



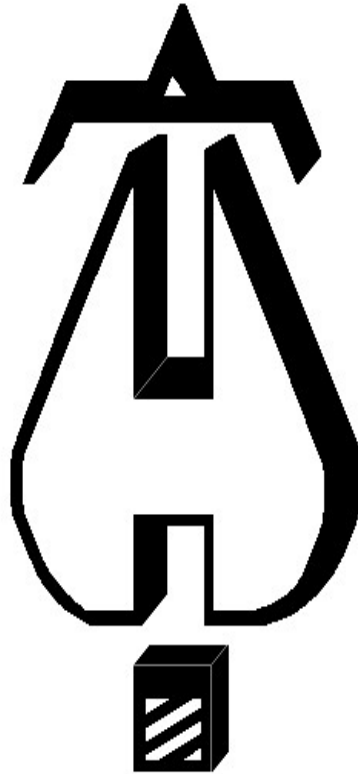
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1731 Round Rock Drive, Raleigh, NC 27615 • (919) 872-3250 • fax (919) 877-5775 • [www.flsamerica.com](http://www.flsamerica.com)

# OAKHAVEN LOT 25

## HYDRAULIC CALCULATIONS

12/20/2021



Hydraulic calculations using HydraCALC

Fire & Life Safety America  
1731 Roundrock Drive  
Raleigh, NC 27615  
P: (919) 872-3250  
F: (919) 877-5775

Job Name : Oakhaven Lot 25- Bedroom #2  
Drawing : FP1  
Location : 124 Buckhaven Dr  
Remote Area : RA1  
Contract : 22NC1459  
Data File : RA1-Bedroom #2.WXF

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**HYDRAULIC CALCULATIONS**  
**for**

**Project name:** Oakhaven Lot 25  
**Location:** 124 Buckhaven Dr  
**Drawing no:** FP1  
**Date:** 12/14/2021

**Design**

**Remote area number:** RA1  
**Remote area location:** Bedroom #2  
**Occupancy classification:** Residential  
**Density:** .05 - Gpm/SqFt  
**Area of application:** 1 Head - SqFt  
**Coverage per sprinkler:** 400 - SqFt  
**Type of sprinklers calculated:** VK494  
**No. of sprinklers calculated:** 1  
**In-rack demand:** N/A - GPM  
**Hose streams:** 3 - GPM  
**Total water required (including hose streams):** 23.03 - GPM @ 29.34 - Psi  
**Type of system:** WET  
**Volume of dry or preaction system:** N/A - Gal

**Water supply information**

**Date:** 4/21/2021  
**Location:** NC 42, NC 27540  
**Source:** Fire & Life Safety America

**Name of contractor:** Fire & Life Safety America  
**Address:** 1731 Roundrock Drive / Raleigh, NC 27615 / P: (919) 872-3250  
**Phone number:** F: (919) 877-57  
**Name of designer:** H. WEYANT  
**Authority having jurisdiction:** Harnett County  
**Notes: (Include peaking information or gridded systems here.)**

