



Most Demanding Single Head Information		Most Demanding Two Head Information	
Information	Results	Information	Results
Flow Required at Head (GPM):	17	Flow Required at Head (GPM):	13
Source Pressure at Head (PSI):	12.03	Source Pressure at Head (PSI):	7.04
Maximum Spacing (length):	18	Maximum Spacing (length):	16
Maximum Spacing (Width):	18	Maximum Spacing (Width):	16
Domestic Flow Added (GPM):	0	Domestic Flow Added (GPM):	0
Sprinkler Model:	RFC49	Sprinkler Model:	RFC49
Elevation of Highest Head:	118	Elevation of Highest Head:	118
K-Factor	4.9	K-Factor	4.9
Temperature Rating:	155	Temperature Rating:	155
Flow Required at Source (GPM)	17	Flow Required at Source (GPM)	26.3032
Pressure Required at Source (psi)	38.38	Pressure Required at Source (psi)	51.74
Source Reference Point:	At Ref Pt STR	Source Reference Point:	At Ref Pt STR
C-Factor of Sprinkler Pipe	150	C-Factor of Sprinkler Pipe	150
C-Factor of Service Line	150	C-Factor of Service Line	150
Head Reference Point:	H.8	Head Reference Point:	H.9 & H.12

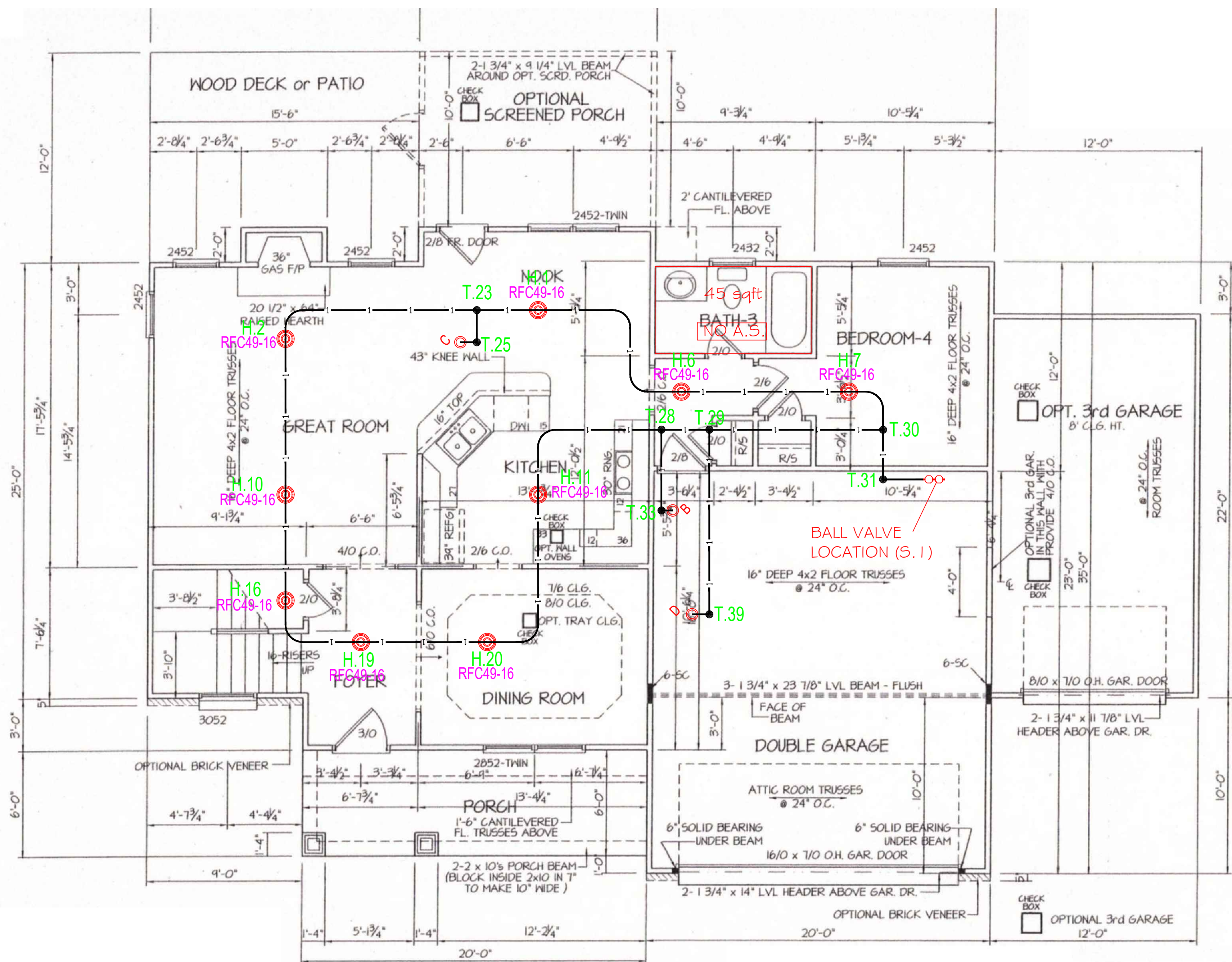
- 21
 RFC49-16
- 1
 RFC49-18

RELIABLE Model RFC49Concealed Pendent Spr FP
 K=4.9, 155F°, 7/16" Orifice, Maximum Spacing 16"x16"
 Sprinkler head demand: 13 gpm @ 7.04

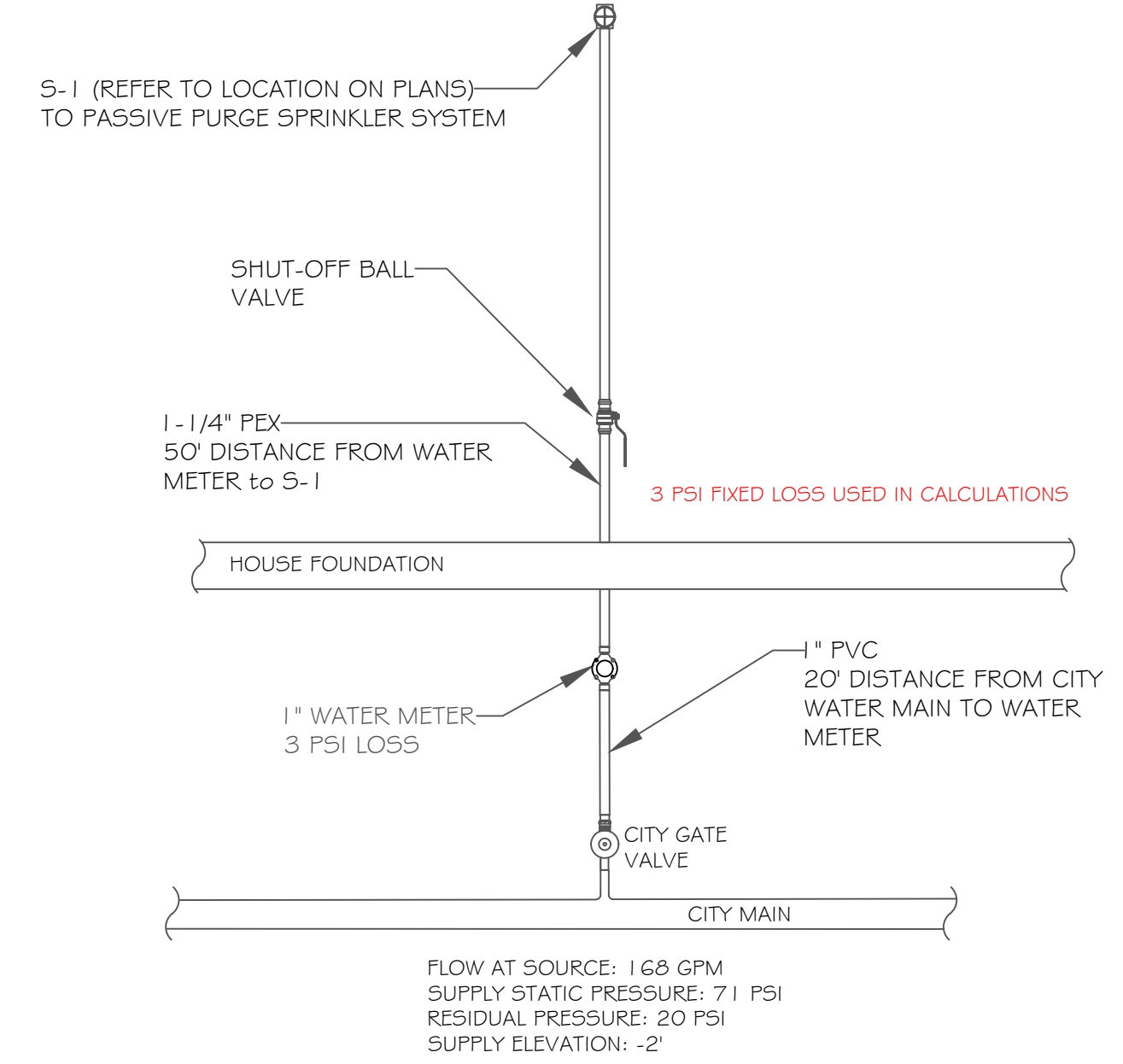
RELIABLE Model RFC49Concealed Pendent Spr FP
 K=4.9, 155F°, 7/16" Orifice, Maximum Spacing 18"x18"
 Sprinkler head demand: 17 gpm @ 12.03

SPRINKLER DESCRIPTIONS

LEGEND	
	Manifold
	Inter Level Connection
	Hot Water Fixture
	Cold Water Fixture
	Type K Copper w/ ProPress Fittings
	Type L Copper w/ ProPress Fittings
	Type M Copper w/ ProPress Fittings
	ViegaPEX Ultra Black
	ViegaPEX Ultra Blue - Cold Plumbing
	ViegaPEX Ultra Red - Hot Plumbing



