ISO 9001: 2008 Certified

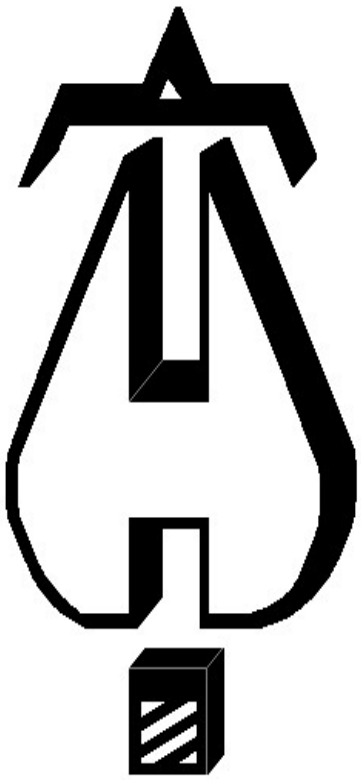
FLSA FIRE & LIFE SAFETY AMERICA PROTECTING AMERICA

1731 Round Rock Drive, Raleigh, NC 27615 ● (919) 872-3250 ● fax (919) 877-5775 ● www.flsamerica.com

OAKHAVEN LOT 7

HYDRAULIC CALCULATIONS

8/25/2021



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 07 - Bedroom #3
Drawing	:	FP1
Location	:	276 Oakhaven Drive
Remote Area	:	RA1
Contract	:	21NC1531
Data File	:	RA1.WXF

HYDRAULIC CALCULATIONS
for

Project name: Oak Haven Lot 07
Location: 276 Oakhaven Drive
Drawing no: FP1
Date: 8/23/2021

Design

Remote area number: RA1
Remote area location: Bedroom #3
Occupancy classification: Residential
Density: .05 - Gpm/SqFt
Area of application: 165 - 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 @ 30.45 - Psi
Type of system: WET
Volume of dry or preaction system: N/A - Gal

