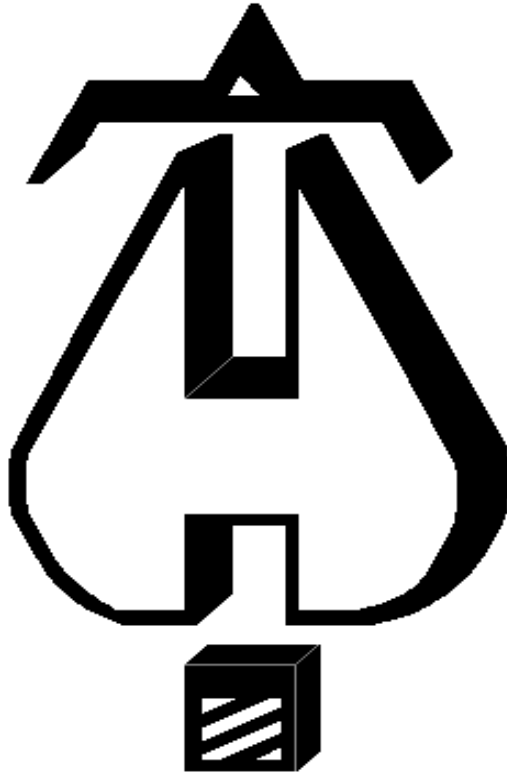




. . . Fire Protection by Computer Design

STAR FIRE SPRINKLERS, INC
686 EDGEWOOD AVE. N.
JACKSONVILLE, FL 32254
904 384-1066

Job Name : TEXAS ROADHOUSE LAKE CITY
Building : DINING ROOM
Location : 117 NW KNIGHTS AVE, LAKE CITY, FLORIDA
System : 1, WET
Contract :
Data File : TEXAS ROADHOUSE - AREA 2.WXF

Hydraulic Design Information Sheet

Name - TEXAS ROADHOUSE Date - 02/27/2020
Location - 117 NW KNIGHTS AVE, LAKE CITY, FLORIDA
Building - DINING ROOM System No. - 1, WET
Contractor - STAR FIRE SPRINKLER, INC. Contract No. -
Calculated By - Drawing No. - FP-2
Construction: () Combustible () Non-Combustible Ceiling Height - VARIES
Occupancy - RESTAURANT

S (X) NFPA 13 (X) Lt. Haz. Ord. Haz. Gp. () 1 () 2 () 3 () Ex. Haz.
Y () NFPA 231 () NFPA 231C () Figure Curve
S Other

T Specific Ruling Made By Date

E
M Area of Sprinkler Operation - 1500 System Type Sprinkler/Nozzle
Density - 0.10 (X) Wet Make VIKING
D Area Per Sprinkler - 122 () Dry Model UPRIGHT
E Elevation at Highest Outlet - 15.66' () Deluge Size 1/2"
S Hose Allowance - Inside - () Preaction K-Factor 5.6
I Rack Sprinkler Allowance - () Other Temp. Rat. 155
G Hose Allowance - Outside - 100
N

Note

Calculation Flow Required - 363.0 Press Required - 72.1 AT TEST
Summary C-Factor Used: 120 Overhead 140 Underground

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - 02/20/2020 Cap. -
T Time of Test - 10:30 AM Rated Cap. - Elev. -
E Static Press - 85 @ Press -
R Residual Press - 65 Elev. - Well
Flow - 1340 Proof Flow
S Elevation - NA

U Location - NW KNIGHTS AVE & NW MEDICAL CENTER LN.

