City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning | Engineering | Public Works | Fire | Traffic

Hydraulic Summary

Job Number: S23-90
Report Description: Light Hazard - Level 1 - Provider - Floor Area

Job

Job Number: S23-90	Design Engineer: Queen
Job Name: CHC Puyallup Cannery	State Certification/License Number: ARCHEI*219DR
Address 1: 201 W. Main St	AHJ: Puyallup
Address 2: Puyallup, WA 98371	Job Site/Building: Cannery
Address 3:	Drawing Name: S23-090 - CHC Puyallup Cannery - 1-8th scale REV 01

System

Most Demanding Sprinkler Data: 5.6 K-Factor 20.00 at 12.76

Hose Allowance At Source: 100.00

Additional Hose Supplies

Node	Flow(gpm)

Total Hose Streams: 100.00

System Flow Demand	Total Water Required (Including Hose Allowance)
352.43	452.43

Maximum Pressure Unbalance In Loops: 0.00

Maximum Velocity Above Ground: 18.79 between nodes 1036 and 112

Maximum Velocity Under Ground: 3.65 between nodes 8 and 7

Volume capacity of Wet Pipes	Volume capacity of Dry Pipes
1555.97gal	

Remote Area(s)

Occupancy	Job Suffix
Light Hazard - Level 1 - Provider - Fl	

Density	Area of Application
0.10gpm/ft²	976.00ft² (Actual 985.06ft²)

Number Of Sprinklers Calculated	Coverage Per Sprinkler
15	225.00ft²

REV 01

Expires DEC 31, 24
WASHINGTON STATE
CERTIFICATE OF COMPETENCY
FIRE SPRINKLER SYSTEMS

Theodore M. Queen
4930-0205-C Level 3
Archer Construction, Inc.
ARCHEI*219DR

Signature: Ted Queen Date: 3-14-24

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	100.00	51.00	38.00	2460.00	50.43	452.43	46.26	4.18

Contractor

Contractor Number	Contact Name	Contact Title
22		

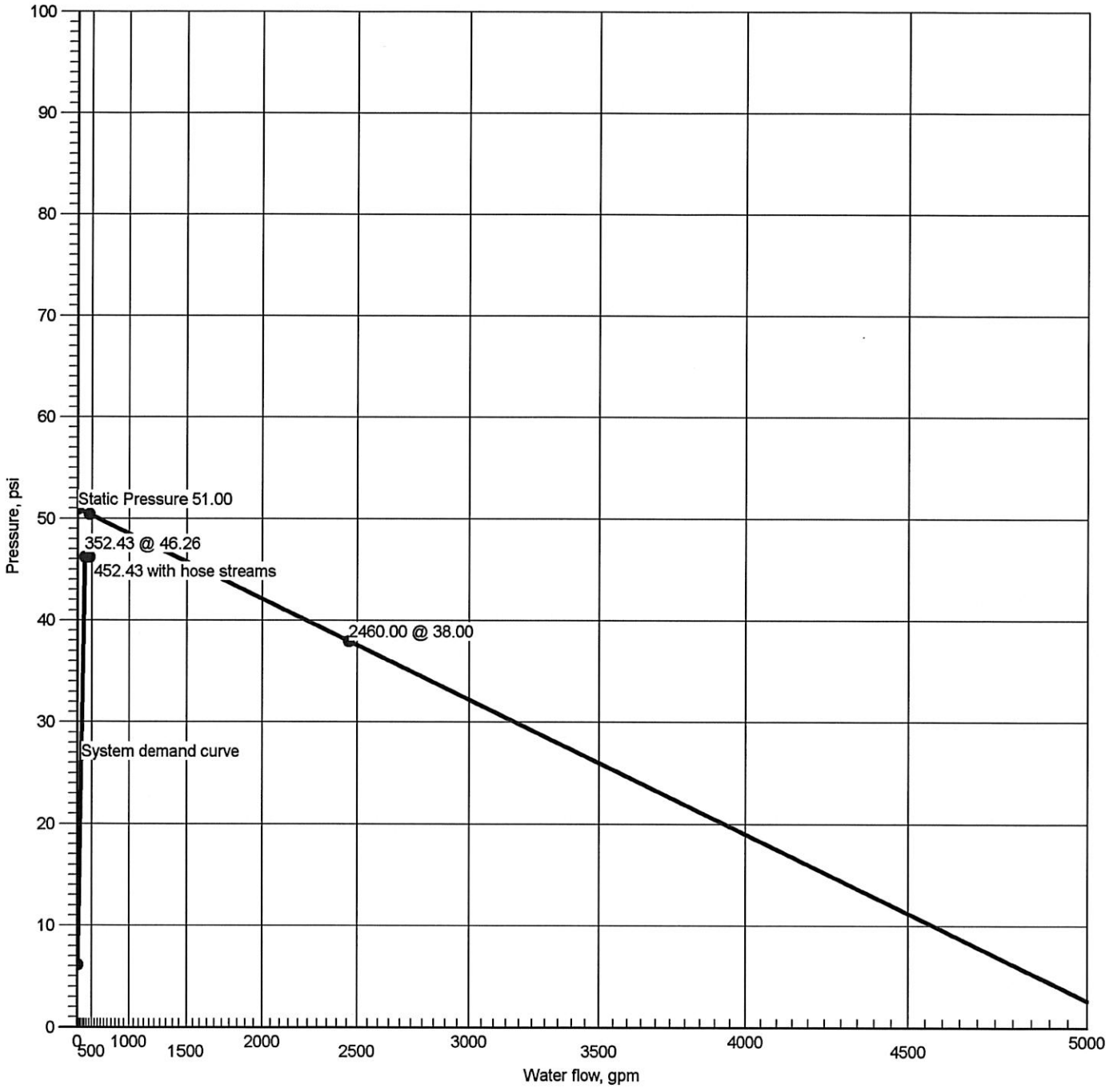
Name of Contractor	Phone	Extension
Archer Construction		

Address 1	FAX
7855 South 206th ST	

Address 2	E-mail
Kent, WA 98032	

Address 3	Web-Site

Water Supply at Node 1



Hydraulic Graph	Water Supply at Node 1
Static: Pressure	51.00
Residual: Pressure	38.00 @ 2460.00
Available Pressure at Time of Test	50.43 @ 452.43
System Demand	46.26 @ 352.43
System Demand (Including Hose Allowance at Source)	46.26 @ 452.43

Summary Of Outflowing Devices

Job Number: S23-90
Report Description: Light Hazard - Level 1 - Provider - Floor Area

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)		
⇨ **Sprinkler**	**1001**	**20.00**	**20.00**	**5.6**	**12.76**		
Sprinkler	1002	22.21	14.82	5.6	15.73		
Sprinkler	1003	20.74	14.82	5.6	13.71		
Sprinkler	1004	20.62	14.82	5.6	13.56		
Sprinkler	1005	22.25	14.82	5.6	15.79		
Sprinkler	1006	24.34	14.82	5.6	18.88		
Sprinkler	1007	21.96	18.20	5.6	15.38		
Sprinkler	1008	24.44	14.82	5.6	19.05		
Sprinkler	1009	24.72	14.82	5.6	19.49		
Sprinkler	1010	25.45	14.82	5.6	20.65		
Sprinkler	1011	27.26	14.82	5.6	23.69		
Sprinkler	1012	25.02	14.82	5.6	19.96		
Sprinkler	1013	25.06	14.82	5.6	20.02		
Sprinkler	1014	25.21	15.40	5.6	20.27		
Sprinkler	1015	23.15	19.20	5.6	17.09		

⇨ Most Demanding Sprinkler Data

Node Analysis

Job Number: S23-90
Report Description: Light Hazard - Level 1 - Provider - Floor Area

Node	Elevation(Foot)	Fittings	Pressure(psi)	Discharge(gpm)	
1	-4-0	S	46.26	352.43	
1001	8-6	Spr(-12.76), fd(23-0)	12.76	20.00	
1002	10-3	Spr(-15.73)	15.73	22.21	
1003	8-0	Spr(-13.71), fd(23-0)	13.71	20.74	
1004	8-0	Spr(-13.56), fd(34-0)	13.56	20.62	
1005	8-6	Spr(-15.79), fd(23-0)	15.79	22.25	
1006	8-6	Spr(-18.88), fd(23-0)	18.88	24.34	
1007	8-6	Spr(-15.38), fd(23-0)	15.38	21.96	
1008	10-3	Spr(-19.05)	19.05	24.44	
1009	10-3	Spr(-19.49)	19.49	24.72	
1010	10-3	Spr(-20.65)	20.65	25.45	
1011	10-3	Spr(-23.69)	23.69	27.26	
1012	10-3	Spr(-19.96)	19.96	25.02	
1013	10-3	Spr(-20.02)	20.02	25.06	
1014	10-3	Spr(-20.27)	20.27	25.21	
1015	8-6	Spr(-17.09), fd(23-0)	17.09	23.15	
7	0-0		38.50		
8	-4-0	T(47-3½)	46.22		
9	2-0	PO(20-0)	37.57		
84	23-6½	fE(5-0)	24.61		
101	19-5½	PO(20-0), C(20-0)	26.38		
105	10-6	fT(16-0)	30.32		
107	10-3	E(2-0)	16.21		
108	10-3	T(9-11)	16.39		
109	10-3	PO(5-0)	15.64		
110	10-3	PO(5-0)	23.36		
112	10-3	T(9-11)	23.66		
113	10-3	PO(5-0)	19.47		
114	10-3	PO(5-0)	17.95		
116	10-3	T(9-11)	24.02		
117	10-3	PO(5-0)	18.95		
119	10-3	PO(5-0)	21.11		
120	10-6	fT(16-0)	30.16		
123	19-3½	PO(20-0)	26.41		
175	24-4	fE(5-0)	24.22		
635	20-4		25.99		
636	20-4		25.97		
754	12-0½	fE(6-9½)	31.10		
818	12-0½	fT(16-0)	30.62		
860	10-6	fE(6-9½)	30.35		
861	12-0	fE(6-9½)	29.79		
905	12-0	E(10-0)	29.67		
907	11-10	E(13-2)	29.59		
1036	9-7½	PO(9-11)	28.06		
1038	9-7½	PO(9-11)	28.06		
1040	9-7½	PO(9-11)	28.16		

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt	Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
• • • • • Route 1 • • • • •								
DY	1.0490	20.00	7.42	120		0.130131	0-0	Pf 3.64
1001	8-6	20.00	5.6	12.76		Sprinkler,	28-0	Pe -0.76
109	10-3			15.64		PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	20.00	2.89	120		0.013055	7-0½	Pf 0.09
109	10-3			15.64				Pe
1002	10-3			15.73			7-0½	Pv
BL	1.6820	42.21	6.09	120		0.051991	2-9	Pf 0.66
1002	10-3	22.21	5.6	15.73		Sprinkler,	9-11	Pe
108	10-3			16.39		T(9-11)	12-7½	Pv
BL	1.6820	62.95	9.09	120		0.108890	6-11	Pf 1.56
108	10-3	20.74		16.39		Flow (q) from Route 5	7-5	Pe 0.00
114	10-3			17.95		3LtE(2-5½)	14-4	Pv
BL	1.6820	83.57	12.07	120		0.183919	8-3	Pf 1.52
114	10-3	20.62		17.95		Flow (q) from Route 4		Pe
113	10-3			19.47			8-3	Pv
BL	1.6820	105.82	15.28	120		0.284648	4-10	Pf 4.19
113	10-3	22.25		19.47		Flow (q) from Route 6	9-11	Pe
112	10-3			23.66		T(9-11)	14-8½	Pv
DY	1.6820	130.15	18.79	120		0.417463	0-0	Pf 4.13
112	10-3	24.34		23.66		Flow (q) from Route 7	9-11	Pe 0.27
1036	9-7½			28.06		PO(9-11)	9-11	Pv
CM	3.2600	150.17	5.77	120		0.021674	111-8½	Pf 2.64
1036	9-7½	20.01		28.06		Flow (q) from Route 13	10-0	Pe -0.38
105	10-6			30.32		2fE(5-0)	121-8½	Pv
CM	4.2600	173.43	3.90	120		0.007688	81-7½	Pf 0.96
105	10-6	23.26		30.32		Flow (q) from Route 11	43-2	Pe -0.66
818	12-0½			30.62		4fE(6-9½), fT(16-0)	124-9½	Pv
CM	4.2600	352.43	7.93	120		0.028543	9-10½	Pf 0.48
818	12-0½	179.00		30.62		Flow (q) from Route 2	6-9½	Pe
754	12-0½			31.10		fE(6-9½)	16-8	Pv
CM	4.0260	352.43	8.88	120		0.037583	11-0	Pf 2.13
754	12-0½			31.10			45-7	Pe 4.35
9	2-0			37.57		2fE(6-9½), BV(12-0), PO(20-0)	56-7	Pv
UG	6.3570	352.43	3.56	120		0.004063	2-10	Pf 0.06
9	2-0			37.57			11-4	Pe 0.87
7	0-0			38.50		LtE(11-4)	14-2	Pv
UG	6.2800	352.43	3.65	140		0.003242	168-7	Pf 5.99
7	0-0			38.50			135-6½	Pe 1.73
8	-4-0			46.22		4E(22-1), BFP(-5.00), T(47-3½)	304-1	Pv
UG	8.3900	352.43	2.05	140		0.000791	50-8½	Pf 0.04
8	-4-0			46.22				Pe
1	-4-0			46.26		Water Supply	50-8½	Pv
		100.00				Hose Allowance At Source		
1		452.43						
• • • • • Route 2 • • • • •								
DY	1.0490	21.96	8.15	120		0.154706	0-0	Pf 4.33
1007	8-6	21.96	5.6	15.38		Sprinkler,	28-0	Pe -0.76
117	10-3			18.95		PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	21.96	3.17	120		0.015521	6-7	Pf 0.10
117	10-3			18.95				Pe
1008	10-3			19.05			6-7	Pv
BL	1.6820	46.40	6.70	120		0.061946	7-1	Pf 0.44
1008	10-3	24.44	5.6	19.05		Sprinkler		Pe
1009	10-3			19.49			7-1	Pv
BL	1.6820	71.13	10.27	120		0.136509	8-6	Pf 1.16
1009	10-3	24.72	5.6	19.49		Sprinkler		Pe
1010	10-3			20.65			8-6	Pv
BL	1.6820	96.58	13.94	120		0.240383	4-1½	Pf 3.37
1010	10-3	25.45	5.6	20.65		Sprinkler,	9-11	Pe
116	10-3			24.02		T(9-11)	14-0	Pv
DY	1.6820	123.83	17.88	120		0.380748	0-0	Pf 3.77
116	10-3	27.26		24.02		Flow (q) from Route 10	9-11	Pe 0.27
1038	9-7½			28.06		PO(9-11)	9-11	Pv
CM	3.2600	103.82	3.99	120		0.010950	8-11	Pf 0.10
1038	9-7½			28.06				Pe
1040	9-7½			28.16			8-11	Pv

