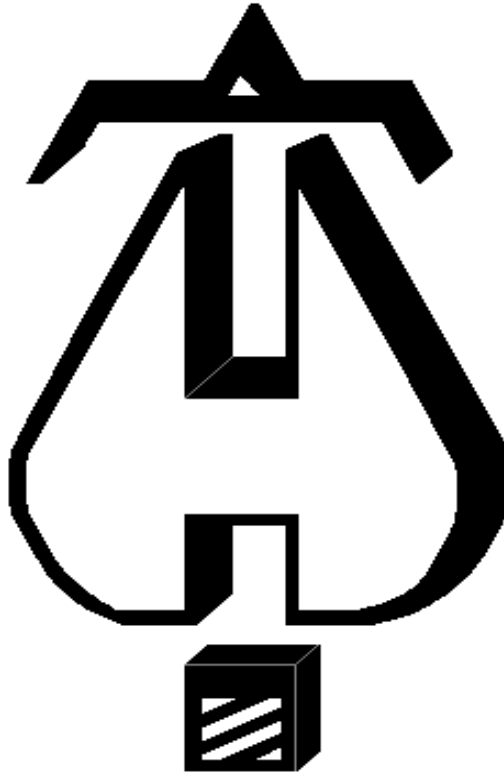




. . . Fire Protection by Computer Design

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

Job Name : TEXAS ROADHOUSE LAKE CITY
Building : KITCHEN
Location : 117 NW KNIGHTS AVE, LAKE CITY, FLORIDA
System : 1, WET
Contract :
Data File : TEXAS ROADHOUSE - AREA 3.WXF

Hydraulic Design Information Sheet

Name - TEXAS ROADHOUSE Date - 02/27/2020
Location - 117 NW KNIGHTS AVE, LAKE CITY, FLORIDA
Building - KITCHEN System No. - 1, WET
Contractor - STAR FIRE SPRINKLER, INC. Contract No. -
Calculated By - Drawing No. - FP-2
Construction: () Combustible () Non-Combustible Ceiling Height - 9'
Occupancy - RESTAURANT

S (X) NFPA 13 () Lt. Haz. Ord. Haz. Gp. (X) 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 - ENTIRE K. System Type Sprinkler/Nozzle
Density - 0.15 (X) Wet Make VIKING
D Area Per Sprinkler - 130 () Dry Model PENDENT
E Elevation at Highest Outlet - 9.66' () 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 - 250
N

Note

Calculation Flow Required - 446.1 Press Required - 43.4 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:

Water Supply Curve C

STAR FIRE SPRINKLERS, INC
TEXAS ROADHOUSE LAKE CITY

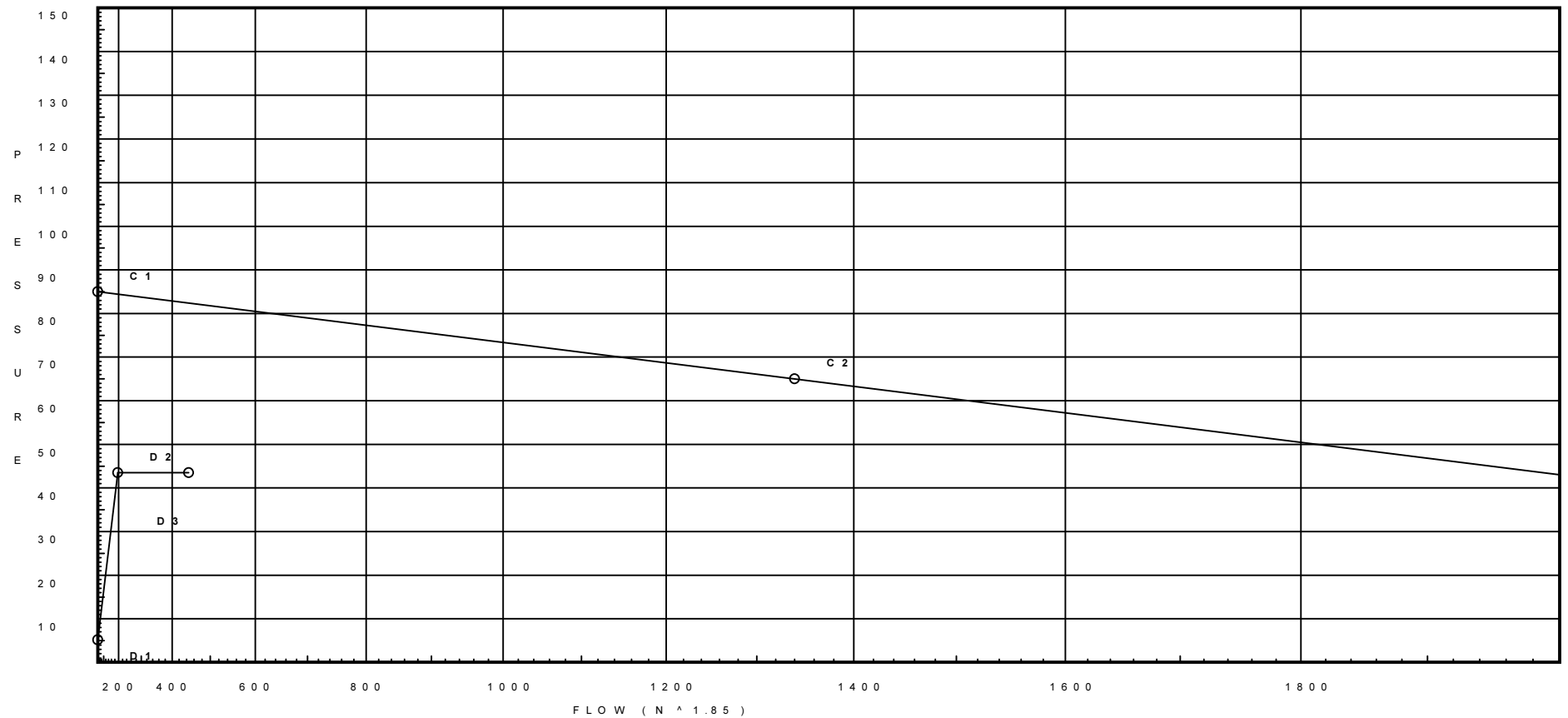
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City Water Supply:

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

Demand:

D 1 - Elevation : 5.197
D 2 - System Flow : 196.117
D 2 - System Pressure : 43.481
Hose (Demand) : 250
D 3 - System Demand : 446.117
Safety Margin : 38.904



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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TEXAS ROADHOUSE LAKE CITY

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Node	Elevation	K-Fact	P t	P n	Flow	Density	Area	Press
No.			Actual		Actual			Req.
D 200	9.0	5.6	12.13	na	19.5	0.15	130	7.0
D 201	9.0	5.6	14.42	na	21.26	0.15	130	7.0
D 202	9.0	5.6	15.36	na	21.95	0.15	130	7.0
D 203	9.0	5.6	16.35	na	22.64	0.15	130	7.0
D 204	9.0	5.6	18.3	na	23.96	0.15	130	7.0
D 205	9.0	5.6	13.31	na	20.43	0.15	130	7.0
D 206	9.0	5.6	14.42	na	21.26	0.15	130	7.0
D 207	9.0	5.6	15.4	na	21.98	0.15	130	7.0
D 208	9.0	5.6	17.06	na	23.13	0.15	130	7.0
412	12.66		12.51	na				
438	12.66		14.12	na				
413	12.66		14.31	na				
439	12.66		15.14	na				
414	12.66		15.48	na				
203	12.66		16.22	na				
415	12.66		17.02	na				
440	12.66		18.33	na				
416	12.66		20.11	na				
401	12.66		13.11	na				
441	12.66		14.12	na				
402	12.66		14.32	na				
442	12.66		15.19	na				
403	12.66		15.53	na				
404	12.66		16.77	na				
208	12.66		16.98	na				
405	12.66		19.05	na				
433	12.66		21.51	na				
434	12.66		21.66	na				
433A	12.66		21.83	na				
TW R	12.66		23.95	na				
BW R	1.0		34.37	na				
STUB	-3.0		36.12	na				
UG 1	-3.0		36.22	na				
UG 2	-3.0		43.33	na				
UG 3	-3.0		43.36	na				
TEST	-3.0		43.48	na	250.0			

The maximum velocity is 13.68 and it occurs in the pipe between nodes 208 and 405

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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 *****
D 2 0 0 to 4 1 2	19.50 19.5	1.049 120.0 0.1242	1 E 2.0 1 T 5.0 0.0	8.850 7.000 15.850	12.125 -1.585 1.968		K Factor = 5.60 Vel = 7.24
	0.0 19.50					12.508	K Factor = 5.51
D 2 0 1 to 4 3 8	21.26 21.26	1.049 120.0 0.1458	1 T 5.0 0.0 0.0	3.850 5.000 8.850	14.418 -1.585 1.290		K Factor = 5.60 Vel = 7.89
	0.0 21.26					14.123	K Factor = 5.66
D 2 0 2 to 4 3 9	21.95 21.95	1.049 120.0 0.1546	1 T 5.0 0.0 0.0	3.850 5.000 8.850	15.362 -1.585 1.368		K Factor = 5.60 Vel = 8.15
	0.0 21.95					15.145	K Factor = 5.64
D 2 0 3 to 2 0 3	22.64 22.64	1.049 120.0 0.1636	1 T 5.0 0.0 0.0	3.850 5.000 8.850	16.352 -1.585 1.448		K Factor = 5.60 Vel = 8.40
	0.0 22.64					16.215	K Factor = 5.62
D 2 0 4 to 4 4 0	23.96 23.96	1.049 120.0 0.1817	1 T 5.0 0.0 0.0	3.850 5.000 8.850	18.304 -1.585 1.608		K Factor = 5.60 Vel = 8.89
	0.0 23.96					18.327	K Factor = 5.60
D 2 0 5 to 4 0 1	20.43 20.43	1.049 120.0 0.1354	1 T 5.0 0.0 0.0	5.180 5.000 10.180	13.314 -1.585 1.378		K Factor = 5.60 Vel = 7.58
	0.0 20.43					13.107	K Factor = 5.64
D 2 0 6 to 4 4 1	21.26 21.26	1.049 120.0 0.1456	1 T 5.0 0.0 0.0	3.850 5.000 8.850	14.418 -1.585 1.289		K Factor = 5.60 Vel = 7.89
	0.0 21.26					14.122	K Factor = 5.66
D 2 0 7 to 4 4 2	21.98 21.98	1.049 120.0 0.1549	1 T 5.0 0.0 0.0	3.850 5.000 8.850	15.402 -1.585 1.371		K Factor = 5.60 Vel = 8.16
	0.0 21.98					15.188	K Factor = 5.64
D 2 0 8 to 2 0 8	23.13 23.13	1.049 120.0 0.1703	1 T 5.0 0.0 0.0	3.850 5.000 8.850	17.056 -1.585 1.507		K Factor = 5.60 Vel = 8.59
	0.0 23.13					16.978	K Factor = 5.61
4 1 2 to 4 3 8	19.50 19.5	1.049 120.0 0.1242	0.0 0.0 0.0	13.000 0.0 13.000	12.508 0.0 1.615		Vel = 7.24

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TEXAS ROADHOUSE LAKE CITY

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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 *****
438 to 413	21.26 40.76	1.38 0.1273	0.0 0.0	1.500 0.0	14.123 0.0		Vel = 8.74
413 to 439	0.0 40.76	1.38 0.1278	0.0 0.0	6.500 0.0	14.314 0.0		Vel = 8.74
439 to 414	21.95 62.71	1.61 0.1336	0.0 0.0	2.500 2.500	15.145 0.334		Vel = 9.88
414 to 203	0.0 62.71	1.61 0.1338	0.0 0.0	5.500 5.500	15.479 0.736		Vel = 9.88
203 to 415	22.65 85.36	1.61 0.2368	0.0 0.0	3.420 3.420	16.215 0.810		Vel = 13.45
415 to 440	0.0 85.36	1.61 0.2367	0.0 0.0	5.500 5.500	17.025 1.302		Vel = 13.45
440 to 416	23.96 109.32	2.067 0.1108	2 E 10.0 0.0	6.080 10.000	18.327 0.0		Vel = 10.45
416 to 433	0.0 109.32	2.067 0.1108	1 T 10.0 0.0	2.660 10.000	20.108 0.0		Vel = 10.45
	0.0 109.32				21.511		K Factor = 23.57
401 to 441	20.43 20.43	1.049 0.1353	0.0 0.0	7.500 7.500	13.107 1.015		Vel = 7.58
441 to 402	21.27 41.7	1.38 0.1333	0.0 0.0	1.500 1.500	14.122 0.200		Vel = 8.94
402 to 442	0.0 41.7	1.38 0.1332	0.0 0.0	6.500 6.500	14.322 0.866		Vel = 8.94
442 to 403	21.97 63.67	1.61 0.1376	0.0 0.0	2.500 2.500	15.188 0.344		Vel = 10.03
403 to 404	0.0 63.67	1.61 0.1377	0.0 0.0	9.000 9.000	15.532 1.239		Vel = 10.03
404 to 208	0.0 63.67	1.61 0.1380	0.0 0.0	1.500 1.500	16.771 0.207		Vel = 10.03
208 to 405	23.13 86.8	1.61 0.2441	0.0 0.0	8.500 8.500	16.978 2.075		Vel = 13.68
405 to 434	0.0 86.8	1.61 0.2442	1 T 8.0 0.0	2.660 10.660	19.053 2.603		Vel = 13.68

STAR FIRE SPRINKLERS, INC
TEXAS ROADHOUSE LAKE CITY

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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 *****
	0.0						
	86.80				21.656		K Factor = 18.65
433	109.32	3.26	1 T	20.159	6.330	21.511	
to		120.0		0.0	20.159	0.0	
433 A	109.32	0.0120		0.0	26.489	0.319	Vel = 4.20
	0.0						
	109.32				21.830		K Factor = 23.40
434	86.80	3.26	1 T	20.159	2.000	21.656	
to		120.0		0.0	20.159	0.0	
433 A	86.8	0.0079		0.0	22.159	0.174	Vel = 3.34
433 A	109.32	3.26	2 E	18.815	40.850	21.830	
to		120.0		0.0	18.815	0.0	
T W R	196.12	0.0355		0.0	59.665	2.119	Vel = 7.54
T W R	0.0	3.26	1 T	20.159	11.660	23.949	
to		120.0	1 B	13.44	55.102	8.050	* * Fixed Loss = 3
B W R	196.12	0.0355	1 S	21.503	66.762	2.371	Vel = 7.54
			1 F s p	0.0			
B W R	0.0	4.26		0.0	2.000	34.370	
to		120.0		0.0	0.0	1.732	
S T U B	196.12	0.0100		0.0	2.000	0.020	Vel = 4.41
S T U B	0.0	6.16	2 E	40.168	39.000	36.122	
to		140.0		0.0	40.168	0.0	
U G 1	196.12	0.0012		0.0	79.168	0.095	Vel = 2.11
U G 1	0.0	8.27	1 T	55.354	303.000	36.217	
to		140.0	1 F	14.234	75.914	7.000	* * Fixed Loss = 7
U G 2	196.12	0.0003	1 G	6.326	378.914	0.109	Vel = 1.17
U G 2	0.0	10.28	1 T	75.336	300.000	43.326	
to		140.0	1 G	7.534	82.870	0.0	
U G 3	196.12	0.0001		0.0	382.870	0.038	Vel = 0.76
U G 3	0.0	6.16	1 T	43.037	50.000	43.364	
to		140.0	1 G	4.304	47.341	0.0	
T E S T	196.12	0.0012		0.0	97.341	0.117	Vel = 2.11
	250.00						Q a = 250.00
	446.12				43.481		K Factor = 67.66