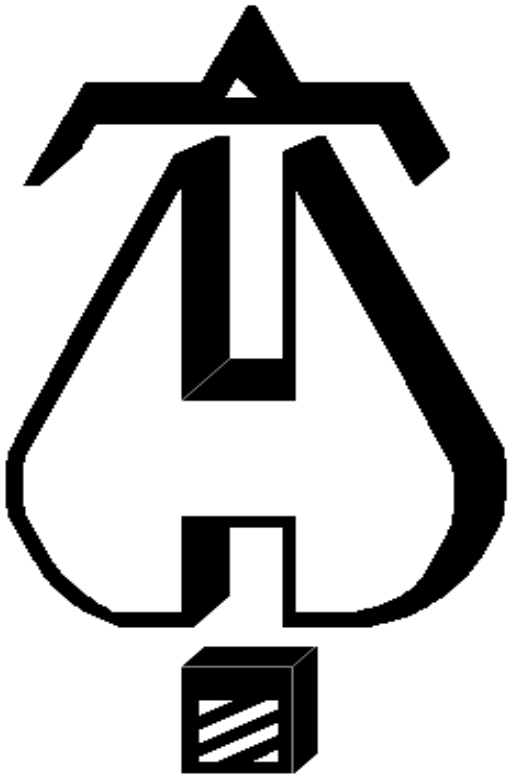


. . . Fire Protection by Computer Design

Reliable Fire Protection LLC
32 Partin Rd.
Dunn, NC 28334
Robert Lawley
NICET Level III #103122

Job Name	:	ADAMS RESIDENCE 1-HEAD
Building	:	NEW RESIDENTIAL
Location	:	219 HARVELL RD., COATS, NC
System	:	1
Contract	:	2020-XXX
Data File	:	1ST FLR AREA 1 1-HEAD.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - ADAMS RESIDENCE
Date - 12-09-20
Location - 219 HARVELL RD., COATS, NC
Building - NEW RESIDENTIAL
System No. - 1
Contractor - STE GENERAL CONTRACTOR, LLC
Contract No. - 2020-XXX
Calculated By - ROBERT LAWLEY
Drawing No. - FP1
Construction: (X) Combustible ( ) Non-Combustible
Ceiling Height VARIES
OCCUPANCY - SINGLE FAMILY RESIDENCE NFPA 13D 2013

SYSTEM DESIGN

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

Listed Flow at Start Point - 20 Gpm
Listed Pres. at Start Point - 16.7 Psi
MAXIMUM LISTED SPACING 18 x 18
Domestic Flow Added - 0 Gpm
Additional Flow Added - 0 Gpm
Elevation at Highest Outlet - 9 Feet
Note:SAFETY MARGIN: 33 PSI
6 PSI ADDED FOR WATER METER LOSS

System Type
(X) Wet ( ) Dry
( ) Deluge ( ) PreAction
Sprinkler or Nozzle
Make TYCO Model LFII
Size 1/2 K-Factor 4.9
Temperature Rating 155*

Calculation Summary
Gpm Required 21 Psi Required 52 At Test
C-Factor Used: Overhead 150 Underground 150

WATER SUPPLY

Water Flow Test:
Date of Test - 12-09-20
Time of Test - 10:10 AM
Static (Psi) - 85
Residual (Psi) - 20
Flow (Gpm) - 530
Elevation - 0

Pump Data:
Rated Cap.
@ Psi
Elev.
Other

Tank or Reservoir:
Cap.
Elev.

Well
Proof Flow Gpm

Location: 6" MAIN ON BRICK MILL RD.

