Permit Revision Submittal Requirements and Application

A Permit Revision is required when there are proposed changes to the project after the permit has been issued. This may arise due to discrepancies between the city-approved permit drawings and actual field conditions, or the customer has changed their mind about an aspect of the project. In all cases, a revision to the existing permit must be submitted, reviewed and approved.

Minimum Submittal Requirements (check all boxes and sign below):

- ☑ A copy of this application.
- ☑ One PDF copy of plans for electronic submittals or three copies for paper submittals.
- ☑ All plans must clearly reflect the proposed change(s). Changes must be bubbled.
- ☐ Drawings and calculations must be stamped and signed by the Architect and/or the Engineer of Record, if applicable.
- ☐ Project narrative for extensive revisions.
- ☐ One PDF copy of calculations and other supporting documents for electronic submittals or two copies for paper submittals.
- ☐ Copy of Inspector's correction notice, if the revision is due to an inspection correction. One PDF copy for electronic submittals and two copies for paper submittals.

Applicant Information:

Applicant Name: Bradlee Hersey (Faster Permits)

Street Address: 2000 SW 1st Ste — City/State/ZIP: Portland OR 97201

Email: Bradlee@fasterpermits.com — Phone: 503-913-8811

Value of Proposed Revision: $0 — Issued Permit #: 21-085113-RS

Job Site Address: 15421 SE FLAVEL ST — City/State/ZIP: Portland OR

Description of Revision

Revision to Fire Sprinkler plans that were submitted as DFS (21-085113-DFS-01-RS). The plans and calculations are replacing the previous submittal.

Applicant Signature: _____ Date: 8/4/2022

Fees:

An invoice with permit fees will be sent to the applicant once minimum submittal requirements have been verified. Permit Revisions are subject to fees associated with plan review, processing and any increase in project value.

The Bureau of Development Services fee schedule is on the BDS web site: www.portlandoregon.gov/bds/article/102792

Helpful Information:

Bureau of Development Services |City of Portland, Oregon
1900 SW 4th Avenue, Portland, OR 97201
For Hours Call 503-823-7310 or visit www.portlandoregon.gov/bds

Important Telephone Numbers:

BDS main number	503-823-7300
DSC automated information line	503-823-7310
Building code information	503-823-1456
BDS 24-hour inspection request line	503-823-7000
Residential information for one- and two-family dwelling	503-823-7388
General Permit Processing and Fee Estimate info	503-823-7357
Zoning Information Line	503-823-7526
City of Portland TTY	503-823-6868

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am NICET Certified.

Tim W McDonald Date: 07/22/2022

NICET Certification No. 150393
Water-Based Systems Layout - Level III
Certification Expires: June 1, 2025

AquaSAFE™ Fire Safety System

Hydratec Incorporated
64 Haverhill Road
Route 111
Windham, NH 03087
603-434-0502

Job Name	:	HAWTHORNE ESTATES - CAMBRIDGE - One Head Calculation (H.29)
Drawing	:	RESIDENTIAL
Location	:	SE HAWTHORNE MEADOWS ST PORTLAND OR 97236
Remote Area	:	1
Contract	:	42892F 004
Data File	:	42892F 004 Hawthorne Estates - Cambridge.wx1
Date/Time	:	07/22/2022 - 12:55 PM

SUBMITTED
09/15/2022

HYDRAULIC DESIGN INFORMATION SHEET

Name - HAWTHORNE ESTATES - CAMBRIDGE Date - 7/21/2022
Location - PORTLAND OR 97236
Building - RESIDENTIAL System No. - 1
Contractor - WOLCOTT PLUMBING Contract No. - 42892F 004
Calculated By - SILVIU RADES Drawing No. - F100
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height VARIES
OCCUPANCY - RESIDENTIAL

SYSTEM DESIGN

Type of Calculation: ( )NFPA 13 Residential ( )NFPA 13R (X)NFPA 13D
Number of Sprinklers Flowing: (X)1 ( )2 ( )4 ( )
( )Other
( )Specific Ruling Made by Date

Listed Flow at Start Point - 17 Gpm System Type
Listed Pres. at Start Point - 12 Psi (X) Wet ( ) Dry
MAXIMUM LISTED SPACING 18 x 18 ( ) Deluge ( ) PreAction
Domestic Flow Added - 0 Gpm Sprinkler or Nozzle
Additional Flow Added - Gpm Make SENJU Model RC-RES
Elevation at Highest Outlet - 109 Feet Size 7/16 K-Factor 4.9
Note: Temperature Rating 162

Calculation Summary: Gpm Required 17 Psi Required 74.34 At Ref Pt STR
C-Factor Used: Overhead 150 Underground 150

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - x	Rated Cap.	Cap.
Time of Test - x	@ Psi	Elev.
Static (Psi) - 112	Elev.	
Residual (Psi) - 97	Other	Well
Flow (Gpm) - 300		Proof Flow Gpm
Elevation - 97		

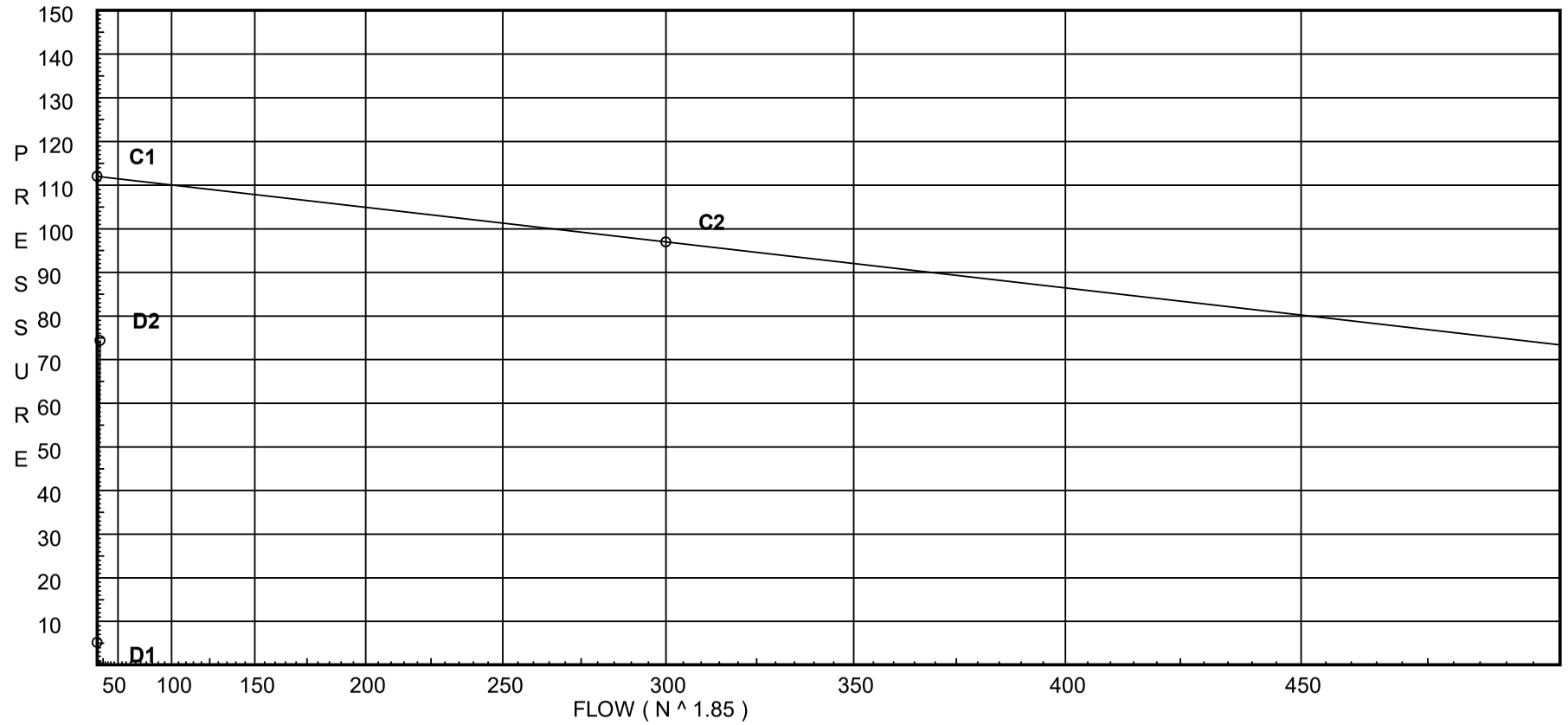
Location: STREET

Source of Information: CONTRACTOR

City Water Supply:
- C1 - Static Pressure : 112
- C2 - Residual Pressure: 97
- C2 - Residual Flow : 300

Demand:

D1 - Elevation	5.197
D2 - System Flow	16.974
D2 - System Pressure	74.343
Hose (Demand)	_____
D3 - System Demand	16.974
Safety Margin	37.583



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

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

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
STR	112.0	97	300.0	111.926	16.97	74.343

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
H.29	109.0	4.9	12.0	16.97	0.05	324
T.56	109.0		15.27			
T.55	109.0		15.71			
H.25	109.0		17.43			
T.53	109.0		18.46			
T.52	109.0		18.98			
H.20	109.0		20.09			
T.42	109.0		24.35			
H.19	109.0		24.86			
H.15	109.0		25.11			
T.41	109.0		25.58			
H.14	109.0		25.96			
H.18	109.0		26.15			
H.17	109.0		26.28			
H.16	109.0		26.46			
T.44	109.0		26.87			
T.43	109.0		26.94			
T.49	109.0		27.36			
T.50	109.0		27.56			
T.54	109.0		27.81			
S.1	109.0		29.08			
PRV	97.0		62.64			
SOV	97.0		62.69			
MTR	97.0		69.57			
STR	97.0		74.34			
H.30	109.0		13.39			
H.28	109.0		15.48			
T.57	109.0		16.88			
T.51	109.0		18.96			
T.48	109.0		19.86			
T.47	109.0		20.19			
H.23	109.0		20.96			
H.22	109.0		22.37			
T.46	109.0		23.78			
T.45	109.0		24.05			
H.21	109.0		24.18			
H.27	109.0		15.48			
H.24	109.0		20.03			
H.26	109.0		23.92			
T.36	118.0		20.77			
H.12	118.0		21.47			
H.11	118.0		21.64			

NODE ANALYSIS (cont.)

Node Tag	*Elevation*	*Node Type*	*Pressure at Node*	*Discharge at Node*	*Notes*
H.13	118.0		22.18		
T.39	118.0		22.47		
H.9	118.0		22.66		
T.37	118.0		23.25		
T.34	118.0		21.44		
H.5	118.0		21.65		
H.6	118.0		21.76		
H.4	118.0		21.89		
H.7	118.0		22.03		
H.8	118.0		22.14		
T.35	118.0		22.34		
T.38	118.0		23.21		
H.1	118.0		21.53		
T.32	118.0		21.69		
T.33	118.0		21.93		
H.2	118.0		21.96		
H.3	118.0		22.17		
H.10	118.0		23.23		

