

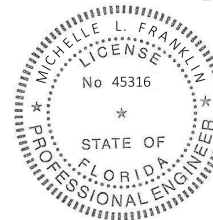


Hydraulic Analysis by HydraCALC

**Received after DRC Meeting  
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Building Permit Application.**

**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  
19:43:37  
-05'00'

Job Name : Bldg#1 UNIT C Fire Plans-rev-calc  
Drawing : 1  
Location : 117 SOUTH RIVERSIDE DRIVE, POMPANO BEACH FLORIDA  
Remote Area : C  
Contract : BC922  
Data File : Bldg#2 UNIT E Fire Plans-rev-calc Area 3.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - RIVERSIDE TOWNHOMES Date - 1/2022  
Location - 117 SOUTH RIVERSIDE DRIVE, POMPANO BEACH FLORIDA  
Building - 1 System No. - C  
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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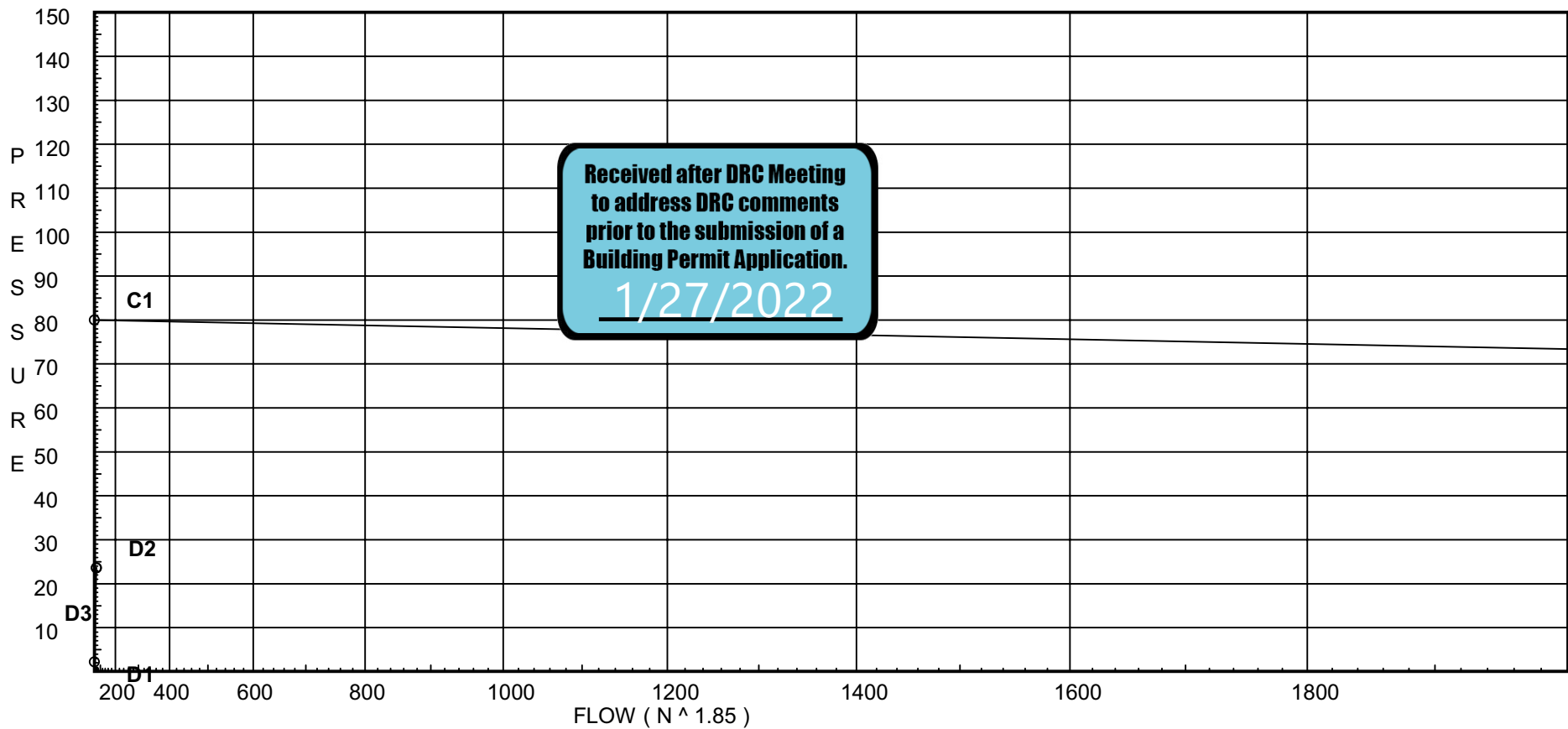
# Water Supply Curve

SUMMERS FIRE SPRINKLERS, INC  
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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 : 23.588  
Hose ( Demand ) : 5  
D3 - System Demand : 59.26  
Safety Margin : 56.402



## Fittings Used Summary

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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

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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.
21	7.67	4.9	7.0	na	12.96	0.05	176	7.0
S12	8.5		6.78	na				
S11	8.5		7.09	na				
22	8.5		8.1	na				
23	8.5		8.87	na				
TOR3	8.5		10.14	na				
BOR3	-1.5		17.71	na				
3	-1.5		18.06	na				
U16	-2.5		18.52	na				
U15	-2.5		18.69	na				
U14	-2.5		19.78	na				
U13	-2.5		19.78	na				
U10	-2.5		19.82	na				
U9	-2.5		19.82	na				
U6	-2.5		19.83	na				
U5	-2.5		19.87	na				
U4	-2.5		19.91	na				
BK4	-2.5		19.93	na				
BK3	1.5		23.86	na				
BK2	1.5		23.9	na				
BK1	-2.5		25.64	na				
U3	-2.5		25.66	na				
U2	-2.5		25.67	na				
U1	-2.5		25.72	na				
6	-2.5		25.76	na				
7	-2.5							
TEST	2.6				5.0			
24	7.67	4.9			13.08	0.05	160	7.0
25	7.67	4.9			13.8	0.05	160	7.0
S10	8.5							
26	7.67	4.9			14.42	0.05	171	7.0
S9	8.5							