P
L Source of Information - STAR FIRE SPRINKLERS, INC.
Y

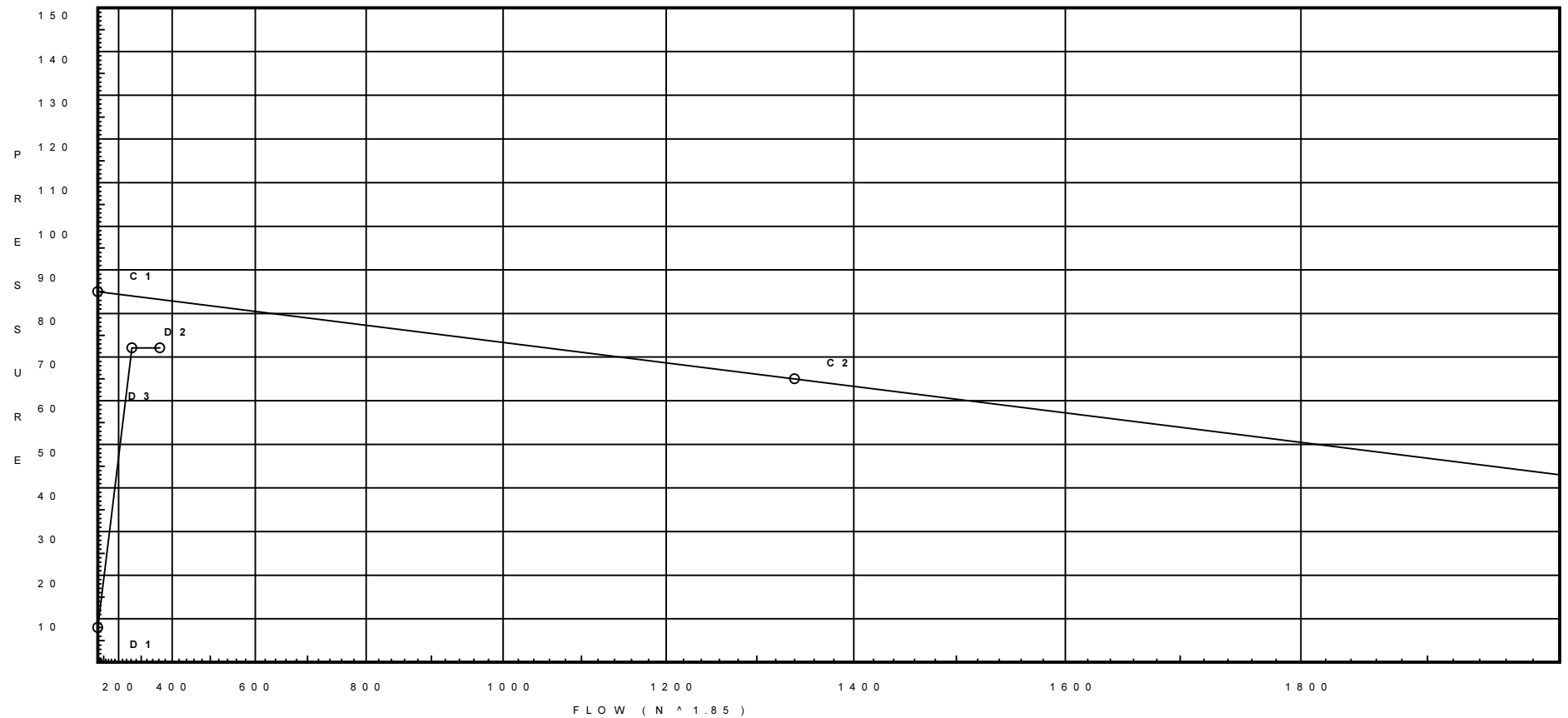
C Commodity Class Location
O Storage Ht. Area Aisle W.
M Storage Method: Solid Piled % Palletized % Rack
M
() Single Row () Conven. Pallet () Auto. Storage () Encap.
S R () Double Row () Slave Pallet () Solid Shelf () Non
T A () Mult. Row () Open Shelf
O C
R K Flue Spacing Clearance: Storage to Ceiling
A Longitudinal Transverse
G
E Horizontal Barriers Provided:

City Water Supply:

C 1 - Static Pressure : 85
C 2 - Residual Pressure: 65
C 2 - Residual Flow : 1340

Demand:

D 1 - Elevation : 7.978
D 2 - System Flow : 263.095
D 2 - System Pressure : 72.138
Hose (Demand) : 100
D 3 - System Demand : 363.095
Safety Margin : 11.076



Fittings Used Summary

STAR FIRE SPRINKLERS, INC
TEXAS ROADHOUSE LAKE CITY

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Fitting Legend

Abbrev.	Name	½	¾	1	1 ½	2	2 ½	3	3 ½	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
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
F	NFPA 13 45° Elbow	1	1	1	1	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																		
G	NFPA 13 Gate Valve	0	0	0	0	0	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

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 C Factors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and C Factors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for C Factors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

