AutoCAD® Structural Detailing 2010

Getting Started with AutoCAD® Structural Detailing, Formwork Drawings module

Contents

Getting Started Guide

Thank you for choosing AutoCAD® Structural Detailing. The Formwork Drawings module is a 3D tool for modeling and drawing buildings. Formwork drawings may detail selected elements, story projections, or vertical cross-sections of the building. Drawings can then be exported to the Reinforcement module, providing the basis for definition reinforcement drawings.

Getting Started

Before beginning the exercises, you need to install and register the software. AutoCAD® Structural Detailing software comes with the AutoCAD® Revit® Structure Suite. This software is only available for 32-bit Windows XP/Vista systems and cannot be installed on 64-bit machines.

Exploring the User Interface

Open AutoCAD® Structural Detailing, Formwork Drawings module, and take a minute to view the different areas of the interface.

Ribbon

At the top of the interface is the standard Microsoft® Windows® element - ribbon. The ribbon is an element of the user interface which replaces the traditional menu and toolbars and allows easy managing and adjusting the workspace. The ribbon consists of several panels, grouped on tabs that are named by task or subject. The ribbon panels include many AutoCAD ® Structural Detailing commands that have been on toolbars and in dialogs so far, such as icons, drop-down lists, sliders, text fields and other elements characteristic of a given tab.

NOTE It is possible to switch between workspaces (such as the classic workspace without the ribbon). To do it follow one of the given methods:

1 Click Manage ➤ Customization ➤ 

(User Interface) ➤ in the Customize User Interface dialog box select the Customize tab and in ASD/Workspaces select ASD Formwork Drawings Classic ➤ right-click and select Set current from the context menu ➤ click Apply

2 Click 

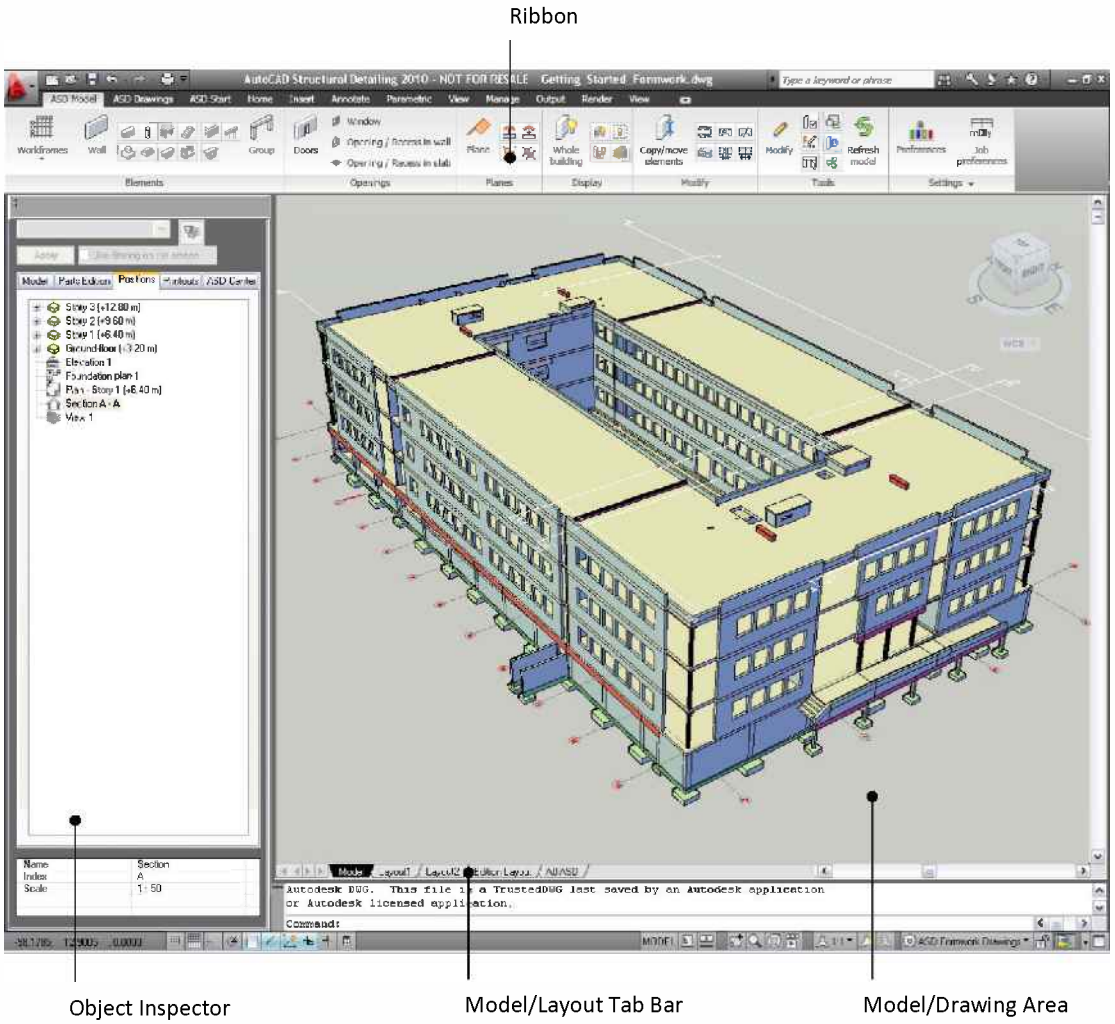
(at the bottom right corner of the screen) and select ASD Formwork Drawings Classic.

Object Inspector

Inspector lets you manage elements (objects) included in a project that was created in AutoCAD ® Structural Detailing.

Layout/Model Tab Bar

At the bottom of the drawing area is the standard AutoCAD ® Model/ Layout Tab Bar. There are 2 additional tabs defined – Edition Layout and Templates Layout. On the Edition Layout tab, you can modify the drawings (documents) generated for the structure elements or group of elements. The Templates Layout tab displays the printout templates defined in the project.



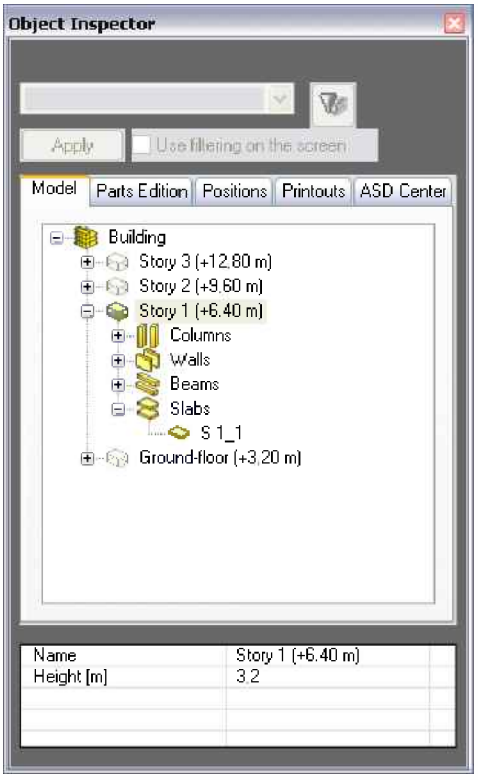
Object Inspector

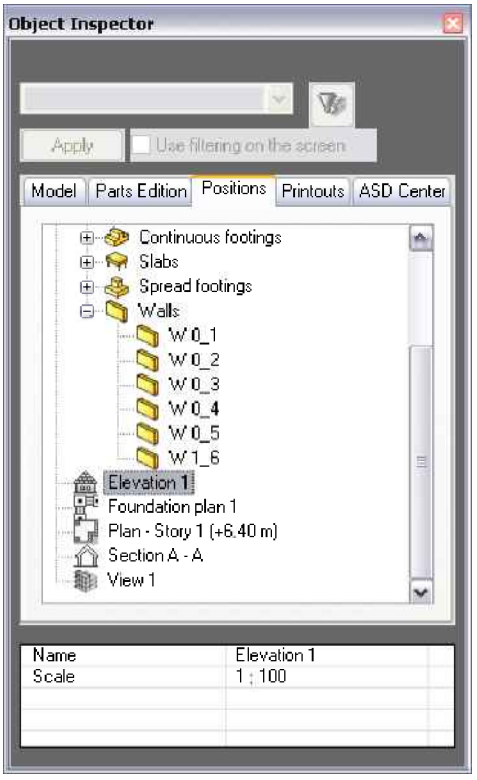
Using the Inspector, you have quick access to project elements from every stage of work, which helps you manage your project. By default, the Object Inspector dialog displays on the left side of the interface, beside the drawing area. You can adjust the width of the dialog to leave as much space as possible for drawing the graphic model.

On the Model tab is a list of model elements (beams, walls, columns), organized by story, that have been defined in a structure. By default, the whole structure model is called Building. Elements found on the list may be selected using the mouse cursor. When selected on the list, an element is simultaneously highlighted in the drawing area.