1st Floor 9 Sprinklers



WATER SERVICE DETAIL

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Design Services Department
 1900 Southwood Drive - Nashua, NH 03063
 Tel: 877-843-4262 x 351 Fax: 316-425-8466

Project:
200 OAKHAVEN DRIVE, LOT 3
HOLLY SPRINGS, NC 27540

Dwg no.:
FP 1

Title:
FIRST FLOOR PLAN

Quotation no.: FPNM2102-016 NC

Drawn by:	N.M.
Approved by:	
Date Submitted:	2/26/2021
Scale:	1/4" = 1'
Revision No:	Revision Date:

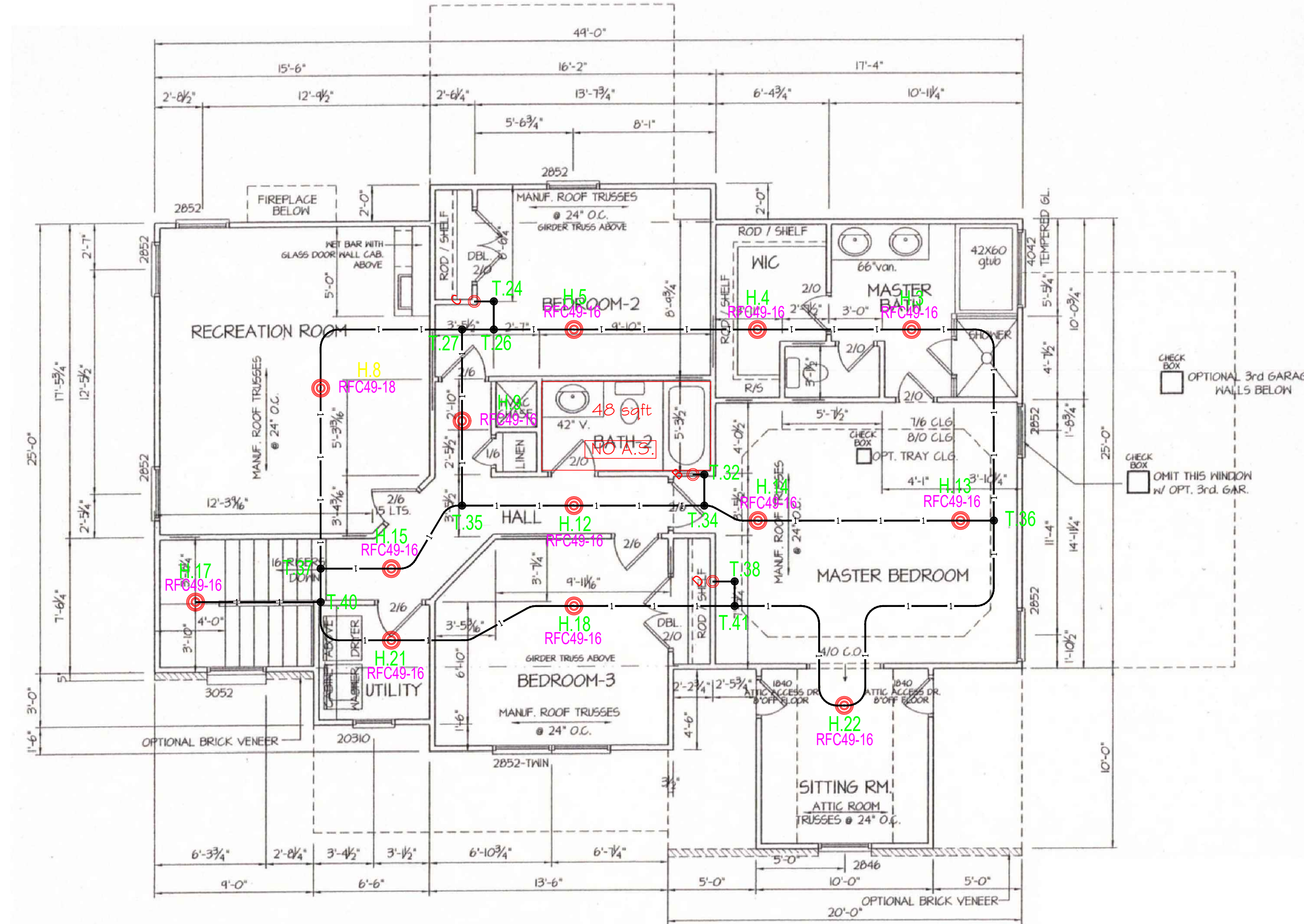
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Tel: 877-843-4262 x 351 Fax: 316-425-8466



2nd Floor 13 Sprinklers

Project:

200 OAKHAVEN DRIVE, LOT 3
HOLLY SPRINGS, NC 27540

Dwg no.:

FP 2

Title:

SECOND FLOOR PLAN

Quotation no.: FPNM2102-016 NC

Drawn by: N.M.

Approved by:

Date Submitted: 2/26/2021

Scale: 1/4" = 1'

Revision No: Revision Date:

FIRE PROTECTION INSTALLATION NOTES:

- INSTALLATION OF THE FIRE PROTECTION SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE 2016 EDITION OF NFPA 13D OR SECTION P2904 OF THE 2018 INTERNATIONAL RESIDENTIAL CODE (IRC). NFPA 13D IS THE STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS IN ONE- AND TWO-FAMILY DWELLINGS AND MANUFACTURED HOMES.
- INSTALLATION OF THE FIRE PROTECTION SYSTEM SHALL COMPLY WITH ALL LOCAL RESIDENTIAL FIRE PROTECTION CODES AND ALL APPLICABLE STATE REGULATIONS.
- SPRINKLER HEADS SHALL MEET ALL GENERAL CARE AND INSTALLATION REQUIREMENTS OF THE SPRINKLER MANUFACTURER. SUBSTITUTION OF SPRINKLER HEADS IS NOT PERMITTED.
- AFTER INSTALLATION OF THE SPRINKLERS, THE ENTIRE SYSTEM SHALL BE PRESSURE TESTED IN ACCORDANCE WITH STATE AND LOCAL CODE REQUIREMENTS. SPRINKLERS SHALL BE LOCATED PER THE LAYOUT. DO NOT INSTALL SPRINKLERS IN AREAS EXPOSED TO TEMPERATURES THAT EXCEED THE MAXIMUM RECOMMENDED AMBIENT TEMPERATURE FOR THE TEMPERATURE RATING USED. MINIMUM DISTANCE OF SPRINKLER HEADS FROM HEAT SOURCES SHALL COMPLY WITH TABLE 7.5.6.3 IN THE 2016 EDITION OF NFPA 13D, INSTALLATION OF SPRINKLER SYSTEMS IN ONE - AND TWO - FAMILY DWELLINGS AND MANUFACTURED HOMES.
- NO DEVIATIONS FROM THE PLAN SHALL BE ALLOWED WITHOUT APPROVAL FROM THE AUTHORITY HAVING JURISDICTION AND DESIGNER.
- PIPING AND SPRINKLER FITTINGS SHALL BE SUPPORTED IN COMPLIANCE WITH LOCAL PLUMBING CODE AND THE 2016 EDITION OF NFPA 13D, INSTALLATION OF SPRINKLER SYSTEMS IN ONE - AND TWO - FAMILY DWELLINGS AND MANUFACTURED HOMES.
- SMOKE DETECTORS SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 72, NATIONAL FIRE ALARM CODE. WHEN NOT EQUIPPED WITH SMOKE DETECTORS, LOCAL WATERFLOW ALARMS SHALL BE REQUIRED.
- WATER SOFTENERS AND WATER FILTRATION DEVICES SHALL NOT BE INSTALLED IN THE SYSTEM WITHOUT A REVIEW OF THE HYDRAULIC CALCULATIONS OF THE SYSTEM.
- A SIGN SHALL BE AFFIXED ADJACENT TO THE MAIN SHUTOFF VALVE THAT STATES IN MINIMUM 1/4" LETTERS, "WARNING: THE WATER SYSTEM FOR THIS HOME SUPPLIES FIRE SPRINKLERS THAT REQUIRE CERTAIN FLOWS AND PRESSURES TO FIGHT A FIRE. DEVICES THAT RESTRICT THE FLOW OR DECREASE THE PRESSURE OR AUTOMATICALLY SHUT OFF THE WATER TO THE FIRE SPRINKLER SYSTEM, SUCH AS WATER SOFTENERS, FILTRATION SYSTEMS, AND AUTOMATIC SHUT-OFF VALVES, SHALL NOT BE ADDED TO THIS SYSTEM WITHOUT A REVIEW OF THE FIRE SPRINKLER SYSTEM BY A FIRE PROTECTION SPECIALIST. DO NOT REMOVE THIS SIGN."
- ALL PIPING AND FITTINGS SHALL BE PROPERLY INSULATED AND PROTECTED SO THAT THEY ARE NOT EXPOSED TO TEMPERATURES BELOW 40° F.
- WHEN THE MAXIMUM STATIC PRESSURE EXCEEDS 80 PSI, A PRESSURE-REDUCING VALVE SHALL BE INSTALLED. NFPA 13D RESTRICTS THE OPERATING PRESSURE OF PEX SYSTEMS TO 80 PSI. PRESSURE DROP THROUGH THE PRESSURE-REDUCING DEVICE SHALL BE INCLUDED IN THE HYDRAULIC CALCULATIONS.
- WHEN A FIRE DEPARTMENT CONNECTION IS REQUIRED, PEX TUBING SHALL NOT BE PERMITTED. CONSULT WITH THE AUTHORITY HAVING JURISDICTION (AHJ) ABOUT THIS REQUIREMENT PRIOR TO INSTALLATION.