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt	Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
CM	3.2600	202.26	7.77	120		0.037603	53-4	Pf 2.38
1040	9-7½	98.44		28.16		Flow (q) from Route 3	10-0	Pe -0.38
120	10-6			30.16		2fE(5-0)	63-4	Pv
CM	4.2600	179.00	4.03	120		0.008151	16-11½	Pf 0.19
120	10-6			30.16			6-9½	Pe
860	10-6			30.35		fE(6-9½)	23-9	Pv
CM	4.0260	179.00	4.51	120		0.010732	1-6	Pf 0.09
860	10-6			30.35			6-9½	Pe -0.65
861	12-0			29.79		fE(6-9½)	8-3½	Pv
CM	4.2600	179.00	4.03	120		0.008151	87-0½	Pf 0.84
861	12-0			29.79			16-0	Pe -0.01
818	12-0½			30.62		fT(16-0)	103-0½	Pv
Route 3								
DY	1.0490	23.15	8.59	120		0.170599	0-0	Pf 4.78
1015	8-6	23.15	5.6	17.09		Sprinkler,	28-0	Pe -0.76
119	10-3			21.11		PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	98.44	14.21	120		0.249028	7-5	Pf 6.78
119	10-3	75.29		21.11		Flow (q) from Route 8	19-9½	Pe 0.27
1040	9-7½			28.16		T(9-11), PO(9-11)	27-2½	Pv
Route 4								
DY	1.0490	20.62	7.65	120		0.137666	0-0	Pf 5.37
1004	8-0	20.62	5.6	13.56		Sprinkler,	39-0	Pe -0.98
114	10-3			17.95		PO(5-0), fd(34-0)	39-0	Pv
Route 5								
DY	1.0490	20.74	7.70	120		0.139127	0-0	Pf 3.48
1003	8-0	20.74	5.6	13.71		Sprinkler,	25-0	Pe -0.98
107	10-3			16.21		E(2-0), fd(23-0)	25-0	Pv
BL	1.6820	20.74	2.99	120		0.013958	2-8	Pf 0.18
107	10-3			16.21			9-11	Pe
108	10-3			16.39		T(9-11)	12-6½	Pv
Route 6								
DY	1.0490	22.25	8.26	120		0.158527	0-0	Pf 4.44
1005	8-6	22.25	5.6	15.79		Sprinkler,	28-0	Pe -0.76
113	10-3			19.47		PO(5-0), fd(23-0)	28-0	Pv
Route 7								
DY	1.0490	24.34	9.03	120		0.187078	0-0	Pf 5.24
1006	8-6	24.34	5.6	18.88		Sprinkler,	28-0	Pe -0.76
110	10-3			23.36		PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	24.34	3.51	120		0.018768	5-11	Pf 0.30
110	10-3			23.36			9-11	Pe
112	10-3			23.66		T(9-11)	15-10	Pv
Route 8								
BL	1.6820	75.29	10.87	120		0.151643	5-6	Pf 0.84
1014	10-3	50.07	5.6	20.27		Sprinkler, Flow (q) from Route 9		Pe
119	10-3			21.11			5-6	Pv
Route 9								
BL	1.6820	25.02	3.61	120		0.019752	3-2½	Pf 0.06
1012	10-3	25.02	5.6	19.96		Sprinkler		Pe
1013	10-3			20.02			3-2½	Pv
BL	1.6820	50.07	7.23	120		0.071309	3-7	Pf 0.25
1013	10-3	25.06	5.6	20.02		Sprinkler		Pe
1014	10-3			20.27			3-7	Pv
Route 10								
BL	1.6820	27.26	3.94	120		0.023148	4-4½	Pf 0.33
1011	10-3	27.26	5.6	23.69		Sprinkler,	9-11	Pe
116	10-3			24.02		T(9-11)	14-3½	Pv
Route 11								
CM	3.0680	9.30	0.40	120		0.000170	151-3½	Pf 0.03
175	24-4			24.22			40-0	Pe 0.35
84	23-6½			24.61		8fE(5-0)	191-3½	Pv
CM	4.0260	9.30	0.23	120		0.000045	37-6	Pf 0.00
84	23-6½			24.61			53-7	Pe 1.77
101	19-5½			26.38		2fE(6-9½), PO(20-0), C(20-0)	91-1	Pv
CM	4.0260	23.26	0.59	120		0.000246	207-5½	Pf 0.06
101	19-5½	13.96		26.38		Flow (q) from Route 14	20-0	Pe 3.23
905	12-0			29.67		2E(10-0)	227-5½	Pv

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt	Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
CM	4.2600	23.26	0.52	120		0.000187	1-6	Pf 0.00
905	12-0			29.67			16-0	Pe 0.65
105	10-6			30.32		fT(16-0)	17-6	Pv
• • • • • Route 12 • • • • •								
CM	4.2600	23.26	0.52	120		0.000187	1-4	Pf 0.01
120	10-6			30.16		fT(16-0)	29-2	Pe -0.58
907	11-10			29.59		E(13-2)	30-6	Pv
CM	4.0260	23.26	0.59	120		0.000246	207-5½	Pf 0.06
907	11-10			29.59			30-0	Pe -3.23
123	19-3½			26.41		E(10-0), PO(20-0)	237-5½	Pv
CM	4.0260	9.30	0.23	120		0.000045	36-1	Pf 0.00
123	19-3½			26.41			32-2	Pe -2.20
175	24-4			24.22		4fE(6-9½), fE(5-0)	68-3	Pv
• • • • • Route 13 • • • • •								
CM	3.2600	20.01	0.77	120		0.000521	7-0	Pf 0.00
1038	9-7½			28.06				Pe
1036	9-7½			28.06			7-0	Pv
• • • • • Route 14 • • • • •								
CM	4.0260	13.96	0.35	120		0.000096	88-0½	Pf 0.01
635	20-4	13.96		25.99		Flow (q) from Route 15	53-7	Pe 0.38
101	19-5½			26.38		2fE(6-9½), PO(20-0), C(20-0)	141-7½	Pv
• • • • • Route 15 • • • • •								
CM	3.0680	13.96	0.61	120		0.000360	46-10½	Pf 0.02
636	20-4			25.97				Pe
635	20-4			25.99			46-10½	Pv
• • • • • Route 16 • • • • •								
CM	4.0260	13.96	0.35	120		0.000096	82-9	Pf 0.01
123	19-3½			26.41			13-7	Pe -0.45
636	20-4			25.97		2fE(6-9½)	96-4	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

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
BalV	Ball Valve
BFP	Backflow Preventer
BV	Butterfly Valve
C	Cross Flow Turn 90°
cplg	Coupling
Cr	Cross Run
CV	Check Valve
DelV	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 Reducing Valve
PrV	Pressure Relief Valve
red	Reducer/Adapter
S	Supply
sCV	Swing Check Valve
Spr	Sprinkler
St	Strainer
T	Tee Flow Turn 90°
Tr	Tee Run
U	Union
WirF	Wirsbo
WMV	Water Meter Valve
Z	Cap

Hydraulic Summary

Job Number: S23-90
Report Description: Light Hazard - Level 2 - Reception - Floor Area

Job

Job Number: S23-90	Design Engineer: Queen
Job Name: CHC Puyallup Cannery	State Certification/License Number: ARCHEI*219DR
Address 1: 201 W. Main St	AHJ: Puyallup
Address 2: Puyallup, WA 98371	Job Site/Building: Cannery
Address 3:	Drawing Name: S23-090 - CHC Puyallup Cannery - 1-8th scale - L

System

Most Demanding Sprinkler Data: 4.2 K-Factor 14.21 at 11.45

Hose Allowance At Source: 100.00

Additional Hose Supplies

Node	Flow(gpm)

Total Hose Streams: 100.00

System Flow Demand	Total Water Required (Including Hose Allowance)
484.73	584.73

Maximum Pressure Unbalance In Loops: 0.00

Maximum Velocity Above Ground: 12.22 between nodes 9 and 754

Maximum Velocity Under Ground	
5.02 between nodes 8 and 7	

Volume capacity of Wet Pipes	Volume capacity of Dry Pipes
1275.90gal	

Remote Area(s)

Occupancy	Job Suffix
Light Hazard - Level 2 - Reception -	f

Density	Area of Application
0.07gpm/ft²	3000.00ft² (Actual 3014.18ft²)

Number Of Sprinklers Calculated	Coverage Per Sprinkler
35	225.00ft²

REV 01

Expires DEC 31, 24
WASHINGTON STATE
CERTIFICATE OF COMPETENCY
FIRE SPRINKLER SYSTEMS

Theodore M. Queen
4930-0205-C Level 3
Archer Construction, Inc.
ARCHEI*219DR

Signature: Ted Queen Date: 3-14-24

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	100.00	51.00	38.00	2460.00	50.09	584.73	44.58	5.51

Contractor

Contractor Number	Contact Name	Contact Title
22		

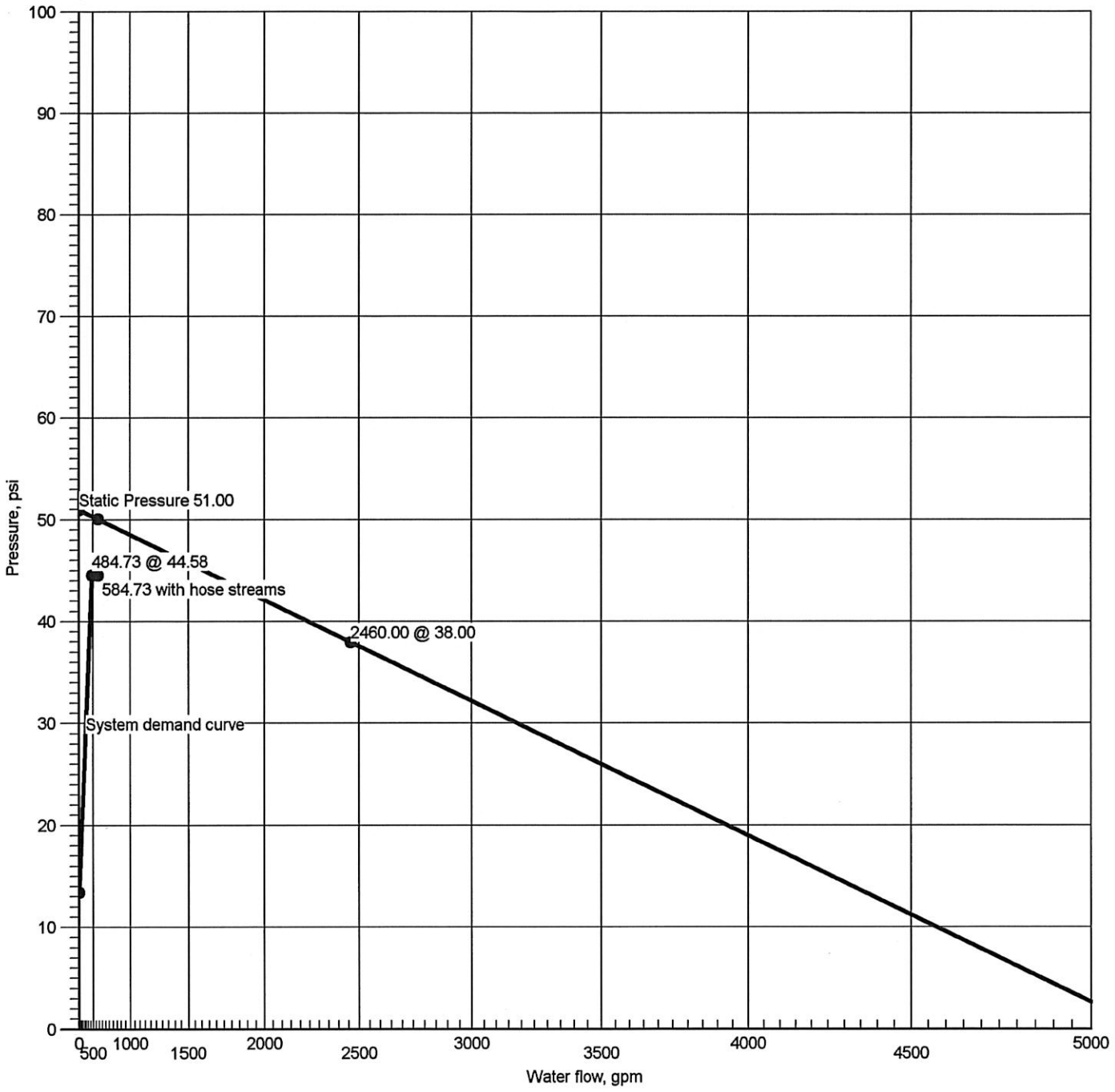
Name of Contractor	Phone	Extension
Archer Construction		