The Parts Edition tab is use to collect information about machinings of an element. Machinings displayed for elements include fitting to polyline or slab inclination. This tab allows you to delete machinings of individual elements without the need to redefine the element. The tab is filled according to the selection of elements. It is blank if you have not selected any elements. If selected elements have not any machinings, this tab displays the message that there are no such elements.

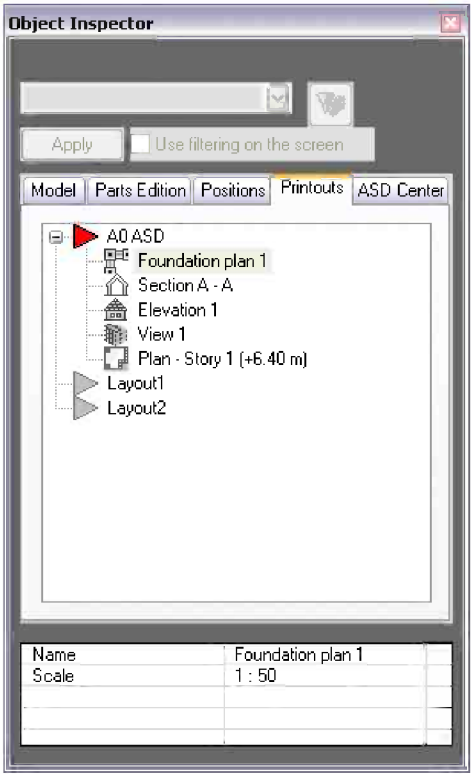
The list of defined positions that displays on the Positions tab is sorted alpha-numerically.

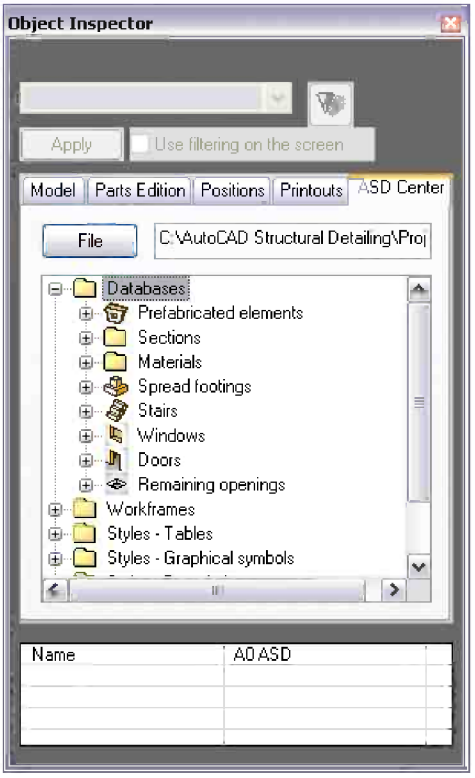




The Printouts tab lets you manage printouts in AutoCAD ® Structural Detailing. It displays the list of all printouts and the associated views defined in the AutoCAD ® Structural Detailing project. The list includes all printouts, even those that do not contain views.

Use the ASD Center tab to copy databases (sections, prefabricated elements, materials) and styles between projects.

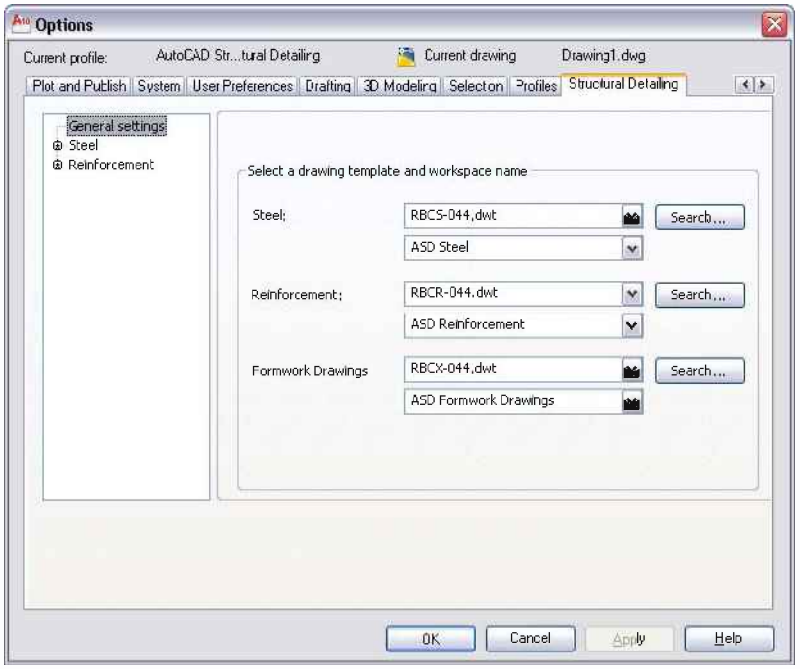




Program Preferences

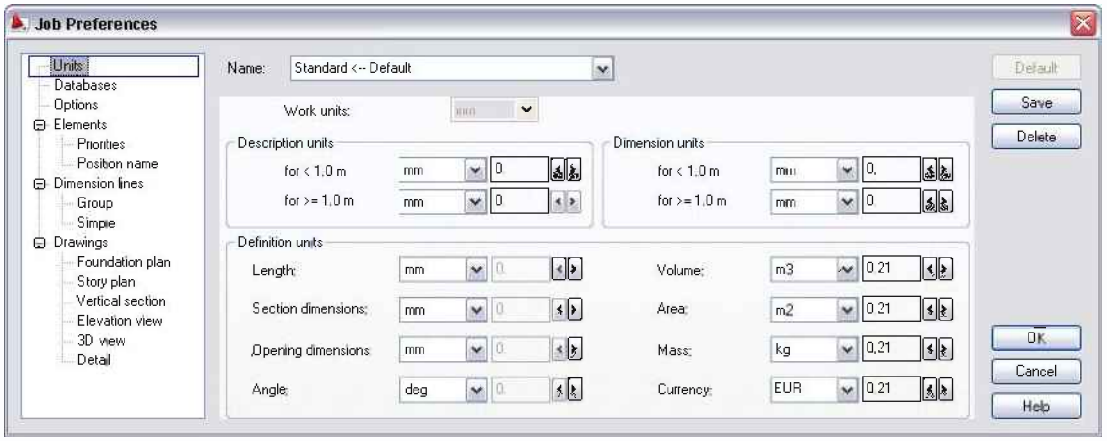
Preferences

The Preferences are located in AutoCAD's Options dialog. The Structural Detailing tab lets you select the the default start template and workspace name for the Formwork Drawings module.



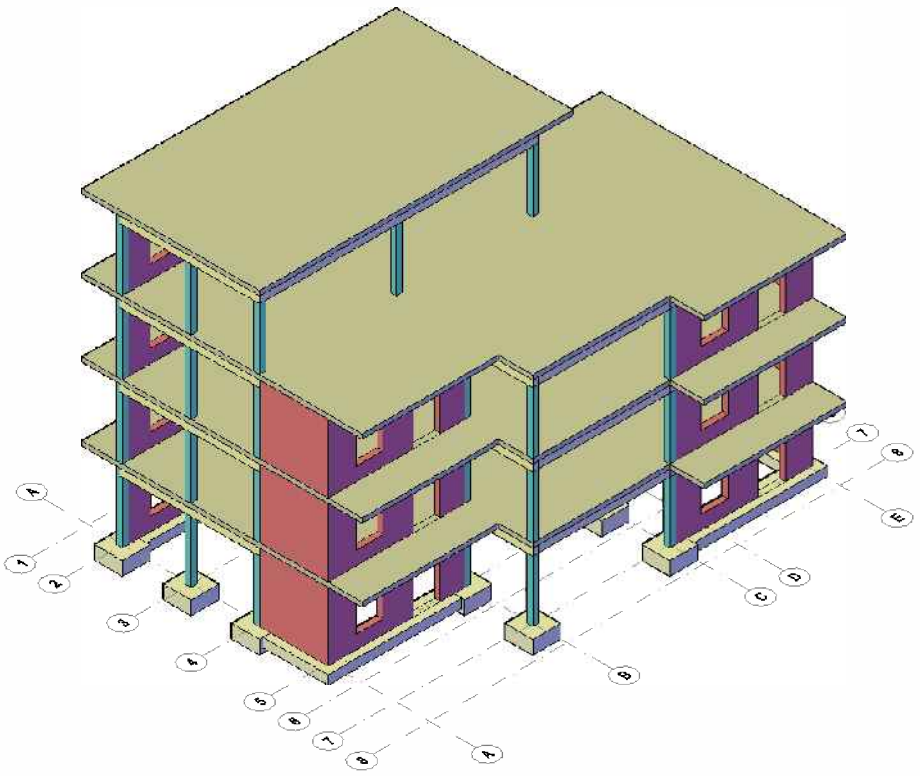
Job preferences

These preferences are related to a particular template and project. After you have started working on a project, it is not possible to change work units.



