# Test reflections

For every test you archived in your ePortfolio Google drive, you should have a reflection that briefly discusses:

1) How and why the test demonstrates your work toward one, or more, of the course learning objectives. Be specific on the course objectives you decide to mention.

Bernoulli's equation was used to find the pump power in part A of the test. In doing so, we had to calculate  $H_A$  which was done by going from point 1 (water level of the lower open channel) to point 4 (water level of the upper open channel).

2) How your test compares against the available solution? State the mistakes you made and what you will do next time to avoid making same mistakes. Please point out exactly where you made the mistake, say why you made the mistake, and how you should have done it. If you were taking this test again, what advice would you give yourself to ensure that you had a successful test?

Overall my procedure was in line with the procedure of the solutions. In the solution the diameter of the buoy was found and I found the volume. I isolated the elbows when finding the forces in the discharge pipe and my sign was backwards in finding the solution of the pressure in the U-tube manometer. I had the opposite problem when finding the forces and the pressure in the manometer reading. What I mean by that is, I initially had the free body diagram correct for finding the forces but a t the first road block I realized the velocities cancelled each other so I stopped. For the manometer reading I continued the problem until I was able to eliminate values.

If I had to do the test again I would approach all problems the same and go with my initial instinct and then ask the professor questions after I finished ALL the problems. Keep each mistake or what I thought were mistakes and compared the solutions each time I attempted the problem.

3) What your grade should be. Base it on the writing rubric provided in the test and the correctness of your solution. What are the strengths and weaknesses of your test?

My strengths were understanding what formula/procedure was needed for each problem. My biggest weakness was recognizing the that even though the weight of the discharge pipe was not distributed evenly that I had to assume the Weight acted through the longest portion of the pipe.

# WRITING RUBRIC

- 1. Purpose 0.5
- 2. Drawings 1
- 3. Sources -1
- 4. Design considerations -1
- 5. Data and variables -0.5
- 6. Procedure -1.5
- 7. Calculations 1.5
- 8. Summary 0.5
- 9. Materials -0.5
- 10. Analysis 1

TOTAL - 9.0

## PROBLEM 1)

Compute pump power

- Flow in the lower open channel
  - a. Correct equation 1
  - b. Area and hydraulic radius 1
- Pump head
  - a. Select pipe diameter 1
  - b. Use Bernoulli's to get ha 1
  - c. Energy losses 1
  - d. Pump power with efficiency 1

Design of buoy to open gate

- Hydrostatic force on the gate 1
  - a. Magnitude 1
  - b. Location 1
- Solve for buoy force with moment conservation 1
- Using buoyancy, get sphere diameter 0.5

Manometer reading

- Use gamma\*h procedure 1
- Solve for "h" using geometry relation 0.5

#### Pipe-elbow forces

- Free body diagram and correct forces 0.5
- Force in x 0.5
- Force in y (weight) 0.5

Flow-nozzle flowmeter pressure drop

- Right equation and A1/A2 1
- C value 1

Water hammer & cavitation

- Water hammer
  - a. Wave velocity (units?) & pressure increase 0.5
  - b. Operating pressure & pipe thickness 0.5
- Cavitation
  - a. Lowest pressure & compare to sat pressure 0.5

Drag force on object at the bottom

- Correct area 1
- Correct velocity 1
- How Cd was obtained? 1

FINAL GRADE:

### 9.0 + (80)\*(6/21+4.5/14+1.75/14+1.5/21+2/14+1.5/21+3/21) = 94.7

### May more deserving of a B+ because of the calculations

- 4. Discuss the following:
- What issues did you encounter in completing the test? How did you troubleshoot them?

Each time I was stuck on a particular problem I went to my sources (blackboard and the text as well as the information you provided from our responses). I was able to use the text, the information you provided and the solutions to the homework to get a better understanding not just on the test itself but the tasks/project.

• What steps did you take to complete the whole test? Would you change something?

I read the chapter of the text that I think would help me with the solution to the problem as I was working on the problem. The answers you provided to our questions were very helpful. I read it multiple times while solving the problems. And, I still managed to second guess myself by isolating the elbows when finding the forces even though you mentioned use the WHOLE discharge pipe.

• What new concepts have you learned?

Piecing all the necessary components to come up with a design.

• Where you think engineers use those concepts (provide specific examples)?

Engineers use new concepts daily in the industry. They learn from asking questions, trial and error, doing and reading.

• Where do you think you will be using everything you learned?

In other classes and in my professional life

• Do you think what you learn is important for your professional career?

Some things are. Balancing your time with others is as real as it can be in the professional world.

• How, when, where and why you might use this information or skill in the future?

Other classes, at work, at home. Time management is skill we use in our daily life.

• Have you been able to apply concepts you have learned in the course to what you do at work or in other courses?

Yes. Meeting timelines are a very important part of my day to day function.

• What areas did you feel you were most successful, or improved the most?

Know how to apply Bernoulli's equation. I remember the first time you mentioned Bernoulli's equation you wrote it out and said you have done it so much that its hard to forget but most importantly you understood when to use it. I feel a little more comfortable in solving pressure problems with Gamma H as well.

• How do you see this course's content intersecting with your field or career?

I am looking forward to the topic of how to select pumps/motors as I think this may help shape/influence my path on where to go next in my career.

• How much time did you spend on the test? How was the time organized? What would you do differently? Why?

I spent approximately 2 days on the test. The time was organized reading the text and doing partial solutions and going over homework problems.

If I had to do it over again I would spend most of my time doing the complete test and then send my solutions to you for feedback and then attempt to fix what and if any problems that needed fixing.