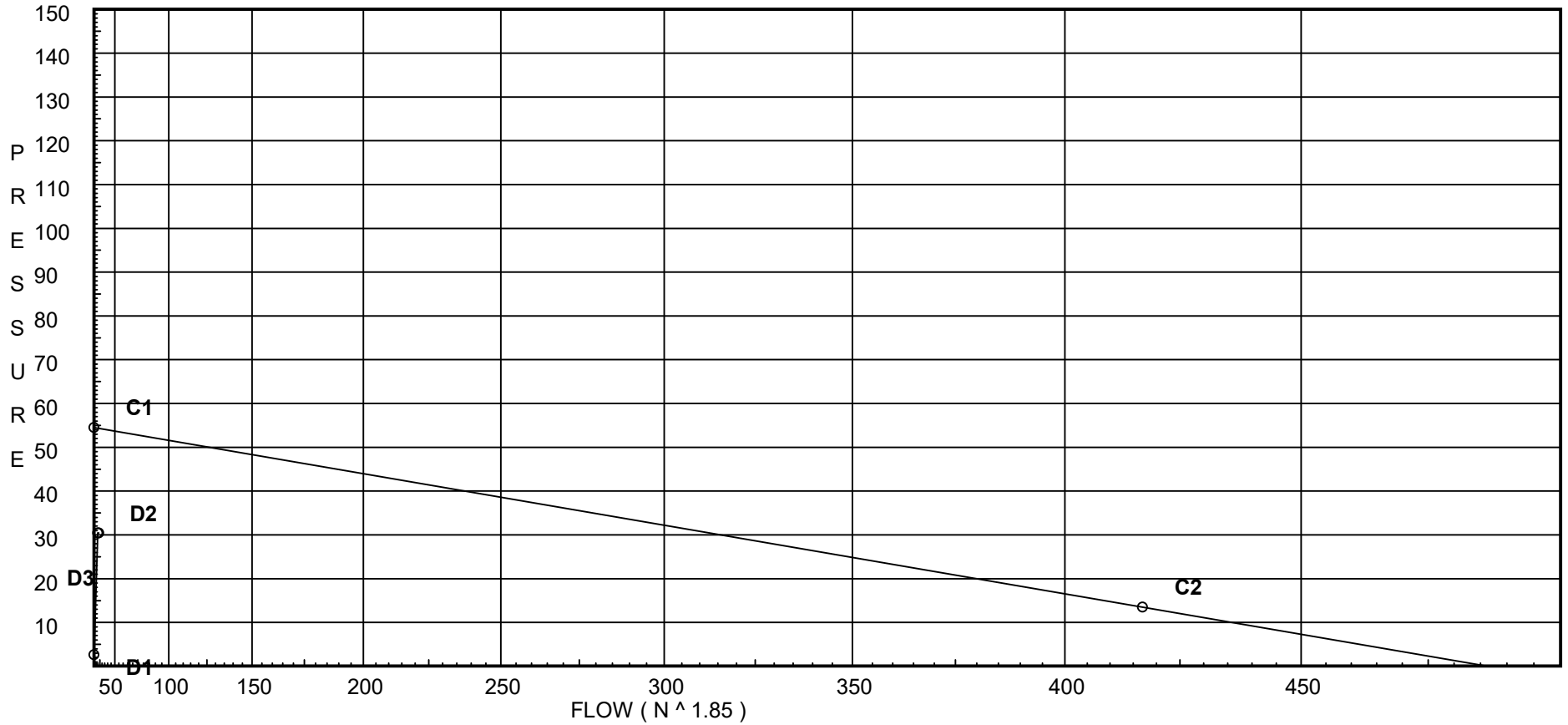
Water supply information

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.)

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 : 30.451
- Hose (Demand) : 3
- D3 - System Demand : 23.024
- Safety Margin : 23.856



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
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'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

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.

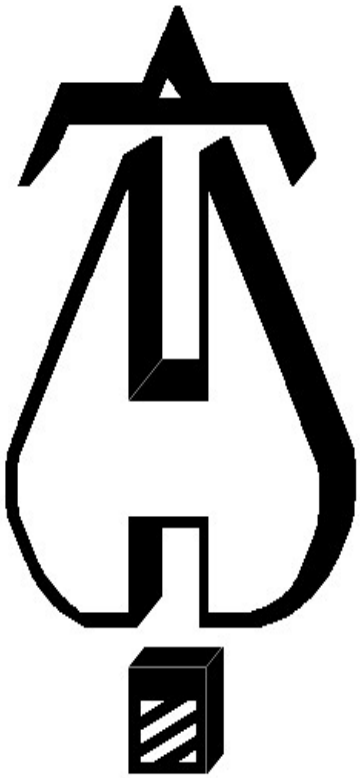
SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	54.5	13.5	417.0	54.307	23.02	30.451

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
S101	9.0	4.9	16.7	20.02	
101	10.0		17.32		
M101	10.0		19.17		
M102	10.0		22.31		
TOR	8.0		24.04		
BOR	3.0		27.53		
UG1	3.0		28.32	3.0	
UG2	-3.0		32.99		
UG3	-3.0		33.02		
TEST	3.0		30.45		

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	9	4.90	20.02	1	2N	14.0	1.500	150	16.700	
to						0.0	14.000		-0.433	
101	10		20.02	1.101		0.0	15.500	0.0682	1.057	Vel = 6.75
			0.0							
101			20.02						17.324	K Factor = 4.81
101	10		20.02	1	N	7.0	15.000	150	17.324	
to					O	5.0	12.000		0.0	
M101	10		20.02	1.101		0.0	27.000	0.0682	1.841	Vel = 6.75
			0.0							
M101			20.02						19.165	K Factor = 4.57
M101	10		20.02	1	N	7.0	39.083	150	19.165	
to						0.0	7.000		0.0	
M102	10		20.02	1.101		0.0	46.083	0.0682	3.143	Vel = 6.75
M102	10		0.0	1	N	7.0	5.750	150	22.308	
to						0.0	7.000		0.866	
TOR	8		20.02	1.101		0.0	12.750	0.0682	0.869	Vel = 6.75
			0.0							
TOR			20.02						24.043	K Factor = 4.08
TOR	8		20.02	1	Ball	4.303	8.000	150	24.043	
to					N	7.0	11.303		2.166	
BOR	3		20.02	1.101		0.0	19.303	0.0682	1.316	Vel = 6.75
BOR	3		0.0	1	2E	7.65	4.000	150	27.525	
to						0.0	7.650		0.0	
UG1	3		20.02	1.101		0.0	11.650	0.0682	0.795	Vel = 6.75
UG1	3	H3	3.00	1.25	T	9.523	55.000	150	28.320	
to					2E	9.523	19.046		2.599	
UG2	-3		23.02	1.394		0.0	74.046	0.0280	2.071	Vel = 4.84
UG2	-3		0.0	6	2G	9.25	1538.750	150	32.990	
to					3E	64.749	95.581		0.0	
UG3	-3		23.02	6.09	2F	21.583	1634.331	0	0.035	Vel = 0.25
UG3	-3		0.0	6	T	43.037	1000.000	140	33.025	
to					2E	40.168	87.509		-2.599	
TEST	3		23.02	6.16	G	4.304	1087.509	0	0.025	Vel = 0.25
			0.0							
TEST			23.02						30.451	K Factor = 4.17