Source of Information: TESTED BY RELIABLE FIRE PROTECTION

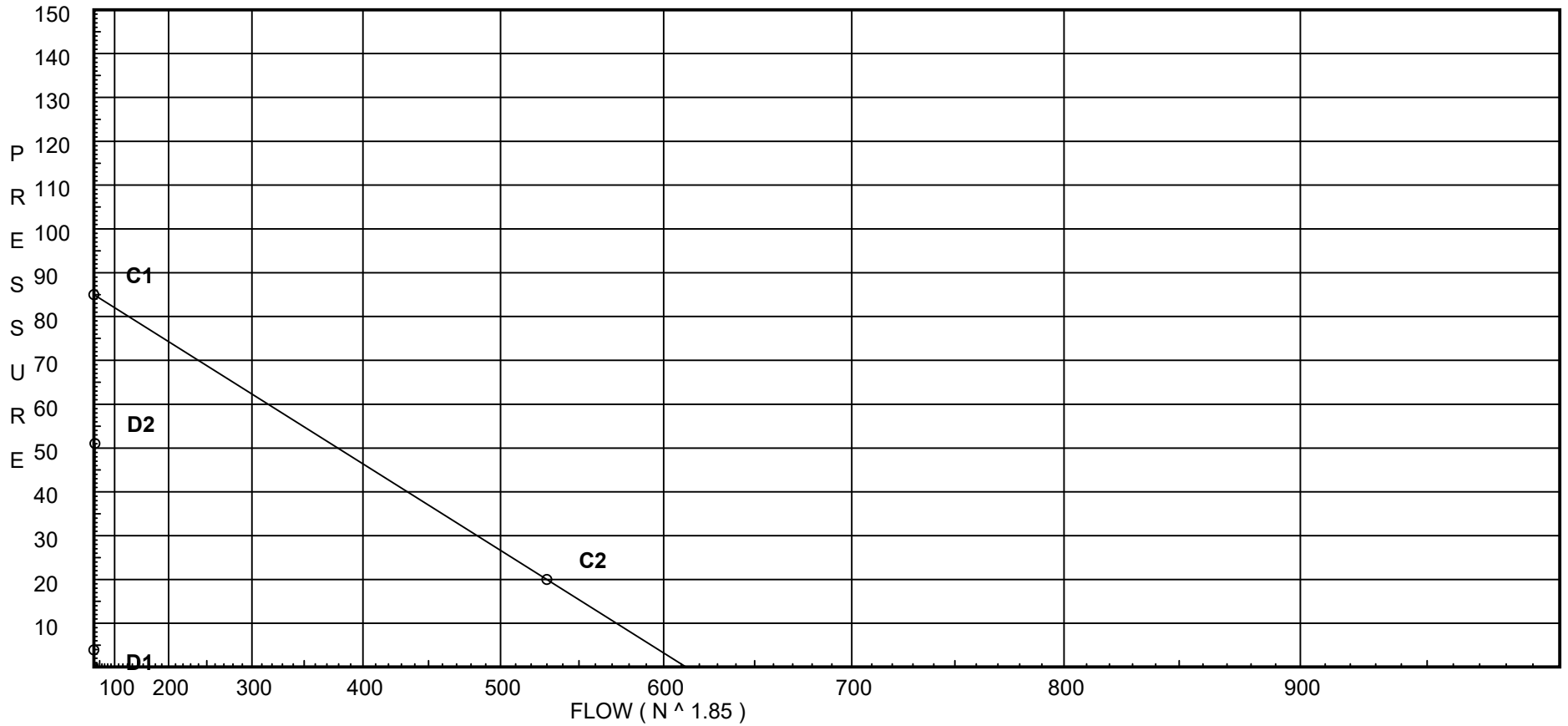
Water Supply Curve C

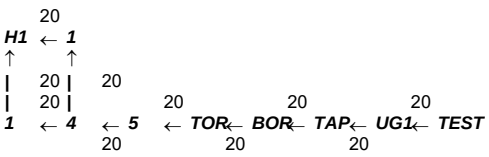
Reliable Fire Protection LLC
ADAMS RESIDENCE 1-HEAD

Date 11-24-20

City Water Supply:
- C1 - Static Pressure : 85
- C2 - Residual Pressure: 20
- C2 - Residual Flow : 530

Demand:
- D1 - Elevation : 3.898
- D2 - System Flow : 20.024
- D2 - System Pressure : 51.009
- Hose (Demand) : _____
- D3 - System Demand : 20.024
- Safety Margin : 33.839




20
H1
1
20
20
20
1
4
5
TOR
BOR
TAP
UG1
TEST
20
20
20

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
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
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
Zwa	Watts 007	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

