Hydraulic Calculations by HydraCALC

SUMMERS FIRE SPRINKLERS, INC
751 PARK OF COMMERCE DR, #100
BOCA RATON, FL 33487
MICHELLE MEISEL, P.E. #45316
561-393-6718

Job Name	:	Bldg#1 UNIT A Fire Plans-cALAC
Drawing	:	BLDG 1
Location	:	117 SOUTH RIVERSIDE DRIVE, POMPANO BEACH FL
Remote Area	:	UNIT B
Contract	:	BC922
Data File	:	Bldg#1 UNIT A Fire Plans-cALAC Area 2.WXF

DRC

PZ21-12000029
12/01/2021

Computer Programs by Hydratec Inc. Revision: 50.54.4

HYDRAULIC DESIGN INFORMATION SHEET

Name - RIVERSIDE TOWNHOUSE Date - 10/23/21
Location - 117 SOUTH RIVERSIDE DRIVE, POMPANO BEACH FL
Building - BLDG 1 System No. - UNIT B
Contractor - SUMMERS FIRE SPRINKLERS, INC Contract No. - BC922
Calculated By - CD Drawing No. - FP-2
Construction: ( ) Combustible ( ) Non-Combustible Ceiling Height
OCCUPANCY - 13R

SYSTEM DESIGN

Type of Calculation: (X)NFPA 13 Residential ( )NFPA 13R (X)NFPA 13D
Number of Sprinklers Flowing: ( )1 (X)2 ( )4 ( )
( )Other
( )Specific Ruling Made by Date

Listed Flow at Start Point - Gpm System Type
Listed Pres. at Start Point - Psi (X) Wet ( ) Dry
MAXIMUM LISTED SPACING 16 x 16 ( ) Deluge ( ) PreAction
Domestic Flow Added - Gpm Sprinkler or Nozzle
Additional Flow Added - Gpm Make TYCO Model TY3596
Elevation at Highest Outlet - Feet Size 1/2" K-Factor 4.9
Note: Temperature Rating 155

Calculation Summary: Gpm Required 3098 Psi Required 66.69 At Test
C-Factor Used: Overhead 150 Underground 140

WATER SUPPLY

Water Flow Test:		Pump Data:	Tank or Reservoir:
Date of Test	- 10/22/21	Rated Cap.	Cap.
Time of Test	- 9:15 AM	@ Psi	Elev.
Static (Psi)	- 80	Elev.	
Residual (Psi)	- 77	Other	Well
Flow (Gpm)	- 1306		Proof Flow Gpm
Elevation	- 2.5		

Location:

Source of Information:

