

Page 5
Date 4-4-2024

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	126.750 125.917	14.00	80.06 80.06	2 2.157			18.333 18.333	120 0.0506	32.700 0.361 0.927			
16 to 17	125.917 125.084	14.00	81.62 161.68	2 2.157			18.333 18.333	120 0.1857	33.988 0.361 3.404	Vel = 7.03		
17 to 18	125.084 124.542	14.00	86.02 247.7	2 2.157	T	12.307	11.667 12.307 23.974	120 0.4089	37.753 0.235 9.802			
18 to B1	124.542 122.667		0.0 247.7	2 2.157	T	12.307	1.875 12.307 14.182	120 0.4088	47.790 0.812 5.798			
B1			0.0 247.70						54.400		K Factor = 33.58	
19 to 20	126.750 126.750	14.00	80.33 80.33	2 2.157			18.333 18.333	120 0.0509	32.920 0.0 0.933			
20 to 21	126.750 125.084	14.00	81.45 161.78	2 2.157			18.333 18.333	120 0.1859	33.853 0.722 3.408	Vel = 7.05		
21 to 22	125.084 124.542	14.00	86.28 248.06	2 2.157	T	12.307	11.667 12.307 23.974	120 0.4099	37.983 0.235 9.828			
22 to B2	124.542 122.667		0.0 248.06	2 2.157	T	12.307	1.875 12.307 14.182	120 0.4100	48.046 0.812 5.815			
B2			0.0 248.06						54.673		K Factor = 33.55	
B1 to B2	122.667 122.667		247.70 247.7	4 4.26			18.333 18.333	120 0.0149	54.400 0.0 0.273			
B2 to B3	122.667 122.667		248.06 495.76	4 4.26	2V T	17.907 26.334	305.750 44.241 349.991	120 0.0537	54.673 0.0 18.782	Vel = 5.58		
B3 to TOR2	122.667 122.667		0.0 495.76	4 4.26	2V	17.907	55.187 17.907 73.094	120 0.0537	73.455 0.0 3.922			
TOR2 to BOR2	122.667 101.833		0.0 495.76	6 6.357	B X	12.573 31.433	20.833 44.006 64.839	120 0.0076	77.377 9.023 0.496	Vel = 11.16		
BOR2 to UNG	101.833 101		0.0 495.76	6 6.357	S V	40.235 12.573	3.396 52.808 56.204	120 0.0076	86.896 0.361 0.429			
UNG to UNG1	101 95		0.0 495.76	6 6.16	Zce E G T	0.0 20.084 4.304 43.037	79.000 67.425 146.425	140 0.0067	87.686 5.391 0.980	** Fixed Loss = 2.792 Vel = 5.34		
UNG1 to TEST	95 95		0.0 495.76	12 12.34	E G	42.195 9.377	937.000 51.572 988.572	140 0.0002	94.057 0.0 0.225			

Final Calculations : Hazen-Williams

ADVANTAGE FIRE PROTECTION
LOT 1

Page 6
Date 4-4-2024

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	*****
			250.00									
TEST			745.76						94.282		Qa = 250.00 K Factor = 76.80	