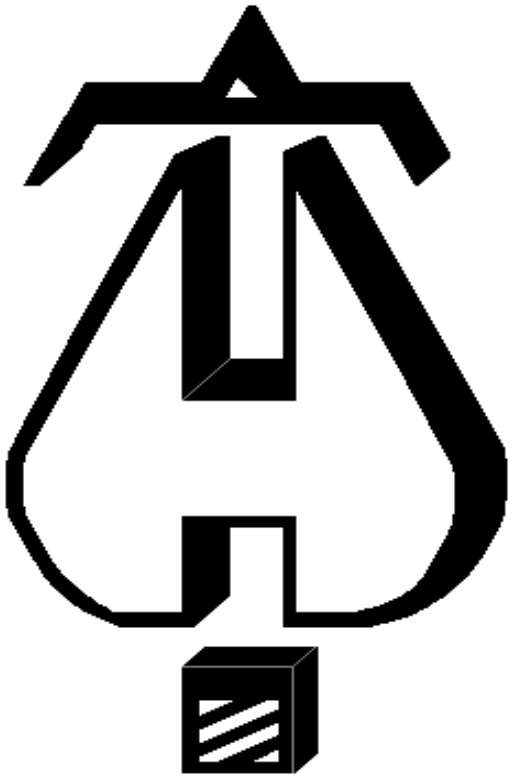
Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers 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.

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
H1	9.0	4.9	16.7	na	20.02	0.05	400	16.7
1	9.0		17.21	na				
4	9.0		19.67	na				
5	9.0		19.72	na				
TOR	9.0		23.06	na				
BOR	1.0		32.86	na				
TAP	0.0		50.85	na				
UG1	0.0		51.01	na				
TEST	0.0		51.01	na				

The maximum velocity is 6.75 and it occurs in the pipe between nodes H1 and 1

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
H1	9	4.90	20.02	1	1N	7.0	0.500	150	16.700	
to						0.0	7.000		0.0	
1	9		20.02	1.101		0.0	7.500	0.0681	0.511	Vel = 6.75
			0.0							
1			20.02						17.211	K Factor = 4.83
*										
1	9		20.02	1	1O	5.0	31.000	150	17.211	
to						0.0	5.000		0.0	
4	9		20.02	1.101		0.0	36.000	0.0682	2.455	Vel = 6.75
4	9		0.0	1		0.0	0.833	150	19.666	
to						0.0	0.0		0.0	
5	9		20.02	1.101		0.0	0.833	0.0684	0.057	Vel = 6.75
5	9		0.0	1	2N	14.0	35.000	150	19.723	
to						0.0	14.000		0.0	
TOR	9		20.02	1.101		0.0	49.000	0.0682	3.342	Vel = 6.75
			0.0							
TOR			20.02						23.065	K Factor = 4.17
*										
TOR	9		20.02	1	1Zwa	0.0	8.000	150	23.065	
to						0.0	0.0		9.248	* * Fixed Loss = 5.783
BOR	1		20.02	1.101		0.0	8.000	0.0681	0.545	Vel = 6.75
BOR	1		0.0	1	1O	5.0	155.000	150	32.858	
to					1T	9.563	14.562		6.433	* * Fixed Loss = 6
TAP	0		20.02	1.101		0.0	169.562	0.0682	11.563	Vel = 6.75
TAP	0		0.0	4	1F	5.813	1167.000	140	50.854	
to					1T	29.067	34.880		0.0	
UG1	0		20.02	4.1		0.0	1201.880	0.0001	0.155	Vel = 0.49
UG1	0		0.0	6		0.0	36.000	140	51.009	
to						0.0	0.0		0.0	
TEST	0		20.02	6.16		0.0	36.000	0	0.0	Vel = 0.22
			0.0							
TEST			20.02						51.009	K Factor = 2.80



. . . Fire Protection by Computer Design

Reliable Fire Protection LLC
32 Partin Rd.
Dunn, NC 28334
Robert Lawley
NICET Level III #103122

Job Name	:	ADAMS RESIDENCE 2-HEAD
Building	:	NEW RESIDENTIAL
Location	:	219 HARVELL RD., COATS, NC
System	:	1
Contract	:	2020-XXX
Data File	:	1ST FLR AREA 1 2-HEAD.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - ADAMS RESIDENCE — Date - 12-09-20
Location - 219 HARVELL RD., COATS, NC
Building - NEW RESIDENTIAL — System No. - 1
Contractor - STE GENERAL CONTRACTOR, LLC — Contract No. - 2020-XXX
Calculated By - ROBERT LAWLEY — Drawing No. - FP1
Construction: (X) Combustible ( ) Non-Combustible — Ceiling Height VARIES
OCCUPANCY - SINGLE FAMILY RESIDENCE NFPA 13D 2013