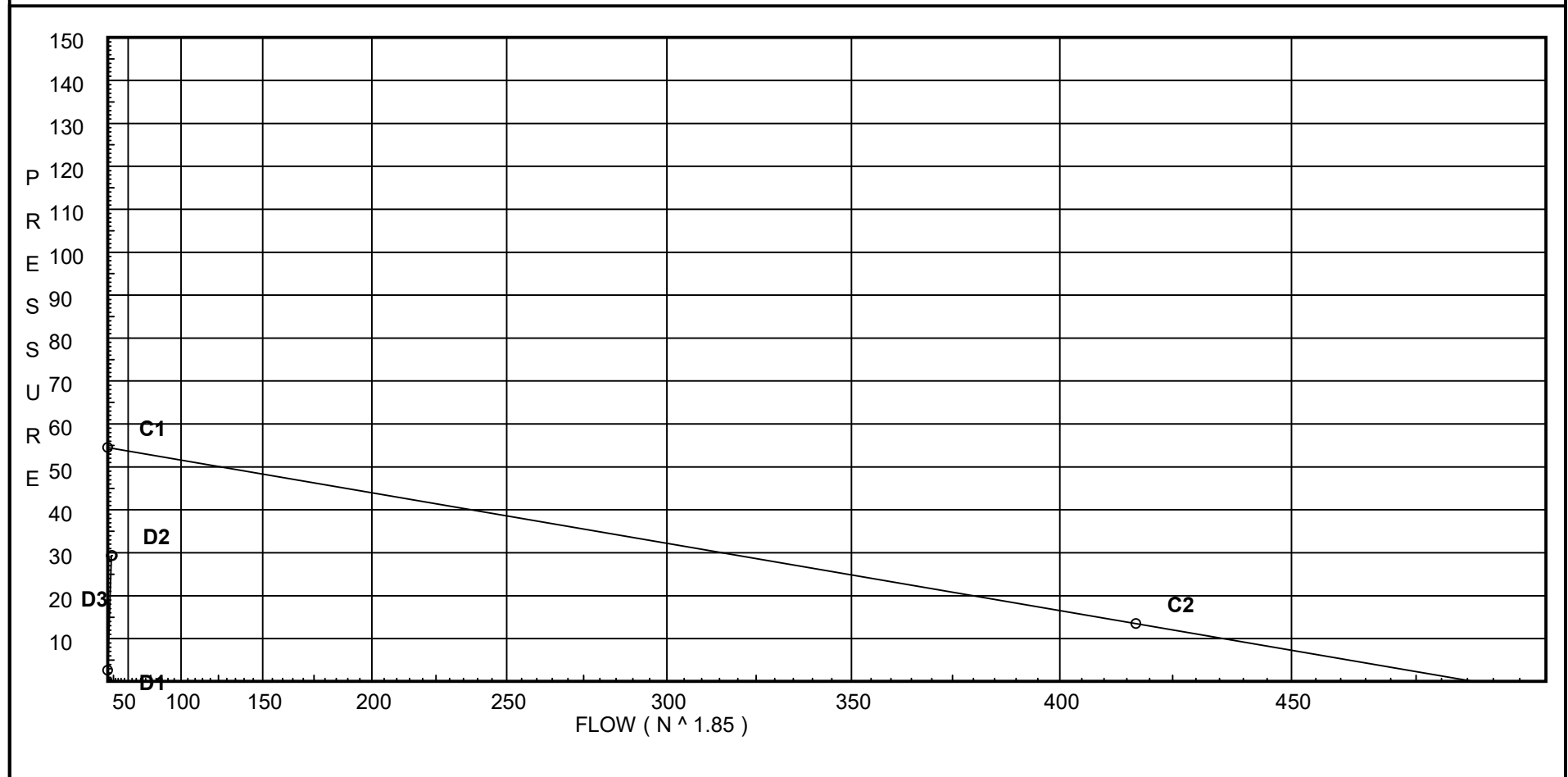
# Water Supply Curve C

Fire & Life Safety America  
Oakhaven Lot 25- Bedroom #2

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City Water Supply:  
C1 - Static Pressure : 54.5  
C2 - Residual Pressure: 13.5  
C2 - Residual Flow : 417

Demand:  
D1 - Elevation : 2.599  
D2 - System Flow : 20.024  
D2 - System Pressure : 29.341  
Hose ( Demand ) : 3  
D3 - System Demand : 23.024  
Safety Margin : 24.966



# Fittings Used Summary

Fire & Life Safety America  
Oakhaven Lot 25- Bedroom #2

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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	
Ball	B Ball Milw BB-SC100			2.25	2	2.5	2.25	10														
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	
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	
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13	
N *	CPVC 90'EII Harvel-Spears		7	7	8	9	11	12	13	0	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	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	

