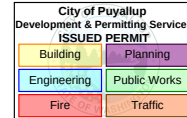


RED HAWK FIRE PROTECTION, LLC

801 Valley Ave NW, Suite D
Puyallup, WA 98371
(253) 840-9900

REDHAHF901QP



Ever Vigilant®

HYDRAULIC CALCULATIONS

FOR

Wesley Bradley Park – Phase 2
Puyallup, WA

RHFP JOB NO. 70120

 Expires DEC 31, 25	WASHINGTON STATE CERTIFICATE OF COMPETENCY FIRE SPRINKLER SYSTEMS
Travis Clifton Kinne 0835-1021-C Level 3 Red Hawk Fire Protection, LLC REDHAHF901QP	
 Signature	09/17/2025 Date

MEMORANDUM

TO: BRIAN JOHNSON, WATER SYSTEM
SPECIALIST
FROM: MAYA VITA, E.I.T.
KERRI SIDEBOTTOM, P.E.
DATE: MARCH 6, 2025
SUBJECT: WESLEY HOMES FIRE FLOW
AVAILABILITY – 707 39TH AVENUE SE
CITY OF PUYALLUP, PIERCE COUNTY,
WASHINGTON
G&O #21415.23

Per your request, we have analyzed the available fire flow at the Wesley Homes site located at 707 39th Avenue SE. The following assumptions used to determine the static pressure and available fire flow are noted as follows.

- The available fire flows and pressures are measured at six nodes, corresponding to five existing hydrants within the Wesley Homes site, as shown in the attached figure.
- Water system demands are based on projected 2038 demands and reservoirs are depleted of fire suppression and equalizing storage, as established in the *2019 Water System Plan (WSP)*, approved by the Washington State Department of Health (DOH). The City's water model was updated in 2021 to reflect additional system improvements since the WSP was developed.
- All pump stations are idle, and the Salmon Springs source is operating at 1,100 gallons per minute (gpm).

The site is located in Zone 4, which is supplied by the 39th Avenue SE Reservoir 1. The system was modeled with the piping indicated on the attached figure.

The available pressure under 2038 peak hour demands at the hydrants is included in Table 1.

TABLE 1

Modeled Fire Flow Availability

Node	Hydrant	Elevation, feet	Peak Hour Pressure, psi
J1832	SE 903	462	82
J1834	SE 905	473	77
J2434	SE 902	474	77
J2436	SE 901	472	78
J2438	SE 900	465	81
J2440	SE 904	470	78



March 6, 2025
Page 2

Available fire flow was modeled at six existing hydrants around the Wesley Homes site. All site piping is 12-inch ductile iron. The results of this modeling are included in Table 2. The modeled fire flow is available at either hydrant individually, but not simultaneously.

TABLE 2
Modeled Fire Flow Availability

Node	Hydrant	Modeled Fire Flow, gpm	Residual Pressure at Modeled Fire Flow, psi	Minimum System Pressure at Modeled Fire Flow, psi
J1832	SE 903	3,320 ⁽¹⁾	24	20
J1834	SE 905	3,250 ⁽¹⁾	20	20
J2434	SE 902	3,330 ⁽¹⁾	20	20
J2436	SE 901	3,350 ⁽¹⁾	21	20
J2438	SE 900	3,390 ⁽¹⁾	24	20
J2440	SE 904	3,340 ⁽¹⁾	21	20

(1) Limited by the minimum system-wide pressure requirement of 20 psi at all service locations.

Fire flow to the hydrants is limited by the 20-psi minimum system pressure.

The Department of Health and City Standards for water distribution systems are to meet the peak hourly demand of the system while providing a minimum pressure of 30 psi, system-wide. Under peak daily demand with a fire flow, the system is designed to maintain a minimum pressure of 20 psi, system-wide. Although the peak hourly demand pressure may currently be higher than these standards, the Developer must recognize that the City may not provide pressure higher than 30 psi in the future. The flows and pressures determined in this memo are based on the approximate hydrant elevation at ground level. The Developer may design their sprinkler system for whatever pressure they wish; however, they must recognize and be responsible for conditions when the pressure may be less than currently exists.

MV/sr

0 50 100 150 200 FEET

SE 509

THE MAP FEATURES ARE APPROXIMATE AND ARE INTENDED ONLY TO PROVIDE AN INDICATION OF SAID FEATURE. THIS IS NOT A SURVEY. THE CITY ASSUMES NO LIABILITY FOR VARIATIONS ASCERTAINED BY ACTUAL SURVEY. ALL DATA IS EXPRESSLY PROVIDED 'AS IS' AND 'WITH ALL FAULTS'. THE CITY MAKES NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

SE 508

3511

J2438

SE 900

707
BLDG A

J2436

SE 901

PARKING AREA

J1832

SE 903

12" D.I.

SE 902

J2434

SE 904

J2440

707
BLDG C

707
BLDG B

6" FIRE

2" SERVICE

707
BLDG E

SE 905

707
BLDG D

2" IRRIG.

J1834

SE 888

ZONE VALVE OFF

PUMP STATION

SE 499

SE 889

3" SERVICE
2" IRRIG.

8" D.I.

39TH AVE SE

16" D.I.

18" D.I.



CITY OF PUYALLUP
PUBLIC WORKS
WATER DIVISION

HYDRAULIC MODEL FOR WESLEY HOMES AT 707 39TH AVE SE

SCALE AS SHOWN

02/19/2025

COP\PW\WATER\S_MAINT\PDF\QSEC\
PG011\MODEL FOR 707 39TH AVE SE

Hydraulic Calculations

for

Project Name: BRADLEY PARK PHASE 2: (70120)

Location: 707 39TH AVE SE, BLDG D, , PUYALLUP, WA 98374

Drawing Name: 70120 Wesley Bradley Park R02 Site Plan and Stairs

Calculation Date: 9/12/2025

Design

Remote Area Number: STP

Remote Area Location: Stair A & Stair B

Occupancy Classification: Standpipe

Commodity Classification: N/A

Density 0.000gpm/ft²

Area of Application: 0.00ft² (Actual 36597.13ft²)

Coverage per Sprinkler: 0.00ft²

Type of sprinklers calculated: NA

No. of sprinklers calculated: 0

No. of nozzles calculated: 0

In-rack Demand: N/A gpm at Node: N/A

Hose Streams: 0.0 gpm at Node: S1 Type: Allowance at Source

250.00 at Node: S11 Type: Hose

250.00 at Node: S13 Type: Hose

250.00 at Node: S9 Type: Hose

Total Water Required (including Hose Streams where applicable):

From Water Supply at Node S1: 750.00 @ 150.785 (Safety Margin = 3.628)

Type of System: Wet

Volume of Dry/PreAction/Antifreeze/OtherAgent System: N/A

Name of Contractor: RED HAWK FIRE PROTECTION, LLC

Address: 801 VALLEY AVE NW, SUITE D, PUYALLUP, WA 98371

Phone Number: 253-202-7007

Name of designer: BROOKE MCDANIELS

Authority Having Jurisdiction: : CITY OF PUYALLUP

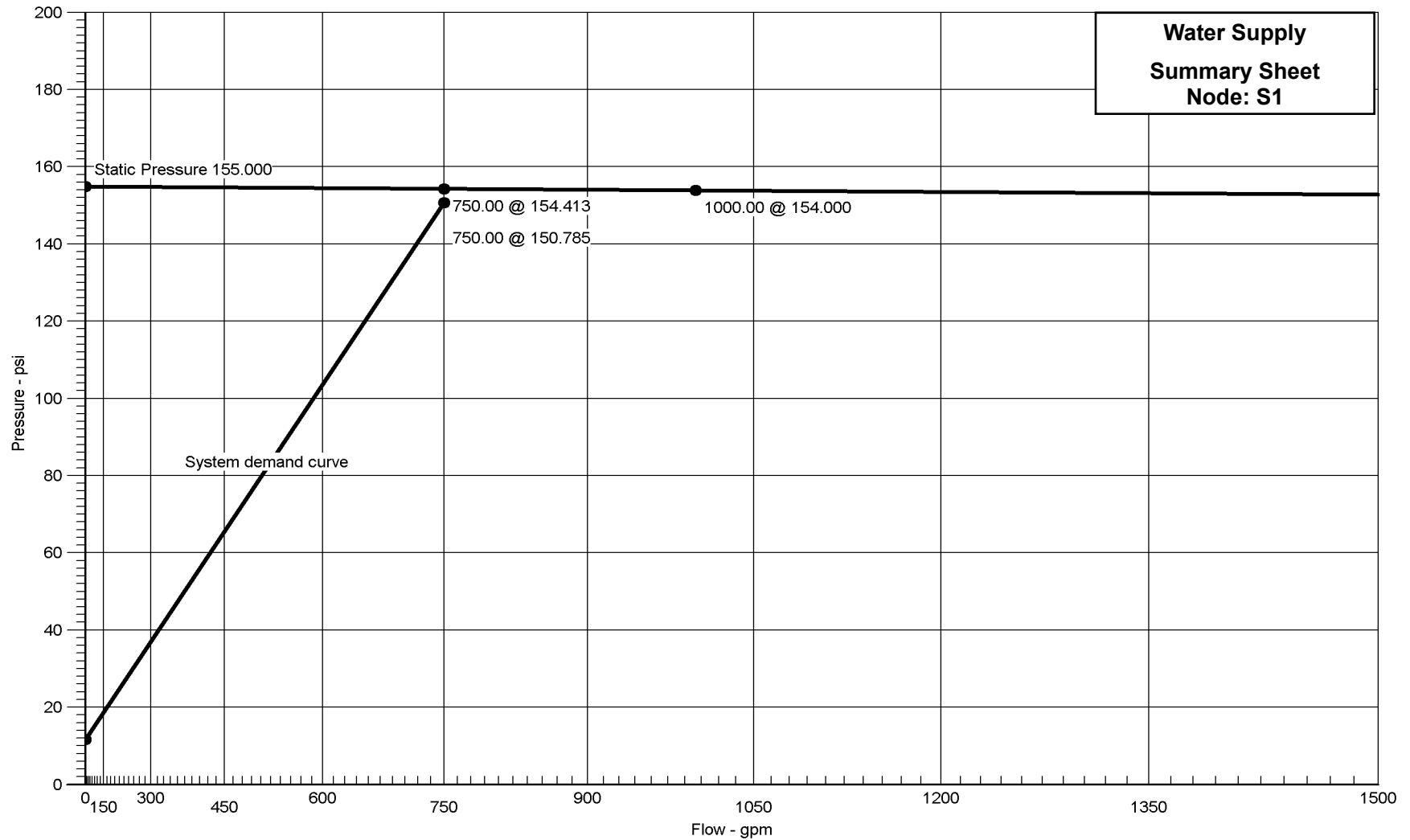
Notes:

Hydraulic Graph

Job Name: BRADLEY PARK PHASE 2
Remote Area Number: STP

N 1.85

Date: 9/12/2025



Supply:Static:155.000
Residual:154.000
Flowing:1000.00
Available Flow @ 20 PSI:14137.75



Summary Of Outflowing Devices

Job Number: 70120

Report Description: Standpipe (STP)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)			
Hose	S9	250.00	250.00	25	128.662			
Hose	S11	250.00	250.00	25	105.075			
Hose	S13	250.00	250.00	25	100.000			

⇒ Most Demanding Sprinkler Data

Supply Analysis

Node	Name	Static (psi)	Residual (psi) @	Flow (gpm)	Available (psi) @	Total Demand (gpm)	Required Pressure (psi)
S1	Water Supply	155.000	154.000	1000.00	154.413	750.00	150.785

Node Analysis

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
S1	98-6	Supply	150.785	750.00	
S9	125-8	Hose	128.662	250.00	Hose(-100.000)
S11	114-4	Hose	105.075	250.00	Hose(-100.000)
S13	125-8	Hose	100.000	250.00	Hose(-100.000)
S2	98-6		150.785		
S3	96-0		150.109		
S4	96-0		150.094		
S5	91-0	Supply	148.677		
S6	91-0		148.559		
S7	91-0		148.556		
S8	125-8		131.251		
S10	114-4		107.660		

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
	Node 2		Elev 2 (Foot)	Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	
Friction(Pf)									
S13	125-8		250.00	2½	(See Notes)	0-0	120	100.000	***** Route 1 ***** Hose(-100.000) PO(12-0), f(-0.000)
S12	125-8		250.00	2.4690		12-0	0.215409	0.004	
						12-0		2.585	
S12	125-8			4		11-4	120	102.589	
S10	114-4		250.00	4.3100			0.014287	4.909	
						11-4		0.162	
S10	114-4		250.00	4	(See Notes)	420-0½	120	107.660	Flow (q) from Route 2 T(22-3½), 4E(13-11), 2EE(5-7) , 5fE(9-5½), ALV(4-2), BV(-0.46 5), PO(27-10½)
S6	91-0		500.00	4.3100		168-7½	0.051504	10.116	
						588-8		30.784	
S6	91-0		250.00	6	(See Notes)	0-10½	120	148.559	Flow (q) from Route 3 sCV(6-3½)
S5	91-0		750.00	6.3570		6-3½	0.016432		
						7-2		0.118	
S5	91-0			4	(See Notes)	5-0	120	148.677	2E(13-11)
S4	96-0		750.00	4.3100		27-10½	0.109047	-2.168	
						32-10½		3.585	
S4	96-0			6		0-11	120	150.094	
S3	96-0		750.00	6.3570			0.016432		
						0-11		0.015	
S3	96-0			6	(See Notes)	100-11½	140	150.109	EE(11-0½), E(22-1), FDC
S2	98-6		750.00	6.2800		33-1	0.013110	-1.082	
						134-0½		1.757	
S2	98-6			5	(See Notes)	0-0	120	150.785	Water Supply
S1	98-6		750.00	5.0470			0.050553		
						0-0		0.000	
			0.00					150.785	Hose Allowance At Source
S1			750.00						Total(Pt) Route 1
S11	114-4		250.00	2½	(See Notes)	0-0	120	105.075	***** Route 2 ***** Hose(-100.000) PO(12-0)
S10	114-4		250.00	2.4690		12-0	0.215409		
						12-0		2.585	
								107.660	Total(Pt) Route 2

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
						Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Total (Foot)		Friction(Pf)	
S9	125-8		250.00	2½	(See Notes)	0-0	120	128.662	
S8	125-8		250.00	2.4690		12-0	0.215409	0.004	• • • • • Route 3 • • • • • Hose(-100.000) PO(12-0), f(-0.000)
						12-0		2.585	
S8	125-8			4	(See Notes)	59-6½	120	131.251	
S7	91-0		250.00	4.3100		95-0½	0.014287	15.025	
						154-7		2.280	
S7	91-0			6		1-8	120	148.556	
S6	91-0		250.00	6.3570			0.002153		
						1-8		0.004	
								148.559	Total(Pt) Route 3

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

C Value Multiplier

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

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

Fittings Legend

ALV	Alarm Valve	AngV	Angle Valve	b	Bushing
BaIV	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 Relief Valve
PRV	Pressure Reducing Valve	red	Reducer/Adapter	S	Supply
sCV	Swing Check Valve	SFx	Seismic Flex	Spr	Sprinkler
St	Strainer	T	Tee Flow Turn 90°	Tr	Tee Run
U	Union	WirF	Wirsbo	WMV	Water Meter Valve
Z	Cap				

Hydraulic Calculations

for

Project Name: BRADLEY PARK PHASE 2: (70120)

Location: 707 39TH AVE SE, BLDG D, , PUYALLUP, WA 98374

Drawing Name: 70120 Wesley Bradley Park R02 Level 0

Calculation Date: 9/16/2025

Design

Remote Area Number: L0-1
Remote Area Location: PARKING SOUTH 0001
Occupancy Classification: Ordinary Group I

Density 0.150gpm/ft²
Area of Application: 1950.00ft² (Actual 2034.92ft²)
Coverage per Sprinkler: 256.00ft²
Type of sprinklers calculated: Upright
No. of sprinklers calculated: 10
No. of nozzles calculated: 0

In-rack Demand: N/A gpm at Node: N/A
Hose Streams: 250.00 at Node: 1 Type: Allowance at Source

Total Water Required (including Hose Streams where applicable):
From Water Supply at Node 1: 718.67 @ 57.554 (Safety Margin = 15.950)
Type of System: DRY
Volume of Dry/PreAction/Antifreeze/OtherAgent System: 445.20gal

Name of Contractor: RED HAWK FIRE PROTECTION, LLC
Address: 801 VALLEY AVE NW, SUITE D, PUYALLUP, WA 98371
Phone Number: 253-202-7007
Name of designer: BROOKE MCDANIELS
Authority Having Jurisdiction: : CITY OF PUYALLUP

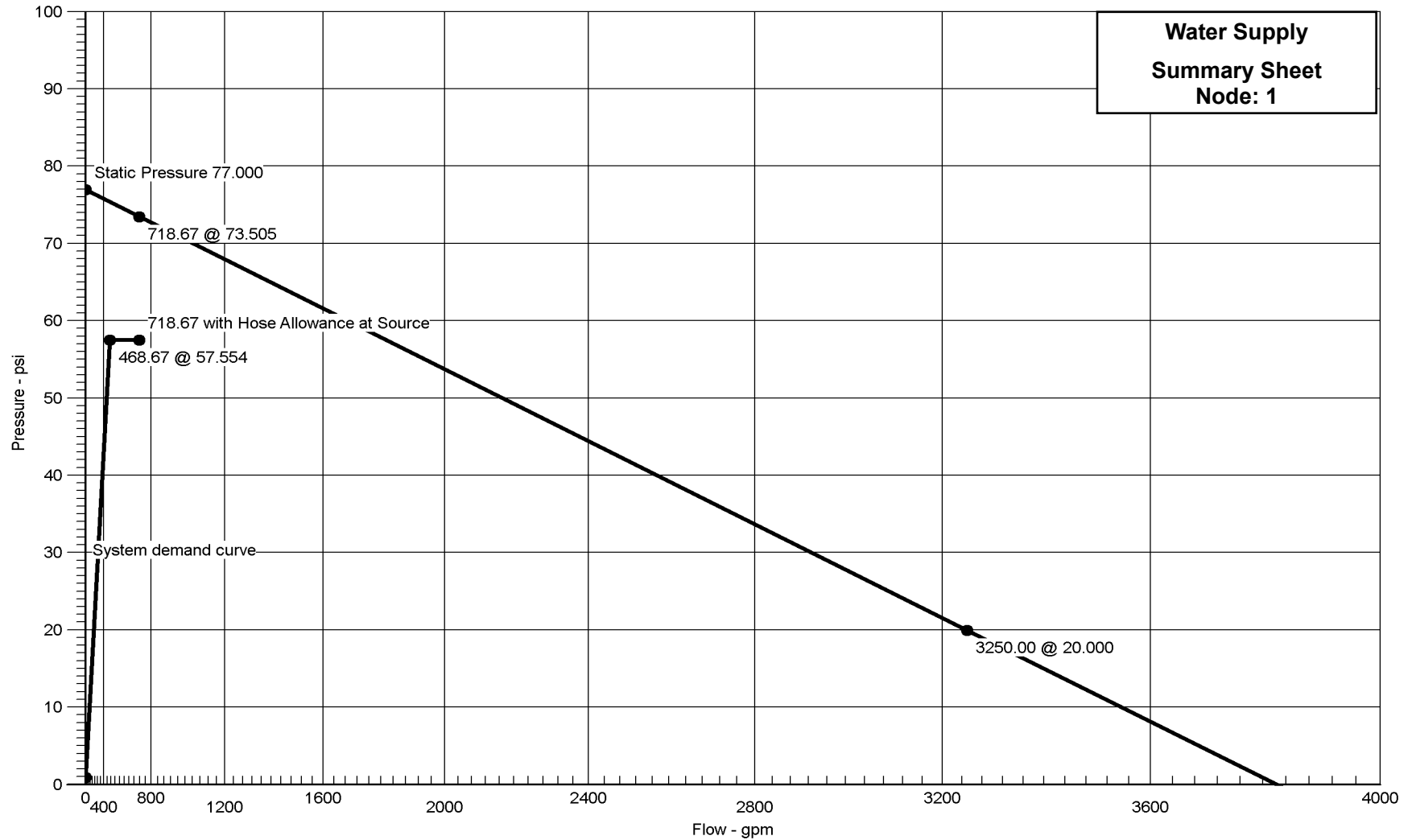
Notes:

Hydraulic Graph

Job Name: BRADLEY PARK PHASE 2
Remote Area Number: L0-1

N 1.85

Date: 9/16/2025



Supply:Static:77.000
Residual:20.000
Flowing:3250.00
Available Flow @ 20 PSI:3250.00



Summary Of Outflowing Devices

Job Number: 70120
Report Description: Ordinary Group I (L0-1)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)			
Sprinkler	1000	53.88	39.00	11.2	23.144			
Sprinkler	1001	45.88	39.00	11.2	16.779			
Sprinkler	1002	53.98	39.00	11.2	23.227			
Sprinkler	1003	40.74	39.00	11.2	13.230			
Sprinkler	1004	46.13	39.00	11.2	16.962			
Sprinkler	1005	54.33	39.00	11.2	23.531			
Sprinkler	1006	39.54	39.00	11.2	12.464			
Sprinkler	1007	40.63	39.00	11.2	13.161			
Sprinkler	1008	54.56	39.00	11.2	23.732			
⇒ Sprinkler	1009	39.00	39.00	11.2	12.125			

⇒ Most Demanding Sprinkler Data

Supply Analysis							
Node	Name	Static (psi)	Residual (psi)	@ Flow (gpm)	Available (psi)	@ Total Demand (gpm)	Required Pressure (psi)
1	Water Supply	77.000	20.000	3250.00	73.505	718.67	57.554
Node Analysis							
Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes		
1	95-6	Supply	57.554	468.67			
1000	97-6	Sprinkler	23.144	53.88			
1001	97-6	Sprinkler	16.779	45.88			
1002	97-6	Sprinkler	23.227	53.98			
1003	97-6½	Sprinkler	13.230	40.74			
1004	97-6½	Sprinkler	16.962	46.13			
1005	97-6½	Sprinkler	23.531	54.33			
1006	97-7½	Sprinkler	12.464	39.54			
1007	97-7	Sprinkler	13.161	40.63			
1008	97-6½	Sprinkler	23.732	54.56			
1009	97-8	Sprinkler	12.125	39.00			
2	95-6		57.444				
3	95-6		57.428				
4	95-6		56.727				
7	91-0		56.752				
8	91-0		56.491				
12	97-4½		50.790				
100	97-5½		24.559				

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
101	97-6½		14.010		
102	97-6		24.647		
103	97-6		24.697		
104	97-6		24.827		
105	97-6		24.968		
106	97-6½		25.392		
107	97-6½		26.028		
108	97-7		27.025		

Pipe Information

Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot) Total (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe) Friction(Pf)	Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
1009	97-8	11.2	39.00	1½	(See Notes)	16-0	100	12.125	Route 1..... Sprinkler
1007	97-7		39.00	1.6820			0.062927	0.029	
						16-0		1.007	
1007	97-7	11.2	40.63	1½	(See Notes)	16-0	100	13.161	Sprinkler
							0.235707	0.029	
1004	97-6½		79.63	1.6820		16-0		3.772	
1004	97-6½	11.2	46.13	1½	(See Notes)	7-0	100	16.962	Sprinkler, PO(7-0½)
						7-0½	0.548924	0.013	
103	97-6		125.76	1.6820		14-1		7.721	
103	97-6		234.02	4		4-6	120	24.697	Flow (q) from Route 2
							0.029654	-0.004	
104	97-6		359.77	4.2600		4-6		0.134	
104	97-6			4		3-6	100	24.827	
							0.041550	-0.003	
105	97-6		359.77	4.2600		3-6		0.145	
105	97-6		54.33	4		8-0	100	24.968	Flow (q) from Route 5
							0.053897	-0.007	
106	97-6½		414.11	4.2600		8-0		0.431	
106	97-6½		54.56	4		9-6	100	25.392	Flow (q) from Route 6
							0.067766	-0.009	
107	97-6½		468.67	4.2600		9-6		0.645	
107	97-6½			4		21-0	120	26.028	
							0.048364	-0.019	
108	97-7		468.67	4.2600		21-0		1.016	
108	97-7			4	(See Notes)	304-4	100	27.025	2EE(3-9), Tr(6-9½), fT(15-0½), fE(6-4½), E(9-4½)
						45-1	0.067766	0.085	
12	97-4½		468.67	4.2600		349-5		23.679	
12	97-4½			4	(See Notes)	4-10	100	50.790	DPV(8-4½), BV(11-3), PO(18-9 ½)
						38-5	0.067766	2.771	
8	91-0		468.67	4.2600		43-3		2.930	
8	91-0			6	(See Notes)	2-7½	120	56.491	2E(17-7)
						35-2½	0.006885		
7	91-0		468.67	6.3570		37-10		0.261	

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
						Total (Foot)		Friction(Pf)	
7	91-0			6	(See Notes)	0-0	120	56.752	BFP(-1.652)
508	91-0		468.67	6.3570			0.006885		
						0-0		1.652	
508	91-0			6	(See Notes)	6-10	150	58.404	2E(26-7)
4	95-6		468.67	6.3570		53-2	0.004556	-1.951	
						60-0		0.273	
4	95-6			6	(See Notes)	85-0½	140	56.727	EE(11-0½), 2GV(4-8½), E(22-1)
3	95-6		468.67	6.2800		42-6½	0.005493		
						127-7½		0.701	
3	95-6			12	(See Notes)	37-11	140	57.428	E(44-3)
2	95-6		468.67	12.4600		44-3	0.000195		
						82-2		0.016	
2	95-6			6	(See Notes)	15-5	140	57.444	GV(4-8½), S
1	95-6		468.67	6.2800		4-8½	0.005493		
						20-2		0.111	
			250.00					57.554	Hose Allowance At Source
1			718.67						Total(Pt) Route 1
1006	97-7½	11.2	39.54	1½	(See Notes)	16-0	120	12.464	 Route 2 Sprinkler
1003	97-6½		39.54	1.6820			0.046071	0.029	
						16-0		0.737	
1003	97-6½	11.2	40.74	1½	(See Notes)	4-6	120	13.230	Sprinkler
101	97-6½		80.28	1.6820			0.170767	0.008	
						4-6		0.772	
101	97-6½			1½		11-6	100	14.010	
1001	97-6		80.28	1.6820			0.239270	0.021	
						11-6		2.747	
1001	97-6	11.2	45.88	1½	(See Notes)	7-0	100	16.779	Sprinkler, PO(7-0½)
100	97-5½		126.16	1.6820		7-0½	0.552146	0.013	
						14-1		7.767	
100	97-5½		53.88	4		12-0	120	24.559	Flow (q) from Route 3
102	97-6		180.04	4.2600			0.008239	-0.011	
						12-0		0.099	

Pipe Information										
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.	
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)		
						Total (Foot)		Friction(Pf)		
102	97-6		53.98	4		4-0	120	24.647	Flow (q) from Route 4	
										-0.004
103	97-6		234.02	4.2600		4-0	0.013382	0.054		
								24.697	Total(Pt) Route 2	
1000	97-6	11.2	53.88	1½	(See Notes)	5-2½	100	23.144	••••• Route 3 ••••• Sprinkler, PO(7-0½)	
						7-0½	0.114425	0.010		
100	97-5½		53.88	1.6820		12-3½		1.405		
								24.559	Total(Pt) Route 3	
1002	97-6	11.2	53.98	1½	(See Notes)	5-2½	100	23.227	••••• Route 4 ••••• Sprinkler, PO(7-0½)	
						7-0½	0.114806	0.010		
102	97-6		53.98	1.6820		12-3½		1.410		
								24.647	Total(Pt) Route 4	
1005	97-6½	11.2	54.33	1½	(See Notes)	5-2½	100	23.531	••••• Route 5 ••••• Sprinkler, PO(7-0½)	
						7-0½	0.116196	0.010		
105	97-6		54.33	1.6820		12-3½		1.427		
								24.968	Total(Pt) Route 5	
1008	97-6½	11.2	54.56	1½	(See Notes)	7-0	100	23.732	••••• Route 6 ••••• Sprinkler, PO(7-0½)	
						7-0½	0.117111	0.013		
106	97-6½		54.56	1.6820		14-1		1.647		
								25.392	Total(Pt) Route 6	

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

C Value Multiplier

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

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

Fittings Legend

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

Hydraulic Calculations

for

Project Name: BRADLEY PARK PHASE 2: (70120)

Location: 707 39TH AVE SE, BLDG D, , PUYALLUP, WA 98374

Drawing Name: 70120 Wesley Bradley Park R02 Level 0

Calculation Date: 9/16/2025

Design

Remote Area Number: L0-2
Remote Area Location: STORAGE 0015
Occupancy Classification: Ordinary Group II

Density 0.200gpm/ft²
Area of Application: 1950.00ft² (Actual 1034.16ft²)
Coverage per Sprinkler: 130.00ft²
Type of sprinklers calculated: Upright
No. of sprinklers calculated: 12
No. of nozzles calculated: 0

In-rack Demand: N/A gpm at Node: N/A
Hose Streams: 250.00 at Node: 1 Type: Allowance at Source

Total Water Required (including Hose Streams where applicable):
From Water Supply at Node 1: 606.05 @ 68.703 (Safety Margin = 5.748)
Type of System: DRY
Volume of Dry/PreAction/Antifreeze/OtherAgent System: 445.20gal

Name of Contractor: RED HAWK FIRE PROTECTION, LLC
Address: 801 VALLEY AVE NW, SUITE D, PUYALLUP, WA 98371
Phone Number: 253-202-7007
Name of designer: BROOKE MCDANIELS
Authority Having Jurisdiction: : CITY OF PUYALLUP

