



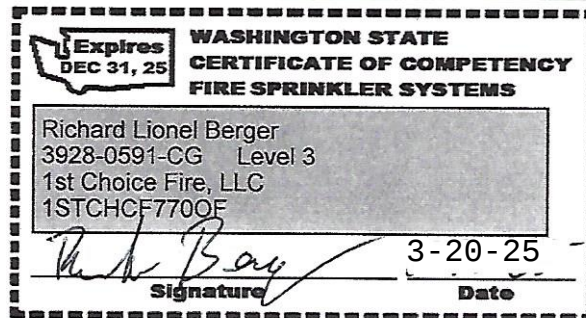
Hydraulic Overview

Job Number: 1
Report Description: Residential (#1)

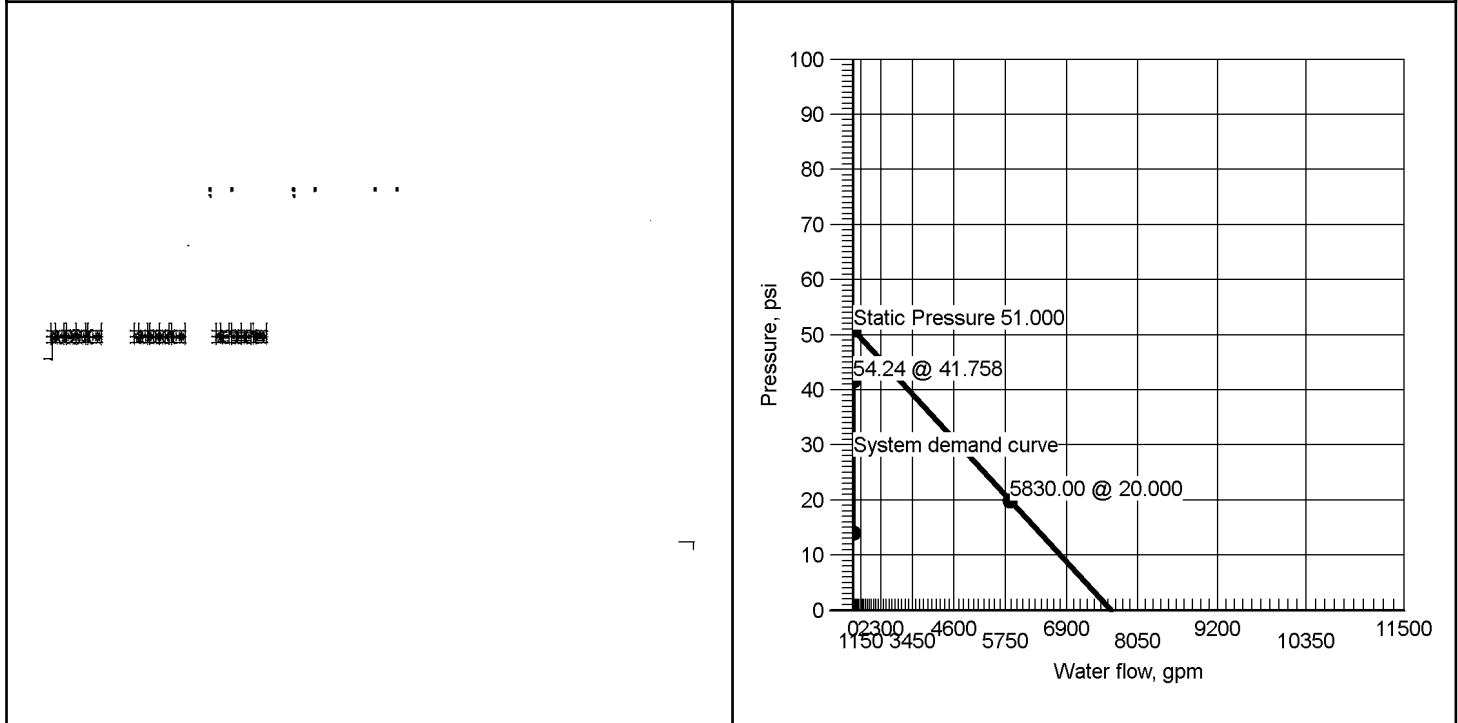
Job		
Job Number 1	Design Engineer	
Job Name: Drawing1	Phone	FAX
Address 1	State Certification/License Number	
Address 2	AHJ	
Address 3	Job Site/Building	

System		
Density 0.05gpm/ft ²	Area of Application 1024ft ² (Actual 447ft ²)	
Most Demanding Sprinkler Data 4.9 K-Factor 13.00 at 7.039	Hose Streams 0.00	
Coverage Per Sprinkler 256ft ²	Number Of Sprinklers Calculated 4	Number Of Sprinklers Calculated 0
System Pressure Demand 41.758	System Flow Demand 54.24	
Total Demand 54.24 @ 41.758	Pressure Result +9.236 (18.1%)	

Supplies						Check Point Gauges			
Node	Name	Flow(gpm)	Hose Flow(gpm)	Static(psi)	Residual(psi)	Identifier	Pressure(psi)	K-Factor(K)	Flow(gpm)
1	Water Supply	5830.00		51.000	20.000				



2nd St Apts, Main Water Supply at Node 1 (5830.00, 0.00, 51.000, 20.000)





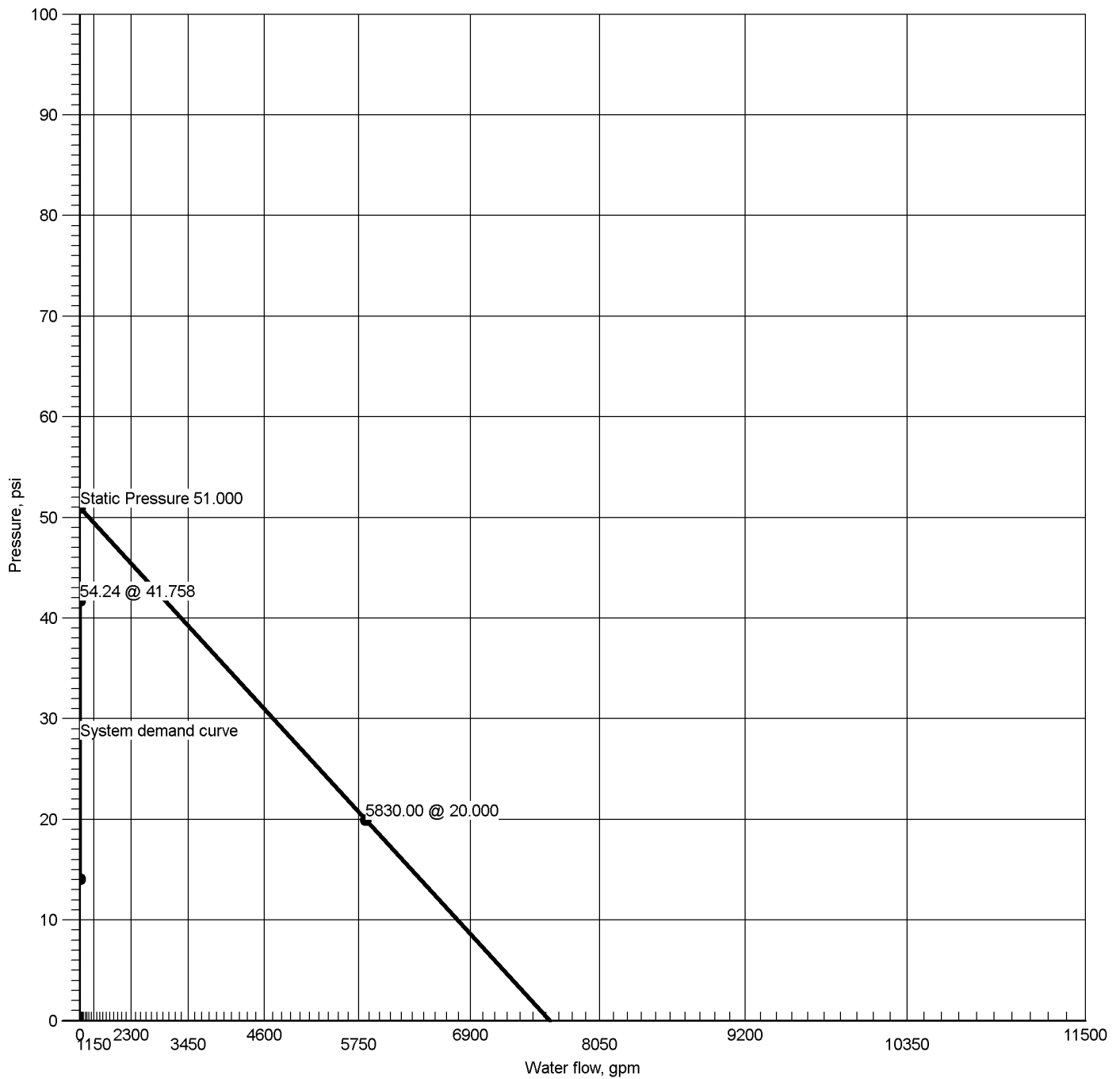
Hydraulic Summary

Job Number: 1
Report Description: Residential (#1)

Job											
Job Number 1				Design Engineer							
Job Name: Drawing1				State Certification/License Number							
Address 1				AHJ							
Address 2				Job Site/Building							
Address 3				Drawing Name 2nd St Apts, Main							
System				Remote Area(s)							
Most Demanding Sprinkler Data 4.9 K-Factor 13.00 at 7.039				Occupancy Residential			Job Suffix				
Hose Allowance At Source 0.00				Density 0.05gpm/ft ²			Area of Application 1024ft ² (Actual 447ft ²)				
Additional Hose Supplies Node Flow(gpm)				Number Of Sprinklers Calculated 4		Number Of Nozzles Calculated 0		Coverage Per Sprinkler 256ft ²			
				AutoPeak Results: Pressure For Remote Area(s) Adjacent To Most Remote Area							
Total Hose Streams 0.00											
System Flow Demand 54.24		Total Water Required (Including Hose Allowance) 54.24									
Maximum Pressure Unbalance In Loops 0.000											
Maximum Velocity Above Ground 8.68 between nodes 278 and 220											
Maximum Velocity Under Ground 1.24 between nodes 5 and 3											
Volume capacity of Wet Pipes 347.68gal		Volume capacity of Dry Pipes									
Supplies											
Node	Name	Hose Flow (gpm)	Static (psi)	Residual (psi)	@	Flow (gpm)	Available (psi)	@	Total Demand (gpm)	Required (psi)	Safety Margin (psi)
1	Water Supply		51.000	20.000		5830.00	50.995		54.24	41.758	9.236
Contractor											
Contractor Number		Contact Name				Contact Title					
Name of Contractor:				Phone				Extension			
Address 1				FAX							
Address 2				E-mail							
Address 3				Web-Site							



