

ME 160 Project 2 - Final Design

The second project for ME 160L is a continuation of the work you started in the first project. In that project, you designed an underwater housing for a video camera. In this project, you will refine that design and create Pro/E drawings of the underwater housing. You will work in the same groups for the second project as you worked in for the first.

In this assignment, you will write a brief report describing your design and use Pro/E to create a set of working drawings for the underwater housing. The report will be typed and will be no longer than three pages. It will include at least one paragraph on each of the following topics:

1. Brief description of the housing and how it is used. This is not a commercial. It is a description of the features and capabilities of the housing.
2. The features of your case that make it easy for the diver to use.
3. The features of your case that make it easy to repair.
4. The features incorporated into your design making it easy to manufacture.
5. The features incorporated into your design making it easy to assemble.
6. Case thickness calculations – assume a maximum stress in the plastic of 1000 psi. These calculations will be typed and included as a part of the report.

The report should reference specific Pro/E drawings by both the name and page number of the drawing.

The Pro/E working drawings must include:

1. An assembled view of the entire underwater housing. The visible parts will be labeled with a number (balloon). These numbers will refer to the part in the bill of materials.
2. The bill of materials will list of all of the parts used to construct the housing, the material used in the construction, and the number required for a single camera housing. All standard parts such as o-rings, bolts, screws, washers, and nuts will be listed in the bill of materials.
3. An exploded assembly view of the housing showing all of its parts. All of the parts will be labeled with a number (balloon). The name of the part can be found in the bill of materials for the housing by looking up this number. This exploded assembly view may be spread out over several sheets if necessary for clarity.
4. The button sub-assembly will be displayed on one or more separate sheets in both exploded and unexploded states. Balloons will be used to identify these parts. The numbering will be the same as in the bill of materials.
5. Detailed drawings of **4 most complex parts** (not assemblies) showing their shape and size. **All dimensions must be in millimeters.** There should be sufficient dimensions to build the part. The name of the part must be same as the name used in the bill of materials.
6. Create at least two sectional views from these major parts. The sectional views should contain dimensions.
7. At least one detail or exploded view of an area of one of the major parts. The detail view should be at a larger scale than the view it is taken from. This detail view should be used for dimensioning features that were too small to dimension in the original view. (See Page 307 Figure 8-40 for an example).

The drawings will be placed on Pro/E A (use a.fmt for the sheet borders and title block) sized drawing format and will contain the following information. The drawings will include.

1. A Cover page with your company name (make up one) and the Class IDs of each of your group members who participated in the project.
2. A title block - (every sheet) containing:
 - a. The name of the company make up one
 - b. Name of the part or assembly
 - c. The scale of the drawing
 - d. The sheet number
 - e. The date it was drawn
 - f. Your name - if several of you worked on the drawing then list each person
3. General notes - (where needed)
4. Local notes - (where needed)

The sheets should be printed on normal 8.5 x 11 paper stapled on the top left corner. The order of the sheets should be:

1. Cover page
2. Isometric or pictorial of the entire case
3. One or more assembly views of the entire case along with the bill-of-materials (BOM). If the bill of materials is too large, it can be placed on a separate sheet by itself. The bill of materials should only be shown once in the drawing set.
4. One or more exploded assembly views. All parts should be labeled with balloons.
5. One or more sub-assembly drawings of the buttons used in the design. Both exploded and unexploded drawings should be included.
6. Detailed (dimensioned) drawings of the more complex parts. Each view should be large enough for easy reading. Multiple sheets can be used if there is too much information for a single sheet. These detailed drawings should contain sectional and detail views as required.

The Pro/E assembly and parts for the video camera can be downloaded from my web site. Use this camera to establish the size of the housing and the placement of the controls.

The project will be due May 3, 2012 (Thursday) at the end of your lab.

Grading - Report

1. (10 Points) Description of video camera housing
2. (10 Points) Description of functional design elements
3. (10 Points) Description of features which facilitate manufacturing
4. (10 Points) Description of features which facilitate assembly
5. (10 Points) Case thickness calculations

Grading - Drawings

1. (20 Points) Assembled view of the entire video housing
2. (10 Points) Bill of materials
3. (20 Points) Exploded Assembly View
4. (20 Points) Exploded and unexploded assembly view of button or control
5. (40 Points) Dimensioned drawings of 4 major components - Sufficient dimensions - easy to read
6. (20 Points) 2 Sectional views
7. (10 Points) 1 Detail view (exploded view)
8. (10 Points) Sheet format and title block