PLUMBING INSTALLATION NOTES:

- INSTALLATION OF HOT AND COLD WATER DISTRIBUTION SYSTEMS SHALL BE IN ACCORDANCE WITH THE LOCAL PLUMBING CODE.
- WATER SOFTENERS AND WATER FILTRATION DEVICES SHALL NOT BE INSTALLED WITHOUT A REVIEW OF THE HYDRAULIC CALCULATIONS OF THE SYSTEM.
- FINAL APPROVAL OF MULTIPURPOSE AND PASSIVE PURGE FIRE SPRINKLER INSTALLATIONS SHALL BE FROM THE AUTHORITY HAVING JURISDICTION.

TESTING:

- EVERY VIEGA NFPA 13D FIRE PROTECTION INSTALLATION SHALL BE PRESSURE TESTED IN ACCORDANCE WITH NFPA 13D, WHICH STATES THAT SYSTEMS WITHOUT FIRE DEPARTMENT CONNECTIONS SHALL BE TESTED FOR LEAKAGE AT THE NORMAL SYSTEM OPERATING WATER PRESSURE.
- THE AUTHORITY HAVING JURISDICTION (AHJ) MAY REQUIRE A FLOW VERIFICATION TEST OF THE MOST HYDRAULICALLY REMOTE SPRINKLER HEAD(S). THIS FLOW VERIFICATION TEST IS AVAILABLE TO ENSURE THE INSTALLED FIRE PROTECTION SYSTEM OPERATES AS DESIGNED. DOCUMENTATION ON HOW TO PERFORM A FLOW VERIFICATION TEST IS AVAILABLE THROUGH VIEGA TECHNICAL SERVICES.
- THE FLOW VERIFICATION TEST SHALL BE PERFORMED AFTER ALL PIPING, FITTINGS, SPRINKLER HEADS AND PLUMBING CONNECTIONS HAVE BEEN INSTALLED AND PRESSURE TESTING OF THE SYSTEM HAS BEEN COMPLETED. THE FLOW TEST SHOULD OCCUR WHILE IN THE "ROUGH" STAGE OF CONSTRUCTION. FLOW TEST RESULTS SHOULD BE COMPARED TO THE SYSTEM DESIGN VALUES. RESIDUAL PRESSURE (PSI) AND FLOW (GPM) MUST BE EQUAL TO OR GREATER THEN THE DESIGN VALUES TO ENSURE A PROPERLY FUNCTIONING SYSTEM.

DRAWING AND DESIGN NOTES:

- DESIGN SHALL ENSURE WATER SUPPLY TO THE MOST HYDRAULICALLY DEMANDING SINGLE AND DUAL SPRINKLER HEADS.
- TUBING AND FITTINGS SHALL BE U.L. LISTED FOR RESIDENTIAL FIRE PROTECTION SYSTEMS IN ACCORDANCE WITH NFPA 13D.
- VIEGAFEX ULTRA (BLACK IN COLOR) LISTED TO U.L. 1821 FOR RESIDENTIAL WET-PIPE FIRE PROTECTION SYSTEMS IN ACCORDANCE WITH NFPA 13D.
- VIEGA PEX PRESS FITTINGS (POLYMER AND BRONZE) LISTED TO U.L. 1821 FOR RESIDENTIAL WET-PIPE FIRE PROTECTION SYSTEMS IN ACCORDANCE WITH NFPA 13D.
- APPROVED SMOKE DETECTION SYSTEMS AND/OR WATER FLOW ALARMS SHALL BE INSTALLED WHERE REQUIRED BY THE AUTHORITY HAVING JURISDICTION (AHJ).

MATERIALS LIST NOTES:

- SERVICE ENTRANCE MATERIALS FROM WATER MAIN CONNECTION TO DISTRIBUTION MANIFOLD ARE EXCLUDED.
- SPRINKLERS AND ASSOCIATED ESCUTCHEONS OR COVER PLATES ARE NOT SUPPLIED BY VIEGA.
- MATERIAL LIST IS SUGGESTED ONLY. CONTRACTOR SHALL CONFIRM REQUIRED MATERIALS PRIOR TO PLACEMENT OF ORDER.

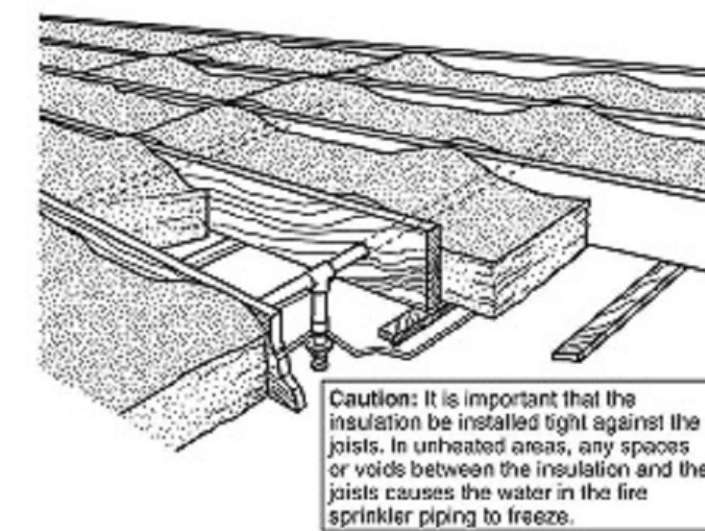


FIGURE A.9.1.1(a) Insulation Recommendations — Arrangement 1.

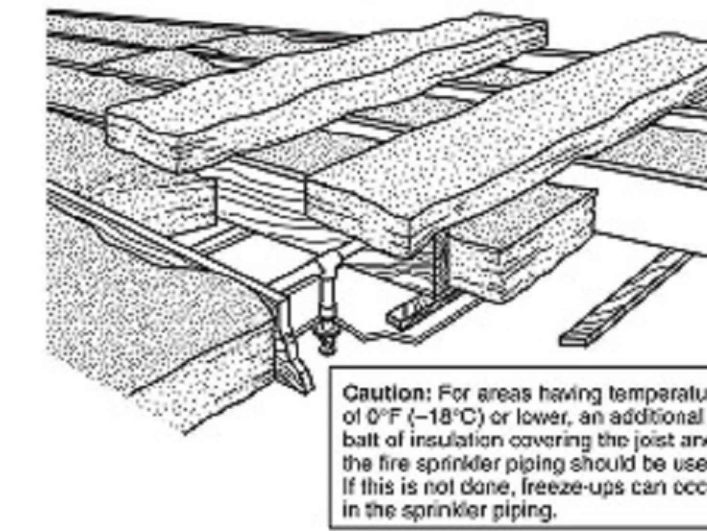


FIGURE A.9.1.1(b) Insulation Recommendations — Arrangement 2.

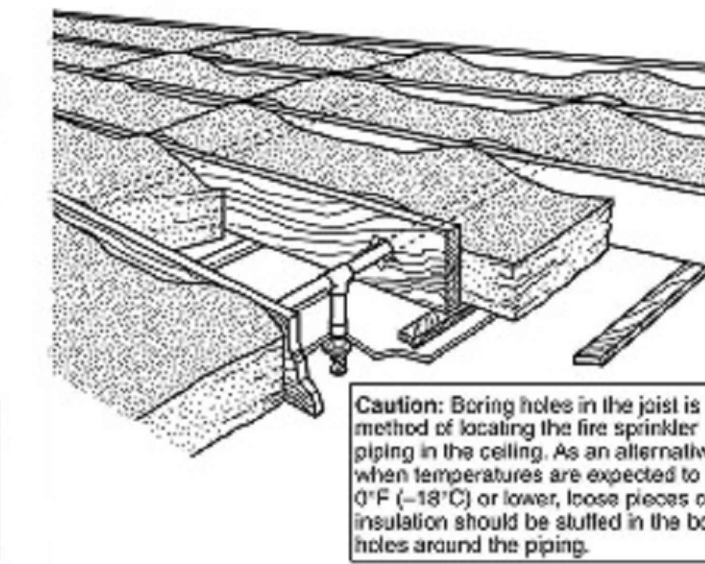


FIGURE A.9.1.1(c) Insulation Recommendations — Arrangement 3.

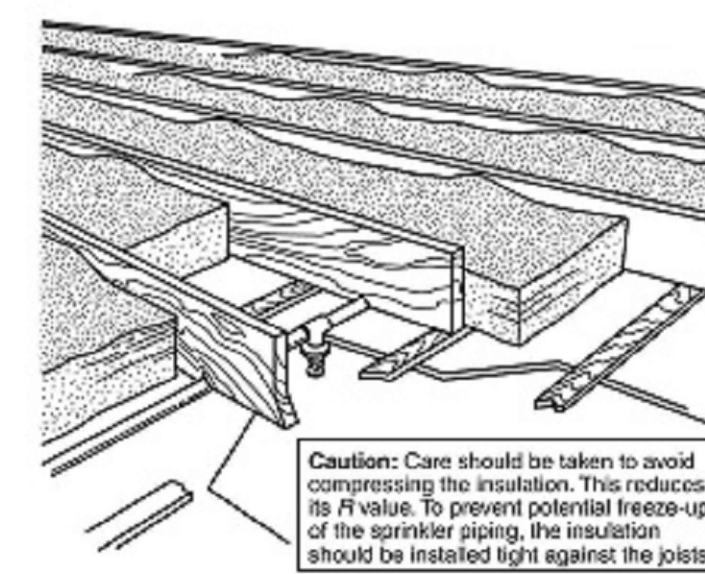


FIGURE A.9.1.1(d) Insulation Recommendations — Arrangement 4.

