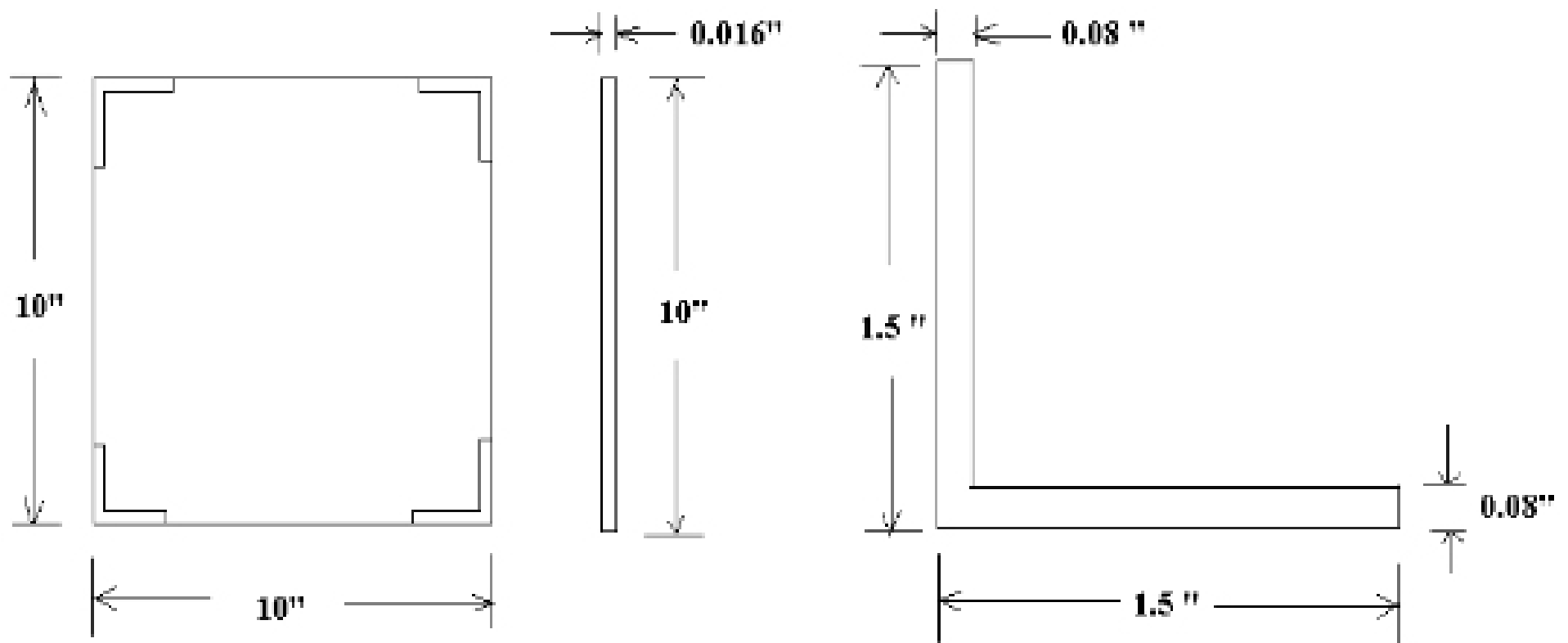