Hydraulic calculations using HydraCALC

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

Job Name	:	Oak Haven Lot 07 - RA2
Drawing	:	FP1
Location	:	276 Oakhaven Drive
Remote Area	:	RA2
Contract	:	21NC1531
Data File	:	RA2.WXF

HYDRAULIC CALCULATIONS
for

Project name: Oak Haven Lot 07
Location: 276 Oakhaven Drive
Drawing no: FP1
Date: 8/23/2021

Design

Remote area number: RA2
Remote area location: Bonus Room
Occupancy classification: Residential
Density: .05 - Gpm/SqFt
Area of application: 328 - 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): 29.45 - GPM @ 29.22 - 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

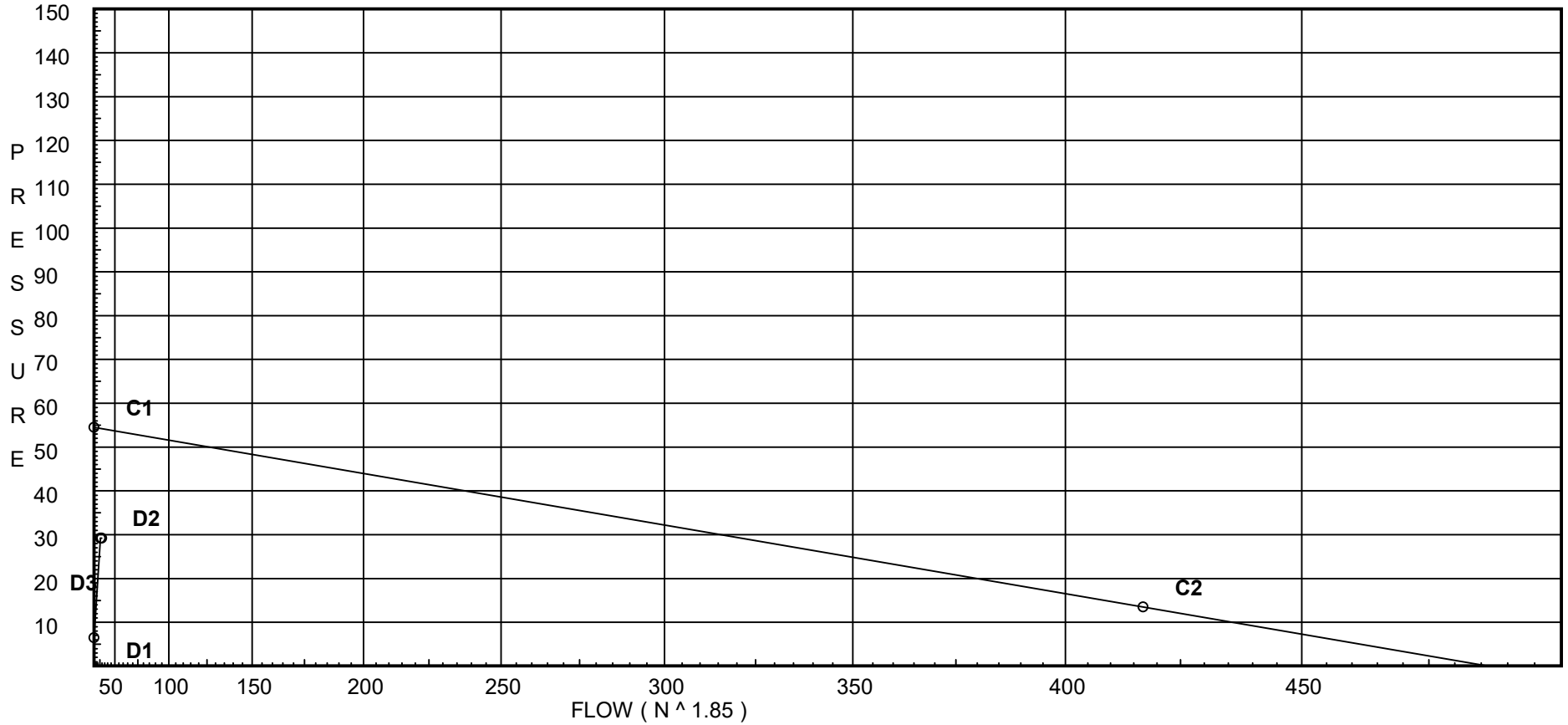
Name of contractor: Fire & Life Safety America
Address: 1731 Roundrock Drive / Raleigh, NC 27615 / P: (919) 872-3250
Phone number: F: (919) 877-57
Name of designer: H. WEYANT
Authority having jurisdiction: Harnett County
Notes: (Include peaking information or gridded systems here.)