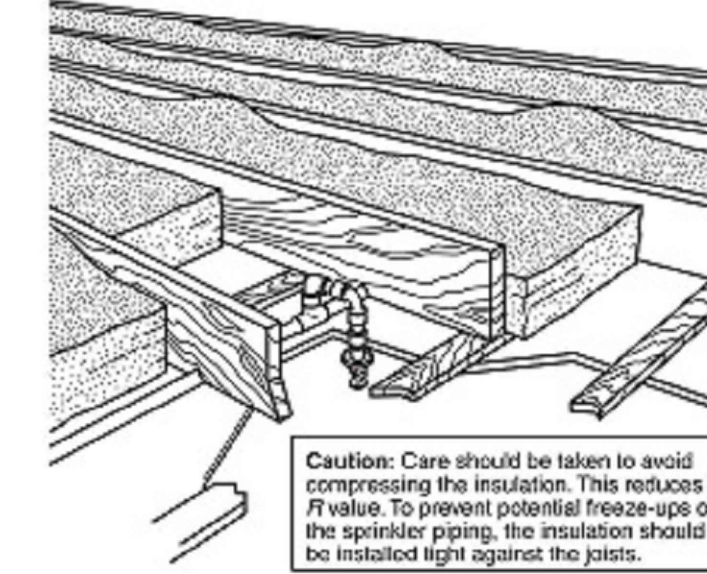


FIGURE A.9.1.1(e) Insulation Recommendations — Arrangement 5.

INSULATION DETAILS - ANNEX A.9.1.1 (NFPA 13D 2016)

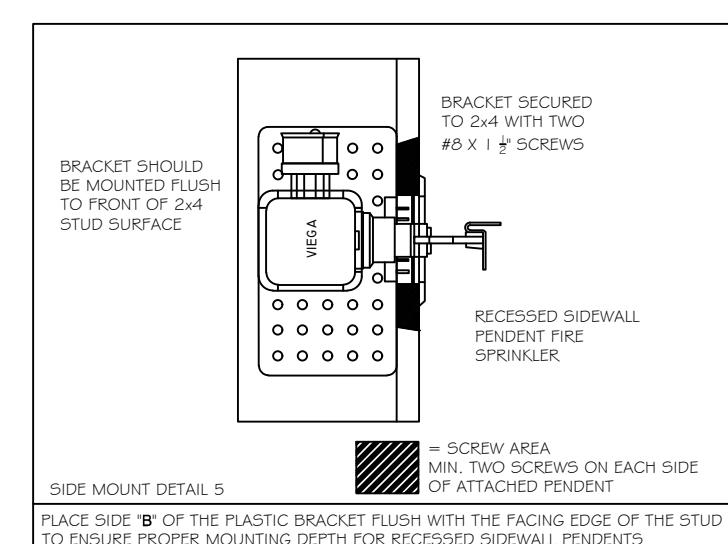
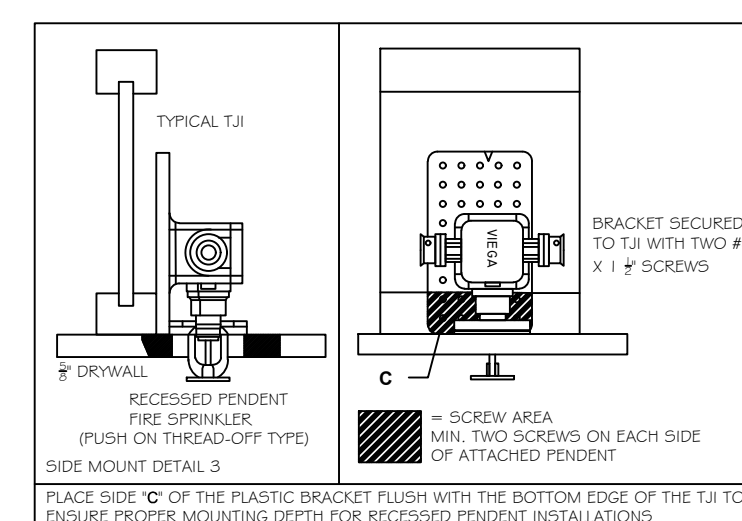
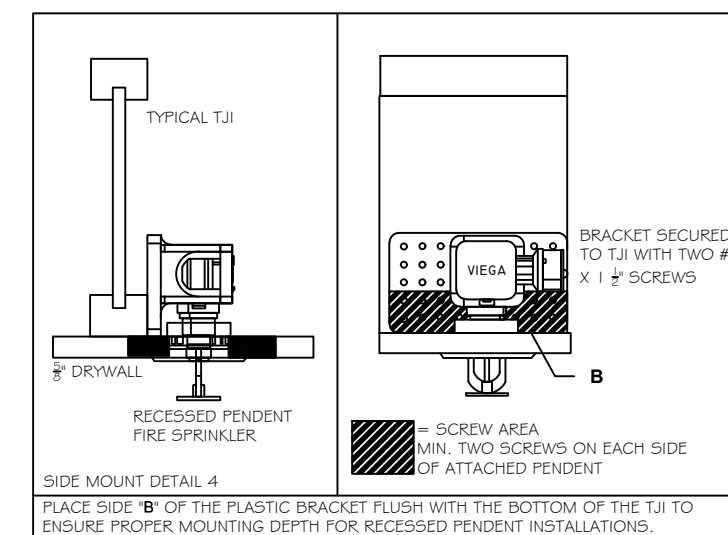
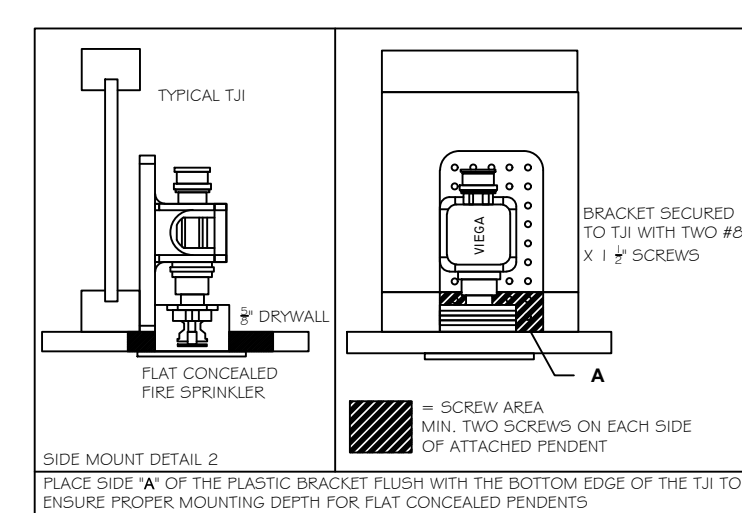
WATER METER PRESSURE LOSSES (PSI) - TABLE 10.4.4(A) NFPA 13D (2016)						
Meter Size (in.)	Flow (gpm)					
	18 or less	23	26	31	39	52
5/8"	9	14	18	26	38	*
3/4"	7	11	14	22	35	*
1"	2	3	3	4	6	10
1-1/2"	1	1	2	2	4	7
2"	1	1	1	1	2	3

TABLE 10.4.4(a) (NFPA 13D 2016)

DISTANCES FROM HEAT SOURCES - TABLE 7.5.6.3 NFPA 13D (2016)		
Heat Source	Ordinary Temp. 135° - 170°	Intermediate Temp. 175° - 220°
Side of Fireplace	36"	12"
Front of Fireplace	60"	36"
Coal or Wood Burning Stove	42"	12"
Kitchen Range	18"	9"
Wall Oven	18"	9"
Hot Air Flues	18"	9"
Uninsulated Heat Ducts	18"	9"
Uninsulated Hot Water Pipes	12"	6"
Side of Hot Air Diffusers	24"	12"
Front of Hot Air Diffusers	36"	18"
Hot Water Heater or Furnace	6"	3"
Light Fixture 0 W - 250 W	6"	3"
Light Fixture 250 W - 499 W	12"	6"

TABLE 7.5.6.3 (NFPA 13D 2016)

INSTALLATION NOTES



INSTALLATION DETAIL - SPRINKLER BRACKETS

Project:

200 OAKHAVEN DRIVE, LOT 3
HOLLY SPRINGS, NC 27540

Dwg no.:

FP 3

Title:

NOTES & DETAILS

Quotation no.: FPNM2102-016 NC

Drawn by:

N.M.