Creating a Concrete Building Structure

In this lesson, you will create the following building model using the tools available in the Formwork Drawings module of AutoCAD ® Structural Detailing.



Creating a New Project

In this exercise, you will create and name a project in which you will define a concrete building structure.

1 Start the Formwork Drawings module of AutoCAD® Structural Detailing:

Click ASD Start ➤  (Formwork Drawings).

2 Click  ➤ New.

3 In the Select template dialog, select RBCX-044.dwt (English template), and click Open.

4 Click  ➤ Save.

5 In the Save Drawing As dialog:
   - Navigate to the desired location.
   - For File name, enter **Getting_Started_Formwork.**
   - Click Save.

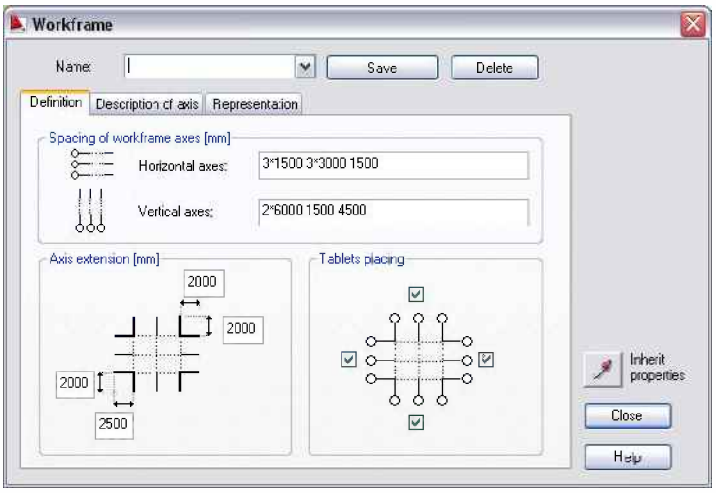
6 Proceed to the next exercise, Adding a Workframe.

Adding a Workframe

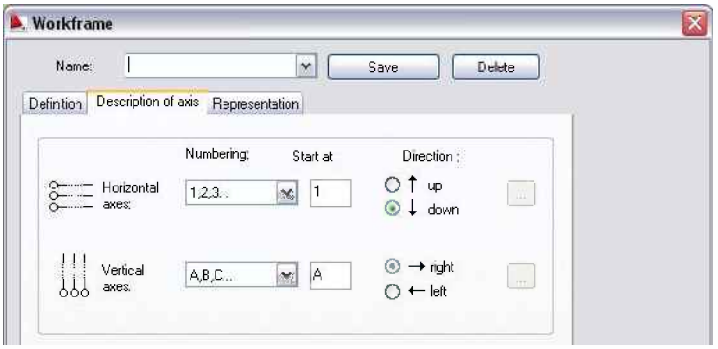
In this exercise, you will create a 2D rectangular workframe, which facilitates the definition of a structure model on the plane.

1 Click ASD Model ➤ Elements ➤ (Workframes).
Alternatively, (for ASD Formwork Drawings Steel Classic workspace) click Formwork Drawings menu ➤ Workframes ➤ Insert rectangular workframe.

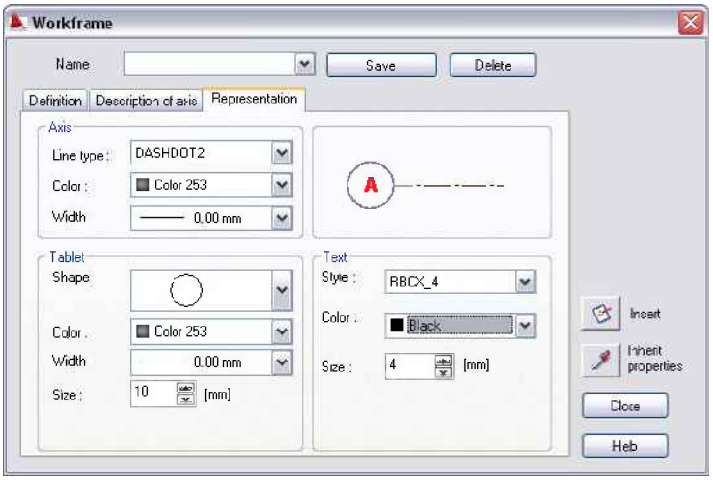
2 On the Definition tab, for Horizontal axes and Vertical axes, enter values that define the spacing of workframe axes as shown (**2000** and **2500**).



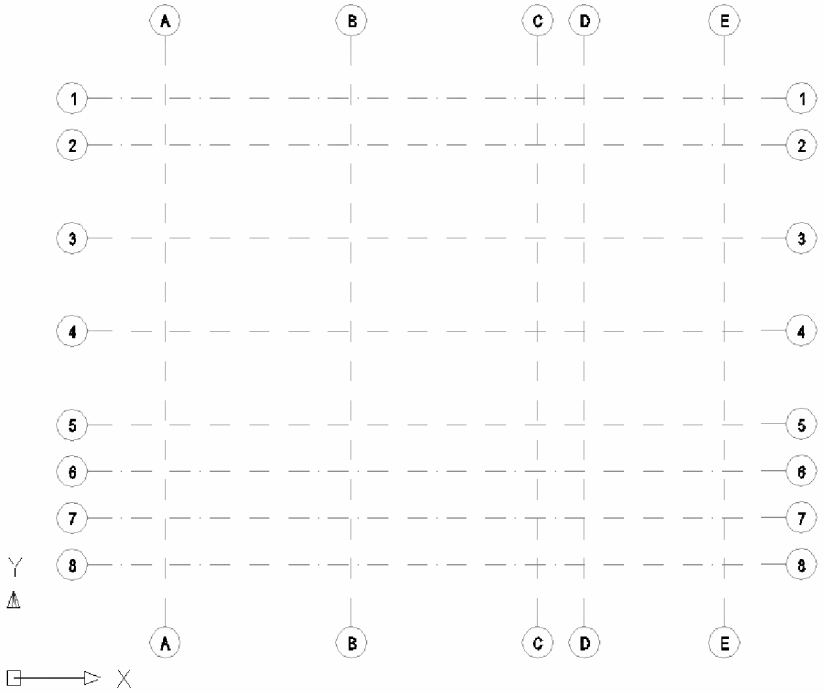
3 On the Description of axis tab, keep the default settings.



4 On the Representation tab, under Text, for Color, select Black.



5 Click , and then click 2 points along the **X** axis to specify the workframe insertion location.



NOTE Be sure that Ortho Mode in AutoCAD ® is on (press **F8** to switch it on/off).

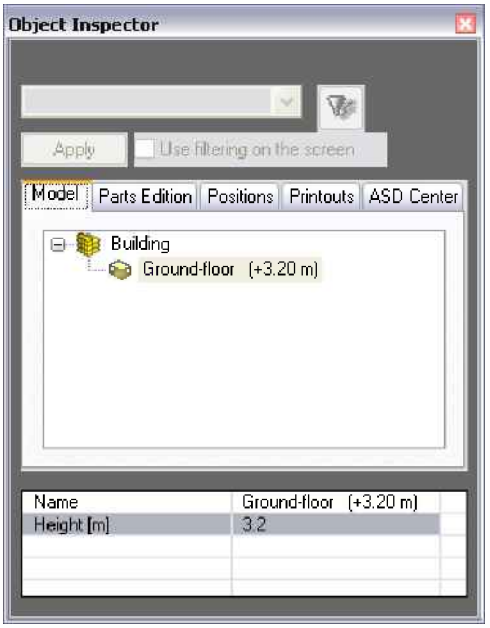
6 Proceed to the next exercise, Defining Story Height.

Defining Story Height

In this exercise, you will define the height of a story in the structural model.

1 At the bottom of the Object Inspector, double-click the value for Height (the default value is 3.00 m).

2 Type **3.20 m** for the new value.



3 Proceed to the next exercise, Adding Columns.

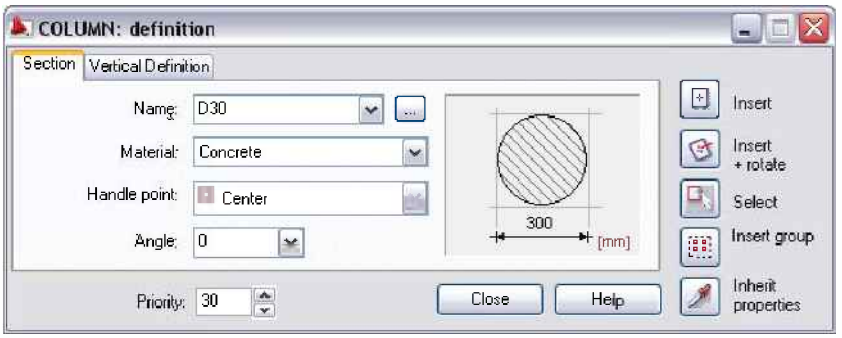
Adding Columns

In this exercise, you will define a new column section and insert columns into the project.

