

MEMO

- To: Jessica Klimek, American Development Group
- From: Scott A. Miller, PE
- **Re:** 555 Court Street, Water Booster Pump Station Domestic Flow Design

Date: January 20, 2023

You have asked for a summary of the design basis for the recently installed water booster pump station installed to serve the multifamily development at 555 Court Street in Auburn, Maine. Specifically, you are asking for confirmation of the domestic flow design basis. The is the normal day to day flow and pressure to be provided to the multifamily units.

I have attached the domestic flow calculation sheet from our 8.16.2022 Preliminary Design report that was used to design the booster pump system.

The design allowed for a total of 132 units: 60 in Phase 1 and 72 in Phase 2. Our domestic flow demand design is based upon 1.75 residents per unit for a total residential population of 231.

The design pressure target under normal flow conditions provides for a static pressure of 75 psi at a 430-foot first floor sill elevation. This is the projected sill elevation of the highest structure at the rear of the site.

The design of the booster pump station high flow pump is similarly targeted to provide 800 gallons per minute of fire flow to that sill elevation.



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Domestic Flow Demand Summary

		Units	I	ppl/unit			ppl				
Phase I	Five 12 unit structures	60.0		1.75			105				
Phase II	Eight 12 unit structures	72.0		1.75			126				
							-				
							-				
Total population							231	ppl			
Domestic Use		65.0	gpcd				15,015	gpd			
Peak Use		5.0	peak factor				52	gpm			
Irrigation											
		2.2	Ac/d				19,610	gpd			
		0.3	in				54	gpm			
		6.0	hrs								
					No flow Flow		Flow Pc	oint 1 Flow Point 2		oint 2	
								60	gpm	90	gpm
						St	atic (psi)	Re	esidual (psi)	Re	esidual (psi)
Pressure at system connection from test							29.0		29.0		29.0
Elevation adjus	tment (test/site/difference)	372		430		(58.0)	(25.1)		(25.1)		(25.1)
Line losses		Length	Dia	ameter		C value		Slope (psi/ft)	Loss (psi)	Slope (psi/ft)	Loss (psi)
100 lf 8" DIP co	onnection to pump station	130	ft	8	in	120		5.02E-05	-	1.06E-04	-
10 lf 4" DIP sta	tion interior	10	ft	4	in	120		1.47E-03	-	3.11E-03	-
30 lf 6" DIP sta	tion interior	30	ft	6	in	120		2.04E-04	-	4.32E-04	-
1520 lf 8" DIP p	oump station to fire service	1520	ft	8	in	120		5.02E-05	(0.1)	1.06E-04	(0.2)
50 lf 4" DIP fire	eservice	50	ft	2	in	120		4.30E-02	(2.1)	9.10E-02	(4.6)
Allowance for system pressure variations			ft		in		(3.0)		(3.0)		(3.0)
Pump Lift							119.0		77.0		60.0
Base of riser upstream of backflow device							119.9		75.7		56.1
Backflow device preload and loss											
Base of riser do	ownstream of backflow device										
Backflow device		Manufacturer and Model						Туре			