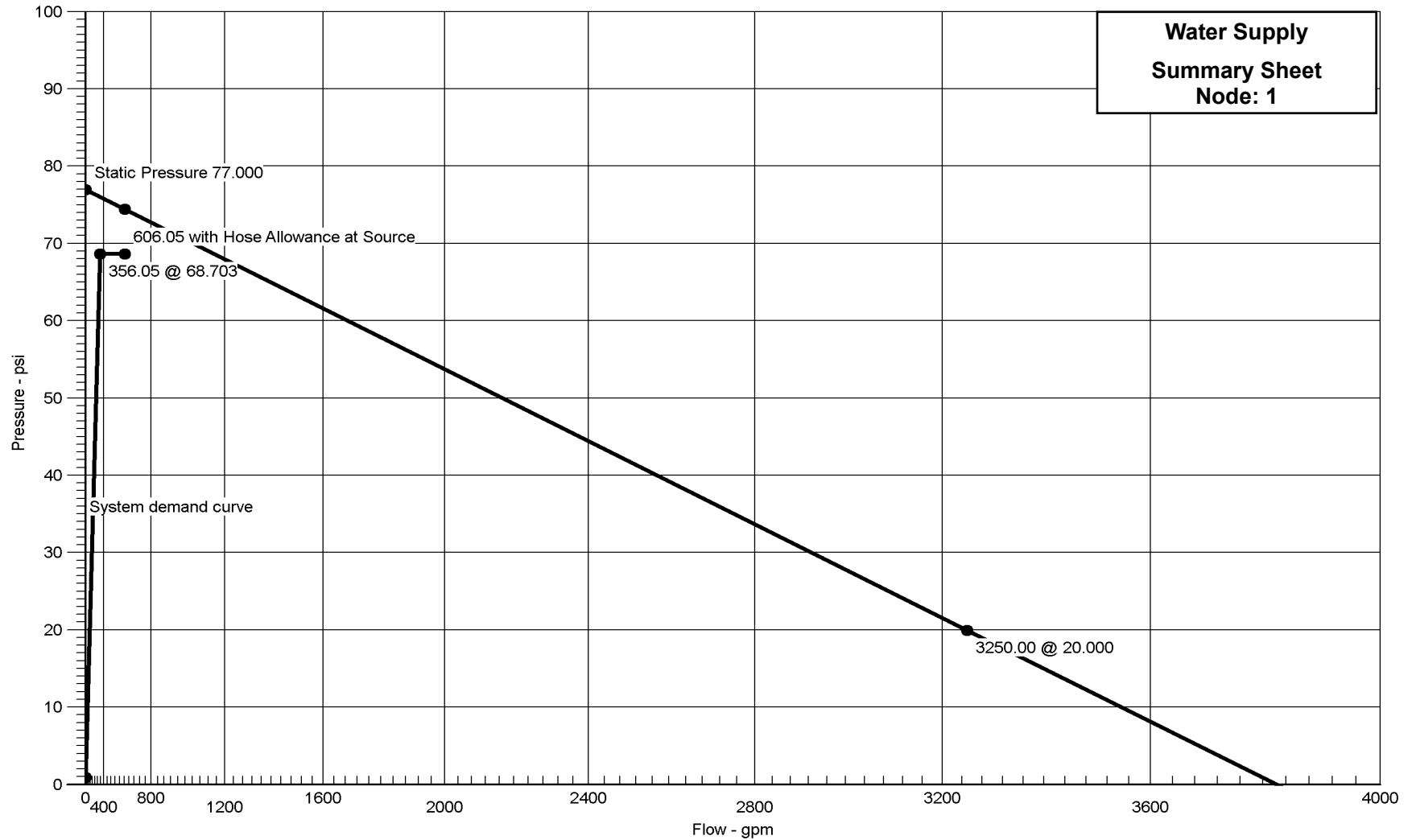
Notes:

Hydraulic Graph

Job Name: BRADLEY PARK PHASE 2
Remote Area Number: L0-2

N 1.85

Date: 9/16/2025



Supply:Static:77.000
Residual:20.000
Flowing:3250.00
Available Flow @ 20 PSI:3250.00



Summary Of Outflowing Devices

Job Number: 70120
Report Description: Ordinary Group II (L0-2)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)			
Sprinkler	1010	36.37	26.00	5.6	42.189			
Sprinkler	1011	34.69	26.00	5.6	38.366			
Sprinkler	1012	30.69	26.00	5.6	30.029			
Sprinkler	1013	30.99	26.00	5.6	30.626			
Sprinkler	1014	27.85	26.00	5.6	24.729			
Sprinkler	1015	27.97	26.00	5.6	24.947			
Sprinkler	1016	28.25	26.00	5.6	25.451			
Sprinkler	1017	27.57	26.00	5.6	24.238			
Sprinkler	1018	30.78	26.00	5.6	30.217			
⇒ Sprinkler	1019	26.00	26.00	5.6	21.556			
Sprinkler	1020	26.26	26.00	5.6	21.997			
Sprinkler	1021	28.62	26.00	5.6	26.127			

⇒ Most Demanding Sprinkler Data

Supply Analysis

Node	Name	Static (psi)	Residual (psi)	@ Flow (gpm)	Available (psi)	@ Total Demand (gpm)	Required Pressure (psi)
1	Water Supply	77.000	20.000	3250.00	74.450	606.05	68.703

Node Analysis

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
1	95-6	Supply	68.703	356.05	
1010	97-7½	Sprinkler	42.189	36.37	
1011	97-7½	Sprinkler	38.366	34.69	
1012	97-7½	Sprinkler	30.029	30.69	
1013	97-7½	Sprinkler	30.626	30.99	
1014	97-7	Sprinkler	24.729	27.85	
1015	97-7½	Sprinkler	24.947	27.97	
1016	97-7	Sprinkler	25.451	28.25	
1017	97-7½	Sprinkler	24.238	27.57	
1018	97-6½	Sprinkler	30.217	30.78	
1019	97-7½	Sprinkler	21.556	26.00	
1020	97-7	Sprinkler	21.997	26.26	
1021	97-7	Sprinkler	26.127	28.62	
2	95-6		68.636		
3	95-6		68.626		
4	95-6		68.205		
7	91-0		68.357		
8	91-0		68.200		

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
12	97-4½		63.667		
109	97-7½		56.743		
110	97-7½		45.077		
111	97-7½		41.731		
112	97-7		33.105		
113	97-7		39.732		
114	97-7		27.541		
115	97-7		37.706		
116	97-6½		36.875		
117	97-7		26.764		
118	97-6½		36.711		
119	97-7		23.824		
120	97-6½		36.642		

Pipe Information

Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot) Total (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe) Friction(Pf)	Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
1019	97-7½	5.6	26.00	1	(See Notes)	7-7½	100	21.556	•••••Route 1••••• Sprinkler
119	97-7		26.00	1.0490			0.296253	0.014	
						7-7½		2.254	
119	97-7		26.26	1	(See Notes)	8-4½	100	23.824	Flow (q) from Route 2 PO(3-7)
118	97-6½		52.26	1.0490		3-7	1.078067	0.015	
						11-11½		12.872	
118	97-6½		59.41	2½		3-4½	100	36.711	Flow (q) from Route 7
116	97-6½		111.67	2.6350			0.049503	-0.003	
						3-4½		0.167	
116	97-6½		55.42	2½		8-0½	100	36.875	Flow (q) from Route 3
115	97-7		167.09	2.6350			0.104326	-0.007	
						8-0½		0.838	
115	97-7		56.22	2½		11-5	100	37.706	Flow (q) from Route 5
113	97-7		223.31	2.6350			0.178410	-0.010	
						11-5		2.036	
113	97-7		61.68	2½		7-2	100	39.732	Flow (q) from Route 8
111	97-7½		284.99	2.6350			0.280136	-0.006	
						7-2		2.005	
111	97-7½		34.69	2½		9-8	100	41.731	Flow (q) from Route 10
110	97-7½		319.68	2.6350			0.346457	-0.009	
						9-8		3.355	
110	97-7½		36.37	2½	(See Notes)	14-11½	100	45.077	Flow (q) from Route 11 3fE(4-2½)
109	97-7½		356.05	2.6350		12-7½	0.422893	0.006	
						27-7		11.660	
109	97-7½			4	(See Notes)	103-7	100	56.743	Tr(6-9½), 2EE(3-9), T(18-9½), fT(15-0½), fE(6-4½), E(9-4½)
12	97-4½		356.05	4.2600		63-10½	0.040757	0.098	
						167-5½		6.826	
12	97-4½			4	(See Notes)	4-10	100	63.667	DPV(8-4½), BV(11-3), PO(18-9 ½)
8	91-0		356.05	4.2600		38-5	0.040757	2.771	
						43-3		1.762	
8	91-0			6	(See Notes)	2-7½	120	68.200	2E(17-7)
7	91-0		356.05	6.3570		35-2½	0.004141		
						37-10		0.157	

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
						Total (Foot)		Friction(Pf)	
7	91-0			6	(See Notes)	0-0	120	68.357	BFP(-1.634)
508	91-0		356.05	6.3570			0.004141		
						0-0		1.634	
508	91-0			6	(See Notes)	6-10	150	69.991	2E(26-7)
4	95-6		356.05	6.3570		53-2	0.002740	-1.951	
						60-0		0.164	
4	95-6			6	(See Notes)	85-0½	140	68.205	EE(11-0½), 2GV(4-8½), E(22-1)
3	95-6		356.05	6.2800		42-6½	0.003304		
						127-7½		0.422	
3	95-6			12	(See Notes)	37-11	140	68.626	E(44-3)
2	95-6		356.05	12.4600		44-3	0.000117		
						82-2		0.010	
2	95-6			6	(See Notes)	15-5	140	68.636	GV(4-8½), S
1	95-6		356.05	6.2800		4-8½	0.003304		
						20-2		0.067	
			250.00					68.703	Hose Allowance At Source
1			606.05						Total(Pt) Route 1
1020	97-7	5.6	26.26	1	(See Notes)	2-5½	100	21.997	 Route 2
119	97-7		26.26	1.0490		3-7	0.301855	0.004	Sprinkler,
						6-0½		1.822	T(3-7)
								23.824	Total(Pt) Route 2
1017	97-7½	5.6	27.57	1	(See Notes)	7-7½	100	24.238	 Route 3
117	97-7		27.57	1.0490			0.330193	0.014	Sprinkler
						7-7½		2.512	
117	97-7		27.85	1	(See Notes)	4-10	100	26.764	Flow (q) from Route 4 PO(3-7)
116	97-6½		55.42	1.0490		3-7	1.201462	0.009	
						8-5		10.103	
								36.875	Total(Pt) Route 3
1014	97-7	5.6	27.85	1	(See Notes)	2-5½	100	24.729	 Route 4
117	97-7		27.85	1.0490		3-7	0.336373	0.004	Sprinkler,
						6-0½		2.031	T(3-7)
								26.764	Total(Pt) Route 4

Pipe Information

Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.	
	Node 2		Elev 2 (Foot)	Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)		Elev(Pe)
			Total (Foot)				Friction(Pf)			
1015	97-7½	5.6	27.97	1	(See Notes)	7-7½	100	24.947	***** Route 5 ***** Sprinkler	
114	97-7		27.97	1.0490			0.339115	0.014		
						7-7½		2.580		
114	97-7		28.25	1	(See Notes)	4-8	100	27.541	Flow (q) from Route 6 PO(3-7)	
						3-7	1.233900	0.008		
115	97-7		56.22	1.0490		8-3		10.157		
									37.706	Total(Pt) Route 5
1016	97-7	5.6	28.25	1	(See Notes)	2-5½	100	25.451	***** Route 6 ***** Sprinkler, T(3-7)	
						3-7	0.345447	0.004		
114	97-7		28.25	1.0490		6-0½		2.086		
									27.541	Total(Pt) Route 6
1021	97-7	5.6	28.62	1	(See Notes)	10-1	100	26.127	***** Route 7 ***** Sprinkler, E(1-5)	
1018	97-6½		28.62	1.0490			0.353926	0.018		
						11-6		4.073		
1018	97-6½	5.6	30.78	1	(See Notes)	1-1½	100	30.217	Sprinkler, PO(3-7)	
						3-7	1.366363	0.002		
120	97-6½		59.41	1.0490		4-8½		6.423		
120	97-6½			2½		4-9½	100	36.642		
							0.015401	-0.004		
118	97-6½		59.41	2.6350		4-9½		0.074		
									36.711	Total(Pt) Route 7
1012	97-7½	5.6	30.69	1	(See Notes)	7-7½	100	30.029	***** Route 8 ***** Sprinkler	
							0.402561	0.014		
112	97-7		30.69	1.0490		7-7½		3.063		
112	97-7		30.99	1	(See Notes)	0-11½	100	33.105	Flow (q) from Route 9 PO(3-7)	
						3-7	1.464545	0.002		
113	97-7		61.68	1.0490		4-6½		6.625		
									39.732	Total(Pt) Route 8
1013	97-7½	5.6	30.99	1	(See Notes)	2-5½	100	30.626	***** Route 9 ***** Sprinkler, T(3-7)	
						3-7	0.409961	0.004		
112	97-7		30.99	1.0490		6-0½		2.475		
									33.105	Total(Pt) Route 9

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
						Total (Foot)		Friction(Pf)	
1011	97-7½	5.6	34.69	1	(See Notes)	3-1	100	38.366	***** Route 10 ***** Sprinkler, PO(3-7)
111	97-7½		34.69	1.0490		3-7	0.504965	0.006	
						6-8		3.359	
								41.731	Total(Pt) Route 10
1010	97-7½	5.6	36.37	1	(See Notes)	1-8	100	42.189	***** Route 11 ***** Sprinkler, PO(3-7)
110	97-7½		36.37	1.0490		3-7	0.551335	0.003	
						5-3		2.885	
								45.077	Total(Pt) Route 11

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

C Value Multiplier

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

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

Fittings Legend

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

Hydraulic Calculations

for

Project Name: BRADLEY PARK PHASE 2: (70120)

Location: 707 39TH AVE SE, BLDG D, , PUYALLUP, WA 98374

Drawing Name: 70120 Wesley Bradley Park R01 Level 1

Calculation Date: 9/16/2025

Design

Remote Area Number: L1-1
Remote Area Location: COMMONS 1036
Occupancy Classification: Light Hazard

Density 0.100gpm/ft²
Area of Application: 1500.00ft² (Actual 1075.19ft²)
Coverage per Sprinkler: 180.00ft²
Type of sprinklers calculated: Other
No. of sprinklers calculated: 8
No. of nozzles calculated: 0

In-rack Demand: N/A gpm at Node: N/A
Hose Streams: 100.00 at Node: 1 Type: Allowance at Source

Total Water Required (including Hose Streams where applicable):
From Water Supply at Node 1: 263.20 @ 49.757 (Safety Margin = 26.698)
Type of System: WET
Volume of Dry/PreAction/Antifreeze/OtherAgent System: N/A

Name of Contractor: RED HAWK FIRE PROTECTION, LLC
Address: 801 VALLEY AVE NW, SUITE D, PUYALLUP, WA 98371
Phone Number: 253-202-7007
Name of designer: BROOKE MCDANIELS
Authority Having Jurisdiction: : CITY OF PUYALLUP

Notes:

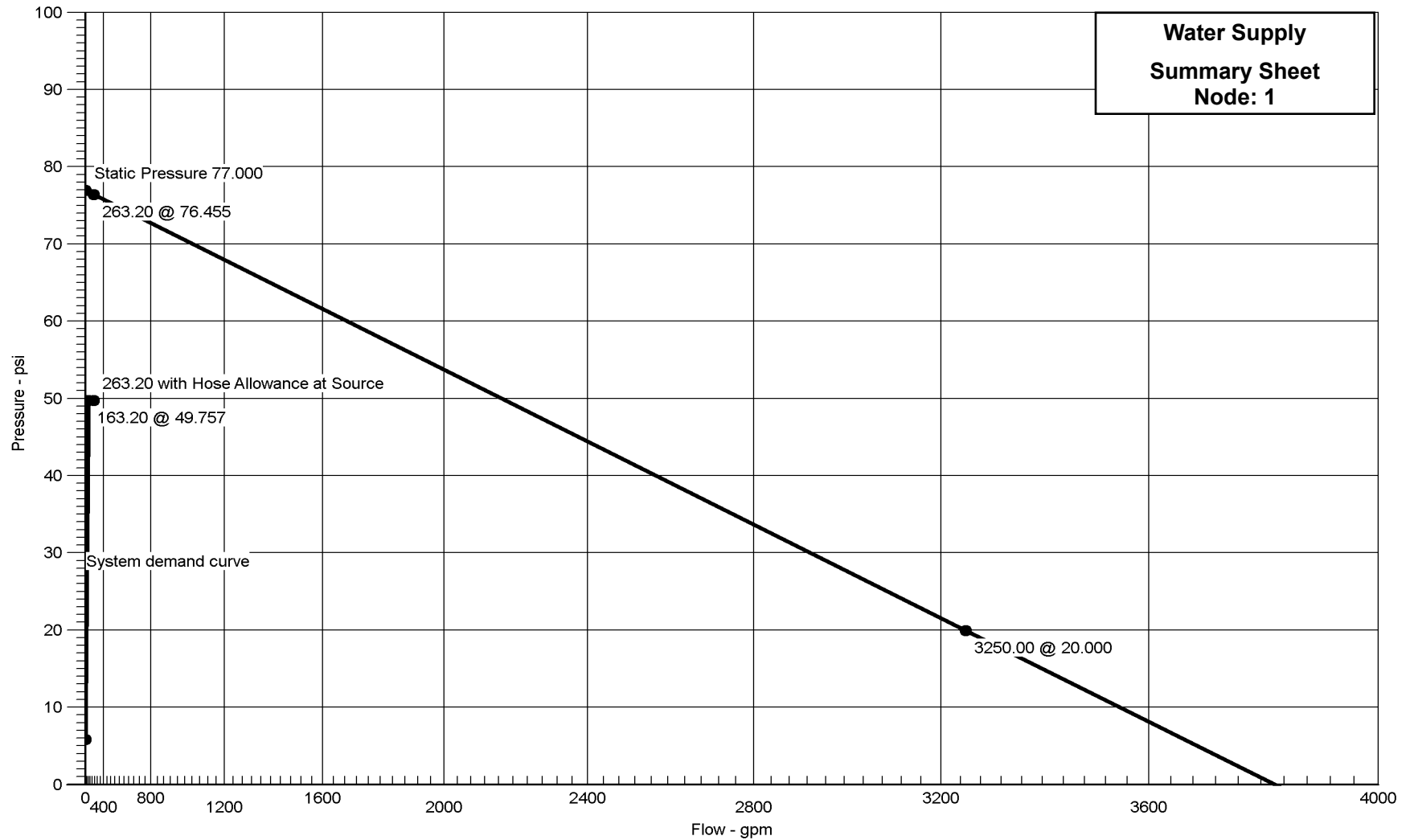
Hydraulic Graph

Job Name: BRADLEY PARK PHASE 2

N 1.85

Remote Area Number: L1-1

Date: 9/16/2025



Supply:Static:77.000
Residual:20.000
Flowing:3250.00
Available Flow @ 20 PSI:3250.00



Summary Of Outflowing Devices

Job Number: 70120

Report Description: Light Hazard (L1-1)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)			
Sprinkler	2000	19.53	18.00	5.6	12.158			
Sprinkler	2001	25.23	23.00	5.6	20.304			
Sprinkler	2002	20.80	18.00	5.6	13.793			
Sprinkler	2003	20.08	18.00	5.6	12.858			
➡ Sprinkler	2004	18.00	18.00	5.6	10.332			
Sprinkler	2005	20.89	18.00	5.6	13.918			
Sprinkler	2006	20.28	18.00	5.6	13.117			
Sprinkler	2007	18.39	18.00	5.6	10.788			

➡ Most Demanding Sprinkler Data

Supply Analysis							
Node	Name	Static (psi)	Residual (psi)	@ Flow (gpm)	Available (psi)	@ Total Demand (gpm)	Required Pressure (psi)
1	Water Supply	77.000	20.000	3250.00	76.455	263.20	49.757
Node Analysis							
Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes		
1	95-6	Supply	49.757	163.20			
2000	109-0½	Sprinkler	12.158	19.53			
2001	108-6	Sprinkler	20.304	25.23			
2002	108-0½	Sprinkler	13.793	20.80			
2003	109-0½	Sprinkler	12.858	20.08			
2004	109-0½	Sprinkler	10.332	18.00			
2005	108-0½	Sprinkler	13.918	20.89			
2006	109-0½	Sprinkler	13.117	20.28			
2007	109-0½	Sprinkler	10.788	18.39			
2	95-6		49.745				
3	95-6		49.742				
4	95-6		49.650				
6	91-0		51.562				
7	91-0		48.761				
8	91-0		48.724				
9	91-0		48.721				
10	91-0		48.719				
11	91-0		48.719				

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
200	109-3½		25.771		
201	109-3½		25.531		
202	109-9½		15.717		
203	109-9½		13.537		
204	109-9½		15.301		
205	109-9½		14.412		
206	109-9½		14.227		
207	109-9½		14.261		
208	109-9½		11.700		
209	109-9½		37.542		
210	103-6		42.043		
211	103-6		43.073		

Pipe Information

Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot) Total (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe) Friction(Pf)	Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
2004	109-0½	5.6	18.00	1	(See Notes)	14-1	150	10.332	•••••Route 1••••• Sprinkler, 2E(7-0), 2Tr(1-0)
208	109-9½		18.00	1.1010		16-0	0.055991	-0.315	
						30-1		1.684	
208	109-9½		18.39	1	(See Notes)	11-3½	150	11.700	Flow (q) from Route 2 b(1-0)
206	109-9½		36.39	1.1010		1-0	0.205942		
						12-3½		2.527	
206	109-9½			1½	(See Notes)	0-0	150	14.227	Tr(1-0)
207	109-9½		36.39	1.5980		1-0	0.033561		
						1-0		0.034	
207	109-9½		20.08	1½	(See Notes)	1-0	150	14.261	Flow (q) from Route 4 Tr(1-0)
205	109-9½		56.47	1.5980		1-0	0.075658		
						2-0		0.151	
205	109-9½		20.28	1½	(See Notes)	5-8	150	14.412	Flow (q) from Route 5 Tr(1-0)
204	109-9½		76.75	1.5980		1-0	0.133473		
						6-8		0.888	
204	109-9½		20.89	1½	(See Notes)	1-0	150	15.301	Flow (q) from Route 8 Tr(1-0)
202	109-9½		97.65	1.5980		1-0	0.208359		
						2-0		0.417	
202	109-9½		40.32	1½	(See Notes)	7-3½	150	15.717	Flow (q) from Route 3 E(9-0), T(8-0)
201	109-3½		137.97	1.5980		17-0	0.394961	0.217	
						24-3½		9.597	
201	109-3½			2	(See Notes)	219-0½	150	25.531	21Tr(2-0), 2E(11-0), T(10-0), cplg(1-0)
212	109-9		77.86	2.0030		75-0	0.045619	-0.208	
						294-0½		13.413	
212	109-9			2½	(See Notes)	14-4	120	38.736	fE(4-3½), 2E(6-0), CV(15-9), BV(7-0), PO(12-0)
211	103-6		77.86	2.4690		51-0½	0.024891	2.710	
						65-4½		1.628	
211	103-6			4	(See Notes)	37-4½	120	43.073	E(13-11), 2EE(5-7), 4fE(9-5½), ALV(4-2), BV(-0.008), PO(27-1 0½)
10	91-0		77.86	4.3100		95-0½	0.001651	5.419	
						132-5½		0.227	
10	91-0		85.34	6		2-1	120	48.719	Flow (q) from Route 6
9	91-0		163.20	6.3570			0.000978		
						2-1		0.002	

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot) Total (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe) Friction(Pf)	
Node 2									
9	91-0			6		2-9	120	48.721	
8	91-0		163.20	6.3570		2-9	0.000978	0.003	
8	91-0			6	(See Notes)	2-7½	120	48.724	
7	91-0		163.20	6.3570		35-2½	0.000978		2E(17-7)
						37-10		0.037	
7	91-0			6	(See Notes)	0-0	120	48.761	
6	91-0		163.20	6.3570		0-0	0.000978	2.801	BFP(-2.801)
6	91-0			6	(See Notes)	6-10	150	51.562	
4	95-6		163.20	6.3570		53-2	0.000647	-1.951	
						60-0		0.039	2E(26-7)
4	95-6			6	(See Notes)	85-1½	140	49.650	
3	95-6		163.20	6.2800		33-1	0.000780		
						118-2½		0.092	EE(11-0½), E(22-1)
3	95-6			12	(See Notes)	37-11	140	49.742	
2	95-6		163.20	12.4600		44-3	0.000028		
						82-2		0.002	E(44-3)
2	95-6			6	(See Notes)	15-5	140	49.745	
1	95-6		163.20	6.2800		15-5	0.000780	0.012	
			100.00					49.757	Hose Allowance At Source
1			263.20						
2007	109-0½	5.6	18.39	1	(See Notes)	4-1	150	10.788	 Route 2 Sprinkler, E(7-0), 2T(5-0)
208	109-9½		18.39	1.1010		17-0	0.058273	-0.315	
						21-1		1.228	
								11.700	Total(Pt) Route 2
2000	109-0½	5.6	19.53	1	(See Notes)	11-0½	150	12.158	 Route 3 Sprinkler, 2E(7-0), Tr(1-0)
203	109-9½		19.53	1.1010		15-0	0.065087	-0.315	
						26-0½		1.694	
203	109-9½		20.80	1	(See Notes)	3-9	150	13.537	Flow (q) from Route 7 T(5-0)
202	109-9½		40.32	1.1010		5-0	0.248977		
						8-9		2.180	

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
	Node 2		Elev 2 (Foot)	Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
								15.717	
2003	109-0½	5.6	20.08	1	(See Notes)	13-1	150	12.858	***** Route 4 ***** Sprinkler, E(7-0), T(5-0)
						12-0	0.068546	-0.315	
207	109-9½		20.08	1.1010		25-1		1.718	
								14.261	Total(Pt) Route 4
2006	109-0½	5.6	20.28	1	(See Notes)	4-1	150	13.117	***** Route 5 ***** Sprinkler, 2E(7-0), T(5-0)
						19-0	0.069823	-0.315	
205	109-9½		20.28	1.1010		23-1		1.611	
								14.412	Total(Pt) Route 5
2001	108-6	5.6	25.23	1	(See Notes)	0-0	120	20.304	***** Route 6 ***** Sprinkler, T(5-0), fd(24-0)
						29-0	0.200047	-0.334	
200	109-3½		25.23	1.0490		29-0		5.801	
200	109-3½		60.11	2	(See Notes)	160-9½	150	25.771	Flow (q) from Route 9 14Tr(2-0), 2E(11-0), T(10-0), cplg(1-0)
						61-0	0.054054	-0.217	
209	109-9½		85.34	2.0030		221-9½		11.988	
209	109-9½			2½	(See Notes)	9-5	120	37.542	fE(4-3½), 2E(6-0), CV(15-9), BV(7-0), PO(12-0)
						51-0½	0.029493	2.719	
210	103-6		85.34	2.4690		60-5½		1.783	
210	103-6			4	(See Notes)	429-9½	120	42.043	T(27-10½), 10fE(9-5½), 2EE(5 -7), 3E(13-11), ALV(4-2), BV(-0 .010), PO(27-10½)
						207-8	0.001956	5.419	
11	91-0		85.34	4.3100		637-5		1.257	
11	91-0			6	(See Notes)	1-8	120	48.719	
							0.000295		
10	91-0		85.34	6.3570		1-8		0.000	
								48.719	Total(Pt) Route 6
2002	108-0½	5.6	20.80	1	(See Notes)	1-8½	150	13.793	***** Route 7 ***** Sprinkler, T(5-0)
						5-0	0.073150	-0.749	
203	109-9½		20.80	1.1010		6-8½		0.492	
								13.537	Total(Pt) Route 7
2005	108-0½	5.6	20.89	1	(See Notes)	9-10½	150	13.918	***** Route 8 ***** Sprinkler, 2E(7-0), T(5-0)
						19-0	0.073760	-0.749	
204	109-9½		20.89	1.1010		28-10½		2.131	

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
						Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Total (Foot)		Friction(Pf)	
								15.301	
201	109-3½		77.86	2	(See Notes)	4-6	150	25.531	 Route 9 Flow (q) from Route 1 2Tr(2-0)
200	109-3½		60.11	2.0030		4-0	0.028262		
						8-6		0.240	
								25.771	Total(Pt) Route 9

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

C Value Multiplier

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

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

Fittings Legend

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

Hydraulic Calculations

for

Project Name: BRADLEY PARK PHASE 2: (70120)

Location: 707 39TH AVE SE, BLDG D, , PUYALLUP, WA 98374

Drawing Name: 70120 Wesley Bradley Park R01 Level 1

Calculation Date: 9/16/2025

Design

Remote Area Number: L1-2
Remote Area Location: GAME ROOM 1042
Occupancy Classification: Light Hazard

Density 0.100gpm/ft²
Area of Application: 1500.00ft² (Actual 937.15ft²)
Coverage per Sprinkler: 130.00ft²
Type of sprinklers calculated: Other
No. of sprinklers calculated: 13
No. of nozzles calculated: 0

In-rack Demand: N/A gpm at Node: N/A
Hose Streams: 100.00 at Node: 1 Type: Allowance at Source

Total Water Required (including Hose Streams where applicable):
From Water Supply at Node 1: 316.55 @ 69.744 (Safety Margin = 6.489)
Type of System: WET
Volume of Dry/PreAction/Antifreeze/OtherAgent System: N/A

