

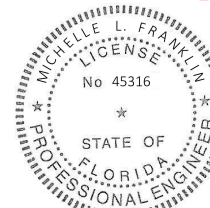


Hydraulic Analysis by HydraCALC

**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  
19:44:10<sup>®</sup>  
-05'00'

Job Name : Bldg#2 LEVEL 2-rev-calc  
Drawing : 1  
Location : 117 SOUTH RIVERSIDE DRIVE, POMPAÑO BEACH FL  
Remote Area : C LEVEL 2  
Contract : BC955  
Data File : Bldg#2 LEVEL 2-rev-calc Area 3.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - RIVERSIDE TOWNHOMES Date - 1/2022  
Location - 117 SOUTH RIVERSIDE DRIVE, POMPANO BEACH FL  
Building - 1 System No. - C LEVEL 2  
Contractor - SUMMERS FIRE SPRINKLERS, INC Contract No. - BC955  
Calculated By - CD Drawing No. - FP-2  
Construction: ( ) Combustible ( ) Non-Combustible Ceiling Height  
OCCUPANCY -

S Type of Calculation: (X)NFPA 13 Residential ( )NFPA 13R (X)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 LFII  
I Elevation at Highest Outlet - Feet Size 1/2" K-Factor 4.9  
G Note: Temperature Rating 175  
N

Calculation Gpm Required 64.905 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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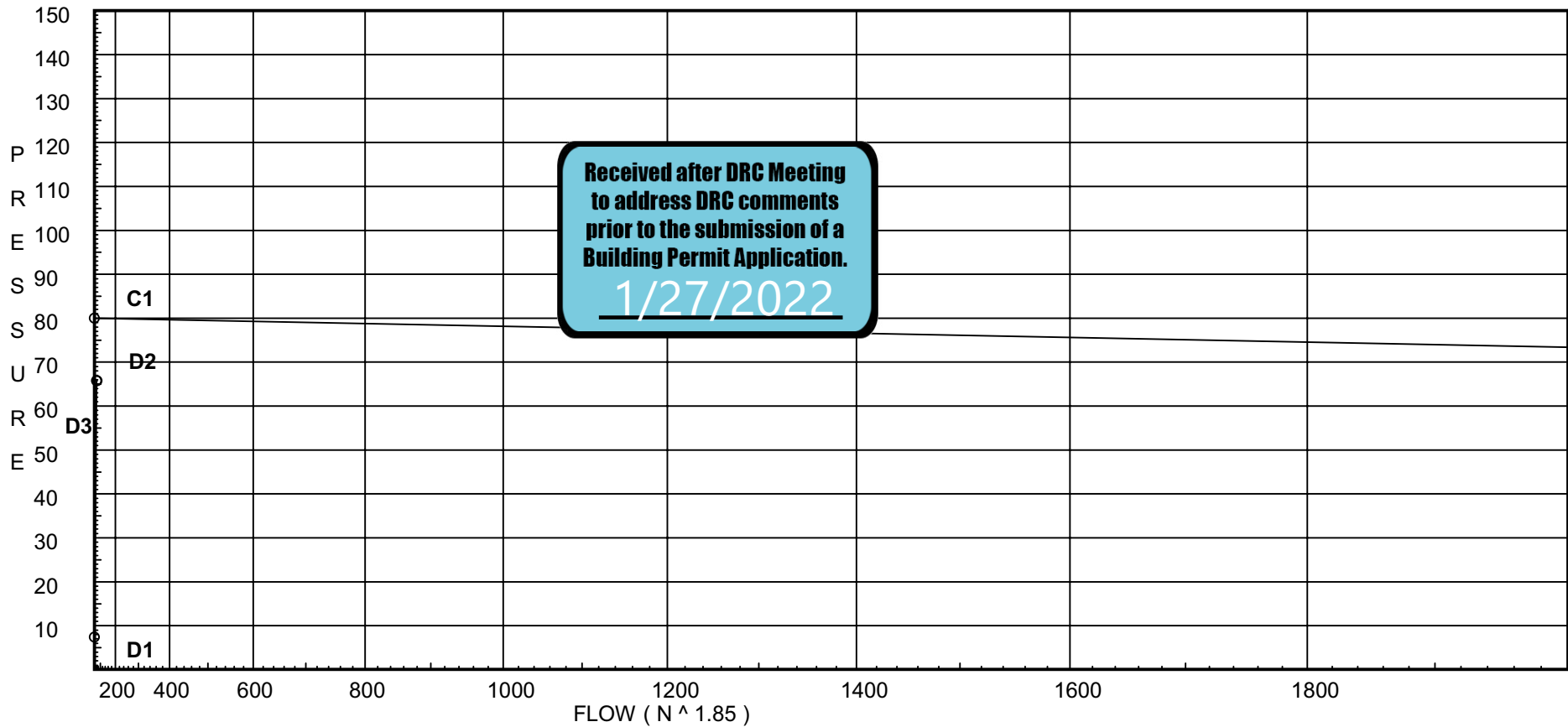
# Water Supply Curve