Water Supply at Node 1



Hydraulic Graph

Water Supply at Node 1

Static: Pressure
51.000

Residual: Pressure
20.000 @ 5830.00

Available Pressure at Time of Test
50.995 @ 54.24

System Demand
41.758 @ 54.24

System Demand (Including Hose Allowance at Source)
41.758 @ 54.24



Summary Of Outflowing Devices

Job Number: 1

Report Description: Residential (#1)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)		
Sprinkler	639	13.75	13.00	4.9	7.874		
⇒ Sprinkler	649	13.00	13.00	4.9	7.039		
Sprinkler	659	13.44	13.00	4.9	7.524		
Sprinkler	697	14.05	13.00	4.9	8.221		

⇒ Most Demanding Sprinkler Data



Hydraulic Analysis

Job Number: 1
Report Description: Residential (#1)

Pipe Type	Diameter	Flow	Velocity	HWC	Pn	Friction Loss	Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt		Fittings	Eq. Length	Summary
Upstream							Total Length	
Route 1								
DR	1.1010	13.00	4.38	150		0.030666	14'-5½"	Pf 1.240
649	29'-0"	13.00	4.9	7.039		Sprinkler,	26'-0"	Pe -0.434
118	30'-0"			7.845		3E(7'-0"), T(5'-0")	40'-5½"	Pv
BL	1.5980	26.75	4.28	150		0.018989	5'-11"	Pf 0.131
118	30'-0"	13.75		7.845		Flow (q) from Route 3	1'-0"	Pe
174	30'-0"			7.976		Tr(1'-0")	6'-11"	Pv
BL	1.5980	40.19	6.43	150		0.040325	4'-9"	Pf 0.232
174	30'-0"	13.44		7.976		Flow (q) from Route 2	1'-0"	Pe
220	30'-0"			8.209		Tr(1'-0")	5'-9"	Pv
BL	1.5980	54.24	8.68	150		0.070216	31'-4"	Pf 4.027
220	30'-0"	14.05		8.209		Flow (q) from Route 4	26'-0"	Pe 8.671
278	10'-0"			20.906		2T(8'-0"), E(9'-0"), Tr(1'-0")	57'-4"	Pv
BL	2.0030	54.24	5.52	150		0.023370	78'-8"	Pf 2.493
278	10'-0"			20.906			28'-0"	Pe
261	10'-0"			23.399		14Tr(2'-0")	106'-8"	Pv
BL	1.5980	54.24	8.68	150		0.070216	0'-3"	Pf 0.088
261	10'-0"			23.399			1'-0"	Pe
260	10'-0"			23.487		Tr(1'-0")	1'-3"	Pv
BL	2.0030	54.24	5.52	150		0.023370	99'-0"	Pf 8.342
260	10'-0"			23.487			44'-0"	Pe 3.862
3	1'-1"			35.691		11Tr(2'-0"), 2E(11'-0"), BFP(-5.000)	143'-0"	Pv
UG	4.2200	54.24	1.24	140		0.000705	72'-6½"	Pf 2.075
3	1'-1"			35.691			33'-5½"	Pe 1.991
5	-3'-6"			39.756		2E(16'-8½"), PIV(-2.000)	105'-11½"	Pv
UG	6.2800	54.24	0.56	140		0.000102	22'-9"	Pf 2.002
5	-3'-6"			39.756				Pe
1	-3'-6"			41.758		GV(-2.000), S	22'-9"	Pv
		0.00				Hose Allowance At Source		
1		54.24						
Route 2								
DR	1.1010	13.44	4.53	150		0.032615	15'-2"	Pf 0.886
659	29'-0"	13.44	4.9	7.524		Sprinkler,	12'-0"	Pe -0.434
174	30'-0"			7.976		E(7'-0"), T(5'-0")	27'-2"	Pv
Route 3								
DR	1.1010	13.75	4.63	150		0.034019	1'-10½"	Pf 0.405
639	29'-0"	13.75	4.9	7.874		Sprinkler,	10'-0"	Pe -0.434
118	30'-0"			7.845		2T(5'-0")	11'-10½"	Pv
Route 4								
DR	1.1010	14.05	4.73	150		0.035403	1'-10½"	Pf 0.421
697	29'-0"	14.05	4.9	8.221		Sprinkler,	10'-0"	Pe -0.434
220	30'-0"			8.209		T(5'-0"), C(5'-0")	11'-10½"	Pv

Equivalent Pipe Lengths of Valves and Fittings (C=120 only)

C Value Multiplier

$$\left(\frac{\text{Actual Inside Diameter}}{\text{Schedule 40 Steel Pipe Inside Diameter}} \right)^{4.87} = \text{Factor}$$

Value Of C	100	130	140	150
Multiplying Factor	0.713	1.16	1.33	1.51



Hydraulic Analysis

Job Number: 1

Report Description: Residential (#1)

Pipe Type	Diameter	Flow	Velocity	HWC	Friction Loss		Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Fittings	Eq. Length	Summary
Upstream							Total Length	

Pipe Type Legend		Units Legend		Fittings Legend	
AO	Arm-Over	Diameter	Inch	ALV	Alarm Valve
BL	Branch Line	Elevation	Foot	AngV	Angle Valve
CM	Cross Main	Flow	gpm	b	Bushing
DN	Drain	Discharge	gpm	BaV	Ball Valve
DR	Drop	Velocity	fps	BFP	Backflow Preventer
DY	Dynamic	Pressure	psi	BV	Butterfly Valve
FM	Feed Main	Length	Foot	C	Cross Flow Turn 90°
FR	Feed Riser	Friction Loss	psi/Foot	cplg	Coupling
MS	Miscellaneous	HWC	Hazen-Williams Constant	Cr	Cross Run
OR	Outrigger	Pt	Total pressure at a point in a pipe	CV	Check Valve
RN	Riser Nipple	Pn	Normal pressure at a point in a pipe	DeV	Deluge Valve
SP	Sprig	Pf	Pressure loss due to friction between points	DPV	Dry Pipe Valve
ST	Stand Pipe	Pe	Pressure due to elevation difference between indicated points	E	90° Elbow
UG	Underground	Pv	Velocity pressure at a point in a pipe	EE	45° Elbow
				Ee1	11¼° Elbow
				Ee2	22½° Elbow
				f	Flow Device
				fd	Flex Drop
				FDC	Fire Department Connection
				fE	90° FireLock(TM) Elbow
				fEE	45° FireLock(TM) Elbow
				flg	Flange
				FN	Floating Node
				fT	FireLock(TM) Tee
				g	Gauge
				GloV	Globe Valve
				GV	Gate Valve
				Ho	Hose
				Hose	Hose
				HV	Hose Valve
				Hyd	Hydrant
				LtE	Long Turn Elbow
				mecT	Mechanical Tee
				Noz	Nozzle
				P1	Pump In
				P2	Pump Out
				PIV	Post Indicating Valve
				PO	Pipe Outlet
				PrV	Pressure Relief Valve
				PRV	Pressure Reducing Valve
				red	Reducer/Adapter
				S	Supply
				sCV	Swing Check Valve
				SFx	Seismic Flex
				Spr	Sprinkler
				St	Strainer
				T	Tee Flow Turn 90°
				Tr	Tee Run
				U	Union
				WirF	Wirsbo
				WMV	Water Meter Valve
				Z	Cap



Hydraulic Analysis

Job Number: 1
Report Description: Residential (#1)

Pipe Type	Diameter	Flow	Velocity	HWC	Pn	Friction Loss	Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt		Fittings	Eq. Length	Summary
Upstream							Total Length	
Route 1								
DR	1.1010	13.00	4.38	150		0.030666	14'-5½"	Pf 1.240
649	29'-0"	13.00	4.9	7.039		Sprinkler,	26'-0"	Pe -0.434
118	30'-0"			7.845		3E(7'-0"), T(5'-0")	40'-5½"	Pv
BL	1.5980	26.75	4.28	150		0.018989	5'-11"	Pf 0.131
118	30'-0"	13.75		7.845		Flow (q) from Route 3	1'-0"	Pe
174	30'-0"			7.976		Tr(1'-0")	6'-11"	Pv
BL	1.5980	40.19	6.43	150		0.040325	4'-9"	Pf 0.232
174	30'-0"	13.44		7.976		Flow (q) from Route 2	1'-0"	Pe
220	30'-0"			8.209		Tr(1'-0")	5'-9"	Pv
BL	1.5980	54.24	8.68	150		0.070216	31'-4"	Pf 4.027
220	30'-0"	14.05		8.209		Flow (q) from Route 4	26'-0"	Pe 8.671
278	10'-0"			20.906		2T(8'-0"), E(9'-0"), Tr(1'-0")	57'-4"	Pv
BL	2.0030	54.24	5.52	150		0.023370	78'-8"	Pf 2.493
278	10'-0"			20.906			28'-0"	Pe
261	10'-0"			23.399		14Tr(2'-0")	106'-8"	Pv
BL	1.5980	54.24	8.68	150		0.070216	0'-3"	Pf 0.088
261	10'-0"			23.399			1'-0"	Pe
260	10'-0"			23.487		Tr(1'-0")	1'-3"	Pv
BL	2.0030	54.24	5.52	150		0.023370	99'-0"	Pf 8.342
260	10'-0"			23.487			44'-0"	Pe 3.862
3	1'-1"			35.691		11Tr(2'-0"), 2E(11'-0"), BFP(-5.000)	143'-0"	Pv
UG	4.2200	54.24	1.24	140		0.000705	72'-6½"	Pf 2.075
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UG	6.2800	54.24	0.56	140		0.000102	22'-9"	Pf 2.002
5	-3'-6"			39.756				Pe
1	-3'-6"			41.758		GV(-2.000), S	22'-9"	Pv
		0.00				Hose Allowance At Source		
1		54.24						
Route 2								
DR	1.1010	13.44	4.53	150		0.032615	15'-2"	Pf 0.886
659	29'-0"	13.44	4.9	7.524		Sprinkler,	12'-0"	Pe -0.434
174	30'-0"			7.976		E(7'-0"), T(5'-0")	27'-2"	Pv
Route 3								
DR	1.1010	13.75	4.63	150		0.034019	1'-10½"	Pf 0.405
639	29'-0"	13.75	4.9	7.874		Sprinkler,	10'-0"	Pe -0.434
118	30'-0"			7.845		2T(5'-0")	11'-10½"	Pv
Route 4								
DR	1.1010	14.05	4.73	150		0.035403	1'-10½"	Pf 0.421
697	29'-0"	14.05	4.9	8.221		Sprinkler,	10'-0"	Pe -0.434
220	30'-0"			8.209		T(5'-0"), C(5'-0")	11'-10½"	Pv