Name of Contractor: RED HAWK FIRE PROTECTION, LLC
Address: 801 VALLEY AVE NW, SUITE D, PUYALLUP, WA 98371
Phone Number: 253-202-7007
Name of designer: BROOKE MCDANIELS
Authority Having Jurisdiction: : CITY OF PUYALLUP

Notes:

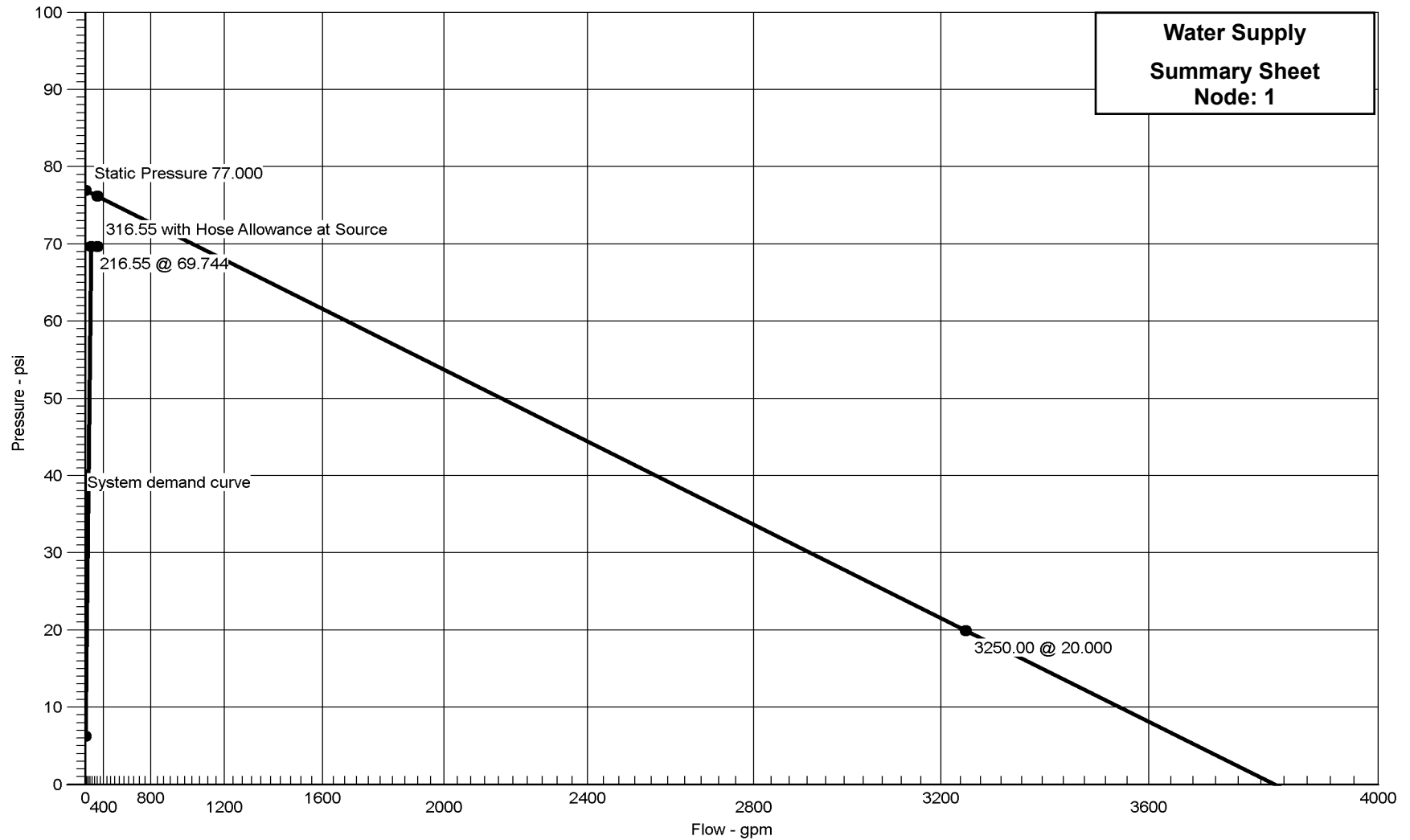
Hydraulic Graph

Job Name: BRADLEY PARK PHASE 2

Remote Area Number: L1-2

N 1.85

Date: 9/16/2025



Supply:Static:77.000
Residual:20.000
Flowing:3250.00
Available Flow @ 20 PSI:3250.00



Summary Of Outflowing Devices

Job Number: 70120

Report Description: Light Hazard (L1-2)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)			
➡ Sprinkler	2008	14.82	13.00	5.6	7.000			
Sprinkler	2009	19.47	13.00	5.6	12.086			
Sprinkler	2010	18.47	13.00	5.6	10.874			
Sprinkler	2011	18.91	13.00	5.6	11.407			
Sprinkler	2012	15.06	13.00	5.6	7.237			
Sprinkler	2013	17.09	13.00	5.6	9.313			
Sprinkler	2014	16.13	13.00	5.6	8.295			
Sprinkler	2015	16.19	13.00	5.6	8.362			
Sprinkler	2016	16.12	13.00	5.6	8.284			
Sprinkler	2017	16.30	13.00	5.6	8.471			
Sprinkler	2018	16.06	13.00	5.6	8.221			
Sprinkler	2019	15.78	13.00	5.6	7.937			
Sprinkler	2020	16.15	13.00	5.6	8.320			

➡ Most Demanding Sprinkler Data

Supply Analysis							
Node	Name	Static (psi)	Residual (psi)	@ Flow (gpm)	Available (psi)	@ Total Demand (gpm)	Required Pressure (psi)
1	Water Supply	77.000	20.000	3250.00	76.233	316.55	69.744
Node Analysis							
Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes		
1	95-6	Supply	69.744	216.55			
2008	110-0½	Sprinkler	7.000	14.82			
2009	109-0½	Sprinkler	12.086	19.47			
2010	109-0½	Sprinkler	10.874	18.47			
2011	109-0½	Sprinkler	11.407	18.91			
2012	110-0½	Sprinkler	7.237	15.06			
2013	109-0½	Sprinkler	9.313	17.09			
2014	110-0½	Sprinkler	8.295	16.13			
2015	110-0½	Sprinkler	8.362	16.19			
2016	109-0½	Sprinkler	8.284	16.12			
2017	109-0½	Sprinkler	8.471	16.30			
2018	110-0½	Sprinkler	8.221	16.06			
2019	109-0½	Sprinkler	7.937	15.78			
2020	109-0½	Sprinkler	8.320	16.15			
2	95-6		69.724				
3	95-6		69.720				
4	95-6		69.565				
6	91-0		71.450				

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
7	91-0		69.480		
8	91-0		69.418		
9	91-0		69.413		
10	91-0		69.410		
11	91-0		69.410		
209	109-9½		60.399		
210	103-6		63.630		
211	103-6		62.996		
212	109-9		53.153		
213	109-9½		52.296		
214	110-0		12.808		
215	110-0		12.154		
216	110-0		10.810		
217	110-6		7.568		
218	110-0		10.207		
219	110-0		9.350		
220	110-6		8.498		
221	110-0		9.201		
222	110-6		8.415		
223	110-0		9.025		
224	110-6		8.347		
225	110-0		8.987		

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
226	110-0		8.910		
227	110-6		8.271		
228	110-0		8.634		
229	110-0		8.555		

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
Node 2						Total (Foot)		Friction(Pf)	
2008	110-0½	5.6	14.82	1	(See Notes)	11-7	150	7.000	• • • • • Route 1 • • • • • Sprinkler, E(7-0), Tr(1-0)
217	110-6		14.82	1.1010		8-0	0.039060	-0.198	
						19-7		0.766	
217	110-6		15.06	1	(See Notes)	1-6	150	7.568	Flow (q) from Route 2 T(5-0)
220	110-6		29.88	1.1010		5-0	0.143004		
						6-6		0.930	
220	110-6		16.19	1½	(See Notes)	11-9	150	8.498	Flow (q) from Route 8 E(9-0), T(8-0)
218	110-0		46.07	1.5980		17-0	0.051922	0.217	
						28-9		1.492	
218	110-0		113.62	2	(See Notes)	1-6	150	10.207	Flow (q) from Route 3 Tr(2-0)
216	110-0		159.70	2.0030		2-0	0.172297		
						3-6		0.603	
216	110-0		18.47	2		6-4½	150	10.810	Flow (q) from Route 11
215	110-0		178.16	2.0030			0.210958		
						6-4½		1.345	
215	110-0		18.91	2	(See Notes)	0-7	150	12.154	Flow (q) from Route 12 Tr(2-0)
214	110-0		197.08	2.0030		2-0	0.254248		
						2-7		0.654	
214	110-0		19.47	2	(See Notes)	64-1½	150	12.808	Flow (q) from Route 13 6Tr(2-0), 4E(11-0), T(10-0)
213	109-9½		216.55	2.0030		66-0	0.302656	0.099	
						130-1½		39.388	
213	109-9½			2	(See Notes)	3-3	150	52.296	cplg(1-0)
212	109-9		173.07	2.0030		1-0	0.199935	0.009	
						4-3		0.848	
212	109-9			2½	(See Notes)	14-4	120	53.153	fE(4-3½), 2E(6-0), CV(15-9), BV(7-0), PO(12-0)
211	103-6		173.07	2.4690		51-0½	0.109089	2.710	
						65-4½		7.134	
211	103-6			4	(See Notes)	37-4½	120	62.996	E(13-11), 2EE(5-7), 4fE(9-5½), ALV(4-2), BV(-0.036), PO(27-1 0½)
10	91-0		173.07	4.3100		95-0½	0.007235	5.419	
						132-5½		0.994	
10	91-0		43.48	6		2-1	120	69.410	Flow (q) from Route 14
9	91-0		216.55	6.3570			0.001650		
						2-1		0.003	

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot) Total (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe) Friction(Pf)	
Node 2									
9	91-0			6		2-9	120	69.413	
8	91-0		216.55	6.3570		2-9	0.001650	0.005	
8	91-0			6	(See Notes)	2-7½	120	69.418	
7	91-0		216.55	6.3570		35-2½	0.001650		2E(17-7)
						37-10		0.062	
7	91-0			6	(See Notes)	0-0	120	69.480	
6	91-0		216.55	6.3570		0-0	0.001650	1.970	BFP(-1.970)
6	91-0			6	(See Notes)	6-10	150	71.450	
4	95-6		216.55	6.3570		53-2	0.001092	-1.951	
						60-0		0.066	2E(26-7)
4	95-6			6	(See Notes)	85-1½	140	69.565	
3	95-6		216.55	6.2800		33-1	0.001317		
						118-2½		0.156	EE(11-0½), E(22-1)
3	95-6			12	(See Notes)	37-11	140	69.720	
2	95-6		216.55	12.4600		44-3	0.000047		
						82-2		0.004	E(44-3)
2	95-6			6	(See Notes)	15-5	140	69.724	
1	95-6		216.55	6.2800		15-5	0.001317	0.020	
			100.00					69.744	Hose Allowance At Source
1			316.55						
2012	110-0½	5.6	15.06	1	(See Notes)	1-1½	150	7.237	 Route 2 Sprinkler, E(7-0), T(5-0)
217	110-6		15.06	1.1010		12-0	0.040281	-0.198	
						13-1½		0.529	
								7.568	Total(Pt) Route 2
2019	109-0½	5.6	15.78	1	(See Notes)	6-4	150	7.937	 Route 3 Sprinkler, 2E(7-0), T(5-0)
228	110-0		15.78	1.1010		19-0	0.043875	-0.414	
						25-4		1.111	
228	110-0		16.15	1½	(See Notes)	9-6	150	8.634	Flow (q) from Route 7 Tr(1-0)
226	110-0		31.93	1.5980		1-0	0.026347		
						10-6		0.277	

Pipe Information

Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
						Fitting (Foot)		Elev(Pe)	
						Total (Foot)		Friction(Pf)	
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)		Pf Friction Loss Per Unit (psi)		
226	110-0		16.30	1½	(See Notes)	0-4½	150	8.910	Flow (q) from Route 9 b(1-0)
225	110-0		48.23	1.5980		1-0	0.056504		
						1-4½		0.077	
225	110-0			2	(See Notes)	0-0	150	8.987	Tr(2-0)
223	110-0		48.23	2.0030		2-0	0.018807		
						2-0		0.038	
223	110-0		16.12	2	(See Notes)	3-6	150	9.025	Flow (q) from Route 5 Tr(2-0)
221	110-0		64.35	2.0030		2-0	0.032060		
						5-6		0.176	
221	110-0		17.09	2	(See Notes)	1-0	150	9.201	Flow (q) from Route 10 Tr(2-0)
219	110-0		81.44	2.0030		2-0	0.049568		
						3-0		0.149	
219	110-0		32.19	2	(See Notes)	7-4	150	9.350	Flow (q) from Route 4 Tr(2-0)
218	110-0		113.62	2.0030		2-0	0.091788		
						9-4		0.857	
								10.207	Total(Pt) Route 3
2018	110-0½	5.6	16.06	1	(See Notes)	0-5½	150	8.221	••••• Route 4 ••••• Sprinkler, T(5-0)
227	110-6		16.06	1.1010		5-0	0.045323	-0.198	
						5-5½		0.247	
227	110-6			1½	(See Notes)	9-3½	150	8.271	Tr(1-0)
224	110-6		16.06	1.5980		1-0	0.007386		
						10-3½		0.076	
224	110-6		16.13	1½	(See Notes)	12-5	150	8.347	Flow (q) from Route 6 E(9-0), T(8-0)
219	110-0		32.19	1.5980		17-0	0.026737	0.217	
						29-5		0.786	
								9.350	Total(Pt) Route 4
2016	109-0½	5.6	16.12	1	(See Notes)	6-4	150	8.284	••••• Route 5 ••••• Sprinkler, 2E(7-0), T(5-0)
223	110-0		16.12	1.1010		19-0	0.045644	-0.414	
						25-4		1.156	
								9.025	Total(Pt) Route 5
2014	110-0½	5.6	16.13	1	(See Notes)	0-5½	150	8.295	••••• Route 6 ••••• Sprinkler, T(5-0)
224	110-6		16.13	1.1010		5-0	0.045701	-0.198	
						5-5½		0.249	

Pipe Information

Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes
						Fitting (Foot)		Elev(Pe)	Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Total (Foot)	Pf Friction Loss Per Unit (psi)	Friction(Pf)	
								8.347	Total(Pt) Route 6
2020	109-0½	5.6	16.15	1	(See Notes)	6-2	150	8.320	***** Route 7 ***** Sprinkler, E(7-0), b(1-0)
229	110-0		16.15	1.1010		8-0	0.045830	-0.414	
						14-2		0.649	
229	110-0			1½	(See Notes)	0-6	150	8.555	E(9-0), Tr(1-0)
228	110-0		16.15	1.5980		10-0	0.007468	0.000	
						10-6		0.078	
								8.634	Total(Pt) Route 7
2015	110-0½	5.6	16.19	1	(See Notes)	0-5½	150	8.362	***** Route 8 ***** Sprinkler, T(5-0)
222	110-6		16.19	1.1010		5-0	0.046039	-0.198	
						5-5½		0.251	
222	110-6			1½	(See Notes)	10-0	150	8.415	Tr(1-0)
220	110-6		16.19	1.5980		1-0	0.007503		
						11-0		0.082	
								8.498	Total(Pt) Route 8
2017	109-0½	5.6	16.30	1	(See Notes)	6-3½	150	8.471	***** Route 9 ***** Sprinkler, E(7-0), T(5-0)
226	110-0		16.30	1.1010		12-0	0.046599	-0.414	
						18-3½		0.853	
								8.910	Total(Pt) Route 9
2013	109-0½	5.6	17.09	1	(See Notes)	0-11½	150	9.313	***** Route 10 ***** Sprinkler, T(5-0)
221	110-0		17.09	1.1010		5-0	0.050863	-0.414	
						5-11½		0.303	
								9.201	Total(Pt) Route 10
2010	109-0½	5.6	18.47	1	(See Notes)	0-11½	150	10.874	***** Route 11 ***** Sprinkler, T(5-0)
216	110-0		18.47	1.1010		5-0	0.058706	-0.414	
						5-11½		0.350	
								10.810	Total(Pt) Route 11
2011	109-0½	5.6	18.91	1	(See Notes)	6-11	150	11.407	***** Route 12 ***** Sprinkler, E(7-0), T(5-0)
215	110-0		18.91	1.1010		12-0	0.061362	-0.414	
						18-11		1.161	
								12.154	Total(Pt) Route 12

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
						Total (Foot)		Friction(Pf)	
2009	109-0½	5.6	19.47	1	(See Notes)	5-6½	150	12.086	***** Route 13 ***** Sprinkler, E(7-0), T(5-0)
214	110-0		19.47	1.1010		12-0	0.064735	-0.414	
						17-6½		1.136	
								12.808	Total(Pt) Route 13
11	91-0		43.48	6		1-8	120	69.410	***** Route 14 ***** Flow (q) from Route 15
10	91-0		43.48	6.3570			0.000085		
						1-8		0.000	
								69.410	Total(Pt) Route 14
210	103-6		43.48	4	(See Notes)	429-9½	120	63.630	***** Route 15 ***** Flow (q) from Route 16 T(27-10½), 10fE(9-5½), 2EE(5 -7), 3E(13-11), ALV(4-2), BV(-0 .003), PO(27-10½)
11	91-0		43.48	4.3100		207-8	0.000562	5.419	
						637-5		0.361	
								69.410	Total(Pt) Route 15
209	109-9½		43.48	2½	(See Notes)	9-5	120	60.399	***** Route 16 ***** Flow (q) from Route 17 fE(4-3½), 2E(6-0), CV(15-9), BV(7-0), PO(12-0)
210	103-6		43.48	2.4690		51-0½	0.008469	2.719	
						60-5½		0.512	
								63.630	Total(Pt) Route 16
213	109-9½			2	(See Notes)	381-0½	150	52.296	***** Route 17 ***** T(10-0) 38Tr(2-0), 4E(11-0), T(10-0), cplg(1-0)
209	109-9½		43.48	2.0030		141-0	0.015522		
						522-0½		8.104	
								60.399	Total(Pt) Route 17

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

C Value Multiplier

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

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

Fittings Legend

ALV	Alarm Valve	AngV	Angle Valve	b	Bushing
BaIV	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 Relief Valve
PRV	Pressure Reducing Valve	red	Reducer/Adapter	S	Supply
sCV	Swing Check Valve	SFx	Seismic Flex	Spr	Sprinkler
St	Strainer	T	Tee Flow Turn 90°	Tr	Tee Run
U	Union	WirF	Wirsbo	WMV	Water Meter Valve
Z	Cap				

Hydraulic Calculations

for

Project Name: BRADLEY PARK PHASE 2: (70120)

Location: 707 39TH AVE SE, BLDG D, , PUYALLUP, WA 98374

Drawing Name: 70120 Wesley Bradley Park R01 Level 2

Calculation Date: 9/16/2025

Design

Remote Area Number: L2-1
Remote Area Location: FOX 2000
Occupancy Classification: Residential

Density 0.100gpm/ft²
Area of Application: 0.00ft² (Actual 311.70ft²)
Coverage per Sprinkler: 400.00ft²
Type of sprinklers calculated: Other
No. of sprinklers calculated: 4
No. of nozzles calculated: 0

In-rack Demand: N/A gpm at Node: N/A
Hose Streams: 100.00 at Node: 1 Type: Allowance at Source

Total Water Required (including Hose Streams where applicable):
From Water Supply at Node 1: 189.56 @ 59.458 (Safety Margin = 17.245)
Type of System: WET
Volume of Dry/PreAction/Antifreeze/OtherAgent System: N/A

Name of Contractor: RED HAWK FIRE PROTECTION, LLC
Address: 801 VALLEY AVE NW, SUITE D, PUYALLUP, WA 98371
Phone Number: 253-202-7007
Name of designer: BROOKE MCDANIELS
Authority Having Jurisdiction: : CITY OF PUYALLUP

Notes:

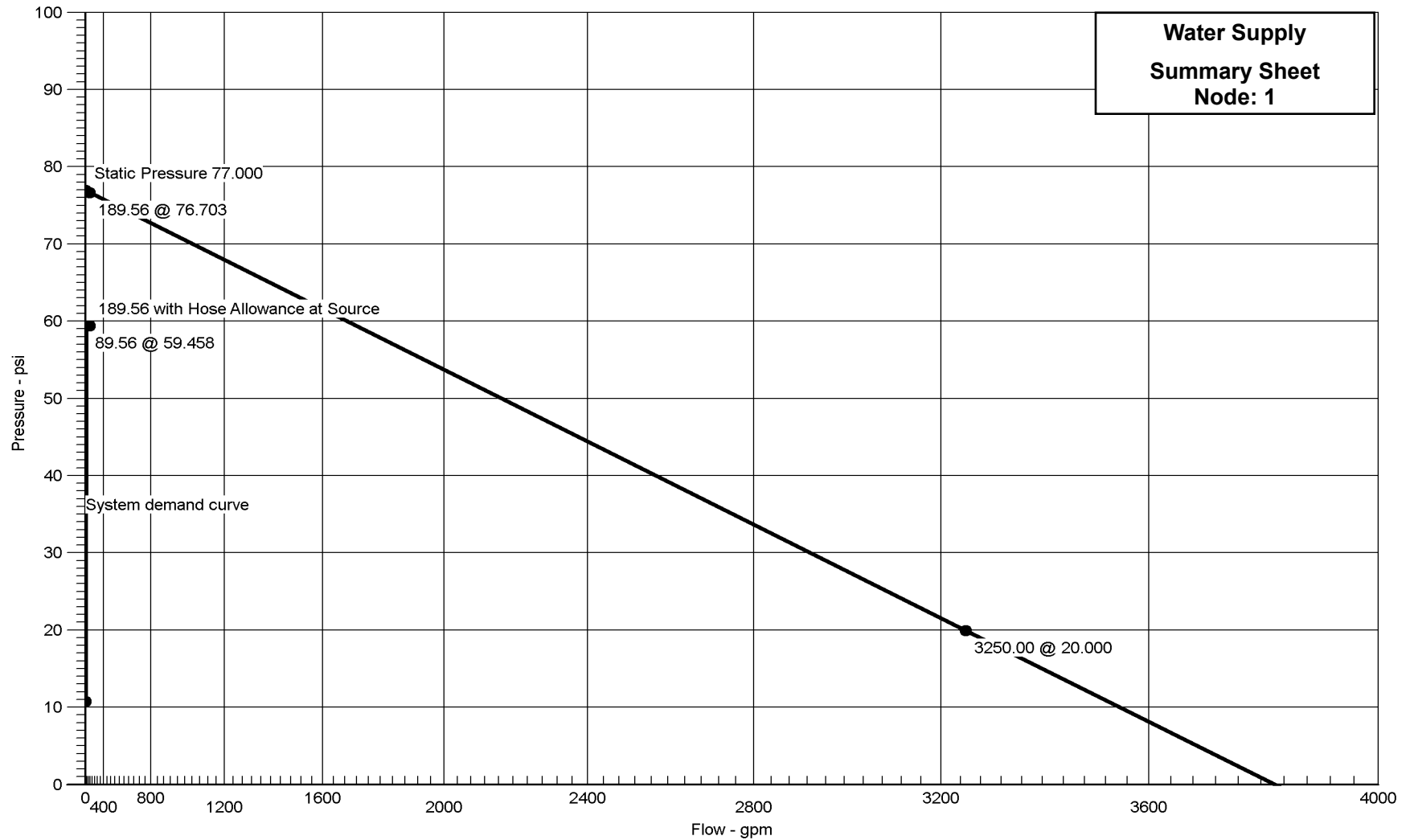
Hydraulic Graph

Job Name: BRADLEY PARK PHASE 2

Remote Area Number: L2-1

N 1.85

Date: 9/16/2025



Supply:Static:77.000

Residual:20.000

Flowing:3250.00

Available Flow @ 20 PSI:3250.00



Summary Of Outflowing Devices

Job Number: 70120 - WESLEY BRADLEY PARK

Report Description: Residential (L2-1)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)			
Sprinkler	3000	24.99	20.00	4.9	26.014			
Sprinkler	3001	23.88	20.00	4.9	23.753			
Sprinkler	3002	20.69	20.00	4.9	17.822			
➡ Sprinkler	3014	20.00	20.00	4.9	16.660			

➡ Most Demanding Sprinkler Data

Supply Analysis							
Node	Name	Static (psi)	Residual (psi)	@ Flow (gpm)	Available (psi)	@ Total Demand (gpm)	Required Pressure (psi)
1	Water Supply	77.000	20.000	3250.00	76.703	189.56	59.458
Node Analysis							
Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes		
1	95-6	Supply	59.458	89.56			
3000	120-4½	Sprinkler	26.014	24.99			
3001	120-2	Sprinkler	23.753	23.88			
3002	120-2	Sprinkler	17.822	20.69			
3014	120-2	Sprinkler	16.660	20.00			
2	95-6		59.454				
3	95-6		59.453				
4	95-6		59.423				
6	91-0		61.361				
7	91-0		57.384				
8	91-0		57.372				
9	91-0		57.371				
10	91-0		57.371				
11	91-0		57.371				
300	114-4		46.836				
301	121-1		43.164				
302	120-7½		39.497				
303	121-1		30.122				

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
304	121-1		30.139		
305	121-1		23.901		
306	121-1		17.839		
307	114-4		47.176		
322	121-1½		43.708		

Pipe Information

Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot) Total (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe) Friction(Pf)	Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
3014	120-2	4.9	20.00	1	(See Notes)	7-5	150	16.660	• • • • • Route 1 • • • • • Sprinkler, 2E(7-0), 2Tr(1-0)
306	121-1		20.00	1.1010		16-0	0.068041	-0.414	
						23-5		1.594	
306	121-1		20.69	1	(See Notes)	15-11½	150	17.839	Flow (q) from Route 2 E(7-0), Tr(1-0)
305	121-1		40.69	1.1010		8-0	0.253126		
						23-11½		6.062	
305	121-1		23.88	1	(See Notes)	5-6	150	23.901	Flow (q) from Route 3 T(5-0)
304	121-1		64.57	1.1010		5-0	0.594820		
						10-6		6.237	
304	121-1		24.99	1½	(See Notes)	29-6	150	30.139	Flow (q) from Route 4 5Tr(1-0), E(9-0), T(8-0)
302	120-7½		89.56	1.5980		22-0	0.177564	0.217	
						51-6		9.141	
302	120-7½			2	(See Notes)	227-5½	150	39.497	20Tr(2-0), 2E(11-0), T(10-0)
322	121-1½		42.35	2.0030		72-0	0.014786	-0.217	
						299-5½		4.428	
322	121-1½			2½	(See Notes)	15-0	120	43.708	fE(4-3½), 2E(6-0), CV(15-9), BV(7-0), PO(12-0)
307	114-4		42.35	2.4690		51-0½	0.008068	2.935	
						66-0½		0.533	
307	114-4			4	(See Notes)	48-2½	120	47.176	E(13-11), 2EE(5-7), 4fE(9-5½), ALV(4-2), BV(-0.003), PO(27-1 0½)
10	91-0		42.35	4.3100		95-0½	0.000535	10.116	
						143-3½		0.079	
10	91-0		47.21	6		2-1	120	57.371	Flow (q) from Route 5
9	91-0		89.56	6.3570			0.000322		
						2-1		0.001	
9	91-0			6		2-9	120	57.371	
8	91-0		89.56	6.3570			0.000322		
						2-9		0.001	
8	91-0			6	(See Notes)	2-7½	120	57.372	2E(17-7)
7	91-0		89.56	6.3570		35-2½	0.000322		
						37-10		0.012	
7	91-0			6	(See Notes)	0-0	150	57.384	BFP(-3.977)
6	91-0		89.56	6.3570			0.000213		
						0-0		3.977	

Pipe Information										
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.	
						Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)		
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Total (Foot)		Friction(Pf)		
6	91-0			6	(See Notes)	6-10	150	61.361	2E(26-7)	
4	95-6		89.56	6.3570		53-2	0.000213	-1.951		
						60-0		0.013		
4	95-6			6	(See Notes)	85-1½	140	59.423	EE(11-0½), E(22-1)	
3	95-6		89.56	6.2800		33-1	0.000257			
						118-2½		0.030		
3	95-6			12	(See Notes)	37-11	140	59.453	E(44-3)	
2	95-6		89.56	12.4600		44-3	0.000009			
						82-2		0.001		
2	95-6			6	(See Notes)	15-5	140	59.454	Water Supply	
1	95-6		89.56	6.2800			0.000257			
						15-5		0.004		
			100.00					59.458	Hose Allowance At Source	
1			189.56							Total(Pt) Route 1
3002	120-2	4.9	20.69	1	(See Notes)	0-11½	150	17.822	***** Route 2 ***** Sprinkler, T(5-0)	
						5-0	0.072421	-0.414		
306	121-1		20.69	1.1010		5-11½		0.431		
								17.839	Total(Pt) Route 2	
3001	120-2	4.9	23.88	1	(See Notes)	0-11½	150	23.753	***** Route 3 ***** Sprinkler, T(5-0)	
						5-0	0.094464	-0.414		
305	121-1		23.88	1.1010		5-11½		0.563		
								23.901	Total(Pt) Route 3	
3000	120-4½	4.9	24.99	1	(See Notes)	21-0½	150	26.014	***** Route 4 ***** Sprinkler, 3E(7-0), b(1-0)	
303	121-1		24.99	1.1010		22-0	0.102754	-0.315		
						43-0½		4.423		
303	121-1			1½	(See Notes)	0-0	150	30.122	Tr(1-0)	
						1-0	0.016745			
304	121-1		24.99	1.5980		1-0		0.017		
								30.139	Total(Pt) Route 4	
11	91-0		47.21	6		1-8	120	57.371	***** Route 5 ***** Flow (q) from Route 6	
							0.000099			
10	91-0		47.21	6.3570		1-8		0.000		