Water Supply Curve C

Fire & Life Safety America
Oak Haven Lot 07 - RA2

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 : 26.448
- D2 - System Pressure : 29.218
- Hose (Demand) : 3
- D3 - System Demand : 29.448
- Safety Margin : 24.977



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
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'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

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.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	54.5	13.5	417.0	54.196	29.45	29.218

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
S201	18.0	4.9	7.0	12.96	
S202	18.0	4.9	7.57	13.48	
201	19.0		6.81		
202	19.0		7.4		
M201	19.0		7.14		
M202	19.0		7.69		
M203	10.0		14.17		
M204	10.0		16.0		
TOR	8.0		20.16		
BOR	3.0		24.53		
UG1	3.0		25.86	3.0	
UG2	-3.0		31.72		
UG3	-3.0		31.78		
TEST	3.0		29.22		

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	18	4.90	12.96	1	N	7.0	1.000	150	7.000	
to						0.0	7.000		-0.433	
201	19		12.96	1.101		0.0	8.000	0.0305	0.244	Vel = 4.37
			0.0							
201			12.96						6.811	K Factor = 4.97
S202	18	4.90	13.48	1	N	7.0	1.000	150	7.572	
to						0.0	7.000		-0.433	
202	19		13.48	1.101		0.0	8.000	0.0328	0.262	Vel = 4.54
			0.0							
202			13.48						7.401	K Factor = 4.96
201	19		12.96	1	N	7.0	3.667	150	6.811	
to						0.0	7.000		0.0	
M201	19		12.96	1.101		0.0	10.667	0.0305	0.325	Vel = 4.37
			0.0							
M201			12.96						7.136	K Factor = 4.85
202	19		13.48	1	O	5.0	3.667	150	7.401	
to						0.0	5.000		0.0	
M202	19		13.48	1.101		0.0	8.667	0.0329	0.285	Vel = 4.54
			0.0							
M202			13.48						7.686	K Factor = 4.86
M201	19		12.96	1		0.0	18.000	150	7.136	
to						0.0	0.0		0.0	
M202	19		12.96	1.101		0.0	18.000	0.0306	0.550	Vel = 4.37
M202	19		13.49	1	N	7.0	15.667	150	7.686	
to						0.0	7.000		3.898	
M203	10		26.45	1.101		0.0	22.667	0.1141	2.586	Vel = 8.91
M203	10		0.0	1	N	7.0	9.000	150	14.170	
to						0.0	7.000		0.0	
M204	10		26.45	1.101		0.0	16.000	0.1141	1.825	Vel = 8.91
M204	10		0.0	1	O	5.0	9.917	150	15.995	
to					2N	14.0	19.000		0.866	
TOR	8		26.45	1.101		0.0	28.917	0.1141	3.300	Vel = 8.91
			0.0							
TOR			26.45						20.161	K Factor = 5.89
TOR	8		26.45	1	N	7.0	8.000	150	20.161	
to					Ball	4.303	11.303		2.166	
BOR	3		26.45	1.101		0.0	19.303	0.1141	2.202	Vel = 8.91
BOR	3		0.0	1	2E	7.65	4.000	150	24.529	
to						0.0	7.650		0.0	
UG1	3		26.45	1.101		0.0	11.650	0.1141	1.329	Vel = 8.91
UG1	3	H3	3.00	1.25	T	9.523	55.000	150	25.858	
to					2E	9.523	19.046		2.599	
UG2	-3		29.45	1.394		0.0	74.046	0.0441	3.266	Vel = 6.19
UG2	-3		0.0	6	2G	9.25	1538.750	150	31.723	
to					3E	64.749	95.581		0.0	
UG3	-3		29.45	6.09	2F	21.583	1634.331	0	0.055	Vel = 0.32
UG3	-3		0.0	6	T	43.037	1000.000	140	31.778	
to					2E	40.168	87.509		-2.599	
TEST	3		29.45	6.16	G	4.304	1087.509	0	0.039	Vel = 0.32

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	******
			0.0									
TEST			29.45						29.218	K Factor =	5.45	