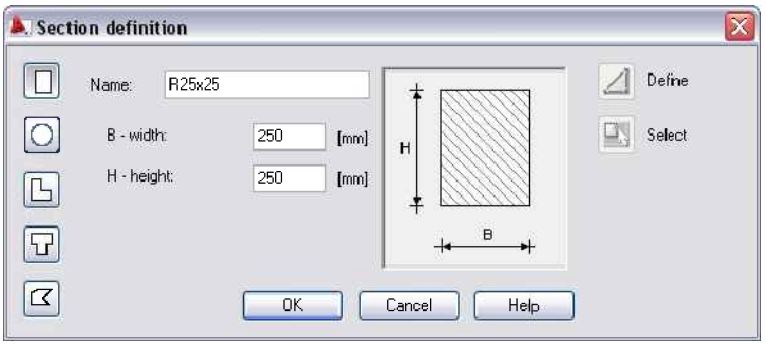
1 Define a new section of column:

- Click ASD Model ➤ Elements ➤  (Column).
  Alternatively, click Formwork Drawings menu ➤ Define ➤ Column.

- On the Section tab, click ... (to the right of Name).

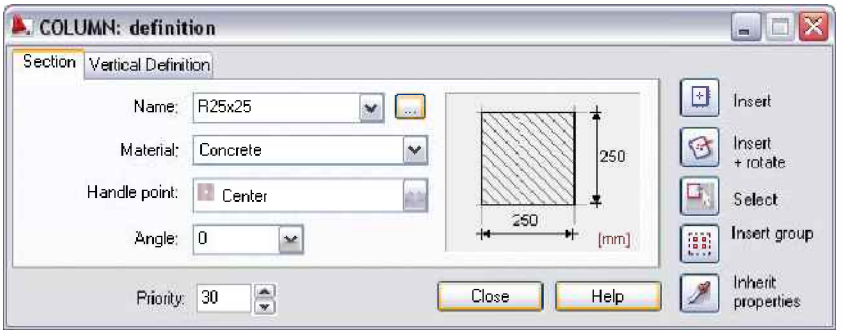


- In the Section list dialog, click (Create new).
- In the Section definition dialog, for Name, type **R25x25;** for B-width and H-height**,** type **250**.
- Click OK, and then click Close.

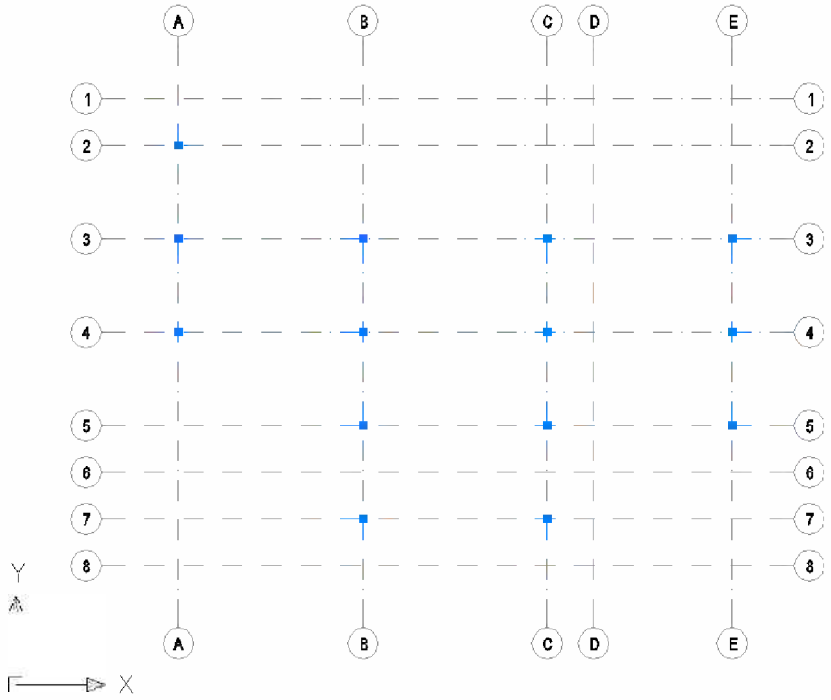


2 Insert columns into the Ground-floor level:

- On the Section tab, click (Insert) to insert columns.



- In the drawing area, click to select the following axes intersections: 2A, 3A, 3B, 3C, 3E, 4A, 4B, 4C, 4E, 5B, 5C, 5E, 7B, and 7C.



4 Proceed to the next exercise, Adding Walls.

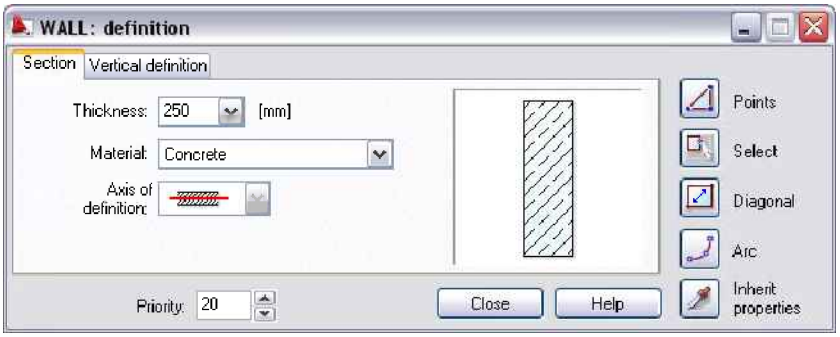
Adding Walls

In this exercise, you will define walls and place them in the project.

1 Define a new section of wall:

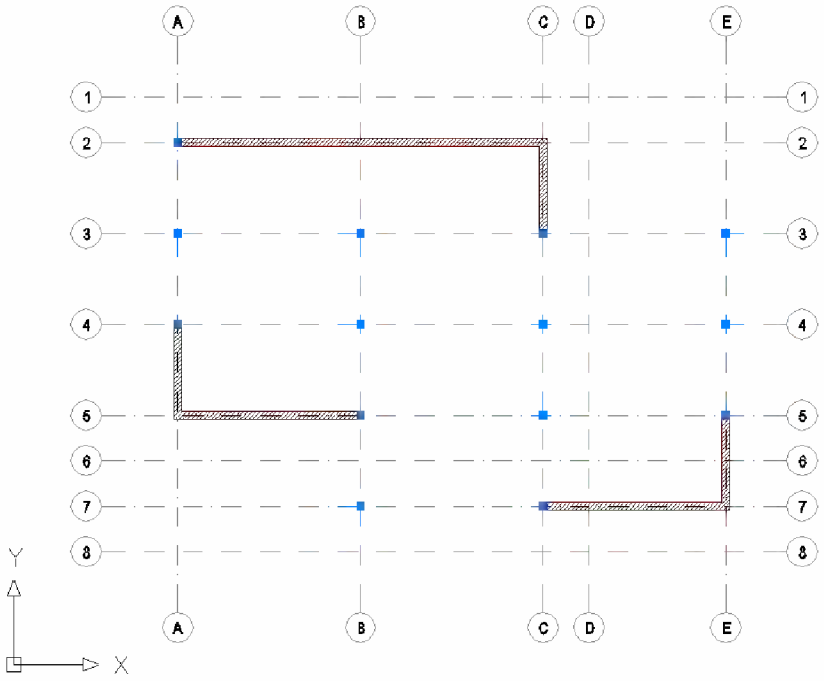
- Click ASD Model ➤ Elements ➤  (Wall).
  Alternatively, click Formwork Drawings menu ➤ Define ➤ Wall.

- On the Section tab, for Thickness, type 250.



2 Place walls on the ground floor:

- On the Section tab, click  (Points) to place walls.
- In the drawing area, click to select the following axis intersections: 2A, 2C, and 3C, and then press **Enter**.
- Using the same method, define a wall with axis intersections at 5E, 7E, and 7C, and then another at 5B, 5A, and 4A, as shown.
- Close the dialog.



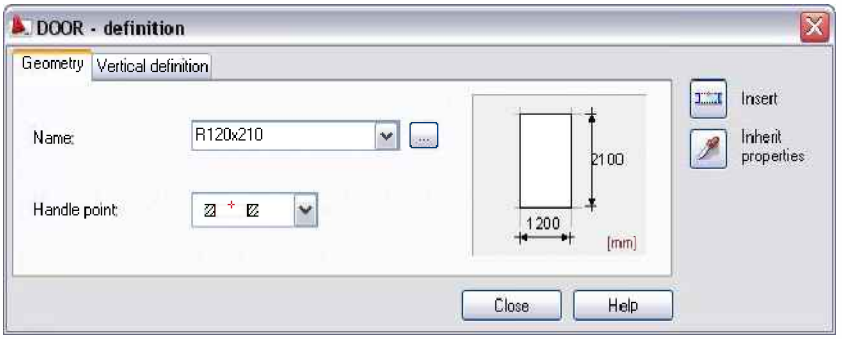
3 Proceed to the next exercise, Adding Doors.