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
						Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Total (Foot)		Friction(Pf)	
								57.371	
300	114-4		47.21	4	(See Notes)	428-11½	120	46.836	***** Route 6 ***** Flow (q) from Route 7 7fE(9-5½), 2EE(5-7), 7E(13-11) , ALV(4-2), BV(-0.003), PO(27- 10½)
11	91-0		47.21	4.3100		207-1	0.000654	10.116	
						636-0½		0.419	
								57.371	Total(Pt) Route 6
301	121-1		47.21	2½	(See Notes)	9-11	120	43.164	***** Route 7 ***** Flow (q) from Route 8 T(12-0), 3E(6-0), CV(15-9), BV (7-0), PO(12-0)
300	114-4		47.21	2.4690		64-9	0.009864	2.935	
						74-8		0.736	
								46.836	Total(Pt) Route 7
302	120-7½		42.35	2	(See Notes)	156-10	150	39.497	***** Route 8 ***** Flow (q) from Route 1 13Tr(2-0), 2E(11-0), T(10-0)
301	121-1		47.21	2.0030		58-0	0.018078	-0.217	
						214-10		3.884	
								43.164	Total(Pt) Route 8

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

C Value Multiplier

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

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

Fittings Legend

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

Hydraulic Calculations

for

Project Name: BRADLEY PARK PHASE 2: (70120)

Location: 707 39TH AVE SE, BLDG D, , PUYALLUP, WA 98374

Drawing Name: 70120 Wesley Bradley Park R01 Level 2

Calculation Date: 9/16/2025

Design

Remote Area Number: L2-2
Remote Area Location: CLUBROOM 2036
Occupancy Classification: Light Hazard

Density 0.100gpm/ft²
Area of Application: 1500.00ft² (Actual 986.87ft²)
Coverage per Sprinkler: 196.00ft²
Type of sprinklers calculated: Other
No. of sprinklers calculated: 11
No. of nozzles calculated: 0

In-rack Demand: N/A gpm at Node: N/A
Hose Streams: 100.00 at Node: 1 Type: Allowance at Source

Total Water Required (including Hose Streams where applicable):
From Water Supply at Node 1: 304.69 @ 66.132 (Safety Margin = 10.154)
Type of System: WET
Volume of Dry/PreAction/Antifreeze/OtherAgent System: N/A

Name of Contractor: RED HAWK FIRE PROTECTION, LLC
Address: 801 VALLEY AVE NW, SUITE D, PUYALLUP, WA 98371
Phone Number: 253-202-7007
Name of designer: BROOKE MCDANIELS
Authority Having Jurisdiction: : CITY OF PUYALLUP

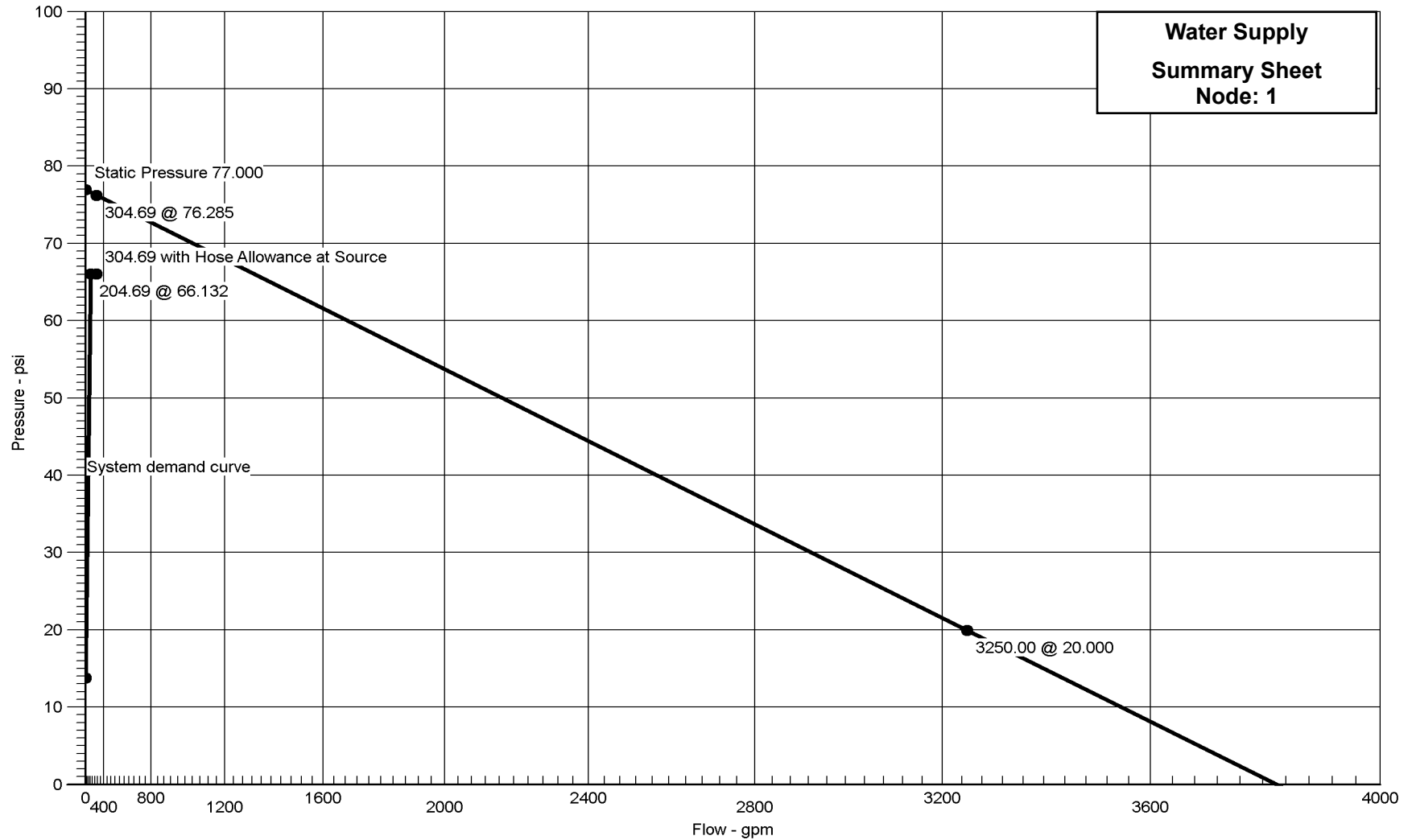
Notes:

Hydraulic Graph

Job Name: BRADLEY PARK PHASE 2
Remote Area Number: L2-2

N 1.85

Date: 9/16/2025



Supply:Static:77.000
Residual:20.000
Flowing:3250.00
Available Flow @ 20 PSI:3250.00



Summary Of Outflowing Devices

Job Number: 70120

Report Description: Light Hazard (L2-2)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)			
Sprinkler	3003	21.18	8.80	5.6	14.301			
Sprinkler	3004	18.28	8.80	5.6	10.652			
Sprinkler	3005	18.55	12.00	5.6	10.971			
Sprinkler	3006	19.84	8.80	5.6	12.551			
Sprinkler	3007	18.10	8.80	5.6	10.445			
Sprinkler	3008	19.06	8.80	5.6	11.585			
Sprinkler	3009	16.09	15.60	5.6	8.255			
⇒ Sprinkler	3010	19.60	19.60	5.6	12.250			
Sprinkler	3011	20.56	15.60	5.6	13.476			
Sprinkler	3012	16.66	15.40	5.6	8.848			
Sprinkler	3013	16.78	15.40	5.6	8.980			

⇒ Most Demanding Sprinkler Data

Supply Analysis							
Node	Name	Static (psi)	Residual (psi)	@ Flow (gpm)	Available (psi)	@ Total Demand (gpm)	Required Pressure (psi)
1	Water Supply	77.000	20.000	3250.00	76.285	304.69	66.132
Node Analysis							
Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes		
1	95-6	Supply	66.132	204.69			
3003	124-1	Sprinkler	14.301	21.18			
3004	125-1½	Sprinkler	10.652	18.28			
3005	121-4½	Sprinkler	10.971	18.55			
3006	122-2½	Sprinkler	12.551	19.84			
3007	125-1	Sprinkler	10.445	18.10			
3008	124-1	Sprinkler	11.585	19.06			
3009	127-5	Sprinkler	8.255	16.09			
3010	122-4	Sprinkler	12.250	19.60			
3011	123-2	Sprinkler	13.476	20.56			
3012	123-4½	Sprinkler	8.848	16.66			
3013	123-4½	Sprinkler	8.980	16.78			
2	95-6		66.113				
3	95-6		66.110				
4	95-6		65.970				
6	91-0		67.862				
7	91-0		65.870				
8	91-0		65.814				

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
9	91-0		65.810		
10	91-0		65.807		
11	91-0		65.806		
300	114-4		55.367		
301	121-1		51.864		
307	114-4		54.724		
308	121-1½		38.357		
309	121-1½		44.708		
310	125-3		15.067		
311	124-4		13.061		
312	125-6½		10.783		
313	124-4		12.776		
314	125-6		10.569		
315	124-4		12.609		
316	125-3		12.127		
317	123-7½		12.829		
318	123-7½		13.669		
319	122-9½		12.934		
320	122-4		12.760		
321	123-10		10.149		
322	121-1½		45.293		

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
						Total (Foot)		Friction(Pf)	
3010	122-4	5.6	19.60	1	(See Notes)	1-5½	150	12.250	•••••Route 1••••• Sprinkler, E(7-0), T(5-0)
319	122-9½		19.60	1.1010		12-0	0.065545	-0.198	
						13-5½		0.882	
319	122-9½		33.44	2	(See Notes)	1-10	150	12.934	Flow (q) from Route 3 T(10-0)
317	123-7½		53.04	2.0030		10-0	0.022423	-0.371	
						11-10		0.265	
317	123-7½		1.34	1½	(See Notes)	10-11	150	12.829	Flow (q) from Route 15 Tr(1-0)
318	123-7½		54.38	1.5980		1-0	0.070559		
						11-11		0.840	
318	123-7½		20.56	1½	(See Notes)	71-8½	150	13.669	Flow (q) from Route 10 10E(9-0), 7Tr(1-0), 2T(8-0)
308	121-1½		74.94	1.5980		113-0	0.127694	1.101	
						184-8½		23.587	
308	121-1½		129.75	2	(See Notes)	13-3½	150	38.357	Flow (q) from Route 2 T(10-0)
309	121-1½		204.69	2.0030		10-0	0.272711		
						23-3½		6.351	
309	121-1½			2		3-3	150	44.708	
322	121-1½		163.65	2.0030			0.180281	-0.000	
						3-3		0.585	
322	121-1½			2½	(See Notes)	15-0	120	45.293	fE(4-3½), 2E(6-0), CV(15-9), BV(7-0), PO(12-0)
307	114-4		163.65	2.4690		51-0½	0.098365	2.935	
						66-0½		6.496	
307	114-4			4	(See Notes)	48-2½	120	54.724	E(13-11), 2EE(5-7), 4fE(9-5½), ALV(4-2), BV(-0.033), PO(27-1 0½)
10	91-0		163.65	4.3100		95-0½	0.006524	10.116	
						143-3½		0.967	
10	91-0		41.03	6		2-1	120	65.807	Flow (q) from Route 12
9	91-0		204.69	6.3570			0.001487		
						2-1		0.003	
9	91-0			6		2-9	120	65.810	
8	91-0		204.69	6.3570			0.001487		
						2-9		0.004	
8	91-0			6	(See Notes)	2-7½	120	65.814	2E(17-7)
7	91-0		204.69	6.3570		35-2½	0.001487		
						37-10		0.056	

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot) Total (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe) Friction(Pf)	
Node 2									
7	91-0			6	(See Notes)	0-0	150	65.870	BFP(-1.992)
6	91-0		204.69	6.3570			0.000984		
						0-0		1.992	
6	91-0			6	(See Notes)	6-10	150	67.862	2E(26-7)
4	95-6		204.69	6.3570		53-2	0.000984	-1.951	
						60-0		0.059	
4	95-6			6	(See Notes)	85-1½	140	65.970	EE(11-0½), E(22-1)
3	95-6		204.69	6.2800		33-1	0.001186		
						118-2½		0.140	
3	95-6			12	(See Notes)	37-11	140	66.110	E(44-3)
2	95-6		204.69	12.4600		44-3	0.000042		
						82-2		0.003	
2	95-6			6	(See Notes)	15-5	140	66.113	Water Supply
1	95-6		204.69	6.2800			0.001186		
						15-5		0.018	
			100.00					66.132	Hose Allowance At Source
1			304.69						Total(Pt) Route 1
3009	127-5	5.6	16.09	1	(See Notes)	10-9	150	8.255	 Route 2 Sprinkler, 3E(7-0), Tr(1-0)
314	125-6		16.09	1.1010		22-0	0.045497	0.824	
						32-9		1.490	
314	125-6		18.10	1	(See Notes)	3-4	150	10.569	Flow (q) from Route 5 T(5-0)
315	124-4		34.19	1.1010		5-0	0.183462	0.513	
						8-4		1.527	
315	124-4		17.72	2	(See Notes)	5-8½	150	12.609	Flow (q) from Route 8 Tr(2-0)
313	124-4		51.91	2.0030		2-0	0.021544		
						7-8½		0.166	
313	124-4		19.84	2	(See Notes)	5-3½	150	12.776	Flow (q) from Route 9 Tr(2-0)
311	124-4		71.74	2.0030		2-0	0.039210	-0.000	
						7-3½		0.286	
311	124-4		36.83	2	(See Notes)	4-6½	150	13.061	Flow (q) from Route 6 2E(11-0), Tr(2-0)
310	125-3		108.57	2.0030		24-0	0.084382	-0.401	
						28-6½		2.407	

Pipe Information

Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.	
	Node 2		Elev 2 (Foot)	Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)		Elev(Pe)
			Total (Foot)				Friction(Pf)			
310	125-3		21.18	2	(See Notes)	43-1½	150	15.067	Flow (q) from Route 11 12E(11-0), 4Tr(2-0)	
308	121-1½		129.75	2.0030		140-0	0.117332	1.801		
						183-1½		21.489		
								38.357	Total(Pt) Route 2	
3012	123-4½	5.6	16.66	1	(See Notes)	11-10½	150	8.848	••••• Route 3 ••••• Sprinkler, 2E(7-0), T(5-0)	
321	123-10		16.66	1.1010		19-0	0.048514	-0.198		
						30-10½		1.498		
321	123-10		16.78	1	(See Notes)	3-1½	150	10.149	Flow (q) from Route 4 E(7-0), b(1-0)	
320	122-4		33.44	1.1010		8-0	0.176090	0.650		
						11-1½		1.961		
320	122-4			2	(See Notes)	3-11	150	12.760	3E(11-0), Tr(2-0)	
319	122-9½		33.44	2.0030		35-0	0.009551	-0.197		
						38-11		0.372		
								12.934	Total(Pt) Route 3	
3013	123-4½	5.6	16.78	1	(See Notes)	8-9½	150	8.980	••••• Route 4 ••••• Sprinkler, 2E(7-0), T(5-0)	
321	123-10		16.78	1.1010		19-0	0.049179	-0.198		
						27-9½		1.366		
								10.149	Total(Pt) Route 4	
3007	125-1	5.6	18.10	1	(See Notes)	0-5½	150	10.445	••••• Route 5 ••••• Sprinkler, T(5-0)	
314	125-6		18.10	1.1010		5-0	0.056561	-0.185		
						5-5½		0.309		
								10.569	Total(Pt) Route 5	
3004	125-1½	5.6	18.28	1	(See Notes)	0-5½	150	10.652	••••• Route 6 ••••• Sprinkler, T(5-0)	
312	125-6½		18.28	1.1010		5-0	0.057596	-0.184		
						5-5½		0.314		
312	125-6½		18.55	1	(See Notes)	3-4	150	10.783	Flow (q) from Route 7 T(5-0)	
311	124-4		36.83	1.1010		5-0	0.210497	0.526		
						8-4		1.752		
								13.061	Total(Pt) Route 6	
3005	121-4½	5.6	18.55	1	(See Notes)	12-4½	150	10.971	••••• Route 7 ••••• Sprinkler, 2E(7-0), Tr(1-0)	
312	125-6½		18.55	1.1010		15-0	0.059189	-1.808		
						27-4½		1.619		
								10.783	Total(Pt) Route 7	

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
						Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Total (Foot)		Friction(Pf)	
3008	124-1	5.6	19.06	1	(See Notes)	4-10	150	11.585	***** Route 8 ***** Sprinkler, E(7-0), T(5-0)
316	125-3		19.06	1.1010		12-0	0.062247	-0.506	
						16-10		1.047	
316	125-3			2	(See Notes)	3-10½	150	12.127	2E(11-0), Tr(2-0)
						24-0	0.002949	0.401	
315	124-4		17.72	2.0030		27-10½		0.082	
								12.609	Total(Pt) Route 8
3006	122-2½	5.6	19.84	1	(See Notes)	5-0½	150	12.551	***** Route 9 ***** Sprinkler, E(7-0), T(5-0)
313	124-4		19.84	1.1010		12-0	0.067032	-0.916	
						17-0½		1.141	
								12.776	Total(Pt) Route 9
3011	123-2	5.6	20.56	1	(See Notes)	0-5½	150	13.476	***** Route 10 ***** Sprinkler, T(5-0)
318	123-7½		20.56	1.1010		5-0	0.071591	-0.198	
						5-5½		0.391	
								13.669	Total(Pt) Route 10
3003	124-1	5.6	21.18	1	(See Notes)	4-10	150	14.301	***** Route 11 ***** Sprinkler, E(7-0), T(5-0)
310	125-3		21.18	1.1010		12-0	0.075634	-0.506	
						16-10		1.273	
								15.067	Total(Pt) Route 11
11	91-0		41.03	6		1-8	120	65.806	***** Route 12 ***** Flow (q) from Route 13
10	91-0		41.03	6.3570			0.000076		
						1-8		0.000	
								65.807	Total(Pt) Route 12
300	114-4		41.03	4	(See Notes)	428-11½	120	55.367	***** Route 13 ***** Flow (q) from Route 14 7fE(9-5½), 2EE(5-7), 7E(13-11) , ALV(4-2), BV(-0.003), PO(27- 10½)
11	91-0		41.03	4.3100		207-1	0.000505	10.116	
						636-0½		0.324	
								65.806	Total(Pt) Route 13
301	121-1		41.03	2½	(See Notes)	9-11	120	51.864	***** Route 14 ***** Flow (q) from Route 16 T(12-0), 3E(6-0), CV(15-9), BV (7-0), PO(12-0)
300	114-4		41.03	2.4690		64-9	0.007610	2.935	
						74-8		0.568	
								55.367	Total(Pt) Route 14

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
						Total (Foot)		Friction(Pf)	
316	125-3		17.72	2	(See Notes)	13-9	150	12.127	***** Route 15 ***** Flow (q) from Route 8 6E(11-0), T(10-0)
317	123-7½		1.34	2.0030		76-0	0.000025	0.700	
						89-9		0.002	
								12.829	Total(Pt) Route 15
309	121-1½			2	(See Notes)	381-0½	150	44.708	***** Route 16 ***** T(10-0) 34Tr(2-0), 4E(11-0), T(10-0)
301	121-1		41.03	2.0030		132-0	0.013947	0.000	
						513-0½		7.156	
								51.864	Total(Pt) Route 16

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

C Value Multiplier

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

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

Fittings Legend

ALV	Alarm Valve	AngV	Angle Valve	b	Bushing
BaIV	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 Relief Valve
PRV	Pressure Reducing Valve	red	Reducer/Adapter	S	Supply
sCV	Swing Check Valve	SFx	Seismic Flex	Spr	Sprinkler
St	Strainer	T	Tee Flow Turn 90°	Tr	Tee Run
U	Union	WirF	Wirsbo	WMV	Water Meter Valve
Z	Cap				

Hydraulic Calculations

for

Project Name: BRADLEY PARK PHASE 2: (70120)

Location: 707 39TH AVE SE, BLDG D, , PUYALLUP, WA 98374

Drawing Name: 70120 Wesley Bradley Park R01 Level 3

Calculation Date: 9/16/2025

Design

Remote Area Number: L3-1
Remote Area Location: FOX 3000
Occupancy Classification: Residential

Density 0.100gpm/ft²
Area of Application: 0.00ft² (Actual 314.46ft²)
Coverage per Sprinkler: 400.00ft²
Type of sprinklers calculated: Other
No. of sprinklers calculated: 4
No. of nozzles calculated: 0

In-rack Demand: N/A gpm at Node: N/A
Hose Streams: 100.00 at Node: 1 Type: Allowance at Source

Total Water Required (including Hose Streams where applicable):
From Water Supply at Node 1: 189.56 @ 64.168 (Safety Margin = 12.535)
Type of System: WET
Volume of Dry/PreAction/Antifreeze/OtherAgent System: N/A

Name of Contractor: RED HAWK FIRE PROTECTION, LLC
Address: 801 VALLEY AVE NW, SUITE D, PUYALLUP, WA 98371
Phone Number: 253-202-7007
Name of designer: BROOKE MCDANIELS
Authority Having Jurisdiction: : CITY OF PUYALLUP

Notes:

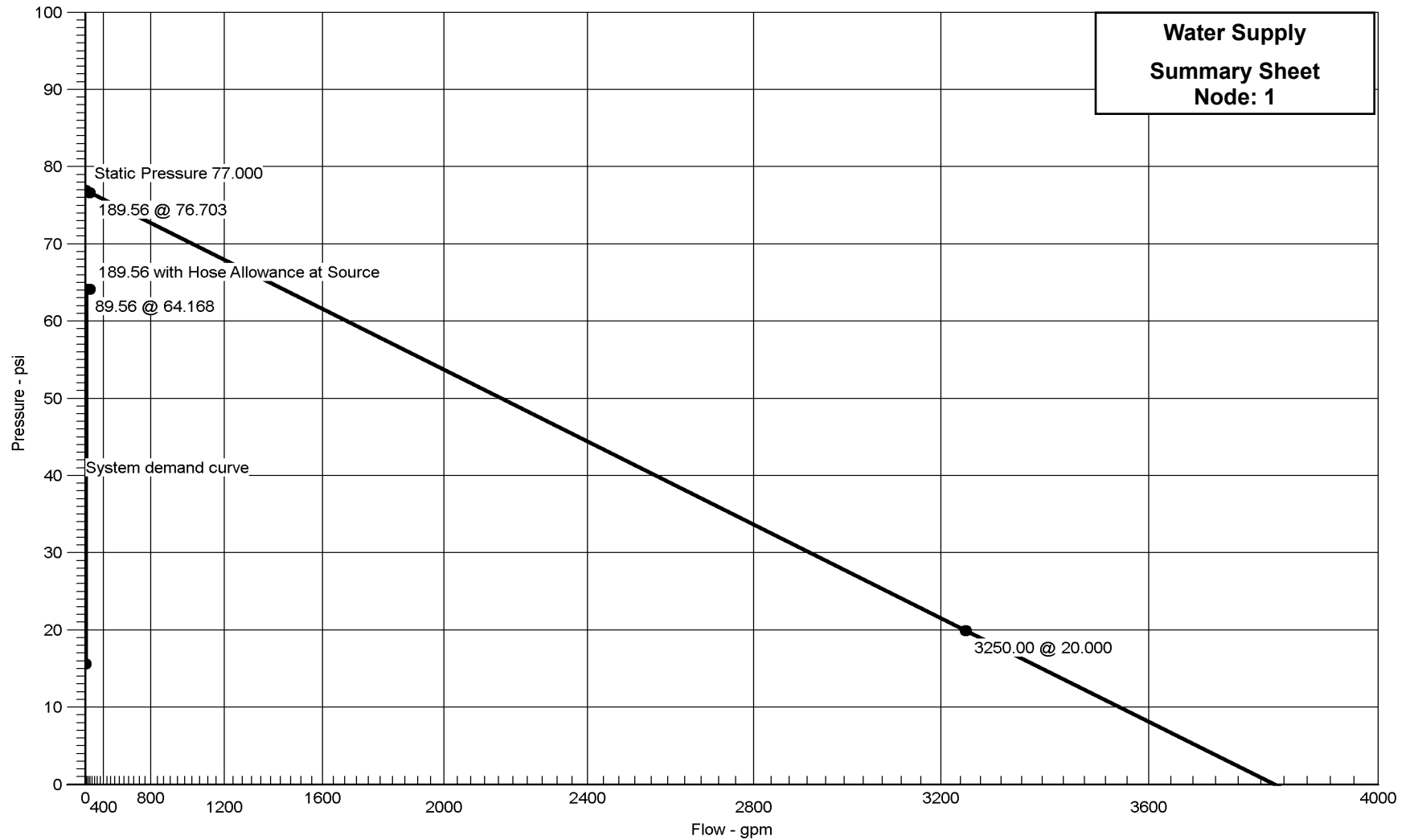
Hydraulic Graph

Job Name: BRADLEY PARK PHASE 2

N 1.85

Remote Area Number: L3-1

Date: 9/16/2025



Supply:Static:77.000
Residual:20.000
Flowing:3250.00
Available Flow @ 20 PSI:3250.00



Summary Of Outflowing Devices

Job Number: 70120 - WESLEY BRADLEY PARK

Report Description: Residential (L3-1)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)			
Sprinkler	4000	23.88	20.00	4.9	23.753			
Sprinkler	4001	20.69	20.00	4.9	17.822			
⇒ Sprinkler	4002	20.00	20.00	4.9	16.660			
Sprinkler	4007	24.99	20.00	4.9	26.014			

⇒ Most Demanding Sprinkler Data

Supply Analysis							
Node	Name	Static (psi)	Residual (psi)	@ Flow (gpm)	Available (psi)	@ Total Demand (gpm)	Required Pressure (psi)
1	Water Supply	77.000	20.000	3250.00	76.703	189.56	64.168
Node Analysis							
Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes		
1	95-6	Supply	64.168	89.56			
4000	131-6	Sprinkler	23.753	23.88			
4001	131-6	Sprinkler	17.822	20.69			
4002	131-6	Sprinkler	16.660	20.00			
4007	131-8½	Sprinkler	26.014	24.99			
2	95-6		64.164				
3	95-6		64.163				
4	95-6		64.133				
6	91-0		66.071				
7	91-0		62.094				
8	91-0		62.082				
9	91-0		62.081				
10	91-0		62.081				
11	91-0		62.081				
400	125-9½		46.914				
401	132-5		43.666				
402	131-11½		39.497				
403	132-5		23.901				

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
404	132-5		17.839		
405	132-5		30.139		
406	132-5		30.122		
407	125-9½		46.538		
413	132-5½		43.224		

Pipe Information

Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot) Total (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe) Friction(Pf)	Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
4002	131-6	4.9	20.00	1	(See Notes)	7-5	150	16.660	•••••Route 1••••• Sprinkler, 2E(7-0), 2Tr(1-0)
404	132-5		20.00	1.1010		16-0	0.068041	-0.414	
						23-5		1.594	
404	132-5		20.69	1	(See Notes)	15-11½	150	17.839	Flow (q) from Route 2 E(7-0), Tr(1-0)
403	132-5		40.69	1.1010		8-0	0.253126		
						23-11½		6.062	
403	132-5		23.88	1	(See Notes)	5-6	150	23.901	Flow (q) from Route 3 T(5-0)
405	132-5		64.57	1.1010		5-0	0.594820		
						10-6		6.237	
405	132-5		24.99	1½	(See Notes)	29-6	150	30.139	Flow (q) from Route 4 5Tr(1-0), E(9-0), T(8-0)
402	131-11½		89.56	1.5980		22-0	0.177564	0.217	
						51-6		9.141	
402	131-11½			2	(See Notes)	227-5½	150	39.497	21Tr(2-0), 2E(11-0), T(10-0)
401	132-5		41.94	2.0030		74-0	0.014521	-0.208	
						301-5½		4.377	
401	132-5			2½	(See Notes)	14-3½	120	43.666	fE(4-3½), E(6-0), CV(15-9), BV (7-0)
400	125-9½		41.94	2.4690		33-0½	0.007923	2.872	
						47-4		0.375	
400	125-9½			4	(See Notes)	59-8	120	46.914	E(13-11), 2EE(5-7), 4fE(9-5½), ALV(4-2), BV(-0.003), PO(27-1 0½)
10	91-0		41.94	4.3100		95-0½	0.000525	15.083	
						154-9		0.084	
10	91-0		47.62	6		2-1	120	62.081	Flow (q) from Route 5
9	91-0		89.56	6.3570			0.000322		
						2-1		0.001	
9	91-0			6		2-9	120	62.081	
8	91-0		89.56	6.3570			0.000322		
						2-9		0.001	
8	91-0			6	(See Notes)	2-7½	120	62.082	2E(17-7)
7	91-0		89.56	6.3570		35-2½	0.000322		
						37-10		0.012	
7	91-0			6	(See Notes)	0-0	150	62.094	BFP(-3.977)
6	91-0		89.56	6.3570			0.000213		
						0-0		3.977	

Pipe Information										
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.	
						Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)		
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Total (Foot)		Friction(Pf)		
6	91-0			6	(See Notes)	6-10	150	66.071	2E(26-7)	
4	95-6		89.56	6.3570		53-2	0.000213	-1.951		
						60-0		0.013		
4	95-6			6	(See Notes)	85-1½	140	64.133	EE(11-0½), E(22-1)	
3	95-6		89.56	6.2800		33-1	0.000257			
						118-2½		0.030		
3	95-6			12	(See Notes)	37-11	140	64.163	E(44-3)	
2	95-6		89.56	12.4600		44-3	0.000009			
						82-2		0.001		
2	95-6			6	(See Notes)	15-5	140	64.164	Water Supply	
1	95-6		89.56	6.2800			0.000257			
						15-5		0.004		
			100.00					64.168	Hose Allowance At Source	
1			189.56							Total(Pt) Route 1
4001	131-6	4.9	20.69	1	(See Notes)	0-11½	150	17.822	***** Route 2 ***** Sprinkler, T(5-0)	
						5-0	0.072421	-0.414		
404	132-5		20.69	1.1010		5-11½		0.431		
								17.839	Total(Pt) Route 2	
4000	131-6	4.9	23.88	1	(See Notes)	0-11½	150	23.753	***** Route 3 ***** Sprinkler, T(5-0)	
						5-0	0.094464	-0.414		
403	132-5		23.88	1.1010		5-11½		0.563		
								23.901	Total(Pt) Route 3	
4007	131-8½	4.9	24.99	1	(See Notes)	21-0½	150	26.014	***** Route 4 ***** Sprinkler, 3E(7-0), b(1-0)	
406	132-5		24.99	1.1010		22-0	0.102754	-0.315		
						43-0½		4.423		
406	132-5			1½	(See Notes)	0-0	150	30.122	Tr(1-0)	
						1-0	0.016745			
405	132-5		24.99	1.5980		1-0		0.017		
								30.139	Total(Pt) Route 4	
11	91-0		47.62	6		1-8	120	62.081	***** Route 5 ***** Flow (q) from Route 6	
							0.000100			
10	91-0		47.62	6.3570		1-8		0.000		

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
						Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Total (Foot)		Friction(Pf)	
								62.081	Total(Pt) Route 5
407	125-9½		47.62	4	(See Notes)	440-4½	120	46.538	***** Route 6 ***** Flow (q) from Route 7 T(27-10½), 14fE(9-5½), 2EE(5-7), 3E(13-11), ALV(4-2), BV(-0.003), PO(27-10½)
11	91-0		47.62	4.3100		245-7	0.000665	15.083	
						685-11½		0.459	
								62.081	Total(Pt) Route 6
402	131-11½		41.94	2	(See Notes)	156-8	150	39.497	***** Route 7 ***** Flow (q) from Route 1 13Tr(2-0), 2E(11-0), T(10-0)
413	132-5½		47.62	2.0030		58-0	0.018371	-0.217	
						214-8		3.944	
413	132-5½			2½	(See Notes)	8-5½	120	43.224	2E(6-0), CV(15-9), BV(7-0)
407	125-9½		47.62	2.4690		34-9	0.010023	2.881	
						43-2½		0.433	
								46.538	Total(Pt) Route 7

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

C Value Multiplier

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

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

Fittings Legend

ALV	Alarm Valve	AngV	Angle Valve	b	Bushing
BaIV	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 Relief Valve
PRV	Pressure Reducing Valve	red	Reducer/Adapter	S	Supply
sCV	Swing Check Valve	SFx	Seismic Flex	Spr	Sprinkler
St	Strainer	T	Tee Flow Turn 90°	Tr	Tee Run
U	Union	WirF	Wirsbo	WMV	Water Meter Valve
Z	Cap				

Hydraulic Calculations

for

Project Name: BRADLEY PARK PHASE 2: (70120)

Location: 707 39TH AVE SE, BLDG D, , PUYALLUP, WA 98374

Drawing Name: 70120 Wesley Bradley Park R01 Level 3

Calculation Date: 9/16/2025

Design

Remote Area Number: L3-2
Remote Area Location: LUMMI 3012
Occupancy Classification: Residential

Density 0.100gpm/ft²
Area of Application: 0.00ft² (Actual 390.61ft²)
Coverage per Sprinkler: 400.00ft²
Type of sprinklers calculated: Other
No. of sprinklers calculated: 4
No. of nozzles calculated: 0

In-rack Demand: N/A gpm at Node: N/A
Hose Streams: 100.00 at Node: 1 Type: Allowance at Source

Total Water Required (including Hose Streams where applicable):
From Water Supply at Node 1: 184.45 @ 70.342 (Safety Margin = 6.375)
Type of System: WET
Volume of Dry/PreAction/Antifreeze/OtherAgent System: N/A

Name of Contractor: RED HAWK FIRE PROTECTION, LLC
Address: 801 VALLEY AVE NW, SUITE D, PUYALLUP, WA 98371
Phone Number: 253-202-7007
Name of designer: BROOKE MCDANIELS
Authority Having Jurisdiction: : CITY OF PUYALLUP

Notes:

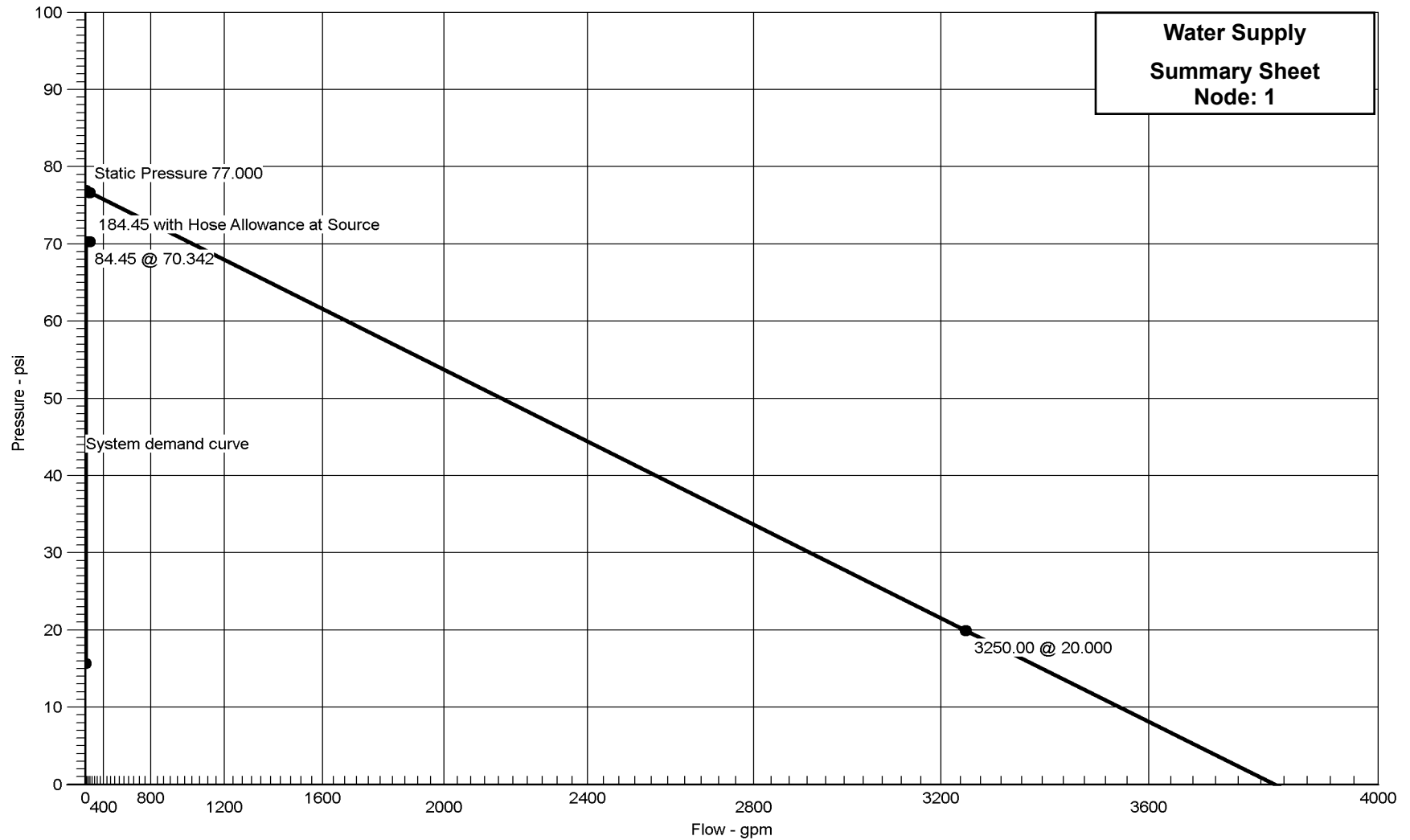
Hydraulic Graph

Job Name: BRADLEY PARK PHASE 2

Remote Area Number: L3-2

N 1.85

Date: 9/16/2025



Supply:Static:77.000
Residual:20.000
Flowing:3250.00
Available Flow @ 20 PSI:3250.00



Summary Of Outflowing Devices

Job Number: 70120 - WESLEY BRADLEY PARK

Report Description: Residential (L3-2)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)			
Sprinkler	4003	22.88	20.00	4.9	21.795			
⇒ Sprinkler	4004	20.00	20.00	4.9	16.660			
Sprinkler	4005	21.30	20.00	4.9	18.889			
Sprinkler	4006	20.28	20.00	4.9	17.123			

⇒ Most Demanding Sprinkler Data

Supply Analysis							
Node	Name	Static (psi)	Residual (psi)	@ Flow (gpm)	Available (psi)	@ Total Demand (gpm)	Required Pressure (psi)
1	Water Supply	77.000	20.000	3250.00	76.718	184.45	70.342
Node Analysis							
Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes		
1	95-6	Supply	70.342	84.45			
4003	131-9	Sprinkler	21.795	22.88			
4004	131-9	Sprinkler	16.660	20.00			
4005	131-9	Sprinkler	18.889	21.30			
4006	131-9	Sprinkler	17.123	20.28			
2	95-6		70.339				
3	95-6		70.338				
4	95-6		70.311				
6	91-0		72.250				
7	91-0		68.214				
8	91-0		68.203				
9	91-0		68.202				
10	91-0		68.202				
11	91-0		68.202				
400	125-9½		52.935				
401	132-5		49.242				
407	125-9½		53.023				
408	132-5½		48.196				

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
409	132-5		19.026		
410	132-5		17.568		
411	132-5		23.064		
412	132-5		41.881		
413	132-5½		50.051		

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
						Total (Foot)		Friction(Pf)	
4004	131-9	4.9	20.00	1	(See Notes)	5-8½	150	16.660	•••••Route 1••••• Sprinkler, E(7-0), T(5-0)
410	132-5		20.00	1.1010		12-0	0.068041	-0.298	
						17-8½		1.206	
410	132-5		20.28	1	(See Notes)	4-10½	150	17.568	Flow (q) from Route 2 Tr(1-0)
409	132-5		40.28	1.1010		1-0	0.248430		
						5-10½		1.458	
409	132-5		21.30	1	(See Notes)	6-5	150	19.026	Flow (q) from Route 3 Tr(1-0)
411	132-5		61.57	1.1010		1-0	0.544793		
						7-5		4.038	
411	132-5		22.88	1	(See Notes)	16-3	150	23.064	Flow (q) from Route 4 2Tr(1-0), b(1-0)
412	132-5		84.45	1.1010		3-0	0.977365		
						19-3		18.817	
412	132-5			1½	(See Notes)	21-8½	150	41.881	2Tr(1-0), 2T(8-0)
408	132-5½		84.45	1.5980		18-0	0.159273	-0.009	
						39-8½		6.325	
408	132-5½			2	(See Notes)	20-7½	150	48.196	Tr(2-0), T(10-0)
401	132-5		64.03	2.0030		12-0	0.031764	0.009	
						32-7½		1.037	
401	132-5			2½	(See Notes)	14-3½	120	49.242	fE(4-3½), E(6-0), CV(15-9), BV (7-0)
400	125-9½		64.03	2.4690		33-0½	0.017331	2.872	
						47-4		0.821	
400	125-9½			4	(See Notes)	59-8	120	52.935	E(13-11), 2EE(5-7), 4fE(9-5½), ALV(4-2), BV(-0.006), PO(27-1 0½)
10	91-0		64.03	4.3100		95-0½	0.001149	15.083	
						154-9		0.184	
10	91-0		20.42	6		2-1	120	68.202	Flow (q) from Route 5
9	91-0		84.45	6.3570			0.000289		
						2-1		0.001	
9	91-0			6		2-9	120	68.202	
8	91-0		84.45	6.3570			0.000289		
						2-9		0.001	
8	91-0			6	(See Notes)	2-7½	120	68.203	2E(17-7)
7	91-0		84.45	6.3570		35-2½	0.000289		
						37-10		0.011	

Pipe Information

Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
						Total (Foot)		Friction(Pf)	
7	91-0			6	(See Notes)	0-0	150	68.214	BFP(-4.036)
6	91-0		84.45	6.3570			0.000191		
						0-0		4.036	
6	91-0			6	(See Notes)	6-10	150	72.250	2E(26-7)
4	95-6		84.45	6.3570		53-2	0.000191	-1.951	
						60-0		0.011	
4	95-6			6	(See Notes)	85-1½	140	70.311	EE(11-0½), E(22-1)
3	95-6		84.45	6.2800		33-1	0.000231		
						118-2½		0.027	
3	95-6			12	(See Notes)	37-11	140	70.338	E(44-3)
2	95-6		84.45	12.4600		44-3	0.000008		
						82-2		0.001	
2	95-6			6	(See Notes)	15-5	140	70.339	Water Supply
1	95-6		84.45	6.2800			0.000231		
						15-5		0.004	
			100.00					70.342	Hose Allowance At Source
1			184.45						Total(Pt) Route 1
4006	131-9	4.9	20.28	1	(See Notes)	2-8	150	17.123	 Route 2 Sprinkler, E(7-0), Tr(1-0)
410	132-5		20.28	1.1010		8-0	0.069789	-0.298	
						10-8		0.743	
								17.568	Total(Pt) Route 2
4005	131-9	4.9	21.30	1	(See Notes)	0-8½	150	18.889	 Route 3 Sprinkler, T(5-0)
409	132-5		21.30	1.1010		5-0	0.076424	-0.298	
						5-8½		0.435	
								19.026	Total(Pt) Route 3
4003	131-9	4.9	22.88	1	(See Notes)	5-11½	150	21.795	 Route 4 Sprinkler, E(7-0), T(5-0)
411	132-5		22.88	1.1010		12-0	0.087238	-0.298	
						17-11½		1.567	
								23.064	Total(Pt) Route 4
11	91-0		20.42	6		1-8	120	68.202	 Route 5 Flow (q) from Route 6
10	91-0		20.42	6.3570			0.000021		
						1-8		0.000	

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
						Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Total (Foot)		Friction(Pf)	
								68.202	
407	125-9½		20.42	4	(See Notes)	440-4½	120	53.023	••••• Route 6 ••••• Flow (q) from Route 7 T(27-10½), 14fE(9-5½), 2EE(5-7), 3E(13-11), ALV(4-2), BV(-0.001), PO(27-10½)
11	91-0		20.42	4.3100		245-7	0.000139	15.083	
						685-11½		0.096	
								68.202	Total(Pt) Route 6
413	132-5½			2½	(See Notes)	8-5½	120	50.051	••••• Route 7 ••••• 2E(6-0), CV(15-9), BV(7-0)
407	125-9½		20.42	2.4690		34-9	0.002093	2.881	
						43-2½		0.090	
								53.023	Total(Pt) Route 7
408	132-5½		64.03	2	(See Notes)	363-6	150	48.196	••••• Route 8 ••••• Flow (q) from Route 1 33Tr(2-0), 4E(11-0), T(10-0)
413	132-5½		20.42	2.0030		120-0	0.003836		
						483-6		1.855	
								50.051	Total(Pt) Route 8

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

C Value Multiplier

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

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

Fittings Legend

ALV	Alarm Valve	AngV	Angle Valve	b	Bushing
BaIV	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 Relief Valve
PRV	Pressure Reducing Valve	red	Reducer/Adapter	S	Supply
sCV	Swing Check Valve	SFx	Seismic Flex	Spr	Sprinkler
St	Strainer	T	Tee Flow Turn 90°	Tr	Tee Run
U	Union	WirF	Wirsbo	WMV	Water Meter Valve
Z	Cap				

Hydraulic Calculations

for

Project Name: BRADLEY PARK PHASE 2: (70120)

Location: 707 39TH AVE SE, BLDG D, , PUYALLUP, WA 98374

Drawing Name: 70120_Wesley Bradley Park_R03_Attic

Calculation Date: 9/17/2025

Design

Remote Area Number: L3-3
Remote Area Location: CLUBROOM ATTIC
Occupancy Classification: Light Hazard

Density 0.100gpm/ft²

Area of Application: 0.00ft² (Actual 453.61ft²)

Coverage per Sprinkler: 100.00ft²

Type of sprinklers calculated: Upright

No. of sprinklers calculated: 9

No. of nozzles calculated: 0

In-rack Demand: N/A gpm at Node: N/A

Hose Streams: 100.00 at Node: 1 Type: Allowance at Source

Total Water Required (including Hose Streams where applicable):

From Water Supply at Node 1: 300.15 @ 72.208 (Safety Margin = 4.097)

Type of System: DRY

Volume of Dry/PreAction/Antifreeze/OtherAgent System: 1216.46gal

Name of Contractor: RED HAWK FIRE PROTECTION, LLC

Address: 801 VALLEY AVE NW, SUITE D, PUYALLUP, WA 98371

Phone Number: 253-202-7007

Name of designer: BROOKE MCDANIELS

Authority Having Jurisdiction: CITY OF PUYALLUP

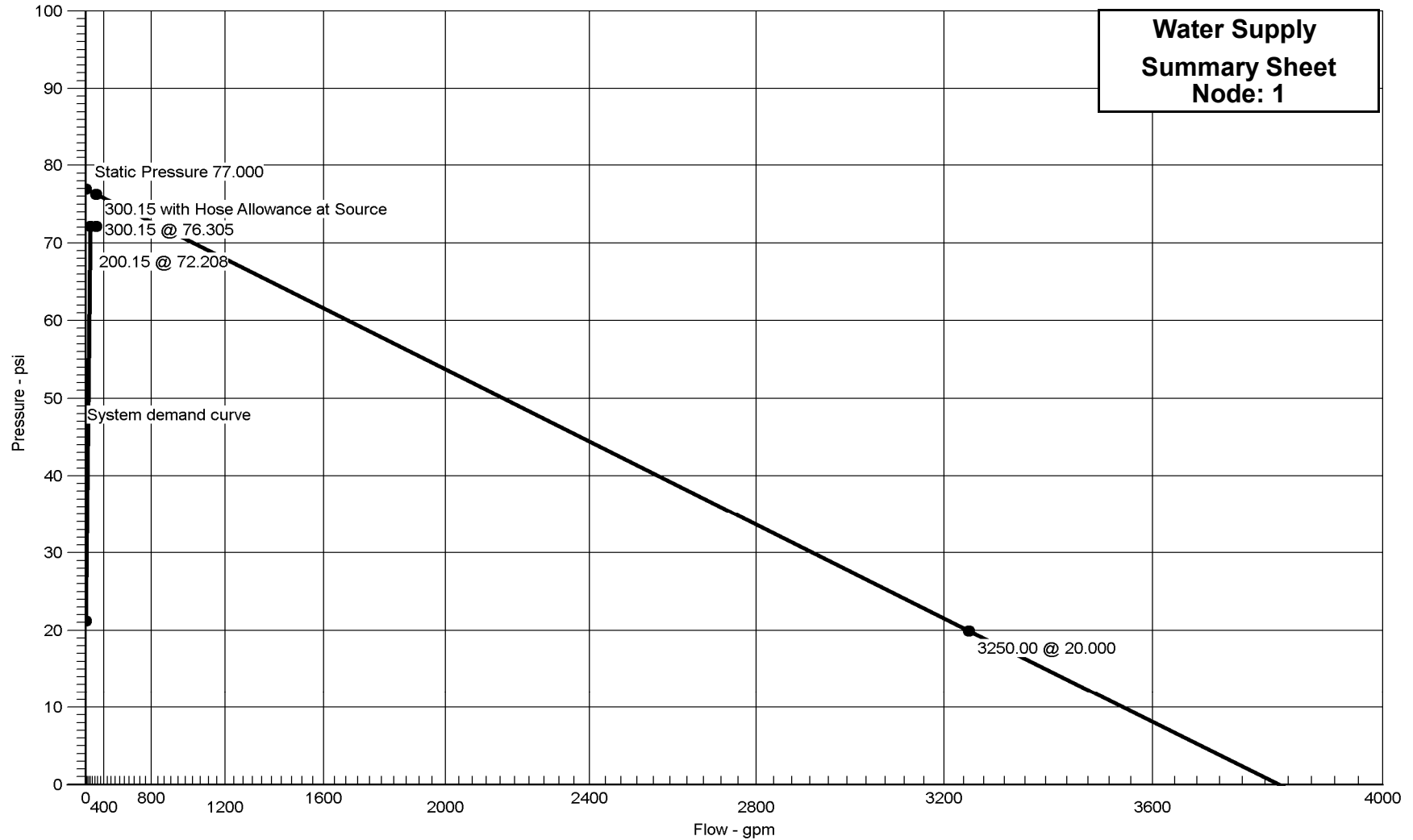
Notes:

Hydraulic Graph

Job Name: BRADLEY PARK PHASE 2
Remote Area Number: L3-3

N 1.85

Date: 9/17/2025



Supply:Static:77.000
Residual:20.000
Flowing:3250.00
Available Flow @ 20 PSI:3250.00



Summary Of Outflowing Devices

Job Number: 70120
Report Description: Light Hazard (L3-3)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)			
Sprinkler	4010	24.83	20.00	5.6	19.662			
Sprinkler	4011	23.62	20.00	5.6	17.783			
Sprinkler	4012	23.07	20.00	5.6	16.968			
Sprinkler	4013	21.21	20.00	5.6	14.351			
Sprinkler	4014	22.43	20.00	5.6	16.044			
Sprinkler	4015	20.53	20.00	5.6	13.434			
➡ Sprinkler	4016	20.00	20.00	5.6	12.755			
Sprinkler	4017	21.03	20.00	5.6	14.105			
Sprinkler	4018	23.44	20.00	5.6	17.516			

➡ Most Demanding Sprinkler Data

Supply Analysis							
Node	Name	Static (psi)	Residual (psi) @	Flow (gpm)	Available (psi) @	Total Demand (gpm)	Required Pressure (psi)
1	Water Supply	77.000	20.000	3250.00	76.305	300.15	72.208
Node Analysis							
Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes		
1	95-6	Supply	72.208	200.15			
4010	132-6	Sprinkler	19.662	24.83			
4011	132-6	Sprinkler	17.783	23.62			
4012	137-2½	Sprinkler	16.968	23.07			
4013	137-2½	Sprinkler	14.351	21.21			
4014	132-6	Sprinkler	16.044	22.43			
4015	144-6½	Sprinkler	13.434	20.53			
4016	137-2½	Sprinkler	12.755	20.00			
4017	137-2½	Sprinkler	14.105	21.03			
4018	132-6	Sprinkler	17.516	23.44			
2	95-6		72.190				
3	95-6		72.187				
4	95-6		72.050				
5	91-0		73.915				
6	91-0		73.890				
7	91-0		71.387				
8	91-0		71.383				
12	98-3		67.766				

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
415	131-2		23.264		
416	131-2		26.306		
417	131-2		25.453		
418	131-2		23.028		
419	131-2		25.081		

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot) Total (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe) Friction(Pf)	
4016	137-2½	5.6	20.00	1	(See Notes)	6-10½	100	12.755	••••• Route 1 ••••• Sprinkler
4014	132-6		20.00	1.0490			0.182334	2.037	
						6-10½		1.251	
4014	132-6	5.6	22.43	1	(See Notes)	2-4	100	16.044	Sprinkler, 2E(1-5), PO(3-7)
418	131-2		42.43	1.0490		6-5	0.733104	0.578	
						8-9		6.407	
418	131-2			2		10-9	100	23.028	
415	131-2		42.43	2.1570			0.021902	-0.000	
						10-9		0.236	
415	131-2		68.42	2	(See Notes)	10-11½	100	23.264	Flow (q) from Route 2 fE(3-9½), T(8-9½)
416	131-2		110.85	2.1570		12-6½	0.129445	0.000	
						23-6		3.042	
416	131-2		89.30	3	(See Notes)	360-11½	100	26.306	Flow (q) from Route 3 1fE(4-9½), T(12-5½), PO(14-4½), C(14-4½)
420	120-2½		200.15	3.2600		93-11	0.051676	4.763	
						454-10½		23.506	
420	120-2½			4	(See Notes)	217-4	100	54.575	5fE(6-4½), EE(3-9), E(9-4½)
12	98-3		200.15	4.2600		45-1	0.014042	9.507	
						262-5		3.685	
12	98-3			4	(See Notes)	6-1	100	67.766	DPV(8-4½), PO(18-9½)
8	91-0		200.15	4.2600		27-2	0.014042	3.150	
						33-3		0.467	
8	91-0			6		3-0	120	71.383	
7	91-0		200.15	6.3570			0.001427		
						3-0		0.004	
7	91-0			6	(See Notes)	2-0½	120	71.387	BFP(-2.500)
6	91-0		200.15	6.3570			0.001427		
						2-0½		2.503	
6	91-0			6	(See Notes)	0-0	140	73.890	E(22-1)
5	91-0		200.15	6.2800		22-1	0.001138		
						22-1		0.025	
5	91-0			6	(See Notes)	9-3½	140	73.915	3E(22-1)
4	95-6		200.15	6.2800		66-2½	0.001138	-1.951	
						75-6		0.086	

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot) Total (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe) Friction(Pf)	
4	95-6			6	(See Notes)	87-0	140	72.050	EE(11-0½), E(22-1)
3	95-6		200.15	6.2800		33-1	0.001138		
						120-1		0.137	
3	95-6			12	(See Notes)	37-11	140	72.187	E(44-3)
2	95-6		200.15	12.4600		44-3	0.000040		
						82-2		0.003	
2	95-6			6	(See Notes)	15-5	140	72.190	Water Supply
1	95-6		200.15	6.2800			0.001138		
						15-5		0.018	
			100.00					72.208	Hose Allowance At Source
1			300.15						Total(Pt) Route 1
4015	144-6½	5.6	20.53	1½	(See Notes)	9-1½	100	13.434	••••• Route 2 ••••• Sprinkler, 2E(2-10)
4012	137-2½		20.53	1.6100		5-8½	0.023749	3.181	
						14-10		0.352	
4012	137-2½	5.6	23.07	1½	(See Notes)	6-10½	100	16.968	Sprinkler
4010	132-6		43.59	1.6100			0.095680	2.037	
						6-10½		0.657	
4010	132-6	5.6	24.83	1½	(See Notes)	2-4	100	19.662	Sprinkler, 2E(2-10), PO(5-8½)
415	131-2		68.42	1.6100		11-5	0.220312	0.578	
						13-8½		3.025	
								23.264	Total(Pt) Route 2
4017	137-2½	5.6	21.03	1	(See Notes)	6-10½	100	14.105	••••• Route 3 ••••• Sprinkler
4018	132-6		21.03	1.0490			0.200120	2.037	
						6-10½		1.373	
4018	132-6	5.6	23.44	1	(See Notes)	2-4	100	17.516	Sprinkler, 2E(1-5), PO(3-7)
419	131-2		44.47	1.0490		6-5	0.799593	0.578	
						8-9		6.987	
419	131-2			2	(See Notes)	12-6½	100	25.081	fE(3-1)
417	131-2		44.47	2.1570		3-1	0.023889	-0.000	
						15-7		0.373	
417	131-2		44.83	2	(See Notes)	1-0½	100	25.453	Flow (q) from Route 4 T(8-9½)
416	131-2		89.30	2.1570		8-9½	0.086766	0.000	
						9-10		0.853	

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
						Total (Foot)		Friction(Pf)	
								26.306	
4013	137-2½	5.6	21.21	1	(See Notes)	6-10½	100	14.351	••••• Route 4 ••••• Sprinkler
4011	132-6		21.21	1.0490		6-10½	0.203339	2.037	
								1.395	
4011	132-6	5.6	23.62	1	(See Notes)	2-4	100	17.783	Sprinkler, 2E(1-5), PO(3-7)
						6-5	0.811628	0.578	
417	131-2		44.83	1.0490		8-9		7.092	
								25.453	Total(Pt) Route 4

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

C Value Multiplier

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

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

Fittings Legend

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

Hydraulic Calculations

for

Project Name: BRADLEY PARK PHASE 2: (70120)

Location: 707 39TH AVE SE, BLDG D, , PUYALLUP, WA 98374

Drawing Name: 70120 Wesley Bradley Park R03 Attic

Calculation Date: 9/17/2025

Design

Remote Area Number: L4-1
Remote Area Location: ATTIC RIDGE
Occupancy Classification: Light Hazard
Commodity Classification: N/A

Density 0.100gpm/ft²
Area of Application: 0.00ft² (Actual 227.62ft²)
Coverage per Sprinkler: 100.00ft²
Type of sprinklers calculated: Upright
No. of sprinklers calculated: 8
No. of nozzles calculated: 0

In-rack Demand: N/A gpm at Node: N/A
Hose Streams: 100.00 at Node: 1 Type: Allowance at Source

Total Water Required (including Hose Streams where applicable):

From Water Supply at Node 1: 265.89 @ 46.475

(Safety Margin = 29.970)

Type of System: DRY

Volume of Dry/PreAction/Antifreeze/OtherAgent System: 1216.46gal

Name of Contractor: RED HAWK FIRE PROTECTION, LLC
Address: 801 VALLEY AVE NW, SUITE D, PUYALLUP, WA 98371
Phone Number: 253-202-7007
Name of designer: BROOKE MCDANIELS
Authority Having Jurisdiction: : CITY OF PUYALLUP

