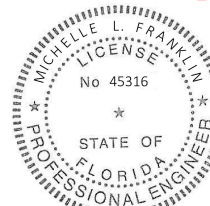


Hydraulic Analysis by HydraCALC

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1/27/2022

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



Digitally
signed by
Michelle L.
Franklin
Date:
2022.01.26
20:00:16[®]
-05'00'

Job Name : Bldg#2 Fire Plans-rev-calc
Drawing : 2
Location : 117 SOUTH RIVERSIDE DRIVE, POMPAÑO BEACH FL
Remote Area : F
Contract : BC922
Data File : Bldg#2 Fire Plans-rev-calc Area 6.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - RIVERSIDE TOWNHOME Date - 1/2022
Location - 117 SOUTH RIVERSIDE DRIVE, POMPANO BEACH FL
Building - 2 System No. - F
Contractor - SUMMERS FIRE SPRINKLERS,, INC Contract No. - BC922
Calculated By - CD Drawing No. - FP-2
Construction: () Combustible () Non-Combustible Ceiling Height
OCCUPANCY -

S Type of Calculation: () NFPA 13 Residential (X) NFPA 13R () NFPA 13D
Y Number of Sprinklers Flowing: () 1 () 2 (X) 4 ()
S () Other
T () Specific Ruling Made by Date
E
M Listed Flow at Start Point - Gpm System Type
Listed Pres. at Start Point - Psi (X) Wet () Dry
D MAXIMUM LISTED SPACING 16 x 16 () Deluge () PreAction
E Domestic Flow Added - Gpm Sprinkler or Nozzle
S Additional Flow Added - Gpm Make TYCO Model LF II
I Elevation at Highest Outlet - Feet Size 1/2" K-Factor 4.9
G Note: Temperature Rating 175
N

Calculation Gpm Required 59.260 At Test
Summary C-Factor Used: Underground 140

W Water Flow Test:
A Date of Test -
T Time of Test -
E Static (Psi) - 80
R Residual (Psi) - 77
Flow (Gpm) - 1306
S Elevation - 2.6
P Location:
P
L Source of Information:
Y

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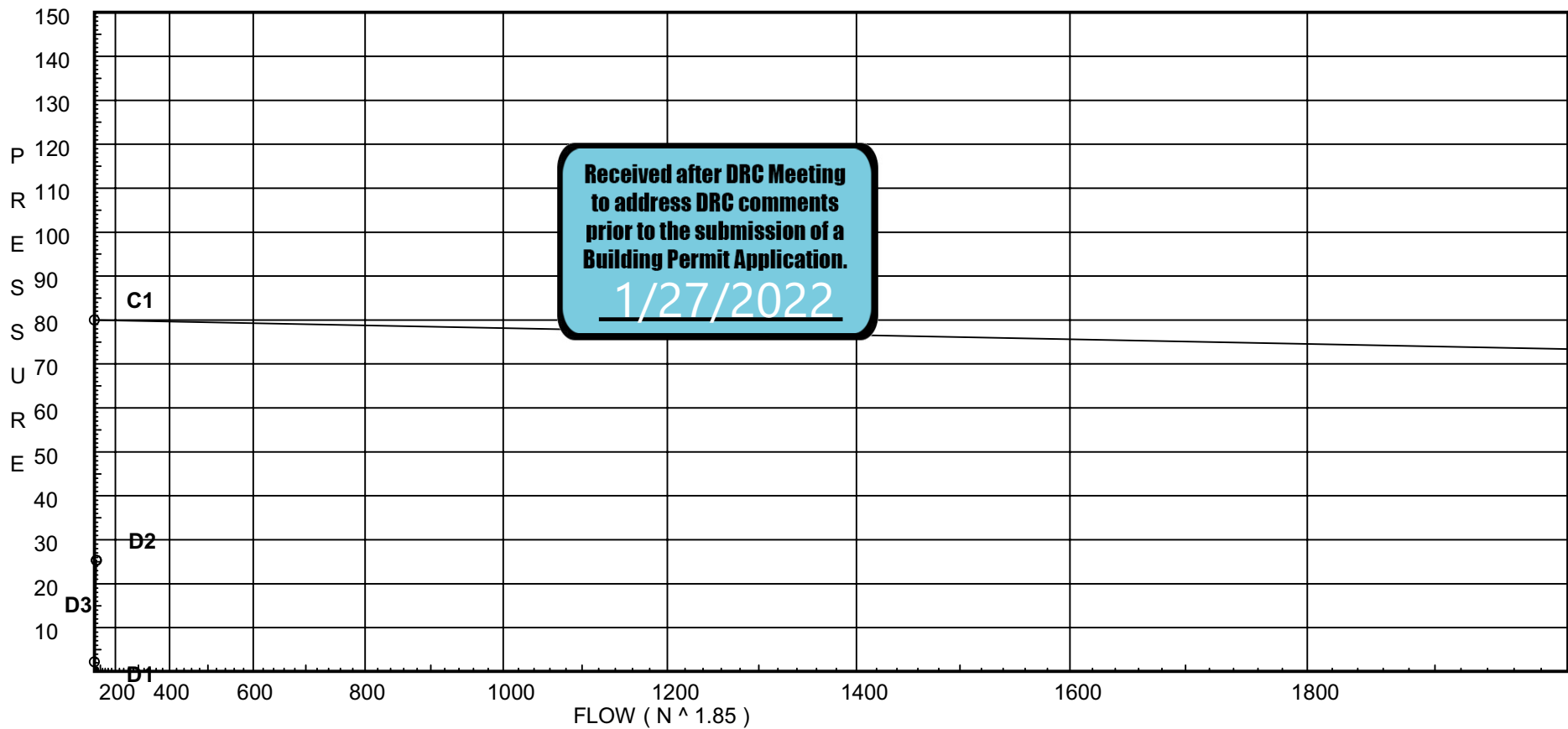
Water Supply Curve

SUMMERS FIRE SPRINKLERS, INC
Bldg#2 Fire Plans-rev-calc

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Date

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

Demand:
D1 - Elevation : 2.196
D2 - System Flow : 54.26
D2 - System Pressure : 25.272
Hose (Demand) : 5
D3 - System Demand : 59.26
Safety Margin : 54.718



Fittings Used Summary

SUMMERS FIRE SPRINKLERS, INC
Bldg#2 Fire Plans-rev-calc

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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
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
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
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
Zaf	Ames 3000SS	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 Foot

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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.

Pressure / Flow Summary - STANDARD

SUMMERS FIRE SPRINKLERS, INC
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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
39	7.67	4.9	7.0	na	12.96	0.05	176	7.0
S21	8.5		6.78	na				
S22	8.5		7.09	na				
40	8.5		8.12	na				
41	8.5		8.89	na				
TOB6	8.5		10.21	na				
BOR6	-1.5		19.95	na				
U22	-1.5		19.98	na				
U21	-2.5		20.59	na				
U13	-2.5		21.47	na				
U10	-2.5		21.51	na				
U9	-2.5		21.51	na				
U6	-2.5		21.52	na				
U5	-2.5		21.56	na				
U4	-2.5		21.59	na				
BK4	-2.5		21.61	na				
BK3	1.5		25.54	na				
BK2	1.5		25.58	na				
BK1	-2.5		27.33	na				
U3	-2.5		27.34	na				
U2	-2.5		27.36	na				
U1	-2.5		27.41	na				
6	-2.5		27.44	na				
7	-2.5		27.44	na				
TEST	2.6		25.27	na	5.0			
42	7.67	4.9			13.08	0.05	160	7.0
43	7.67	4.9			13.8	0.05	160	7.0
S23	8.5							
44	7.67	4.9			14.42	0.05	167	7.0
S24	8.5							

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The maximum velocity is 11.41 and it occurs in the pipe between nodes 41 and TOB6