Adding Doors

In this exercise, you will define doors in the walls.

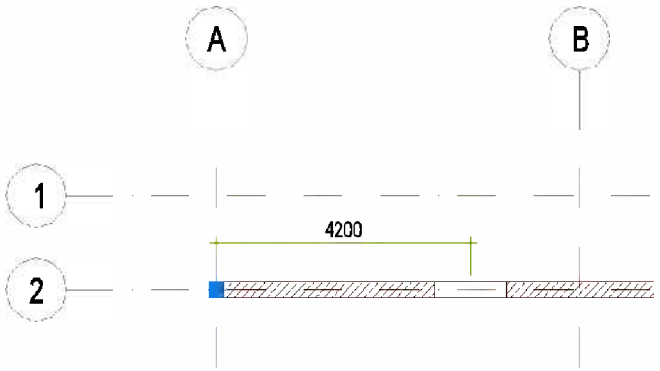
1 Define doors and their location in the walls:

- Click ASD Model ➤ Openings ➤  (Doors).
  Alternatively, click Formwork Drawings menu ➤ Define ➤ Door.
- Select the wall on axis 2.
- On the Geometry tab, keep the default settings for Name and Handle point, and click  (Insert) to insert the selected door type.

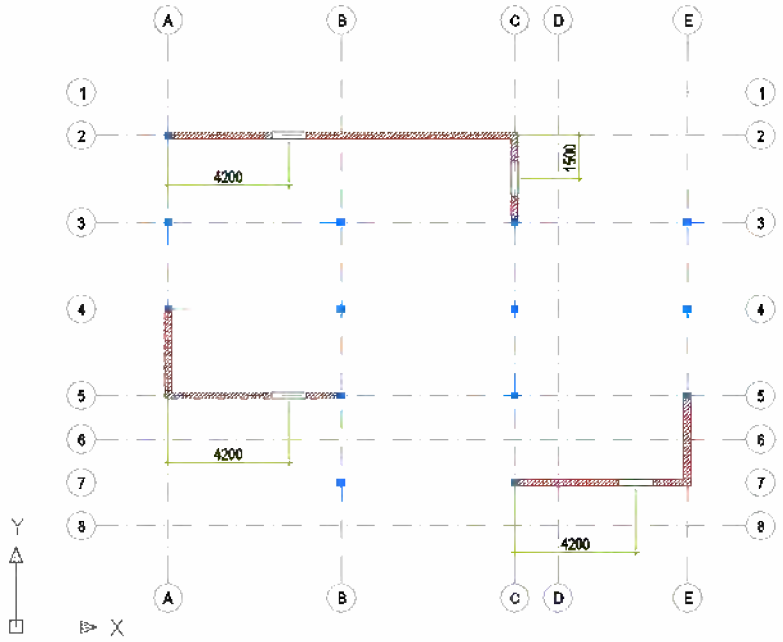


2 Insert doors in the walls:

- On the command line, type **r** to define the opening location from the reference point, and then click on the intersection of axes 2 and A to define a new reference point.
- Specify the distance (by enter value) as **4200**, and then press **Enter.**
- Close the dialog.



- Using the same method, define doors in the walls on axes 5, 7, and C as shown.



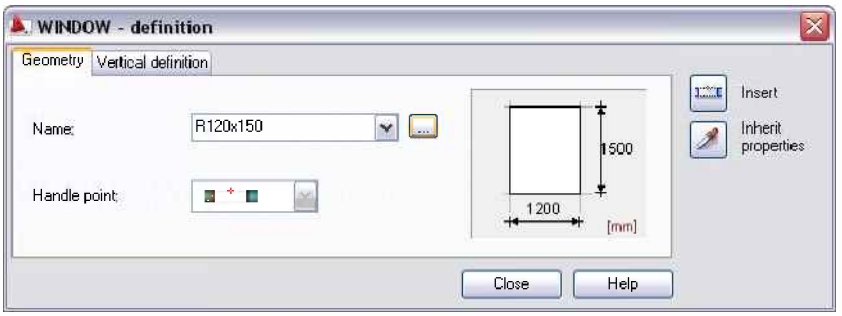
3 Proceed to the next exercise, Adding Windows.

Adding Windows

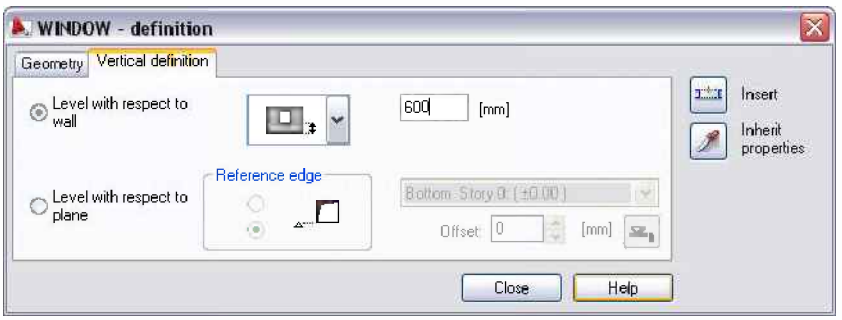
In this exercise, you will define windows in the walls.

1 Define windows and their location in the walls:

- Click ASD Model ➤ Openings ➤ (Window).
  Alternatively, click Formwork Drawings menu ➤ Define ➤ Window.
- Select the wall on axis 2.
- On the Geometry tab, keep the default settings for Name and Handle point.

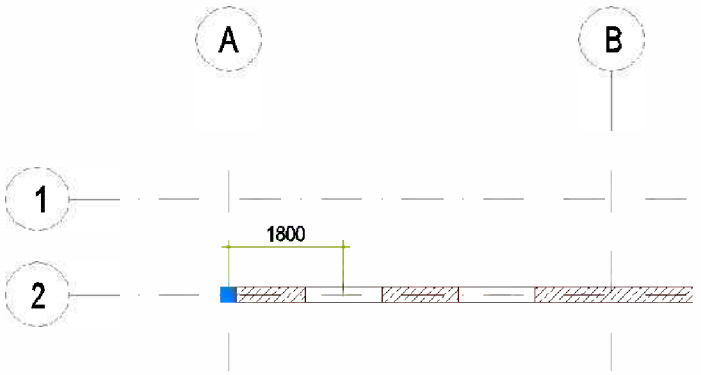


- On the Vertical definition tab, specify the level of the window with respect to wall as **600**, and then click (Insert) to insert the selected window type.

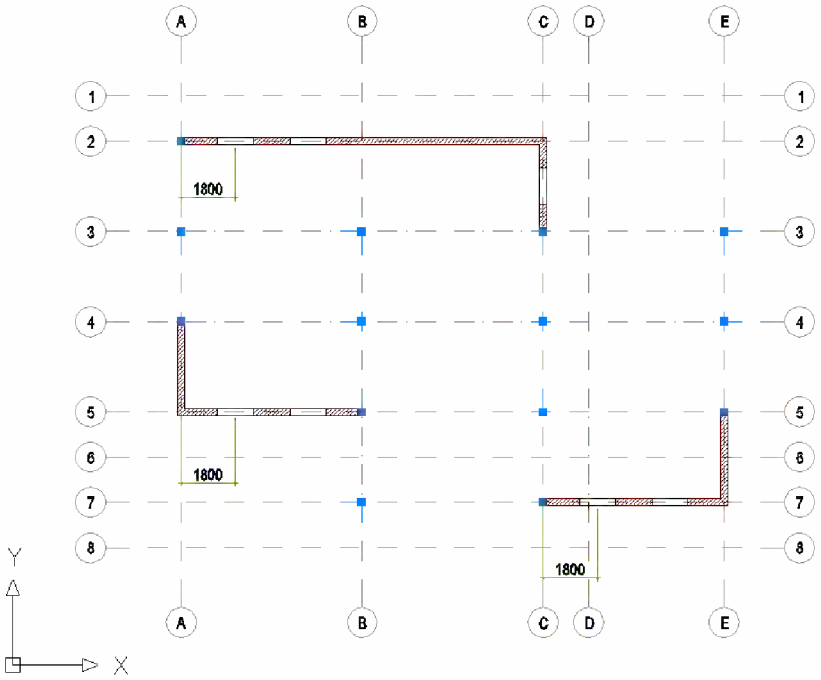


2 Insert windows in the walls:

- On the command line, type **r** to define the opening location from the reference point, and then click on the intersection of axes 2 and A to define a new reference point.
- Specify the distance as **1800**, and then press **Enter**.
- Close the dialog.



- Using the same method, define windows in the walls on axes 5 and 7 as shown.