Node1 / to / Node2	Elev1 / Elev2	K / Fact	Qa / Qt	Nom / Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact / Pf/Ft	Pt / Pe / Pf	*******	Notes	******
*Remote Head to Supply												
H.29	109	4.90	8.98	0.75	Utr	0.0	17.000	150	12.000			
to							2.000		0.0			
T.56	109		8.98	0.671			19.000	0.1723	3.274	Vel = 8.15		
T.56	109		-2.01	0.75	Utr	0.0	2.000	150	15.274			
to							2.000		0.0			
T.55	109		6.97	0.671			4.000	0.1080	0.432	Vel = 6.32		
T.55	109		2.01	0.75	Utr	0.0	8.000	150	15.706			
to							2.000		0.0			
H.25	109		8.98	0.671			10.000	0.1723	1.723	Vel = 8.15		
H.25	109		0.0	0.75	Utr	0.0	4.000	150	17.429			
to							2.000		0.0			
T.53	109		8.98	0.671			6.000	0.1722	1.033	Vel = 8.15		
T.53	109		0.0	0.75	Utr	0.0	1.000	150	18.462			
to							2.000		0.0			
T.52	109		8.98	0.671			3.000	0.1723	0.517	Vel = 8.15		
T.52	109		0.35	0.75	Utr	0.0	4.000	150	18.979			
to							2.000		0.0			
H.20	109		9.33	0.671			6.000	0.1853	1.112	Vel = 8.46		
H.20	109		0.0	0.75	Utb	0.0	4.000	150	20.091			
to					Utr	0.0	19.000		0.0			
T.42	109		9.33	0.671			23.000	0.1852	4.259	Vel = 8.46		
T.42	109		-6.56	0.75	Utb	0.0	9.000	150	24.350			
to							17.000		0.0			
H.19	109		2.77	0.671			26.000	0.0196	0.509	Vel = 2.51		
H.19	109		0.0	0.75	Utr	0.0	11.000	150	24.859			
to							2.000		0.0			
H.15	109		2.77	0.671			13.000	0.0195	0.254	Vel = 2.51		
H.15	109		0.0	0.75	Utb	0.0	5.000	150	25.113			
to					Utr	0.0	19.000		0.0			
T.41	109		2.77	0.671			24.000	0.0195	0.469	Vel = 2.51		
T.41	109		-0.41	0.75	Utb	0.0	7.000	150	25.582			
to					Utr	0.0	19.000		0.0			
H.14	109		2.36	0.671			26.000	0.0146	0.379	Vel = 2.14		
H.14	109		0.0	0.75	Utr	0.0	11.000	150	25.961			
to							2.000		0.0			
H.18	109		2.36	0.671			13.000	0.0146	0.190	Vel = 2.14		
H.18	109		0.0	0.75			9.000	150	26.151			
to									0.0			
H.17	109		2.36	0.671			9.000	0.0146	0.131	Vel = 2.14		
H.17	109		0.0	0.75	Utr	0.0	10.000	150	26.282			
to							2.000		0.0			
H.16	109		2.36	0.671			12.000	0.0146	0.175	Vel = 2.14		
H.16	109		0.0	0.75	Utb	0.0	11.000	150	26.457			
to							17.000		0.0			
T.44	109		2.36	0.671			28.000	0.0146	0.409	Vel = 2.14		
T.44	109		7.65	1.25			3.000	150	26.866			
to									0.0			
T.43	109		10.01	1.054			3.000	0.0233	0.070	Vel = 3.68		

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
T.43	109		0.0	1.25	Utr	0.0	3.000	150	26.936	
to					Uel	0.0	15.000		0.0	
T.49	109		10.01	1.054			18.000	0.0234	0.421	Vel = 3.68
T.49	109		3.43	1.25	Utr	0.0	1.000	150	27.357	
to							4.000		0.0	
T.50	109		13.44	1.054			5.000	0.0402	0.201	Vel = 4.94
T.50	109		3.53	1.25			4.000	150	27.558	
to									0.0	
T.54	109		16.97	1.054			4.000	0.0622	0.249	Vel = 6.24
T.54	109		0.0	1.25	Uel	0.0	7.000	150	27.807	
to					T	2.44	13.440		0.0	
S.1	109		16.97	1.054			20.440	0.0621	1.269	Vel = 6.24
S.1	109		0.0	1.25	E	2.746	5.000	150	29.076	
to					T	5.492	8.237		33.197	* * Fixed Loss = 28
PRV	97		16.97	1.245			13.237	0.0276	0.366	Vel = 4.47
PRV	97		0.0	1.25			2.000	150	62.639	
to									0.0	
SOV	97		16.97	1.245			2.000	0.0275	0.055	Vel = 4.47
SOV	97		0.0	1.25	2E	2.44	60.000	150	62.694	
to							2.440		3.000	* * Fixed Loss = 3
MTR	97		16.97	1.054			62.440	0.0621	3.879	Vel = 6.24
MTR	97		0.0	1	2E	4.673	40.000	150	69.573	
to					G	0.0	5.841		1.000	* * Fixed Loss = 1
STR	97		16.97	0.995			45.841	0.0822	3.770	Vel = 7.00
			0.0							
STR			16.97						74.343	K Factor = 1.97
*New Path										
H.29	109		8.00	0.75			10.000	150	12.000	
to									0.0	
H.30	109		8.0	0.671			10.000	0.1393	1.393	Vel = 7.26
H.30	109		0.0	0.75	Utr	0.0	13.000	150	13.393	
to							2.000		0.0	
H.28	109		8.0	0.671			15.000	0.1393	2.089	Vel = 7.26
H.28	109		0.0	0.75	Utr	0.0	8.000	150	15.482	
to							2.000		0.0	
T.57	109		8.0	0.671			10.000	0.1393	1.393	Vel = 7.26
T.57	109		0.0	0.75	Utr	0.0	13.000	150	16.875	
to							2.000		0.0	
T.51	109		8.0	0.671			15.000	0.1393	2.089	Vel = 7.26
T.51	109		-0.36	0.75	Utr	0.0	5.000	150	18.964	
to							2.000		0.0	
T.48	109		7.64	0.671			7.000	0.1280	0.896	Vel = 6.93
T.48	109		-1.58	0.75	Utr	0.0	2.000	150	19.860	
to							2.000		0.0	
T.47	109		6.06	0.671			4.000	0.0832	0.333	Vel = 5.50
T.47	109		1.58	0.75			6.000	150	20.193	
to									0.0	
H.23	109		7.64	0.671			6.000	0.1280	0.768	Vel = 6.93

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
H.23	109		0.0	0.75	Utr	0.0	9.000	150	20.961	
to							2.000		0.0	
H.22	109		7.64	0.671			11.000	0.1280	1.408	Vel = 6.93
H.22	109		0.0	0.75	Utr	0.0	9.000	150	22.369	
to							2.000		0.0	
T.46	109		7.64	0.671			11.000	0.1280	1.408	Vel = 6.93
T.46	109		-1.29	0.75	Utr	0.0	1.000	150	23.777	
to							2.000		0.0	
T.45	109		6.35	0.671			3.000	0.0910	0.273	Vel = 5.76
T.45	109		1.29	0.75			1.000	150	24.050	
to									0.0	
H.21	109		7.64	0.671			1.000	0.1280	0.128	Vel = 6.93
H.21	109		0.0	0.75	Utb	0.0	2.000	150	24.178	
to					Utr	0.0	19.000		0.0	
T.44	109		7.64	0.671			21.000	0.1280	2.688	Vel = 6.93
			0.0							
T.44			7.64						26.866	K Factor = 1.47
*New Path										
T.56	109		2.01	0.75	Utb	0.0	2.000	150	15.274	
to							17.000		0.0	
H.27	109		2.01	0.671			19.000	0.0108	0.205	Vel = 1.82
H.27	109		0.0	0.75	Utb	0.0	2.000	150	15.479	
to					Utr	0.0	19.000		0.0	
T.55	109		2.01	0.671			21.000	0.0108	0.227	Vel = 1.82
			0.0							
T.55			2.01						15.706	K Factor = 0.51
*New Path										
T.51	109		0.36	0.75	2Utb	0.0	1.000	150	18.964	
to							34.000		0.0	
T.52	109		0.36	0.671			35.000	0.0004	0.015	Vel = 0.33
			0.0							
T.52			0.36						18.979	K Factor = 0.08
*New Path										
T.48	109		1.58	0.75	Utb	0.0	6.000	150	19.860	
to					Utr	0.0	19.000		0.0	
H.24	109		1.58	0.671			25.000	0.0070	0.174	Vel = 1.43
H.24	109		0.0	0.75	Utb	0.0	6.000	150	20.034	
to							17.000		0.0	
T.47	109		1.58	0.671			23.000	0.0069	0.159	Vel = 1.43
			0.0							
T.47			1.58						20.193	K Factor = 0.35
*New Path										
T.46	109		1.29	0.75	Utb	0.0	11.000	150	23.777	
to					Utr	0.0	19.000		0.0	
H.26	109		1.29	0.671			30.000	0.0048	0.144	Vel = 1.17
H.26	109		0.0	0.75	Utb	0.0	10.000	150	23.921	
to							17.000		0.0	
T.45	109		1.29	0.671			27.000	0.0048	0.129	Vel = 1.17

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
			0.0							
T.45			1.29						24.050	K Factor = 0.26
*New Path										
T.42	109		6.56	1			11.000	150	24.350	
to									-3.898	
T.36	118		6.56	0.862			11.000	0.0285	0.314	Vel = 3.61
T.36	118		-3.45	0.75	Utb	0.0	10.000	150	20.766	
to					Utr	0.0	19.000		0.0	
H.12	118		3.11	0.671			29.000	0.0243	0.705	Vel = 2.82
H.12	118		0.0	0.75	Utr	0.0	5.000	150	21.471	
to							2.000		0.0	
H.11	118		3.11	0.671			7.000	0.0243	0.170	Vel = 2.82
H.11	118		0.0	0.75	Utr	0.0	20.000	150	21.641	
to							2.000		0.0	
H.13	118		3.11	0.671			22.000	0.0243	0.535	Vel = 2.82
H.13	118		0.0	0.75			12.000	150	22.176	
to									0.0	
T.39	118		3.11	0.671			12.000	0.0243	0.292	Vel = 2.82
T.39	118		0.0	0.75	Utr	0.0	6.000	150	22.468	
to							2.000		0.0	
H.9	118		3.11	0.671			8.000	0.0242	0.194	Vel = 2.82
H.9	118		0.0	0.75	Utb	0.0	5.000	150	22.662	
to					Utr	0.0	19.000		0.0	
T.37	118		3.11	0.671			24.000	0.0243	0.584	Vel = 2.82
T.37	118		0.43	1	Utb	0.0	31.625	150	23.246	
to							14.000		3.898	
T.50	109		3.54	0.862			45.625	0.0091	0.414	Vel = 1.95
			0.0							
T.50			3.54						27.558	K Factor = 0.67
*New Path										
T.36	118		3.45	0.75	Utb	0.0	6.000	150	20.766	
to							17.000		0.0	
T.34	118		3.45	0.671			23.000	0.0294	0.676	Vel = 3.13
T.34	118		-1.47	0.75	Utb	0.0	1.000	150	21.442	
to					Utr	0.0	19.000		0.0	
H.5	118		1.98	0.671			20.000	0.0105	0.210	Vel = 1.80
H.5	118		0.0	0.75			10.000	150	21.652	
to									0.0	
H.6	118		1.98	0.671			10.000	0.0105	0.105	Vel = 1.80
H.6	118		0.0	0.75	Utr	0.0	11.000	150	21.757	
to							2.000		0.0	
H.4	118		1.98	0.671			13.000	0.0105	0.136	Vel = 1.80
H.4	118		0.0	0.75	Utr	0.0	11.000	150	21.893	
to							2.000		0.0	
H.7	118		1.98	0.671			13.000	0.0105	0.137	Vel = 1.80
H.7	118		0.0	0.75			10.000	150	22.030	
to									0.0	
H.8	118		1.98	0.671			10.000	0.0105	0.105	Vel = 1.80

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
H.8	118		0.0	0.75	Utb	0.0	1.000	150	22.135	
to					Utr	0.0	19.000		0.0	
T.35	118		1.98	0.671			20.000	0.0104	0.209	Vel = 1.80
T.35	118		1.88	0.75	Utb	0.0	7.000	150	22.344	
to							17.000		0.0	
T.38	118		3.86	0.671			24.000	0.0361	0.866	Vel = 3.50
T.38	118		-0.43	1	Utb	0.0	14.848	150	23.210	
to							14.000		3.898	
T.49	109		3.43	0.862			28.848	0.0086	0.249	Vel = 1.89
			0.0							
T.49			3.43						27.357	K Factor = 0.66
*New Path										
T.34	118		1.47	0.75	Utr	0.0	13.000	150	21.442	
to							2.000		0.0	
H.1	118		1.47	0.671			15.000	0.0061	0.092	Vel = 1.33
H.1	118		0.0	0.75	Utb	0.0	6.000	150	21.534	
to					Utr	0.0	19.000		0.0	
T.32	118		1.47	0.671			25.000	0.0061	0.152	Vel = 1.33
T.32	118		0.41	0.75	Utr	0.0	7.000	150	21.686	
to					Utb	0.0	19.000		0.0	
T.33	118		1.88	0.671			26.000	0.0095	0.248	Vel = 1.71
T.33	118		0.0	0.75	Utr	0.0	1.000	150	21.934	
to							2.000		0.0	
H.2	118		1.88	0.671			3.000	0.0097	0.029	Vel = 1.71
H.2	118		0.0	0.75	Utr	0.0	20.000	150	21.963	
to							2.000		0.0	
H.3	118		1.88	0.671			22.000	0.0095	0.210	Vel = 1.71
H.3	118		0.0	0.75	Utr	0.0	16.000	150	22.173	
to							2.000		0.0	
T.35	118		1.88	0.671			18.000	0.0095	0.171	Vel = 1.71
			0.0							
T.35			1.88						22.344	K Factor = 0.40
*New Path										
T.41	109		0.40	1			11.000	150	25.582	
to									-3.898	
T.32	118		0.4	0.862			11.000	0.0002	0.002	Vel = 0.22
			0.0							
T.32			0.40						21.686	K Factor = 0.09
*New Path										
T.38	118		0.42	0.75	Utb	0.0	10.000	150	23.210	
to					Utr	0.0	19.000		0.0	
H.10	118		0.42	0.671			29.000	0.0006	0.018	Vel = 0.38
H.10	118		0.0	0.75	Utb	0.0	13.000	150	23.228	
to							17.000		0.0	
T.37	118		0.42	0.671			30.000	0.0006	0.018	Vel = 0.38
			0.0							
T.37			0.42						23.246	K Factor = 0.09

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*******	Notes	******

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am NICET Certified.