Notes:

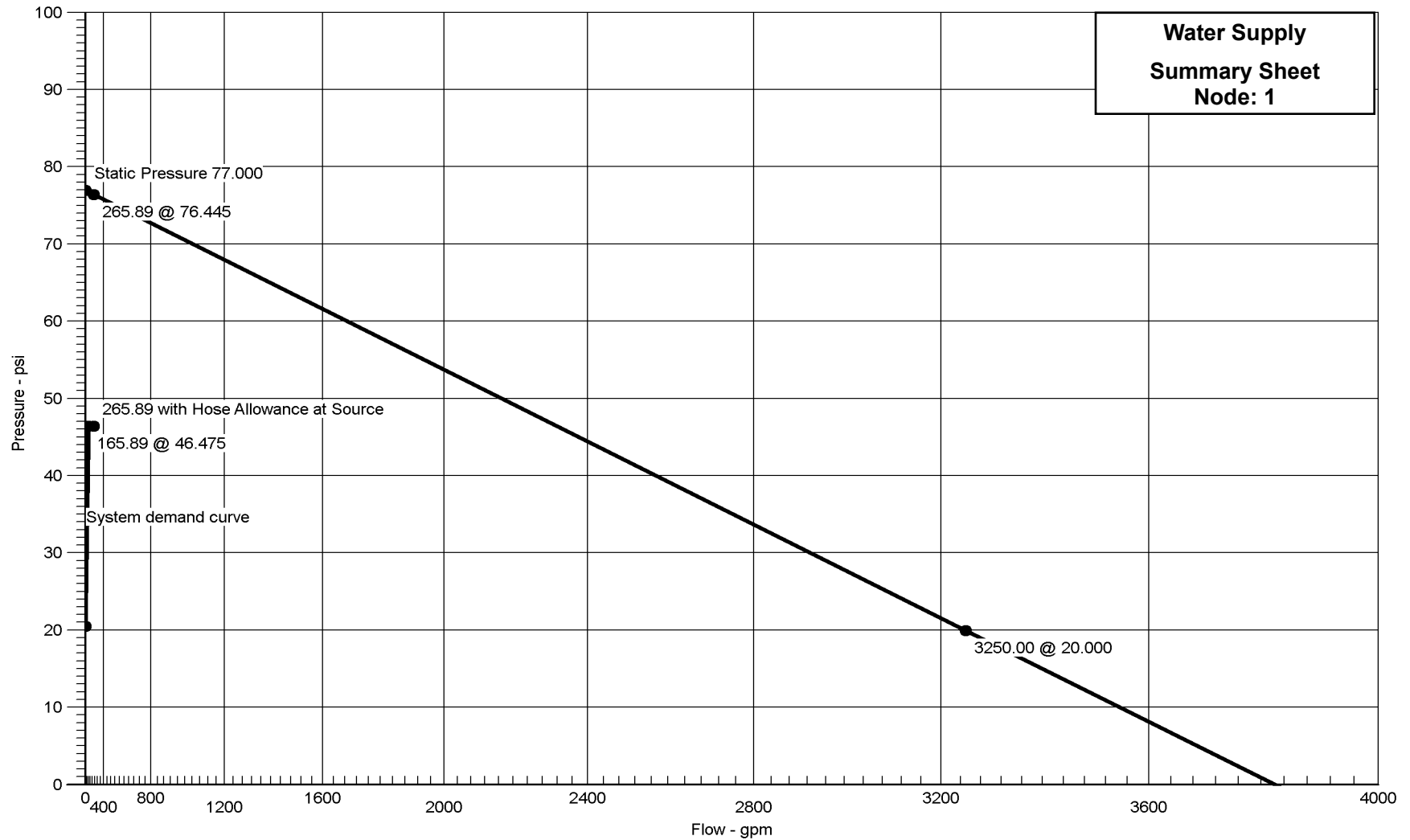
Hydraulic Graph

Job Name: BRADLEY PARK PHASE 2

N 1.85

Remote Area Number: L4-1

Date: 9/17/2025



Supply:Static:77.000
Residual:20.000
Flowing:3250.00
Available Flow @ 20 PSI:3250.00



Summary Of Outflowing Devices

Job Number: 70120

Report Description: Light Hazard (L4-1)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)			
Sprinkler	5000	22.04	20.00	5.6	15.487			
Sprinkler	5001	20.00	20.00	5.6	12.756			
Sprinkler	5002	21.99	20.00	5.6	15.422			
Sprinkler	5003	20.05	20.00	5.6	12.814			
⇒ Sprinkler	5004	20.00	20.00	5.6	12.755			
Sprinkler	5005	20.05	20.00	5.6	12.813			
Sprinkler	5006	20.25	20.00	5.6	13.081			
Sprinkler	5007	21.52	20.00	5.6	14.764			

⇒ Most Demanding Sprinkler Data

Supply Analysis							
Node	Name	Static (psi)	Residual (psi)	@ Flow (gpm)	Available (psi)	@ Total Demand (gpm)	Required Pressure (psi)
1	Water Supply	77.000	20.000	3250.00	76.445	265.89	46.475
Node Analysis							
Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes		
1	95-6	Supply	46.475	165.89			
5000	142-10½	Sprinkler	15.487	22.04			
5001	142-11	Sprinkler	12.756	20.00			
5002	142-11	Sprinkler	15.422	21.99			
5003	142-10½	Sprinkler	12.814	20.05			
5004	142-11	Sprinkler	12.755	20.00			
5005	142-10½	Sprinkler	12.813	20.05			
5006	140-7½	Sprinkler	13.081	20.25			
5007	139-8	Sprinkler	14.764	21.52			
2	95-6		46.463				
3	95-6		46.460				
4	95-6		46.364				
5	91-0		48.254				
6	91-0		48.236				
7	91-0		44.863				
8	91-0		44.860				
12	98-3		41.380				
500	134-2		20.250				

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
501	134-2		20.066		
502	134-2		17.950		
503	142-10½		13.046		
504	139-8		14.720		

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
						Total (Foot)		Friction(Pf)	
5004	142-11	5.6	20.00	2	(See Notes)	8-0	100	12.755	Route 1 Sprinkler
5005	142-10½		20.00	2.1570			0.005447	0.014	
						8-0		0.044	
5005	142-10½	5.6	20.05	2	(See Notes)	4-0½	100	12.813	Sprinkler, T(7-5½)
503	142-10½		40.05	2.1570		7-5½	0.019679	0.007	
						11-6		0.226	
503	142-10½		40.05	2	(See Notes)	8-8	100	13.046	Flow (q) from Route 2 T(7-5½)
502	134-2		80.09	2.1570		7-5½	0.070947	3.759	
						16-1½		1.144	
502	134-2		41.77	2	(See Notes)	4-10½	100	17.950	Flow (q) from Route 3 PO(8-9½)
501	134-2		121.86	2.1570		8-9½	0.154226	0.009	
						13-8		2.107	
501	134-2			4		32-10	100	20.066	
500	134-2		121.86	4.2600			0.005608		
						32-10		0.184	
500	134-2		44.03	4	(See Notes)	440-5½	100	20.250	Flow (q) from Route 4 2EE(3-9), 8fE(6-4½), T(15-0½) , C(18-9½), E(9-4½)
12	98-3		165.89	4.2600		120-6½	0.009922	15.564	
						561-0		5.566	
12	98-3			4	(See Notes)	6-1	100	41.380	DPV(8-4½), PO(18-9½)
8	91-0		165.89	4.2600		27-2	0.009922	3.150	
						33-3		0.330	
8	91-0			6		3-0	120	44.860	
7	91-0		165.89	6.3570			0.001008		
						3-0		0.003	
7	91-0			6	(See Notes)	2-0½	120	44.863	BFP(-3.371)
6	91-0		165.89	6.3570			0.001008		
						2-0½		3.373	
6	91-0			6	(See Notes)	0-0	140	48.236	E(22-1)
5	91-0		165.89	6.2800		22-1	0.000804		
						22-1		0.018	
5	91-0			6	(See Notes)	9-3½	140	48.254	3E(22-1)
4	95-6		165.89	6.2800		66-2½	0.000804	-1.951	
						75-6		0.061	

Pipe Information										
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.	
	Node 2		Elev 2 (Foot)	Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)		Elev(Pe)
Total (Foot)		Friction(Pf)								
4	95-6			6	(See Notes)	87-0	140	46.364	EE(11-0½), E(22-1)	
3	95-6		165.89	6.2800		33-1	0.000804			
						120-1		0.097		
3	95-6			12	(See Notes)	37-11	140	46.460	E(44-3)	
2	95-6		165.89	12.4600		44-3	0.000029			
						82-2		0.002		
2	95-6			6	(See Notes)	15-5	140	46.463	Water Supply	
1	95-6		165.89	6.2800			0.000804			
						15-5		0.012		
			100.00					46.475	Hose Allowance At Source	
1			265.89							Total(Pt) Route 1
5001	142-11	5.6	20.00	2	(See Notes)	8-0	100	12.756	••••• Route 2 ••••• Sprinkler	
							0.005448	0.014		
5003	142-10½		20.00	2.1570		8-0		0.044		
5003	142-10½	5.6	20.05	2	(See Notes)	3-11½	100	12.814	Sprinkler, T(7-5½)	
						7-5½	0.019681	0.007		
503	142-10½		40.05	2.1570		11-5		0.225		
								13.046	Total(Pt) Route 2	
5006	140-7½	5.6	20.25	1	(See Notes)	3-0½	100	13.081	••••• Route 3 ••••• Sprinkler, PO(3-7)	
504	139-8		20.25	1.0490		3-7	0.186636	0.404		
						6-7½		1.235		
504	139-8			2		6-0	100	14.720		
							0.005576	0.011		
5007	139-8		20.25	2.1570		6-0		0.034		
5007	139-8	5.6	21.52	2	(See Notes)	24-4	100	14.764	Sprinkler, T(7-5½), fE(3-1), Tr(3-6)	
						14-0½	0.021277	2.369		
502	134-2		41.77	2.1570		38-4½		0.817		
								17.950	Total(Pt) Route 3	
5002	142-11	5.6	21.99	2	(See Notes)	8-0	100	15.422	••••• Route 4 ••••• Sprinkler	
							0.006493	0.012		
5000	142-10½		21.99	2.1570		8-0		0.052		

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
						Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
						Total (Foot)		Friction(Pf)	
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)				
5000	142-10½	5.6	22.04	2	(See Notes)	18-5	100	15.487	Sprinkler, 2T(7-5½), PO(8-9½)
500	134-2		44.03	2.1570		23-8½	0.023454	3.776	
						42-1		0.987	
								20.250	Total(Pt) Route 4

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

C Value Multiplier

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

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

Fittings Legend

ALV	Alarm Valve	AngV	Angle Valve	b	Bushing
BaIV	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 Relief Valve
PRV	Pressure Reducing Valve	red	Reducer/Adapter	S	Supply
sCV	Swing Check Valve	SFx	Seismic Flex	Spr	Sprinkler
St	Strainer	T	Tee Flow Turn 90°	Tr	Tee Run
U	Union	WirF	Wirsbo	WMV	Water Meter Valve
Z	Cap				

Hydraulic Calculations

for

Project Name: BRADLEY PARK PHASE 2: (70120)

Location: 707 39TH AVE SE, BLDG D, , PUYALLUP, WA 98374

Drawing Name: 70120 Wesley Bradley Park R03 Attic

Calculation Date: 9/17/2025

Design

Remote Area Number: L4-2
Remote Area Location: ATTIC HIP
Occupancy Classification: Light Hazard
Commodity Classification: N/A

Density 0.100gpm/ft²
Area of Application: 0.00ft² (Actual 592.88ft²)
Coverage per Sprinkler: 100.00ft²
Type of sprinklers calculated: Upright
No. of sprinklers calculated: 9
No. of nozzles calculated: 0

In-rack Demand: N/A gpm at Node: N/A
Hose Streams: 100.00 at Node: 1 Type: Allowance at Source

Total Water Required (including Hose Streams where applicable):
From Water Supply at Node 1: 314.57 @ 68.744 (Safety Margin = 7.498)
Type of System: DRY
Volume of Dry/PreAction/Antifreeze/OtherAgent System: 1216.46gal

Name of Contractor: RED HAWK FIRE PROTECTION, LLC
Address: 801 VALLEY AVE NW, SUITE D, PUYALLUP, WA 98371
Phone Number: 253-202-7007
Name of designer: BROOKE MCDANIELS
Authority Having Jurisdiction: : CITY OF PUYALLUP

Notes:

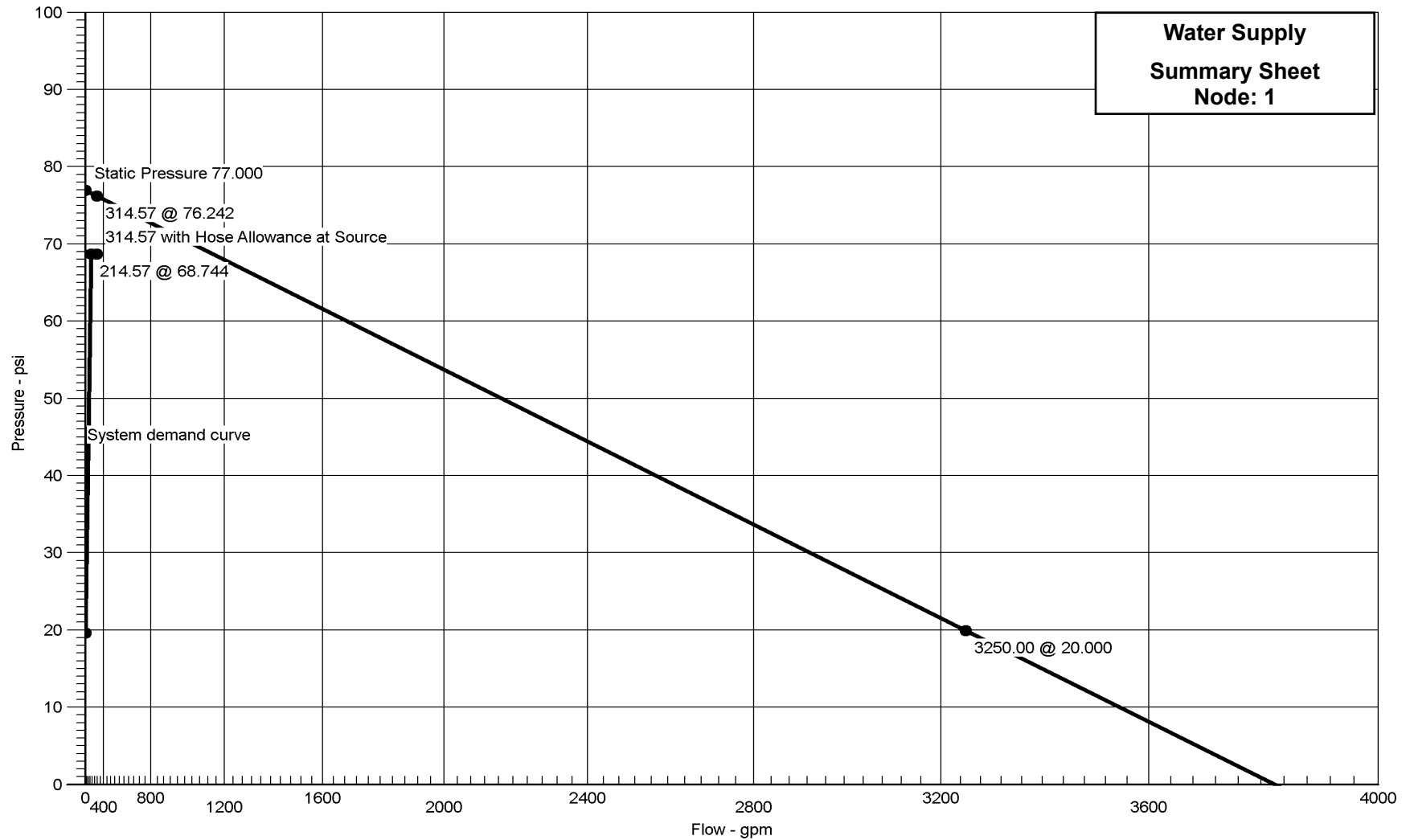
Hydraulic Graph

Job Name: BRADLEY PARK PHASE 2

Remote Area Number: L4-2

N 1.85

Date: 9/17/2025



Supply:Static:77.000
Residual:20.000
Flowing:3250.00
Available Flow @ 20 PSI:3250.00



Summary Of Outflowing Devices

Job Number: 70120
Report Description: Light Hazard (L4-2)

Device		Actual Flow (gpm)	Minimum Flow (gpm)	K-Factor (K)	Pressure (psi)			
Sprinkler	5008	20.80	20.00	5.6	13.796			
Sprinkler	5009	26.25	20.00	5.6	21.979			
Sprinkler	5010	26.51	20.00	5.6	22.409			
Sprinkler	5011	21.98	20.00	5.6	15.412			
Sprinkler	5012	26.55	20.00	5.6	22.469			
➡ Sprinkler	5013	20.00	20.00	5.6	12.755			
Sprinkler	5014	24.98	20.00	5.6	19.895			
Sprinkler	5015	22.64	20.00	5.6	16.347			

➡ Most Demanding Sprinkler Data

Supply Analysis							
Node	Name	Static (psi)	Residual (psi)	@ Flow (gpm)	Available (psi)	@ Total Demand (gpm)	Required Pressure (psi)
1	Water Supply	77.000	20.000	3250.00	76.242	314.57	68.744
Node Analysis							
Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes		
1	95-6	Supply	68.744	214.57			
5008	137-9½	Sprinkler	13.796	20.80			
5009	133-8	Sprinkler	21.979	26.25			
5010	137-6	Sprinkler	22.409	26.51			
5011	135-10½	Sprinkler	15.412	21.98			
5012	134-11½	Sprinkler	22.469	26.55			
5013	140-10	Sprinkler	12.755	20.00			
5014	135-10	Sprinkler	19.895	24.98			
5015	135-10	Sprinkler	16.347	22.64			
5016	135-10	Sprinkler	19.707	24.86			
2	95-6		68.724				
3	95-6		68.720				
4	95-6		68.564				
5	91-0		70.418				
6	91-0		70.389				
7	91-0		67.886				
8	91-0		67.881				
12	98-3		64.200				

Node Number	Elevation (Foot)	Node Type	Pressure at Node (psi)	Discharge at Node (gpm)	Notes
505	135-10½		16.255		
506	134-2		39.237		
507	133-7		24.245		
508	133-5½		28.251		
509	133-6½		24.532		
510	133-5½		27.393		
511	133-6		27.049		
512	133-6		24.256		
513	133-6		26.942		
514	133-6½		23.449		
515	133-6½		23.216		

Pipe Information									
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
						Total (Foot)		Friction(Pf)	
5013	140-10	5.6	20.00	1	(See Notes)	7-9½	100	12.755	Route 1..... Sprinkler
5015	135-10		20.00	1.0490			0.182334	2.168	
						7-9½		1.424	
5015	135-10	5.6	22.64	1	(See Notes)	2-11	100	16.347	Sprinkler, 2E(1-5), PO(3-7)
512	133-6		42.64	1.0490		6-5	0.739863	1.014	
						9-4		6.895	
512	133-6		49.84	1½	(See Notes)	3-0	100	24.256	Flow (q) from Route 4 PO(7-0½)
510	133-5½		92.48	1.6820		7-0½	0.310850	0.005	
						10-1		3.132	
510	133-5½		95.58	2		2-6	100	27.393	Flow (q) from Route 2
508	133-5½		188.06	2.1570			0.344151	0.004	
						2-6		0.853	
508	133-5½		26.51	2	(See Notes)	10-9½	100	28.251	Flow (q) from Route 7 2fE(3-1), PO(8-9½)
506	134-2		214.57	2.1570		14-11	0.439239	-0.304	
						25-8½		11.290	
506	134-2			4	(See Notes)	486-9	100	39.237	2EE(3-9), 8fE(6-4½), T(15-0½) , C(18-9½), T(18-9½), E(9-4½)
12	98-3		214.57	4.2600		101-9	0.015971	15.564	
						588-6½		9.399	
12	98-3			4	(See Notes)	6-1	100	64.200	DPV(8-4½), PO(18-9½)
8	91-0		214.57	4.2600		27-2	0.015971	3.150	
						33-3		0.531	
8	91-0			6		3-0	120	67.881	
7	91-0		214.57	6.3570			0.001623		
						3-0		0.005	
7	91-0			6	(See Notes)	2-0½	120	67.886	BFP(-2.500)
6	91-0		214.57	6.3570			0.001623		
						2-0½		2.503	
6	91-0			6	(See Notes)	0-0	140	70.389	E(22-1)
5	91-0		214.57	6.2800		22-1	0.001295		
						22-1		0.029	
5	91-0			6	(See Notes)	9-3½	140	70.418	3E(22-1)
4	95-6		214.57	6.2800		66-2½	0.001295	-1.951	
						75-6		0.098	

Pipe Information										
Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.	
						Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)		
Node 2	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Total (Foot)		Friction(Pf)		
4	95-6			6	(See Notes)	87-0	140	68.564	EE(11-0½), E(22-1)	
3	95-6		214.57	6.2800		33-1	0.001295			
						120-1		0.155		
3	95-6			12	(See Notes)	37-11	140	68.720	E(44-3)	
2	95-6		214.57	12.4600		44-3	0.000046			
						82-2		0.004		
2	95-6			6	(See Notes)	15-5	140	68.724	Water Supply	
1	95-6		214.57	6.2800			0.001295			
						15-5		0.020		
			100.00					68.744	Hose Allowance At Source	
1			314.57							Total(Pt) Route 1
5008	137-9½	5.6	20.80	1	(See Notes)	5-6	100	13.796	••••• Route 2 ••••• Sprinkler, 2E(1-5)	
505	135-10½		20.80	1.0490		2-10	0.196060	0.822		
						8-4		1.637		
505	135-10½		21.98	1	(See Notes)	3-4	100	16.255	Flow (q) from Route 3 2E(1-5), PO(3-7)	
509	133-6½		42.78	1.0490		6-5	0.744469	1.012		
						9-9		7.264		
509	133-6½		26.25	1½	(See Notes)	10-10½	100	24.532	Flow (q) from Route 6 fE(2-4)	
513	133-6		69.04	1.6820		2-4	0.181002	0.020		
						13-2½		2.391		
513	133-6			2		1-11	100	26.942		
511	133-6		69.04	2.1570			0.053902	0.003		
						1-11		0.104		
511	133-6		26.55	2		3-5	100	27.049	Flow (q) from Route 8	
510	133-5½		95.58	2.1570			0.098400	0.006		
						3-5		0.338		
								27.393	Total(Pt) Route 2	
5011	135-10½	5.6	21.98	1	(See Notes)	0-4	100	15.412	••••• Route 3 ••••• Sprinkler, T(3-7)	
505	135-10½		21.98	1.0490		3-7	0.217209			
						3-10½		0.843		
								16.255	Total(Pt) Route 3	

Pipe Information

Node 1	Elev 1 (Foot)	K-Factor	Flow added this step (q)	Nominal ID	Fittings & Devices	Length (Foot)	C Factor	Total(Pt)	Notes Fitting/Device (Equivalent Length) Fixed Pressure Losses, when applicable, are added directly to (Pf) and shown as a negative value.
	Elev 2 (Foot)		Total Flow (Q)	Actual ID	Equiv. Length (Foot)	Fitting (Foot)	Pf Friction Loss Per Unit (psi)	Elev(Pe)	
						Total (Foot)		Friction(Pf)	
5016	135-10	5.6	24.86	1	(See Notes)	2-10	100	19.707	***** Route 4 ***** Sprinkler, 2E(1-5), PO(3-7)
515	133-6½		24.86	1.0490		6-5	0.272673	0.985	
						9-3		2.523	
515	133-6½			1½		8-0	100	23.216	
514	133-6½		24.86	1.6820			0.027356	0.014	
						8-0		0.219	
514	133-6½		24.98	1½		8-0	100	23.449	Flow (q) from Route 5
512	133-6		49.84	1.6820			0.099050	0.014	
						8-0		0.792	
								24.256	Total(Pt) Route 4
5014	135-10	5.6	24.98	1	(See Notes)	2-10½	100	19.895	***** Route 5 ***** Sprinkler, 2E(1-5), PO(3-7)
514	133-6½		24.98	1.0490		6-5	0.275072	1.000	
						9-3½		2.554	
								23.449	Total(Pt) Route 5
5009	133-8	5.6	26.25	1	(See Notes)	2-4½	100	21.979	***** Route 6 ***** Sprinkler, E(1-5), PO(3-7)
507	133-7		26.25	1.0490		5-0	0.301621	0.046	
						7-4½		2.220	
507	133-7			1½		8-11½	100	24.245	
509	133-6½		26.25	1.6820			0.030260	0.016	
						8-11½		0.271	
								24.532	Total(Pt) Route 6
5010	137-6	5.6	26.51	1	(See Notes)	8-4	100	22.409	***** Route 7 ***** Sprinkler, E(1-5), PO(3-7)
508	133-5½		26.51	1.0490		5-0	0.307083	1.747	
						13-4		4.095	
								28.251	Total(Pt) Route 7
5012	134-11½	5.6	26.55	1	(See Notes)	4-11½	100	22.469	***** Route 8 ***** Sprinkler, 3E(1-5), PO(3-7)
511	133-6		26.55	1.0490		7-10	0.307843	0.638	
						12-9½		3.942	
								27.049	Total(Pt) Route 8

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

C Value Multiplier

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

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

Fittings Legend

ALV	Alarm Valve	AngV	Angle Valve	b	Bushing
BaIV	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 Relief Valve
PRV	Pressure Reducing Valve	red	Reducer/Adapter	S	Supply
sCV	Swing Check Valve	SFx	Seismic Flex	Spr	Sprinkler
St	Strainer	T	Tee Flow Turn 90°	Tr	Tee Run
U	Union	WirF	Wirsbo	WMV	Water Meter Valve
Z	Cap				

RED HAWK FIRE PROTECTION, LLC

801 Valley Ave NW, Suite D
Puyallup, WA 98371
(253) 840-9900

REDHAHF901QP



Ever Vigilant®

SEISMIC CALCULATIONS

FOR

Wesley Bradley Park – Phase 2
Puyallup, WA

RHFP JOB NO. 70120

Expires DEC 31, 25	WASHINGTON STATE CERTIFICATE OF COMPETENCY FIRE SPRINKLER SYSTEMS
Travis Clifton Kinne 0835-1021-C Level 3 Red Hawk Fire Protection, LLC REDHAHF901QP	
 Signature	09/17/2025 Date

SITE SPECIFIC INFORMATION

APPLIED BUILDING CODE (IBC): 2018

APPLIED EDITION OF NFPA 13: 2019

SEISMIC DESIGN CATEGORY: D

SITE CLASS: C

OCCUPANCY CATEGORY: II

S_s : 1.257

S_1 : 0.434

S_{DS} : 1.000

S_{D1} : 0.434

C_p : 0.61

(C_p FACTOR DETERMINED BY NFPA 13 (2016) TABLE 9.3.5.9.3 OR NFPA 13 (2019)
TABLE 18.5.9.3)

SITE & BUILDING STRUCTURAL ANALYSIS BY: **AHBL**

Table of Contents

SB#1

- a. Concrete Pre-Insert - 4" Lateral w/ Branches
- b. Concrete Pre-Insert - 4" Lateral w/ no Branches
- c. Concrete Pre-Insert - 2.5" Lateral w/ Branches

SB#2

- a. Concrete Pre-Insert - 4" Longitudinal
- b. Concrete Pre-Insert - 2.5" Longitudinal

SB#3 – Concrete Post Installation – 4" Lateral w/ Branches

SB#4 – Concrete Post Installation – 4" Longitudinal

SB#5

- a. Wood - 4" Lateral w/ Branches
- b. Wood – 4" Lateral w/ no Branches
- c. Wood – 3" Lateral w/ Branches
- d. Wood – 2.5" Lateral w/ no Branches
- e. Wood – 2" Lateral w/ with Branches

SB#6

- a. Wood – 4" Longitudinal
- b. Wood – 2.5" Longitudinal

NFPA 13 2019 Seismic Bracing Calculations

Project Name: Wesley Bradley Park - Phase 2

Brace Design: SB#1a

Address: 707 39th Ave SE

Contractor Name: Red Hawk Fire Protection

City, State, Zip: Puyallup, WA 98374

Address: 801 Valley Ave NW Ste. D

Prepared By: McDaniels, Brooke

City, State, Zip: Puyallup, Washington 98371

Date: 19-Aug-2025

Fax:

Phone: 253-840-9900

Brace Information

Maximum Length of Brace: 7'-0"
Size of Brace (in): 1" - Sch40
Type of Brace: Sch 40 Pipe
Brace Angle Range: 45-59 Degrees
Maximum Brace Spacing (ft): 20.00
Least Radius of Gyration* (in): 0.421
*kl/r Value: * 200*
Maximum Horizontal Load (lbs): 1310

Seismic Brace Attachments

Structure Attachment Fitting: Universal Structural Bracket, EG, 9/16" Hole
Make: CADDY Model: CSBU1
UL Load Rating (lbs): 2000 Adjusted Per 18.5.2.3 (lbs): 1414
Structure Attachment Adapter: n/a
Make: CADDY Model: n/a
UL Load Rating (lbs): n/a Adjusted Per 18.5.2.3 (lbs): n/a
Sway Brace Fitting: 4" Single Pipe/Conduit Rigid Universal Sway Brace, electrogalvanized
Make: CADDY Model: CSB0400
UL Load Rating (lbs): 1800 Adjusted Per 18.5.2.3 (lbs): 1272