Equivalent Pipe Lengths of Valves and Fittings (C=120 only)

C Value Multiplier

$$\left(\frac{\text{Actual Inside Diameter}}{\text{Schedule 40 Steel Pipe Inside Diameter}} \right)^{4.87} = \text{Factor}$$

Value Of C	100	130	140	150
Multiplying Factor	0.713	1.16	1.33	1.51



Hydraulic Analysis

Job Number: 1

Report Description: Residential (#1)

Pipe Type	Diameter	Flow	Velocity	HWC	Friction Loss		Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Fittings	Eq. Length	Summary
Upstream							Total Length	

Pipe Type Legend		Units Legend		Fittings Legend	
AO	Arm-Over	Diameter	Inch	ALV	Alarm Valve
BL	Branch Line	Elevation	Foot	AngV	Angle Valve
CM	Cross Main	Flow	gpm	b	Bushing
DN	Drain	Discharge	gpm	BaV	Ball Valve
DR	Drop	Velocity	fps	BFP	Backflow Preventer
DY	Dynamic	Pressure	psi	BV	Butterfly Valve
FM	Feed Main	Length	Foot	C	Cross Flow Turn 90°
FR	Feed Riser	Friction Loss	psi/Foot	cplg	Coupling
MS	Miscellaneous	HWC	Hazen-Williams Constant	Cr	Cross Run
OR	Outrigger	Pt	Total pressure at a point in a pipe	CV	Check Valve
RN	Riser Nipple	Pn	Normal pressure at a point in a pipe	DeV	Deluge Valve
SP	Sprig	Pf	Pressure loss due to friction between points	DPV	Dry Pipe Valve
ST	Stand Pipe	Pe	Pressure due to elevation difference between indicated points	E	90° Elbow
UG	Underground	Pv	Velocity pressure at a point in a pipe	EE	45° Elbow
				Ee1	11¼° Elbow
				Ee2	22½° Elbow
				f	Flow Device
				fd	Flex Drop
				FDC	Fire Department Connection
				fE	90° FireLock(TM) Elbow
				fEE	45° FireLock(TM) Elbow
				flg	Flange
				FN	Floating Node
				fT	FireLock(TM) Tee
				g	Gauge
				GloV	Globe Valve
				GV	Gate Valve
				Ho	Hose
				Hose	Hose
				HV	Hose Valve
				Hyd	Hydrant
				LtE	Long Turn Elbow
				mecT	Mechanical Tee
				Noz	Nozzle
				P1	Pump In
				P2	Pump Out
				PIV	Post Indicating Valve
				PO	Pipe Outlet
				PrV	Pressure Relief Valve
				PRV	Pressure Reducing Valve
				red	Reducer/Adapter
				S	Supply
				sCV	Swing Check Valve
				SFx	Seismic Flex
				Spr	Sprinkler
				St	Strainer
				T	Tee Flow Turn 90°
				Tr	Tee Run
				U	Union
				WirF	Wirsbo
				WMV	Water Meter Valve
				Z	Cap



Hydraulic Overview

Job Number: 1
Report Description: Residential (#2)

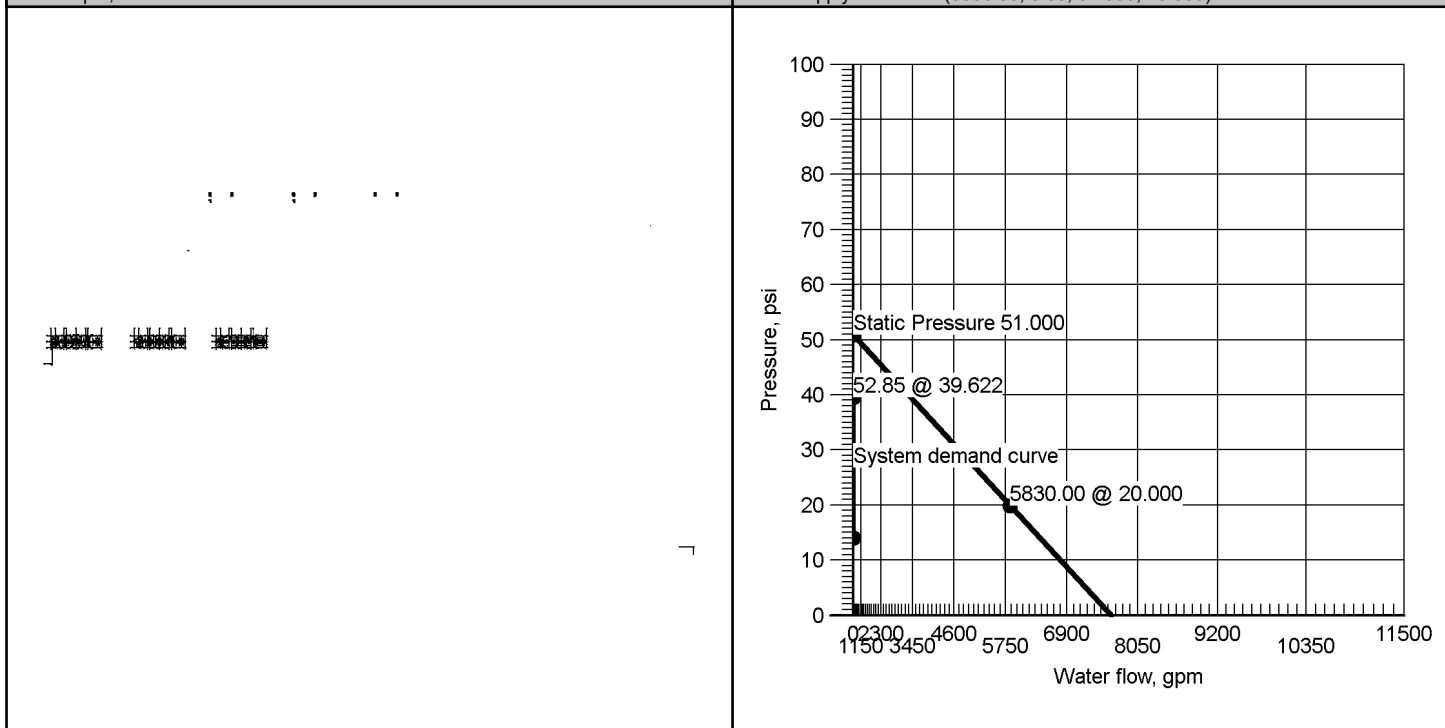
Job		
Job Number 1	Design Engineer	
Job Name: Drawing1	Phone	FAX
Address 1	State Certification/License Number	
Address 2	AHJ	
Address 3	Job Site/Building	

System		
Density 0.05gpm/ft ²	Area of Application 1024ft ² (Actual 359ft ²)	
Most Demanding Sprinkler Data 4.9 K-Factor 13.00 at 7.039	Hose Streams 0.00	
Coverage Per Sprinkler 256ft ²	Number Of Sprinklers Calculated 4	Number Of Sprinklers Calculated 0
System Pressure Demand 39.622	System Flow Demand 52.85	
Total Demand 52.85 @ 39.622	Pressure Result +11.373 (22.3%)	

Supplies						Check Point Gauges			
Node	Name	Flow(gpm)	Hose Flow(gpm)	Static(psi)	Residual(psi)	Identifier	Pressure(psi)	K-Factor(K)	Flow(gpm)
1	Water Supply	5830.00		51.000	20.000				



2nd St Apts, Main Water Supply at Node 1 (5830.00, 0.00, 51.000, 20.000)