Address 1	FAX
7855 South 206th ST	

Address 2	E-mail
Kent, WA 98032	

Address 3	Web-Site

Water Supply at Node 1



Hydraulic Graph
Water Supply at Node 1

Static: Pressure
51.00

Residual: Pressure
38.00 @ 2460.00

Available Pressure at Time of Test
50.09 @ 584.73

System Demand
44.58 @ 484.73

System Demand (Including Hose Allowance at Source)
44.58 @ 584.73

Summary Of Outflowing Devices

Job Number: S23-90
Report Description: Light Hazard - Level 2 - Reception - Floor Area

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)		
Sprinkler	2001	14.47	10.90	4.2	11.86		
Sprinkler	2002	14.62	11.11	4.2	12.11		
Sprinkler	2003	14.03	11.11	4.2	11.15		
Sprinkler	2004	14.27	11.11	4.2	11.55		
Sprinkler	2005	14.59	11.11	4.2	12.06		
Sprinkler	2006	14.28	11.11	4.2	11.56		
Sprinkler	2007	13.71	11.11	4.2	10.66		
Sprinkler	2008	13.49	11.11	4.2	10.31		
Sprinkler	2009	13.80	11.11	4.2	10.79		
⇨ **Sprinkler**	**2010**	**14.21**	**14.21**	**4.2**	**11.45**		
Sprinkler	2011	13.37	11.11	4.2	10.13		
Sprinkler	2012	13.48	11.11	4.2	10.30		
Sprinkler	2013	13.05	11.11	4.2	9.65		
Sprinkler	2014	13.53	11.11	4.2	10.38		
Sprinkler	2015	13.24	11.11	4.2	9.94		
Sprinkler	2016	13.05	11.11	4.2	9.65		
Sprinkler	2017	13.29	11.11	4.2	10.01		
Sprinkler	2018	13.60	11.11	4.2	10.49		
Sprinkler	2019	14.22	14.21	4.2	11.46		
Sprinkler	2020	13.60	11.11	4.2	10.49		
Sprinkler	2021	13.40	11.11	4.2	10.18		
Sprinkler	2022	13.23	11.11	4.2	9.92		
Sprinkler	2023	13.55	11.11	4.2	10.40		
Sprinkler	2024	13.84	11.11	4.2	10.86		
Sprinkler	2025	13.88	11.11	4.2	10.92		
Sprinkler	2026	14.34	11.11	4.2	11.66		
Sprinkler	2027	13.88	11.11	4.2	10.92		
Sprinkler	2028	13.92	11.11	4.2	10.99		
Sprinkler	2029	13.96	13.72	4.2	11.05		
Sprinkler	2030	13.84	11.11	4.2	10.86		
Sprinkler	2031	14.28	11.11	4.2	11.57		
Sprinkler	2032	14.34	11.11	4.2	11.67		
Sprinkler	2033	14.37	11.11	4.2	11.71		
Sprinkler	2034	14.05	11.11	4.2	11.19		
Sprinkler	2035	13.97	11.11	4.2	11.06		

⇨ Most Demanding Sprinkler Data

Node	Elevation(Foot)	Fittings	Pressure(psi)	Discharge(gpm)	
1	-4-0	S	44.58	484.73	
2001	23-2	Spr(-11.86), fd(23-0)	11.86	14.47	
2002	23-2	Spr(-12.11), fd(23-0)	12.11	14.62	
2003	22-8	Spr(-11.15), fd(34-0)	11.15	14.03	
2004	23-2	Spr(-11.55), fd(23-0)	11.55	14.27	
2005	25-8½	Spr(-12.06)	12.06	14.59	
2006	27-0½	Spr(-11.56)	11.56	14.28	
2007	22-8	Spr(-10.66), fd(23-0)	10.66	13.71	
2008	26-5	Spr(-10.31)	10.31	13.49	
2009	25-2½	Spr(-10.79)	10.79	13.80	
2010	23-2	Spr(-11.45), fd(23-0)	11.45	14.21	
2011	22-8	Spr(-10.13), fd(34-0)	10.13	13.37	
2012	22-8	Spr(-10.30), fd(23-0)	10.30	13.48	
2013	26-9½	Spr(-9.65)	9.65	13.05	
2014	24-9½	Spr(-10.38)	10.38	13.53	
2015	22-8	Spr(-9.94), fd(34-0)	9.94	13.24	
2016	22-8	Spr(-9.65), fd(34-0)	9.65	13.05	
2017	26-3	Spr(-10.01)	10.01	13.29	
2018	25-0	Spr(-10.49)	10.49	13.60	
2019	23-2	Spr(-11.46), fd(23-0)	11.46	14.22	
2020	22-8	Spr(-10.49), fd(23-0)	10.49	13.60	
2021	22-8	Spr(-10.18), fd(23-0)	10.18	13.40	
2022	26-3	Spr(-9.92)	9.92	13.23	
2023	25-0	Spr(-10.40)	10.40	13.55	
2024	24-3	Spr(-10.86), fd(23-0)	10.86	13.84	
2025	24-3	Spr(-10.92), fd(23-0)	10.92	13.88	
2026	22-8	Spr(-11.66), fd(23-0)	11.66	14.34	
2027	24-3	Spr(-10.92), fd(23-0)	10.92	13.88	
2028	24-3	Spr(-10.99), fd(23-0)	10.99	13.92	
2029	22-8	Spr(-11.05), fd(23-0)	11.05	13.96	
2030	22-8	Spr(-10.86), fd(23-0)	10.86	13.84	
2031	20-7	Spr(-11.57), fd(23-0)	11.57	14.28	
2032	23-2	Spr(-11.67), fd(23-0)	11.67	14.34	
2033	23-2	Spr(-11.71), fd(23-0)	11.71	14.37	
2034	22-8	Spr(-11.19), fd(34-0)	11.19	14.05	
2035	22-8	Spr(-11.06), fd(34-0)	11.06	13.97	
7	0-0		36.00		
8	-4-0	T(47-3½)	44.51		
9	2-0	PO(20-0)	35.03		
200	24-11½	PO(5-0)	12.85		
201	24-11½	PO(5-0)	12.38		
202	24-11½	PO(5-0)	12.46		
203	26-1½	PO(5-0)	12.10		
204	26-1½	PO(5-0)	12.58		
205	24-11½	PO(5-0)	12.62		
206	24-11½	PO(5-0)	12.90		
207	24-11½	PO(5-0)	12.47		
208	24-4	PO(9-11)	13.58		
209	24-4	PO(9-11)	13.60		
210	24-11½	PO(5-0)	12.55		
211	23-5½	fE(5-0)	17.11		
212	24-4	PO(5-0)	13.65		
213	24-4	PO(9-11)	13.56		
214	24-4	PO(9-11)	13.50		
215	24-4	PO(9-11)	13.29		
216	24-4	PO(9-11)	13.26		
217	24-4	PO(9-11)	13.09		
218	24-4	PO(9-11)	13.07		
219	24-4	PO(9-11)	13.05		
220	24-4	PO(9-11)	13.04		
221	24-4	PO(9-11)	13.04		
222	24-4	PO(9-11)	13.06		

Node	Elevation(Foot)	Fittings	Pressure(psi)	Discharge(gpm)	
223	24-4	PO(9-11)	13.07		
224	24-4	PO(9-11)	13.12		
225	24-4	PO(9-11)	13.12		
226	24-4	fE(5-0)	16.98		
227	24-11½	PO(5-0)	11.55		
228	24-11½	PO(5-0)	12.79		
229	24-11½	PO(5-0)	11.92		
230	24-11½	PO(5-0)	11.32		
231	24-11½	PO(5-0)	11.29		
232	24-11½	PO(5-0)	12.84		
233	24-3½	PO(5-0)	13.01		
234	24-11½	PO(5-0)	12.64		
235	24-3½	PO(5-0)	11.77		
236	24-11½	PO(5-0)	11.07		
237	24-11½	PO(5-0)	10.97		
238	24-11½	PO(5-0)	10.93		
239	24-11½	PO(5-0)	11.71		
240	26-9½	PO(5-0)	9.99		
241	27-1	PO(5-0)	11.76		
242	23-10	PO(5-0)	12.11		
243	24-9½	E(2-0)	10.73		
244	18-4½	PO(26-4)	20.61		
245	12-0	E(13-2)	23.67		
246	11-10	E(13-2)	23.78		
247	18-4½	PO(26-4)	20.68		
248	20-3½	fE(6-9½)	19.79		
249	20-4	fE(6-9½)	19.81		
250	10-6	fT(16-0)	24.78		
251	10-6	fT(16-0)	24.78		
754	12-0½	fE(6-9½)	26.84		
818	12-0½	fT(16-0)	25.98		
860	10-6	fE(6-9½)	25.10		
861	12-0	fE(6-9½)	24.60		
905	12-0	E(10-0)	23.87		
907	11-10	E(10-0)	23.96		