3 Proceed to the next exercise, Adding Spread Footings.

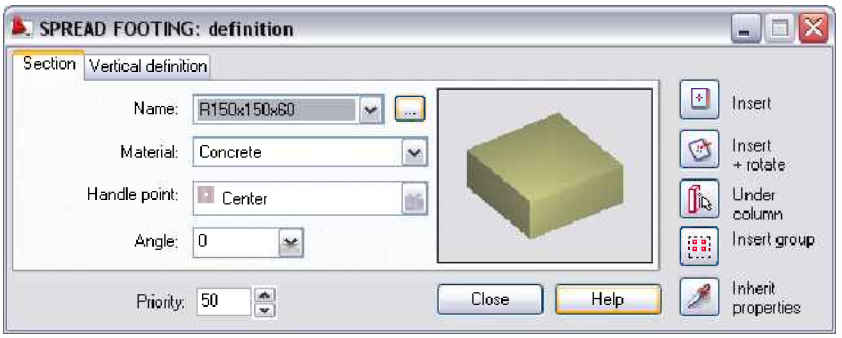
Adding Spread Footings

In this exercise, you will define spread footings under the columns.

1 Define new type of spread footing:

- Click ASD Model ➤ Elements ➤  (Spread Footing). Alternatively, click Formwork Drawings menu ➤Define ➤ Spread Footing.

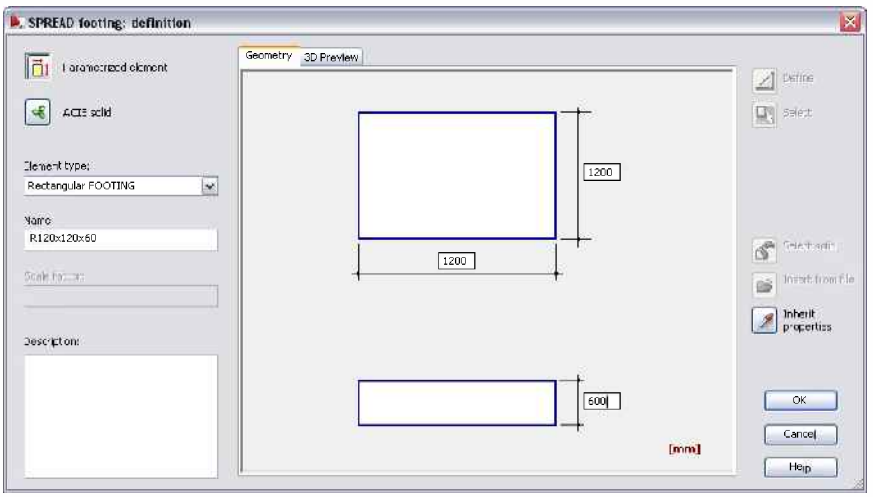
- On the Section tab, click ... (next to Name).



- In the Spread footing list dialog, click (Create new).

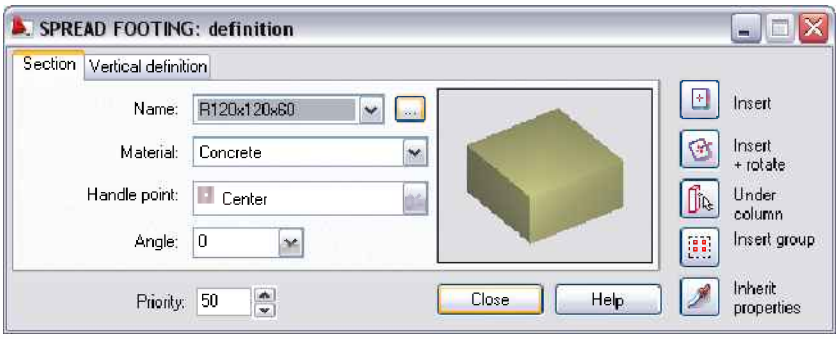
- In the SPREAD footing: definition dialog, for Name, enter **R120x120x60**, enter **1200** for both the length and width, and then enter **600** for the height of the spread footing.

- Click OK, and then click Close.

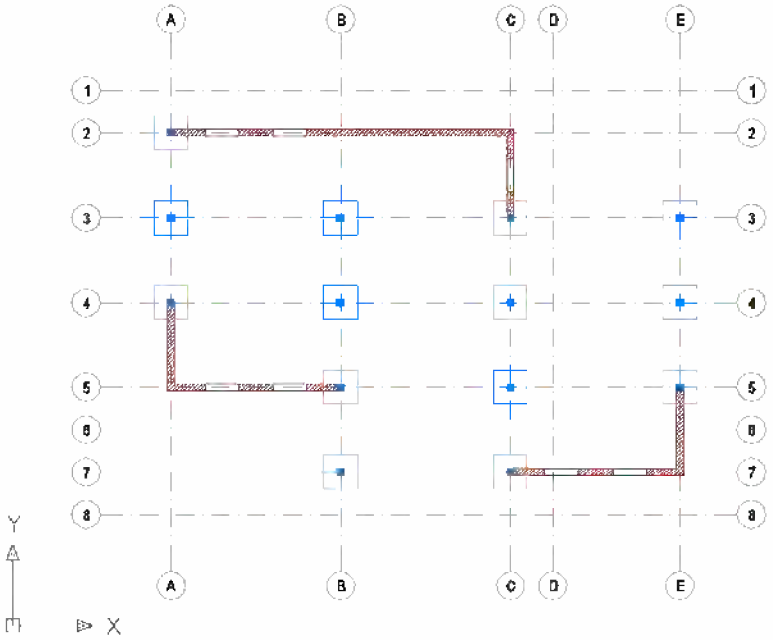


2 Insert spread footings under the columns of the ground floor:

- On the Section tab, click (Under column) to insert spread footings.



- Using a crossing window, select all objects on the ground floor, and then press **Enter.**
- Close the dialog.



3 Proceed to the next exercise, Adding Continuous Footings.

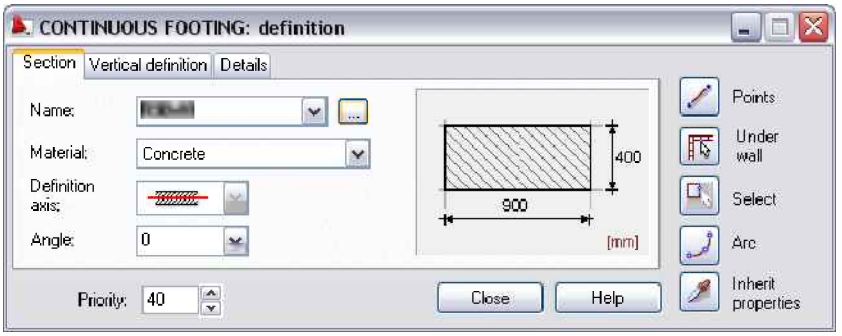
Adding Continuous Footings

In this exercise, you will define continuous footings under the walls.

1 Define continuous footings:

- Click ASD Model ➤ Elements ➤  (Continuous Footing). Alternatively, click Formwork Drawings menu ➤ Define ➤ Continuous Footing.

- On the Section tab, keep default settings for all categories.

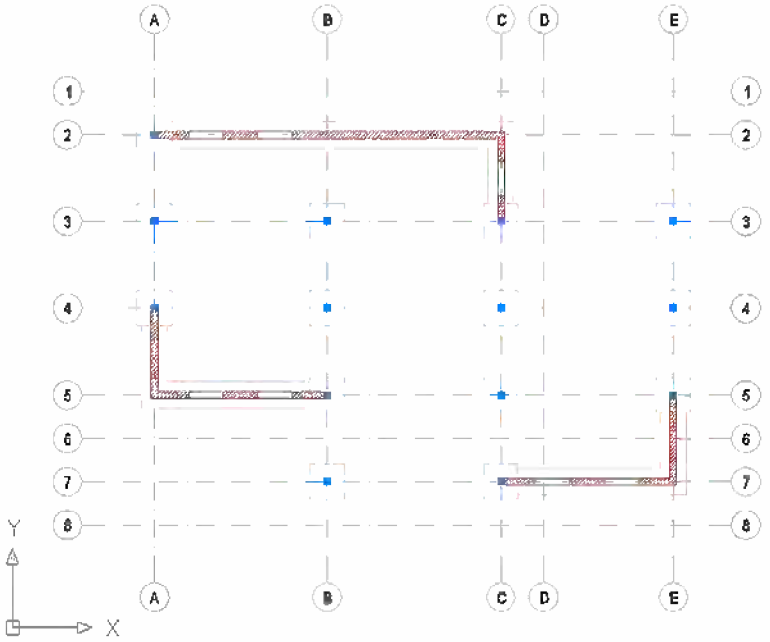


2 Insert continuous footings under the walls of the ground floor:

- On the Section tab, click  (Under wall) to insert continuous footings.

- Using a crossing window, select all objects on the ground floor, and then press **Enter**.

- Close the dialog.