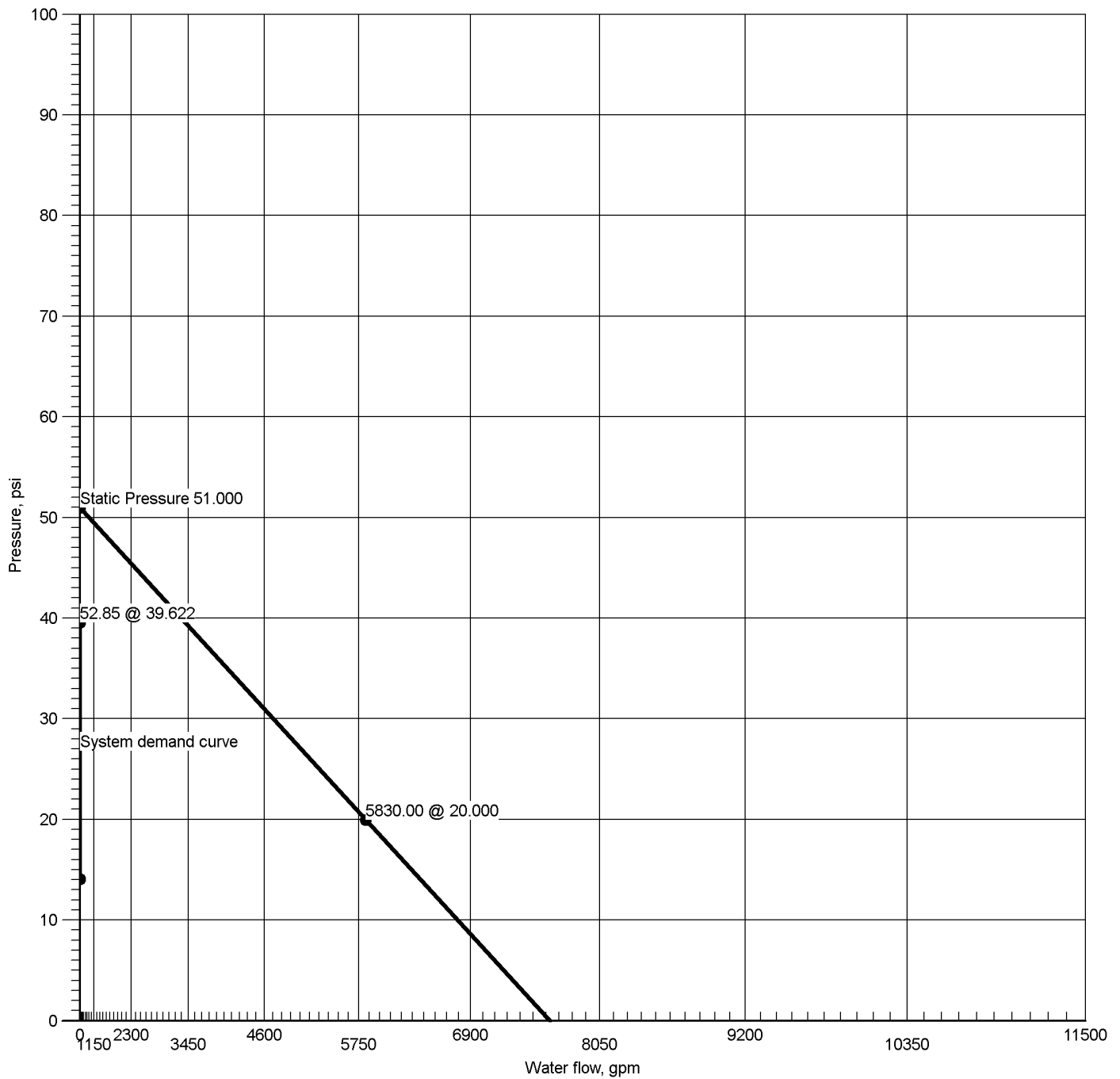
Hydraulic Summary

Job Number: 1
Report Description: Residential (#2)

Job											
Job Number 1				Design Engineer							
Job Name: Drawing1				State Certification/License Number							
Address 1				AHJ							
Address 2				Job Site/Building							
Address 3				Drawing Name 2nd St Apts, Main							
System				Remote Area(s)							
Most Demanding Sprinkler Data 4.9 K-Factor 13.00 at 7.039				Occupancy Residential			Job Suffix				
Hose Allowance At Source 0.00				Density 0.05gpm/ft ²			Area of Application 1024ft ² (Actual 359ft ²)				
Additional Hose Supplies Node Flow(gpm)				Number Of Sprinklers Calculated 4		Number Of Nozzles Calculated 0		Coverage Per Sprinkler 256ft ²			
				AutoPeak Results: Pressure For Remote Area(s) Adjacent To Most Remote Area Left: 38.841							
Total Hose Streams 0.00											
System Flow Demand 52.85		Total Water Required (Including Hose Allowance) 52.85									
Maximum Pressure Unbalance In Loops 0.000											
Maximum Velocity Above Ground 8.95 between nodes 212 and 213											
Maximum Velocity Under Ground 1.21 between nodes 5 and 3											
Volume capacity of Wet Pipes 347.68gal		Volume capacity of Dry Pipes									
Supplies											
Node	Name	Hose Flow (gpm)	Static (psi)	Residual (psi)	@	Flow (gpm)	Available (psi)	@	Total Demand (gpm)	Required (psi)	Safety Margin (psi)
1	Water Supply		51.000	20.000		5830.00	50.995		52.85	39.622	11.373
Contractor											
Contractor Number		Contact Name				Contact Title					
Name of Contractor:				Phone				Extension			
Address 1				FAX							
Address 2				E-mail							
Address 3				Web-Site							



Water Supply at Node 1



Hydraulic Graph

Water Supply at Node 1

Static: Pressure

51.000

Residual: Pressure

20.000 @ 5830.00

Available Pressure at Time of Test

50.995 @ 52.85

System Demand

39.622 @ 52.85

System Demand (Including Hose Allowance at Source)

39.622 @ 52.85



Summary Of Outflowing Devices

Job Number: 1

Report Description: Residential (#2)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)		
Sprinkler	630	13.28	13.00	4.9	7.348		
⇒ Sprinkler	631	13.00	13.00	4.9	7.039		
Sprinkler	686	13.45	13.00	4.9	7.540		
Sprinkler	687	13.12	13.00	4.9	7.164		

⇒ Most Demanding Sprinkler Data



Node Analysis

Job Number: 1

Report Description: Residential (#2)

Node	Elevation(Foot)	Fittings	Pressure(psi)	Discharge(gpm)
1	-3'-6	S	39.622	52.85
630	29'-0	Spr(-7.348)	7.348	13.28
631	29'-0	Spr(-7.039)	7.039	13.00
686	29'-0	Spr(-7.540)	7.540	13.45
687	29'-0	Spr(-7.164)	7.164	13.12
3	1'-1		33.558	
5	-3'-6	PIV(-2.000)	37.619	
110	30'-0	T(5'-0)	8.003	
111	30'-0	T(5'-0), Tr(1'-0)	7.106	
212	30'-0	C(5'-0), Tr(1'-0)	8.217	
213	30'-0	T(5'-0), Tr(1'-0)	7.302	
260	10'-0	T(5'-0), Tr(1'-0)	21.510	
261	10'-0	T(5'-0), Tr(2'-0)	21.426	
270	10'-0	T(8'-0)	20.484	



Hydraulic Analysis

Job Number: 1
Report Description: Residential (#2)

Pipe Type	Diameter	Flow	Velocity	HWC	Friction Loss	Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Eq. Length	Summary
Upstream					Fittings	Total Length	
Route 1							
DR	1.1010	13.00	4.38	150	0.030666	10'-4"	Pf 0.501
631	29'-0"	13.00	4.9	7.039	Sprinkler,	6'-0"	Pe -0.434
111	30'-0"			7.106	T(5'-0), Tr(1'-0)	16'-4"	Pv
BL	1.1010	26.28	8.86	150	0.112786	2'-11½"	Pf 0.897
111	30'-0"	13.28		7.106	Flow (q) from Route 3	5'-0"	Pe
110	30'-0"			8.003	T(5'-0)	7'-11½"	Pv
BL	1.5980	26.28	4.20	150	0.018380	10'-8"	Pf 0.214
110	30'-0"			8.003		1'-0"	Pe
212	30'-0"			8.217	Tr(1'-0)	11'-8"	Pv
BL	1.5980	52.85	8.45	150	0.066931	27'-9"	Pf 3.597
212	30'-0"	26.57		8.217	Flow (q) from Route 2	26'-0"	Pe 8.671
270	10'-0"			20.484	2T(8'-0), E(9'-0), Tr(1'-0)	53'-9"	Pv
BL	2.0030	52.85	5.38	150	0.022277	28'-3½"	Pf 0.942
270	10'-0"			20.484		14'-0"	Pe
261	10'-0"			21.426	7Tr(2'-0)	42'-3½"	Pv
BL	1.5980	52.85	8.45	150	0.066931	0'-3"	Pf 0.084
261	10'-0"			21.426		1'-0"	Pe
260	10'-0"			21.510	Tr(1'-0)	1'-3"	Pv
BL	2.0030	52.85	5.38	150	0.022277	99'-0"	Pf 8.186
260	10'-0"			21.510		44'-0"	Pe 3.862
3	1'-1"			33.558	11Tr(2'-0), 2E(11'-0), BFP(-5.000)	143'-0"	Pv
UG	4.2200	52.85	1.21	140	0.000672	72'-6½"	Pf 2.071
3	1'-1"			33.558		33'-5½"	Pe 1.991
5	-3'-6"			37.619	2E(16'-8½), PIV(-2.000)	105'-11½"	Pv
UG	6.2800	52.85	0.55	140	0.000097	22'-9"	Pf 2.002
5	-3'-6"			37.619			Pe
1	-3'-6"			39.622	GV(-2.000), S	22'-9"	Pv
		0.00			Hose Allowance At Source		
1		52.85					
Route 2							
DR	1.1010	13.12	4.42	150	0.031172	10'-4"	Pf 0.571
687	29'-0"	13.12	4.9	7.164	Sprinkler,	8'-0"	Pe -0.434
213	30'-0"			7.302	E(7'-0), Tr(1'-0)	18'-4"	Pv
BL	1.1010	26.57	8.95	150	0.115079	2'-11½"	Pf 0.915
213	30'-0"	13.45		7.302	Flow (q) from Route 4	5'-0"	Pe
212	30'-0"			8.217	C(5'-0)	7'-11½"	Pv
Route 3							
DR	1.1010	13.28	4.48	150	0.031911	1'-0"	Pf 0.191
630	29'-0"	13.28	4.9	7.348	Sprinkler,	5'-0"	Pe -0.434
111	30'-0"			7.106	T(5'-0)	6'-0"	Pv
Route 4							
DR	1.1010	13.45	4.53	150	0.032680	1'-0"	Pf 0.196
686	29'-0"	13.45	4.9	7.540	Sprinkler,	5'-0"	Pe -0.434
213	30'-0"			7.302	T(5'-0)	6'-0"	Pv

Equivalent Pipe Lengths of Valves and Fittings (C=120 only)

$$\left(\frac{\text{Actual Inside Diameter}}{\text{Schedule 40 Steel Pipe Inside Diameter}} \right)^{4.87} = \text{Factor}$$

C Value Multiplier

Value Of C	100	130	140	150
Multiplying Factor	0.713	1.16	1.33	1.51



Hydraulic Analysis

Job Number: 1
Report Description: Residential (#2)