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 : 7.393  
D2 - System Flow : 59.905  
D2 - System Pressure : 65.725  
Hose ( Demand ) : 5  
D3 - System Demand : 64.905  
Safety Margin : 14.263



## Fittings Used Summary

SUMMERS FIRE SPRINKLERS, INC  
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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

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
26	19.67	4.9	7.6	na	13.51	0.05	156	7.6
P11	20.5		7.39	na				
27	20.5		7.75	na				
28	20.5		11.33	na				
X6	20.5		26.34	na				
X5	8.5		33.51	na				
TOR3	8.5		40.78	na				
BOR3	-1.5		51.78	na				
3	-1.5		52.15	na				
U16	-2.5		54.36	na				
U15	-2.5		54.54	na				
U14	-2.5		62.3	na				
U13	-2.5		62.3	na				
U10	-2.5		62.35	na				
U9	-2.5		62.35	na				
U6	-2.5		62.36	na				
U5	-2.5		62.41	na				
U4	-2.5		62.45	na				
BK4	-2.5		62.47	na				
BK3	1.5		65.95	na				
BK2	1.5		66.0	na				
BK1	-2.5		67.75	na				
U3	-2.5		67.77	na				
U2	-2.5		67.79	na				
U1	-2.5		67.85	na				
TEST	2.6				5.0			
29	19.67	4.9			13.71	0.05	156	7.6
P10	20.5							
30	19.67	4.9			16.23	0.05	233	7.6
P12	20.5							
31	19.67	4.9			16.46	0.05	156	7.6
P9	20.5							

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The maximum velocity is 20.19 and it occurs in the pipe between nodes 28 and X6

# Final Calculations : Hazen-Williams

SUMMERS FIRE SPRINKLERS, INC  
Bldg#2 LEVEL 2-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	*****
26 to P11	19.67 20.5	4.90	13.51 13.51	1 1.101	E 3.825	0.830 3.825 4.655	150 0.0329	7.600 -0.359 0.153		Vel = 4.55	
P11 to 27	20.5 20.5		0.0 13.51	1 1.101		10.880 10.880	150 0.0329	7.394 0.0 0.358		Vel = 4.55	
27 to 28	20.5 20.5		13.70 27.21	1 1.101	2T 19.125	10.620 19.126 29.746	150 0.1203	7.752 0.0 3.578		Vel = 9.17	
28 to X6	20.5 20.5		32.70 59.91	1 1.101	T 2E 7.65	11.780 17.212 28.992	150 0.5178	11.330 0.0 15.013		Vel = 20.19	
X6 to X5	20.5 8.5		0.0 59.91	1.25 1.394		12.000 12.000	150 0.1641	26.343 5.197 1.969		Vel = 12.59	
X5 to TOR3	8.5 8.5		0.0 59.91	1.25 1.394	2E T 9.523	25.290 19.046	150 0.1641	33.509 0.0 7.276		Vel = 12.59	
TOR3 to BOR3	8.5 -1.5		0.0 59.91	1.25 1.442			120 0.2102	40.785 7.331 3.665		** Fixed Loss = 3 Vel = 11.77	
BOR3 to 3	-1.5 -1.5		0.0 59.91	1.25 1.442			120 0.2103	51.781 0.0 0.368		Vel = 11.77	
3 to U16	-1.5 -2.5		0.0 59.91	1.25 1.442	2E 7.432	1.000 7.432 8.432	120 0.2104	52.149 0.433 1.774		Vel = 11.77	
U16 to U15	-2.5 -2.5		0.0 59.91	1.25 1.442		0.880 0.880	120 0.2102	54.356 0.0 0.185		Vel = 11.77	
U15 to U14	-2.5 -2.5		0.0 59.91	1.25 1.442	E T 7.432	25.730 11.148 36.878	120 0.2103	54.541 0.0 7.754		Vel = 11.77	
U14 to U13	-2.5 -2.5		0.0 59.91	4 4.1		1.870 1.870	120 0.0016	62.295 0.0 0.003		Vel = 1.46	
U13 to U10	-2.5 -2.5		0.0 59.91	4 4.1		39.360 39.360	120 0.0013	62.298 0.0 0.051		Vel = 1.46	
U10 to U9	-2.5 -2.5		0.0 59.91	4 4.1		1.280 1.280	120 0.0008	62.349 0.0 0.001		Vel = 1.46	
U9 to U6	-2.5 -2.5		0.0 59.91	4 4.1		7.700 7.700	120 0.0013	62.350 0.0 0.010		Vel = 1.46	
U6 to U5	-2.5 -2.5		0.0 59.91	4 4.1	E 10.928	24.150 10.928 35.078	120 0.0013	62.360 0.0 0.046		Vel = 1.46	