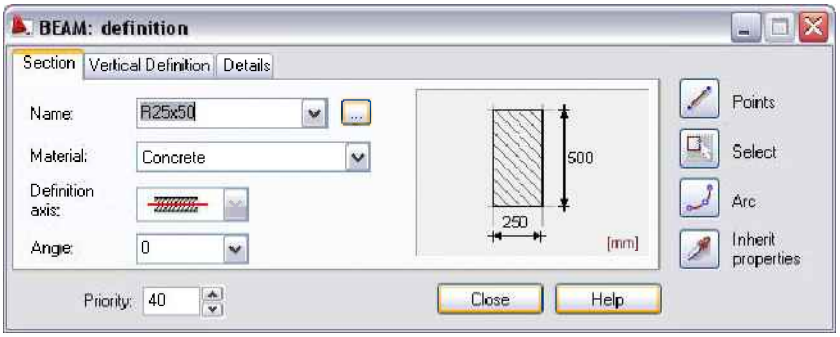
3 Proceed to the next exercise, Adding Beams.

Adding Beams

In this exercise, you will define a new beam section and place beams in the project.

1 Define new section of beam:

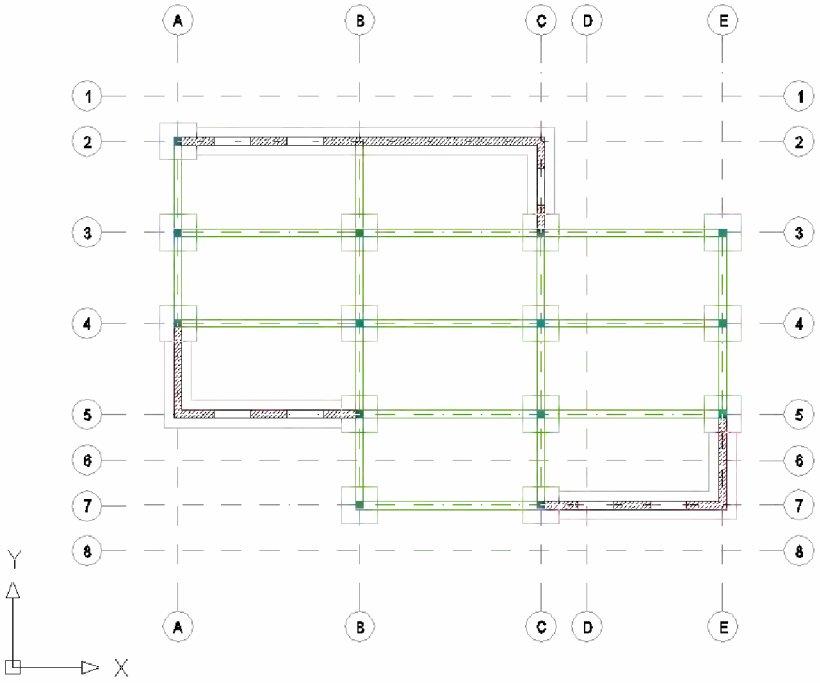
- Click ASD Model ➤ Elements ➤  (Beam).
  Alternatively, click Formwork Drawings menu ➤ Define ➤ Beam.
- On the Section tab, for Name, enter **R25x50**.



NOTE You can quickly create round or rectangular sections by specifying required parameters for Name. An acceptable syntax for a round section is D250 (diameter) and for a rectangular section is R200x400 (width x height).

2 Place beams on the ground floor:

- Click  (Points) to place beams.
- In the drawing area, click to select axis intersections 2A and 4A, and then press **Enter**.
- Using the same method, define a beam at each of the following axis intersections: 2B and 7B, 3C and 7C, 3E and 5E, 3A and 3E, 4A and 4E, 5B and 5E, 7B and 7C, as shown.
- Close the dialog.

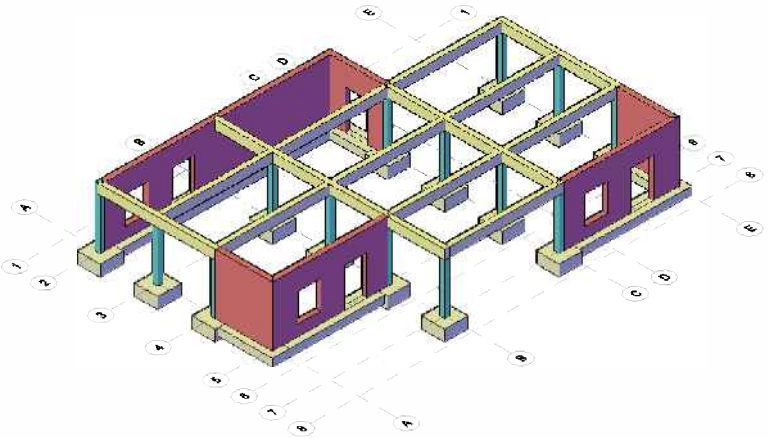


3 Specify an isometric view of the defined story:

- Click View ➤ Views ➤ (SW Isometric).
  Alternatively, click View menu ➤ 3D Views ➤ SW Isometric.

- On the command line, type **visualstyles**, and then press **Enter**.

  In the Visual Styles Manager dialog, double click  (Conceptual).
  Alternatively, click View menu ➤ Visual Styles ➤ Conceptual.



4 Restore the top view:

- In the Visual Styles Manager dialog, double click  (2D Wireframe). Alternatively, click View menu ➤ Visual Styles ➤ 2D Wireframe.

- Close the dialog.

- Click View ➤ Views ➤  (Top).
  Alternatively, click View menu ➤ 3D Views ➤ Top.

5 Proceed to the next exercise, Adding a Slab.

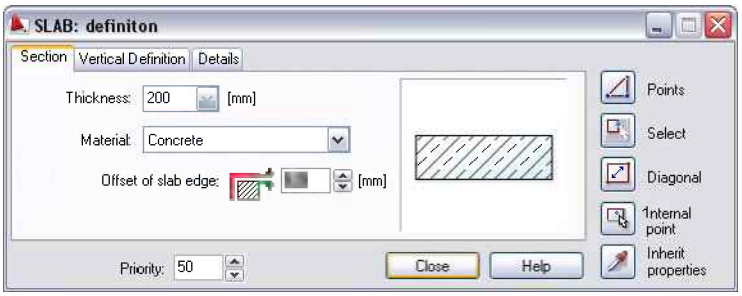
Adding a Slab

In this exercise, you will define a floor slab.

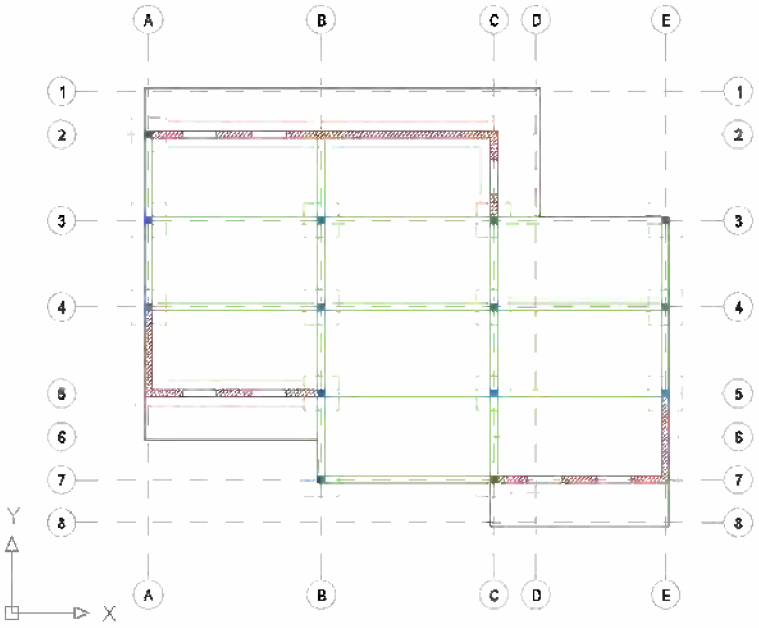
1 Define thickness and geometry of the slab:

- Click ASD Model ➤ Elements ➤  (Slab).
  Alternatively, click Formwork Drawings menu ➤ Define ➤ Slab.

- On the Section tab, keep default settings for Thickness and Material, and for Offset of slab edge, enter **125**.



- Click  (Points) to start defining the slab geometry.
- In the drawing area, click to select the following axis intersections: 2A, 1A, 1D, 3D, 3E, 8E, 8C, 7C, 7B, 6B, 6A and 2A.
- Press **Enter**, and then close the dialog.



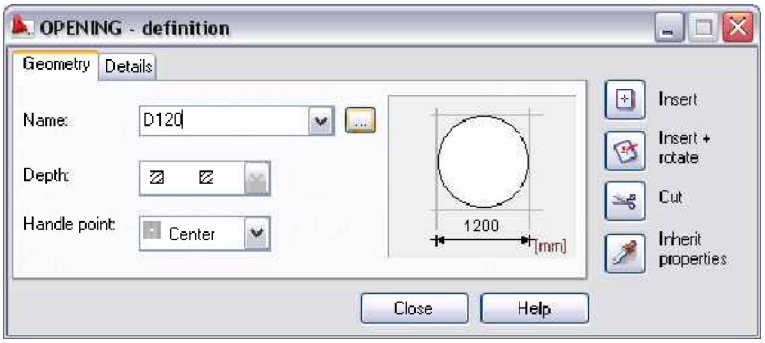
2 Proceed to the next exercise, Adding an Opening in the Slab.