Pipe Type	Diameter	Flow	Velocity	HWC	Friction Loss		Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Fittings	Eq. Length	Summary
Upstream							Total Length	

Pipe Type Legend	
AO	Arm-Over
BL	Branch Line
CM	Cross Main
DN	Drain
DR	Drop
DY	Dynamic
FM	Feed Main
FR	Feed Riser
MS	Miscellaneous
OR	Outrigger
RN	Riser Nipple
SP	Sprig
ST	Stand Pipe
UG	Underground

Units Legend	
Diameter	Inch
Elevation	Foot
Flow	gpm
Discharge	gpm
Velocity	fps
Pressure	psi
Length	Foot
Friction Loss	psi/Foot
HWC	Hazen-Williams Constant
Pt	Total pressure at a point in a pipe
Pn	Normal pressure at a point in a pipe
Pf	Pressure loss due to friction between points
Pe	Pressure due to elevation difference between indicated points
Pv	Velocity pressure at a point in a pipe

Fittings Legend	
ALV	Alarm Valve
AngV	Angle Valve
b	Bushing
BaV	Ball Valve
BFP	Backflow Preventer
BV	Butterfly Valve
C	Cross Flow Turn 90°
cplg	Coupling
Cr	Cross Run
CV	Check Valve
DeV	Deluge Valve
DPV	Dry Pipe Valve
E	90° Elbow
EE	45° Elbow
Ee1	11¼° Elbow
Ee2	22½° Elbow
f	Flow Device
fd	Flex Drop
FDC	Fire Department Connection
fE	90° FireLock(TM) Elbow
fEE	45° FireLock(TM) Elbow
flg	Flange
FN	Floating Node
fT	FireLock(TM) Tee
g	Gauge
GloV	Globe Valve
GV	Gate Valve
Ho	Hose
Hose	Hose
HV	Hose Valve
Hyd	Hydrant
LtE	Long Turn Elbow
mecT	Mechanical Tee
Noz	Nozzle
P1	Pump In
P2	Pump Out
PIV	Post Indicating Valve
PO	Pipe Outlet
PrV	Pressure Relief Valve
PRV	Pressure Reducing Valve
red	Reducer/Adapter
S	Supply
sCV	Swing Check Valve
SFx	Seismic Flex
Spr	Sprinkler
St	Strainer
T	Tee Flow Turn 90°
Tr	Tee Run
U	Union
WirF	Wirsbo
WMV	Water Meter Valve
Z	Cap



Hydraulic Overview

Job Number: 1
Report Description: Residential (#3)

Job		
Job Number 1	Design Engineer	
Job Name: Drawing1	Phone	FAX
Address 1	State Certification/License Number	
Address 2	AHJ	
Address 3	Job Site/Building	

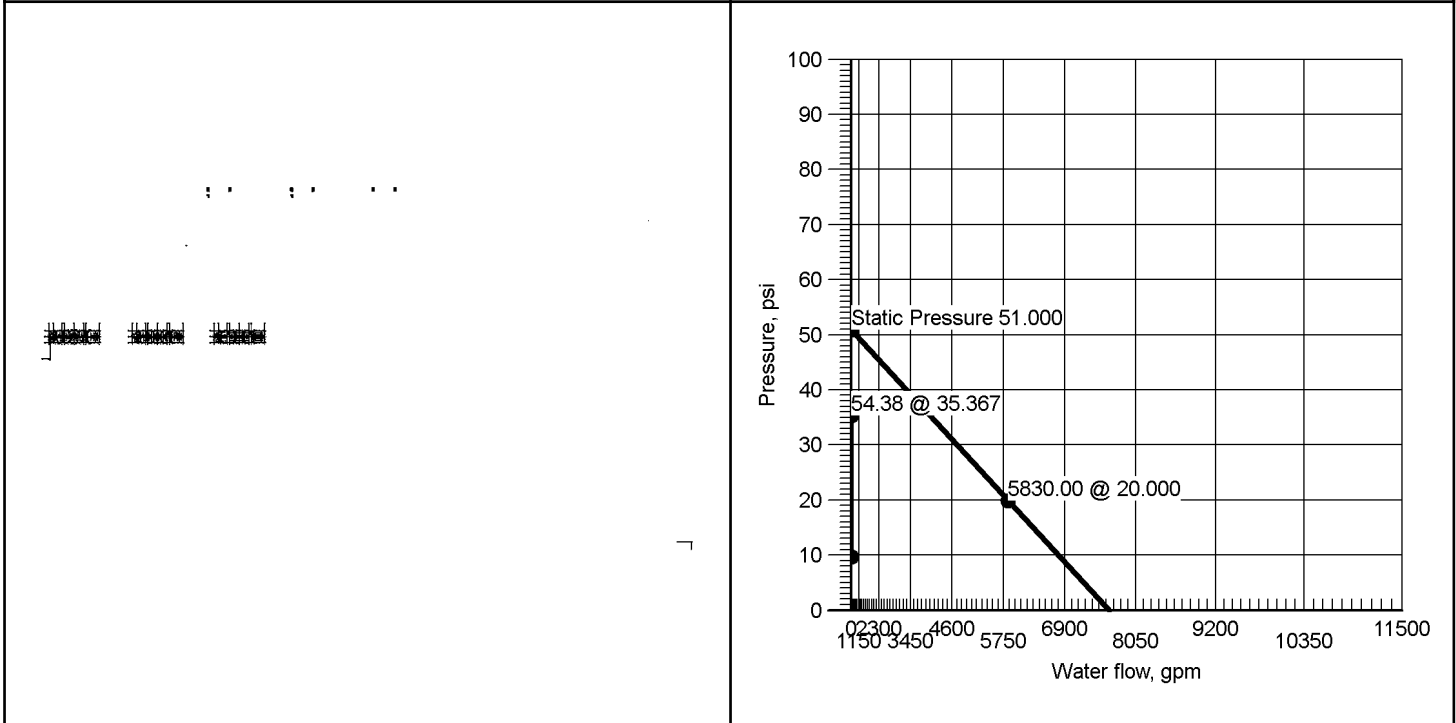
System		
Density 0.05gpm/ft ²	Area of Application 1024ft ² (Actual 446ft ²)	
Most Demanding Sprinkler Data 4.9 K-Factor 13.00 at 7.039	Hose Streams 0.00	
Coverage Per Sprinkler 256ft ²	Number Of Sprinklers Calculated 4	Number Of Sprinklers Calculated 0
System Pressure Demand 35.367	System Flow Demand 54.38	
Total Demand 54.38 @ 35.367	Pressure Result +15.628 (30.6%)	

Supplies						Check Point Gauges			
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Node	Name	Flow(gpm)	Hose Flow(gpm)	Static(psi)	Residual(psi)	Identifier	Pressure(psi)	K-Factor(K)	Flow(gpm)
1	Water Supply	5830.00		51.000	20				



2nd St Apts, Main	Water Supply at Node 1 (5830.00, 0.00, 51.000, 20.000)
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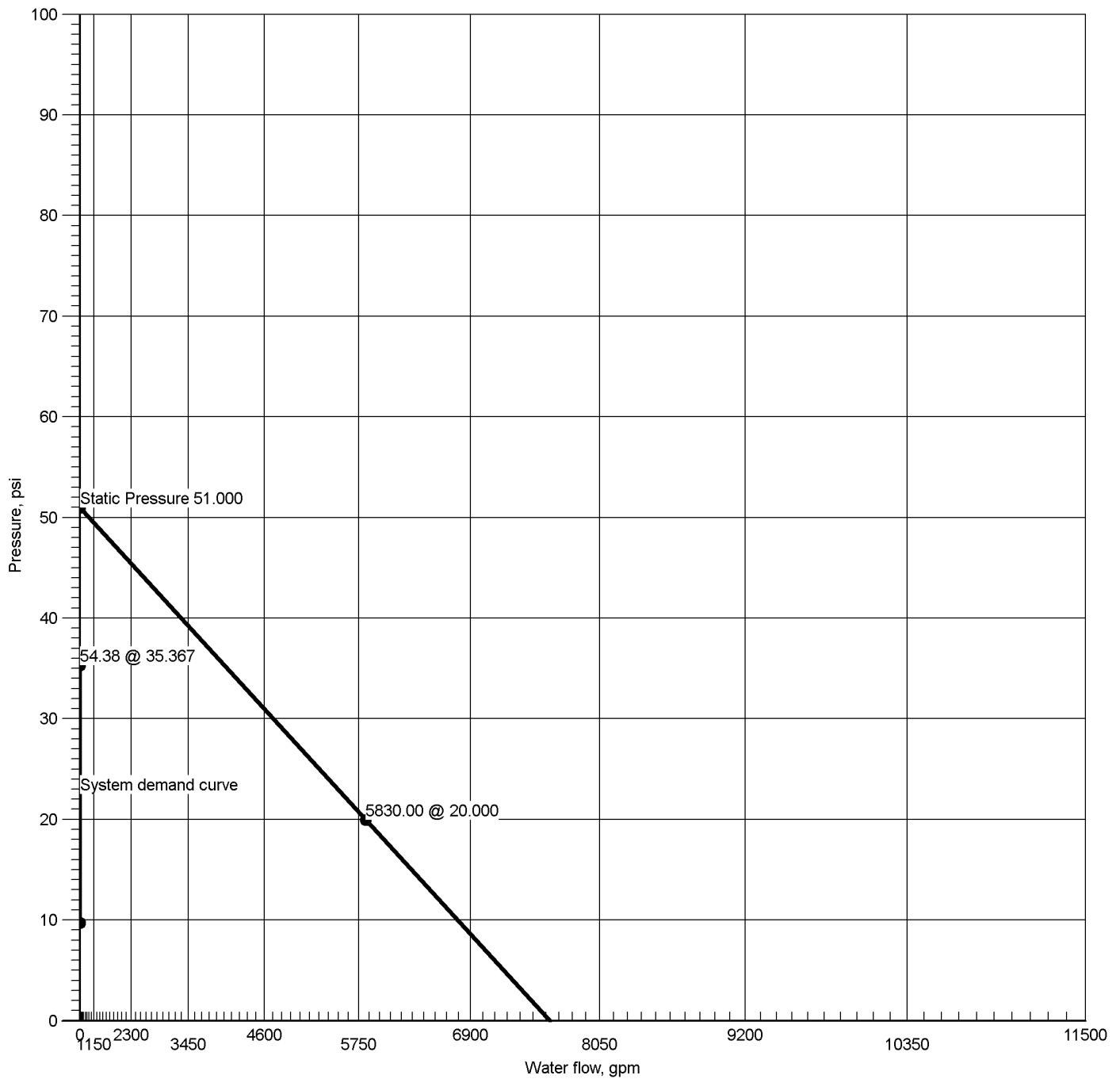
Hydraulic Summary