Tim W McDonald Date: 07/22/2022

NICET Certification No. 150393
Water-Based Systems Layout - Level III
Certification Expires: June 1, 2025

AquaSAFE™ Fire Safety System

Hydratec Incorporated
64 Haverhill Road
Route 111
Windham, NH 03087
603-434-0502

Job Name	:	HAWTHORNE ESTATES - CAMBRIDGE - One Head Calculation (H.29)
Drawing	:	RESIDENTIAL
Location	:	SE HAWTHORNE MEADOWS ST PORTLAND OR 97236
Remote Area	:	1
Contract	:	42892F 004
Data File	:	42892F 004 Hawthorne Estates - Cambridge.wx1
Date/Time	:	07/22/2022 - 12:55 PM

HYDRAULIC DESIGN INFORMATION SHEET

Name - HAWTHORNE ESTATES - CAMBRIDGE Date - 7/21/2022
Location - PORTLAND OR 97236
Building - RESIDENTIAL System No. - 1
Contractor - WOLCOTT PLUMBING Contract No. - 42892F 004
Calculated By - SILVIU RADES Drawing No. - F100
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height VARIES
OCCUPANCY - RESIDENTIAL

SYSTEM DESIGN

Type of Calculation: ( )NFPA 13 Residential ( )NFPA 13R (X)NFPA 13D
Number of Sprinklers Flowing: (X)1 ( )2 ( )4 ( )
( )Other
( )Specific Ruling Made by Date

Listed Flow at Start Point - 17 Gpm System Type
Listed Pres. at Start Point - 12 Psi (X) Wet ( ) Dry
MAXIMUM LISTED SPACING 18 x 18 ( ) Deluge ( ) PreAction
Domestic Flow Added - 0 Gpm Sprinkler or Nozzle
Additional Flow Added - Gpm Make SENJU Model RC-RES
Elevation at Highest Outlet - 109 Feet Size 7/16 K-Factor 4.9
Note: Temperature Rating 162

Calculation Summary: Gpm Required 17 Psi Required 74.34 At Ref Pt STR
C-Factor Used: Overhead 150 Underground 150

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - x	Rated Cap.	Cap.
Time of Test - x	@ Psi	Elev.
Static (Psi) - 112	Elev.	
Residual (Psi) - 97	Other	Well
Flow (Gpm) - 300		Proof Flow Gpm
Elevation - 97		

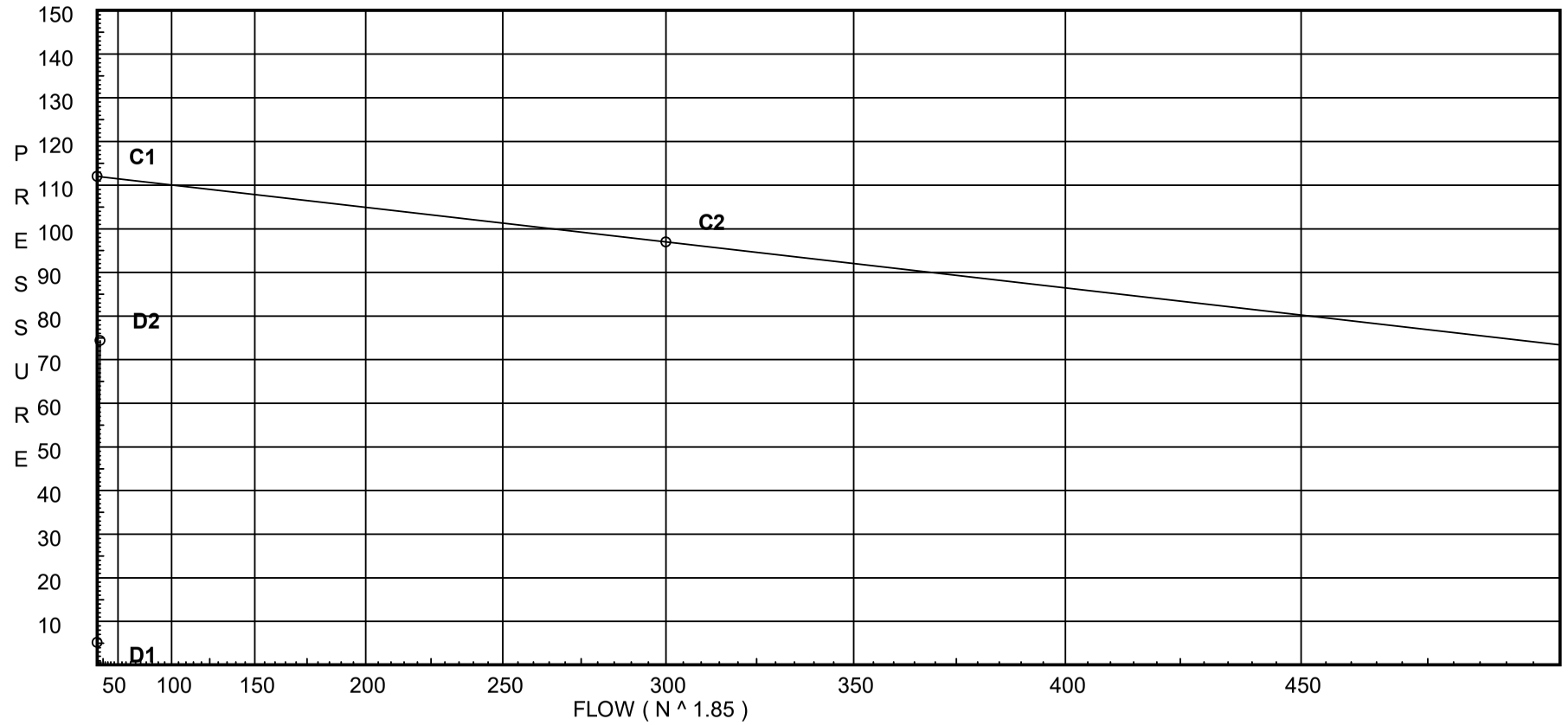
Location: STREET

Source of Information: CONTRACTOR

City Water Supply:
- C1 - Static Pressure : 112
- C2 - Residual Pressure: 97
- C2 - Residual Flow : 300

Demand:

D1 - Elevation	5.197
D2 - System Flow	16.974
D2 - System Pressure	74.343
Hose (Demand)	_____
D3 - System Demand	16.974
Safety Margin	37.583



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

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

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
STR	112.0	97	300.0	111.926	16.97	74.343

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
H.29	109.0	4.9	12.0	16.97	0.05	324
T.56	109.0		15.27			
T.55	109.0		15.71			
H.25	109.0		17.43			
T.53	109.0		18.46			
T.52	109.0		18.98			
H.20	109.0		20.09			
T.42	109.0		24.35			
H.19	109.0		24.86			
H.15	109.0		25.11			
T.41	109.0		25.58			
H.14	109.0		25.96			
H.18	109.0		26.15			
H.17	109.0		26.28			
H.16	109.0		26.46			
T.44	109.0		26.87			
T.43	109.0		26.94			
T.49	109.0		27.36			
T.50	109.0		27.56			
T.54	109.0		27.81			
S.1	109.0		29.08			
PRV	97.0		62.64			
SOV	97.0		62.69			
MTR	97.0		69.57			
STR	97.0		74.34			
H.30	109.0		13.39			
H.28	109.0		15.48			
T.57	109.0		16.88			
T.51	109.0		18.96			
T.48	109.0		19.86			
T.47	109.0		20.19			
H.23	109.0		20.96			
H.22	109.0		22.37			
T.46	109.0		23.78			
T.45	109.0		24.05			
H.21	109.0		24.18			
H.27	109.0		15.48			
H.24	109.0		20.03			
H.26	109.0		23.92			
T.36	118.0		20.77			
H.12	118.0		21.47			
H.11	118.0		21.64			

NODE ANALYSIS (cont.)

Node Tag	*Elevation*	*Node Type*	*Pressure at Node*	*Discharge at Node*	*Notes*
H.13	118.0		22.18		
T.39	118.0		22.47		
H.9	118.0		22.66		
T.37	118.0		23.25		
T.34	118.0		21.44		
H.5	118.0		21.65		
H.6	118.0		21.76		
H.4	118.0		21.89		
H.7	118.0		22.03		
H.8	118.0		22.14		
T.35	118.0		22.34		
T.38	118.0		23.21		
H.1	118.0		21.53		
T.32	118.0		21.69		
T.33	118.0		21.93		
H.2	118.0		21.96		
H.3	118.0		22.17		
H.10	118.0		23.23		

Node1 / to / Node2	Elev1 / Elev2	K / Fact	Qa / Qt	Nom / Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact / Pf/Ft	Pt / Pe / Pf	*******	Notes	******
*Remote Head to Supply												
H.29	109	4.90	8.98	0.75	Utr	0.0	17.000	150	12.000			
to							2.000		0.0			
T.56	109		8.98	0.671			19.000	0.1723	3.274	Vel = 8.15		
T.56	109		-2.01	0.75	Utr	0.0	2.000	150	15.274			
to							2.000		0.0			
T.55	109		6.97	0.671			4.000	0.1080	0.432	Vel = 6.32		
T.55	109		2.01	0.75	Utr	0.0	8.000	150	15.706			
to							2.000		0.0			
H.25	109		8.98	0.671			10.000	0.1723	1.723	Vel = 8.15		
H.25	109		0.0	0.75	Utr	0.0	4.000	150	17.429			
to							2.000		0.0			
T.53	109		8.98	0.671			6.000	0.1722	1.033	Vel = 8.15		
T.53	109		0.0	0.75	Utr	0.0	1.000	150	18.462			
to							2.000		0.0			
T.52	109		8.98	0.671			3.000	0.1723	0.517	Vel = 8.15		
T.52	109		0.35	0.75	Utr	0.0	4.000	150	18.979			
to							2.000		0.0			
H.20	109		9.33	0.671			6.000	0.1853	1.112	Vel = 8.46		
H.20	109		0.0	0.75	Utb	0.0	4.000	150	20.091			
to					Utr	0.0	19.000		0.0			
T.42	109		9.33	0.671			23.000	0.1852	4.259	Vel = 8.46		
T.42	109		-6.56	0.75	Utb	0.0	9.000	150	24.350			
to							17.000		0.0			
H.19	109		2.77	0.671			26.000	0.0196	0.509	Vel = 2.51		
H.19	109		0.0	0.75	Utr	0.0	11.000	150	24.859			
to							2.000		0.0			
H.15	109		2.77	0.671			13.000	0.0195	0.254	Vel = 2.51		
H.15	109		0.0	0.75	Utb	0.0	5.000	150	25.113			
to					Utr	0.0	19.000		0.0			
T.41	109		2.77	0.671			24.000	0.0195	0.469	Vel = 2.51		
T.41	109		-0.41	0.75	Utb	0.0	7.000	150	25.582			
to					Utr	0.0	19.000		0.0			
H.14	109		2.36	0.671			26.000	0.0146	0.379	Vel = 2.14		
H.14	109		0.0	0.75	Utr	0.0	11.000	150	25.961			
to							2.000		0.0			
H.18	109		2.36	0.671			13.000	0.0146	0.190	Vel = 2.14		
H.18	109		0.0	0.75			9.000	150	26.151			
to									0.0			
H.17	109		2.36	0.671			9.000	0.0146	0.131	Vel = 2.14		
H.17	109		0.0	0.75	Utr	0.0	10.000	150	26.282			
to							2.000		0.0			
H.16	109		2.36	0.671			12.000	0.0146	0.175	Vel = 2.14		
H.16	109		0.0	0.75	Utb	0.0	11.000	150	26.457			
to							17.000		0.0			
T.44	109		2.36	0.671			28.000	0.0146	0.409	Vel = 2.14		
T.44	109		7.65	1.25			3.000	150	26.866			
to									0.0			
T.43	109		10.01	1.054			3.000	0.0233	0.070	Vel = 3.68		

