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MET 330

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Test 2 Reflection

This test was able to apply concepts presented in class and on homework to build upon a real world pumped piping system. Due to changes in the in the system or new challenges, the pump horsepower needed increased. Added considerations versus last test were cavitation, open channel characteristics, buoyancy effects, water hammer, and reaction forces on the pipe.

The system could experience some cavitation. We interpreted this incorrectly though we had the correct numbers to use. Likewise, we did not solve for Qpumped percentage on problem A. I disagree with the solution for problem B, specifically the forces in the y. If this problem was to support a pipe, as defined in the problem, the pipe would collapse under the weight of the steel pipe itself with these numbers and would ultimately fail. It should be considered that water is not the only weight that needs calculated. Problem C was fairly straight forward. It was easily solved if you understand and apply the concept of change of pressure being directly proportional to the energy losses. Problem D involved using the pump outlet pressure calculation which was solved correctly. However, some steps were missed solving for t and was misunderstood what would cause cavitation. The bouy problem, F, was very similar to a homework problem from chapter 4. Applying these concepts was a quick way to getting through it. Problem F set up incorrectly and therefore missed the mark.

When it boils down to it, homework and lectures contain all the answers we needed to complete this exam. The professor constructs the concepts in way that forces the students to truly understand why and how these ideas are applied to real world problems. It is not enough to merely regurgitate or memorize a series of problems we've seen before. Rather, master the application of such engineering and design calculations.

		My Grade
1. Purpose	0.5/10.0	0.5/10.0
2. Drawings	1.0/10.0	1.0/10.0
3. Sources	1.0/10.0	1.0/10.0
4. Design considerations	1.0/10.0	1.0/10.0
5. Data and variables	0.5/10.0	0.5/10.0
6. Procedure	2.0/10.0	2.0/10.0
7. Calculations	2.0/10.0	2.0/10.0
8. Summary	0.5/10.0	0.5/10.0
9. Materials	0.5/10.0	0.5/10.0
10. Analysis	1.0/10.0	1.0/10.0
TOTAL	10.0/10.0	**10.0/10.0**

PART 1)		
1. Correct equation	1/4	1/4
2. Area calculation	1/4	1/4
3. Hydraulic radius calculation	1/4	1/4
4. Correct results?	1/4	.5/4
PART 2)		
1. Free body diagram and correct forces	1/4	1/4
2. Force in x	1/4	1/4
3. Force in y (weight)	1/4	1/4
4. Correct results?	1/4	**.**25/4
PART 3)		
1. Right equation and A1/A2	1/3	1/3
2. C value	1/3	1/3
3. Correct results?	1/3	1/3
PART 4)		
1. Water hammer		
a. Wave velocity (units?) & pressure increase	1/4	.5/4
b. Operating pressure & pipe thickness	1/4	1/4
2. Cavitation		
a. Lowest pressure & compare to sat pressure	1/4	.5/4
3. Correct results?	1/4	0/4
PART 5)		
1. Hydrostatic force on the gate		
a. Magnitude	1/5	1/5
b. Location	1/5	1/5
2. Solve for buoy force with moment conservation	1/5	1/5
3. Using buoyancy, get sphere diameter.	1/5	1/5
4. Correct results?	1/5	1/5
PART 6)		
1. Correct area	1/4	.5/4

2. Correct velocity	1/4	1/4
3. How Cd was obtained?	1/4	0/4
4. Correct results?	1/4	0/4

PART 7)

1. Setting up the spreadsheet for all parts	1/3	1/3
2. Case for flow rate when the pump power is half	1/3	1/3
3. Correct results?	1/3	.5/3

FINAL GRADE:

10.0 + (80/7)*(3.5/4 + 3.25/4 + 3/3 + 2/4 + 5/5 + 1.5/4 + 2.5/3) **= 71.7**