Job Number: 1
Report Description: Residential (#3)

Job											
Job Number 1				Design Engineer							
Job Name: Drawing1				State Certification/License Number							
Address 1				AHJ							
Address 2				Job Site/Building							
Address 3				Drawing Name 2nd St Apts, Main							
System				Remote Area(s)							
Most Demanding Sprinkler Data 4.9 K-Factor 13.00 at 7.039				Occupancy Residential			Job Suffix				
Hose Allowance At Source 0.00				Density 0.05gpm/ft ²			Area of Application 1024ft ² (Actual 446ft ²)				
Additional Hose Supplies Node Flow(gpm)				Number Of Sprinklers Calculated 4		Number Of Nozzles Calculated 0		Coverage Per Sprinkler 256ft ²			
				AutoPeak Results: Pressure For Remote Area(s) Adjacent To Most Remote Area							
Total Hose Streams 0.00											
System Flow Demand 54.38		Total Water Required (Including Hose Allowance) 54.38									
Maximum Pressure Unbalance In Loops 0.000											
Maximum Velocity Above Ground 8.89 between nodes 301 and 221											
Maximum Velocity Under Ground 1.25 between nodes 5 and 3											
Volume capacity of Wet Pipes 347.68gal		Volume capacity of Dry Pipes									
Supplies											
Node	Name	Hose Flow (gpm)	Static (psi)	Residual (psi)	@	Flow (gpm)	Available (psi)	@	Total Demand (gpm)	Required (psi)	Safety Margin (psi)
1	Water Supply		51.000	20.000		5830.00	50.995		54.38	35.367	15.628
Contractor											
Contractor Number		Contact Name				Contact Title					
Name of Contractor:				Phone				Extension			
Address 1				FAX							
Address 2				E-mail							
Address 3				Web-Site							



Water Supply at Node 1



Hydraulic Graph

Water Supply at Node 1

Static: Pressure

51.000

Residual: Pressure

20.000 @ 5830.00

Available Pressure at Time of Test

50.995 @ 54.38

System Demand

35.367 @ 54.38

System Demand (Including Hose Allowance at Source)

35.367 @ 54.38



Summary Of Outflowing Devices

Job Number: 1

Report Description: Residential (#3)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)		
⇒ Sprinkler	636	13.00	13.00	4.9	7.039		
Sprinkler	648	13.81	13.00	4.9	7.941		
Sprinkler	658	14.20	13.00	4.9	8.396		
Sprinkler	693	13.37	13.00	4.9	7.448		

⇒ Most Demanding Sprinkler Data



Node Analysis

Job Number: 1

Report Description: Residential (#3)

Node	Elevation(Foot)	Fittings	Pressure(psi)	Discharge(gpm)
1	-3'-6	S	35.367	54.38
636	19'-0	Spr(-7.039)	7.039	13.00
648	19'-0	Spr(-7.941)	7.941	13.81
658	19'-0	Spr(-8.396)	8.396	14.20
693	19'-0	Spr(-7.448)	7.448	13.37
3	1'-1		29.299	
5	-3'-6	PIV(-2.000)	33.364	
221	20'-0	T(5'-0), Tr(1'-0)	7.208	
260	10'-0	T(5'-0), Tr(1'-0)	17.079	
261	10'-0	T(5'-0), Tr(2'-0)	16.991	
278	10'-0	T(8'-0)	14.485	
300	20'-0	C(5'-0)	8.273	
301	20'-0	C(5'-0), Tr(1'-0)	8.335	
303	20'-0	C(8'-0)	8.880	
306	20'-0	C(5'-0)	8.782	



Hydraulic Analysis

Job Number: 1
Report Description: Residential (#3)

Pipe Type	Diameter	Flow	Velocity	HWC	Friction Loss	Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Eq. Length	Summary
Upstream					Fittings	Total Length	
Route 1							
DR	1.1010	13.00	4.38	150	0.030666	11'-8"	Pf 0.603
636	19'-0"	13.00	4.9	7.039	Sprinkler,	8'-0"	Pe -0.434
221	20'-0"			7.208	E(7'-0"), Tr(1'-0")	19'-8"	Pv
BL	1.1010	26.37	8.89	150	0.113500	4'-11"	Pf 1.127
221	20'-0"	13.37		7.208	Flow (q) from Route 2	5'-0"	Pe
301	20'-0"			8.335	C(5'-0")	9'-11"	Pv
BL	1.5980	40.18	6.43	150	0.040307	5'-6½"	Pf 0.545
301	20'-0"	13.81		8.335	Flow (q) from Route 3	8'-0"	Pe
303	20'-0"			8.880	C(8'-0")	13'-6½"	Pv
BL	1.5980	54.38	8.70	150	0.070550	10'-0"	Pf 1.270
303	20'-0"	14.20		8.880	Flow (q) from Route 4	8'-0"	Pe 4.335
278	10'-0"			14.485	T(8'-0")	18'-0"	Pv
BL	2.0030	54.38	5.54	150	0.023482	78'-8"	Pf 2.505
278	10'-0"			14.485		28'-0"	Pe
261	10'-0"			16.991	14Tr(2'-0")	106'-8"	Pv
BL	1.5980	54.38	8.70	150	0.070550	0'-3"	Pf 0.088
261	10'-0"			16.991		1'-0"	Pe
260	10'-0"			17.079	Tr(1'-0")	1'-3"	Pv
BL	2.0030	54.38	5.54	150	0.023482	99'-0"	Pf 8.358
260	10'-0"			17.079		44'-0"	Pe 3.862
3	1'-1"			29.299	11Tr(2'-0"), 2E(11'-0"), BFP(-5.000)	143'-0"	Pv
UG	4.2200	54.38	1.25	140	0.000708	72'-6½"	Pf 2.075
3	1'-1"			29.299		33'-5½"	Pe 1.991
5	-3'-6"			33.364	2E(16'-8½"), PIV(-2.000)	105'-11½"	Pv
UG	6.2800	54.38	0.56	140	0.000102	22'-9"	Pf 2.002
5	-3'-6"			33.364			Pe
1	-3'-6"			35.367	GV(-2.000), S	22'-9"	Pv
		0.00			Hose Allowance At Source		
1		54.38					
Route 2							
DR	1.1010	13.37	4.51	150	0.032312	1'-0"	Pf 0.194
693	19'-0"	13.37	4.9	7.448	Sprinkler,	5'-0"	Pe -0.434
221	20'-0"			7.208	T(5'-0")	6'-0"	Pv
Route 3							
DR	1.1010	13.81	4.65	150	0.034285	12'-4"	Pf 0.766
648	19'-0"	13.81	4.9	7.941	Sprinkler,	10'-0"	Pe -0.434
300	20'-0"			8.273	T(5'-0"), C(5'-0")	22'-4"	Pv
BL	1.5980	13.81	2.21	150	0.005587	10'-1"	Pf 0.062
300	20'-0"			8.273		1'-0"	Pe
301	20'-0"			8.335	Tr(1'-0")	11'-1"	Pv
Route 4							
DR	1.1010	14.20	4.78	150	0.036100	10'-8"	Pf 0.819
658	19'-0"	14.20	4.9	8.396	Sprinkler,	12'-0"	Pe -0.434
306	20'-0"			8.782	E(7'-0"), C(5'-0")	22'-8"	Pv
BL	1.5980	14.20	2.27	150	0.005883	7'-9"	Pf 0.099
306	20'-0"			8.782		9'-0"	Pe -0.000
303	20'-0"			8.880	Tr(1'-0"), C(8'-0")	16'-9"	Pv

Equivalent Pipe Lengths of Valves and Fittings (C=120 only)

C Value Multiplier

$$\left(\frac{\text{Actual Inside Diameter}}{\text{Schedule 40 Steel Pipe Inside Diameter}} \right)^{4.87} = \text{Factor}$$

Value Of C	100	130	140	150
Multiplying Factor	0.713	1.16	1.33	1.51



Hydraulic Analysis

Job Number: 1

Report Description: Residential (#3)

Pipe Type	Diameter	Flow	Velocity	HWC	Friction Loss		Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Fittings	Eq. Length	Summary
Upstream							Total Length	

Pipe Type Legend		Units Legend		Fittings Legend	
AO	Arm-Over	Diameter	Inch	ALV	Alarm Valve
BL	Branch Line	Elevation	Foot	AngV	Angle Valve
CM	Cross Main	Flow	gpm	b	Bushing
DN	Drain	Discharge	gpm	BaV	Ball Valve
DR	Drop	Velocity	fps	BFP	Backflow Preventer
DY	Dynamic	Pressure	psi	BV	Butterfly Valve
FM	Feed Main	Length	Foot	C	Cross Flow Turn 90°
FR	Feed Riser	Friction Loss	psi/Foot	cplg	Coupling
MS	Miscellaneous	HWC	Hazen-Williams Constant	Cr	Cross Run
OR	Outrigger	Pt	Total pressure at a point in a pipe	CV	Check Valve
RN	Riser Nipple	Pn	Normal pressure at a point in a pipe	DeV	Deluge Valve
SP	Sprig	Pf	Pressure loss due to friction between points	DPV	Dry Pipe Valve
ST	Stand Pipe	Pe	Pressure due to elevation difference between indicated points	E	90° Elbow
UG	Underground	Pv	Velocity pressure at a point in a pipe	EE	45° Elbow
				Ee1	11¼° Elbow
				Ee2	22½° Elbow
				f	Flow Device
				fd	Flex Drop
				FDC	Fire Department Connection
				fE	90° FireLock(TM) Elbow
				fEE	45° FireLock(TM) Elbow
				flg	Flange
				FN	Floating Node
				fT	FireLock(TM) Tee
				g	Gauge
				GloV	Globe Valve
				GV	Gate Valve
				Ho	Hose
				Hose	Hose
				HV	Hose Valve
				Hyd	Hydrant
				LtE	Long Turn Elbow
				mecT	Mechanical Tee
				Noz	Nozzle
				P1	Pump In
				P2	Pump Out
				PIV	Post Indicating Valve
				PO	Pipe Outlet
				PrV	Pressure Relief Valve
				PRV	Pressure Reducing Valve
				red	Reducer/Adapter
				S	Supply
				sCV	Swing Check Valve
				SFx	Seismic Flex
				Spr	Sprinkler
				St	Strainer
				T	Tee Flow Turn 90°
				Tr	Tee Run
				U	Union
				WirF	Wirsbo
				WMV	Water Meter Valve
				Z	Cap



