Beam and Column

Enter Component Section Values in Beam and Column Calculator

To perform a beam or column calculation using the Beam and Column Calculator, you need model data to perform the calculation and set Loads and Supports. You enter model data in the Beam / Column Component area on the Model tab. In this Skill Builder, you learn three ways to get the model data. We do not show you the whole functionality of the calculator.

Expected completion time: **20 minutes**

Use with: **Inventor 2009**

Workflow Overview

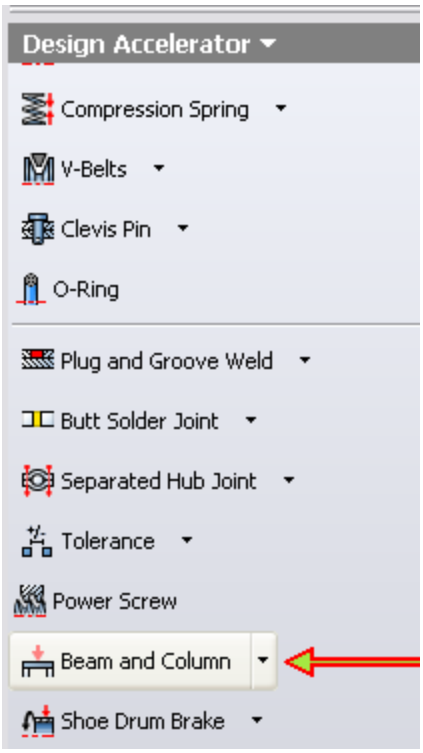
To complete this exercise, you will learn three possible ways to insert the data of a component to perform the calculation of beams or columns using Beam and Column Calculator.

Prerequisites

- Have Inventor R2009 installed.
- Have Content Center installed and configured.
- Understand how to open, create, and save part files in your active project.

A. Enter values manually

1. Open an assembly file. In the Design Accelerator panel bar, start the Beam and Column Calculator.



In the Beam / Column Component area, enter values for your beam or column component manually. Click the value in the Size column and enter the value. We recommend entering all values. However they are not mandatory and the calculation will be inserted into Autodesk Inventor graphics area. When you switch to Beam Calculation tab and click Calculate, the calculation will fail and messages in the Summary of Messages area inform you that values for parameters cannot be zero to perform the calculation successfully.

In this example, enter the following values:

Section Length: **100 mm**

Section Area: **706 mm**

Section Modulus 1: **7245 mm**

Section Modulus 2: **7245 mm**

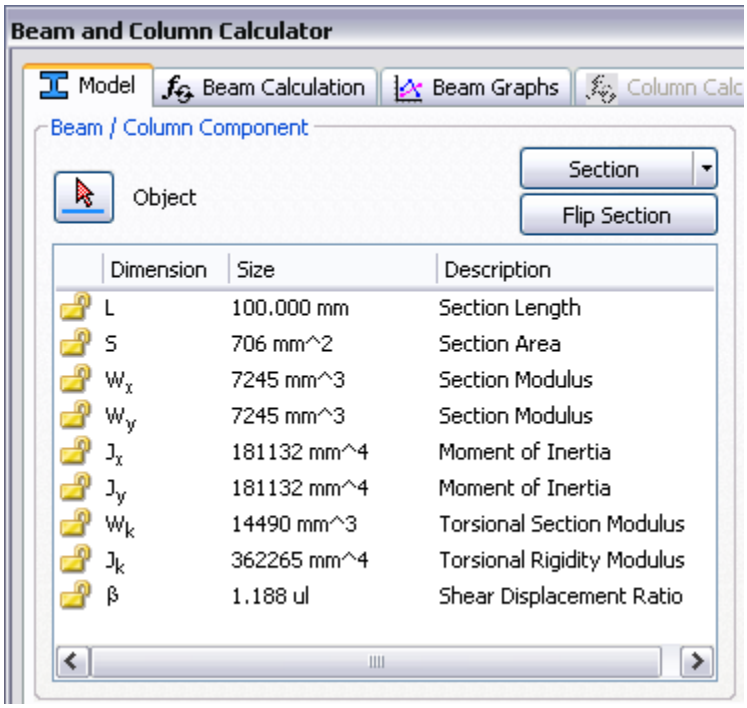
Moment of Inertia 1: **181132**

Moment of Inertia 2: **181132**

Torsional Section Modulus: **14490**

Torsional Rigidity Modulus: **362265**

Shear Displacement Ratio**: 1.188**



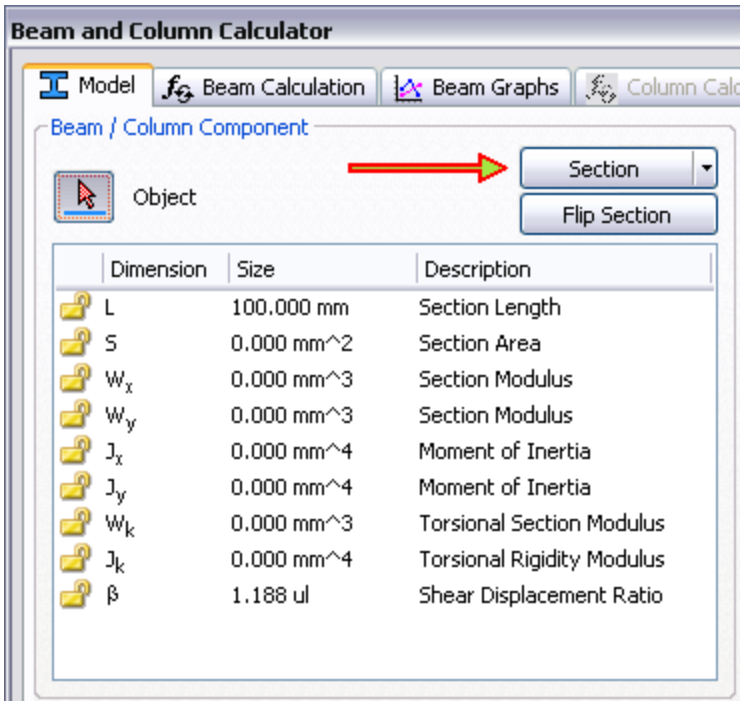
2. Switch to the **Beam Calculation** tab.
3. Click **Calculate** to perform the calculation.
4. When you perform the appropriate calculation, click **OK** to insert a calculation to the assembly.

Note: In the Calculation Type area, select what calculation you want to perform. By default, the Beam Calculation option is selected. The calculation of beam is inserted into the assembly. Also, the Beam Calculation tab is available where you can set additional values for beam calculation. To insert a calculation of a column, check the Column Calculation box. The Column Calculation tab is enabled, and you can set further parameters for column calculation.

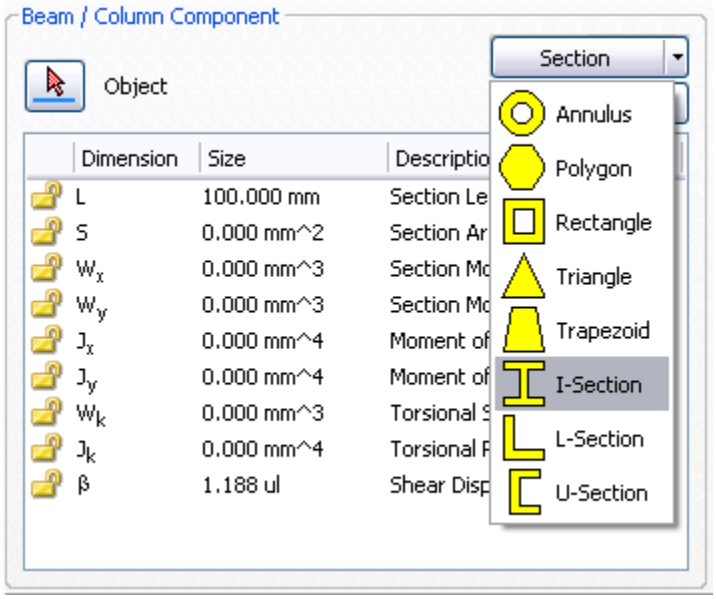
B. Use the Section command

1. Open an assembly file. In the Design Accelerator panel bar, start the Beam and Column Calculator.
2. On the Design tab, In the Beam / Column Component area, click the **Section** command.