Fastener Information

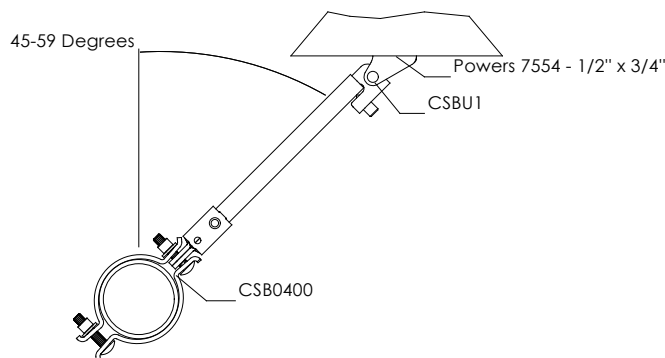
Fastener Orientation: B
Structure: Concrete (Cracked) - 4,000 psi
NW

Fastener Qty: 1

Fastener Type: Powers 7554
Powers Wood-Knocker
Fastener Size: 1/2" x 3/4"
Fastener Embedment: 1 3/4"
Fastener Max. Load (lbs): 549

Brace Orientation: Lateral

Brace I.D. (on plan): SB#1a



Sprinkler System Zone of Influence (ZOI) Load Calculation ($F_{pw} = C_p \times W_p$)

Pipe Size	Pipe Description	Wt/ft (lbs)	15% for Fittings	Total Wt/ft	Length (ft)	Total Wt	Cp = 0.61 per NFPA 13 2019 2018 IBC Sway Brace Attached to 4" Sch10 Pipe Max Fpw Based on 4" Sch10 Pipe Horizontal Earthquake Load $F_{pw} = C_p \times W_p$ $F_{pw} = 0.61 \times 667.12$ $F_{pw} = 407.00$ lbs
4"	Sch 10	11.80	1.77	13.57	20.00	271.40	
1 1/2"	Sch 10	3.00	0.45	3.45	86.00	296.70	
2"	Sch 10	4.20	0.63	4.83	13.00	62.79	
1"	Sch 40	2.10	0.32	2.42	15.00	36.23	
Weight of Misc. ZOI Valves and Fittings						0.00	
Total Zone of Influence (ZOI) Weight (W_p)						667.12	
Max Fpw per NFPA 13 2019, Section 18.5.5.2 including Section 18.5.5.2.4						1634 lbs	

*Excludes tension-only bracing systems



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Concrete Anchor Calculations

In Accordance with NFPA 13 2019 Edition, Annex A.18.5.12

Project Name: Wesley Bradley Park - Phase 2

Address: 707 39th Ave SE

City, State, Zip: Puyallup, WA 98374

Prepared By: McDaniels, Brooke

Date: 19-Aug-2025

Contractor Name: Red Hawk Fire Protection

Address: 801 Valley Ave NW Ste. D

City, State, Zip: Puyallup, Washington
98371

Phone: 253-840-9900

Fax:

Horizontal Earthquake Load (F_{pw}) = 407 lbs

Brace Angle from Vertical = 45-59 Degrees

Concrete = Concrete (Cracked) - 4,000 psi NW

Fastener Orientation = B

Prying Factor (Pr) = 1.1

Embedment = 1 3/4"

Anchor Manufacturer Information

Powers Wood-Knocker, Powers 7554, 1/2" x 3/4"

ICC-ES ESR-2502

LRFD Loads

Tension (T) = 2460 lbs

Shear (V) = 1998 lbs

ASD Loads = LRFD Load / 1.4 / 2.0 * 1.2

Where: 1.4 = Factor to convert LRFD to ASD

2.0 = Overstrength Factor for Anchors

1.2 = Allowable Stress Increase for Load Combinations With Overstrength

Tension (T_{ASD}) = 1054 lbs

Shear (V_{ASD}) = 856 lbs

Anchor Design Information

Number of Anchors Per Brace = 1

Number of Braces Resisting Seismic Load = 1

Actual ASD Loads per anchor

Actual Tension (T_{ACT}) = F_{pw} * Pr = 407 * 1.1 = 448 lbs

Actual Shear (V_{ACT}) = F_{pw} = 407 lbs

Anchor Analysis

Tension Ratio = T_{ACT} / T_{ASD} = 448 / 1054 = 0.43 ≤ 1.0 → OK

Shear Ratio = V_{ACT} / V_{ASD} = 407 / 856 = 0.48 ≤ 1.0 → OK

Interaction = (T_{ACT} / T_{ASD}) + (V_{ACT} / V_{ASD}) = 0.91 ≤ 1.2 → OK

Reviewed and Approved By: _____



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NFPA 13 2019 Seismic Bracing Calculations

Project Name: Wesley Bradley Park - Phase 2

Brace Design: SB#1b

Address: 707 39th Ave SE

Contractor Name: Red Hawk Fire Protection

City, State, Zip: Puyallup, WA 98374

Address: 801 Valley Ave NW Ste. D

Prepared By: McDaniels, Brooke

City, State, Zip: Puyallup, Washington 98371

Date: 19-Aug-2025

Fax:

Phone: 253-840-9900

Brace Information

Maximum Length of Brace: 7'-0"
 Size of Brace (in): 1" - Sch40
 Type of Brace: Sch 40 Pipe
 Brace Angle Range: 45-59 Degrees
 Maximum Brace Spacing (ft): 40.00
 Least Radius of Gyration* (in): 0.421
*kl/r Value: * 200*
 Maximum Horizontal Load (lbs): 1310

Seismic Brace Attachments

Structure Attachment Fitting: Universal Structural Bracket, EG, 9/16" Hole
 Make: CADDY Model: CSBU1
 UL Load Rating (lbs): 2000 Adjusted Per 18.5.2.3 (lbs): 1414

Structure Attachment Adapter: n/a
 Make: CADDY Model: n/a
 UL Load Rating (lbs): n/a Adjusted Per 18.5.2.3 (lbs): n/a

Sway Brace Fitting: 4" Single Pipe/Conduit Rigid Universal Sway Brace, electrogalvanized
 Make: CADDY Model: CSB0400
 UL Load Rating (lbs): 1800 Adjusted Per 18.5.2.3 (lbs): 1272

Fastener Information

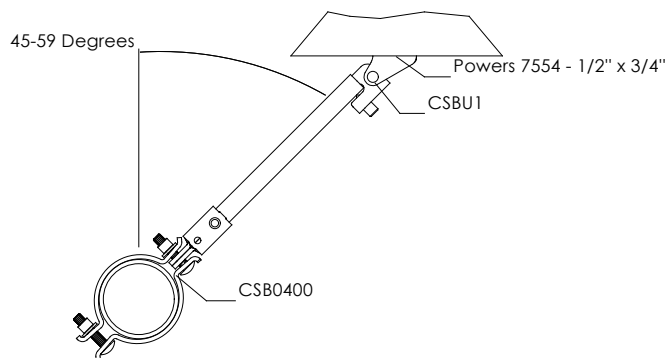
Fastener Orientation: B
 Structure: Concrete (Cracked) - 4,000 psi
 NW

Fastener Qty: 1

Fastener Type: Powers 7554
 Powers Wood-Knocker
 Fastener Size: 1/2" x 3/4"
 Fastener Embedment: 1 3/4"
 Fastener Max. Load (lbs): 549

Brace Orientation:

Brace I.D. (on plan): SB#1b



Sprinkler System Zone of Influence (ZOI) Load Calculation ($F_{pw} = C_p \times W_p$)

Pipe Size	Pipe Description	Wt/ft (lbs)	15% for Fittings	Total Wt/ft	Length (ft)	Total Wt	$C_p = 0.61$ per NFPA 13 2019 2018 IBC
4"	Sch 10	11.80	1.77	13.57	40.00	542.80	
							Sway Brace Attached to 4" Sch10 Pipe Max F_{pw} Based on 4" Sch10 Pipe
							Horizontal Earthquake Load $F_{pw} = C_p \times W_p$ $F_{pw} = 0.61 \times 542.80$ $F_{pw} = 331.00$ lbs
Weight of Misc. ZOI Valves and Fittings						0.00	
Total Zone of Influence (ZOI) Weight (W_p)						542.80	
Max F_{pw} per NFPA 13 2019, Section 18.5.5.2 including Section 18.5.5.2.4						769 lbs	

*Excludes tension-only bracing systems



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Concrete Anchor Calculations

In Accordance with NFPA 13 2019 Edition, Annex A.18.5.12

Project Name: Wesley Bradley Park - Phase 2

Address: 707 39th Ave SE

City, State, Zip: Puyallup, WA 98374

Prepared By: McDaniels, Brooke

Date: 19-Aug-2025

Contractor Name: Red Hawk Fire Protection

Address: 801 Valley Ave NW Ste. D

City, State, Zip: Puyallup, Washington
98371

Phone: 253-840-9900

Fax:

Horizontal Earthquake Load (Fpw) = 331 lbs

Brace Angle from Vertical = 45-59 Degrees

Concrete = Concrete (Cracked) - 4,000 psi NW

Fastener Orientation = B

Prying Factor (Pr) = 1.1

Embedment = 1 3/4"

Anchor Manufacturer Information

Powers Wood-Knocker, Powers 7554, 1/2" x 3/4"

ICC-ES ESR-2502

LRFD Loads

Tension (T) = 2460 lbs

Shear (V) = 1998 lbs

ASD Loads = LRFD Load / 1.4 / 2.0 * 1.2

Where: 1.4 = Factor to convert LRFD to ASD

2.0 = Overstrength Factor for Anchors

1.2 = Allowable Stress Increase for Load Combinations With Overstrength

Tension (T_{ASD}) = 1054 lbs

Shear (V_{ASD}) = 856 lbs

Anchor Design Information

Number of Anchors Per Brace = 1

Number of Braces Resisting Seismic Load = 1

Actual ASD Loads per anchor

Actual Tension (T_{ACT}) = Fpw * Pr = 331 * 1.1 = 364 lbs

Actual Shear (V_{ACT}) = Fpw = 331 lbs

Anchor Analysis

Tension Ratio = $T_{ACT} / T_{ASD} = 364 / 1054 = 0.35 \leq 1.0 \rightarrow OK$

Shear Ratio = $V_{ACT} / V_{ASD} = 331 / 856 = 0.39 \leq 1.0 \rightarrow OK$

Interaction = $(T_{ACT} / T_{ASD}) + (V_{ACT} / V_{ASD}) = 0.74 \leq 1.2 \rightarrow OK$

Reviewed and Approved By: _____



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NFPA 13 2019 Seismic Bracing Calculations

Project Name: Wesley Bradley Park - Phase 2

Brace Design: SB#1c

Address: 707 39th Ave SE

Contractor Name: Red Hawk Fire Protection

City, State, Zip: Puyallup, WA 98374

Address: 801 Valley Ave NW Ste. D

Prepared By: McDaniels, Brooke

City, State, Zip: Puyallup, Washington 98371

Date: 19-Aug-2025

Fax:

Phone: 253-840-9900

Brace Information			Seismic Brace Attachments				
Maximum Length of Brace: 7'-0" Size of Brace (in): 1" - Sch40 Type of Brace: Sch 40 Pipe Brace Angle Range: 45-59 Degrees Maximum Brace Spacing (ft): 20.00 Least Radius of Gyration* (in): 0.421 <i>kl/r Value</i> :* 200 Maximum Horizontal Load (lbs): 1310			Structure Attachment Fitting: Universal Structural Bracket, EG, 9/16" Hole Make: CADDY				



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Concrete Anchor Calculations

In Accordance with NFPA 13 2019 Edition, Annex A.18.5.12

Project Name: Wesley Bradley Park - Phase 2

Address: 707 39th Ave SE

City, State, Zip: Puyallup, WA 98374

Prepared By: McDaniels, Brooke

Date: 19-Aug-2025

Contractor Name: Red Hawk Fire Protection

Address: 801 Valley Ave NW Ste. D

City, State, Zip: Puyallup, Washington
98371

Phone: 253-840-9900

Fax:

Horizontal Earthquake Load (Fpw) = 184 lbs

Brace Angle from Vertical = 45-59 Degrees

Concrete = Concrete (Cracked) - 4,000 psi NW

Fastener Orientation = B

Prying Factor (Pr) = 1.1

Embedment = 1 3/4"

Anchor Manufacturer Information

Powers Wood-Knocker, Powers 7554, 1/2" x 3/4"

ICC-ES ESR-2502

LRFD Loads

Tension (T) = 2460 lbs

Shear (V) = 1998 lbs

ASD Loads = LRFD Load / 1.4 / 2.0 * 1.2

Where: 1.4 = Factor to convert LRFD to ASD

2.0 = Overstrength Factor for Anchors

1.2 = Allowable Stress Increase for Load Combinations With Overstrength

Tension (T_{ASD}) = 1054 lbs

Shear (V_{ASD}) = 856 lbs

Anchor Design Information

Number of Anchors Per Brace = 1

Number of Braces Resisting Seismic Load = 1

Actual ASD Loads per anchor

Actual Tension (T_{ACT}) = Fpw * Pr = 184 * 1.1 = 202 lbs

Actual Shear (V_{ACT}) = Fpw = 184 lbs

Anchor Analysis

Tension Ratio = $T_{ACT} / T_{ASD} = 202 / 1054 = 0.19 \leq 1.0 \rightarrow \text{OK}$

Shear Ratio = $V_{ACT} / V_{ASD} = 184 / 856 = 0.21 \leq 1.0 \rightarrow \text{OK}$

Interaction = $(T_{ACT} / T_{ASD}) + (V_{ACT} / V_{ASD}) = 0.40 \leq 1.2 \rightarrow \text{OK}$

Reviewed and Approved By: _____



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NFPA 13 2019 Seismic Bracing Calculations

Project Name: Wesley Bradley Park - Phase 2

Brace Design: SB#2a

Address: 707 39th Ave SE

Contractor Name: Red Hawk Fire Protection

City, State, Zip: Puyallup, WA 98374

Address: 801 Valley Ave NW Ste. D

Prepared By: McDaniels, Brooke

City, State, Zip: Puyallup, Washington 98371

Date: 19-Aug-2025

Fax:

Phone: 253-840-9900

Brace Information

Maximum Length of Brace: 7'-0"
 Size of Brace (in): 1" - Sch40
 Type of Brace: Sch 40 Pipe
 Brace Angle Range: 45-59 Degrees
 Maximum Brace Spacing (ft): 65.00
 Least Radius of Gyration* (in): 0.421
*kl/r Value: * 200*
 Maximum Horizontal Load (lbs): 1310

Seismic Brace Attachments

Structure Attachment Fitting: Universal Structural Bracket, EG, 9/16" Hole
 Make: CADDY Model: CSBU1
 UL Load Rating (lbs): 2000 Adjusted Per 18.5.2.3 (lbs): 1414

Structure Attachment Adapter: n/a
 Make: CADDY Model: n/a
 UL Load Rating (lbs): n/a Adjusted Per 18.5.2.3 (lbs): n/a

Sway Brace Fitting: 4" Single Pipe/Conduit Rigid Universal Sway Brace, electrogalvanized
 Make: CADDY Model: CSB0400
 UL Load Rating (lbs): 1700 Adjusted Per 18.5.2.3 (lbs): 1202

Fastener Information

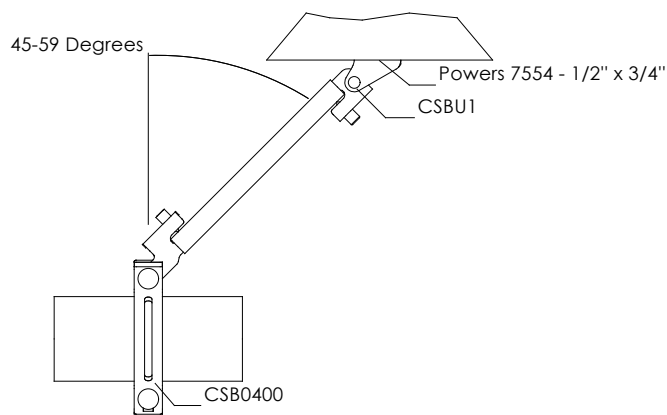
Fastener Orientation: B
 Structure: Concrete (Cracked) - 4,000 psi
 NW

Fastener Qty: 1

Fastener Type: Powers 7554
 Powers Wood-Knocker
 Fastener Size: 1/2" x 3/4"
 Fastener Embedment: 1 3/4"
 Fastener Max. Load (lbs): 549

Brace Orientation: Longitudinal

Brace I.D. (on plan): SB#2a



Sprinkler System Zone of Influence (ZOI) Load Calculation ($F_{pw} = C_p \times W_p$)

Pipe Size	Pipe Description	Wt/ft (lbs)	15% for Fittings	Total Wt/ft	Length (ft)	Total Wt	$C_p = 0.61$ per NFPA 13 2019 2018 IBC
4"	Sch 10	11.80	1.77	13.57	65.00	882.10	
							Sway Brace Attached to 4" Sch10 Pipe
							Horizontal Earthquake Load
Weight of Misc. ZOI Valves and Fittings						0.00	$F_{pw} = C_p \times W_p$ $F_{pw} = 0.61 \times 882.10$ $F_{pw} = 538.00$ lbs
Total Zone of Influence (ZOI) Weight (W_p)						882.10	

*Excludes tension-only bracing systems



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Concrete Anchor Calculations

In Accordance with NFPA 13 2019 Edition, Annex A.18.5.12

Project Name: Wesley Bradley Park - Phase 2

Address: 707 39th Ave SE

City, State, Zip: Puyallup, WA 98374

Prepared By: McDaniels, Brooke

Date: 19-Aug-2025

Contractor Name: Red Hawk Fire Protection

Address: 801 Valley Ave NW Ste. D

City, State, Zip: Puyallup, Washington
98371

Phone: 253-840-9900

Fax:

Horizontal Earthquake Load (Fpw) = 538 lbs

Brace Angle from Vertical = 45-59 Degrees

Concrete = Concrete (Cracked) - 4,000 psi NW

Fastener Orientation = B

Prying Factor (Pr) = 1.1

Embedment = 1 3/4"

Anchor Manufacturer Information

Powers Wood-Knocker, Powers 7554, 1/2" x 3/4"

ICC-ES ESR-2502

LRFD Loads

Tension (T) = 2460 lbs

Shear (V) = 1998 lbs

ASD Loads = LRFD Load / 1.4 / 2.0 * 1.2

Where: 1.4 = Factor to convert LRFD to ASD

2.0 = Overstrength Factor for Anchors

1.2 = Allowable Stress Increase for Load Combinations With Overstrength

Tension (T_{ASD}) = 1054 lbs

Shear (V_{ASD}) = 856 lbs

Anchor Design Information

Number of Anchors Per Brace = 1

Number of Braces Resisting Seismic Load = 1

Actual ASD Loads per anchor

Actual Tension (T_{ACT}) = Fpw * Pr = 538 * 1.1 = 592 lbs

Actual Shear (V_{ACT}) = Fpw = 538 lbs

Anchor Analysis

Tension Ratio = $T_{ACT} / T_{ASD} = 592 / 1054 = 0.56 \leq 1.0 \rightarrow OK$

Shear Ratio = $V_{ACT} / V_{ASD} = 538 / 856 = 0.63 \leq 1.0 \rightarrow OK$

Interaction = $(T_{ACT} / T_{ASD}) + (V_{ACT} / V_{ASD}) = 1.19 \leq 1.2 \rightarrow OK$

Reviewed and Approved By: _____



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NFPA 13 2019 Seismic Bracing Calculations			
Project Name:	Wesley Bradley Park - Phase 2	Brace Design:	SB#2b
Address:	707 39th Ave SE	Contractor Name:	Red Hawk Fire Protection
City, State, Zip:	Puyallup, WA 98374	Address:	801 Valley Ave NW Ste. D
Prepared By:	McDaniels, Brooke	City, State, Zip:	Puyallup, Washington 98371
Date: 19-Aug-2025	Fax:		Phone: 253-840-9900

Brace Design: SB#2b

Contractor Name: Red Hawk Fire Protection

Address: 801 Valley Ave NW Ste. D

City, State, Zip: Puyallup, Washington 98371

Phone: 253-840-9900

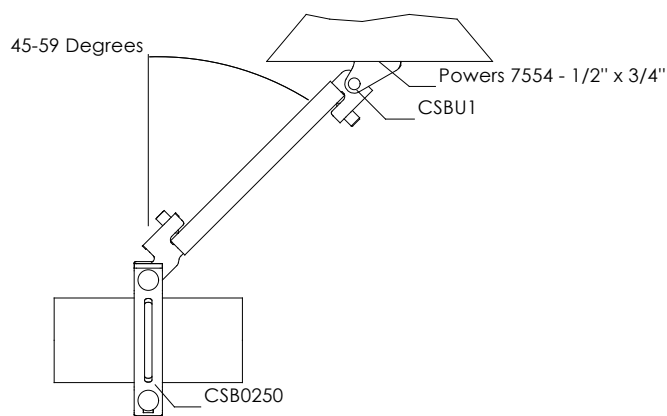
Seismic Brace Attachments

Structure Attachment Fitting: Universal Structural Bracket, EG, 9/16" Hole	
Make: CADDY	Model: CSBU1
UL Load Rating (lbs): 2000	Adjusted Per 18.5.2.3 (lbs): 1414
Structure Attachment Adapter: n/a	
Make: CADDY	Model: n/a
UL Load Rating (lbs): n/a	Adjusted Per 18.5.2.3 (lbs): n/a
Sway Brace Fitting: Universal Sway Brace, EG, 2 1/2" Pipe	
Make: CADDY	Model: CSB0250
UL Load Rating (lbs): 1300	Adjusted Per 18.5.2.3 (lbs): 919

Fastener Orientation: B
Structure: Concrete (Cracked) - 4,000 psi
NW
Fastener Qty: 1
Fastener Type: Powers 7554
Powers Wood-Knocker
Fastener Size: 1/2" x 3/4"
Fastener Embedment: 1 3/4"
Fastener Max. Load (lbs): 549

Brace Orientation: Longitudinal

Brace I.D. (on plan): SB#2b



Pipe Size	Pipe Description	Wt/ft (lbs)	15% for Fittings	Total Wt/ft	Length (ft)	Total Wt	Cp = 0.61 per NFPA 13 2019 2018 IBC
2 1/2"	Sch 10	5.90	0.89	6.79	65.00	441.00	
							Sway Brace Attached to 2 1/2" Sch10 Pipe
							Horizontal Earthquake Load $F_{pw} = C_p \times W_p$ $F_{pw} = 0.61 \times 441.00$ $F_{pw} = 269.00$ lbs
Weight of Misc. ZOI Valves and Fittings						0.00	
Total Zone of Influence (ZOI) Weight (Wp)						441.00	



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Concrete Anchor Calculations

In Accordance with NFPA 13 2019 Edition, Annex A.18.5.12

Project Name: Wesley Bradley Park - Phase 2	Contractor Name: Red Hawk Fire Protection
Address: 707 39th Ave SE	Address: 801 Valley Ave NW Ste. D
City, State, Zip: Puyallup, WA 98374	City, State, Zip: Puyallup, Washington 98371
Prepared By: McDaniels, Brooke	Phone: 253-840-9900
Date: 19-Aug-2025	Fax:

Horizontal Earthquake Load (Fpw) = 269 lbs

Brace Angle from Vertical = 45-59 Degrees

Concrete = Concrete (Cracked) - 4,000 psi NW

Fastener Orientation = B

Prying Factor (Pr) = 1.1

Embedment = 1 3/4"

Anchor Manufacturer Information

Powers Wood-Knocker, Powers 7554, 1/2" x 3/4"

ICC-ES ESR-2502

LRFD Loads

Tension (T) = 2460 lbs

Shear (V) = 1998 lbs

ASD Loads = LRFD Load / 1.4 / 2.0 * 1.2

Where: 1.4 = Factor to convert LRFD to ASD

2.0 = Overstrength Factor for Anchors

1.2 = Allowable Stress Increase for Load Combinations With Overstrength

Tension (T_{ASD}) = 1054 lbs

Shear (V_{ASD}) = 856 lbs

Anchor Design Information

Number of Anchors Per Brace = 1

Number of Braces Resisting Seismic Load = 1

Actual ASD Loads per anchor

Actual Tension (T_{ACT}) = Fpw * Pr = 269 * 1.1 = 296 lbs

Actual Shear (V_{ACT}) = Fpw = 269 lbs

Anchor Analysis

Tension Ratio = $T_{ACT} / T_{ASD} = 296 / 1054 = 0.28 \leq 1.0 \rightarrow OK$

Shear Ratio = $V_{ACT} / V_{ASD} = 269 / 856 = 0.31 \leq 1.0 \rightarrow OK$

Interaction = $(T_{ACT} / T_{ASD}) + (V_{ACT} / V_{ASD}) = 0.59 \leq 1.2 \rightarrow OK$

Reviewed and Approved By: _____



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NFPA 13 2019 Seismic Bracing Calculations

Project Name: Wesley Bradley Park - Phase 2

Brace Design: SB#3

Address: 707 39th Ave SE

Contractor Name: Red Hawk Fire Protection

City, State, Zip: Puyallup, WA 98374

Address: 801 Valley Ave NW Ste. D

Prepared By: McDaniels, Brooke

City, State, Zip: Puyallup, Washington 98371

Date: 19-Aug-2025

Fax:

Phone: 253-840-9900

Brace Information

Maximum Length of Brace: 7'-0"
Size of Brace (in): 1" - Sch40
Type of Brace: Sch 40 Pipe
Brace Angle Range: 45-59 Degrees
Maximum Brace Spacing (ft): 20.00
Least Radius of Gyration* (in): 0.421
*kl/r Value: * 200*
Maximum Horizontal Load (lbs): 1310

Seismic Brace Attachments

Structure Attachment Fitting: Universal Structural Bracket, EG, 9/16" Hole
Make: CADDY Model: CSBU1
UL Load Rating (lbs): 2000 Adjusted Per 18.5.2.3 (lbs): 1414
Structure Attachment Adapter: n/a
Make: CADDY Model: n/a
UL Load Rating (lbs): n/a Adjusted Per 18.5.2.3 (lbs): n/a
Sway Brace Fitting: 4" Single Pipe/Conduit Rigid Universal Sway Brace, electrogalvanized
Make: CADDY Model: CSB0400
UL Load Rating (lbs): 1800 Adjusted Per 18.5.2.3 (lbs): 1272

Fastener Information

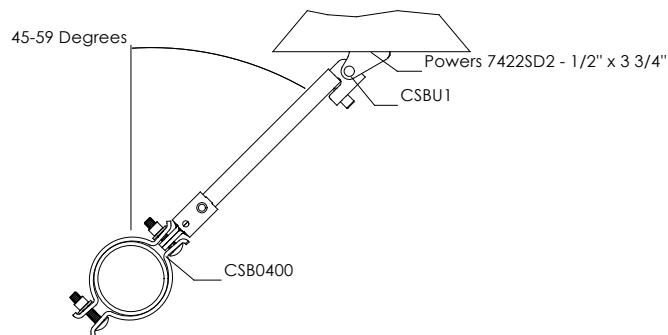
Fastener Orientation: B
Structure: Concrete (Cracked) - 4,000 psi
NW

Fastener Qty: 1

Fastener Type: Powers 7422SD2
Powers Power-Stud+ SD2
Fastener Size: 1/2" x 3 3/4"
Fastener Embedment: 2 1/2"
Fastener Max. Load (lbs): 414

Brace Orientation: Lateral

Brace I.D. (on plan): SB#3



Sprinkler System Zone of Influence (ZOI) Load Calculation ($F_{pw} = C_p \times W_p$)

Pipe Size	Pipe Description	Wt/ft (lbs)	15% for Fittings	Total Wt/ft	Length (ft)	Total Wt	Cp = 0.61 per NFPA 13 2019 2018 IBC Sway Brace Attached to 4" Sch10 Pipe Max Fpw Based on 4" Sch10 Pipe Horizontal Earthquake Load $F_{pw} = C_p \times W_p$ $F_{pw} = 0.61 \times 667.12$ $F_{pw} = 407.00$ lbs
4"	Sch 10	11.80	1.77	13.57	20.00	271.40	
1 1/2"	Sch 10	3.00	0.45	3.45	86.00	296.70	
2"	Sch 10	4.20	0.63	4.83	13.00	62.79	
1"	Sch 40	2.10	0.32	2.42	15.00	36.23	
Weight of Misc. ZOI Valves and Fittings						0.00	
Total Zone of Influence (ZOI) Weight (W_p)						667.12	
Max Fpw per NFPA 13 2019, Section 18.5.5.2 including Section 18.5.5.2.4						1634 lbs	

*Excludes tension-only bracing systems



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Concrete Anchor Calculations

In Accordance with NFPA 13 2019 Edition, Annex A.18.5.12

Project Name: Wesley Bradley Park - Phase 2

Address: 707 39th Ave SE

City, State, Zip: Puyallup, WA 98374

Prepared By: McDaniels, Brooke

Date: 19-Aug-2025

Contractor Name: Red Hawk Fire Protection

Address: 801 Valley Ave NW Ste. D

City, State, Zip: Puyallup, Washington
98371

Phone: 253-840-9900

Fax:

Horizontal Earthquake Load (Fpw) = 407 lbs

Brace Angle from Vertical = 45-59 Degrees

Concrete = Concrete (Cracked) - 4,000 psi NW

Fastener Orientation = B

Prying Factor (Pr) = 1.1

Embedment = 2 1/2"

Anchor Manufacturer Information

Powers Power-Stud+ SD2, Powers 7422SD2, 1/2" x 3 3/4"

ICC-ES ESR-2502

LRFD Loads

Tension (T) = 1483 lbs

Shear (V) = 2003 lbs

ASD Loads = LRFD Load / 1.4 / 2.0 * 1.2

Where: 1.4 = Factor to convert LRFD to ASD

2.0 = Overstrength Factor for Anchors

1.2 = Allowable Stress Increase for Load Combinations With Overstrength

Tension (T_{ASD}) = 635 lbs

Shear (V_{ASD}) = 858 lbs

Anchor Design Information

Number of Anchors Per Brace = 1

Number of Braces Resisting Seismic Load = 1

Actual ASD Loads per anchor

Actual Tension (T_{ACT}) = Fpw * Pr = 407 * 1.1 = 448 lbs

Actual Shear (V_{ACT}) = Fpw = 407 lbs

Anchor Analysis

Tension Ratio = $T_{ACT} / T_{ASD} = 448 / 635 = 0.71 \leq 1.0 \rightarrow OK$

Shear Ratio = $V_{ACT} / V_{ASD} = 407 / 858 = 0.47 \leq 1.0 \rightarrow OK$

Interaction = $(T_{ACT} / T_{ASD}) + (V_{ACT} / V_{ASD}) = 1.18 \leq 1.2 \rightarrow OK$

Reviewed and Approved By: _____



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NFPA 13 2019 Seismic Bracing Calculations			
Project Name:	Wesley Bradley Park - Phase 2	Brace Design:	SB#4
Address:	707 39th Ave SE	Contractor Name:	Red Hawk Fire Protection
City, State, Zip:	Puyallup, WA 98374	Address:	801 Valley Ave NW Ste. D
Prepared By:	McDaniels, Brooke	City, State, Zip:	Puyallup, Washington 98371
Date: 19-Aug-2025	Fax:		Phone: 253-840-9900

Brace Design: SB#4

Contractor Name: Red Hawk Fire Protection

Address: 801 Valley Ave NW Ste. D

City, State, Zip: Puyallup, Washington 98371

Phone: 253-840-9900

Brace Information	Seismic Brace Attachments
Maximum Length of Brace: 7'-0"	Structure Attachment Fitting: Universal Structural Bracket, EG, 9/16" Hole
Size of Brace (in): 1" - Sch40	Make: CADDY Model: CSBU1
Type of Brace: Sch 40 Pipe	UL Load Rating (lbs): 2000 Adjusted Per 18.5.2.3 (lbs): 1414
Brace Angle Range: 45-59 Degrees	Structure Attachment Adapter: n/a
Maximum Brace Spacing (ft): 50.00	Make: CADDY Model: n/a
Least Radius of Gyration* (in): 0.421	UL Load Rating (lbs): n/a Adjusted Per 18.5.2.3 (lbs): n/a
<i>kl/r Value:</i> * 200	Sway Brace Fitting: 4" Single Pipe/Conduit Rigid Universal Sway Brace, electrogalvanized
Maximum Horizontal Load (lbs): 1310	Make: CADDY Model: CSB0400
	UL Load Rating (lbs): 1700 Adjusted Per 18.5.2.3 (lbs): 1202
Fastener Information	
Fastener Orientation: B	
Structure: Concrete (Cracked) - 4,000 psi NW	
Fastener Qty: 1	
Fastener Type: Powers 7422SD2	
Powers Power-Stud+ SD2	
Fastener Size: 1/2" x 3 3/4"	
Fastener Embedment: 2 1/2"	
Fastener Max. Load (lbs): 414	
Brace Orientation: Longitudinal	
Brace I.D. (on plan): SB#4	

45-59 Degrees

Powers 7422SD2 - 1/2" x 3 3/4"

CSBU1

CSB0400

Sprinkler System Zone of Influence (ZOI) Load Calculation($F_{pw} = C_p \times W_p$)						
Pipe Size	Pipe Description	Wt/ft (lbs)	15% for Fittings	Total Wt/ft	Length (ft)	Total Wt
4"	Sch 10	11.80	1.77	13.57	50.00	678.50
Weight of Misc. ZOI Valves and Fittings						0.00
Total Zone of Influence (ZOI) Weight (W_p)						678.50

*Excludes tension-only bracing systems

Concrete Anchor Calculations

In Accordance with NFPA 13 2019 Edition, Annex A.18.5.12

Project Name: Wesley Bradley Park - Phase 2

Address: 707 39th Ave SE

City, State, Zip: Puyallup, WA 98374

Prepared By: McDaniels, Brooke

Date: 19-Aug-2025

Contractor Name: Red Hawk Fire Protection

Address: 801 Valley Ave NW Ste. D

City, State, Zip: Puyallup, Washington
98371

Phone: 253-840-9900

Fax:

Horizontal Earthquake Load (Fpw) = 414 lbs

Brace Angle from Vertical = 45-59 Degrees

Concrete = Concrete (Cracked) - 4,000 psi NW

Fastener Orientation = B

Prying Factor (Pr) = 1.1

Embedment = 2 1/2"

Anchor Manufacturer Information

Powers Power-Stud+ SD2, Powers 7422SD2, 1/2" x 3 3/4"

ICC-ES ESR-2502

LRFD Loads

Tension (T) = 1483 lbs

Shear (V) = 2003 lbs

ASD Loads = LRFD Load / 1.4 / 2.0 * 1.2

Where: 1.4 = Factor to convert LRFD to ASD

2.0 = Overstrength Factor for Anchors

1.2 = Allowable Stress Increase for Load Combinations With Overstrength

Tension (T_{ASD}) = 635 lbs

Shear (V_{ASD}) = 858 lbs

Anchor Design Information

Number of Anchors Per Brace = 1

Number of Braces Resisting Seismic Load = 1

Actual ASD Loads per anchor

Actual Tension (T_{ACT}) = Fpw * Pr = 414 * 1.1 = 455 lbs

Actual Shear (V_{ACT}) = Fpw = 414 lbs

Anchor Analysis

Tension Ratio = $T_{ACT} / T_{ASD} = 455 / 635 = 0.72 \leq 1.0 \rightarrow OK$

Shear Ratio = $V_{ACT} / V_{ASD} = 414 / 858 = 0.48 \leq 1.0 \rightarrow OK$

Interaction = $(T_{ACT} / T_{ASD}) + (V_{ACT} / V_{ASD}) = 1.20 \leq 1.2 \rightarrow OK$

Reviewed and Approved By: _____



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NFPA 13 2019 Seismic Bracing Calculations

Project Name: Wesley Bradley Park - Phase 2

Brace Design: SB#5a

Address: 707 39th Ave SE

Contractor Name: Red Hawk Fire Protection

City, State, Zip: Puyallup, WA 98374

Address: 801 Valley Ave NW Ste. D

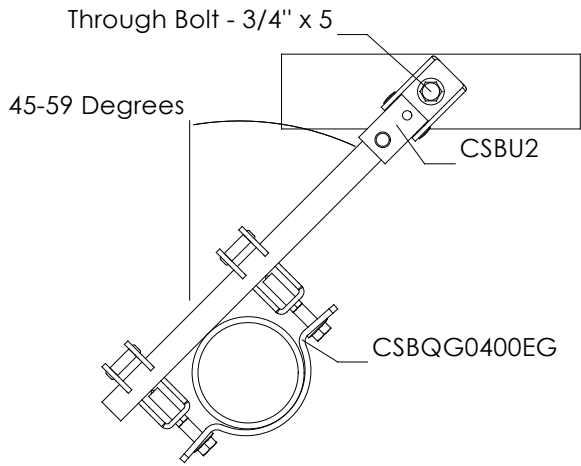
Prepared By: McDaniels, Brooke

City, State, Zip: Puyallup, Washington 98371

Date: 19-Aug-2025

Fax:

Phone: 253-840-9900

Brace Information	Seismic Brace Attachments
Maximum Length of Brace: 7'-0"	Structure Attachment Fitting: Universal Structural Bracket, EG, 13/16" Hole
Size of Brace (in): 1" - Sch40	Make: CADDY Model: CSBU2
Type of Brace: Sch 40 Pipe	UL Load Rating (lbs): 2000 Adjusted Per 18.5.2.3 (lbs): 1414
Brace Angle Range: 45-59 Degrees	Structure Attachment Adapter: n/a
Maximum Brace Spacing (ft): 35.00	Make: CADDY Model: n/a
Least Radius of Gyration* (in): 0.421	UL Load Rating (lbs): n/a Adjusted Per 18.5.2.3 (lbs): n/a
kl/r Value: * 200	Sway Brace Fitting: 4" Pipe/Conduit Rigid Quick Grip Lateral Sway Brace, electrogalvanized
Maximum Horizontal Load (lbs): 1310	Make: CADDY Model: CSBQG0400EG
	UL Load Rating (lbs): 1500 Adjusted Per 18.5.2.3 (lbs): 1060
Fastener Information	
Fastener Orientation: H	
Structure: Wood - Through Bolt	
Fastener Qty: 1	
Fastener Type: Through Bolt	
Fastener Size: 3/4" x 5	
Fastener Embedment: 3 1/2"	
Fastener Max. Load (lbs): 455	
Brace Orientation: Lateral	
Brace I.D. (on plan): SB#5a	

Sprinkler System Zone of Influence (ZOI) Load Calculation ($F_{pw} = C_p \times W_p$)

Pipe Size	Pipe Description	Wt/ft (lbs)	15% for Fittings	Total Wt/ft	Length (ft)	Total Wt	Cp = 0.61 per NFPA 13 2019 2018 IBC
4"	Sch 10	11.80	1.77	13.57	35.00	475.00	
1 1/2"	Sch 10	3.00	0.45	3.45	50.00	172.50	
							Sway Brace Attached to 4" Sch10 Pipe Max Fpw Based on 4" Sch10 Pipe
							Horizontal Earthquake Load $F_{pw} = C_p \times W_p$ $F_{pw} = 0.61 \times 647.50$ $F_{pw} = 395.00$ lbs
Weight of Misc. ZOI Valves and Fittings						0.00	
Total Zone of Influence (ZOI) Weight (W_p)						647.50	
Max Fpw per NFPA 13 2019, Section 18.5.5.2 including Section 18.5.5.2.4						918 lbs	

*Excludes tension-only bracing systems



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NFPA 13 2019 Seismic Bracing Calculations

Project Name: Wesley Bradley Park - Phase 2

Brace Design: SB#5b

Address: 707 39th Ave SE

Contractor Name: Red Hawk Fire Protection

City, State, Zip: Puyallup, WA 98374

Address: 801 Valley Ave NW Ste. D

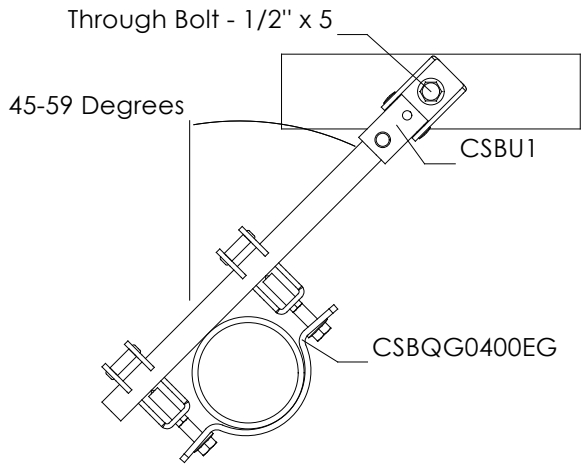
Prepared By: McDaniels, Brooke

City, State, Zip: Puyallup, Washington 98371

Date: 19-Aug-2025

Fax:

Phone: 253-840-9900

Brace Information	Seismic Brace Attachments
Maximum Length of Brace: 7'-0"	Structure Attachment Fitting: Universal Structural Bracket, EG, 9/16" Hole
Size of Brace (in): 1" - Sch40	Make: CADDY Model: CSBU1
Type of Brace: Sch 40 Pipe	UL Load Rating (lbs): 2000 Adjusted Per 18.5.2.3 (lbs): 1414
Brace Angle Range: 45-59 Degrees	Structure Attachment Adapter: n/a
Maximum Brace Spacing (ft): 35.00	Make: CADDY Model: n/a
Least Radius of Gyration* (in): 0.421	UL Load Rating (lbs): n/a Adjusted Per 18.5.2.3 (lbs): n/a
kl/r Value: * 200	Sway Brace Fitting: 4" Pipe/Conduit Rigid Quick Grip Lateral Sway Brace, electrogalvanized
Maximum Horizontal Load (lbs): 1310	Make: CADDY Model: CSBQG0400EG
	UL Load Rating (lbs): 1500 Adjusted Per 18.5.2.3 (lbs): 1060
Fastener Information	
Fastener Orientation: H	
Structure: Wood - Through Bolt	
Fastener Qty: 1	
Fastener Type: Through Bolt	
Fastener Size: 1/2" x 5	
Fastener Embedment: 3 1/2"	
Fastener Max. Load (lbs): 330	
Brace Orientation: Lateral	
Brace I.D. (on plan): SB#5b	

Sprinkler System Zone of Influence (ZOI) Load Calculation ($F_{pw} = C_p \times W_p$)

Pipe Size	Pipe Description	Wt/ft (lbs)	15% for Fittings	Total Wt/ft	Length (ft)	Total Wt	Cp = 0.61 per NFPA 13 2019 2018 IBC
4"	Sch 10	11.80	1.77	13.57	35.00	475.00	
							Sway Brace Attached to 4" Sch10 Pipe Max Fpw Based on 4" Sch10 Pipe
							Horizontal Earthquake Load $F_{pw} = C_p \times W_p$ $F_{pw} = 0.61 \times 475.00$ Fpw = 290.00 lbs
Weight of Misc. ZOI Valves and Fittings						0.00	
Total Zone of Influence (ZOI) Weight (Wp)						475.00	
Max Fpw per NFPA 13 2019, Section 18.5.5.2 including Section 18.5.5.2.4						918 lbs	

*Excludes tension-only bracing systems



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NFPA 13 2019 Seismic Bracing Calculations

Project Name: Wesley Bradley Park - Phase 2

Brace Design: SB#5c

Address: 707 39th Ave SE

Contractor Name: Red Hawk Fire Protection

City, State, Zip: Puyallup, WA 98374

Address: 801 Valley Ave NW Ste. D

Prepared By: McDaniels, Brooke

City, State, Zip: Puyallup, Washington 98371

Date: 19-Aug-2025

Fax:

Phone: 253-840-9900

Brace Information

Maximum Length of Brace: 7'-0"
Size of Brace (in): 1" - Sch40
Type of Brace: Sch 40 Pipe
Brace Angle Range: 45-59 Degrees
Maximum Brace Spacing (ft): 35.00
Least Radius of Gyration* (in): 0.421
*kl/r Value: * 200*
Maximum Horizontal Load (lbs): 1310

Seismic Brace Attachments

Structure Attachment Fitting: Universal Structural Bracket, EG, 9/16" Hole
Make: CADDY Model: CSBU1
UL Load Rating (lbs): 2000 Adjusted Per 18.5.2.3 (lbs): 1414
Structure Attachment Adapter: n/a
Make: CADDY Model: n/a
UL Load Rating (lbs): n/a Adjusted Per 18.5.2.3 (lbs): n/a
Sway Brace Fitting: Quick Grip Lateral Sway Brace, 3" Pipe
Make: CADDY Model: CSBQG0300EG
UL Load Rating (lbs): 1300 Adjusted Per 18.5.2.3 (lbs): 919

Fastener Information

Fastener Orientation: H
Structure: Wood - Through Bolt

Fastener Qty: 1

Fastener Type: Through Bolt

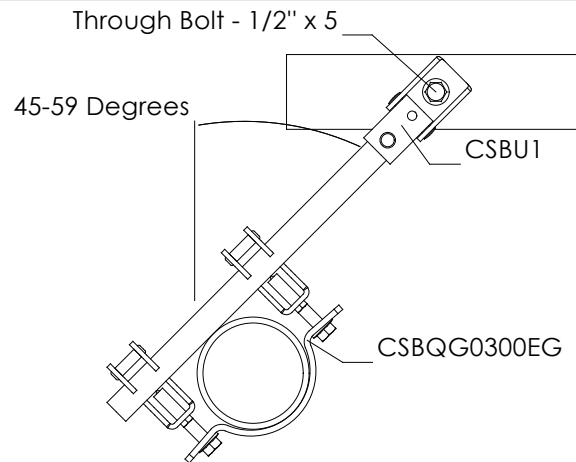
Fastener Size: 1/2" x 5

Fastener Embedment: 3 1/2"

Fastener Max. Load (lbs): 330

Brace Orientation: Lateral

Brace I.D. (on plan): SB#5a (copy)



Sprinkler System Zone of Influence (ZOI) Load Calculation ($F_{pw} = C_p \times W_p$)

Pipe Size	Pipe Description	Wt/ft (lbs)	15% for Fittings	Total Wt/ft	Length (ft)	Total Wt	Cp = 0.61 per NFPA 13 2019 2018 IBC
3"	Sch 10	7.90	1.19	9.09	35.00	318.00	
1 1/2"	Sch 10	3.00	0.45	3.45	50.00	172.50	
							Sway Brace Attached to 3" Sch10 Pipe Max Fpw Based on 3" Sch10 Pipe
							Horizontal Earthquake Load $F_{pw} = C_p \times W_p$ $F_{pw} = 0.61 \times 490.50$ Fpw = 299.00 lbs
Weight of Misc. ZOI Valves and Fittings						0.00	
Total Zone of Influence (ZOI) Weight (Wp)						490.50	
Max Fpw per NFPA 13 2019, Section 18.5.5.2 including Section 18.5.5.2.4						543 lbs	

*Excludes tension-only bracing systems



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NFPA 13 2019 Seismic Bracing Calculations

Project Name: Wesley Bradley Park - Phase 2

Brace Design: SB#5d

Address: 707 39th Ave SE

Contractor Name: Red Hawk Fire Protection

City, State, Zip: Puyallup, WA 98374

Address: 801 Valley Ave NW Ste. D

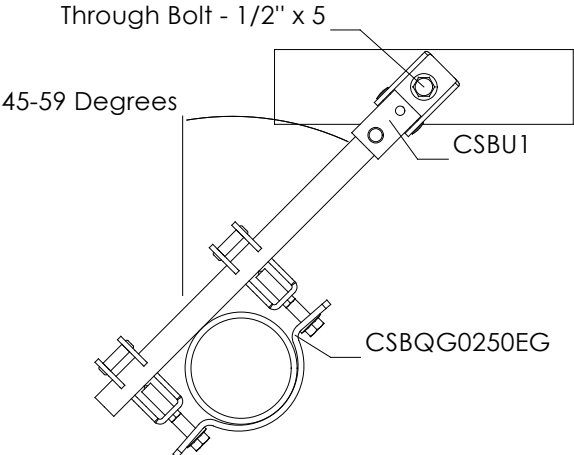
Prepared By: McDaniels, Brooke

City, State, Zip: Puyallup, Washington 98371

Date: 19-Aug-2025

Fax:

Phone: 253-840-9900

Brace Information	Seismic Brace Attachments
Maximum Length of Brace: 7'-0"	Structure Attachment Fitting: Universal Structural Bracket, EG, 9/16" Hole
Size of Brace (in): 1" - Sch40	Make: CADDY Model: CSBU1
Type of Brace: Sch 40 Pipe	UL Load Rating (lbs): 2000 Adjusted Per 18.5.2.3 (lbs): 1414
Brace Angle Range: 45-59 Degrees	Structure Attachment Adapter: n/a
Maximum Brace Spacing (ft): 35.00	Make: CADDY Model: n/a
Least Radius of Gyration* (in): 0.421	UL Load Rating (lbs): n/a Adjusted Per 18.5.2.3 (lbs): n/a
<i>kl/r Value:</i> * 200	Sway Brace Fitting: Quick Grip Lateral Sway Brace, 2 1/2" Pipe
Maximum Horizontal Load (lbs): 1310	Make: CADDY Model: CSBQG0250EG
	UL Load Rating (lbs): 1500 Adjusted Per 18.5.2.3 (lbs): 1060
Fastener Information	
Fastener Orientation: H	
Structure: Wood - Through Bolt	
Fastener Qty: 1	
Fastener Type: Through Bolt	
Fastener Size: 1/2" x 5	
Fastener Embedment: 3 1/2"	
Fastener Max. Load (lbs): 330	
Brace Orientation: Lateral	
Brace I.D. (on plan): SB#5d	

Sprinkler System Zone of Influence (ZOI) Load Calculation ($F_{pw} = C_p \times W_p$)

Pipe Size	Pipe Description	Wt/ft (lbs)	15% for Fittings	Total Wt/ft	Length (ft)	Total Wt	$C_p = 0.61$ per NFPA 13 2019 2018 IBC
2 1/2"	Sch 10	5.90	0.89	6.79	35.00	237.50	
							Sway Brace Attached to 2 1/2" Sch10 Pipe Max F_{pw} Based on 2 1/2" Sch10 Pipe
							Horizontal Earthquake Load $F_{pw} = C_p \times W_p$ $F_{pw} = 0.61 \times 237.50$ $F_{pw} = 145.00$ lbs
Weight of Misc. ZOI Valves and Fittings						0.00	
Total Zone of Influence (ZOI) Weight (W_p)						237.50	
Max F_{pw} per NFPA 13 2019, Section 18.5.5.2 including Section 18.5.5.2.4						360 lbs	

*Excludes tension-only bracing systems



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NFPA 13 2019 Seismic Bracing Calculations

Project Name: Wesley Bradley Park - Phase 2

Brace Design: SB#5e

Address: 707 39th Ave SE

Contractor Name: Red Hawk Fire Protection

City, State, Zip: Puyallup, WA 98374

Address: 801 Valley Ave NW Ste. D

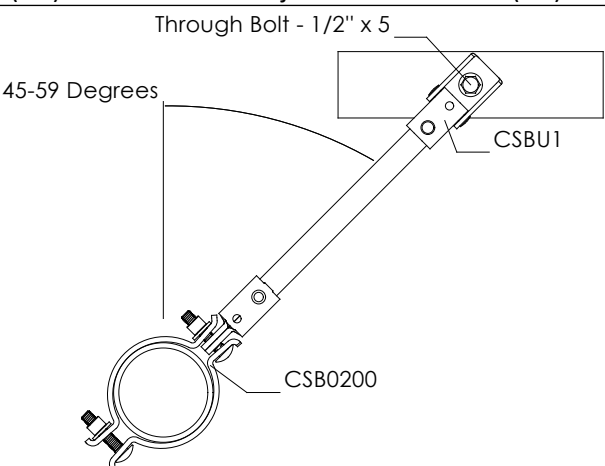
Prepared By: McDaniels, Brooke

City, State, Zip: Puyallup, Washington 98371

Date: 17-Sep-2025

Fax:

Phone: 253-840-9900

Brace Information	Seismic Brace Attachments
Maximum Length of Brace: 7'-0"	Structure Attachment Fitting: Universal Structural Bracket, EG, 9/16" Hole
Size of Brace (in): 1" - Sch40	Make: CADDY Model: CSBU1
Type of Brace: Sch 40 Pipe	UL Load Rating (lbs): 2000 Adjusted Per 18.5.2.3 (lbs): 1414
Brace Angle Range: 45-59 Degrees	Structure Attachment Adapter: n/a
Maximum Brace Spacing (ft): 25.00	Make: CADDY Model: n/a
Least Radius of Gyration* (in): 0.421	UL Load Rating (lbs): n/a Adjusted Per 18.5.2.3 (lbs): n/a
<i>kl/r Value: * 200</i>	Sway Brace Fitting: Universal Sway Brace, EG, 2" Pipe
Maximum Horizontal Load (lbs): 1310	Make: CADDY Model: CSB0200
	UL Load Rating (lbs): 1800 Adjusted Per 18.5.2.3 (lbs): 1272
Fastener Information	
Fastener Orientation: H	
Structure: Wood - Through Bolt	
Fastener Qty: 1	
Fastener Type: Through Bolt	
Fastener Size: 1/2" x 5	
Fastener Embedment: 3 1/2"	
Fastener Max. Load (lbs): 330	
Brace Orientation:	
Brace I.D. (on plan): SB#5e	

Sprinkler System Zone of Influence (ZOI) Load Calculation ($F_{pw} = C_p \times W_p$)

Pipe Size	Pipe Description	Wt/ft (lbs)	15% for Fittings	Total Wt/ft	Length (ft)	Total Wt	$C_p = 0.61$ per NFPA 13 2019 2018 IBC
2"	Sch 10	4.20	0.63	4.83	25.00	120.80	
1 1/2"	Sch 10	3.00	0.45	3.45	45.00	155.25	
1"	Sch 40	2.10	0.32	2.42	15.00	36.23	Sway Brace Attached to 2" Sch10 Pipe Max F_{pw} Based on 2" Sch10 Pipe
							Horizontal Earthquake Load $F_{pw} = C_p \times W_p$ $F_{pw} = 0.61 \times 312.28$ $F_{pw} = 190.00$ lbs
Weight of Misc. ZOI Valves and Fittings						0.00	
Total Zone of Influence (ZOI) Weight (W_p)						312.28	
Max F_{pw} per NFPA 13 2019, Section 18.5.5.2 including Section 18.5.5.2.4						312 lbs	

*Excludes tension-only bracing systems



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NFPA 13 2019 Seismic Bracing Calculations			
Project Name:	Wesley Bradley Park - Phase 2	Brace Design:	SB#6a
Address:	707 39th Ave SE	Contractor Name:	Red Hawk Fire Protection
City, State, Zip:	Puyallup, WA 98374	Address:	801 Valley Ave NW Ste. D
Prepared By:	McDaniels, Brooke	City, State, Zip:	Puyallup, Washington 98371
Date: 19-Aug-2025	Fax:		Phone: 253-840-9900

Sprinkler System Zone of Influence (ZOI) Load Calculation($F_{pw} = C_p \times W_p$)						
Pipe Size	Pipe Description	Wt/ft (lbs)	15% for Fittings	Total Wt/ft	Length (ft)	Total Wt
4"	Sch 10	11.80	1.77	13.57	40.00	542.80
Weight of Misc. ZOI Valves and Fittings						0.00
Total Zone of Influence (ZOI) Weight (W_p)						542.80



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NFPA 13 2019 Seismic Bracing Calculations

Project Name: Wesley Bradley Park - Phase 2

Brace Design: SB#6b

Address: 707 39th Ave SE

Contractor Name: Red Hawk Fire Protection

City, State, Zip: Puyallup, WA 98374

Address: 801 Valley Ave NW Ste. D

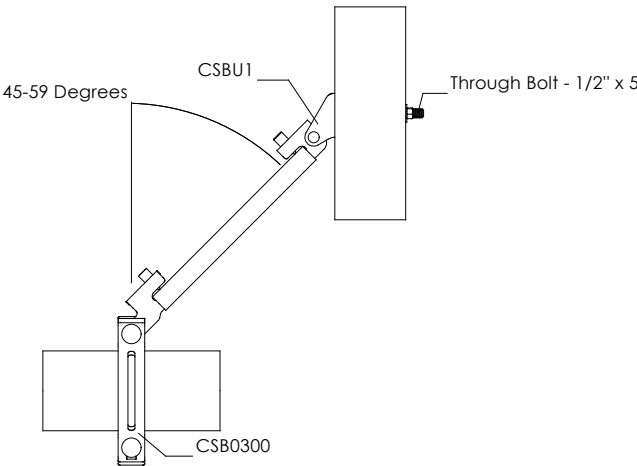
Prepared By: McDaniels, Brooke

City, State, Zip: Puyallup, Washington 98371

Date: 19-Aug-2025

Fax:

Phone: 253-840-9900

Brace Information	Seismic Brace Attachments
Maximum Length of Brace: 7'-0"	Structure Attachment Fitting: Universal Structural Bracket, EG, 9/16" Hole
Size of Brace (in): 1" - Sch40	Make: CADDY Model: CSBU1
Type of Brace: Sch 40 Pipe	UL Load Rating (lbs): 2000 Adjusted Per 18.5.2.3 (lbs): 1414
Brace Angle Range: 45-59 Degrees	Structure Attachment Adapter: n/a
Maximum Brace Spacing (ft): 40.00	Make: CADDY Model: n/a
Least Radius of Gyration* (in): 0.421	UL Load Rating (lbs): n/a Adjusted Per 18.5.2.3 (lbs): n/a
kl/r Value:* 200	Sway Brace Fitting: 3" Single Pipe/Conduit Rigid Universal Sway Brace, electrogalvanized
Maximum Horizontal Load (lbs): 1310	Make: CADDY Model: CSB0300
	UL Load Rating (lbs): 1400 Adjusted Per 18.5.2.3 (lbs): 989
Fastener Information	
Fastener Orientation: E	
Structure: Wood - Through Bolt	
Fastener Qty: 1	
Fastener Type: Through Bolt	
Fastener Size: 1/2" x 5	
Fastener Embedment: 3 1/2"	
Fastener Max. Load (lbs): 350	
Brace Orientation: Longitudinal	
Brace I.D. (on plan): SB#6b	

Sprinkler System Zone of Influence (ZOI) Load Calculation ($F_{pw} = C_p \times W_p$)

Pipe Size	Pipe Description	Wt/ft (lbs)	15% for Fittings	Total Wt/ft	Length (ft)	Total Wt	Cp = 0.61 per NFPA 13 2019 2018 IBC
3"	Sch 10	7.90	1.19	9.09	40.00	363.40	
							Sway Brace Attached to 3" Sch10 Pipe
							Horizontal Earthquake Load
Weight of Misc. ZOI Valves and Fittings						0.00	$F_{pw} = C_p \times W_p$ $F_{pw} = 0.61 \times 363.40$ $F_{pw} = 222.00$ lbs
Total Zone of Influence (ZOI) Weight (W_p)						363.40	

*Excludes tension-only bracing systems



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