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt / Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
• • • • • Route 1 • • • • •							
DY	1.0490	14.21	5.28	120	0.069147	0-0	Pf 1.94
2010	23-2	14.21	4.2	11.45	Sprinkler,	28-0	Pe -1.28
203	26-1½			12.10	PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	14.21	2.05	120	0.006937	13-0	Pf 0.19
203	26-1½			12.10		14-10	Pe 0.77
218	24-4			13.07	2LtE(2-5½), PO(9-11)	27-10	Pv
CM	3.2600	82.21	3.16	120	0.007111	2-7½	Pf 0.02
218	24-4	68.00		13.07	Flow (q) from Route 2		Pe
217	24-4			13.09		2-7½	Pv
CM	3.2600	135.64	5.21	120	0.017955	9-8½	Pf 0.17
217	24-4	53.42		13.09	Flow (q) from Route 4		Pe
216	24-4			13.26		9-8½	Pv
CM	3.2600	176.63	6.79	120	0.029266	1-0	Pf 0.03
216	24-4	41.00		13.26	Flow (q) from Route 12		Pe
215	24-4			13.29		1-0	Pv
CM	3.2600	205.50	7.90	120	0.038723	5-3½	Pf 0.20
215	24-4	28.86		13.29	Flow (q) from Route 28		Pe
214	24-4			13.50		5-3½	Pv
CM	3.2600	233.79	8.99	120	0.049161	1-2½	Pf 0.06
214	24-4	28.30		13.50	Flow (q) from Route 25		Pe
213	24-4			13.56		1-2½	Pv
CM	3.2600	248.26	9.54	120	0.054936	1-8	Pf 0.09
213	24-4	14.47		13.56	Flow (q) from Route 33		Pe
212	24-4			13.65		1-8	Pv
CM	3.2600	262.88	10.10	120	0.061070	40-4½	Pf 3.08
212	24-4	14.62		13.65	Flow (q) from Route 35	10-0	Pe 0.38
211	23-5½			17.11	2fE(5-0)	50-4½	Pv
CM	4.2600	262.88	5.92	120	0.016595	38-9½	Pf 1.31
211	23-5½			17.11		39-11	Pe 2.20
244	18-4½			20.61	2fE(6-9½), PO(26-4)	78-8½	Pv
CM	4.2600	247.96	5.58	120	0.014895	6-4½	Pf 0.29
244	18-4½			20.61		13-2	Pe 2.76
245	12-0			23.67	E(13-2)	19-6½	Pv
CM	4.0260	247.96	6.25	120	0.019612	0-0	Pf 0.20
245	12-0			23.67		10-0	Pe 0.00
905	12-0			23.87	E(10-0)	10-0	Pv
CM	4.2600	247.96	5.58	120	0.014895	1-6	Pf 0.26
905	12-0			23.87		16-0	Pe 0.65
250	10-6			24.78	fT(16-0)	17-6	Pv
CM	4.2600	248.81	5.60	120	0.014989	81-7½	Pf 1.87
250	10-6	0.85		24.78	Flow (q) from Route 36	43-2	Pe -0.66
818	12-0½			25.98	4fE(6-9½), fT(16-0)	124-9½	Pv
CM	4.2600	484.73	10.91	120	0.051477	9-10½	Pf 0.86
818	12-0½	235.93		25.98	Flow (q) from Route 3	6-9½	Pe
754	12-0½			26.84	fE(6-9½)	16-8	Pv
CM	4.0260	484.73	12.22	120	0.067780	11-0	Pf 3.84
754	12-0½			26.84		45-7	Pe 4.35
9	2-0			35.03	2fE(6-9½), BV(12-0), PO(20-0)	56-7	Pv
UG	6.3570	484.73	4.90	120	0.007328	2-10	Pf 0.10
9	2-0			35.03		11-4	Pe 0.87
7	0-0			36.00	LtE(11-4)	14-2	Pv
UG	6.2800	484.73	5.02	140	0.005847	168-7	Pf 6.78
7	0-0			36.00		135-6½	Pe 1.73
8	-4-0			44.51	4E(22-1), BFP(-5.00), T(47-3½)	304-1	Pv
UG	8.3900	484.73	2.81	140	0.001426	50-8½	Pf 0.07
8	-4-0			44.51			Pe
1	-4-0			44.58	Water Supply	50-8½	Pv
		100.00			Hose Allowance At Source		
1		584.73					
• • • • • Route 2 • • • • •							
DY	1.0490	14.22	5.28	120	0.069225	0-0	Pf 1.94
2019	23-2	14.22	4.2	11.46	Sprinkler,	28-0	Pe -0.78
205	24-11½			12.62	PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	14.22	2.05	120	0.006945	9-0½	Pf 0.15
205	24-11½			12.62		12-4½	Pe 0.28
220	24-4			13.04	LtE(2-5½), PO(9-11)	21-5	Pv

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt / Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
CM	3.2600	14.83	0.57	120	0.000299	10-7½	Pf 0.00
220	24-4	0.61		13.04	Flow (q) from Route 38		Pe
219	24-4			13.05		10-7½	Pv
CM	3.2600	68.00	2.61	120	0.005006	5-0½	Pf 0.03
219	24-4	53.18		13.05	Flow (q) from Route 5		Pe
218	24-4			13.07		5-0½	Pv
• • • • • Route 3 • • • • •							
DY	1.0490	13.96	5.18	120	0.066900	0-0	Pf 1.87
2029	22-8	13.96	4.2	11.05	Sprinkler,	28-0	Pe -0.99
229	24-11½			11.92	PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	42.08	6.08	120	0.051695	5-5	Pf 0.92
229	24-11½	28.12		11.92	Flow (q) from Route 20	12-4½	Pe 0.27
224	24-4			13.12	LtE(2-5½), PO(9-11)	17-9½	Pv
CM	3.2600	137.31	5.28	120	0.018368	0-6	Pf 0.01
224	24-4	95.23		13.12	Flow (q) from Route 6		Pe
225	24-4			13.12		0-6	Pv
CM	3.2600	165.12	6.35	120	0.025835	7-6½	Pf 0.45
225	24-4	27.80		13.12	Flow (q) from Route 22	10-0	Pe 0.00
208	24-4			13.58	2fE(5-0)	17-6½	Pv
CM	3.2600	193.14	7.42	120	0.034526	0-9	Pf 0.03
208	24-4	28.02		13.58	Flow (q) from Route 24		Pe
209	24-4			13.60		0-9	Pv
CM	3.2600	221.86	8.53	120	0.044619	50-10	Pf 3.38
209	24-4	28.72		13.60	Flow (q) from Route 31	25-0	Pe -0.01
226	24-4			16.98	5fE(5-0)	75-10	Pv
CM	4.2600	221.86	4.99	120	0.012125	37-7½	Pf 1.10
226	24-4			16.98		53-6	Pe 2.59
247	18-4½			20.68	4fE(6-9½), PO(26-4)	91-1½	Pv
CM	4.2600	236.78	5.33	120	0.013676	6-6½	Pf 0.27
247	18-4½	14.92		20.68	Flow (q) from Route 37	13-2	Pe 2.84
246	11-10			23.78	E(13-2)	19-8½	Pv
CM	4.0260	236.78	5.97	120	0.018007	0-0	Pf 0.18
246	11-10			23.78		10-0	Pe -0.00
907	11-10			23.96	E(10-0)	10-0	Pv
CM	4.2600	236.78	5.33	120	0.013676	1-4	Pf 0.24
907	11-10			23.96		16-0	Pe 0.58
251	10-6			24.78	fT(16-0)	17-4	Pv
CM	4.2600	235.93	5.31	120	0.013585	16-11½	Pf 0.32
251	10-6			24.78		6-9½	Pe
860	10-6			25.10	fE(6-9½)	23-9	Pv
CM	4.0260	235.93	5.95	120	0.017888	1-6	Pf 0.15
860	10-6			25.10		6-9½	Pe -0.65
861	12-0			24.60	fE(6-9½)	8-3½	Pv
CM	4.2600	235.93	5.31	120	0.013585	87-0½	Pf 1.40
861	12-0			24.60		16-0	Pe -0.01
818	12-0½			25.98	fT(16-0)	103-0½	Pv
• • • • • Route 4 • • • • •							
BL	1.0490	13.05	4.84	120	0.059037	0-8½	Pf 0.34
2013	26-9½	13.05	4.2	9.65	Sprinkler,	5-0	Pe
240	26-9½			9.99	PO(5-0)	5-8½	Pv
BL	1.6820	26.57	3.84	120	0.022088	8-1	Pf 0.29
240	26-9½	13.53		9.99	Flow (q) from Route 13	4-11½	Pe 0.79
236	24-11½			11.07	2LtE(2-5½)	13-0½	Pv
BL	1.6820	40.06	5.78	120	0.047187	10-0½	Pf 0.47
236	24-11½	13.48		11.07	Flow (q) from Route 11		Pe 0.01
227	24-11½			11.55		10-0½	Pv
BL	1.6820	53.42	7.71	120	0.080381	3-5	Pf 1.27
227	24-11½	13.37		11.55	Flow (q) from Route 9	12-4½	Pe 0.27
217	24-4			13.09	LtE(2-5½), PO(9-11)	15-9½	Pv
• • • • • Route 5 • • • • •							
DY	1.0490	13.05	4.84	120	0.059058	0-0	Pf 2.30
2016	22-8	13.05	4.2	9.65	Sprinkler,	39-0	Pe -0.99
237	24-11½			10.97	PO(5-0), fd(34-0)	39-0	Pv
BL	1.6820	39.94	5.77	120	0.046924	7-6½	Pf 0.35
237	24-11½	26.89		10.97	Flow (q) from Route 8		Pe -0.00
230	24-11½			11.32		7-6½	Pv

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt / Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
BL	1.6820	53.18	7.68	120	0.079707	5-11	Pf 1.46
230	24-11½	13.24		11.32	Flow (q) from Route 7	12-4½	Pe 0.27
219	24-4			13.05	LtE(2-5½), PO(9-11)	18-3½	Pv
• • • • • Route 6 • • • • •							
BL	1.6820	26.77	3.87	120	0.022396	12-6½	Pf 0.45
2022	26-3	13.55	4.2	9.92	Sprinkler,, Flow (q) from Route	7-5	Pe 0.56
238	24-11½			10.93	14	20-0	Pv
					3LtE(2-5½)		
BL	1.6820	40.18	5.80	120	0.047448	7-6½	Pf 0.36
238	24-11½	13.40		10.93	Flow (q) from Route 10		Pe -0.00
231	24-11½			11.29		7-6½	Pv
BL	1.6820	53.78	7.77	120	0.081380	5-11	Pf 1.49
231	24-11½	13.60		11.29	Flow (q) from Route 16	12-4½	Pe 0.27
221	24-4			13.04	LtE(2-5½), PO(9-11)	18-3½	Pv
CM	3.2600	53.17	2.04	120	0.003175	6-6½	Pf 0.02
221	24-4			13.04			Pe
222	24-4			13.06		6-6½	Pv
CM	3.2600	80.89	3.11	120	0.006901	1-7½	Pf 0.01
222	24-4	27.72		13.06	Flow (q) from Route 19		Pe
223	24-4			13.07		1-7½	Pv
CM	3.2600	95.23	3.66	120	0.009333	4-5½	Pf 0.04
223	24-4	14.34		13.07	Flow (q) from Route 30		Pe
224	24-4			13.12		4-5½	Pv
• • • • • Route 7 • • • • •							
DY	1.0490	13.24	4.92	120	0.060699	0-0	Pf 2.37
2015	22-8	13.24	4.2	9.94	Sprinkler,	39-0	Pe -0.99
230	24-11½			11.32	PO(5-0), fd(34-0)	39-0	Pv
• • • • • Route 8 • • • • •							
BL	1.6820	26.89	3.88	120	0.022570	10-3½	Pf 0.40
2017	26-3	13.60	4.2	10.01	Sprinkler,, Flow (q) from Route	7-5	Pe 0.56
237	24-11½			10.97	15	17-8½	Pv
					3LtE(2-5½)		
• • • • • Route 9 • • • • •							
DY	1.0490	13.37	4.96	120	0.061734	0-0	Pf 2.41
2011	22-8	13.37	4.2	10.13	Sprinkler,	39-0	Pe -0.99
227	24-11½			11.55	PO(5-0), fd(34-0)	39-0	Pv
• • • • • Route 10 • • • • •							
DY	1.0490	13.40	4.97	120	0.062042	0-0	Pf 1.74
2021	22-8	13.40	4.2	10.18	Sprinkler,	28-0	Pe -0.99
238	24-11½			10.93	PO(5-0), fd(23-0)	28-0	Pv
• • • • • Route 11 • • • • •							
DY	1.0490	13.48	5.00	120	0.062730	0-0	Pf 1.76
2012	22-8	13.48	4.2	10.30	Sprinkler,	28-0	Pe -0.99
236	24-11½			11.07	PO(5-0), fd(23-0)	28-0	Pv
• • • • • Route 12 • • • • •							
BL	1.6820	27.29	3.94	120	0.023194	10-3½	Pf 0.53
2008	26-5	13.80	4.2	10.31	Sprinkler,, Flow (q) from Route	12-4½	Pe 0.93
235	24-3½			11.77	18	22-8	Pv
					5LtE(2-5½)		
BL	1.6820	41.00	5.92	120	0.049259	13-5½	Pf 1.52
235	24-3½	13.71		11.77	Flow (q) from Route 17	17-4	Pe -0.02
216	24-4			13.26	3LtE(2-5½), PO(9-11)	30-9½	Pv
• • • • • Route 13 • • • • •							
BL	1.0490	13.53	5.02	120	0.063140	3-7½	Pf 0.35
2014	24-9½	13.53	4.2	10.38	Sprinkler,	2-0	Pe
243	24-9½			10.73	E(2-0)	5-7½	Pv
BL	1.6820	13.53	1.95	120	0.006334	16-8½	Pf 0.12
243	24-9½			10.73		2-5½	Pe -0.87
240	26-9½			9.99	LtE(2-5½)	19-2	Pv
• • • • • Route 14 • • • • •							
BL	1.6820	13.55	1.96	120	0.006349	8-1	Pf 0.05
2023	25-0	13.55	4.2	10.40	Sprinkler		Pe -0.53
2022	26-3			9.92		8-1	Pv
• • • • • Route 15 • • • • •							
BL	1.6820	13.60	1.96	120	0.006397	8-1	Pf 0.05
2018	25-0	13.60	4.2	10.49	Sprinkler		Pe -0.53
2017	26-3			10.01		8-1	Pv
• • • • • Route 16 • • • • •							

