Test Project Day 3

Mechanical Design Challenge

WSC2013\_TP05\_M3\_EN

Submitted by: Autodesk® Inc.

# Contents

This Test Project proposal consists of the following documentation/files:

|  |  |
| --- | --- |
| **PROJECT 1** | **PROJECT 2** |
| WSC2013\_TP05\_M3\_EN.doc | WSC2013\_TP05\_M3\_EN.doc |
| WSC2013\_TP05\_M3\_PROJ1.pdf | Data Files folder > 02\_Conveyor > All files |
| Data Files folder > 01\_Hedgetrimmer > All files |  |

# Introduction

Your company has asked you to work on two design projects. The first is to model an alternate design for a hedge trimmer. The second is to create multiple versions of a conveyor.

# Description of projects and tasks

## PROJECT 1

After you have reviewed the prints, design brief and data files, you revise, model and assemble the alternate design for a hedge trimmer. You also create exploded views, drawings, rendered images and an animation.

## PROJECT 2

After you have reviewed the prints, design brief, and data files, you create 3 versions of the base laptop design. You also create an animation.

You have **6 hours** to complete the projects.

# Instructions to the competitor

## OPEN AND REVIEW SUPPLIED FILES FOR PROJECT 1

1. WSC2013\_TP05\_M3\_PROJ1.pdf is the design brief.
2. Supplied assembly and part files are located in Data Files > 01\_Hedgetrimmer.
3. WSC2013\_TP05\_M3\_PROJ1.iam is the current design of the hedge trimmer body.
4. Open 8102401-1201-Base.ipt. This is the starting file for the alternate housing design. It is described as the left half of the design.
   1. The YZ and XY work planes align with the existing design, 8102401-1201.

## MODEL AND ASSEMBLE THE PARTS FOR PROJECT 1

1. Review the part sketches and notes in the PDF file. Complete the tasks.
   1. Design new hedge trimmer housing parts (right and left).
   2. Model the blades and drive parts.
   3. Open 8102401-14.ipt. Model the handle based on the sketch shown in the PDF.
   4. Assemble the hedge trimmer. Create a single assembly with the original and alternate housing designs. The alternate housing design should be visible.
2. Save the assembly using competition file naming conventions.

## CREATE DRAWINGS FOR PROJECT 1

1. To complete the drawing:
   1. On the first sheet, create an exploded, shaded isometric view of the hedge trimmer with the alternate housing visible.
   2. Add balloons and a parts list. The parts list should have 3 columns, ITEM, QTY, and PART NUMBER. All parts must be listed.
   3. On a new sheet, create a detail drawing of the left alternate housing part.
   4. On a new sheet, create a detail drawing of the right alternate housing part.
   5. If required, create a new sheet for the detail drawings of the handle, blade, and
   6. All annotation styles must meet ISO standards.

## CREATE A RENDERED IMAGE AND ANIMATIONS FOR PROJECT 1

1. Using Autodesk Inventor, create an animation as follows:
   1. Illustrate the 2 housing designs. Start the animation with the original housing design visible.
   2. Screen size: 1024x768
   3. Length: 15 seconds
   4. Save the file using the competition file naming convention.
2. Using Autodesk Inventor, create an animation as follows:
   1. Animate the hedge trimmer blades.
      1. The gearing must be visible at some point during the animation.
      2. A nut and bolt assembly and the slot in the blades must be visible at some point during the animation.
   2. Screen size: 1024x768
   3. Length: 15 seconds
   4. Save the file using the competition file naming convention.
3. Create an animation of the exploded, shaded isometric view.
   1. Use the alternate housing body design for this animation.
   2. Save the file in AVI format using the competition file naming convention.

## OPEN AND REVIEW SUPPLIED FILES FOR PROJECT 2

1. Supplied assembly and part files are located in Data Files > 02\_Conveyor.

## CREATE MULTIPLE VERSIONS OF CONVEYORS FOR PROJECT 2

1. Your company has designed a conveyor system. To improve the efficiency of designing conveyor lines you have been asked to develop a work flow that creates 3 different conveyor sizes from one assembly. The sizes are:

|  |  |  |  |
| --- | --- | --- | --- |
| **DIMENSION NAME** | **SMALL** | **MEDIUM** | **LARGE** |
| length | 1200 | 1600 | 2000 |
| width | 500 | 800 | 1000 |
| height | 800 | 800 | 1000 |

1. The project has been started by another designer and they decided to use a layout to drive all other dimensions. In the supplied file, Conveyor.iam, the layout is named Conveyor layout.ipt and is currently not visible.
2. As part of the layout, 2 holes are used to assemble the conveyor. The holes are located as follows:
   1. Height = 660.95mm
   2. Width = width/2
3. Using the layout as the basis for your solution, create a work flow to quickly generate 3 different conveyor sizes.

## PRINTOUTS FOR PROJECT 2

1. On an A4 sheet, print the spreadsheet used to generate the different conveyors.

## CREATE RENDERED IMAGES FOR PROJECT 2

1. Using Inventor Studio, create rendered images as follows:
2. Individual images of the 3 conveyor’s.
3. Image size: 640 x 480.
4. Save the files in PNG format using the competition file naming convention.

# Marking scheme

|  |  |  |  |
| --- | --- | --- | --- |
| **CRITERION** | **SUB-CRITERION** | **MARKS** | |
| C1 | Fulfilment of the Design Brief | 12.5 | 2 |
| C2 | Physical simulation | 6 | 0 |
| C3 | Exploded view simulation | 2.5 | 0 |
| C4 | Photo rendering | 0.5 | 1.5 |
|  | **Sub-Total**: | 21.5 | 3.5 |
|  | **Project** | PROJ1 | PROJ2 |
|  | **Total:** | 25 | |