PART MINI-PROJECT ASSESSMENT
(submit as cover page)

Name: [Redacted]  Section: 01  Date: 03/09/16

1. How many hours did you spend on each component of the part mini-project, including class time? These are (a) pre-CAD sketching/measuring/planning, (b) solid model development/detailing, and (c) project documentation?

<table>
<thead>
<tr>
<th>Component</th>
<th>Approx Time Spent</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. pre-CAD</td>
<td>5 1/2 hours</td>
</tr>
<tr>
<td>b. solid model</td>
<td>15 hours</td>
</tr>
<tr>
<td>c. project documentation</td>
<td>3 1/2 hours</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>24 hours</td>
</tr>
</tbody>
</table>

2. What are your two most important lessons learned about solid modeling in this project? The two things I learned while doing this project that I found to be most valuable were:

1. Complete, careful, and correct preparation can make all the difference; it requires the time you spend with the program open because you know what you're doing. I learned this from the difference between my "Section 12" "Draining and Irrigation Holes" drawing.
2. You can select a face and use it as a plane to draw on—previously, I thought you'd select the face then create a reference plane.

3. Using the ME 301 grading rubric (1-4), analyze your performance in the following:

1. Incomplete, major deficiencies  
2. Complete, some deficiencies  
3. Complete, meets expectations  
4. Exemplary, exceeds expectations

<table>
<thead>
<tr>
<th>Project Component</th>
<th>Self-Rating</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-CAD Planning</td>
<td>4</td>
<td>This is the first project I've done where my planning cut the actual modeling time significantly. I got detailed very useful information the first day and created a detailed construction plan with the knowledge I had at the time. Any issues I had (orientation issues) were due to not knowing how to approach it.</td>
</tr>
<tr>
<td>Design Layout Sketch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Origin/Axes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurements/Datums/Assumptions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid Model Development</td>
<td>3</td>
<td>I think my model is very average. It has all of the necessary pieces of the part and is very complete, but isn't exceedingly Bennering. In my opinion, it is an acceptable completion of the assignment, and I'm not sure how else the assignment could be exemplary.</td>
</tr>
<tr>
<td>SW Sketches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Features/Design Tree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visualization of Final Part Engineering Drawing</td>
<td>3</td>
<td>(w/ major dimensions and completed title block)</td>
</tr>
<tr>
<td>Project Documentation</td>
<td>4</td>
<td>I took a lot of care in documenting the process by which I created the part. I took screen shots of everything significant I did and explained thoroughly how I did it, as well as took notes while creating the part on various things I'd noticed, questions I needed to ask, and important lessons learned.</td>
</tr>
<tr>
<td>Illustration of Steps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explanation of Steps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lessons/Discoveries</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Construction plan on reverse
progress
issues
needed measurements

3 x 2 (another side too)

r = 1.08691/2
r1 = 1.082
r2 = 1.376
r3 = 0.5
k = 2 / 4

3.073 = 1.111

3.073

Assumptions:
- 3/4 portion (on top drawing) is straight.
- In double fillet edges.
- r2 circle is centered at -233 diam. circle, as is r3 circle.
- Sketching shows this is likely.
- We measured everything correctly.
- No portion (on section) and adjacent line are straight, not curved.
- Some angles can be guessed by eye.

Dimensions are in inches
Three angle projection

Proprietary and confidential

University of Idaho
ME Department
0. Begin by creating 3 extra planes parallel to top plane, offset by widths of sections 2-4, respectively.

1. Open sketch in front plane and draw shape of section 1.
2. Open sketch in plane 1 and draw circular section of plane 2.
3. Open sketch in plane 2 and draw section 3.
4. Open sketch in plane 3 and draw circular section of plane 4.
5. Extrude sections accordingly.
7. Create extra plane in between front plane and plane 1 (plane 4).
8. Create extra planes (2) offset by angle necessary to create two holes on left side of part (planes 5-6).
11. Use sweep to create holes and cut it out of part.
12. I expect steps 2, 4, 9, and 12 to be most difficult.

So far, I need extra information on the following:

Section 3

Section 1

And I've had some issues on the circled area of section 1. I guessed the measurement(s) we got for it, I ended up overfining it, so I guessed and went with making it look similar to the original part. My guess is that he misused the micrometer (forgetting to add the hundredth's digits together) on other measurements.
When creating this part, I made the following assumptions:

- lines that appear straight may be modeled as such
- the dimensions I took and/or were given are vaguely correct and may be used either to construct or check correctness of constructions
- the part is symmetrical about the axis on which all centers of the major circles lie
- edges which appear round can be approximated with only one radius of curvature
- the irrigation holes in Section 1 are perfect circles when they intersect the straight edges.
- the irrigation holes are based off of one singular hole which can be modeled as a drilled hole, and exact interior spacing and orientation are less important than exterior spacing and orientation (I assumed this for two reasons; the first is that measurements of the irrigation holes were nearly impossible to acquire, and the second is that a part’s primary purpose is to interact correctly with other parts on its exterior)

After the peer review, I changed the shape of Section 1 pretty significantly, making it thinner. This was a direct result of getting better measurements and talking to my classmates who had already completed that section of the part. Also as a result of the peer review, I changed my approach to the irrigation holes, adding the Hole Wizard for the largest hole and changing the dimensions to use.

All-in-all, I feel that the creation of this part went relatively smoothly. The majority of the time I wasted was due to incorrect or incomplete measurements, and I learned several new things about operating SolidWorks, including the ability to create a drawing on a face without creating a reference plane. I definitely could have improved by taking more careful measurements and documenting shape more completely. I feel that my design plan was very detailed and complete, thereby aiding in creating this part immensely, and this project made me realize the true value of careful planning and preparation.