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt	Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
DY	1.0490	13.60	5.05	120		0.063785	0-0	Pf 1.79
2020	22-8	13.60	4.2	10.49		Sprinkler,	28-0	Pe -0.99
231	24-11½			11.29		PO(5-0), fd(23-0)	28-0	Pv
• • • • • Route 17 • • • • •								
DY	1.0490	13.71	5.09	120		0.064726	0-0	Pf 1.81
2007	22-8	13.71	4.2	10.66		Sprinkler,	28-0	Pe -0.70
235	24-3½			11.77		PO(5-0), fd(23-0)	28-0	Pv
• • • • • Route 18 • • • • •								
BL	1.6820	13.80	1.99	120		0.006569	8-0½	Pf 0.05
2009	25-2½	13.80	4.2	10.79		Sprinkler		Pe -0.53
2008	26-5			10.31			8-0½	Pv
• • • • • Route 19 • • • • •								
DY	1.0490	13.84	5.14	120		0.065840	0-0	Pf 1.84
2024	24-3	13.84	4.2	10.86		Sprinkler,	28-0	Pe -0.32
201	24-11½			12.38		PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	13.84	2.00	120		0.006605	11-5½	Pf 0.08
201	24-11½			12.38				Pe 0.01
207	24-11½			12.47			11-5½	Pv
BL	1.6820	27.72	4.00	120		0.023879	1-2	Pf 0.32
207	24-11½	13.88		12.47		Flow (q) from Route 21	12-4½	Pe 0.27
222	24-4			13.06		LtE(2-5½), PO(9-11)	13-6½	Pv
• • • • • Route 20 • • • • •								
DY	1.0490	13.84	5.14	120		0.065847	0-0	Pf 1.84
2030	22-8	13.84	4.2	10.86		Sprinkler,	28-0	Pe -0.99
239	24-11½			11.71		PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	28.12	4.06	120		0.024527	8-10½	Pf 0.22
239	24-11½	14.28		11.71		Flow (q) from Route 29		Pe
229	24-11½			11.92			8-10½	Pv
• • • • • Route 21 • • • • •								
DY	1.0490	13.88	5.15	120		0.066208	0-0	Pf 1.85
2025	24-3	13.88	4.2	10.92		Sprinkler,	28-0	Pe -0.31
207	24-11½			12.47		PO(5-0), fd(23-0)	28-0	Pv
• • • • • Route 22 • • • • •								
DY	1.0490	13.88	5.15	120		0.066222	0-0	Pf 1.85
2027	24-3	13.88	4.2	10.92		Sprinkler,	28-0	Pe -0.31
202	24-11½			12.46		PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	13.88	2.00	120		0.006644	11-2	Pf 0.07
202	24-11½			12.46				Pe 0.01
210	24-11½			12.55			11-2	Pv
BL	1.6820	27.80	4.01	120		0.024015	0-5½	Pf 0.31
210	24-11½	13.92		12.55		Flow (q) from Route 23	12-4½	Pe 0.27
225	24-4			13.12		LtE(2-5½), PO(9-11)	12-10	Pv
• • • • • Route 23 • • • • •								
DY	1.0490	13.92	5.17	120		0.066581	0-0	Pf 1.86
2028	24-3	13.92	4.2	10.99		Sprinkler,	28-0	Pe -0.31
210	24-11½			12.55		PO(5-0), fd(23-0)	28-0	Pv
• • • • • Route 24 • • • • •								
DY	1.0490	13.97	5.19	120		0.067006	0-0	Pf 2.61
2035	22-8	13.97	4.2	11.06		Sprinkler,	39-0	Pe -1.91
241	27-1			11.76		PO(5-0), fd(34-0)	39-0	Pv
BL	1.6820	13.97	2.02	120		0.006722	15-6	Pf 0.15
241	27-1			11.76			7-5	Pe 0.92
232	24-11½			12.84		3LtE(2-5½)	22-11	Pv
BL	1.6820	28.02	4.05	120		0.024362	6-10½	Pf 0.47
232	24-11½	14.05		12.84		Flow (q) from Route 26	12-4½	Pe 0.27
208	24-4			13.58		LtE(2-5½), PO(9-11)	19-3	Pv
• • • • • Route 25 • • • • •								
DY	1.0490	14.03	5.21	120		0.067492	0-0	Pf 2.63
2003	22-8	14.03	4.2	11.15		Sprinkler,	39-0	Pe -0.99
228	24-11½			12.79		PO(5-0), fd(34-0)	39-0	Pv
BL	1.6820	28.30	4.09	120		0.024807	5-2½	Pf 0.44
228	24-11½	14.27		12.79		Flow (q) from Route 27	12-4½	Pe 0.27
214	24-4			13.50		LtE(2-5½), PO(9-11)	17-7	Pv
• • • • • Route 26 • • • • •								
DY	1.0490	14.05	5.22	120		0.067714	0-0	Pf 2.64
2034	22-8	14.05	4.2	11.19		Sprinkler,	39-0	Pe -0.99
232	24-11½			12.84		PO(5-0), fd(34-0)	39-0	Pv
• • • • • Route 27 • • • • •								

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt	Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
DY	1.0490	14.27	5.30	120		0.069698	0-0	Pf 1.95
2004	23-2	14.27	4.2	11.55		Sprinkler,	28-0	Pe -0.49
233	24-3½			13.01		PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	14.27	2.06	120		0.006992	4-11½	Pf 0.07
233	24-3½			13.01			4-11½	Pe -0.29
228	24-11½			12.79		2LtE(2-5½)	9-11	Pv
• • • • • Route 28 • • • • •								
BL	1.6820	28.86	4.17	120		0.025736	7-3½	Pf 0.57
2006	27-0½	14.59	4.2	11.56		Sprinkler,, Flow (q) from Route 34	14-10	Pe 1.17
215	24-4			13.29		2LtE(2-5½), PO(9-11)	22-1½	Pv
• • • • • Route 29 • • • • •								
DY	1.0490	14.28	5.30	120		0.069813	0-0	Pf 1.95
2031	20-7	14.28	4.2	11.57		Sprinkler,	28-0	Pe -1.41
242	23-10			12.11		PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	14.28	2.06	120		0.007004	12-0½	Pf 0.08
242	23-10			12.11				Pe -0.48
239	24-11½			11.71			12-0½	Pv
• • • • • Route 30 • • • • •								
DY	1.0490	14.34	5.32	120		0.070335	0-0	Pf 1.97
2026	22-8	14.34	4.2	11.66		Sprinkler,	28-0	Pe -0.99
234	24-11½			12.64		PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	14.34	2.07	120		0.007056	11-4½	Pf 0.17
234	24-11½			12.64			12-4½	Pe 0.27
223	24-4			13.07		LtE(2-5½), PO(9-11)	23-9	Pv
• • • • • Route 31 • • • • •								
DY	1.0490	14.34	5.33	120		0.070365	0-0	Pf 1.97
2032	23-2	14.34	4.2	11.67		Sprinkler,	28-0	Pe -0.79
200	24-11½			12.85		PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	14.34	2.07	120		0.007059	7-9	Pf 0.05
200	24-11½			12.85				Pe 0.00
206	24-11½			12.90			7-9	Pv
BL	1.6820	28.72	4.15	120		0.025497	4-5½	Pf 0.43
206	24-11½	14.37		12.90		Flow (q) from Route 32	12-4½	Pe 0.27
209	24-4			13.60		LtE(2-5½), PO(9-11)	16-10	Pv
• • • • • Route 32 • • • • •								
DY	1.0490	14.37	5.34	120		0.070630	0-0	Pf 1.98
2033	23-2	14.37	4.2	11.71		Sprinkler,	28-0	Pe -0.79
206	24-11½			12.90		PO(5-0), fd(23-0)	28-0	Pv
• • • • • Route 33 • • • • •								
DY	1.0490	14.47	5.37	120		0.071467	0-0	Pf 2.00
2001	23-2	14.47	4.2	11.86		Sprinkler,	28-0	Pe -1.29
204	26-1½			12.58		PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	14.47	2.09	120		0.007170	12-10½	Pf 0.20
204	26-1½			12.58			14-10	Pe 0.78
213	24-4			13.56		2LtE(2-5½), PO(9-11)	27-9	Pv
• • • • • Route 34 • • • • •								
BL	1.6820	14.59	2.11	120		0.007281	8-2	Pf 0.06
2005	25-8½	14.59	4.2	12.06		Sprinkler		Pe -0.57
2006	27-0½			11.56			8-2	Pv
• • • • • Route 35 • • • • •								
DY	1.0490	14.62	5.43	120		0.072866	0-0	Pf 2.04
2002	23-2	14.62	4.2	12.11		Sprinkler,	28-0	Pe -0.51
212	24-4			13.65		PO(5-0), fd(23-0)	28-0	Pv
• • • • • Route 36 • • • • •								
CM	3.2600	0.85	0.03	120		0.000002	181-0	Pf 0.00
251	10-6			24.78			20-0	Pe
250	10-6			24.78		4fE(5-0)	201-0	Pv
• • • • • Route 37 • • • • •								
CM	4.2600	14.92	0.34	120		0.000082	35-10½	Pf 0.01
244	18-4½			20.61		PO(26-4)	53-6	Pe -0.84
248	20-3½			19.79		4fE(6-9½)	89-4½	Pv
CM	3.2600	14.92	0.57	120		0.000303	147-8	Pf 0.05
248	20-3½			19.79			6-9½	Pe -0.02
249	20-4			19.81		fE(6-9½)	154-5½	Pv
CM	4.2600	14.92	0.34	120		0.000082	35-11½	Pf 0.01
249	20-4			19.81			46-8½	Pe 0.85
247	18-4½			20.68		3fE(6-9½), PO(26-4)	82-8	Pv

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt	Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
••••• Route 38 •••••								
CM	3.2600	0.61	0.02	120		0.000001	1-4½	Pf 0.00
221	24-4			13.04				Pe
220	24-4			13.04			1-4½	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

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
BalV	Ball Valve
BFP	Backflow Preventer
BV	Butterfly Valve
C	Cross Flow Turn 90°
cplg	Coupling
Cr	Cross Run
CV	Check Valve
DelV	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 Reducing Valve
PrV	Pressure Relief Valve
red	Reducer/Adapter
S	Supply
sCV	Swing Check Valve
Spr	Sprinkler
St	Strainer
T	Tee Flow Turn 90°
Tr	Tee Run
U	Union
WirF	Wirsbo
WMV	Water Meter Valve
Z	Cap

Hydraulic Summary

Job Number: S23-90
Report Description: Ordinary Group I - Level 2 - Clenan/Dry Floor Area

Job

Job Number: S23-90	Design Engineer: Queen
Job Name: CHC Puyallup Cannery	State Certification/License Number: ARCHEI*219DR
Address 1: 201 W. Main St	AHJ: Puyallup
Address 2: Puyallup, WA 98371	Job Site/Building: Cannery
Address 3:	Drawing Name: S23-090 - CHC Puyallup Cannery - 1-8th scale - L

System

Most Demanding Sprinkler Data: 4.2 K-Factor 11.11 at 7.00

Hose Allowance At Source: 250.00

Additional Hose Supplies

Node	Flow(gpm)

Total Hose Streams: 250.00

System Flow Demand	Total Water Required (Including Hose Allowance)
544.67	794.67

Maximum Pressure Unbalance In Loops: 0.00

Maximum Velocity Above Ground: 13.73 between nodes 9 and 754

Maximum Velocity Under Ground	
5.64 between nodes 8 and 7	

Volume capacity of Wet Pipes	Volume capacity of Dry Pipes
1275.90gal	

Remote Area(s)

Occupancy	Job Suffix
Ordinary Group I - Level 2 - Clenan/D	

Density	Area of Application
0.12gpm/ft²	3000.00ft² (Actual 3029.16ft²)

Number Of Sprinklers Calculated	Coverage Per Sprinkler
44	225.00ft²

REVOI

Expires DEC 31, 24
WASHINGTON STATE
CERTIFICATE OF COMPETENCY
FIRE SPRINKLER SYSTEMS

Theodore M. Queen
4930-0205-C Level 3
Archer Construction, Inc.
ARCHEI*219DR

Signature: Ted Queen Date: 3-14-24

Supplies

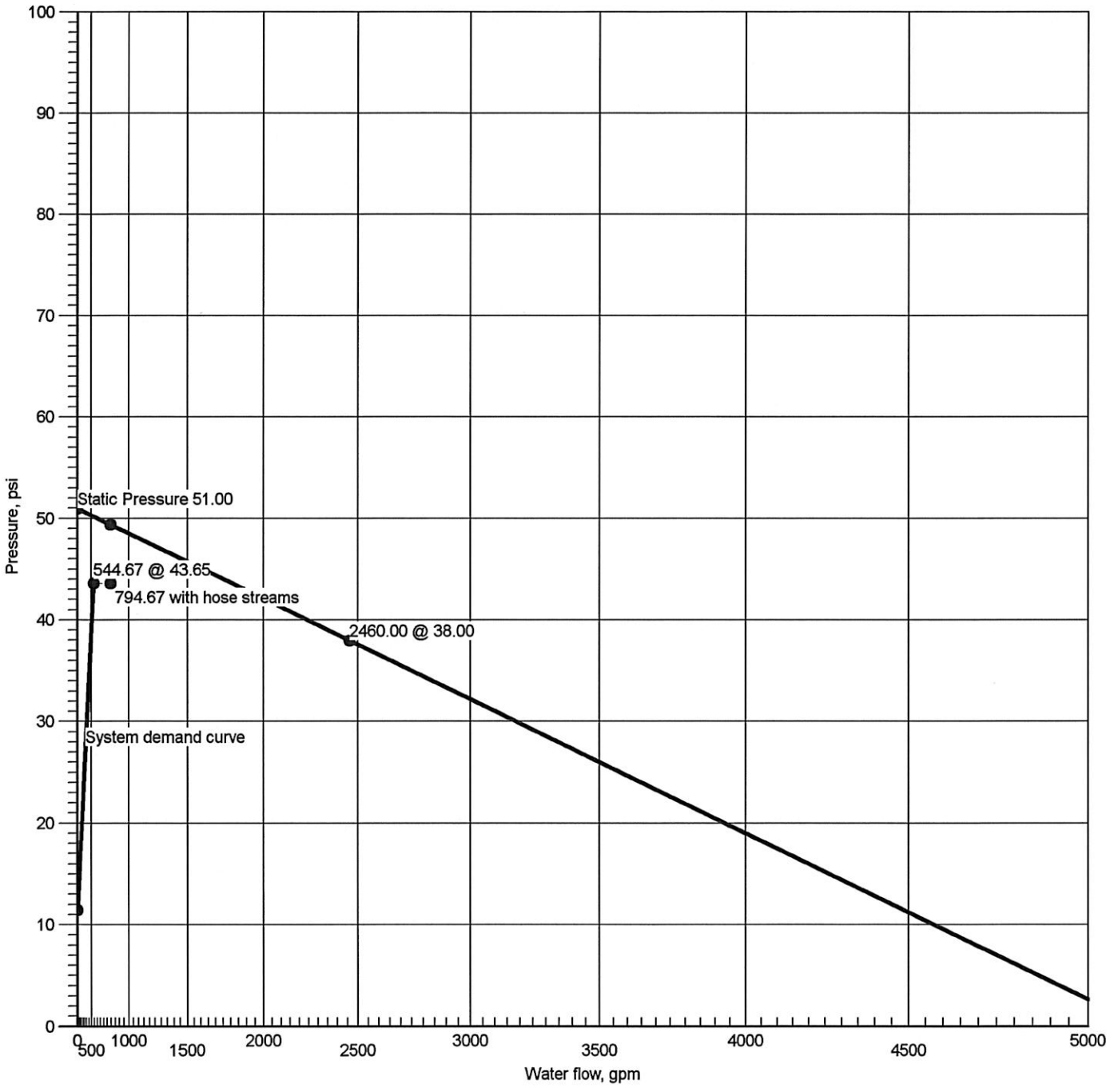
Node	Name	Hose Flow (gpm)	Static (psi)	Residual (psi)	@ Flow (gpm)	Available (psi)	@ Total Demand (gpm)	Required (psi)	Safety Margin (psi)
1	Water Supply	250.00	51.00	38.00	2460.00	49.39	794.67	43.65	5.74

Contractor

Contractor Number	Contact Name	Contact Title
22		

Name of Contractor: Archer Construction	Phone	Extension
Address 1: 7855 South 206th ST	FAX	
Address 2: Kent, WA 98032	E-mail	
Address 3:	Web-Site	

Water Supply at Node 1



Hydraulic Graph	Water Supply at Node 1
Static: Pressure	51.00
Residual: Pressure	38.00 @ 2460.00
Available Pressure at Time of Test	49.39 @ 794.67
System Demand	43.65 @ 544.67
System Demand (Including Hose Allowance at Source)	43.65 @ 794.67

Summary Of Outflowing Devices

Job Number: S23-90
Report Description: Ordinary Group I - Level 2 - Clenan/Dry Floor Area

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)		
Sprinkler	3001	12.36	11.11	4.2	8.66		
Sprinkler	3002	12.42	11.11	4.2	8.75		
Sprinkler	3003	12.62	11.11	4.2	9.02		
Sprinkler	3004	12.81	11.11	4.2	9.30		
Sprinkler	3005	11.31	11.11	4.2	7.25		
⇨ **Sprinkler**	**3006**	**11.11**	**11.11**	**4.2**	**7.00**		
Sprinkler	3007	11.44	11.11	4.2	7.42		
Sprinkler	3008	11.45	11.11	4.2	7.43		
Sprinkler	3009	12.23	11.11	4.2	8.47		
Sprinkler	3010	13.44	11.11	4.2	10.24		
Sprinkler	3011	11.28	11.11	4.2	7.22		
Sprinkler	3012	11.17	11.11	4.2	7.08		
Sprinkler	3013	11.63	11.11	4.2	7.67		
Sprinkler	3014	12.01	11.11	4.2	8.18		
Sprinkler	3015	12.94	11.11	4.2	9.50		
Sprinkler	3016	13.16	11.11	4.2	9.82		
Sprinkler	3017	12.12	11.11	4.2	8.33		
Sprinkler	3018	11.82	11.11	4.2	7.93		
Sprinkler	3019	12.32	11.11	4.2	8.60		
Sprinkler	3020	12.05	11.11	4.2	8.24		
Sprinkler	3021	13.30	11.11	4.2	10.02		
Sprinkler	3022	13.29	11.11	4.2	10.01		
Sprinkler	3023	14.13	11.11	4.2	11.32		
Sprinkler	3024	11.40	11.11	4.2	7.37		
Sprinkler	3025	11.46	11.11	4.2	7.44		
Sprinkler	3026	11.65	11.11	4.2	7.69		
Sprinkler	3027	12.06	11.11	4.2	8.25		
Sprinkler	3028	12.89	11.11	4.2	9.43		
Sprinkler	3029	13.11	11.11	4.2	9.74		
Sprinkler	3030	11.96	11.11	4.2	8.11		
Sprinkler	3031	11.78	11.11	4.2	7.87		
Sprinkler	3032	12.14	11.11	4.2	8.36		
Sprinkler	3033	12.12	11.11	4.2	8.33		
Sprinkler	3034	12.58	11.11	4.2	8.97		
Sprinkler	3035	14.14	11.11	4.2	11.34		
Sprinkler	3036	13.42	11.11	4.2	10.21		
Sprinkler	3037	13.55	11.11	4.2	10.40		
Sprinkler	3038	13.66	11.11	4.2	10.57		
Sprinkler	3039	11.71	11.11	4.2	7.77		
Sprinkler	3040	11.73	11.11	4.2	7.80		
Sprinkler	3041	12.22	11.11	4.2	8.47		
Sprinkler	3042	12.08	11.11	4.2	8.27		
Sprinkler	3043	12.40	11.11	4.2	8.72		
Sprinkler	3044	14.21	11.11	4.2	11.44		

⇨ Most Demanding Sprinkler Data

Node	Elevation(Foot)	Fittings	Pressure(psi)	Discharge(gpm)	
1	-4-0	S	43.65	544.67	
3001	22-5½	Spr(-8.66)	8.66	12.36	
3002	22-4	Spr(-8.75)	8.75	12.42	
3003	22-3½	Spr(-9.02)	9.02	12.62	
3004	21-4½	Spr(-9.30)	9.30	12.81	
3005	22-5	Spr(-7.25)	7.25	11.31	
3006	20-3	Spr(-7.00), fd(23-0)	7.00	11.11	
3007	22-3½	Spr(-7.42)	7.42	11.44	
3008	19-9	Spr(-7.43), fd(23-0)	7.43	11.45	
3009	20-8½	Spr(-8.47)	8.47	12.23	
3010	19-5	Spr(-10.24)	10.24	13.44	
3011	22-5	Spr(-7.22)	7.22	11.28	
3012	20-3	Spr(-7.08), fd(23-0)	7.08	11.17	
3013	22-3	Spr(-7.67)	7.67	11.63	
3014	21-10	Spr(-8.18)	8.18	12.01	
3015	20-8	Spr(-9.50)	9.50	12.94	
3016	19-10	Spr(-9.82)	9.82	13.16	
3017	22-5	Spr(-8.33)	8.33	12.12	
3018	20-3	Spr(-7.93), fd(23-0)	7.93	11.82	
3019	22-3½	Spr(-8.60)	8.60	12.32	
3020	19-2½	Spr(-8.24), fd(34-0)	8.24	12.05	
3021	19-3	Spr(-10.02), fd(23-0)	10.02	13.30	
3022	19-3	Spr(-10.01), fd(23-0)	10.01	13.29	
3023	19-10	Spr(-11.32)	11.32	14.13	
3024	22-5	Spr(-7.37)	7.37	11.40	
3025	22-4	Spr(-7.44)	7.44	11.46	
3026	22-3	Spr(-7.69)	7.69	11.65	
3027	21-8	Spr(-8.25)	8.25	12.06	
3028	20-8	Spr(-9.43)	9.43	12.89	
3029	19-10	Spr(-9.74)	9.74	13.11	
3030	22-2½	Spr(-8.11)	8.11	11.96	
3031	22-2½	Spr(-7.87)	7.87	11.78	
3032	22-2½	Spr(-8.36)	8.36	12.14	
3033	19-9	Spr(-8.33), fd(23-0)	8.33	12.12	
3034	18-9	Spr(-8.97), fd(23-0)	8.97	12.58	
3035	19-6½	Spr(-11.34)	11.34	14.14	
3036	22-1	Spr(-10.21)	10.21	13.42	
3037	20-11	Spr(-10.40)	10.40	13.55	
3038	20-1½	Spr(-10.57)	10.57	13.66	
3039	20-3	Spr(-7.77), fd(23-0)	7.77	11.71	
3040	20-3	Spr(-7.80), fd(23-0)	7.80	11.73	
3041	22-2½	Spr(-8.47)	8.47	12.22	
3042	19-9	Spr(-8.27), fd(23-0)	8.27	12.08	
3043	19-9	Spr(-8.72), fd(23-0)	8.72	12.40	
3044	20-5	Spr(-11.44)	11.44	14.21	
7	0-0		34.62		
8	-4-0	T(47-3½)	43.56		
9	2-0	PO(20-0)	33.63		
211	23-5½	fE(5-0)	15.30		
226	24-4	fE(5-0)	14.90		
244	18-4½	PO(26-4)	17.50		
245	12-0	E(13-2)	20.61		
246	11-10	E(13-2)	20.67		
247	18-4½	PO(26-4)	17.49		
248	20-3½	fE(6-9½)	15.26		
249	20-4	fE(6-9½)	15.11		
250	10-6	fT(16-0)	21.80		
251	10-6	fT(16-0)	21.79		
269	22-5	E(2-0)	7.34		
275	22-2½	PO(5-0)	8.27		
284	22-2½	PO(5-0)	8.15		
292	22-4	PO(5-0)	7.32		

Node	Elevation(Foot)	Fittings	Pressure(psi)	Discharge(gpm)	
293	22-4	PO(5-0)	7.41		
294	22-4	PO(5-0)	8.40		
329	22-1½	PO(5-0)	7.71		
332	22-0½	PO(5-0)	9.01		
334	22-1	E(2-0)	10.37		
344	21-11	PO(5-0)	9.53		
346	21-8½	PO(5-0)	8.91		
357	21-3½	PO(5-0)	8.51		
358	21-5½	PO(5-0)	9.47		
359	21-2½	PO(5-0)	9.44		
362	21-5	PO(5-0)	10.70		
367	20-4	PO(9-11)	11.72		
368	20-4	PO(9-11)	11.46		
369	20-4	PO(9-11)	11.30		
370	20-4	PO(5-0)	11.26		
371	20-4	PO(9-11)	11.25		
372	20-4	PO(9-11)	11.24		
373	20-4	PO(5-0)	11.24		
374	20-4	PO(9-11)	11.24		
375	20-4	PO(9-11)	11.30		
376	20-4	PO(9-11)	11.32		
381	20-4	PO(5-0)	11.47		
382	20-4	PO(9-11)	11.53		
383	20-4	PO(9-11)	11.68		
384	20-4	PO(9-11)	11.93		
408	20-11½	T(9-11)	9.85		
410	20-11½	T(9-11)	9.57		
418	20-11½	T(9-11)	9.64		
429	20-11	PO(5-0)	11.60		
431	19-11½	E(2-0)	10.17		
432	19-11	E(2-0)	11.33		
610	22-2½	PO(5-0)	8.30		
659	22-2½	PO(5-0)	8.64		
754	12-0½	fE(6-9½)	24.52		
818	12-0½	fT(16-0)	23.45		
860	10-6	fE(6-9½)	22.19		
861	12-0	fE(6-9½)	21.72		
905	12-0	E(10-0)	20.84		
907	11-10	E(10-0)	20.90		

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt / Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
• • • • • Route 1 • • • • •							
DY	1.0490	11.11	4.13	120	0.043874	0-0	Pf 1.23
3006	20-3	11.11	4.2	7.00	Sprinkler,	28-0	Pe -0.90
292	22-4			7.32	PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	22.42	3.24	120	0.016124	4-4½	Pf 0.07
292	22-4	11.31		7.32	Flow (q) from Route 4		Pe 0.02
3007	22-3½			7.42		4-4½	Pv
BL	1.6820	33.86	4.89	120	0.034570	6-2½	Pf 0.21
3007	22-3½	11.44	4.2	7.42	Sprinkler		Pe 0.07
329	22-1½			7.71		6-2½	Pv
BL	1.6820	45.31	6.54	120	0.059261	7-7	Pf 0.45
329	22-1½	11.45		7.71	Flow (q) from Route 6		Pe 0.35
357	21-3½			8.51		7-7	Pv
BL	1.6820	57.53	8.31	120	0.092198	3-1	Pf 1.20
357	21-3½	12.23		8.51	Flow (q) from Route 16	9-11	Pe 0.14
408	20-11½			9.85	T(9-11)	13-0	Pv
DY	1.6820	70.97	10.25	120	0.135953	0-0	Pf 1.35
408	20-11½	13.44		9.85	Flow (q) from Route 28	9-11	Pe 0.27
368	20-4			11.46	PO(9-11)	9-11	Pv
CM	3.2600	216.16	8.31	120	0.042522	6-0½	Pf 0.26
368	20-4	145.19		11.46	Flow (q) from Route 2		Pe
367	20-4			11.72		6-0½	Pv
CM	3.2600	266.36	10.24	120	0.062577	49-5½	Pf 3.52
367	20-4	50.20		11.72	Flow (q) from Route 17	6-9½	Pe 0.02
248	20-3½			15.26	fE(6-9½)	56-3	Pv
CM	4.2600	266.36	6.00	120	0.017004	35-10½	Pf 1.40
248	20-3½			15.26		46-8½	Pe 0.84
244	18-4½			17.50	3fE(6-9½), PO(26-4)	82-7	Pv
CM	4.2600	272.38	6.13	120	0.017722	6-4½	Pf 0.35
244	18-4½	6.02		17.50	Flow (q) from Route 34	13-2	Pe 2.76
245	12-0			20.61	E(13-2)	19-6½	Pv
CM	4.0260	272.38	6.86	120	0.023334	0-0	Pf 0.23
245	12-0			20.61		10-0	Pe 0.00
905	12-0			20.84	E(10-0)	10-0	Pv
CM	4.2600	272.38	6.13	120	0.017722	1-6	Pf 0.31
905	12-0			20.84		16-0	Pe 0.65
250	10-6			21.80	fT(16-0)	17-6	Pv
CM	4.2600	279.14	6.28	120	0.018543	81-7½	Pf 2.31
250	10-6	6.75		21.80	Flow (q) from Route 35	43-2	Pe -0.66
818	12-0½			23.45	4fE(6-9½), fT(16-0)	124-9½	Pv
CM	4.2600	544.67	12.26	120	0.063866	9-10½	Pf 1.06
818	12-0½	265.53		23.45	Flow (q) from Route 5	6-9½	Pe
754	12-0½			24.52	fE(6-9½)	16-8	Pv
CM	4.0260	544.67	13.73	120	0.084093	11-0	Pf 4.76
754	12-0½			24.52		45-7	Pe 4.35
9	2-0			33.63	2fE(6-9½), BV(12-0), PO(20-0)	56-7	Pv
UG	6.3570	544.67	5.51	120	0.009092	2-10	Pf 0.13
9	2-0			33.63		11-4	Pe 0.87
7	0-0			34.62	LtE(11-4)	14-2	Pv
UG	6.2800	544.67	5.64	140	0.007254	168-7	Pf 7.21
7	0-0			34.62		135-6½	Pe 1.73
8	-4-0			43.56	4E(22-1), BFP(-5.00), T(47-3½)	304-1	Pv
UG	8.3900	544.67	3.16	140	0.001770	50-8½	Pf 0.09
8	-4-0			43.56			Pe
1	-4-0			43.65	Water Supply	50-8½	Pv
		250.00			Hose Allowance At Source		
1		794.67					
• • • • • Route 2 • • • • •							
DY	1.0490	11.17	4.15	120	0.044333	0-0	Pf 1.24
3012	20-3	11.17	4.2	7.08	Sprinkler,	28-0	Pe -0.91
293	22-4			7.41	PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	22.46	3.24	120	0.016176	8-11½	Pf 0.23
293	22-4	11.28		7.41	Flow (q) from Route 3	4-11½	Pe 0.04
3013	22-3			7.67	2LtE(2-5½)	13-11	Pv
BL	1.6820	34.09	4.92	120	0.035013	8-10	Pf 0.31
3013	22-3	11.63	4.2	7.67	Sprinkler		Pe 0.19
3014	21-10			8.18		8-10	Pv

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt / Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
BL	1.6820	46.10	6.66	120	0.061196	8-0	Pf 1.10
3014	21-10	12.01	4.2	8.18	Sprinkler,	9-11	Pe 0.37
418	20-11½			9.64	T(9-11)	17-11	Pv
DY	1.6820	72.20	10.43	120	0.140355	0-0	Pf 1.39
418	20-11½	26.10		9.64	Flow (q) from Route 22	9-11	Pe 0.27
369	20-4			11.30	PO(9-11)	9-11	Pv
CM	3.2600	145.19	5.58	120	0.020364	8-0½	Pf 0.16
369	20-4	72.98		11.30	Flow (q) from Route 25		Pe
368	20-4			11.46		8-0½	Pv
• • • • • Route 3 • • • • •							
BL	1.0490	11.28	4.19	120	0.045119	0-10½	Pf 0.13
3011	22-5	11.28	4.2	7.22	Sprinkler,	2-0	Pe
269	22-5			7.34	E(2-0)	2-10½	Pv
BL	1.6820	11.28	1.63	120	0.004526	7-0½	Pf 0.03
269	22-5			7.34			Pe 0.03
293	22-4			7.41		7-0½	Pv
• • • • • Route 4 • • • • •							
BL	1.6820	11.31	1.63	120	0.004545	8-5½	Pf 0.04
3005	22-5	11.31	4.2	7.25	Sprinkler		Pe 0.04
292	22-4			7.32		8-5½	Pv
• • • • • Route 5 • • • • •							
BL	1.6820	11.40	1.65	120	0.004618	7-6	Pf 0.03
3024	22-5	11.40	4.2	7.37	Sprinkler		Pe 0.04
3025	22-4			7.44		7-6	Pv
BL	1.6820	22.86	3.30	120	0.016721	8-0	Pf 0.22
3025	22-4	11.46	4.2	7.44	Sprinkler,	4-11½	Pe 0.03
3026	22-3			7.69	2LtE(2-5½)	12-11½	Pv
BL	1.6820	34.51	4.98	120	0.035820	8-4½	Pf 0.30
3026	22-3	11.65	4.2	7.69	Sprinkler		Pe 0.26
3027	21-8			8.25		8-4½	Pv
BL	1.6820	46.57	6.72	120	0.062366	6-6	Pf 1.02
3027	21-8	12.06	4.2	8.25	Sprinkler,	9-11	Pe 0.30
410	20-11½			9.57	T(9-11)	16-4½	Pv
DY	1.6820	72.58	10.48	120	0.141695	0-0	Pf 1.40
410	20-11½	26.00		9.57	Flow (q) from Route 21	9-11	Pe 0.27
374	20-4			11.24	PO(9-11)	9-11	Pv
CM	3.2600	88.62	3.41	120	0.008170	7-4½	Pf 0.06
374	20-4	16.05		11.24	Flow (q) from Route 10		Pe
375	20-4			11.30		7-4½	Pv
CM	3.2600	102.76	3.95	120	0.010745	2-0	Pf 0.02
375	20-4	14.14		11.30	Flow (q) from Route 32		Pe
376	20-4			11.32		2-0	Pv
CM	3.2600	163.34	6.28	120	0.025323	6-0½	Pf 0.15
376	20-4	60.58		11.32	Flow (q) from Route 9		Pe -0.00
381	20-4			11.47		6-0½	Pv
CM	3.2600	177.00	6.80	120	0.029378	2-0	Pf 0.06
381	20-4	13.66		11.47	Flow (q) from Route 30		Pe 0.00
382	20-4			11.53		2-0	Pv
CM	3.2600	203.97	7.84	120	0.038191	3-11½	Pf 0.15
382	20-4	26.97		11.53	Flow (q) from Route 27		Pe
383	20-4			11.68		3-11½	Pv
CM	3.2600	264.10	10.15	120	0.061595	4-0½	Pf 0.25
383	20-4	60.13		11.68	Flow (q) from Route 7		Pe
384	20-4			11.93		4-0½	Pv
CM	3.2600	278.30	10.70	120	0.067864	39-11½	Pf 3.17
384	20-4	14.21		11.93	Flow (q) from Route 33	6-9½	Pe
249	20-4			15.11	fE(6-9½)	46-9	Pv
CM	4.2600	278.30	6.26	120	0.018441	35-11½	Pf 1.52
249	20-4			15.11		46-8½	Pe 0.85
247	18-4½			17.49	3fE(6-9½), PO(26-4)	82-8	Pv
CM	4.2600	272.29	6.13	120	0.017710	6-6½	Pf 0.35
247	18-4½			17.49		13-2	Pe 2.84
246	11-10			20.67	E(13-2)	19-8½	Pv
CM	4.0260	272.29	6.86	120	0.023319	0-0	Pf 0.23
246	11-10			20.67		10-0	Pe -0.00
907	11-10			20.90	E(10-0)	10-0	Pv

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt / Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
CM	4.2600	272.29	6.13	120	0.017710	1-4	Pf 0.31
907	11-10			20.90		16-0	Pe 0.58
251	10-6			21.79	fT(16-0)	17-4	Pv
CM	4.2600	265.53	5.98	120	0.016906	16-11½	Pf 0.40
251	10-6			21.79		6-9½	Pe
860	10-6			22.19	fE(6-9½)	23-9	Pv
CM	4.0260	265.53	6.69	120	0.022260	1-6	Pf 0.18
860	10-6			22.19		6-9½	Pe -0.65
861	12-0			21.72	fE(6-9½)	8-3½	Pv
CM	4.2600	265.53	5.98	120	0.016906	87-0½	Pf 1.74
861	12-0			21.72		16-0	Pe -0.01
818	12-0½			23.45	fT(16-0)	103-0½	Pv
••••• Route 6 •••••							
DY	1.0490	11.45	4.25	120	0.046373	0-0	Pf 1.30
3008	19-9	11.45	4.2	7.43	Sprinkler,	28-0	Pe -1.02
329	22-1½			7.71	PO(5-0), fd(23-0)	28-0	Pv
••••• Route 7 •••••							
DY	1.0490	11.71	4.35	120	0.048315	0-0	Pf 1.35
3039	20-3	11.71	4.2	7.77	Sprinkler,	28-0	Pe -0.85
275	22-2½			8.27	PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	11.71	1.69	120	0.004847	6-3½	Pf 0.03
275	22-2½			8.27			Pe 0.00
610	22-2½			8.30		6-3½	Pv
BL	1.6820	23.43	3.38	120	0.017501	4-2½	Pf 0.16
610	22-2½	11.73		8.30	Flow (q) from Route 8	4-11½	Pe 0.00
3041	22-2½			8.47	2LtE(2-5½)	9-2	Pv
BL	1.6820	35.65	5.15	120	0.038042	4-6	Pf 0.17
3041	22-2½	12.22	4.2	8.47	Sprinkler		Pe 0.00
659	22-2½			8.64		4-6	Pv
BL	1.6820	47.73	6.89	120	0.065260	8-0	Pf 0.52
659	22-2½	12.08		8.64	Flow (q) from Route 13		Pe 0.31
358	21-5½			9.47		8-0	Pv
BL	1.6820	60.13	8.68	120	0.100051	4-10	Pf 1.72
358	21-5½	12.40		9.47	Flow (q) from Route 18	12-4½	Pe 0.49
383	20-4			11.68	LtE(2-5½), PO(9-11)	17-2½	Pv
••••• Route 8 •••••							
DY	1.0490	11.73	4.35	120	0.048467	0-0	Pf 1.36
3040	20-3	11.73	4.2	7.80	Sprinkler,	28-0	Pe -0.85
610	22-2½			8.30	PO(5-0), fd(23-0)	28-0	Pv
••••• Route 9 •••••							
BL	1.0490	11.78	4.37	120	0.048903	0-7½	Pf 0.28
3031	22-2½	11.78	4.2	7.87	Sprinkler,	5-0	Pe
284	22-2½			8.15	PO(5-0)	5-7½	Pv
BL	1.6820	23.74	3.43	120	0.017929	6-8	Pf 0.21
284	22-2½	11.96		8.15	Flow (q) from Route 11	4-11½	Pe 0.00
3032	22-2½			8.36	2LtE(2-5½)	11-7½	Pv
BL	1.6820	35.88	5.18	120	0.038493	9-0½	Pf 0.35
3032	22-2½	12.14	4.2	8.36	Sprinkler		Pe 0.21
346	21-8½			8.91		9-0½	Pv
BL	1.6820	48.00	6.93	120	0.065944	4-8½	Pf 0.31
346	21-8½	12.12		8.91	Flow (q) from Route 14		Pe 0.22
359	21-2½			9.44		4-8½	Pv
BL	1.6820	60.58	8.75	120	0.101430	2-5½	Pf 1.50
359	21-2½	12.58		9.44	Flow (q) from Route 19	12-4½	Pe 0.38
376	20-4			11.32	LtE(2-5½), PO(9-11)	14-10	Pv
••••• Route 10 •••••							
DY	1.0490	11.82	4.39	120	0.049211	0-0	Pf 1.38
3018	20-3	11.82	4.2	7.93	Sprinkler,	28-0	Pe -0.90
294	22-4			8.40	PO(5-0), fd(23-0)	28-0	Pv
BL	1.6820	23.94	3.46	120	0.018214	5-1½	Pf 0.18
294	22-4	12.12		8.40	Flow (q) from Route 15	4-11½	Pe 0.02
3019	22-3½			8.60	2LtE(2-5½)	10-1	Pv
BL	1.6820	36.26	5.24	120	0.039251	7-7	Pf 0.30
3019	22-3½	12.32	4.2	8.60	Sprinkler		Pe 0.11
332	22-0½			9.01		7-7	Pv
BL	1.6820	48.32	6.98	120	0.066749	10-0½	Pf 1.50
332	22-0½	12.05		9.01	Flow (q) from Route 12	12-4½	Pe 0.73
372	20-4			11.24	LtE(2-5½), PO(9-11)	22-5	Pv

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt	Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
CM	3.2600	16.05	0.62	120		0.000346	4-1	Pf 0.00
372	20-4			11.24				Pe
374	20-4			11.24			4-1	Pv
• • • • • Route 11 • • • • •								
BL	1.6820	11.96	1.73	120		0.005041	8-0	Pf 0.04
3030	22-2½	11.96	4.2	8.11		Sprinkler		Pe 0.00
284	22-2½			8.15			8-0	Pv
• • • • • Route 12 • • • • •								
DY	1.0490	12.05	4.47	120		0.051003	0-0	Pf 1.99
3020	19-2½	12.05	4.2	8.24		Sprinkler,	39-0	Pe -1.21
332	22-0½			9.01		PO(5-0), fd(34-0)	39-0	Pv
• • • • • Route 13 • • • • •								
DY	1.0490	12.08	4.48	120		0.051179	0-0	Pf 1.43
3042	19-9	12.08	4.2	8.27		Sprinkler,	28-0	Pe -1.06
659	22-2½			8.64		PO(5-0), fd(23-0)	28-0	Pv
• • • • • Route 14 • • • • •								
DY	1.0490	12.12	4.50	120		0.051506	0-0	Pf 1.44
3033	19-9	12.12	4.2	8.33		Sprinkler,	28-0	Pe -0.86
346	21-8½			8.91		PO(5-0), fd(23-0)	28-0	Pv
• • • • • Route 15 • • • • •								
BL	1.6820	12.12	1.75	120		0.005169	6-10	Pf 0.04
3017	22-5	12.12	4.2	8.33		Sprinkler		Pe 0.04
294	22-4			8.40			6-10	Pv
• • • • • Route 16 • • • • •								
BL	1.0490	12.23	4.54	120		0.052359	0-7½	Pf 0.29
3009	20-8½	12.23	4.2	8.47		Sprinkler,	5-0	Pe -0.26
357	21-3½			8.51		PO(5-0)	5-7½	Pv
• • • • • Route 17 • • • • •								
BL	1.6820	12.36	1.78	120		0.005359	8-9½	Pf 0.05
3001	22-5½	12.36	4.2	8.66		Sprinkler		Pe 0.04
3002	22-4			8.75			8-9½	Pv
BL	1.6820	24.78	3.58	120		0.019412	8-3½	Pf 0.26
3002	22-4	12.42	4.2	8.75		Sprinkler,	4-11½	Pe 0.02
3003	22-3½			9.02		2LtE(2-5½)	13-2½	Pv
BL	1.6820	37.40	5.40	120		0.041558	8-2	Pf 0.34
3003	22-3½	12.62	4.2	9.02		Sprinkler		Pe 0.17
344	21-11			9.53			8-2	Pv
BL	1.6820	50.20	7.25	120		0.071657	8-8½	Pf 1.51
344	21-11	12.81		9.53		Flow (q) from Route 20	12-4½	Pe 0.68
367	20-4			11.72		LtE(2-5½), PO(9-11)	21-1	Pv
• • • • • Route 18 • • • • •								
DY	1.0490	12.40	4.60	120		0.053752	0-0	Pf 1.51
3043	19-9	12.40	4.2	8.72		Sprinkler,	28-0	Pe -0.75
358	21-5½			9.47		PO(5-0), fd(23-0)	28-0	Pv
• • • • • Route 19 • • • • •								
DY	1.0490	12.58	4.67	120		0.055182	0-0	Pf 1.55
3034	18-9	12.58	4.2	8.97		Sprinkler,	28-0	Pe -1.08
359	21-2½			9.44		PO(5-0), fd(23-0)	28-0	Pv
• • • • • Route 20 • • • • •								
BL	1.0490	12.81	4.75	120		0.057044	1-1	Pf 0.46
3004	21-4½	12.81	4.2	9.30		Sprinkler,	7-0	Pe -0.23
344	21-11			9.53		E(2-0), PO(5-0)	8-1	Pv
• • • • • Route 21 • • • • •								
BL	1.6820	26.00	3.75	120		0.021215	2-10½	Pf 0.27
3028	20-8	13.11	4.2	9.43		Sprinkler,, Flow (q) from Route	9-11	Pe -0.13
410	20-11½			9.57		23	12-9	Pv
						T(9-11)		
• • • • • Route 22 • • • • •								
BL	1.6820	26.10	3.77	120		0.021371	2-10½	Pf 0.27
3015	20-8	13.16	4.2	9.50		Sprinkler,, Flow (q) from Route	9-11	Pe -0.13
418	20-11½			9.64		24	12-9	Pv
						T(9-11)		
• • • • • Route 23 • • • • •								
BL	1.6820	13.11	1.89	120		0.005974	8-0½	Pf 0.05
3029	19-10	13.11	4.2	9.74		Sprinkler		Pe -0.36
3028	20-8			9.43			8-0½	Pv
• • • • • Route 24 • • • • •								

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt	Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
BL	1.6820	13.16	1.90	120		0.006019	8-0½	Pf 0.05
3016	19-10	13.16	4.2	9.82		Sprinkler		Pe -0.37
3015	20-8			9.50			8-0½	Pv
• • • • • Route 25 • • • • •								
DY	1.0490	13.29	4.93	120		0.061060	0-0	Pf 1.71
3022	19-3	13.29	4.2	10.01		Sprinkler,	28-0	Pe -0.48
373	20-4			11.24		PO(5-0), fd(23-0)	28-0	Pv
CM	3.2600	45.56	1.75	120		0.002386	2-9	Pf 0.01
373	20-4	32.27		11.24		Flow (q) from Route 37		Pe
371	20-4			11.25			2-9	Pv
CM	3.2600	59.69	2.29	120		0.003932	3-3	Pf 0.01
371	20-4	14.13		11.25		Flow (q) from Route 31		Pe
370	20-4			11.26			3-3	Pv
CM	3.2600	72.98	2.81	120		0.005705	6-9½	Pf 0.04
370	20-4	13.30		11.26		Flow (q) from Route 26		Pe
369	20-4			11.30			6-9½	Pv
• • • • • Route 26 • • • • •								
DY	1.0490	13.30	4.94	120		0.061154	0-0	Pf 1.71
3021	19-3	13.30	4.2	10.02		Sprinkler,	28-0	Pe -0.48
370	20-4			11.26		PO(5-0), fd(23-0)	28-0	Pv
• • • • • Route 27 • • • • •								
BL	1.0490	13.42	4.98	120		0.062223	0-7	Pf 0.16
3036	22-1	13.42	4.2	10.21		Sprinkler,	2-0	Pe
334	22-1			10.37		E(2-0)	2-7	Pv
BL	1.6820	13.42	1.94	120		0.006242	6-4½	Pf 0.04
334	22-1			10.37				Pe 0.29
362	21-5			10.70			6-4½	Pv
BL	1.6820	26.97	3.89	120		0.022697	4-0½	Pf 0.37
362	21-5	13.55		10.70		Flow (q) from Route 29	12-4½	Pe 0.46
382	20-4			11.53		LtE(2-5½), PO(9-11)	16-5	Pv
• • • • • Route 28 • • • • •								
DR	1.0490	13.44	4.99	120		0.062369	0-6½	Pf 0.16
3010	19-5	13.44	4.2	10.24		Sprinkler,	2-0	Pe -0.23
431	19-11½			10.17		E(2-0)	2-6½	Pv
BL	1.6820	13.44	1.94	120		0.006257	9-8½	Pf 0.12
431	19-11½			10.17			9-11	Pe -0.44
408	20-11½			9.85		T(9-11)	19-7	Pv
• • • • • Route 29 • • • • •								
BL	1.0490	13.55	5.03	120		0.063292	1-0	Pf 0.51
3037	20-11	13.55	4.2	10.40		Sprinkler,	7-0	Pe -0.21
362	21-5			10.70		E(2-0), PO(5-0)	8-0	Pv
• • • • • Route 30 • • • • •								
BL	1.0490	13.66	5.07	120		0.064234	8-6½	Pf 1.00
3038	20-1½	13.66	4.2	10.57		Sprinkler,	7-0	Pe -0.09
381	20-4			11.47		E(2-0), PO(5-0)	15-6½	Pv
• • • • • Route 31 • • • • •								
BL	1.6820	14.13	2.04	120		0.006865	10-11	Pf 0.16
3023	19-10	14.13	4.2	11.32		Sprinkler,	12-4½	Pe -0.23
371	20-4			11.25		LtE(2-5½), PO(9-11)	23-3½	Pv
• • • • • Route 32 • • • • •								
BL	1.0490	14.14	5.25	120		0.068541	0-5	Pf 0.16
3035	19-6½	14.14	4.2	11.34		Sprinkler,	2-0	Pe -0.17
432	19-11			11.33		E(2-0)	2-5	Pv
BL	1.6820	14.14	2.04	120		0.006876	9-10	Pf 0.15
432	19-11			11.33			12-4½	Pe -0.18
375	20-4			11.30		LtE(2-5½), PO(9-11)	22-2½	Pv
• • • • • Route 33 • • • • •								
BL	1.0490	14.21	5.27	120		0.069109	0-6	Pf 0.38
3044	20-5	14.21	4.2	11.44		Sprinkler,	5-0	Pe -0.22
429	20-11			11.60		PO(5-0)	5-6	Pv
BL	1.6820	14.21	2.05	120		0.006933	0-7½	Pf 0.09
429	20-11			11.60			12-4½	Pe 0.24
384	20-4			11.93		LtE(2-5½), PO(9-11)	13-0	Pv
• • • • • Route 34 • • • • •								
CM	4.2600	6.02	0.14	120		0.000015	38-9½	Pf 0.00
211	23-5½	6.02		15.30		Flow (q) from Route 36	39-11	Pe 2.20
244	18-4½			17.50		2fE(6-9½), PO(26-4)	78-8½	Pv
• • • • • Route 35 • • • • •								

Hydraulic Analysis

Job Number: S23-90
Report Description: Ordinary Group I - Level 2 - Clenan/Dry Floor Area

Pipe Type / Downstream / Upstream	Diameter / Elevation	Flow / Discharge	Velocity / K-Factor	HWC / Pt	Pn	Friction Loss / Fittings	Length / Eq. Length / Total Length	Pressure Summary
CM	3.2600	6.75	0.26	120		0.000070	181-0	Pf 0.01
251	10-6			21.79			20-0	Pe
250	10-6			21.80		4fE(5-0)	201-0	Pv
• • • • • Route 36 • • • • •								
CM	3.2600	6.02	0.23	120		0.000056	151-2½	Pf 0.01
226	24-4			14.90			40-0	Pe 0.39
211	23-5½			15.30		8fE(5-0)	191-2½	Pv
• • • • • Route 37 • • • • •								
CM	3.2600	32.27	1.24	120		0.001261	1-10½	Pf 0.00
372	20-4			11.24				Pe
373	20-4			11.24			1-10½	Pv
• • • • • Route 38 • • • • •								
CM	4.2600	6.02	0.14	120		0.000015	37-7½	Pf 0.00
247	18-4½			17.49		PO(26-4)	58-6	Pe -2.59
226	24-4			14.90		4fE(6-9½), fE(5-0)	96-1½	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

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
BalV	Ball Valve
BFP	Backflow Preventer
BV	Butterfly Valve
C	Cross Flow Turn 90°
cplg	Coupling
Cr	Cross Run
CV	Check Valve
DelV	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 Reducing Valve
PrV	Pressure Relief Valve
red	Reducer/Adapter
S	Supply
sCV	Swing Check Valve
Spr	Sprinkler
St	Strainer
T	Tee Flow Turn 90°
Tr	Tee Run
U	Union
WirF	Wirsbo
WMV	Water Meter Valve
Z	Cap