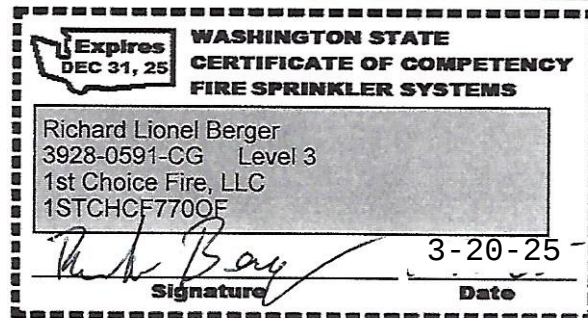
Hydraulic Overview

Job Number: 1
Report Description: Residential (#4)

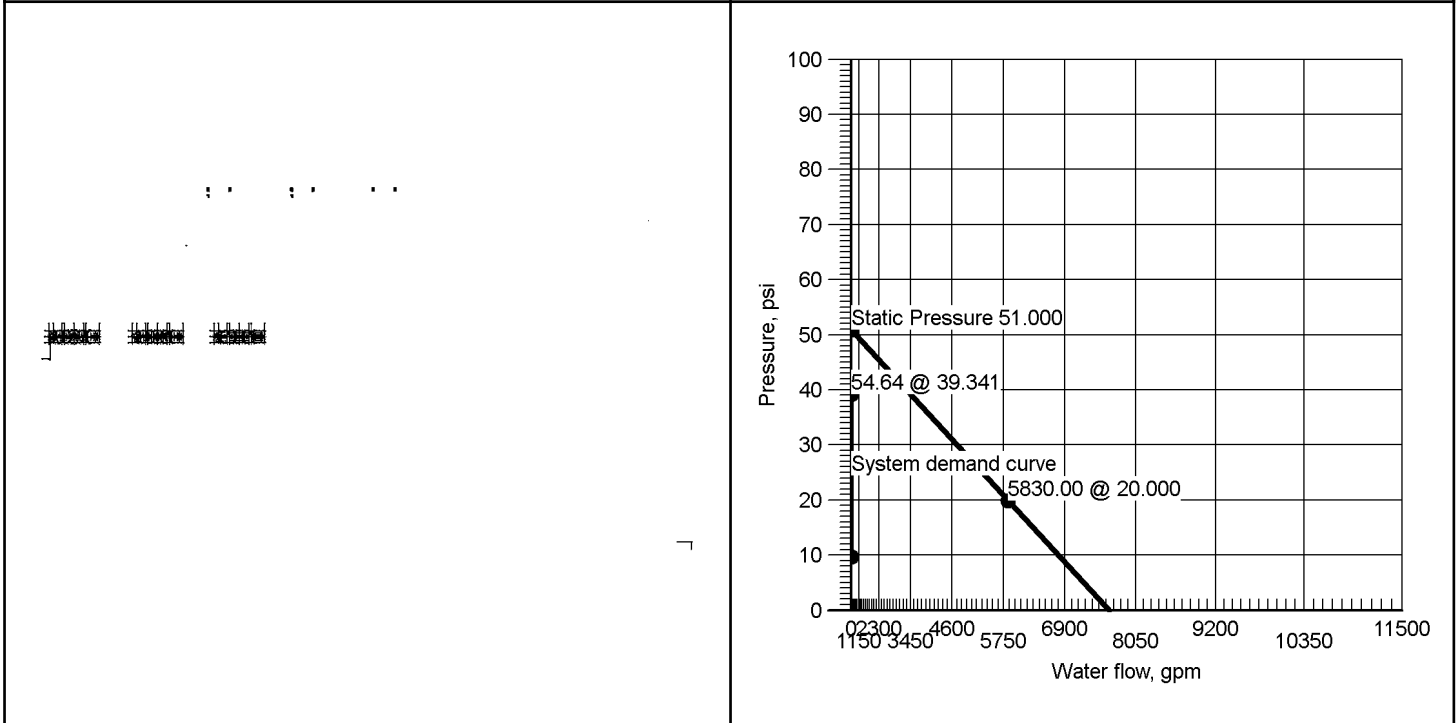
Job		
Job Number 1	Design Engineer	
Job Name: Drawing1	Phone	FAX
Address 1	State Certification/License Number	
Address 2	AHJ	
Address 3	Job Site/Building	

System		
Density 0.05gpm/ft ²	Area of Application 1024ft ² (Actual 360ft ²)	
Most Demanding Sprinkler Data 4.9 K-Factor 13.00 at 7.039	Hose Streams 0.00	
Coverage Per Sprinkler 256ft ²	Number Of Sprinklers Calculated 4	Number Of Sprinklers Calculated 0
System Pressure Demand 39.341	System Flow Demand 54.64	
Total Demand 54.64 @ 39.341	Pressure Result +11.653 (22.9%)	

Supplies						Check Point Gauges			
Node	Name	Flow(gpm)	Hose Flow(gpm)	Static(psi)	Residual(psi)	Identifier	Pressure(psi)	K-Factor(K)	Flow(gpm)
1	Water Supply	5830.00		51.000	20.000				



2nd St Apts, Main Water Supply at Node 1 (5830.00, 0.00, 51.000, 20.000)