SYSTEM DESIGN

Type of Calculation: ( )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	- 12	Gpm	System Type	
Listed Pres. at Start Point	- 7	Psi	(X) Wet	( ) Dry
MAXIMUM LISTED SPACING	12 x 12		( ) Deluge	( ) PreAction
Domestic Flow Added	- 0	Gpm	Sprinkler or Nozzle	
Additional Flow Added	- 0	Gpm	Make TYCO	Model LFII
Elevation at Highest Outlet	- 10	Feet	Size 1/2	K-Factor 4.9
Note:SAFETY MARGIN: 31 PSI			Temperature Rating 155*	
6 PSI ADDED FOR WATER METER LOSS				

Calculation Summary — Gpm Required 27 — Psi Required 54 — At Test
C-Factor Used: Overhead 150 Underground 150

WATER SUPPLY

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - 12-09-20	Rated Cap.	Cap.
Time of Test - 10:10 AM	@ Psi	Elev.
Static (Psi) - 85	Elev.	
Residual (Psi) - 20	Other	Well
Flow (Gpm) - 530		Proof Flow Gpm
Elevation - 0		

Location: 6" MAIN ON BRICK MILL RD.

Source of Information: TESTED BY RELIABLE FIRE PROTECTION

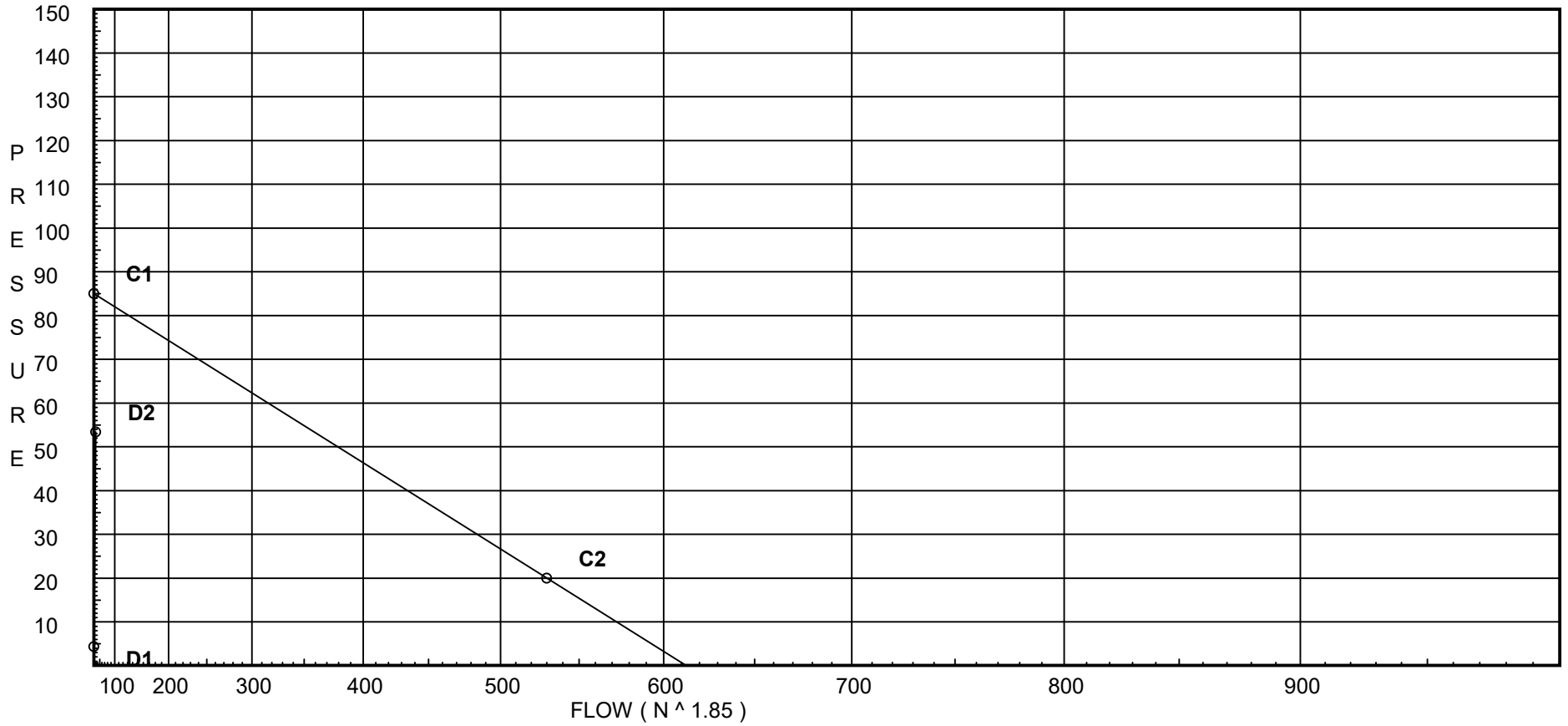
Water Supply Curve C

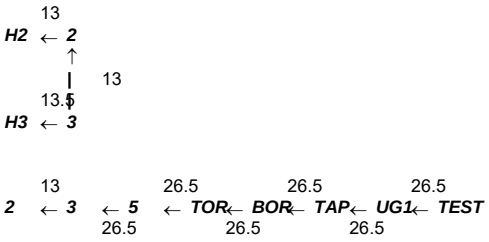
Reliable Fire Protection LLC
ADAMS RESIDENCE 2-HEAD

Date 11-24-20

City Water Supply:
- C1 - Static Pressure : 85
- C2 - Residual Pressure: 20
- C2 - Residual Flow : 530

Demand:
- D1 - Elevation : 4.331
- D2 - System Flow : 26.459
- D2 - System Pressure : 53.400
- Hose (Demand) : _____
- D3 - System Demand : 26.459
- Safety Margin : 31.346




13
H2
2
13
13.5
H3
3

13
26.5
26.5
26.5
2
3
5
TOR
BOR
TAP
UG1
TEST
26.5
26.5
26.5

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
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
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
Zwa	Watts 007	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.

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