## 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.

# Flow Summary - NFPA

Fire & Life Safety America  
 Oakhaven Lot 25- Bedroom #2

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 Date 12/14/2021

## 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>
TEST	54.5	13.5	417.0	54.307	23.02	29.341

## NODE ANALYSIS

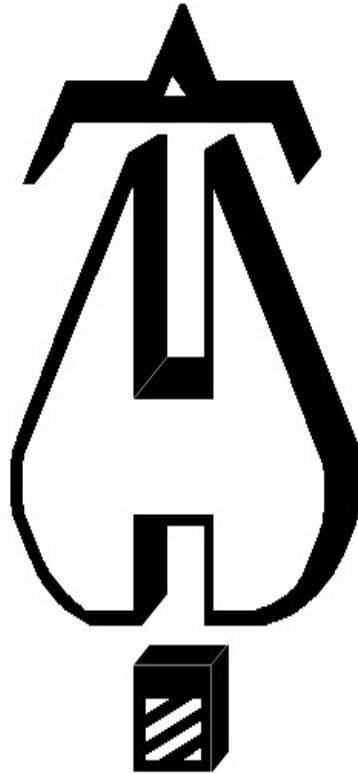
<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
S101	9.0	4.9	16.7	20.02	
101	10.0		16.81		
M101	10.0		18.24		
M102	10.0		21.31		
TOR	8.0		22.93		
BOR	3.0		26.41		
UG1	3.0		27.21	3.0	
UG2	-3.0		31.88		
UG3	-3.0		31.92		
TEST	3.0		29.34		

# Final Calculations : Hazen-Williams

Fire & Life Safety America  
Oakhaven Lot 25- Bedroom #2

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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	*****
S101 to 101	9 10	4.90	20.02	1	N	7.0 0.0	1.000 7.000	150	16.700 -0.433			
			20.02	1.101		0.0	8.000	0.0681	0.545		Vel = 6.75	
			0.0									
101			20.02						16.812		K Factor = 4.88	
101 to M101	10 10		20.02	1	N O	7.0 5.0	9.000 12.000	150	16.812 0.0			
			20.02	1.101		0.0	21.000	0.0682	1.432		Vel = 6.75	
M101 to M102	10 10		0.0	1	O	5.0 0.0	40.000 5.000	150	18.244 0.0			
			20.02	1.101		0.0	45.000	0.0682	3.069		Vel = 6.75	
M102 to TOR	10 8		0.0	1	N	7.0 0.0	4.000 7.000	150	21.313 0.866			
			20.02	1.101		0.0	11.000	0.0683	0.751		Vel = 6.75	
			0.0									
TOR			20.02						22.930		K Factor = 4.18	
TOR to BOR	8 3		20.02	1	N Ball	7.0 4.303	8.000 11.303	150	22.930 2.166			
			20.02	1.101		0.0	19.303	0.0681	1.315		Vel = 6.75	
BOR to UG1	3 3		0.0	1	2E	7.65 0.0	4.000 7.650	150	26.411 0.0			
			20.02	1.101		0.0	11.650	0.0682	0.795		Vel = 6.75	
UG1 to UG2	3 -3	H3	3.00	1.25	T 2E	9.523 9.523	55.000 19.046	150	27.206 2.599			
			23.02	1.394		0.0	74.046	0.0280	2.071		Vel = 4.84	
UG2 to UG3	-3 -3		0.0	6	2G 3E	9.25 64.749	1856.250 95.581	150	31.876 0.0			
			23.02	6.09	2F	21.583	1951.831	0	0.042		Vel = 0.25	
UG3 to TEST	-3 3		0.0	6	T 2E	48.896 45.637	1000.000 99.422	150	31.918 -2.599			
			23.02	6.16	G	4.89	1099.422	0	0.022		Vel = 0.25	
			0.0									
TEST			23.02						29.341		K Factor = 4.25	



Hydraulic calculations using HydraCALC

Fire & Life Safety America  
1731 Roundrock Drive  
Raleigh, NC 27615  
P: (919) 872-3250  
F: (919) 877-5775

Job Name : Oakhaven Lot 17 - Bonus Room  
Drawing : FP1  
Location : 124 Buckhaven Dr.  
Remote Area : RA2  
Contract : 22NC1459  
Data File : RA2- Recreation Room.WXF



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**HYDRAULIC CALCULATIONS**  
**for**

**Project name:** Oakhaven Lot 25  
**Location:** 124 Buckhaven Dr.  
**Drawing no:** FP1  
**Date:** 12/14/2021

**Design**

**Remote area number:** RA2  
**Remote area location:** Recreation Room  
**Occupancy classification:** Residential  
**Density:** .05 - Gpm/SqFt  
**Area of application:** 298 - SqFt  
**Coverage per sprinkler:** 256 - SqFt  
**Type of sprinklers calculated:** VK494  
**No. of sprinklers calculated:** 2  
**In-rack demand:** N/A - GPM  
**Hose streams:** 3 - GPM  
**Total water required (including hose streams):** 29.40 - GPM @ 29.08 - Psi  
**Type of system:** WET  
**Volume of dry or preaction system:** N/A - Gal