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
T.43	109		0.0	1.25	Utr	0.0	3.000	150	26.936	
to					Uel	0.0	15.000		0.0	
T.49	109		10.01	1.054			18.000	0.0234	0.421	Vel = 3.68
T.49	109		3.43	1.25	Utr	0.0	1.000	150	27.357	
to							4.000		0.0	
T.50	109		13.44	1.054			5.000	0.0402	0.201	Vel = 4.94
T.50	109		3.53	1.25			4.000	150	27.558	
to									0.0	
T.54	109		16.97	1.054			4.000	0.0622	0.249	Vel = 6.24
T.54	109		0.0	1.25	Uel	0.0	7.000	150	27.807	
to					T	2.44	13.440		0.0	
S.1	109		16.97	1.054			20.440	0.0621	1.269	Vel = 6.24
S.1	109		0.0	1.25	E	2.746	5.000	150	29.076	
to					T	5.492	8.237		33.197	* * Fixed Loss = 28
PRV	97		16.97	1.245			13.237	0.0276	0.366	Vel = 4.47
PRV	97		0.0	1.25			2.000	150	62.639	
to									0.0	
SOV	97		16.97	1.245			2.000	0.0275	0.055	Vel = 4.47
SOV	97		0.0	1.25	2E	2.44	60.000	150	62.694	
to							2.440		3.000	* * Fixed Loss = 3
MTR	97		16.97	1.054			62.440	0.0621	3.879	Vel = 6.24
MTR	97		0.0	1	2E	4.673	40.000	150	69.573	
to					G	0.0	5.841		1.000	* * Fixed Loss = 1
STR	97		16.97	0.995			45.841	0.0822	3.770	Vel = 7.00
			0.0							
STR			16.97						74.343	K Factor = 1.97
*New Path										
H.29	109		8.00	0.75			10.000	150	12.000	
to									0.0	
H.30	109		8.0	0.671			10.000	0.1393	1.393	Vel = 7.26
H.30	109		0.0	0.75	Utr	0.0	13.000	150	13.393	
to							2.000		0.0	
H.28	109		8.0	0.671			15.000	0.1393	2.089	Vel = 7.26
H.28	109		0.0	0.75	Utr	0.0	8.000	150	15.482	
to							2.000		0.0	
T.57	109		8.0	0.671			10.000	0.1393	1.393	Vel = 7.26
T.57	109		0.0	0.75	Utr	0.0	13.000	150	16.875	
to							2.000		0.0	
T.51	109		8.0	0.671			15.000	0.1393	2.089	Vel = 7.26
T.51	109		-0.36	0.75	Utr	0.0	5.000	150	18.964	
to							2.000		0.0	
T.48	109		7.64	0.671			7.000	0.1280	0.896	Vel = 6.93
T.48	109		-1.58	0.75	Utr	0.0	2.000	150	19.860	
to							2.000		0.0	
T.47	109		6.06	0.671			4.000	0.0832	0.333	Vel = 5.50
T.47	109		1.58	0.75			6.000	150	20.193	
to									0.0	
H.23	109		7.64	0.671			6.000	0.1280	0.768	Vel = 6.93

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
H.23	109		0.0	0.75	Utr	0.0	9.000	150	20.961	
to							2.000		0.0	
H.22	109		7.64	0.671			11.000	0.1280	1.408	Vel = 6.93
H.22	109		0.0	0.75	Utr	0.0	9.000	150	22.369	
to							2.000		0.0	
T.46	109		7.64	0.671			11.000	0.1280	1.408	Vel = 6.93
T.46	109		-1.29	0.75	Utr	0.0	1.000	150	23.777	
to							2.000		0.0	
T.45	109		6.35	0.671			3.000	0.0910	0.273	Vel = 5.76
T.45	109		1.29	0.75			1.000	150	24.050	
to									0.0	
H.21	109		7.64	0.671			1.000	0.1280	0.128	Vel = 6.93
H.21	109		0.0	0.75	Utb	0.0	2.000	150	24.178	
to					Utr	0.0	19.000		0.0	
T.44	109		7.64	0.671			21.000	0.1280	2.688	Vel = 6.93
			0.0							
T.44			7.64						26.866	K Factor = 1.47
*New Path										
T.56	109		2.01	0.75	Utb	0.0	2.000	150	15.274	
to							17.000		0.0	
H.27	109		2.01	0.671			19.000	0.0108	0.205	Vel = 1.82
H.27	109		0.0	0.75	Utb	0.0	2.000	150	15.479	
to					Utr	0.0	19.000		0.0	
T.55	109		2.01	0.671			21.000	0.0108	0.227	Vel = 1.82
			0.0							
T.55			2.01						15.706	K Factor = 0.51
*New Path										
T.51	109		0.36	0.75	2Utb	0.0	1.000	150	18.964	
to							34.000		0.0	
T.52	109		0.36	0.671			35.000	0.0004	0.015	Vel = 0.33
			0.0							
T.52			0.36						18.979	K Factor = 0.08
*New Path										
T.48	109		1.58	0.75	Utb	0.0	6.000	150	19.860	
to					Utr	0.0	19.000		0.0	
H.24	109		1.58	0.671			25.000	0.0070	0.174	Vel = 1.43
H.24	109		0.0	0.75	Utb	0.0	6.000	150	20.034	
to							17.000		0.0	
T.47	109		1.58	0.671			23.000	0.0069	0.159	Vel = 1.43
			0.0							
T.47			1.58						20.193	K Factor = 0.35
*New Path										
T.46	109		1.29	0.75	Utb	0.0	11.000	150	23.777	
to					Utr	0.0	19.000		0.0	
H.26	109		1.29	0.671			30.000	0.0048	0.144	Vel = 1.17
H.26	109		0.0	0.75	Utb	0.0	10.000	150	23.921	
to							17.000		0.0	
T.45	109		1.29	0.671			27.000	0.0048	0.129	Vel = 1.17

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
			0.0							
T.45			1.29						24.050	K Factor = 0.26
*New Path										
T.42	109		6.56	1			11.000	150	24.350	
to									-3.898	
T.36	118		6.56	0.862			11.000	0.0285	0.314	Vel = 3.61
T.36	118		-3.45	0.75	Utb	0.0	10.000	150	20.766	
to					Utr	0.0	19.000		0.0	
H.12	118		3.11	0.671			29.000	0.0243	0.705	Vel = 2.82
H.12	118		0.0	0.75	Utr	0.0	5.000	150	21.471	
to							2.000		0.0	
H.11	118		3.11	0.671			7.000	0.0243	0.170	Vel = 2.82
H.11	118		0.0	0.75	Utr	0.0	20.000	150	21.641	
to							2.000		0.0	
H.13	118		3.11	0.671			22.000	0.0243	0.535	Vel = 2.82
H.13	118		0.0	0.75			12.000	150	22.176	
to									0.0	
T.39	118		3.11	0.671			12.000	0.0243	0.292	Vel = 2.82
T.39	118		0.0	0.75	Utr	0.0	6.000	150	22.468	
to							2.000		0.0	
H.9	118		3.11	0.671			8.000	0.0242	0.194	Vel = 2.82
H.9	118		0.0	0.75	Utb	0.0	5.000	150	22.662	
to					Utr	0.0	19.000		0.0	
T.37	118		3.11	0.671			24.000	0.0243	0.584	Vel = 2.82
T.37	118		0.43	1	Utb	0.0	31.625	150	23.246	
to							14.000		3.898	
T.50	109		3.54	0.862			45.625	0.0091	0.414	Vel = 1.95
			0.0							
T.50			3.54						27.558	K Factor = 0.67
*New Path										
T.36	118		3.45	0.75	Utb	0.0	6.000	150	20.766	
to							17.000		0.0	
T.34	118		3.45	0.671			23.000	0.0294	0.676	Vel = 3.13
T.34	118		-1.47	0.75	Utb	0.0	1.000	150	21.442	
to					Utr	0.0	19.000		0.0	
H.5	118		1.98	0.671			20.000	0.0105	0.210	Vel = 1.80
H.5	118		0.0	0.75			10.000	150	21.652	
to									0.0	
H.6	118		1.98	0.671			10.000	0.0105	0.105	Vel = 1.80
H.6	118		0.0	0.75	Utr	0.0	11.000	150	21.757	
to							2.000		0.0	
H.4	118		1.98	0.671			13.000	0.0105	0.136	Vel = 1.80
H.4	118		0.0	0.75	Utr	0.0	11.000	150	21.893	
to							2.000		0.0	
H.7	118		1.98	0.671			13.000	0.0105	0.137	Vel = 1.80
H.7	118		0.0	0.75			10.000	150	22.030	
to									0.0	
H.8	118		1.98	0.671			10.000	0.0105	0.105	Vel = 1.80

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
H.8	118		0.0	0.75	Utb	0.0	1.000	150	22.135	
to					Utr	0.0	19.000		0.0	
T.35	118		1.98	0.671			20.000	0.0104	0.209	Vel = 1.80
T.35	118		1.88	0.75	Utb	0.0	7.000	150	22.344	
to							17.000		0.0	
T.38	118		3.86	0.671			24.000	0.0361	0.866	Vel = 3.50
T.38	118		-0.43	1	Utb	0.0	14.848	150	23.210	
to							14.000		3.898	
T.49	109		3.43	0.862			28.848	0.0086	0.249	Vel = 1.89
			0.0							
T.49			3.43						27.357	K Factor = 0.66
*New Path										
T.34	118		1.47	0.75	Utr	0.0	13.000	150	21.442	
to							2.000		0.0	
H.1	118		1.47	0.671			15.000	0.0061	0.092	Vel = 1.33
H.1	118		0.0	0.75	Utb	0.0	6.000	150	21.534	
to					Utr	0.0	19.000		0.0	
T.32	118		1.47	0.671			25.000	0.0061	0.152	Vel = 1.33
T.32	118		0.41	0.75	Utr	0.0	7.000	150	21.686	
to					Utb	0.0	19.000		0.0	
T.33	118		1.88	0.671			26.000	0.0095	0.248	Vel = 1.71
T.33	118		0.0	0.75	Utr	0.0	1.000	150	21.934	
to							2.000		0.0	
H.2	118		1.88	0.671			3.000	0.0097	0.029	Vel = 1.71
H.2	118		0.0	0.75	Utr	0.0	20.000	150	21.963	
to							2.000		0.0	
H.3	118		1.88	0.671			22.000	0.0095	0.210	Vel = 1.71
H.3	118		0.0	0.75	Utr	0.0	16.000	150	22.173	
to							2.000		0.0	
T.35	118		1.88	0.671			18.000	0.0095	0.171	Vel = 1.71
			0.0							
T.35			1.88						22.344	K Factor = 0.40
*New Path										
T.41	109		0.40	1			11.000	150	25.582	
to									-3.898	
T.32	118		0.4	0.862			11.000	0.0002	0.002	Vel = 0.22
			0.0							
T.32			0.40						21.686	K Factor = 0.09
*New Path										
T.38	118		0.42	0.75	Utb	0.0	10.000	150	23.210	
to					Utr	0.0	19.000		0.0	
H.10	118		0.42	0.671			29.000	0.0006	0.018	Vel = 0.38
H.10	118		0.0	0.75	Utb	0.0	13.000	150	23.228	
to							17.000		0.0	
T.37	118		0.42	0.671			30.000	0.0006	0.018	Vel = 0.38
			0.0							
T.37			0.42						23.246	K Factor = 0.09

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*******	Notes	******

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am NICET Certified.