H2	10.0	4.9	7.0	na	12.96	0.05	144	7.0
H3	10.0	4.9	7.59	na	13.5	0.05	144	7.0
2	10.5		7.01	na				
3	10.5		7.79	na				
5	9.0		11.37	na				
TOR	9.0		16.97	na				
BOR	1.0		27.34	na				
TAP	0.0		53.14	na				
UG1	0.0		53.4	na				
TEST	0.0		53.4	na				

The maximum velocity is 8.92 and it occurs in the pipe between nodes 3 and 5

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
H2	10	4.90	12.96	1	1N	7.0	0.500	150	7.000	
to						0.0	7.000		-0.217	
2	10.500		12.96	1.101		0.0	7.500	0.0305	0.229	Vel = 4.37
			0.0							
2			12.96						7.012	K Factor = 4.89
H3	10	4.90	13.50	1	1N	7.0	0.833	150	7.585	
to					1O	5.0	12.000		-0.217	
3	10.500		13.5	1.101		0.0	12.833	0.0329	0.422	Vel = 4.55
			0.0							
3			13.50						7.790	K Factor = 4.84
*										
2	10.500		12.96	1	2N	14.0	11.500	150	7.012	
to						0.0	14.000		0.0	
3	10.500		12.96	1.101		0.0	25.500	0.0305	0.778	Vel = 4.37
3	10.500		13.50	1	2N	14.0	6.667	150	7.790	
to					1O	5.0	19.000		0.650	
5	9		26.46	1.101		0.0	25.667	0.1142	2.931	Vel = 8.92
5	9		0.0	1	2N	14.0	35.000	150	11.371	
to						0.0	14.000		0.0	
TOR	9		26.46	1.101		0.0	49.000	0.1142	5.595	Vel = 8.92
			0.0							
TOR			26.46						16.966	K Factor = 6.42
*										
TOR	9		26.46	1	1Zwa	0.0	8.000	150	16.966	
to						0.0	0.0		9.465	* * Fixed Loss = 6
BOR	1		26.46	1.101		0.0	8.000	0.1142	0.914	Vel = 8.92
BOR	1		0.0	1	1O	5.0	155.000	150	27.345	
to					1T	9.563	14.562		6.433	* * Fixed Loss = 6
TAP	0		26.46	1.101		0.0	169.562	0.1142	19.362	Vel = 8.92
TAP	0		0.0	4	1F	5.813	1167.000	140	53.140	
to					1T	29.067	34.880		0.0	
UG1	0		26.46	4.1		0.0	1201.880	0.0002	0.259	Vel = 0.64
UG1	0		0.0	6		0.0	36.000	140	53.399	
to						0.0	0.0		0.0	
TEST	0		26.46	6.16		0.0	36.000	0	0.001	Vel = 0.28
			0.0							
TEST			26.46						53.400	K Factor = 3.62