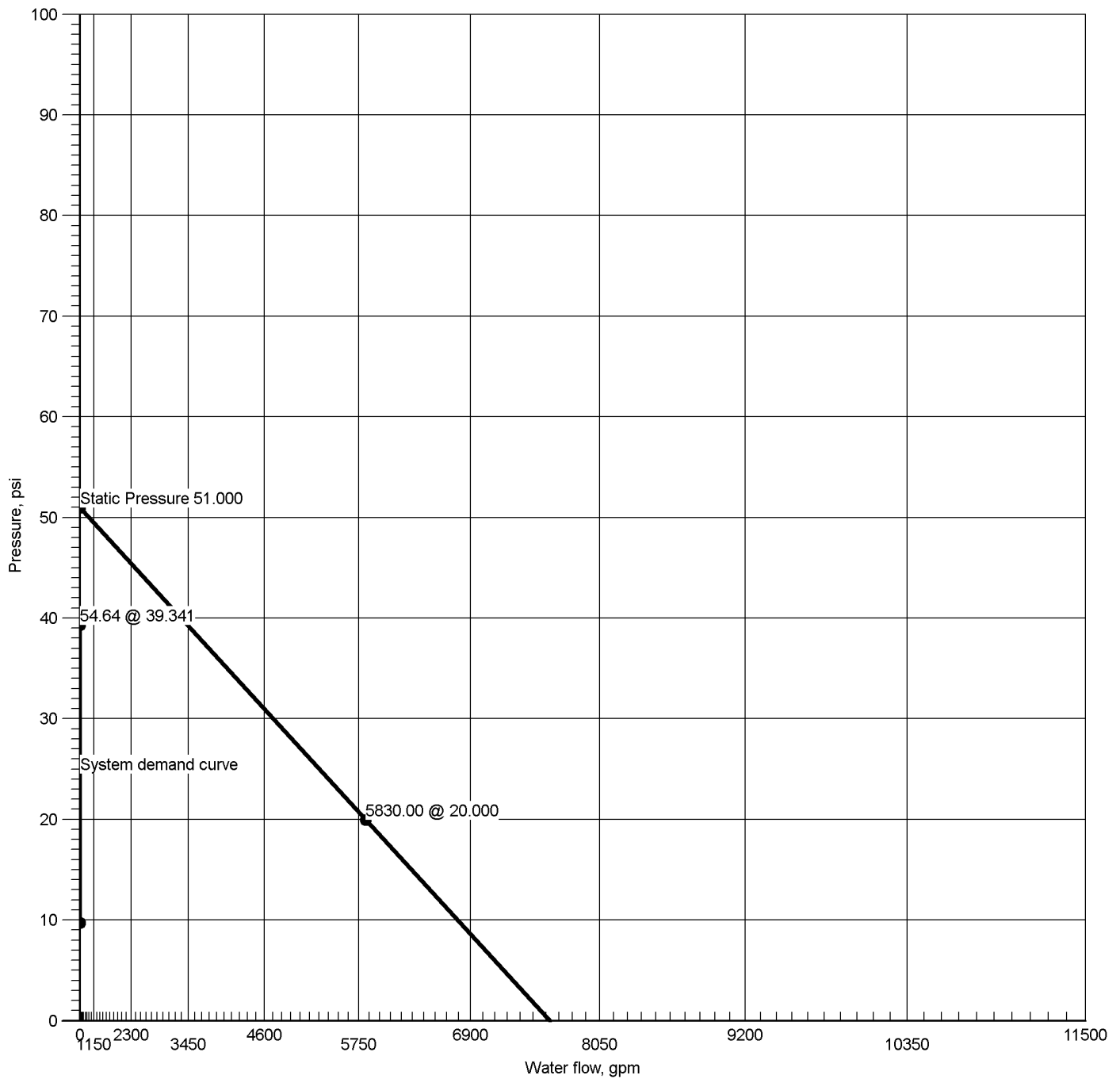




Job											
Job Number 1					Design Engineer						
Job Name: Drawing1					State Certification/License Number						
Address 1					AHJ						
Address 2					Job Site/Building						
Address 3					Drawing Name 2nd St Apts, Main						
System					Remote Area(s)						
Most Demanding Sprinkler Data 4.9 K-Factor 13.00 at 7.039					Occupancy Residential			Job Suffix			
Hose Allowance At Source 0.00					Density 0.05gpm/ft²			Area of Application 1024ft² (Actual 360ft²)			
Additional Hose Supplies NodeFlow(gpm)					Number Of Sprinklers Calculated 4		Number Of Nozzles Calculated 0		Coverage Per Sprinkler 256ft²		
					AutoPeak Results: Pressure For Remote Area(s) Adjacent To Most Remote Area Left: 37.854						
Total Hose Streams 0.00											
System Flow Demand 54.64			Total Water Required (Including Hose Allowance) 54.64								
Maximum Pressure Unbalance In Loops 0.000											
Maximum Velocity Above Ground 18.41 between nodes 295 and 297											
Maximum Velocity Under Ground 1.25 between nodes 5 and 3											
Volume capacity of Wet Pipes 347.68gal			Volume capacity of Dry Pipes								
Supplies											
Node	Name	Hose Flow (gpm)	Static (psi)	Residual (psi)	@	Flow (gpm)	Available (psi)	@	Total Demand (gpm)	Required (psi)	Safety Margin (psi)
1	Water Supply		51.000	20.000		5830.00	50.995		54.64	39.341	11.653
Contractor											
		Contractor Number				Contact Name			Contact Title		
Name of Contractor:						Phone			Extension		
Address 1						FAX					
Address 2						E-mail					
Address 3						Web-Site					



Water Supply at Node 1



Hydraulic Graph

Water Supply at Node 1

Static: Pressure

51.000

Residual: Pressure

20.000 @ 5830.00

Available Pressure at Time of Test

50.995 @ 54.64

System Demand

39.341 @ 54.64

System Demand (Including Hose Allowance at Source)

39.341 @ 54.64



Summary Of Outflowing Devices

Job Number: 1

Report Description: Residential (#4)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)		
Sprinkler	622	13.94	13.00	4.9	8.088		
⇒ Sprinkler	623	13.00	13.00	4.9	7.039		
Sprinkler	680	14.33	13.00	4.9	8.553		
Sprinkler	681	13.37	13.00	4.9	7.448		

⇒ Most Demanding Sprinkler Data



Node Analysis

Job Number: 1

Report Description: Residential (#4)

Node	Elevation(Foot)	Fittings	Pressure(psi)	Discharge(gpm)
1	-3'-6	S	39.341	54.64
622	19'-0	Spr(-8.088)	8.088	13.94
623	19'-0	Spr(-7.039)	7.039	13.00
680	19'-0	Spr(-8.553)	8.553	14.33
681	19'-0	Spr(-7.448)	7.448	13.37
3	1'-1		33.273	
5	-3'-6	PIV(-2.000)	37.339	
203	20'-0	T(5'-0), Tr(1'-0)	8.340	
204	20'-0	T(5'-0), Tr(1'-0)	7.208	
260	10'-0	T(5'-0), Tr(1'-0)	21.023	
261	10'-0	T(5'-0), Tr(2'-0)	20.934	
270	10'-0	T(8'-0)	19.933	
295	20'-0	C(5'-0)	14.316	
297	20'-0	C(5'-0), Tr(1'-0)	9.622	



Hydraulic Analysis

Job Number: 1
Report Description: Residential (#4)

Pipe Type	Diameter	Flow	Velocity	HWC	Friction Loss	Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Eq. Length	Summary
Upstream					Fittings	Total Length	
Route 1							
DR	1.1010	13.00	4.38	150	0.030666	11'-8"	Pf 0.603
623	19'-0"	13.00	4.9	7.039	Sprinkler,	8'-0"	Pe -0.434
204	20'-0"			7.208	E(7'-0"), Tr(1'-0")	19'-8"	Pv
BL	1.1010	26.37	8.89	150	0.113500	14'-3"	Pf 2.414
204	20'-0"	13.37		7.208	Flow (q) from Route 2	7'-0"	Pe
297	20'-0"			9.622	2Tr(1'-0"), T(5'-0")	21'-3"	Pv
BL	1.1010	54.64	18.41	150	0.436756	5'-9"	Pf 4.694
297	20'-0"	28.27		9.622	Flow (q) from Route 3	5'-0"	Pe
295	20'-0"			14.316	C(5'-0")	10'-9"	Pv
BL	1.5980	54.64	8.74	150	0.071175	10'-0"	Pf 1.281
295	20'-0"			14.316		8'-0"	Pe 4.335
270	10'-0"			19.933	T(8'-0")	18'-0"	Pv
BL	2.0030	54.64	5.56	150	0.023690	28'-3½"	Pf 1.002
270	10'-0"			19.933		14'-0"	Pe
261	10'-0"			20.934	7Tr(2'-0")	42'-3½"	Pv
BL	1.5980	54.64	8.74	150	0.071175	0'-3"	Pf 0.089
261	10'-0"			20.934		1'-0"	Pe
260	10'-0"			21.023	Tr(1'-0")	1'-3"	Pv
BL	2.0030	54.64	5.56	150	0.023690	99'-0"	Pf 8.388
260	10'-0"			21.023		44'-0"	Pe 3.862
3	1'-1"			33.273	11Tr(2'-0"), 2E(11'-0"), BFP(-5.000)	143'-0"	Pv
UG	4.2200	54.64	1.25	140	0.000714	72'-6½"	Pf 2.076
3	1'-1"			33.273		33'-5½"	Pe 1.991
5	-3'-6"			37.339	2E(16'-8½"), PIV(-2.000)	105'-11½"	Pv
UG	6.2800	54.64	0.57	140	0.000103	22'-9"	Pf 2.002
5	-3'-6"			37.339			Pe
1	-3'-6"			39.341	GV(-2.000), S	22'-9"	Pv
		0.00			Hose Allowance At Source		
1		54.64					
Route 2							
DR	1.1010	13.37	4.51	150	0.032312	1'-0"	Pf 0.194
681	19'-0"	13.37	4.9	7.448	Sprinkler,	5'-0"	Pe -0.434
204	20'-0"			7.208	T(5'-0")	6'-0"	Pv
Route 3							
DR	1.1010	13.94	4.70	150	0.034872	11'-8"	Pf 0.686
622	19'-0"	13.94	4.9	8.088	Sprinkler,	8'-0"	Pe -0.434
203	20'-0"			8.340	E(7'-0"), Tr(1'-0")	19'-8"	Pv
BL	1.1010	28.27	9.53	150	0.129034	4'-11"	Pf 1.282
203	20'-0"	14.33		8.340	Flow (q) from Route 4	5'-0"	Pe
297	20'-0"			9.622	C(5'-0")	9'-11"	Pv
Route 4							
DR	1.1010	14.33	4.83	150	0.036725	1'-0"	Pf 0.220
680	19'-0"	14.33	4.9	8.553	Sprinkler,	5'-0"	Pe -0.434
203	20'-0"			8.340	T(5'-0")	6'-0"	Pv

Equivalent Pipe Lengths of Valves and Fittings (C=120 only)

C Value Multiplier

$$\left(\frac{\text{Actual Inside Diameter}}{\text{Schedule 40 Steel Pipe Inside Diameter}} \right)^{4.87} = \text{Factor}$$

Value Of C	100	130	140	150
Multiplying Factor	0.713	1.16	1.33	1.51



Hydraulic Analysis

Job Number: 1

Report Description: Residential (#4)

Pipe Type	Diameter	Flow	Velocity	HWC	Friction Loss		Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Fittings	Eq. Length	Summary
Upstream							Total Length	

Pipe Type Legend		Units Legend		Fittings Legend	
AO	Arm-Over	Diameter	Inch	ALV	Alarm Valve
BL	Branch Line	Elevation	Foot	AngV	Angle Valve
CM	Cross Main	Flow	gpm	b	Bushing
DN	Drain	Discharge	gpm	BaV	Ball Valve
DR	Drop	Velocity	fps	BFP	Backflow Preventer
DY	Dynamic	Pressure	psi	BV	Butterfly Valve
FM	Feed Main	Length	Foot	C	Cross Flow Turn 90°
FR	Feed Riser	Friction Loss	psi/Foot	cplg	Coupling
MS	Miscellaneous	HWC	Hazen-Williams Constant	Cr	Cross Run
OR	Outrigger	Pt	Total pressure at a point in a pipe	CV	Check Valve
RN	Riser Nipple	Pn	Normal pressure at a point in a pipe	DeV	Deluge Valve
SP	Sprig	Pf	Pressure loss due to friction between points	DPV	Dry Pipe Valve
ST	Stand Pipe	Pe	Pressure due to elevation difference between indicated points	E	90° Elbow
UG	Underground	Pv	Velocity pressure at a point in a pipe	EE	45° Elbow
				Ee1	11¼° Elbow
				Ee2	22½° Elbow
				f	Flow Device
				fd	Flex Drop
				FDC	Fire Department Connection
				fE	90° FireLock(TM) Elbow
				fEE	45° FireLock(TM) Elbow
				flg	Flange
				FN	Floating Node
				fT	FireLock(TM) Tee
				g	Gauge
				GloV	Globe Valve
				GV	Gate Valve
				Ho	Hose
				Hose	Hose
				HV	Hose Valve
				Hyd	Hydrant
				LtE	Long Turn Elbow
				mecT	Mechanical Tee
				Noz	Nozzle
				P1	Pump In
				P2	Pump Out
				PIV	Post Indicating Valve
				PO	Pipe Outlet
				PrV	Pressure Relief Valve
				PRV	Pressure Reducing Valve
				red	Reducer/Adapter
				S	Supply
				sCV	Swing Check Valve
				SFx	Seismic Flex
				Spr	Sprinkler
				St	Strainer
				T	Tee Flow Turn 90°
				Tr	Tee Run
				U	Union
				WirF	Wirsbo
				WMV	Water Meter Valve
				Z	Cap