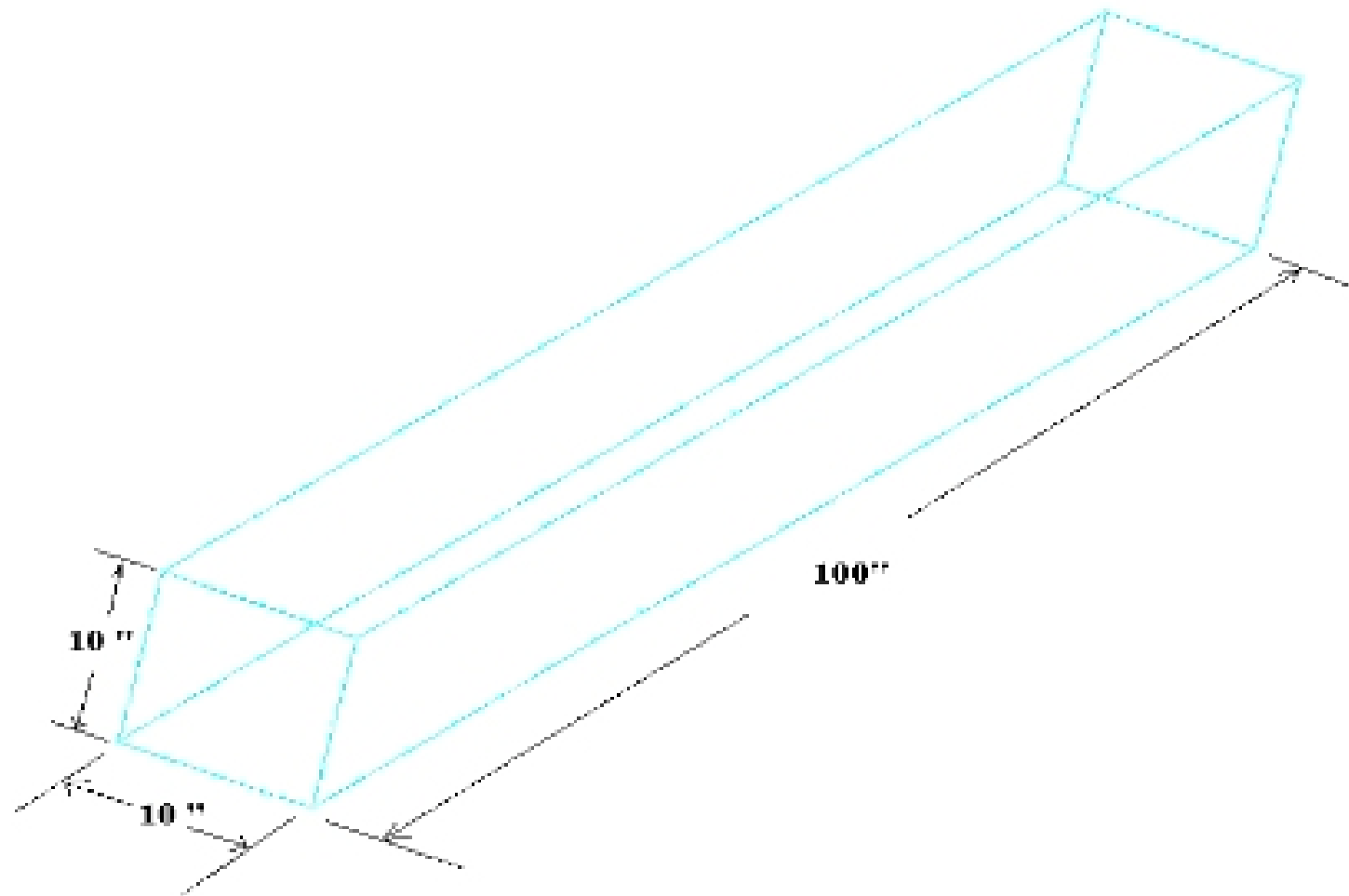