**Water supply information**

**Date:** 4/21/2021  
**Location:** NC 42, NC 27540  
**Source:** Fire & Life Safety America

**Name of contractor:** Fire & Life Safety America  
**Address:** 1731 Roundrock Drive / Raleigh, NC 27615 / P: (919) 872-3250  
**Phone number:** F: (919) 877-57  
**Name of designer:** H. WEYANT  
**Authority having jurisdiction:** Harnett County  
**Notes: (Include peaking information or gridded systems here.)**

# Water Supply Curve C

Fire & Life Safety America  
Oakhaven Lot 17 - Bonus Room

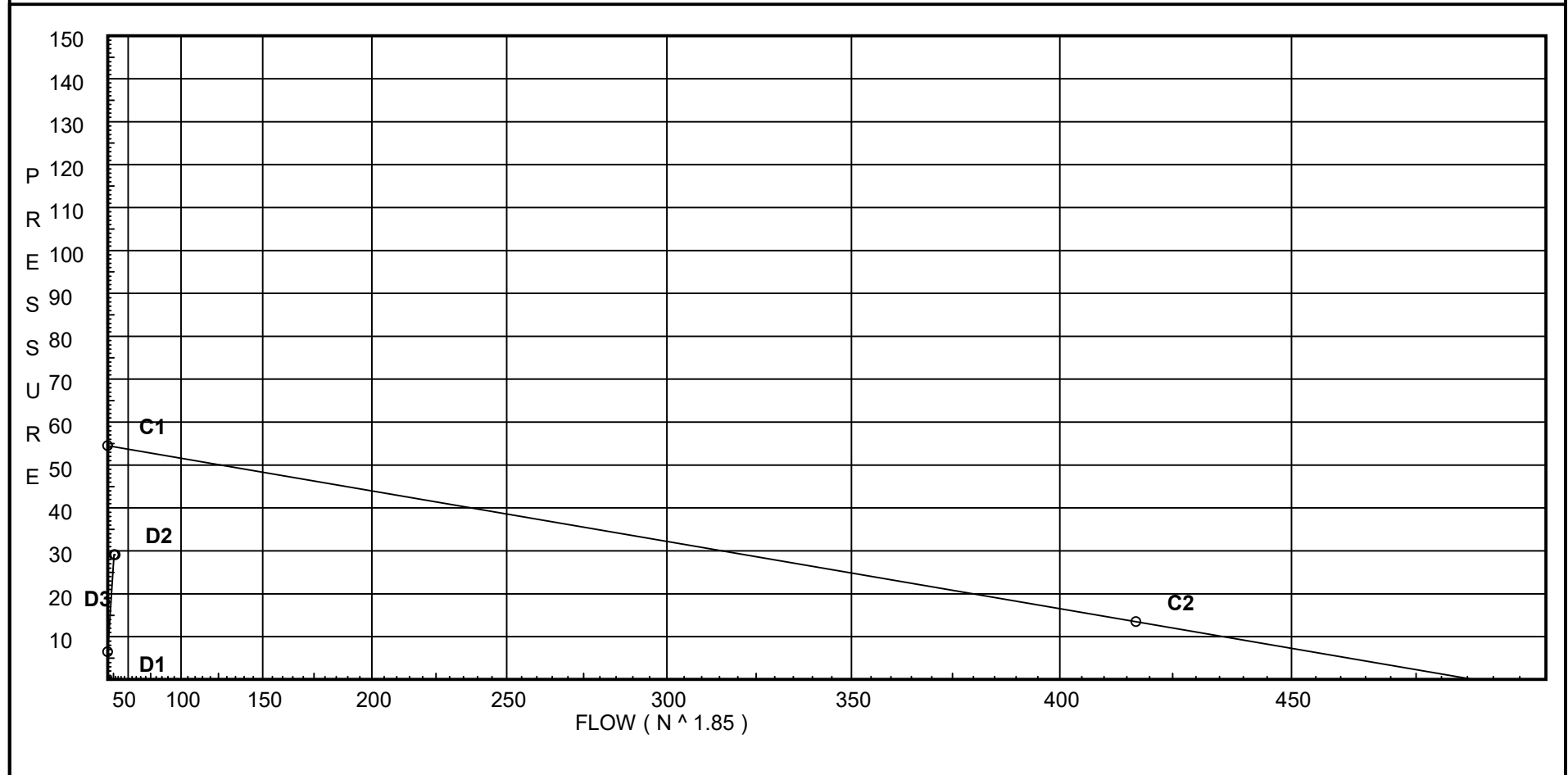
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## City Water Supply:

C1 - Static Pressure : 54.5  
C2 - Residual Pressure: 13.5  
C2 - Residual Flow : 417

## Demand:

D1 - Elevation : 6.496  
D2 - System Flow : 26.402  
D2 - System Pressure : 29.081  
Hose ( Demand ) : 3  
D3 - System Demand : 29.402  
Safety Margin : 25.115



# Fittings Used Summary

Fire & Life Safety America  
Oakhaven Lot 17 - Bonus Room

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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
Ball	B Ball Milw BB-SC100			2.25	2	2.5	2.25	10													
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
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
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N *	CPVC 90'EI 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

## 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.

# Flow Summary - NFPA

Fire & Life Safety America  
Oakhaven Lot 17 - Bonus Room

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Date 9/7/2021

## 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>
TEST	54.5	13.5	417.0	54.197	29.4	29.081

## 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>
S201	18.0	4.9	7.0	12.96	
S202	18.0	4.9	7.52	13.44	
201	19.0		6.81		
202	19.0		7.28		
M201	10.0		14.22		
M202	10.0		16.04		
TOR	8.0		20.04		
BOR	3.0		24.4		
UG1	3.0		25.72	3.0	
UG2	-3.0		31.58		
UG3	-3.0		31.65		
TEST	3.0		29.08		

# Final Calculations : Hazen-Williams

Fire & Life Safety America  
Oakhaven Lot 17 - Bonus Room

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Date 9/7/2021

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	*****
S201 to 201	18 19	4.90	12.96 12.96	1 1.101	N	7.0 0.0	1.000 7.000 8.000	150 0.0305	7.000 -0.433 0.244		Vel = 4.37	
201			0.0 12.96						6.811		K Factor = 4.97	
S202 to 202	18 19	4.90	13.44 13.44	1 1.101	O	5.0 0.0	1.000 5.000 6.000	150 0.0327	7.521 -0.433 0.196		Vel = 4.53	
202			0.0 13.44						7.284		K Factor = 4.98	
201 to 202	19 19		12.96 12.96	1 1.101		0.0 0.0	15.500 0.0 15.500	150 0.0305	6.811 0.0 0.473		Vel = 4.37	
202 to M201	19 10		13.44 26.4	1 1.101	2N	14.0 0.0	12.750 14.000 26.750	150 0.1137	7.284 3.898 3.042		Vel = 8.90	
M201 to M202	10 10		0.0 26.4	1 1.101	N	7.0 0.0	9.000 7.000 16.000	150 0.1138	14.224 0.0 1.820		Vel = 8.90	
M202 to TOR	10 8		0.0 26.4	1 1.101	3O	15.0 0.0	12.500 15.000 27.500	150 0.1137	16.044 0.866 3.128		Vel = 8.90	
TOR			0.0 26.40						20.038		K Factor = 5.90	
TOR to BOR	8 3		26.40 26.4	1 1.101	N Ball	7.0 4.303 0.0	8.000 11.303 19.303	150 0.1137	20.038 2.166 2.195		Vel = 8.90	
BOR to UG1	3 3		0.0 26.4	1 1.101	2E	7.65 0.0	4.000 7.650 11.650	150 0.1137	24.399 0.0 1.325		Vel = 8.90	
UG1 to UG2	3 -3	H3	3.00 29.4	1.25 1.394	T 2E	9.523 9.523 0.0	55.000 19.046 74.046	150 0.0440	25.724 2.599 3.257		Vel = 6.18	
UG2 to UG3	-3 -3		0.0 29.4	6 6.09	2G 3E 2F	9.25 64.749 21.583	1856.250 95.581 1951.831	150 0	31.580 0.0 0.065		Vel = 0.32	
UG3 to TEST	-3 3		0.0 29.4	6 6.16	T 2E G	48.896 45.637 4.89	1000.000 99.422 1099.422	150 0	31.645 -2.599 0.035		Vel = 0.32	
TEST			0.0 29.40						29.081		K Factor = 5.45	