Approved by:

Date Submitted:

2/26/2021

Scale:

N/A

Revision No.:

Revision Date:

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Design Services Department
1900 Southwood Drive - Nashua, NH 03063
Tel: 877-843-4262 x 351 Fax: 316-425-8466



viega

Viega LLC
Technical Services Department
1900 Southwood Drive
Nashua, NH 03063
603-882-7171

Job Name : 200 OAKHAVEN DRIVE, LOT 3 - One Head Calculation (H.8)
Building : SINGLE FAMILY RESIDENCE
Location : HOLLY SPRINGS NC 27540
System : NFPA 13D
Contract : FPNM2102-016 NC
Data File : FPNM2102-016 NC (200 Oakhaven Drive).wx1

HYDRAULIC DESIGN INFORMATION SHEET

Name - 200 OAKHAVEN DRIVE LOT 3 Date - 2/26/2021
Location -
Building - SINGLE FAMILY RESIDENCE System No. - NFPA 13D
Contractor - x Contract No. - FPNM2102-016 NC
Calculated By - VIEGA LLC Drawing No. - FPNM2102-016 NC
Construction: (X) Combustible () Non-Combustible Ceiling Height 9
OCCUPANCY - RESIDENTIAL

S Type of Calculation: ()NFPA 13 Residential ()NFPA 13R (X)NFPA 13D
Y Number of Sprinklers Flowing: (X)1 ()2 ()4 ()
S ()Other
T ()Specific Ruling Made by Date
E
M Listed Flow at Start Point - 17 Gpm System Type
Listed Pres. at Start Point - 12.03Psi (X) Wet () Dry
D MAXIMUM LISTED SPACING 18 x 18 () Deluge () PreAction
E Domestic Flow Added - 0 Gpm Sprinkler or Nozzle
S Additional Flow Added - Gpm Make RELIABLE Model RFC49
I Elevation at Highest Outlet - 118 Feet Size 7/16 K-Factor 4.9
G Note: Temperature Rating 155
N

Calculation Gpm Required 17 Psi Required 38.38 At Ref Pt STR
Summary C-Factor Used: Overhead 150 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - x Rated Cap. Cap.
T Time of Test - x @ Psi Elev.
E Static (Psi) - 60 Elev.
R Residual (Psi) - 20 Other Well
Flow (Gpm) - 168 Proof Flow Gpm
S Elevation - 100

P Location: x
P
L Source of Information: x
Y

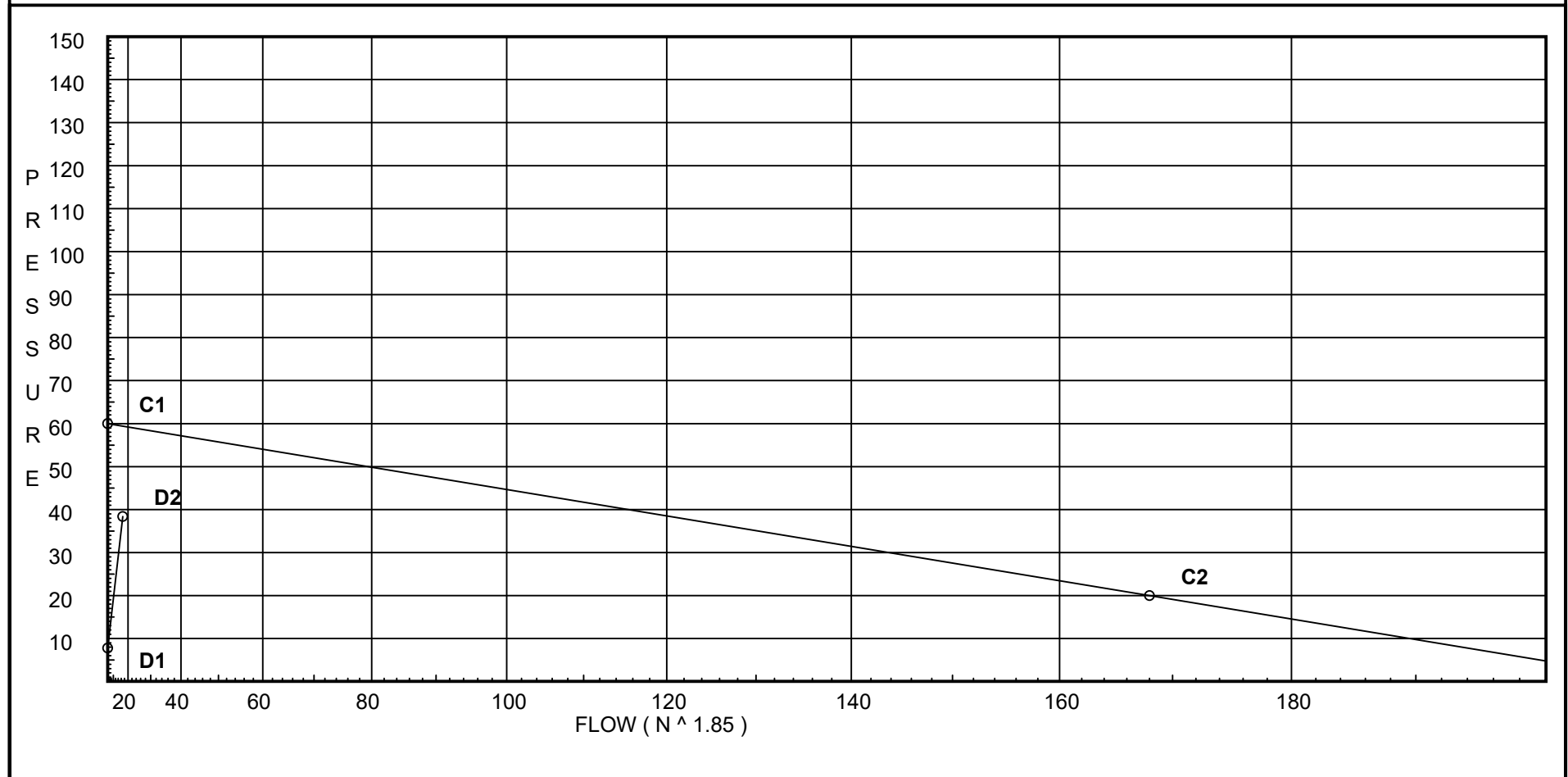
Water Supply Curve C

Viega LLC
200 OAKHAVEN DRIVE, LOT 3 - One Head Calculation (H.8)

Page 2
Date 2/26/2021

City Water Supply:
C1 - Static Pressure : 60
C2 - Residual Pressure: 20
C2 - Residual Flow : 168

Demand:
D1 - Elevation : 7.796
D2 - System Flow : 16.995
D2 - System Pressure : 38.381
Hose (Demand) :
D3 - System Demand : 16.995
Safety Margin : 21.042



Fittings Used Summary

Viega LLC
200 OAKHAVEN DRIVE, LOT 3 - One Head Calculation (H.8)

Page 3
Date 2/26/2021

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	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	Generic Gate Valve	1	1	1	1	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
T	90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Vpel *	PEX Press 90 Elbow - Poly	12.6	18.9	17.7	18.6	29.4	36.4	0	0	0											
Vprt *	PEX Press Tee - Run-Poly	3.9	3.6	3.8	6.4	7.9	10.2	0	0	0											
Vptb *	PEX Press Tee - Branch-Poly	14	19.1	18.4	18.7	28.3	37.5	0	0	0											

Units Summary

Diameter Units Inches
Length Units Feet
Flow Units US Gallons per Minute
Pressure Units Pounds per Square Inch

Flow Summary - NFPA 2007

Viega LLC
200 OAKHAVEN DRIVE, LOT 3 - One Head Calculation (H.8)

Page 4
Date 2/26/2021

SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
STR	60.0	20	168.0	59.423	17.0	38.381

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
H.8	118.0	4.9	12.03	17.0	
T.27	118.0		12.85		
T.26	118.0		13.07		
T.24	118.0		14.02		
T.25	108.0		19.08		
T.23	108.0		19.59		
H.1	108.0		19.87		
H.6	108.0		20.52		
H.7	108.0		21.06		
T.30	108.0		21.38		
T.31	108.0		21.87		
S.1	94.0		32.66		
MTR	100.0		36.34		
STR	100.0		38.38		
T.37	118.0		12.62		
H.15	118.0		12.81		
T.35	118.0		12.91		
H.12	118.0		13.07		
T.34	118.0		13.25		
T.32	118.0		14.02		
T.33	108.0		18.96		
T.28	108.0		19.44		
T.29	108.0		19.52		
T.40	118.0		12.71		
H.21	118.0		12.86		
H.18	118.0		13.05		
T.41	118.0		13.24		
T.38	118.0		14.0		
T.39	108.0		18.92		
H.9	118.0		12.88		
H.5	118.0		13.1		
H.4	118.0		13.13		
H.3	118.0		13.17		
T.36	118.0		13.22		
H.22	118.0		13.23		
H.13	118.0		13.23		
H.14	118.0		13.24		
H.11	108.0		19.46		
H.20	108.0		19.49		
H.19	108.0		19.5		
H.16	108.0		19.52		
H.10	108.0		19.54		

Flow Summary - NFPA 2007

Viega LLC
200 OAKHAVEN DRIVE, LOT 3 - One Head Calculation (H.8)

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Date 2/26/2021

NODE ANALYSIS (cont.)

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
H.2	108.0		19.56		

Final Calculations - Hazen-Williams

Viega LLC
200 OAKHAVEN DRIVE, LOT 3 - One Head Calculation (H.8)

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
H.8 to T.27	9.07	0.863 150.0	Vprt	3.8 0.0	12.000 3.800	12.030 0.0			K Factor = 4.90	
T.27 to T.26	9.07	0.0516		0.0	15.800	0.816			Vel = 4.97	
T.27 to T.26	-1.22	0.863 150.0	Vprt	3.8 0.0	2.000 3.800	12.846 0.0				
T.26 to T.24	7.85	0.0393		0.0	5.800	0.228			Vel = 4.31	
T.26 to T.24	-1.75	0.863 150.0	Vptb Vpel	18.4 17.7	2.000 36.100	13.074 0.0				
T.24 to T.25	6.1	0.0248		0.0	38.100	0.944			Vel = 3.35	
T.24 to T.25	0.0	0.863 150.0	Vpel	17.7 0.0	12.000 17.700	14.018 4.331				
T.25 to T.23	6.1	0.0248		0.0	29.700	0.736			Vel = 3.35	
T.25 to T.23	0.0	0.863 150.0	Vptb	18.4 0.0	2.000 18.400	19.085 0.0				
T.23 to H.1	6.1	0.0248		0.0	20.400	0.505			Vel = 3.35	
T.23 to H.1	1.41	0.863 150.0	Vprt	3.8 0.0	4.000 3.800	19.590 0.0				
H.1 to H.6	7.51	0.0364		0.0	7.800	0.284			Vel = 4.12	
H.1 to H.6	0.0	0.863 150.0	Vprt	3.8 0.0	14.000 3.800	19.874 0.0				
H.6 to H.7	7.51	0.0363		0.0	17.800	0.647			Vel = 4.12	
H.6 to H.7	0.0	0.863 150.0	Vprt	3.8 0.0	11.000 3.800	20.521 0.0				
H.7 to T.30	7.51	0.0364		0.0	14.800	0.538			Vel = 4.12	
H.7 to T.30	0.0	0.863 150.0	Vprt	3.8 0.0	5.000 3.800	21.059 0.0				
T.30 to T.31	7.51	0.0364		0.0	8.800	0.320			Vel = 4.12	
T.30 to T.31	9.49	0.863 150.0		0.0 0.0	3.000 0.0	21.379 0.0				
T.31 to S.1	17.0	0.1650		0.0	3.000	0.495			Vel = 9.32	
T.31 to S.1	0.0	0.863 150.0	Vpel T	17.7 2.92	8.000 20.620	21.874 6.063				
S.1 to MTR	17.0	0.1648		0.0	28.620	4.718			Vel = 9.32	
S.1 to MTR	0.0	1.053 150.0	2E	2.429 0.0	50.000 2.429	32.655 0.401			** Fixed Loss = 3	
MTR to STR	17.0	0.0626		0.0	52.429	3.280			Vel = 6.26	
MTR to STR	0.0	1.049 150.0	E T	3.022 7.555	20.000 12.089	36.336 0.0				
STR	17.0	0.0637	G	1.511	32.089	2.045			Vel = 6.31	
	0.0 17.00					38.381			K Factor = 2.74	
H.8 to T.37	7.92	0.863 150.0	Vprt	3.8 0.0	11.000 3.800	12.030 0.0				
T.37 to H.15	7.92	0.0401		0.0	14.800	0.594			Vel = 4.34	
T.37 to H.15	-4.52	0.863 150.0	Vptb	18.4 0.0	4.000 18.400	12.624 0.0				
H.15 to T.35	3.4	0.0084		0.0	22.400	0.188			Vel = 1.86	
H.15 to T.35	0.0	0.863 150.0	Vprt	3.8 0.0	8.000 3.800	12.812 0.0				
T.35	3.4	0.0084		0.0	11.800	0.099			Vel = 1.86	

Final Calculations - Hazen-Williams

Viega LLC
200 OAKHAVEN DRIVE, LOT 3 - One Head Calculation (H.8)

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
T.35 to H.12	1.22 4.62	0.863 150.0 0.0149	Vprt 3.8 0.0	7.000 3.800 10.800	12.911 0.0 0.161		Vel = 2.53		
H.12 to T.34	0.0 4.62	0.863 150.0 0.0148	Vprt 3.8 0.0	8.000 3.800 11.800	13.072 0.0 0.175		Vel = 2.53		
T.34 to T.32	0.87 5.49	0.863 150.0 0.0204	Vptb 18.4 Vpel 17.7 0.0	2.000 36.100 38.100	13.247 0.0 0.777		Vel = 3.01		
T.32 to T.33	0.0 5.49	0.863 150.0 0.0204	Vpel 17.7 0.0	12.000 17.700 29.700	14.024 4.331 0.605		Vel = 3.01		
T.33 to T.28	0.0 5.49	0.863 150.0 0.0204	Vptb 18.4 0.0	5.000 18.400 23.400	18.960 0.0 0.477		Vel = 3.01		
T.28 to T.29	-1.41 4.08	0.863 150.0 0.0118	Vprt 3.8 0.0	3.000 3.800 6.800	19.437 0.0 0.080		Vel = 2.24		
T.29 to T.30	5.41 9.49	0.863 150.0 0.0561	Vptb 18.4 Vprt 3.8 0.0	11.000 22.200 33.200	19.517 0.0 1.862		Vel = 5.21		
	0.0 9.49				21.379		K Factor = 2.05		
T.37 to T.40	4.52 4.52	0.863 150.0 0.0143	Vprt 3.8 0.0	2.000 3.800 5.800	12.624 0.0 0.083		Vel = 2.48		
T.40 to H.21	0.0 4.52	0.863 150.0 0.0143	Vprt 3.8 0.0	7.000 3.800 10.800	12.707 0.0 0.154		Vel = 2.48		
H.21 to H.18	0.0 4.52	0.863 150.0 0.0142		13.000 0.0 13.000	12.861 0.0 0.185		Vel = 2.48		
H.18 to T.41	0.0 4.52	0.863 150.0 0.0143	Vprt 3.8 0.0	10.000 3.800 13.800	13.046 0.0 0.197		Vel = 2.48		
T.41 to T.38	0.88 5.4	0.863 150.0 0.0198	Vptb 18.4 Vpel 17.7 0.0	2.000 36.100 38.100	13.243 0.0 0.754		Vel = 2.96		
T.38 to T.39	0.0 5.4	0.863 150.0 0.0198	Vpel 17.7 0.0	12.000 17.700 29.700	13.997 4.331 0.588		Vel = 2.96		
T.39 to T.29	0.0 5.4	0.863 150.0 0.0198	Vptb 18.4 0.0	12.000 18.400 30.400	18.916 0.0 0.601		Vel = 2.96		
	0.0 5.40				19.517		K Factor = 1.22		
T.27 to H.9	1.23 1.23	0.863 150.0 0.0013	Vptb 18.4 Vprt 3.8 0.0	6.000 22.200 28.200	12.846 0.0 0.036		Vel = 0.67		

Final Calculations - Hazen-Williams

Viega LLC
200 OAKHAVEN DRIVE, LOT 3 - One Head Calculation (H.8)

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftn'g's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
H.9 to T.35	0.0 1.23	0.863 150.0 0.0012	Vptb 18.4 0.0 0.0	5.000 18.400 23.400	12.882 0.0 0.029		Vel = 0.67		
	0.0 1.23				12.911		K Factor = 0.34		
T.26 to H.5	1.74 1.74	0.863 150.0 0.0025	Vprt 3.8 0.0 0.0	5.000 3.800 8.800	13.074 0.0 0.022		Vel = 0.95		
H.5 to H.4	0.0 1.74	0.863 150.0 0.0024	Vprt 3.8 0.0 0.0	11.000 3.800 14.800	13.096 0.0 0.036		Vel = 0.95		
H.4 to H.3	0.0 1.74	0.863 150.0 0.0025	Vprt 3.8 0.0 0.0	10.000 3.800 13.800	13.132 0.0 0.034		Vel = 0.95		
H.3 to T.36	0.0 1.74	0.863 150.0 0.0025	Vprt 3.8 0.0 0.0	17.000 3.800 20.800	13.166 0.0 0.051		Vel = 0.95		
T.36 to H.22	-0.86 0.88	0.863 150.0 0.0007	Vprt 3.8 0.0 0.0	21.000 3.800 24.800	13.217 0.0 0.017		Vel = 0.48		
H.22 to T.41	0.0 0.88	0.863 150.0 0.0007	0.0 0.0 0.0	13.000 0.0 13.000	13.234 0.0 0.009		Vel = 0.48		
	0.0 0.88				13.243		K Factor = 0.24		
T.36 to H.13	0.86 0.86	0.863 150.0 0.0007	Vptb 18.4 Vprt 3.8 0.0	2.000 22.200 24.200	13.217 0.0 0.016		Vel = 0.47		
H.13 to H.14	0.0 0.86	0.863 150.0 0.0007	0.0 0.0 0.0	13.000 0.0 13.000	13.233 0.0 0.009		Vel = 0.47		
H.14 to T.34	0.0 0.86	0.863 150.0 0.0006	Vprt 3.8 0.0 0.0	4.000 3.800 7.800	13.242 0.0 0.005		Vel = 0.47		
	0.0 0.86				13.247		K Factor = 0.24		
T.28 to H.11	1.40 1.4	0.863 150.0 0.0016	Vprt 3.8 0.0 0.0	12.000 3.800 15.800	19.437 0.0 0.026		Vel = 0.77		
H.11 to H.20	0.0 1.4	0.863 150.0 0.0016	Vprt 3.8 0.0 0.0	13.000 3.800 16.800	19.463 0.0 0.027		Vel = 0.77		
H.20 to H.19	0.0 1.4	0.863 150.0 0.0016	0.0 0.0 0.0	8.000 0.0 8.000	19.490 0.0 0.013		Vel = 0.77		
H.19 to H.16	0.0 1.4	0.863 150.0 0.0017	Vprt 3.8 0.0 0.0	7.000 3.800 10.800	19.503 0.0 0.018		Vel = 0.77		

Final Calculations - Hazen-Williams

Viega LLC
 200 OAKHAVEN DRIVE, LOT 3 - One Head Calculation (H.8)

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
H.16 to H.10	0.0 1.4	0.863 150.0 0.0017	Vprt 0.0	3.8 0.0	7.000 3.800	19.521 0.0		Vel = 0.77	
H.10 to H.2	0.0 1.4	0.863 150.0 0.0016	Vprt 0.0	3.8 0.0	10.000 3.800	19.539 0.0		Vel = 0.77	
H.2 to T.23	0.0 1.4	0.863 150.0 0.0016	Vprt 0.0	3.8 0.0	14.000 3.800	19.561 0.0		Vel = 0.77	
	0.0 1.40					19.590		K Factor = 0.32	



viega

Viega LLC
Technical Services Department
1900 Southwood Drive
Nashua, NH 03063
603-882-7171

Job Name : 200 OAKHAVEN DRIVE, LOT 3 - Two Head Calculation (H.9 & H.12)
Building : SINGLE FAMILY RESIDENCE
Location : HOLLY SPRINGS NC 27540
System : NFPA 13D
Contract : FPNM2102-016 NC
Data File : FPNM2102-016 NC (200 Oakhaven Drive).wx2

HYDRAULIC DESIGN INFORMATION SHEET

Name - 200 OAKHAVEN DRIVE LOT 3 Date - 2/26/2021
Location -
Building - SINGLE FAMILY RESIDENCE System No. - NFPA 13D
Contractor - x Contract No. - FPNM2102-016 NC
Calculated By - VIEGA LLC Drawing No. - FPNM2102-016 NC
Construction: (X) Combustible () Non-Combustible Ceiling Height 9
OCCUPANCY - RESIDENTIAL

S Type of Calculation: ()NFPA 13 Residential ()NFPA 13R (X)NFPA 13D
Y Number of Sprinklers Flowing: ()1 (X)2 ()4 ()
S ()Other

T ()Specific Ruling Made by Date

E
M Listed Flow at Start Point - 13 Gpm System Type
Listed Pres. at Start Point - 7.04 Psi (X) Wet () Dry
D MAXIMUM LISTED SPACING 16 x 16 () Deluge () PreAction
E Domestic Flow Added - 0 Gpm Sprinkler or Nozzle
S Additional Flow Added - Gpm Make RELIABLE Model RFC49
I Elevation at Highest Outlet - 118 Feet Size 7/16 K-Factor 4.9
G Note: Temperature Rating 155
N

Calculation Gpm Required 26.3032 Psi Required 51.74 At Ref Pt STR
Summary C-Factor Used: Overhead 150 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - x Rated Cap. Cap.
T Time of Test - x @ Psi Elev.
E Static (Psi) - 60 Elev.
R Residual (Psi) - 20 Other Well
Flow (Gpm) - 168 Proof Flow Gpm
S Elevation - 100

P Location: x
P
L Source of Information: x
Y

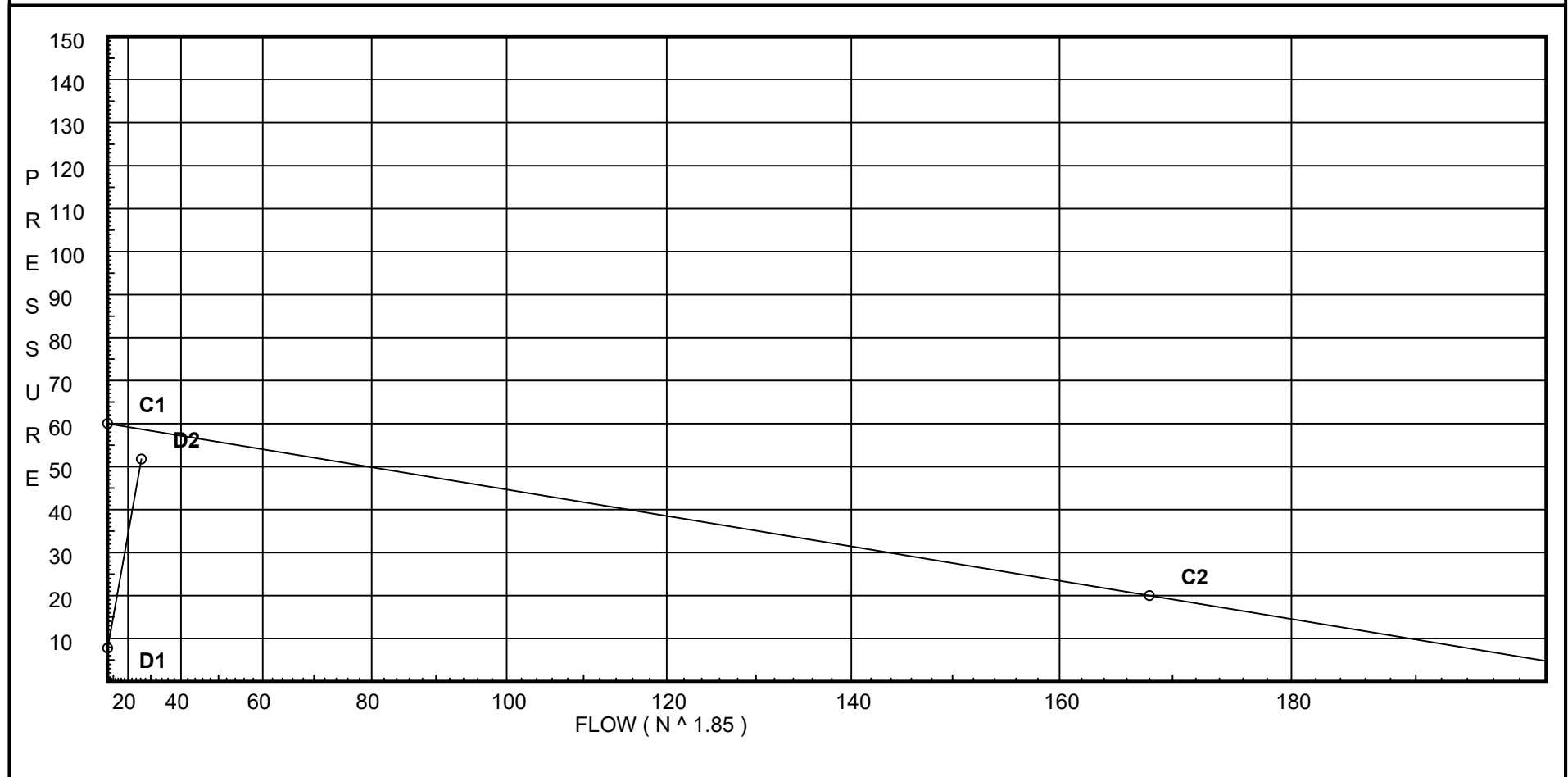
Water Supply Curve C

Viega LLC
200 OAKHAVEN DRIVE, LOT 3 - Two Head Calculation (H.9 & H.12)

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City Water Supply:
C1 - Static Pressure : 60
C2 - Residual Pressure: 20
C2 - Residual Flow : 168

Demand:
D1 - Elevation : 7.796
D2 - System Flow : 26.303
D2 - System Pressure : 51.745
Hose (Demand) : _____
D3 - System Demand : 26.303
Safety Margin : 6.960



Fittings Used Summary

Viega LLC
 200 OAKHAVEN DRIVE, LOT 3 - Two Head Calculation (H.9 & H.12)

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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	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	Generic Gate Valve	1	1	1	1	1	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
T	90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Vpel *	PEX Press 90 Elbow - Poly	12.6	18.9	17.7	18.6	29.4	36.4	0	0	0											
Vprt *	PEX Press Tee - Run-Poly	3.9	3.6	3.8	6.4	7.9	10.2	0	0	0											
Vptb *	PEX Press Tee - Branch-Poly	14	19.1	18.4	18.7	28.3	37.5	0	0	0											

Units Summary

Diameter Units Inches
 Length Units Feet
 Flow Units US Gallons per Minute
 Pressure Units Pounds per Square Inch

Flow Summary - NFPA 2007

Viega LLC
200 OAKHAVEN DRIVE, LOT 3 - Two Head Calculation (H.9 & H.12)

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SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
STR	60.0	20	168.0	58.705	26.3	51.745

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
H.9	118.0	4.9	7.04	13.0	
T.27	118.0		8.29		
T.26	118.0		8.63		
T.24	118.0		10.66		
T.25	108.0		16.57		
T.23	108.0		17.65		
H.1	108.0		18.28		
H.6	108.0		19.73		
H.7	108.0		20.93		
T.30	108.0		21.64		
T.31	108.0		22.75		
S.1	94.0		39.4		
MTR	100.0		47.16		
STR	100.0		51.74		
T.35	118.0		7.39		
H.15	118.0		7.68		
T.37	118.0		8.25		
T.40	118.0		8.34		
H.21	118.0		8.51		
H.18	118.0		8.72		
T.41	118.0		8.94		
T.38	118.0		10.56		
T.39	108.0		16.15		
T.29	108.0		17.44		
H.12	118.0	4.9	7.37	13.3	
T.34	118.0		8.36		
T.32	118.0		10.27		
T.33	108.0		16.08		
T.28	108.0		17.25		
H.8	118.0		8.27		
H.14	118.0		8.41		
H.13	118.0		8.49		
T.36	118.0		8.64		
H.22	118.0		8.84		
H.5	118.0		8.63		
H.4	118.0		8.63		
H.3	118.0		8.64		
H.11	108.0		17.32		
H.20	108.0		17.39		
H.19	108.0		17.42		
H.16	108.0		17.47		
H.10	108.0		17.52		

Flow Summary - NFPA 2007

Viega LLC
200 OAKHAVEN DRIVE, LOT 3 - Two Head Calculation (H.9 & H.12)

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NODE ANALYSIS (cont.)

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
H.2	108.0		17.58		

Final Calculations - Hazen-Williams

Viega LLC
200 OAKHAVEN DRIVE, LOT 3 - Two Head Calculation (H.9 & H.12)

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
H.9 to T.27	8.36	0.863 150.0	Vptb Vprt	18.4 3.8 0.0	6.000 22.200 28.200	7.040 0.0 1.251			K Factor = 4.90	
T.27 to T.26	8.36	0.0444		0.0					Vel = 4.59	
T.27 to T.26	1.31	0.863 150.0	Vprt	3.8 0.0	2.000 3.800	8.291 0.0				
T.26 to T.24	9.67	0.0581		0.0	5.800	0.337			Vel = 5.30	
T.26 to T.24	-0.45	0.863 150.0	Vptb Vpel	18.4 17.7 0.0	2.000 36.100 38.100	8.628 0.0 2.027				
T.24 to T.25	9.22	0.0532		0.0					Vel = 5.06	
T.24 to T.25	0.0	0.863 150.0	Vpel	17.7 0.0	12.000 17.700	10.655 4.331				
T.25 to T.23	9.22	0.0532		0.0	29.700	1.581			Vel = 5.06	
T.25 to T.23	0.0	0.863 150.0	Vptb	18.4 0.0	2.000 18.400	16.567 0.0				
T.23 to H.1	9.22	0.0532		0.0	20.400	1.085			Vel = 5.06	
T.23 to H.1	2.36	0.863 150.0	Vprt	3.8 0.0	4.000 3.800	17.652 0.0				
H.1 to H.6	11.58	0.0810		0.0	7.800	0.632			Vel = 6.35	
H.1 to H.6	0.0	0.863 150.0	Vprt	3.8 0.0	14.000 3.800	18.284 0.0				
H.6 to H.7	11.58	0.0811		0.0	17.800	1.444			Vel = 6.35	
H.6 to H.7	0.0	0.863 150.0	Vprt	3.8 0.0	11.000 3.800	19.728 0.0				
H.7 to T.30	11.58	0.0811		0.0	14.800	1.200			Vel = 6.35	
H.7 to T.30	0.0	0.863 150.0	Vprt	3.8 0.0	5.000 3.800	20.928 0.0				
T.30 to T.31	11.58	0.0810		0.0	8.800	0.713			Vel = 6.35	
T.30 to T.31	14.72	0.863 150.0		0.0 0.0	3.000 0.0	21.641 0.0				
T.31 to S.1	26.3	0.3700		0.0	3.000	1.110			Vel = 14.43	
T.31 to S.1	0.0	0.863 150.0	Vpel T	17.7 2.92 0.0	8.000 20.620 28.620	22.751 6.063 10.585				
S.1 to MTR	26.3	0.3698		0.0	28.620	10.585			Vel = 14.43	
S.1 to MTR	0.0	1.053 150.0	2E	2.429 0.0	50.000 2.429	39.399 0.401			** Fixed Loss = 3	
MTR to STR	26.3	0.1403		0.0	52.429	7.358			Vel = 9.69	
MTR to STR	0.0	1.049 150.0	E T	3.022 7.555	20.000 12.089	47.158 0.0				
STR	26.3	0.1429	G	1.511	32.089	4.587			Vel = 9.76	
	0.0 26.30					51.745			K Factor = 3.66	
H.9 to T.35	4.64	0.863 150.0	Vptb	18.4 0.0	5.000 18.400	7.040 0.0				
T.35 to H.15	4.64	0.0150		0.0	23.400	0.350			Vel = 2.54	
T.35 to H.15	1.50	0.863 150.0	Vprt	3.8 0.0	8.000 3.800	7.390 0.0				
H.15 to T.37	6.14	0.0250		0.0	11.800	0.295			Vel = 3.37	
H.15 to T.37	0.0	0.863 150.0	Vptb	18.4 0.0	4.000 18.400	7.685 0.0				
T.37	6.14	0.0251		0.0	22.400	0.562			Vel = 3.37	

Final Calculations - Hazen-Williams

Viega LLC
200 OAKHAVEN DRIVE, LOT 3 - Two Head Calculation (H.9 & H.12)

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftg's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
T.37 to T.40	-1.31 4.83	0.863 150.0 0.0160	Vprt	3.8 0.0	2.000 3.800 5.800	8.247 0.0 0.093			Vel = 2.65	
T.40 to H.21	0.0 4.83	0.863 150.0 0.0161	Vprt	3.8 0.0	7.000 3.800 10.800	8.340 0.0 0.174			Vel = 2.65	
H.21 to H.18	0.0 4.83	0.863 150.0 0.0161		0.0 0.0	13.000 0.0 13.000	8.514 0.0 0.209			Vel = 2.65	
H.18 to T.41	0.0 4.83	0.863 150.0 0.0161	Vprt	3.8 0.0	10.000 3.800 13.800	8.723 0.0 0.222			Vel = 2.65	
T.41 to T.38	3.33 8.16	0.863 150.0 0.0424	Vptb Vpel	18.4 17.7 0.0	2.000 36.100 38.100	8.945 0.0 1.617			Vel = 4.48	
T.38 to T.39	0.0 8.16	0.863 150.0 0.0425	Vpel	17.7 0.0	12.000 17.700 29.700	10.562 4.331 1.261			Vel = 4.48	
T.39 to T.29	0.0 8.16	0.863 150.0 0.0424	Vptb	18.4 0.0	12.000 18.400 30.400	16.154 0.0 1.290			Vel = 4.48	
T.29 to T.30	6.56 14.72	0.863 150.0 0.1264	Vptb Vprt	18.4 3.8 0.0	11.000 22.200 33.200	17.444 0.0 4.197			Vel = 8.07	
	0.0 14.72					21.641			K Factor = 3.16	
T.35 to H.12	-1.50 -1.5	0.863 150.0 -0.0019	Vprt	3.8 0.0	7.000 3.800 10.800	7.390 0.0 -0.020			Vel = 0.82	
H.12 to T.34	13.30 11.8	0.863 150.0 0.0840	Vprt	3.8 0.0	8.000 3.800 11.800	7.370 0.0 0.991			K Factor = 4.90 Vel = 6.47	
T.34 to T.32	-2.88 8.92	0.863 150.0 0.0500	Vptb Vpel	18.4 17.7 0.0	2.000 36.100 38.100	8.361 0.0 1.905			Vel = 4.89	
T.32 to T.33	0.0 8.92	0.863 150.0 0.0500	Vpel	17.7 0.0	12.000 17.700 29.700	10.266 4.331 1.485			Vel = 4.89	
T.33 to T.28	0.0 8.92	0.863 150.0 0.0500	Vptb	18.4 0.0	5.000 18.400 23.400	16.082 0.0 1.170			Vel = 4.89	
T.28 to T.29	-2.36 6.56	0.863 150.0 0.0282	Vprt	3.8 0.0	3.000 3.800 6.800	17.252 0.0 0.192			Vel = 3.60	
	0.0 6.56					17.444			K Factor = 1.57	
T.37 to H.8	1.31 1.31	0.863 150.0 0.0014	Vprt	3.8 0.0	11.000 3.800 14.800	8.247 0.0 0.021			Vel = 0.72	

Final Calculations - Hazen-Williams

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
H.8 to T.27	0.0 1.31	0.863 150.0 0.0015	Vprt 3.8 0.0 0.0	12.000 3.800 15.800	8.268 0.0 0.023		Vel = 0.72		
	0.0 1.31				8.291		K Factor = 0.45		
T.34 to H.14	2.88	0.863 150.0 0.0062	Vprt 3.8 0.0 0.0	4.000 3.800 7.800	8.361 0.0 0.048		Vel = 1.58		
H.14 to H.13	0.0 2.88	0.863 150.0 0.0062	0.0 0.0 0.0	13.000 0.0 13.000	8.409 0.0 0.080		Vel = 1.58		
H.13 to T.36	0.0 2.88	0.863 150.0 0.0062	Vptb 18.4 Vprt 3.8 0.0	2.000 22.200 24.200	8.489 0.0 0.150		Vel = 1.58		
T.36 to H.22	0.45 3.33	0.863 150.0 0.0081	Vprt 3.8 0.0 0.0	21.000 3.800 24.800	8.639 0.0 0.201		Vel = 1.83		
H.22 to T.41	0.0 3.33	0.863 150.0 0.0081	0.0 0.0 0.0	13.000 0.0 13.000	8.840 0.0 0.105		Vel = 1.83		
	0.0 3.33				8.945		K Factor = 1.11		
T.26 to H.5	0.45 0.45	0.863 150.0 0.0002	Vprt 3.8 0.0 0.0	5.000 3.800 8.800	8.628 0.0 0.002		Vel = 0.25		
H.5 to H.4	0.0 0.45	0.863 150.0 0.0002	Vprt 3.8 0.0 0.0	11.000 3.800 14.800	8.630 0.0 0.003		Vel = 0.25		
H.4 to H.3	0.0 0.45	0.863 150.0 0.0001	Vprt 3.8 0.0 0.0	10.000 3.800 13.800	8.633 0.0 0.002		Vel = 0.25		
H.3 to T.36	0.0 0.45	0.863 150.0 0.0002	Vprt 3.8 0.0 0.0	17.000 3.800 20.800	8.635 0.0 0.004		Vel = 0.25		
	0.0 0.45				8.639		K Factor = 0.15		
T.28 to H.11	2.36	0.863 150.0 0.0042	Vprt 3.8 0.0 0.0	12.000 3.800 15.800	17.252 0.0 0.067		Vel = 1.29		
H.11 to H.20	0.0 2.36	0.863 150.0 0.0043	Vprt 3.8 0.0 0.0	13.000 3.800 16.800	17.319 0.0 0.072		Vel = 1.29		
H.20 to H.19	0.0 2.36	0.863 150.0 0.0042	0.0 0.0 0.0	8.000 0.0 8.000	17.391 0.0 0.034		Vel = 1.29		
H.19 to H.16	0.0 2.36	0.863 150.0 0.0043	Vprt 3.8 0.0 0.0	7.000 3.800 10.800	17.425 0.0 0.046		Vel = 1.29		

Final Calculations - Hazen-Williams

Viega LLC
 200 OAKHAVEN DRIVE, LOT 3 - Two Head Calculation (H.9 & H.12)

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
H.16 to H.10	0.0 2.36	0.863 150.0 0.0043	Vprt 3.8 0.0	7.000 3.800	17.471 0.0		Vel = 1.29		
H.10 to H.2	0.0 2.36	0.863 150.0 0.0043	Vprt 3.8 0.0	10.000 3.800	17.517 0.0		Vel = 1.29		
H.2 to T.23	0.0 2.36	0.863 150.0 0.0043	Vprt 3.8 0.0	14.000 3.800	17.576 0.0		Vel = 1.29		
	0.0 2.36				17.652		K Factor = 0.56		