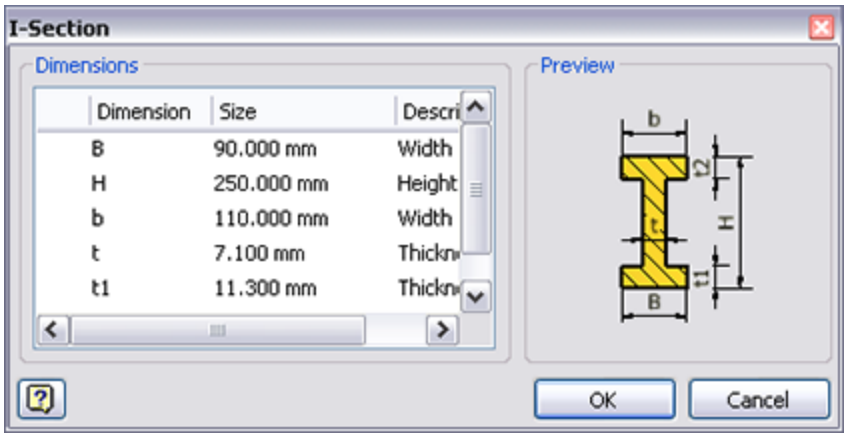
Note: The Flip Section button turns beam section by 90 degrees and changes values for the beam section dimensions. It switches X and Y axes.



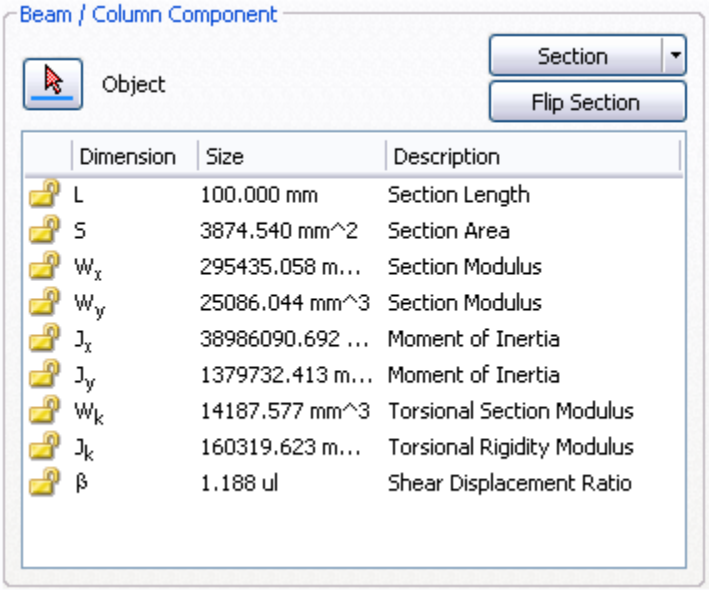
3. The list of possible sections is available. Select the appropriate section profile. In the appropriate dialog box, enter the section values. For example, select I-Section section.



4. On the I-Section dialog box, set Height to **250 mm**, and Width to **110 mm**. Click **OK.**



5. Dimensions and values such as Section Modulus or Moment of Inertia are automatically inserted into the edit fields in the Beam / Column Component area.

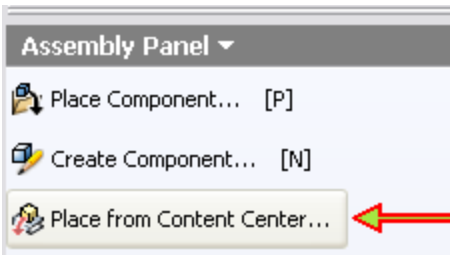


C. Read data from Content Center part

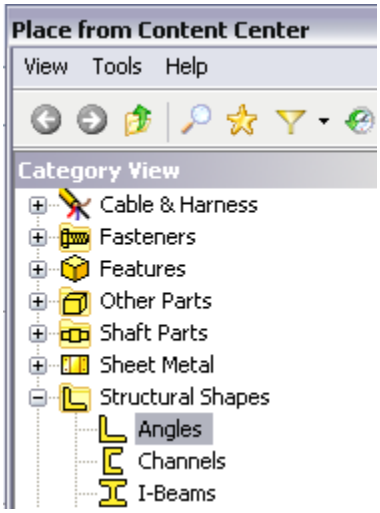
When your assembly contains a part inserted using Content Center, the Beam and Column Calculator is able to read the data of the part.

Note: You must be connected to Content Center to be able to use this procedure.

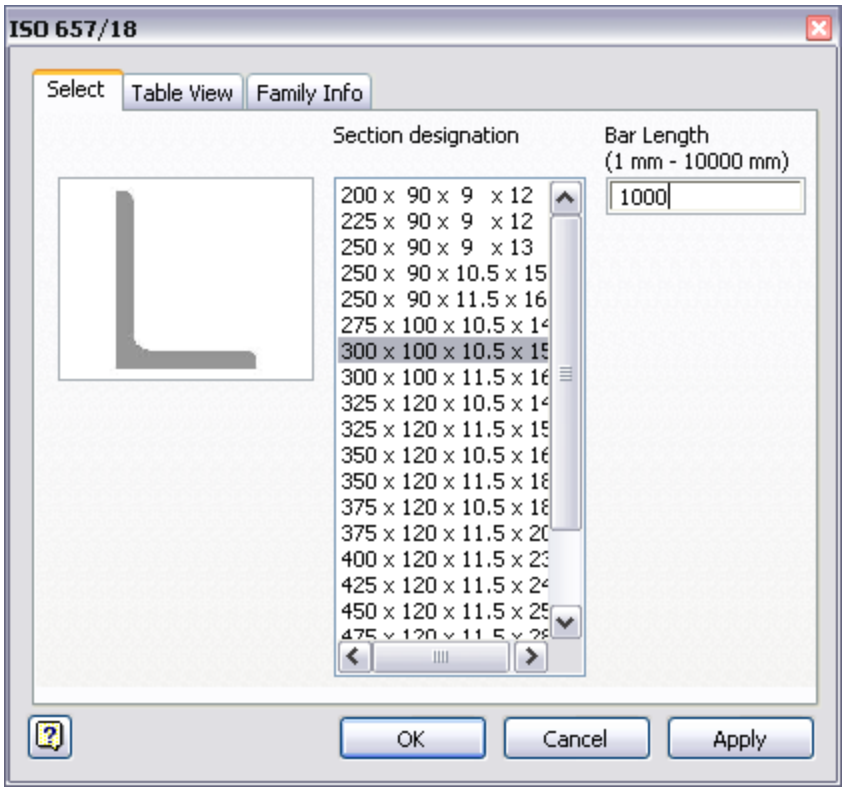
1. Open an assembly file. On the Assembly panel bar, click **Place from Content Center**.



2. In the Category View, select Structural Shapes, and click **Angles**.

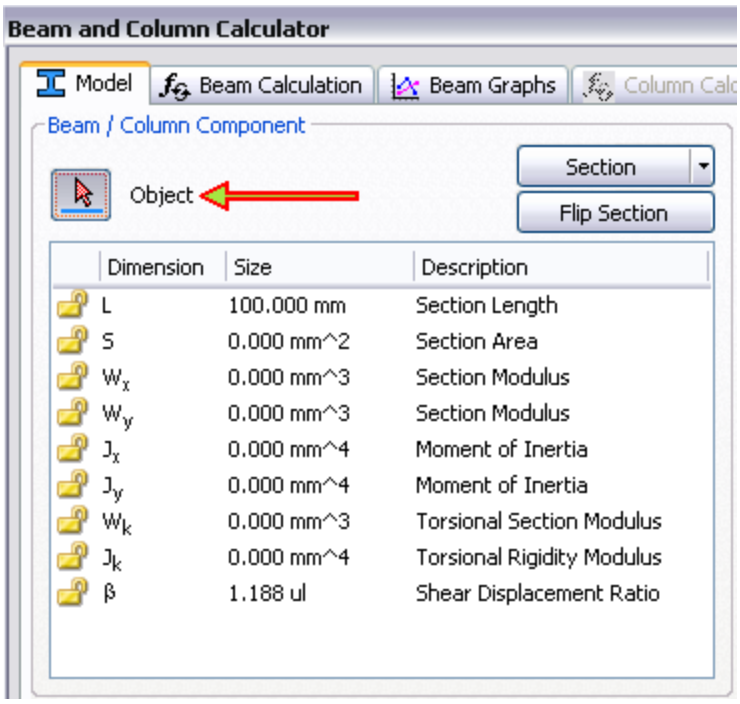


3. Double-click **ISO 657/18** to open the part dialog box. Select parameters of the part: Section designation: 300 x 100 x 10.5 x 15-1000(2):1. Set Bar Length to **1000** mm.

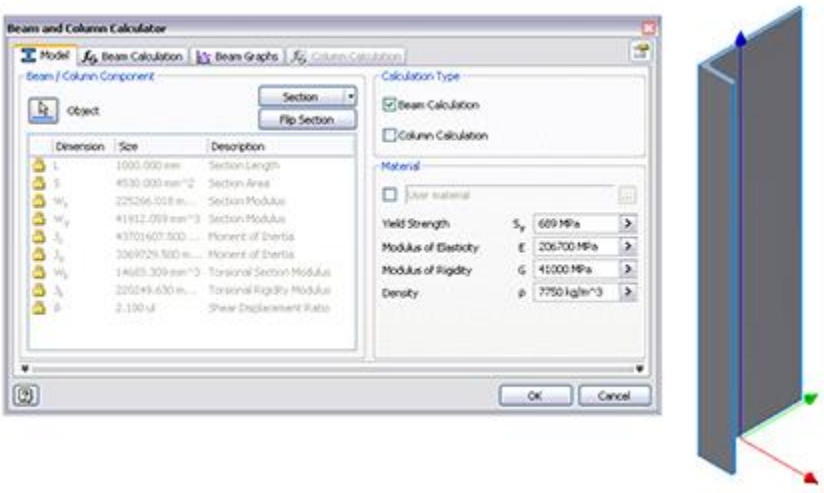


4. Click **OK** to insert the part into the assembly. In the Save As dialog box, specify the part name and its location.
5. Switch to the Design Accelerator panel bar and start the **Beam and Column Calculator**.
6. On the **Model** tab, make sure the Object command is selected. Now, we can select the part in the graphics window. The calculator can read data from the part. We inserted a part from Content Center that contains all necessary data.

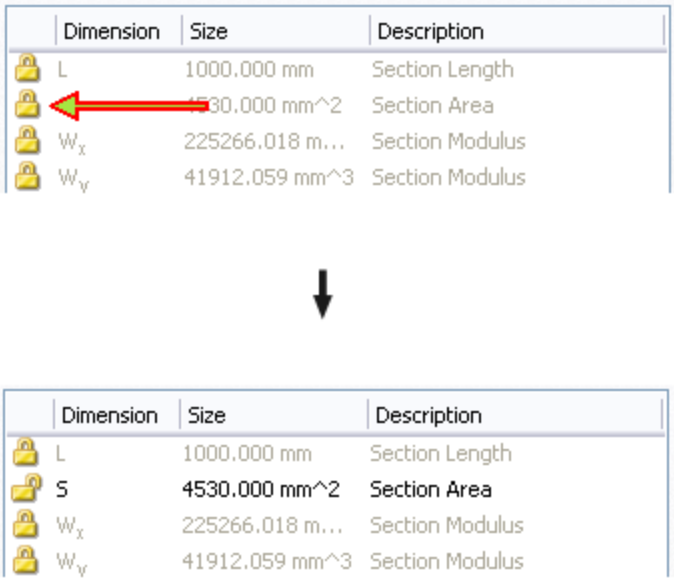
Note: Be aware that not all Content Center parts have all data available. Insert the missing data to Model tab manually.



7. Select the part in the graphics window. All necessary data are inserted into the Beam and Column Calculator. The data in gray are not editable.



8. To change values, click the **lock** icon next to particular edit field. For example, we can change the Section Area value. Click the lock, and the edit field is enabled. Set value to **4550.000 mm^2**.



Summary

In this Skill Builder you:

- Learned how to insert values of the component to perform a beam or column calculation manually.
- Used a Content Center part to get data for beam and column calculation.
- Used a beam or column profile to get data for the calculation using Beam and Column Calculator.