Final Calculations : Hazen-Williams

SUMMERS FIRE SPRINKLERS, INC
Bldg#2 Fire Plans-rev-calc

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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	*****
39 to S21	7.67 8.5	4.90	12.96 12.96	1 1.101	E	3.825 3.825 4.655	150 0.0305	7.000 -0.359 0.142			
S21 to S22	8.5 8.5		0.0 12.96	1 1.101		10.000 10.000	150 0.0305	6.783 0.0 0.305	Vel = 4.37		
S22 to 40	8.5 8.5		13.08 26.04	1.25 1.394	2E	9.523 19.790 9.523 29.313	150 0.0351	7.088 0.0 1.030	Vel = 5.47		
40 to 41	8.5 8.5		13.80 39.84	1.25 1.394		10.000 10.000	150 0.0772	8.118 0.0 0.772	Vel = 8.37		
41 to TOB6	8.5 8.5		14.42 54.26	1.25 1.394	E	4.762 4.920 4.761 9.681	150 0.1366	8.890 0.0 1.322	Vel = 11.41		
TOB6 to BOR6	8.5 -1.5		0.0 54.26	1.25 1.44	E Esp	3.716 10.000 0.0 3.716	120 0.1751	10.212 7.331 2.402	** Fixed Loss = 3 Vel = 10.66		
BOR6 to U22	-1.5 -1.5		0.0 54.26	2 2.15			120 0.0243	19.945 0.0 0.037	Vel = 4.76		
U22 to U21	-1.5 -2.5		0.0 54.26	2 2.15			120 0.0247	19.982 0.433 0.177	Vel = 4.76		
U21 to U13	-2.5 -2.5		0.0 54.26	2 2.157	2E T	12.307 12.307 24.614 35.454	120 0.0246	20.592 0.0 0.873	Vel = 4.76		
U13 to U10	-2.5 -2.5		0.0 54.26	4 4.1		39.360 39.360	120 0.0011	21.465 0.0 0.043	Vel = 1.32		
U10 to U9	-2.5 -2.5		0.0 54.26	4 4.1		1.280 1.280	120 0.0008	21.508 0.0 0.001	Vel = 1.32		
U9 to U6	-2.5 -2.5		0.0 54.26	4 4.1		7.700 7.700	120 0.0012	21.509 0.0 0.009	Vel = 1.32		
U6 to U5	-2.5 -2.5		0.0 54.26	4 4.1	E	10.928 24.150 10.928 35.078	120 0.0011	21.518 0.0 0.037	Vel = 1.32		
U5 to U4	-2.5 -2.5		0.0 54.26	4 4.1		33.860 33.860	120 0.0011	21.555 0.0 0.037	Vel = 1.32		
U4 to BK4	-2.5 -2.5		0.0 54.26	4 4.1	E	10.928 6.510 10.928 17.438	120 0.0011	21.592 0.0 0.019	Vel = 1.32		
BK4 to BK3	-2.5 1.5		0.0 54.26	4 4.1	Zaf	0.0 4.000 4.000	120 0.0010	21.611 3.927 0.004	** Fixed Loss = 5.659 Vel = 1.32		

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Bldg#2 Fire Plans-rev-calc

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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	*****
BK3 to BK2	1.5 1.5		0.0 54.26	4 4.1	2E	21.855 21.855 35.015	120 0.0011	25.542 0.0 0.038		Vel = 1.32	
BK2 to BK1	1.5 -2.5		0.0 54.26	4 4.1	E	10.928 10.928 14.928	120 0.0011	25.580 1.732 0.016		Vel = 1.32	
BK1 to U3	-2.5 -2.5		0.0 54.26	4 4.1	E	14.534 14.534 19.914	140 0.0008	27.328 0.0 0.016		Vel = 1.32	
U3 to U2	-2.5 -2.5		0.0 54.26	4 4.1	E	14.534 14.534 18.344	140 0.0008	27.344 0.0 0.015		Vel = 1.32	
U2 to U1	-2.5 -2.5		0.0 54.26	4 4.1	T	29.067 29.067 61.257	140 0.0008	27.359 0.0 0.050		Vel = 1.32	
U1 to 6	-2.5 -2.5		0.0 54.26	4 4.1	2E	29.067 29.067 30.067	140 0.0008	27.409 0.0 0.034		Vel = 1.32	
6 to 7	-2.5 -2.5		0.0 54.26	4 4.1			140 0.0008	27.443 0.0 0.001		Vel = 1.32	
7 to TEST	-2.5 2.600		0.0 54.26	4 4.1			140 0.0008	27.444 -2.209 0.037		Vel = 1.32	
TEST			5.00 59.26					25.272		Qa = 5.00 K Factor = 11.79	
42 to S22	7.67 8.5	4.90	13.08	1 1.101	T	9.563 0.830 9.562 10.392	150 0.0310	7.125 -0.359 0.322		Vel = 4.41	
S22			0.0 13.08					7.088		K Factor = 4.91	
43 to S23	7.67 8.5	4.90	13.80	1 1.101	E	3.825 0.830 3.825 4.655	150 0.0342	7.931 -0.359 0.159		Vel = 4.65	
S23 to 40	8.5 8.5		0.0 13.8	1 1.101	T	9.563 1.730 9.562 11.292	150 0.0343	7.731 0.0 0.387		Vel = 4.65	
40			0.0 13.80					8.118		K Factor = 4.84	
44 to S24	7.67 8.5	4.90	14.42	1 1.101	E	3.825 0.830 3.825 4.655	150 0.0369	8.657 -0.359 0.172		Vel = 4.86	
S24 to 41	8.5 8.5		0.0 14.42	1 1.101	T	9.563 1.730 9.562 11.292	150 0.0372	8.470 0.0 0.420		Vel = 4.86	
41			0.0 14.42					8.890		K Factor = 4.84	

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Node1	Elev1	K	Qa	Nom	Fitting or	Pipe	CFact	Pt			
to						Ftns		Pe	*****	Notes	*****
Node2	Elev2	Fact	Qt	Act	Equiv	Len	Pf/Ft	Pf			