Tim W McDonald Date: 07/22/2022

NICET Certification No. 150393
Water-Based Systems Layout - Level III
Certification Expires: June 1, 2025

AquaSAFE™ Fire Safety System

SUBMITTED
09/15/2022

Hydratec Incorporated
64 Haverhill Road
Route 111
Windham, NH 03087
603-434-0502

Job Name	:	HAWTHORNE ESTATES - CAMBRIDGE - Two Head Calculation (H.6 & H.5)
Drawing	:	RESIDENTIAL
Location	:	SE HAWTHORNE MEADOWS ST PORTLAND OR 97236
Remote Area	:	1
Contract	:	42892F 004
Data File	:	42892F 004 Hawthorne Estates - Cambridge.wx2
Date/Time	:	07/22/2022 - 12:54 PM

HYDRAULIC DESIGN INFORMATION SHEET

Name - HAWTHORNE ESTATES - CAMBRIDGE Date - 7/21/2022
Location - PORTLAND OR 97236
Building - RESIDENTIAL System No. - 1
Contractor - WOLCOTT PLUMBING Contract No. - 42892F 004
Calculated By - SILVIU RADES Drawing No. - F100
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height VARIES
OCCUPANCY - RESIDENTIAL

SYSTEM DESIGN

Type of Calculation: ( )NFPA 13 Residential ( )NFPA 13R (X)NFPA 13D
Number of Sprinklers Flowing: ( )1 (X)2 ( )4 ( )
( )Other
( )Specific Ruling Made by Date

Listed Flow at Start Point - 13 Gpm System Type
Listed Pres. at Start Point - 7.04 Psi (X) Wet ( ) Dry
MAXIMUM LISTED SPACING 16 x 16 ( ) Deluge ( ) PreAction
Domestic Flow Added - 0 Gpm Sprinkler or Nozzle
Additional Flow Added - Gpm Make SENJU Model RC-RES
Elevation at Highest Outlet - 118 Feet Size 7/16 K-Factor 4.9
Note: Temperature Rating 162

Calculation Summary: Gpm Required 26.1335 Psi Required 90.23 At Ref Pt STR
C-Factor Used: Overhead 150 Underground 150

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - x	Rated Cap.	Cap.
Time of Test - x	@ Psi	Elev.
Static (Psi) - 112	Elev.	
Residual (Psi) - 97	Other	Well
Flow (Gpm) - 300		Proof Flow Gpm
Elevation - 97		

PLOT PLAN

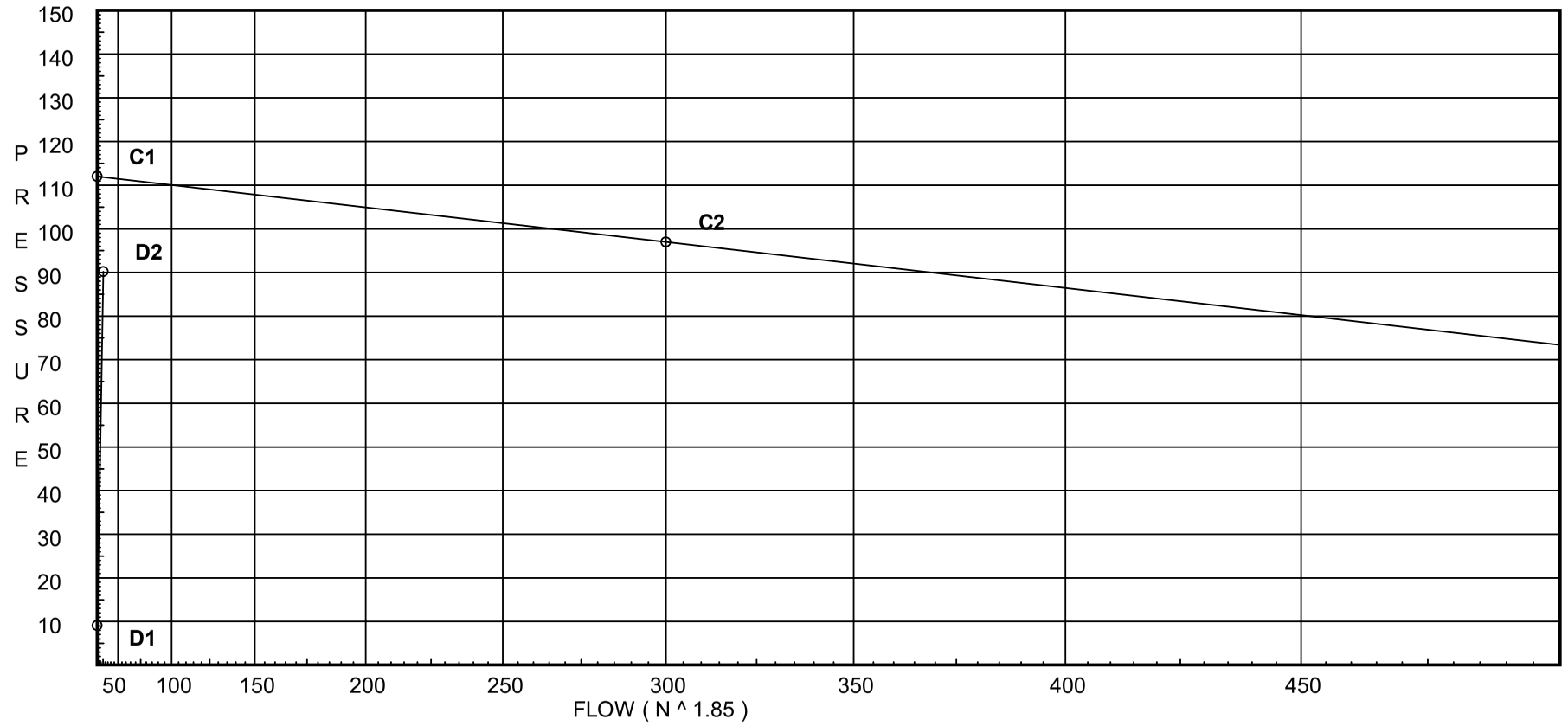
Location: STREET

Source of Information: CONTRACTOR

City Water Supply:
- C1 - Static Pressure : 112
- C2 - Residual Pressure: 97
- C2 - Residual Flow : 300

Demand:

D1 - Elevation	: 9.095
D2 - System Flow	: 26.134
D2 - System Pressure	: 90.226
Hose (Demand)	:
D3 - System Demand	: 26.134
Safety Margin	: 21.610



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

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

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

SUPPLY ANALYSIS

Node at Source	*Static Pressure*	*Residual Pressure*	*Flow*	*Available Pressure*	*Total Demand*	*Required Pressure*
STR	112.0	97	300.0	111.836	26.13	90.226

NODE ANALYSIS

Node Tag	*Elevation*	*Node Type*	*Pressure at Node*	*Discharge at Node*	*Notes*	
H.6	118.0	4.9	7.04	13.0	0.05	256
H.4	118.0		10.12			
H.7	118.0		13.21			
H.8	118.0		15.58			
T.35	118.0		20.32			
T.38	118.0		25.99			
T.49	109.0		31.33			
T.50	109.0		31.73			
T.54	109.0		32.28			
S.1	109.0		35.1			
PRV	97.0		69.11			
SOV	97.0		69.23			
MTR	97.0		80.85			
STR	97.0		90.23			
H.5	118.0	4.9	7.18	13.13	0.05	256
T.34	118.0		16.62			
T.36	118.0		20.64			
H.12	118.0		22.3			
H.11	118.0		22.7			
H.13	118.0		23.96			
T.39	118.0		24.65			
H.9	118.0		25.11			
T.37	118.0		26.48			
H.1	118.0		18.01			
T.32	118.0		20.32			
T.41	109.0		24.52			
H.14	109.0		26.37			
H.18	109.0		27.3			
H.17	109.0		27.94			
H.16	109.0		28.79			
T.44	109.0		30.79			
T.43	109.0		30.86			
H.3	118.0		20.32			
H.2	118.0		20.32			
T.33	118.0		20.32			
H.15	109.0		24.58			
H.19	109.0		24.61			
T.42	109.0		24.67			
H.20	109.0		26.0			
T.52	109.0		26.35			
T.51	109.0		27.21			
T.48	109.0		27.61			

NODE ANALYSIS (cont.)

Node Tag	*Elevation*	*Node Type*	*Pressure at Node*	*Discharge at Node*	*Notes*
T.47	109.0		27.76		
H.23	109.0		28.11		
H.22	109.0		28.75		
T.46	109.0		29.39		
T.45	109.0		29.51		
H.21	109.0		29.57		
T.53	109.0		26.38		
H.25	109.0		26.44		
T.55	109.0		26.53		
T.56	109.0		26.56		
H.29	109.0		26.73		
H.30	109.0		26.83		
H.28	109.0		26.97		
T.57	109.0		27.06		
H.27	109.0		26.54		
H.24	109.0		27.69		
H.26	109.0		29.45		
H.10	118.0		26.23		

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
*Remote Head to Supply										
H.6	118	4.90	10.67	0.75	Utr	0.0	11.000	150	7.040	
to							2.000		0.0	
H.4	118		10.67	0.671			13.000	0.2372	3.083	Vel = 9.68
H.4	118		0.0	0.75	Utr	0.0	11.000	150	10.123	
to							2.000		0.0	
H.7	118		10.67	0.671			13.000	0.2372	3.083	Vel = 9.68
H.7	118		0.0	0.75			10.000	150	13.206	
to									0.0	
H.8	118		10.67	0.671			10.000	0.2372	2.372	Vel = 9.68
H.8	118		0.0	0.75	Utb	0.0	1.000	150	15.578	
to					Utr	0.0	19.000		0.0	
T.35	118		10.67	0.671			20.000	0.2372	4.744	Vel = 9.68
T.35	118		-0.03	0.75	Utb	0.0	7.000	150	20.322	
to							17.000		0.0	
T.38	118		10.64	0.671			24.000	0.2360	5.665	Vel = 9.65
T.38	118		-1.75	1	Utb	0.0	14.848	150	25.987	
to							14.000		3.898	
T.49	109		8.89	0.862			28.848	0.0500	1.443	Vel = 4.89
T.49	109		10.55	1.25	Utr	0.0	1.000	150	31.328	
to							4.000		0.0	
T.50	109		19.44	1.054			5.000	0.0798	0.399	Vel = 7.15
T.50	109		6.69	1.25			4.000	150	31.727	
to									0.0	
T.54	109		26.13	1.054			4.000	0.1380	0.552	Vel = 9.61
T.54	109		0.0	1.25	Uel	0.0	7.000	150	32.279	
to					T	2.44	13.440		0.0	
S.1	109		26.13	1.054			20.440	0.1380	2.821	Vel = 9.61
S.1	109		0.0	1.25	E	2.746	5.000	150	35.100	
to					T	5.492	8.237		33.197	* * Fixed Loss = 28
PRV	97		26.13	1.245			13.237	0.0613	0.812	Vel = 6.89
PRV	97		0.0	1.25			2.000	150	69.109	
to									0.0	
SOV	97		26.13	1.245			2.000	0.0615	0.123	Vel = 6.89
SOV	97		0.0	1.25	2E	2.44	60.000	150	69.232	
to							2.440		3.000	* * Fixed Loss = 3
MTR	97		26.13	1.054			62.440	0.1380	8.618	Vel = 9.61
MTR	97		0.0	1	2E	4.673	40.000	150	80.850	
to					G	0.0	5.841		1.000	* * Fixed Loss = 1
STR	97		26.13	0.995			45.841	0.1827	8.376	Vel = 10.78
			0.0							
STR			26.13						90.226	K Factor = 2.75
*New Path										
H.6	118		2.34	0.75			10.000	150	7.040	
to									0.0	
H.5	118		2.34	0.671			10.000	0.0143	0.143	Vel = 2.12
H.5	118	4.90	13.13	0.75	Utb	0.0	1.000	150	7.183	
to					Utr	0.0	19.000		0.0	
T.34	118		15.47	0.671			20.000	0.4716	9.433	Vel = 14.04

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
T.34	118		-6.42	0.75	Utb	0.0	6.000	150	16.616	
to							17.000		0.0	
T.36	118		9.05	0.671			23.000	0.1750	4.025	Vel = 8.21
T.36	118		-4.10	0.75	Utb	0.0	10.000	150	20.641	
to					Utr	0.0	19.000		0.0	
H.12	118		4.95	0.671			29.000	0.0572	1.660	Vel = 4.49
H.12	118		0.0	0.75	Utr	0.0	5.000	150	22.301	
to							2.000		0.0	
H.11	118		4.95	0.671			7.000	0.0573	0.401	Vel = 4.49
H.11	118		0.0	0.75	Utr	0.0	20.000	150	22.702	
to							2.000		0.0	
H.13	118		4.95	0.671			22.000	0.0572	1.259	Vel = 4.49
H.13	118		0.0	0.75			12.000	150	23.961	
to									0.0	
T.39	118		4.95	0.671			12.000	0.0572	0.687	Vel = 4.49
T.39	118		0.0	0.75	Utr	0.0	6.000	150	24.648	
to							2.000		0.0	
H.9	118		4.95	0.671			8.000	0.0572	0.458	Vel = 4.49
H.9	118		0.0	0.75	Utb	0.0	5.000	150	25.106	
to					Utr	0.0	19.000		0.0	
T.37	118		4.95	0.671			24.000	0.0572	1.374	Vel = 4.49
T.37	118		1.74	1	Utb	0.0	31.625	150	26.480	
to							14.000		3.898	
T.50	109		6.69	0.862			45.625	0.0296	1.349	Vel = 3.68
			0.0							
T.50			6.69						31.727	K Factor = 1.19
*New Path										
T.34	118		6.42	0.75	Utr	0.0	13.000	150	16.616	
to							2.000		0.0	
H.1	118		6.42	0.671			15.000	0.0927	1.390	Vel = 5.82
H.1	118		0.0	0.75	Utb	0.0	6.000	150	18.006	
to					Utr	0.0	19.000		0.0	
T.32	118		6.42	0.671			25.000	0.0926	2.316	Vel = 5.82
T.32	118		0.02	1			11.000	150	20.322	
to									3.898	
T.41	109		6.44	0.862			11.000	0.0275	0.303	Vel = 3.54
T.41	109		-0.88	0.75	Utb	0.0	7.000	150	24.523	
to					Utr	0.0	19.000		0.0	
H.14	109		5.56	0.671			26.000	0.0712	1.851	Vel = 5.04
H.14	109		0.0	0.75	Utr	0.0	11.000	150	26.374	
to							2.000		0.0	
H.18	109		5.56	0.671			13.000	0.0712	0.925	Vel = 5.04
H.18	109		0.0	0.75			9.000	150	27.299	
to									0.0	
H.17	109		5.56	0.671			9.000	0.0712	0.641	Vel = 5.04
H.17	109		0.0	0.75	Utr	0.0	10.000	150	27.940	
to							2.000		0.0	
H.16	109		5.56	0.671			12.000	0.0712	0.854	Vel = 5.04

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
H.16	109		0.0	0.75	Utb	0.0	11.000	150	28.794	
to							17.000		0.0	
T.44	109		5.56	0.671			28.000	0.0712	1.993	Vel = 5.04
T.44	109		4.99	1.25			3.000	150	30.787	
to									0.0	
T.43	109		10.55	1.054			3.000	0.0257	0.077	Vel = 3.88
T.43	109		0.0	1.25	Utr	0.0	3.000	150	30.864	
to					Uel	0.0	15.000		0.0	
T.49	109		10.55	1.054			18.000	0.0258	0.464	Vel = 3.88
			0.0							
T.49			10.55						31.328	K Factor = 1.88
*New Path										
T.35	118		0.03	0.75	Utr	0.0	16.000	150	20.322	
to							2.000		0.0	
H.3	118		0.03	0.671			18.000	0	0.0	Vel = 0.03
H.3	118		0.0	0.75	Utr	0.0	20.000	150	20.322	
to							2.000		0.0	
H.2	118		0.03	0.671			22.000	0	0.0	Vel = 0.03
H.2	118		0.0	0.75	Utr	0.0	1.000	150	20.322	
to							2.000		0.0	
T.33	118		0.03	0.671			3.000	0	0.0	Vel = 0.03
T.33	118		0.0	0.75	Utr	0.0	7.000	150	20.322	
to					Utb	0.0	19.000		0.0	
T.32	118		0.03	0.671			26.000	0	0.0	Vel = 0.03
			0.0							
T.32			0.03						20.322	K Factor = 0.01
*New Path										
T.41	109		0.88	0.75	Utb	0.0	5.000	150	24.523	
to					Utr	0.0	19.000		0.0	
H.15	109		0.88	0.671			24.000	0.0023	0.056	Vel = 0.80
H.15	109		0.0	0.75	Utr	0.0	11.000	150	24.579	
to							2.000		0.0	
H.19	109		0.88	0.671			13.000	0.0024	0.031	Vel = 0.80
H.19	109		0.0	0.75	Utb	0.0	9.000	150	24.610	
to							17.000		0.0	
T.42	109		0.88	0.671			26.000	0.0023	0.060	Vel = 0.80
T.42	109		4.10	0.75	Utb	0.0	4.000	150	24.670	
to					Utr	0.0	19.000		0.0	
H.20	109		4.98	0.671			23.000	0.0580	1.335	Vel = 4.52
H.20	109		0.0	0.75	Utr	0.0	4.000	150	26.005	
to							2.000		0.0	
T.52	109		4.98	0.671			6.000	0.0580	0.348	Vel = 4.52
T.52	109		-1.86	0.75	2Utb	0.0	1.000	150	26.353	
to							34.000		0.0	
T.51	109		3.12	0.671			35.000	0.0244	0.853	Vel = 2.83
T.51	109		1.86	0.75	Utr	0.0	5.000	150	27.206	
to							2.000		0.0	
T.48	109		4.98	0.671			7.000	0.0580	0.406	Vel = 4.52

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
T.48	109		-1.03	0.75	Utr	0.0	2.000	150	27.612	
to							2.000		0.0	
T.47	109		3.95	0.671			4.000	0.0378	0.151	Vel = 3.58
T.47	109		1.03	0.75			6.000	150	27.763	
to									0.0	
H.23	109		4.98	0.671			6.000	0.0580	0.348	Vel = 4.52
H.23	109		0.0	0.75	Utr	0.0	9.000	150	28.111	
to							2.000		0.0	
H.22	109		4.98	0.671			11.000	0.0580	0.638	Vel = 4.52
H.22	109		0.0	0.75	Utr	0.0	9.000	150	28.749	
to							2.000		0.0	
T.46	109		4.98	0.671			11.000	0.0580	0.638	Vel = 4.52
T.46	109		-0.84	0.75	Utr	0.0	1.000	150	29.387	
to							2.000		0.0	
T.45	109		4.14	0.671			3.000	0.0410	0.123	Vel = 3.76
T.45	109		0.84	0.75			1.000	150	29.510	
to									0.0	
H.21	109		4.98	0.671			1.000	0.0580	0.058	Vel = 4.52
H.21	109		0.0	0.75	Utb	0.0	2.000	150	29.568	
to					Utr	0.0	19.000		0.0	
T.44	109		4.98	0.671			21.000	0.0580	1.219	Vel = 4.52
			0.0							
T.44			4.98						30.787	K Factor = 0.90
*New Path										
T.36	118		4.10	1			11.000	150	20.641	
to									3.898	
T.42	109		4.1	0.862			11.000	0.0119	0.131	Vel = 2.25
			0.0							
T.42			4.10						24.670	K Factor = 0.83
*New Path										
T.52	109		1.86	0.75	Utr	0.0	1.000	150	26.353	
to							2.000		0.0	
T.53	109		1.86	0.671			3.000	0.0093	0.028	Vel = 1.69
T.53	109		0.0	0.75	Utr	0.0	4.000	150	26.381	
to							2.000		0.0	
H.25	109		1.86	0.671			6.000	0.0095	0.057	Vel = 1.69
H.25	109		0.0	0.75	Utr	0.0	8.000	150	26.438	
to							2.000		0.0	
T.55	109		1.86	0.671			10.000	0.0094	0.094	Vel = 1.69
T.55	109		-0.41	0.75	Utr	0.0	2.000	150	26.532	
to							2.000		0.0	
T.56	109		1.45	0.671			4.000	0.0058	0.023	Vel = 1.32
T.56	109		0.41	0.75	Utr	0.0	17.000	150	26.555	
to							2.000		0.0	
H.29	109		1.86	0.671			19.000	0.0094	0.179	Vel = 1.69
H.29	109		0.0	0.75			10.000	150	26.734	
to									0.0	
H.30	109		1.86	0.671			10.000	0.0095	0.095	Vel = 1.69

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
H.30	109		0.0	0.75	Utr	0.0	13.000	150	26.829	
to							2.000		0.0	
H.28	109		1.86	0.671			15.000	0.0094	0.141	Vel = 1.69
H.28	109		0.0	0.75	Utr	0.0	8.000	150	26.970	
to							2.000		0.0	
T.57	109		1.86	0.671			10.000	0.0094	0.094	Vel = 1.69
T.57	109		0.0	0.75	Utr	0.0	13.000	150	27.064	
to							2.000		0.0	
T.51	109		1.86	0.671			15.000	0.0095	0.142	Vel = 1.69
			0.0							
T.51			1.86						27.206	K Factor = 0.36
*New Path										
T.55	109		0.42	0.75	Utb	0.0	2.000	150	26.532	
to					Utr	0.0	19.000		0.0	
H.27	109		0.42	0.671			21.000	0.0006	0.012	Vel = 0.38
H.27	109		0.0	0.75	Utb	0.0	2.000	150	26.544	
to							17.000		0.0	
T.56	109		0.42	0.671			19.000	0.0006	0.011	Vel = 0.38
			0.0							
T.56			0.42						26.555	K Factor = 0.08
*New Path										
T.48	109		1.03	0.75	Utb	0.0	6.000	150	27.612	
to					Utr	0.0	19.000		0.0	
H.24	109		1.03	0.671			25.000	0.0031	0.078	Vel = 0.93
H.24	109		0.0	0.75	Utb	0.0	6.000	150	27.690	
to							17.000		0.0	
T.47	109		1.03	0.671			23.000	0.0032	0.073	Vel = 0.93
			0.0							
T.47			1.03						27.763	K Factor = 0.20
*New Path										
T.46	109		0.84	0.75	Utb	0.0	11.000	150	29.387	
to					Utr	0.0	19.000		0.0	
H.26	109		0.84	0.671			30.000	0.0022	0.065	Vel = 0.76
H.26	109		0.0	0.75	Utb	0.0	10.000	150	29.452	
to							17.000		0.0	
T.45	109		0.84	0.671			27.000	0.0021	0.058	Vel = 0.76
			0.0							
T.45			0.84						29.510	K Factor = 0.15
*New Path										
T.38	118		1.75	0.75	Utb	0.0	10.000	150	25.987	
to					Utr	0.0	19.000		0.0	
H.10	118		1.75	0.671			29.000	0.0083	0.242	Vel = 1.59
H.10	118		0.0	0.75	Utb	0.0	13.000	150	26.229	
to							17.000		0.0	
T.37	118		1.75	0.671			30.000	0.0084	0.251	Vel = 1.59
			0.0							
T.37			1.75						26.480	K Factor = 0.34

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*******	Notes	******

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am NICET Certified.

Tim W McDonald Date: 07/22/2022

NICET Certification No. 150393
Water-Based Systems Layout - Level III
Certification Expires: June 1, 2025

AquaSAFE™ Fire Safety System

Hydratec Incorporated
64 Haverhill Road
Route 111
Windham, NH 03087
603-434-0502

Job Name	:	HAWTHORNE ESTATES - CAMBRIDGE - Two Head Calculation (H.6 & H.5)
Drawing	:	RESIDENTIAL
Location	:	SE HAWTHORNE MEADOWS ST PORTLAND OR 97236
Remote Area	:	1
Contract	:	42892F 004
Data File	:	42892F 004 Hawthorne Estates - Cambridge.wx2
Date/Time	:	07/22/2022 - 12:54 PM

HYDRAULIC DESIGN INFORMATION SHEET

Name - HAWTHORNE ESTATES - CAMBRIDGE Date - 7/21/2022
Location - PORTLAND OR 97236
Building - RESIDENTIAL System No. - 1
Contractor - WOLCOTT PLUMBING Contract No. - 42892F 004
Calculated By - SILVIU RADES Drawing No. - F100
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height VARIES
OCCUPANCY - RESIDENTIAL

SYSTEM DESIGN

Type of Calculation: ( )NFPA 13 Residential ( )NFPA 13R (X)NFPA 13D
Number of Sprinklers Flowing: ( )1 (X)2 ( )4 ( )
( )Other
( )Specific Ruling Made by Date

Listed Flow at Start Point - 13 Gpm System Type
Listed Pres. at Start Point - 7.04 Psi (X) Wet ( ) Dry
MAXIMUM LISTED SPACING 16 x 16 ( ) Deluge ( ) PreAction
Domestic Flow Added - 0 Gpm Sprinkler or Nozzle
Additional Flow Added - Gpm Make SENJU Model RC-RES
Elevation at Highest Outlet - 118 Feet Size 7/16 K-Factor 4.9
Note: Temperature Rating 162

Calculation Summary: Gpm Required 26.1335 Psi Required 90.23 At Ref Pt STR
C-Factor Used: Overhead 150 Underground 150

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - x	Rated Cap.	Cap.
Time of Test - x	@ Psi	Elev.
Static (Psi) - 112	Elev.	
Residual (Psi) - 97	Other	Well
Flow (Gpm) - 300		Proof Flow Gpm
Elevation - 97		

PLOT PLAN

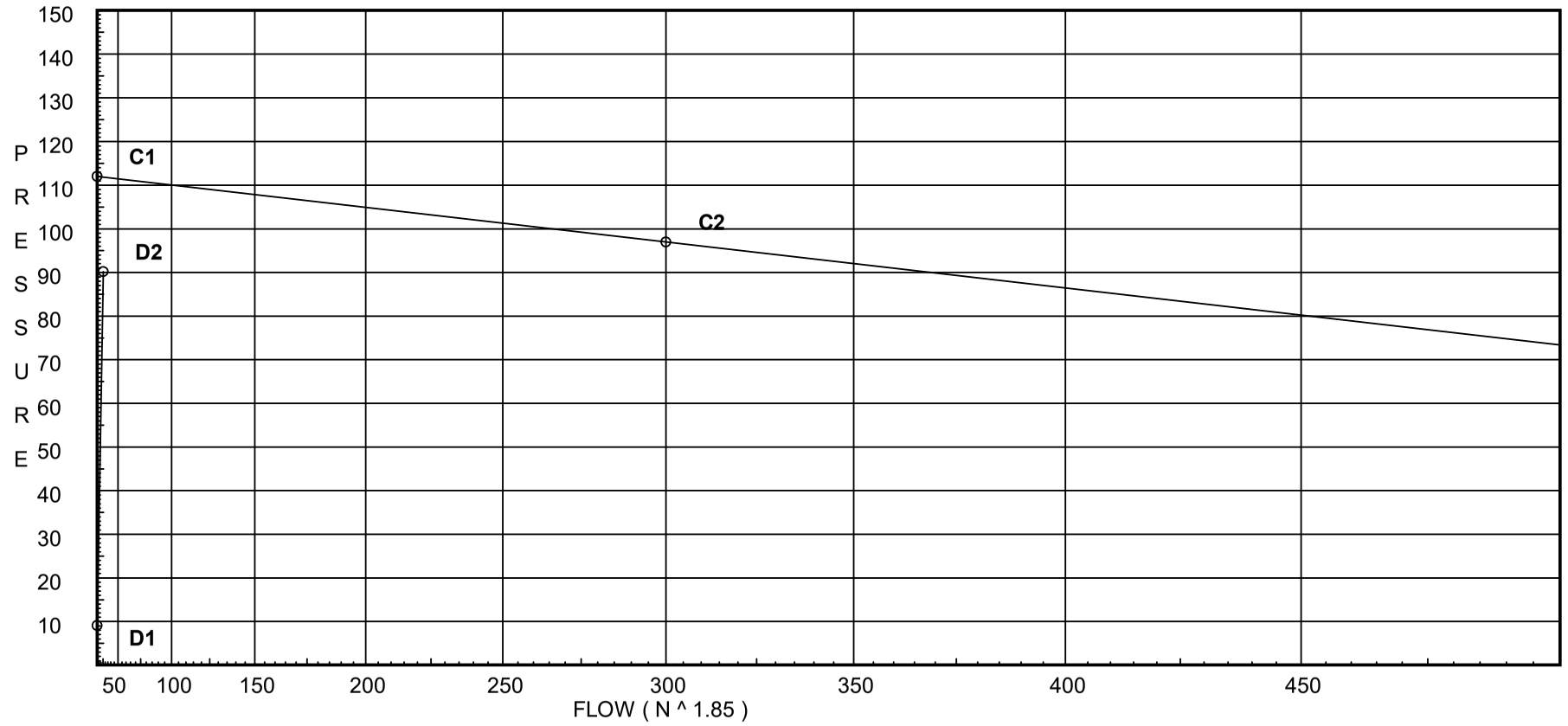
Location: STREET

Source of Information: CONTRACTOR

City Water Supply:
- C1 - Static Pressure : 112
- C2 - Residual Pressure: 97
- C2 - Residual Flow : 300

Demand:

D1 - Elevation	: 9.095
D2 - System Flow	: 26.134
D2 - System Pressure	: 90.226
Hose (Demand)	:
D3 - System Demand	: 26.134
Safety Margin	: 21.610



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

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

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

SUPPLY ANALYSIS

Node at Source	*Static Pressure*	*Residual Pressure*	*Flow*	*Available Pressure*	*Total Demand*	*Required Pressure*
STR	112.0	97	300.0	111.836	26.13	90.226

NODE ANALYSIS

Node Tag	*Elevation*	*Node Type*	*Pressure at Node*	*Discharge at Node*	*Notes*	
H.6	118.0	4.9	7.04	13.0	0.05	256
H.4	118.0		10.12			
H.7	118.0		13.21			
H.8	118.0		15.58			
T.35	118.0		20.32			
T.38	118.0		25.99			
T.49	109.0		31.33			
T.50	109.0		31.73			
T.54	109.0		32.28			
S.1	109.0		35.1			
PRV	97.0		69.11			
SOV	97.0		69.23			
MTR	97.0		80.85			
STR	97.0		90.23			
H.5	118.0	4.9	7.18	13.13	0.05	256
T.34	118.0		16.62			
T.36	118.0		20.64			
H.12	118.0		22.3			
H.11	118.0		22.7			
H.13	118.0		23.96			
T.39	118.0		24.65			
H.9	118.0		25.11			
T.37	118.0		26.48			
H.1	118.0		18.01			
T.32	118.0		20.32			
T.41	109.0		24.52			
H.14	109.0		26.37			
H.18	109.0		27.3			
H.17	109.0		27.94			
H.16	109.0		28.79			
T.44	109.0		30.79			
T.43	109.0		30.86			
H.3	118.0		20.32			
H.2	118.0		20.32			
T.33	118.0		20.32			
H.15	109.0		24.58			
H.19	109.0		24.61			
T.42	109.0		24.67			
H.20	109.0		26.0			
T.52	109.0		26.35			
T.51	109.0		27.21			
T.48	109.0		27.61			

NODE ANALYSIS (cont.)

Node Tag	*Elevation*	*Node Type*	*Pressure at Node*	*Discharge at Node*	*Notes*
T.47	109.0		27.76		
H.23	109.0		28.11		
H.22	109.0		28.75		
T.46	109.0		29.39		
T.45	109.0		29.51		
H.21	109.0		29.57		
T.53	109.0		26.38		
H.25	109.0		26.44		
T.55	109.0		26.53		
T.56	109.0		26.56		
H.29	109.0		26.73		
H.30	109.0		26.83		
H.28	109.0		26.97		
T.57	109.0		27.06		
H.27	109.0		26.54		
H.24	109.0		27.69		
H.26	109.0		29.45		
H.10	118.0		26.23		

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
*Remote Head to Supply										
H.6	118	4.90	10.67	0.75	Utr	0.0	11.000	150	7.040	
to							2.000		0.0	
H.4	118		10.67	0.671			13.000	0.2372	3.083	Vel = 9.68
H.4	118		0.0	0.75	Utr	0.0	11.000	150	10.123	
to							2.000		0.0	
H.7	118		10.67	0.671			13.000	0.2372	3.083	Vel = 9.68
H.7	118		0.0	0.75			10.000	150	13.206	
to									0.0	
H.8	118		10.67	0.671			10.000	0.2372	2.372	Vel = 9.68
H.8	118		0.0	0.75	Utb	0.0	1.000	150	15.578	
to					Utr	0.0	19.000		0.0	
T.35	118		10.67	0.671			20.000	0.2372	4.744	Vel = 9.68
T.35	118		-0.03	0.75	Utb	0.0	7.000	150	20.322	
to							17.000		0.0	
T.38	118		10.64	0.671			24.000	0.2360	5.665	Vel = 9.65
T.38	118		-1.75	1	Utb	0.0	14.848	150	25.987	
to							14.000		3.898	
T.49	109		8.89	0.862			28.848	0.0500	1.443	Vel = 4.89
T.49	109		10.55	1.25	Utr	0.0	1.000	150	31.328	
to							4.000		0.0	
T.50	109		19.44	1.054			5.000	0.0798	0.399	Vel = 7.15
T.50	109		6.69	1.25			4.000	150	31.727	
to									0.0	
T.54	109		26.13	1.054			4.000	0.1380	0.552	Vel = 9.61
T.54	109		0.0	1.25	Uel	0.0	7.000	150	32.279	
to					T	2.44	13.440		0.0	
S.1	109		26.13	1.054			20.440	0.1380	2.821	Vel = 9.61
S.1	109		0.0	1.25	E	2.746	5.000	150	35.100	
to					T	5.492	8.237		33.197	* * Fixed Loss = 28
PRV	97		26.13	1.245			13.237	0.0613	0.812	Vel = 6.89
PRV	97		0.0	1.25			2.000	150	69.109	
to									0.0	
SOV	97		26.13	1.245			2.000	0.0615	0.123	Vel = 6.89
SOV	97		0.0	1.25	2E	2.44	60.000	150	69.232	
to							2.440		3.000	* * Fixed Loss = 3
MTR	97		26.13	1.054			62.440	0.1380	8.618	Vel = 9.61
MTR	97		0.0	1	2E	4.673	40.000	150	80.850	
to					G	0.0	5.841		1.000	* * Fixed Loss = 1
STR	97		26.13	0.995			45.841	0.1827	8.376	Vel = 10.78
			0.0							
STR			26.13						90.226	K Factor = 2.75
*New Path										
H.6	118		2.34	0.75			10.000	150	7.040	
to									0.0	
H.5	118		2.34	0.671			10.000	0.0143	0.143	Vel = 2.12
H.5	118	4.90	13.13	0.75	Utb	0.0	1.000	150	7.183	
to					Utr	0.0	19.000		0.0	
T.34	118		15.47	0.671			20.000	0.4716	9.433	Vel = 14.04

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
T.34	118		-6.42	0.75	Utb	0.0	6.000	150	16.616	
to							17.000		0.0	
T.36	118		9.05	0.671			23.000	0.1750	4.025	Vel = 8.21
T.36	118		-4.10	0.75	Utb	0.0	10.000	150	20.641	
to					Utr	0.0	19.000		0.0	
H.12	118		4.95	0.671			29.000	0.0572	1.660	Vel = 4.49
H.12	118		0.0	0.75	Utr	0.0	5.000	150	22.301	
to							2.000		0.0	
H.11	118		4.95	0.671			7.000	0.0573	0.401	Vel = 4.49
H.11	118		0.0	0.75	Utr	0.0	20.000	150	22.702	
to							2.000		0.0	
H.13	118		4.95	0.671			22.000	0.0572	1.259	Vel = 4.49
H.13	118		0.0	0.75			12.000	150	23.961	
to									0.0	
T.39	118		4.95	0.671			12.000	0.0572	0.687	Vel = 4.49
T.39	118		0.0	0.75	Utr	0.0	6.000	150	24.648	
to							2.000		0.0	
H.9	118		4.95	0.671			8.000	0.0572	0.458	Vel = 4.49
H.9	118		0.0	0.75	Utb	0.0	5.000	150	25.106	
to					Utr	0.0	19.000		0.0	
T.37	118		4.95	0.671			24.000	0.0572	1.374	Vel = 4.49
T.37	118		1.74	1	Utb	0.0	31.625	150	26.480	
to							14.000		3.898	
T.50	109		6.69	0.862			45.625	0.0296	1.349	Vel = 3.68
			0.0							
T.50			6.69						31.727	K Factor = 1.19
*New Path										
T.34	118		6.42	0.75	Utr	0.0	13.000	150	16.616	
to							2.000		0.0	
H.1	118		6.42	0.671			15.000	0.0927	1.390	Vel = 5.82
H.1	118		0.0	0.75	Utb	0.0	6.000	150	18.006	
to					Utr	0.0	19.000		0.0	
T.32	118		6.42	0.671			25.000	0.0926	2.316	Vel = 5.82
T.32	118		0.02	1			11.000	150	20.322	
to									3.898	
T.41	109		6.44	0.862			11.000	0.0275	0.303	Vel = 3.54
T.41	109		-0.88	0.75	Utb	0.0	7.000	150	24.523	
to					Utr	0.0	19.000		0.0	
H.14	109		5.56	0.671			26.000	0.0712	1.851	Vel = 5.04
H.14	109		0.0	0.75	Utr	0.0	11.000	150	26.374	
to							2.000		0.0	
H.18	109		5.56	0.671			13.000	0.0712	0.925	Vel = 5.04
H.18	109		0.0	0.75			9.000	150	27.299	
to									0.0	
H.17	109		5.56	0.671			9.000	0.0712	0.641	Vel = 5.04
H.17	109		0.0	0.75	Utr	0.0	10.000	150	27.940	
to							2.000		0.0	
H.16	109		5.56	0.671			12.000	0.0712	0.854	Vel = 5.04

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
H.16	109		0.0	0.75	Utb	0.0	11.000	150	28.794	
to							17.000		0.0	
T.44	109		5.56	0.671			28.000	0.0712	1.993	Vel = 5.04
T.44	109		4.99	1.25			3.000	150	30.787	
to									0.0	
T.43	109		10.55	1.054			3.000	0.0257	0.077	Vel = 3.88
T.43	109		0.0	1.25	Utr	0.0	3.000	150	30.864	
to					Uel	0.0	15.000		0.0	
T.49	109		10.55	1.054			18.000	0.0258	0.464	Vel = 3.88
			0.0							
T.49			10.55						31.328	K Factor = 1.88
*New Path										
T.35	118		0.03	0.75	Utr	0.0	16.000	150	20.322	
to							2.000		0.0	
H.3	118		0.03	0.671			18.000	0	0.0	Vel = 0.03
H.3	118		0.0	0.75	Utr	0.0	20.000	150	20.322	
to							2.000		0.0	
H.2	118		0.03	0.671			22.000	0	0.0	Vel = 0.03
H.2	118		0.0	0.75	Utr	0.0	1.000	150	20.322	
to							2.000		0.0	
T.33	118		0.03	0.671			3.000	0	0.0	Vel = 0.03
T.33	118		0.0	0.75	Utr	0.0	7.000	150	20.322	
to					Utb	0.0	19.000		0.0	
T.32	118		0.03	0.671			26.000	0	0.0	Vel = 0.03
			0.0							
T.32			0.03						20.322	K Factor = 0.01
*New Path										
T.41	109		0.88	0.75	Utb	0.0	5.000	150	24.523	
to					Utr	0.0	19.000		0.0	
H.15	109		0.88	0.671			24.000	0.0023	0.056	Vel = 0.80
H.15	109		0.0	0.75	Utr	0.0	11.000	150	24.579	
to							2.000		0.0	
H.19	109		0.88	0.671			13.000	0.0024	0.031	Vel = 0.80
H.19	109		0.0	0.75	Utb	0.0	9.000	150	24.610	
to							17.000		0.0	
T.42	109		0.88	0.671			26.000	0.0023	0.060	Vel = 0.80
T.42	109		4.10	0.75	Utb	0.0	4.000	150	24.670	
to					Utr	0.0	19.000		0.0	
H.20	109		4.98	0.671			23.000	0.0580	1.335	Vel = 4.52
H.20	109		0.0	0.75	Utr	0.0	4.000	150	26.005	
to							2.000		0.0	
T.52	109		4.98	0.671			6.000	0.0580	0.348	Vel = 4.52
T.52	109		-1.86	0.75	2Utb	0.0	1.000	150	26.353	
to							34.000		0.0	
T.51	109		3.12	0.671			35.000	0.0244	0.853	Vel = 2.83
T.51	109		1.86	0.75	Utr	0.0	5.000	150	27.206	
to							2.000		0.0	
T.48	109		4.98	0.671			7.000	0.0580	0.406	Vel = 4.52

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
T.48	109		-1.03	0.75	Utr	0.0	2.000	150	27.612	
to							2.000		0.0	
T.47	109		3.95	0.671			4.000	0.0378	0.151	Vel = 3.58
T.47	109		1.03	0.75			6.000	150	27.763	
to									0.0	
H.23	109		4.98	0.671			6.000	0.0580	0.348	Vel = 4.52
H.23	109		0.0	0.75	Utr	0.0	9.000	150	28.111	
to							2.000		0.0	
H.22	109		4.98	0.671			11.000	0.0580	0.638	Vel = 4.52
H.22	109		0.0	0.75	Utr	0.0	9.000	150	28.749	
to							2.000		0.0	
T.46	109		4.98	0.671			11.000	0.0580	0.638	Vel = 4.52
T.46	109		-0.84	0.75	Utr	0.0	1.000	150	29.387	
to							2.000		0.0	
T.45	109		4.14	0.671			3.000	0.0410	0.123	Vel = 3.76
T.45	109		0.84	0.75			1.000	150	29.510	
to									0.0	
H.21	109		4.98	0.671			1.000	0.0580	0.058	Vel = 4.52
H.21	109		0.0	0.75	Utb	0.0	2.000	150	29.568	
to					Utr	0.0	19.000		0.0	
T.44	109		4.98	0.671			21.000	0.0580	1.219	Vel = 4.52
			0.0							
T.44			4.98						30.787	K Factor = 0.90
*New Path										
T.36	118		4.10	1			11.000	150	20.641	
to									3.898	
T.42	109		4.1	0.862			11.000	0.0119	0.131	Vel = 2.25
			0.0							
T.42			4.10						24.670	K Factor = 0.83
*New Path										
T.52	109		1.86	0.75	Utr	0.0	1.000	150	26.353	
to							2.000		0.0	
T.53	109		1.86	0.671			3.000	0.0093	0.028	Vel = 1.69
T.53	109		0.0	0.75	Utr	0.0	4.000	150	26.381	
to							2.000		0.0	
H.25	109		1.86	0.671			6.000	0.0095	0.057	Vel = 1.69
H.25	109		0.0	0.75	Utr	0.0	8.000	150	26.438	
to							2.000		0.0	
T.55	109		1.86	0.671			10.000	0.0094	0.094	Vel = 1.69
T.55	109		-0.41	0.75	Utr	0.0	2.000	150	26.532	
to							2.000		0.0	
T.56	109		1.45	0.671			4.000	0.0058	0.023	Vel = 1.32
T.56	109		0.41	0.75	Utr	0.0	17.000	150	26.555	
to							2.000		0.0	
H.29	109		1.86	0.671			19.000	0.0094	0.179	Vel = 1.69
H.29	109		0.0	0.75			10.000	150	26.734	
to									0.0	
H.30	109		1.86	0.671			10.000	0.0095	0.095	Vel = 1.69

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
H.30	109		0.0	0.75	Utr	0.0	13.000	150	26.829	
to							2.000		0.0	
H.28	109		1.86	0.671			15.000	0.0094	0.141	Vel = 1.69
H.28	109		0.0	0.75	Utr	0.0	8.000	150	26.970	
to							2.000		0.0	
T.57	109		1.86	0.671			10.000	0.0094	0.094	Vel = 1.69
T.57	109		0.0	0.75	Utr	0.0	13.000	150	27.064	
to							2.000		0.0	
T.51	109		1.86	0.671			15.000	0.0095	0.142	Vel = 1.69
			0.0							
T.51			1.86						27.206	K Factor = 0.36
*New Path										
T.55	109		0.42	0.75	Utb	0.0	2.000	150	26.532	
to					Utr	0.0	19.000		0.0	
H.27	109		0.42	0.671			21.000	0.0006	0.012	Vel = 0.38
H.27	109		0.0	0.75	Utb	0.0	2.000	150	26.544	
to							17.000		0.0	
T.56	109		0.42	0.671			19.000	0.0006	0.011	Vel = 0.38
			0.0							
T.56			0.42						26.555	K Factor = 0.08
*New Path										
T.48	109		1.03	0.75	Utb	0.0	6.000	150	27.612	
to					Utr	0.0	19.000		0.0	
H.24	109		1.03	0.671			25.000	0.0031	0.078	Vel = 0.93
H.24	109		0.0	0.75	Utb	0.0	6.000	150	27.690	
to							17.000		0.0	
T.47	109		1.03	0.671			23.000	0.0032	0.073	Vel = 0.93
			0.0							
T.47			1.03						27.763	K Factor = 0.20
*New Path										
T.46	109		0.84	0.75	Utb	0.0	11.000	150	29.387	
to					Utr	0.0	19.000		0.0	
H.26	109		0.84	0.671			30.000	0.0022	0.065	Vel = 0.76
H.26	109		0.0	0.75	Utb	0.0	10.000	150	29.452	
to							17.000		0.0	
T.45	109		0.84	0.671			27.000	0.0021	0.058	Vel = 0.76
			0.0							
T.45			0.84						29.510	K Factor = 0.15
*New Path										
T.38	118		1.75	0.75	Utb	0.0	10.000	150	25.987	
to					Utr	0.0	19.000		0.0	
H.10	118		1.75	0.671			29.000	0.0083	0.242	Vel = 1.59
H.10	118		0.0	0.75	Utb	0.0	13.000	150	26.229	
to							17.000		0.0	
T.37	118		1.75	0.671			30.000	0.0084	0.251	Vel = 1.59
			0.0							
T.37			1.75						26.480	K Factor = 0.34

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*******	Notes	******

Plumbing Checksheet Response

Permit #: 21-085113-REV-01-RS **Date:** 9/15/22

Customer name and phone number: Bradlee Hersey 503-913-8811

Note: In the spaces below, please provide specific information concerning the changes that you have made in response to the checksheet. Note the checksheet item number, your response or a description of the revision, and the location of the change on the plans (i.e. page number and/or detail number). Use as many lines as needed. *If the item is not in response to a checksheet, write **"Applicant"** in the column labeled "Checksheet item number."*

Checksheet item number	Description of changes, corrections, additions, etc.	Location on plans
	Plans and Calcs supplied, if further errors persist please	
	contact applicant to assist in resolving BDS routing issues	

SUBMITTED
09/15/2022

(for office use only)

RESIDENTIAL FIRE SPRINKLER CHECKSHEET

Application # **21-085113-REV-01-RS**

Residential 1 & 2 Family Permit

Review Date **August 25, 2022**

To:	**OWNER**	LENNAR NORTHWEST INC 11807 NE 99TH ST #1170 VANCOUVER, WA 98682-2350		
From:	**BDS Senior Plumbing Inspector**	James Bechtel	Phone Fax Email	503-823-6363 503 823-5433 Jim.Bechtel@portlandoregon.gov
cc:	**OWNER**	LENNAR NORTHWEST INC 11807 NE 99TH ST #1170 VANCOUVER, WA 98682-2350		

PROJECT INFORMATION

Street Address: 15421 SE FLAVEL ST

Description of Work: SINGLEPDF - REVISION TO THE FIRE SPRINKLERS PLANS

Item #	Location on Plans	Clarification / Correction Required
1		Provide scaled drawing with head locations per NFPA 13D
2		Provide sprinkler head cut sheets per NFPA 13D
3		Provide hydraulic calculations per NFPA 13D
4		

To respond to this Checksheet, you may need to revise your plans, your supporting documents, or provide additional information. When you finish with your changes, please submit your updated plans and supporting documents. Make sure to include the attached Checksheet Response Form. Visit the BDS Permit Review Process website for more helpful information and available services: https://www.portland.gov/bds/permit-review-process

If you want to report a delay, a regulatory conflict or other issue that you have been unable to resolve with your City review team, please visit https://www.portland.gov/bds/development-permit-processes/report-problem

If you have questions about this Checksheet, please contact me at the email address or phone number listed above. To check the status of your project, go to https://www.portlandmaps.com/advanced/?action=permits. Or you may request the status to be faxed to you, by calling 503.823.7000 and selecting option 4. Please have your IVR number and fax number available.

Application fees cover an initial plan review and two checksheets. Starting with the third checksheet, additional fees will be added. These fees are based on the current Fee Schedule: https://www.portland.gov/bds/current-fee-schedules#toc-city-of-portland-fee-schedules

Appeals: Pursuant to City Code Chapters 24.10, 25.07, 26.03, 27.02, and 28.03, you may appeal any code provision cited in this Checksheet to the BDS Administrative Board of Appeal within 180 calendar days of the review date. For information on the appeals process and costs, including forms, appeal fee, payment methods and fee waivers, go to www.portland.gov/bds/file-appeal or call (503) 823-7300 for assistance. Permit application expiration will not be extended pending resolution of any administrative appeal.
.