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Node	Elevation	K-Fact	P t	P n	Flow	Density	Area	Press
No.			Actual		Actual			Req.
109	15.66	5.6	8.22	na	16.06	0.1	122	7.0
110	15.66	5.6	9.12	na	16.92	0.1	122	7.0
111	15.66	5.6	12.54	na	19.83	0.1	122	7.0
112	15.66	5.6	14.69	na	21.47	0.1	122	7.0
113	15.66	5.6	18.73	na	24.24	0.1	122	7.0
114	15.66		24.78	na				
100	15.42	5.6	7.0	na	14.82	0.1	122	7.0
101	15.42	5.6	7.69	na	15.53	0.1	122	7.0
102	15.42	5.6	9.38	na	17.15	0.1	122	7.0
103	15.42	5.6	11.16	na	18.71	0.1	122	7.0
104	15.42	5.6	14.37	na	21.23	0.1	122	7.0
105	15.42	5.6	17.52	na	23.44	0.1	122	7.0
106	15.42		24.5	na				
116	15.18	5.6	23.46	na	27.12	0.1	122	7.0
117	13.18	5.6	22.54	na	26.59	0.1	122	7.0
122	15.18		24.61	na				
118	15.18		28.06	na				
119	15.18		29.88	na				
115	12.66		29.55	na				
107	12.66		29.89	na				
120	12.66		31.24	na				
121	12.66		42.79	na				
407	12.66		43.61	na				
433	12.66		45.35	na				
436	12.66		46.97	na				
446	12.66		46.97	na				
435	12.66		46.97	na				
434	12.66		46.97	na				
433A	12.66		46.97	na				
TW R	12.66		50.62	na				
BW R	1.0		62.75	na				
STUB	-3.0		64.52	na				
UG 1	-3.0		64.68	na				
UG 2	-3.0		71.87	na				
UG 3	-3.0		71.94	na				
TEST	-3.0		72.14	na	100.0			

The maximum velocity is 23.78 and it occurs in the pipe between nodes 105 and 106

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Hyd. Ref. Point	Q a Q t	D ia. "C" P f/F t	F itting o r E q v . L n .	P ipe F tng 's T o t a l	P t P e P f	P t P v P n	***** Notes *****
109 to 110	16.06 120.0 16.06	1.049 0.0868	0.0 0.0	10.420 0.0	8.221 0.0		K Factor = 5.60 Vel = 5.96
110 to 111	16.91 120.0 32.97	1.049 0.3281	0.0 0.0	10.420 0.0	9.125 0.0		K Factor = 5.60 Vel = 12.24
111 to 112	19.84 120.0 52.81	1.38 0.2062	0.0 0.0	10.420 0.0	12.544 0.0		K Factor = 5.60 Vel = 11.33
112 to 113	21.46 120.0 74.27	1.38 0.3877	0.0 0.0	10.420 0.0	14.693 0.0		K Factor = 5.60 Vel = 15.93
113 to 114	24.24 120.0 98.51	1.38 0.6537	1 T 6.0 0.0	3.250 6.000	18.733 0.0		K Factor = 5.60 Vel = 21.13
114 to 115	0.0 120.0 98.51	1.61 0.3085	1 T 8.0 0.0	3.250 8.000	24.780 1.299		Vel = 15.52
	0.0 98.51				29.550		K Factor = 18.12
100 to 101	14.82 120.0 14.82	1.049 0.0747	0.0 0.0	9.250 0.0	7.000 0.0		K Factor = 5.60 Vel = 5.50
101 to 102	15.53 120.0 30.35	1.049 0.2815	0.0 0.0	6.000 0.0	7.691 0.0		K Factor = 5.60 Vel = 11.27
102 to 103	17.15 120.0 47.5	1.38 0.1695	0.0 0.0	10.500 0.0	9.380 0.0		K Factor = 5.60 Vel = 10.19
103 to 104	18.70 120.0 66.2	1.38 0.3134	0.0 0.0	10.250 0.0	11.160 0.0		K Factor = 5.60 Vel = 14.20
104 to 105	21.23 120.0 87.43	1.38 0.5243	0.0 0.0	6.000 0.0	14.372 0.0		K Factor = 5.60 Vel = 18.75
105 to 106	23.44 120.0 110.87	1.38 0.8135	1 T 6.0 0.0	2.580 6.000	17.518 0.0		K Factor = 5.60 Vel = 23.78
106 to 107	0.0 120.0 110.87	1.61 0.3840	1 T 8.0 0.0	2.920 8.000	24.498 1.195		Vel = 17.47
	0.0 110.87				29.886		K Factor = 20.28
116 to 122	27.12 120.0 27.12	1.38 0.0602	2 E 6.0 0.0	13.180 6.000	23.460 0.0		K Factor = 5.60 Vel = 5.82
	0.0 27.12				24.614		K Factor = 5.47