Example 2)

In this example a box is going to be created. The length of the box is that of the last example, 100 inches, picture below:

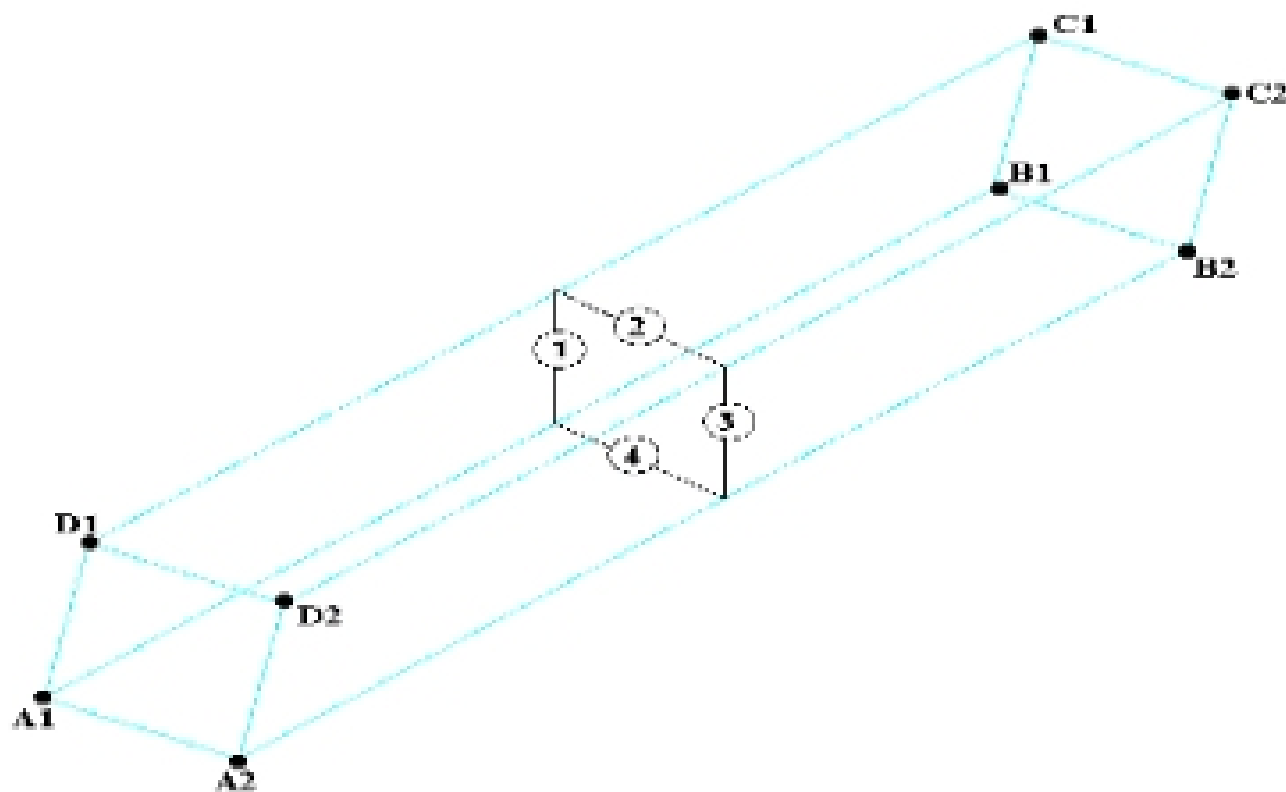


Goal of this tutorial

In this tutorial it is intended to show how a box can be created and also the way to have the correct beam orientation. Students now are familiar with creating simple geometry taught in the first tutorial.

Creating the geometry

As you see in the picture below, the box has four faces, that are 1, 2,3, and 4. So first we start with creating these faces.



Student knows how to create surface # 1(surface A1B1C1D1).(It was taught in the first tutorial). The coordinates of the four corners of the surface 1 are A1(0,0,0) , B1(100,0,0), C1(100,10,0), and D1(0,10,0) inches. The surface is in X – Y plane.

Once you have created its four corners, go to create four sides of the surface that are lines A1B1, B1C1, C1D1, and D1A1.

Once you are done, go to **Geometry – Boundary Surface – From Curve**, and select the four lines, press OK to create the surface.

For creating the opposite surface (surface #3, or A2B2C2D2), you can simple copy the surface 1 for 10 inches in Z direction or create it again by using its four corners coordinates that are A2(0,0,10), B2(100,0,10) ,C(100,10,10), D2(0,10,10).

For creating the top and bottom surfaces that are 2 and 4 :

- 1- create lines A1A2, B1B2, C1C2, and D1D2.
- 2- Select **Geometry – Boundary Surface – From Curve** from the FEMAP menu.
- 3- Select lines D1D2, D2C2, C2C1, C1D1. Press OK to create surface 2.
- 4- Select lines A1A2, A2B2, B2B1, B1A1. Press OK to create surface 4.

Now you are done with all four surfaces.

Materials, Properties and Meshing

For material choose **AISI 4340 Steel** as in Example 1.

The thickness of the shear webs are 0.016 inches.

Before creating the property for the beam elements, just make a layer ID=2 and name it **Beam**.

For L –shape beams , choose dimensions 1.5, 1.5, 0.08, and 0.8.

Meshing

First we mesh the surfaces and then create L- shape beam elements.

- 1- Select **Mesh – Mesh Control – Size Along Curve** from the FEMAP menu.
- 2- Select lines A1A2, B1B2, C1C2, D1D2 and assign 4 elements for them.
- 3- Select lines A1B1, C1D1, A2B2, and D2C2 and assign 20 elements along these lines.
- 4- Select **Mesh-Geometry-Surface** from the FEMAP menu.
- 5- Choose the for surfaces. Press OK to generate mesh for the four surfaces.

Now you should be able to see the following picture: