

OWDP PUMP AND SYSTEM CURVE

WILO WCC17-20.50		SYSTEM CURVE		2 PUMPS IN PARALLEL	
HEAD (FT)	FLOW (GPM)	HEAD (FT)	FLOW (GPM)	HEAD (FT)	FLOW (GPM)
0.00	94.00	5.63	0.00	0.00	188.00
2.00	90.00	5.85	10.00	2.00	180.00
6.00	80.00	6.06	20.00	6.00	160.00
9.50	70.00	6.27	30.00	9.50	140.00
10.80	60.00	6.49	40.00	10.80	120.00
12.50	50.00	6.70	50.00	12.50	100.00
13.00	40.00	6.92	60.00	13.00	80.00
14.60	30.00	7.13	70.00	14.60	60.00
15.30	20.00	7.34	80.00	15.30	40.00
16.00	10.00	7.56	90.00	16.00	20.00
16.50	0.00	7.77	100.00	16.50	0.00
		8.20	120.00		
		8.63	140.00		
		9.06	160.00		
		9.49	180.00		
		9.66	188.00		

Hazen-Williams

C = 148

D = 4"

L = 100 ft

Constant = 0.432

$$Q = 0.432 C D^{2.63} S^{0.54}$$

$$Q = 0.432 C D^{2.63} \left(\frac{H_L}{L}\right)^{0.54}$$

$$H_L = \frac{Q^{1.85} L}{0.432^{1.85} C^{1.85} D^{4.87}}$$

-Used the Hazen-Williams formula to determine the required head at various flows capable by the selected pump. This would find the intersect between the system curve and the pump curve.

-The static head was found to be 5.63 ft based on the profile of Route 4 and finding the head the pump would need to be able to overcome. The 5.63 ft is the elevation change between stations 2+00 and 3+00. After station the 3+00 station, the profile begins a downgrade and would be gravity flow.

-The Hazen-Williams variables are listed. The pipe smoothness coefficient for a PVC pipe is 148 (CITATION). The system will use a 4" (1/3 ft) PVC Pipe (ASTM CITATION).

-The length of the system is 100 ft. This length is the difference in length between the 2+00 and 3+00 stations. This length is the area of the profile of Route 3 that is a positive grade which would require the pump to deliver the wastewater.

-The Hazen-Williams constant is 0.432 because the units are English units.

-When two pumps are in parallel, the flow capabilities of the system are doubled. The system will have two pumps running when the inflow of the system is high and the 2nd float switch is activated and turns on the second pump in order to prevent the pump chamber from flooding.

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