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Bldg#2 LEVEL 2-rev-calc

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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	*****
U5 to U4	-2.5 -2.5		0.0 59.91	4 4.1			33.860 33.860	120 0.0013	62.406 0.0 0.044		Vel = 1.46	
U4 to BK4	-2.5 -2.5		0.0 59.91	4 4.1	E	10.928	6.510 10.928 17.438	120 0.0013	62.450 0.0 0.022		Vel = 1.46	
BK4 to BK3	-2.5 1.5		0.0 59.91	4 4.1	Zaf	0.0	4.000 4.000	120 0.0015	62.472 3.475 0.006		* * Fixed Loss = 5.208 Vel = 1.46	
BK3 to BK2	1.5 1.5		0.0 59.91	4 4.1	2E	21.855	13.160 21.855 35.015	120 0.0013	65.953 0.0 0.045		Vel = 1.46	
BK2 to BK1	1.5 -2.5		0.0 59.91	4 4.1	E	10.928	4.000 10.928 14.928	120 0.0013	65.998 1.732 0.020		Vel = 1.46	
BK1 to U3	-2.5 -2.5		0.0 59.91	4 4.1	E	14.534	5.380 14.534	140 0.0010	67.750 0.0 0.019		Vel = 1.46	
U3 to U2	-2.5 -2.5		0.0 59.91	4 4.1				140 0.0010	67.769 0.0 0.018		Vel = 1.46	
U2 to U1	-2.5 -2.5		0.0 59.91	4 4.1				140 0.0010	67.787 0.0 0.060		Vel = 1.46	
U1 to TEST	-2.5 2.600		0.0 59.91	4 4.1	2E T	29.067 29.067	30.930 58.134 89.064	140 0.0010	67.847 -2.209 0.087		Vel = 1.46	
TEST			5.00 64.91						65.725		Qa = 5.00 K Factor = 8.01	
29 to P10	19.67 20.5	4.90	13.71	1	E	3.825	0.830 3.825 4.655	150 0.0337	7.823 -0.359 0.157		Vel = 4.62	
P10 to 27	20.5 20.5		0.0 13.71	1 1.101			3.860 3.860	150 0.0339	7.621 0.0 0.131		Vel = 4.62	
27			0.0 13.71						7.752		K Factor = 4.92	
30 to P12	19.67 20.5	4.90	16.23	1	E	3.825	0.830 3.825 4.655	150 0.0462	10.971 -0.359 0.215		Vel = 5.47	
P12 to 28	20.5 20.5		0.0 16.23	1 1.101			10.880 10.880	150 0.0462	10.827 0.0 0.503		Vel = 5.47	
28			0.0 16.23						11.330		K Factor = 4.82	
31 to P9	19.67 20.5	4.90	16.46	1	E	3.825	0.830 3.825 4.655	150 0.0473	11.286 -0.359 0.220		Vel = 5.55	

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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	*****
P9 to 28	20.5 20.5		0.0 16.46	1 1.101		3.860 3.860	150 0.0474	11.147 0.0 0.183		Vel = 5.55	
28			0.0 16.46					11.330		K Factor = 4.89	