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The maximum velocity is 11.41 and it occurs in the pipe between nodes 23 and TOR3

# Final Calculations : Hazen-Williams

SUMMERS FIRE SPRINKLERS, INC  
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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	*****
21 to S12	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			
S12 to S11	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		
S11 to 22	8.5 8.5		13.08 26.04	1.25 1.394	2E	9.523 9.523 28.753	150 0.0351	7.088 0.0 1.010	Vel = 5.47		
22 to 23	8.5 8.5		13.80 39.84	1.25 1.394		10.000 10.000	150 0.0772	8.098 0.0 0.772	Vel = 8.37		
23 to TOR3	8.5 8.5		14.42 54.26	1.25 1.394	E	4.762 4.500 4.761 9.261	150 0.1366	8.870 0.0 1.265	Vel = 11.41		
TOR3 to BOR3	8.5 -1.5		0.0 54.26	2 2.15	Fsp	0.0 10.000	120 0.0247	10.135 7.331 0.247	* * Fixed Loss = 3 Vel = 4.76		
BOR3 to 3	-1.5 -1.5		0.0 54.26	2 2.15			120 0.0246	17.713 0.0 0.346	Vel = 4.76		
3 to U16	-1.5 -2.5		0.0 54.26	2 2.15			120 0.0250	18.059 0.433 0.025	Vel = 4.76		
U16 to U15	-2.5 -2.5		0.0 54.26	2 2.157	E	6.153 0.880 6.153 7.033	120 0.0246	18.517 0.0 0.173	Vel = 4.76		
U15 to U14	-2.5 -2.5		0.0 54.26	2 2.157	E T	6.153 25.730 12.307 18.460 44.190	120 0.0246	18.690 0.0 1.089	Vel = 4.76		
U14 to U13	-2.5 -2.5		0.0 54.26	4 4.1		1.870 1.870	120 0.0011	19.779 0.0 0.002	Vel = 1.32		
U13 to U10	-2.5 -2.5		0.0 54.26	4 4.1		39.360 39.360	120 0.0011	19.781 0.0 0.042	Vel = 1.32		
U10 to U9	-2.5 -2.5		0.0 54.26	4 4.1		1.280 1.280	120 0.0016	19.823 0.0 0.002	Vel = 1.32		
U9 to U6	-2.5 -2.5		0.0 54.26	4 4.1		7.700 7.700	120 0.0010	19.825 0.0 0.008	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	19.833 0.0 0.038	Vel = 1.32		
U5 to U4	-2.5 -2.5		0.0 54.26	4 4.1		33.860 33.860	120 0.0011	19.871 0.0 0.036	Vel = 1.32		

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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	*****
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	19.907 0.0 0.019			
BK4 to BK3	-2.5 1.5		0.0 54.26	4 4.1	Zaf	0.0	4.000 4.000	120 0.0010	19.926 3.927 0.004		* * Fixed Loss = 5.659	
BK3 to BK2	1.5 1.5		0.0 54.26	4 4.1	2E	21.855	13.160 21.855 35.015	120 0.0011	23.857 0.0 0.038			
BK2 to BK1	1.5 -2.5		0.0 54.26	4 4.1	E	10.928	4.000 10.928 14.928	120 0.0011	23.895 1.732 0.017			
BK1 to U3	-2.5 -2.5		0.0 54.26	4 4.1	E	14.534	5.380 14.534 19.914	140 0.0008	25.644 0.0 0.016			
U3 to U2	-2.5 -2.5		0.0 54.26	4 4.1	E	14.534	3.810 44.534	140 0.0008	25.660 0.0 0.015			
U2 to U1	-2.5 -2.5		0.0 54.26	4 4.1				140 0.0008	25.675 0.0 0.049			
U1 to 6	-2.5 -2.5		0.0 54.26	4 4.1				140 0.0008	25.724 0.0 0.035			
6 to 7	-2.5 -2.5		0.0 54.26	4 4.1			1.260 1.260	140 0.0008	25.759 0.0 0.001			
7 to TEST	-2.5 2.600		0.0 54.26	4 4.1	T	29.067	16.410 29.067 45.477	140 0.0008	25.760 -2.209 0.037			
TEST			5.00 59.26						23.588		Qa = 5.00 K Factor = 12.20	
24 to S11	7.67 8.5	4.90	13.08 13.08	1 1.101	T	9.563	0.830 9.562 10.392	150 0.0310	7.125 -0.359 0.322			
S11			0.0 13.08						7.088		K Factor = 4.91	
25 to S10	7.67 8.5	4.90	13.80 13.8	1 1.101	E	3.825	0.830 3.825 4.655	150 0.0342	7.931 -0.359 0.159			
S10 to 22	8.5 8.5		0.0 13.8	1 1.101	T	9.563	1.170 9.562 10.732	150 0.0342	7.731 0.0 0.367			
22			0.0 13.80						8.098		K Factor = 4.85	
26 to S9	7.67 8.5	4.90	14.42 14.42	1 1.101	E	3.825	0.830 3.825 4.655	150 0.0369	8.658 -0.359 0.172			

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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	*****
S9 to 23	8.5 8.5		0.0 14.42	1 1.101	T	9.563 9.562 10.732	150 0.0372	8.471 0.0 0.399		Vel = 4.86	
23			0.0 14.42					8.870		K Factor = 4.84	

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