Hyd. Ref. Point	Q a Q t	D i a . " C " P f / F t	F i t t i n g o r E q v . L n .	P i p e F t n g ' s T o t a l	P t P e P f	P t P v P n	***** Notes *****
117 to 122	26.59 26.59	1.049 120.0 0.2204	1 E 2.0 1 T 5.0 0.0	6.330 7.000 13.330	22.542 -0.866 2.938		K Factor = 5.60 Vel = 9.87
122 to 118	27.12 53.71	1.38 0.2129	2 E 6.0 0.0	10.180 6.000 16.180	24.614 0.0 3.444		Vel = 11.52
118 to 119	0.0 53.71	1.38 0.2128	1 T 6.0 0.0	2.580 6.000 8.580	28.058 0.0 1.826		Vel = 11.52
119 to 120	0.0 53.71	1.61 0.1008	0.0 0.0	2.660 0.0 2.660	29.884 1.091 0.268		Vel = 8.46
	0.0 53.71						K Factor = 9.61
115 to 107	98.51 98.51	2.635 120.0 0.0280	0.0 0.0 0.0	12.000 0.0 12.000	29.550 0.0 0.336		Vel = 5.80
107 to 120	110.87 209.38	2.635 120.0 0.1131	0.0 0.0 0.0	12.000 0.0 12.000	29.886 0.0 1.357		Vel = 12.32
120 to 121	53.72 263.1	2.635 0.1724	3 E 24.711 2 T 32.948 0.0	9.330 57.659 66.989	31.243 0.0 11.552		Vel = 15.48
121 to 407	0.0 263.1	2.635 0.1724	0.0 0.0 0.0	4.750 0.0 4.750	42.795 0.0 0.819		Vel = 15.48
407 to 433	0.0 263.1	3.26 120.0 0.0612	2 E 18.815 0.0 0.0	9.580 18.815 28.395	43.614 0.0 1.737		Vel = 10.11
433 to 433 A	0.0 263.1	3.26 120.0 0.0612	1 T 20.159 0.0 0.0	6.330 20.159 26.489	45.351 0.0 1.620		Vel = 10.11
	0.0 263.10						K Factor = 38.39
436 to 446	0.0 0.0	3.26 0.0	0.0 0.0 0.0	4.580 0.0 4.580	46.971 0.0 0.0		Vel = 0
446 to 435	0.0 0.0	3.26 0.0	0.0 0.0 0.0	3.180 0.0 3.180	46.971 0.0 0.0		Vel = 0
435 to 434	0.0 0.0	3.26 0.0	0.0 0.0 0.0	4.850 0.0 4.850	46.971 0.0 0.0		Vel = 0
434 to 433 A	0.0 0.0	3.26 0.0	1 T 20.159 0.0 0.0	2.000 20.159 22.159	46.971 0.0 0.0		Vel = 0
433 A to T W R	263.10 263.1	3.26 0.0612	2 E 18.815 0.0 0.0	40.850 18.815 59.665	46.971 0.0 3.649		Vel = 10.11

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Hyd.	Q a	D ia.	F itting	P ipe	P t	P t			
Ref.		"C"	o r	F tng 's	P e	P v	*****	Notes	*****
Point	Q t	P f/F t	E q v . L n .	T o t a l	P f	P n			
T W R	0.0	3.26	1 T 20.159	11.660	50.620				
to		120.0	1 B 13.44	55.102	8.050			** Fixed Loss = 3	
B W R	263.1	0.0612	1 S 21.503	66.762	4.084			Vel = 10.11	
			1 F s p 0.0						
B W R	0.0	4.26	0.0	2.000	62.754				
to		120.0	0.0	0.0	1.732				
S T U B	263.1	0.0165	0.0	2.000	0.033			Vel = 5.92	
S T U B	0.0	6.16	2 E 40.168	39.000	64.519				
to		140.0	0.0	40.168	0.0				
U G 1	263.1	0.0021	0.0	79.168	0.164			Vel = 2.83	
U G 1	0.0	8.27	1 T 55.354	303.000	64.683				
to		140.0	1 F 14.234	75.914	7.000			** Fixed Loss = 7	
U G 2	263.1	0.0005	1 G 6.326	378.914	0.188			Vel = 1.57	
U G 2	0.0	10.28	1 T 75.336	300.000	71.871				
to		140.0	1 G 7.534	82.870	0.0				
U G 3	263.1	0.0002	0.0	382.870	0.065			Vel = 1.02	
U G 3	0.0	6.16	1 T 43.037	50.000	71.936				
to		140.0	1 G 4.304	47.341	0.0				
T E S T	263.1	0.0021	0.0	97.341	0.202			Vel = 2.83	
	100.00							Q a = 100.00	
	363.10				72.138			K Factor = 42.75	