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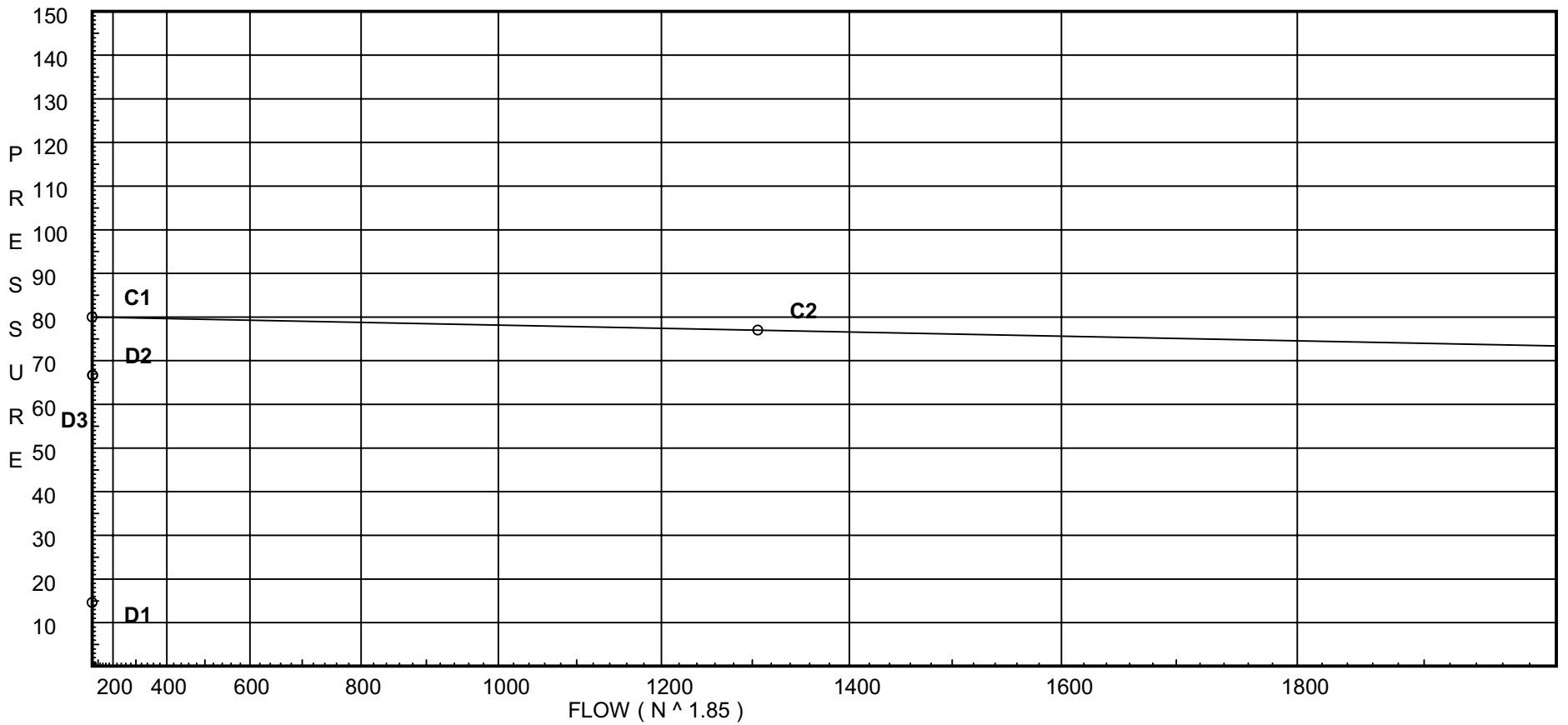
Water Supply Curve

SUMMERS FIRE SPRINKLERS, INC
Bldg#1 UNIT A Fire Plans-cALAC

City Water Supply:
- C1 - Static Pressure : 80
- C2 - Residual Pressure: 77
- C2 - Residual Flow : 1306

Demand:
- D1 - Elevation : 14.617
- D2 - System Flow : 25.987
- D2 - System Pressure : 66.696
- Hose (Demand) : 5
- D3 - System Demand : 30.987
- Safety Margin : 13.301



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Fittings Used Summary

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
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
Zaa	Ames 2000B	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.

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
DP01	35.25	4.9	7.0	na	12.96	0.05	94	7.0
EQ01	36.25		6.71	na				
DP02	35.25	4.9	7.0	na	12.96	0.05	210	7.0
EQ02	36.25		6.71	na				
S4	36.25	K = K @ EQ01	6.71	na	12.96			
B13	36.25		6.89	na				
B12	36.25		7.09	na				
B11	36.25		7.52	na				
B10	36.25		8.59	na				
B9	36.25		8.67	na				
B8	36.25		10.51	na				
B7	25.0		16.63	na				
B6	25.0		17.59	na				
B5	25.0		18.12	na				
B4	13.0		24.64	na				
B3	13.0		26.4	na				
B2	13.0		27.63	na				
B1	13.0		29.49	na				
1	13.0		32.98	na				
2	-2.0		46.02	na				
U11	-2.0		47.2	na				
U10	-2.0		62.08	na				
U9	-2.0		66.33	na				
U8	-2.0		67.48	na				
U2	-2.0		68.64	na				
TEST	2.5		66.7	na	5.0			
S3	36.25	K = K @ EQ02	6.77	na	13.02			

The maximum velocity is 8.82 and it occurs in the pipe between nodes B1 and 1

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 ******
DP01	35.25	4.90	12.96	1	E	3.825	1.000	150	7.000	
to							3.825		-0.433	
EQ01	36.25		12.96	1.101			4.825	0.0305	0.147	Vel = 4.37
			0.0							
EQ01			12.96						6.714	K Factor = 5.00
DP02	35.25	4.90	12.96	1	E	3.825	1.000	150	7.000	
to							3.825		-0.433	
EQ02	36.25		12.96	1.101			4.825	0.0305	0.147	Vel = 4.37
			0.0							
EQ02			12.96						6.714	K Factor = 5.00
S4	36.25	5.0	12.96	1			5.830	150	6.714	K = K @ EQ01
to									0.0	
B13	36.25		12.96	1.101			5.830	0.0305	0.178	Vel = 4.37
B13	36.25		0.0	1	E	3.825	2.740	150	6.892	
to							3.825		0.0	
B12	36.25		12.96	1.101			6.565	0.0305	0.200	Vel = 4.37
B12	36.25		13.03	1			3.880	150	7.092	
to									0.0	
B11	36.25		25.99	1.101			3.880	0.1106	0.429	Vel = 8.76
B11	36.25		0.0	1			9.700	150	7.521	
to									0.0	
B10	36.25		25.99	1.101			9.700	0.1104	1.071	Vel = 8.76
B10	36.25		0.0	1			0.720	150	8.592	
to									0.0	
B9	36.25		25.99	1.101			0.720	0.1111	0.080	Vel = 8.76
B9	36.25		0.0	1	T	9.563	3.300	150	8.672	
to					E	3.825	13.387		0.0	
B8	36.25		25.99	1.101			16.687	0.1104	1.843	Vel = 8.76
B8	36.25		0.0	1			11.250	150	10.515	
to									4.872	
B7	25		25.99	1.101			11.250	0.1105	1.243	Vel = 8.76
B7	25		0.0	1	2E	7.65	1.000	150	16.630	
to							7.650		0.0	
B6	25		25.99	1.101			8.650	0.1104	0.955	Vel = 8.76
B6	25		0.0	1	E	3.825	1.000	150	17.585	
to							3.825		0.0	
B5	25		25.99	1.101			4.825	0.1105	0.533	Vel = 8.76
B5	25		0.0	1			12.000	150	18.118	
to									5.197	
B4	13		25.99	1.101			12.000	0.1105	1.326	Vel = 8.76
B4	13		0.0	1	E	3.825	2.500	150	24.641	
to					T	9.563	13.387		0.0	
B3	13		25.99	1.101			15.887	0.1104	1.754	Vel = 8.76
B3	13		0.0	1			7.380	120	26.395	
to									0.0	
B2	13		25.99	1.101			7.380	0.1669	1.232	Vel = 8.76
B2	13		0.0	1	E	3.825	13.060	150	27.627	
to							3.825		0.0	
B1	13		25.99	1.101			16.885	0.1105	1.865	Vel = 8.76

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 ******
B1	13		0.0	1	2E	4.974	15.530	120	29.492	
to							4.974		0.0	
1	13		25.99	1.097			20.504	0.1699	3.483	Vel = 8.82
1	13		0.0	1	Zaa	0.0	15.000	120	32.975	
to									10.496	* * Fixed Loss = 4
2	-2		25.99	1.097			15.000	0.1699	2.549	Vel = 8.82
2	-2		0.0	1	2E	4.974	1.970	120	46.020	
to							4.974		0.0	
U11	-2		25.99	1.097			6.944	0.1698	1.179	Vel = 8.82
U11	-2		0.0	1	3E	9.923	106.570	140	47.199	
to							9.923		0.0	
U10	-2		25.99	1.097			116.493	0.1277	14.880	Vel = 8.82
U10	-2		0.0	1			1.980	140	62.079	
to									4.000	* * Fixed Loss = 4
U9	-2		25.99	1.097			1.980	0.1278	0.253	Vel = 8.82
U9	-2		0.0	1	T	8.269	0.700	140	66.332	
to							8.269		0.0	
U8	-2		25.99	1.097			8.969	0.1278	1.146	Vel = 8.82
U8	-2		0.0	1	T	8.269	0.830	140	67.478	
to							8.269		0.0	
U2	-2		25.99	1.097			9.099	0.1277	1.162	Vel = 8.82
U2	-2		0.0	4			26.620	140	68.640	
to									-1.949	
TEST	2.500		25.99	4.1			26.620	0.0002	0.005	Vel = 0.63
			5.00							Qa = 5.00
TEST			30.99						66.696	K Factor = 3.79
S3	36.25	5.0	13.02	1	T	6.328	0.500	120	6.775	K = K @ EQ02
to							6.328		0.0	
B12	36.25		13.02	1.101			6.828	0.0464	0.317	Vel = 4.39
			0.0							
B12			13.02						7.092	K Factor = 4.89