Adding an Opening in the Slab

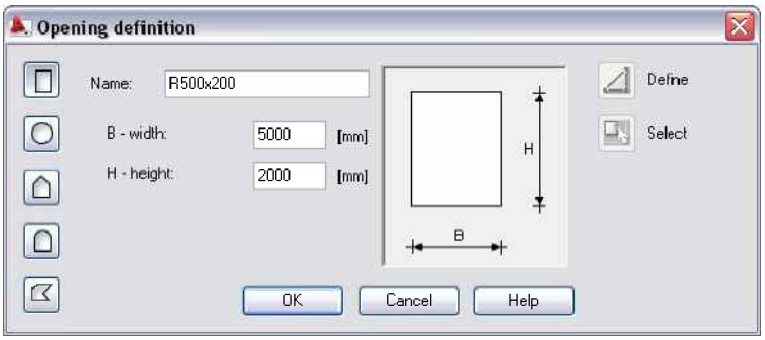
In this exercise, you will define an opening in the floor slab.

1 Define the opening:

- Click ASD Model ➤ Openings ➤ (Opening / Recess in slab). Alternatively, click Formwork Drawings menu ➤ Define ➤ Opening / Recess in Slab).
- In the drawing area, select the slab on the ground floor.
- On the Geometry tab, click (next to Name).

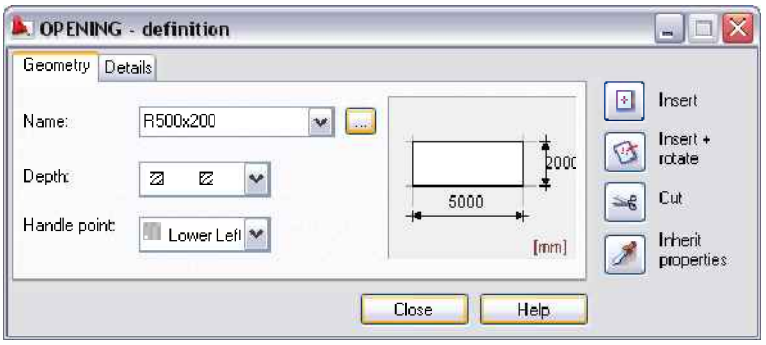


- In the Opening list dialog, click (Create new).
- In the Opening definition dialog, for Name, type **R500x200**; for B – width, type **5000;** and for H – height, type **2000**.
- Click OK, and then click Close.

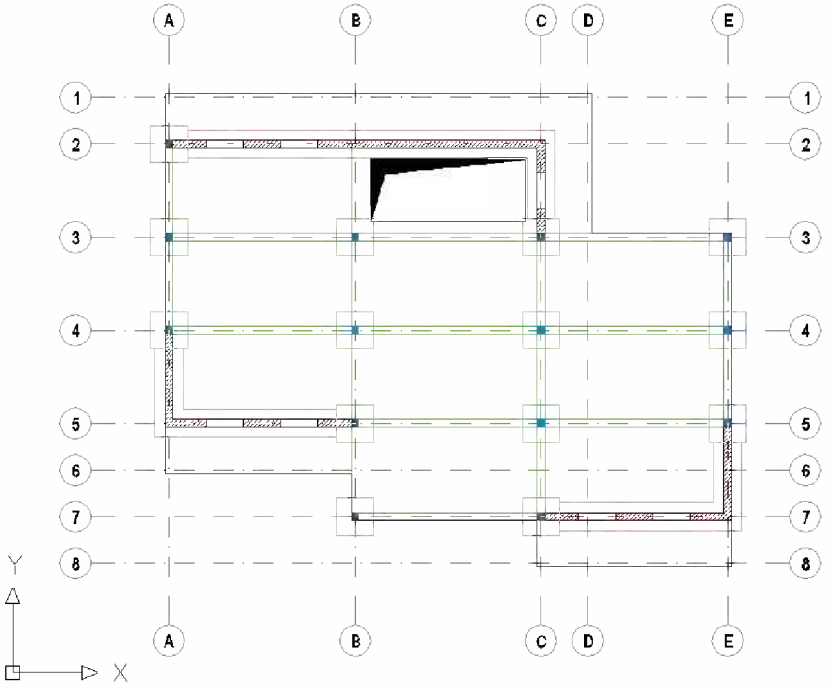


2 Specify the opening location:

- For Handle point, select Lower Left.



- Click  (Insert) to define the opening location.
- In the drawing area, click at intersection **3B** to insert the opening, and then press **Enter**.
- Close the dialog.
- To change the location: select the opening, and click on the grip in lower left corner. On the command line, type **@500,500**, and then press **Enter**.



3 Proceed to the next exercise, Copy a Story.

Copy a Story

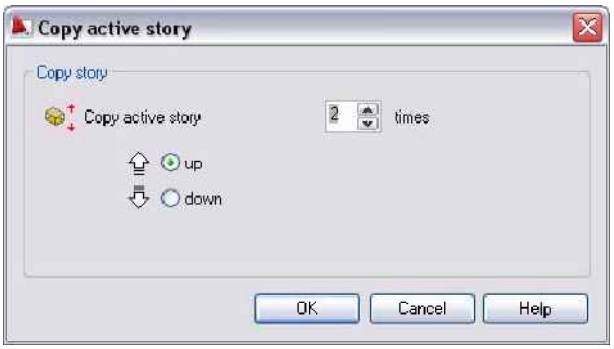
In this exercise, you will copy an existing story.

1 To specify an isometric view of the ground floor, click View ➤ Views ➤ (SW Isometric). Alternatively, click View menu ➤ 3D Views ➤ SW Isometric.

2 Copy the story:

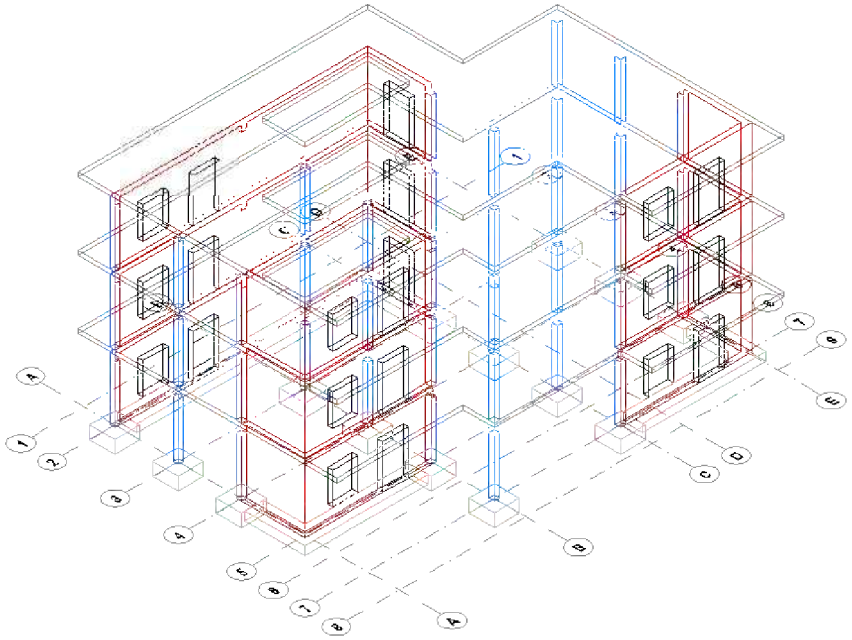
- In the Object Inspector, expand Building (if necessary), and select Ground-floor. Right-click and click Copy story..

- In the Copy active story dialog, specify the number of copied stories as **2**, and then click OK.



NOTE Higher stories were created automatically. Notice that not all of the selected elements were copied. Elements characteristic only for the ground-floor level (such as footings) were omitted.

- The building model should look like the image below.



3 Proceed to the next exercise, Define a Top Story.

Define a Top Story

In this exercise, you will define the top story of the building model. Using the Copy/Move option, you will add a few necessary elements (walls and columns) from the second floor, and then you will add additional beams and slab.

1 Restore the top view:

- Click View ➤ Views ➤ (Top).
  Alternatively, click View menu ➤ 3D Views ➤ Top.

- In the Object Inspector, double-click Story 2 (+9.60 m) to make it the active view.

2 Insert an additional story:

- In the Object Inspector, select Story 2 (+9.60 m), right-click, and click Insert Story.

- On the command line, type **a** to specify the orientation of the inserted story as Above, and then press **Enter**.

- In the Object Inspector, select Story 3 (+12.60 m) and change its height (at the bottom of the Object Inspector) to **3.20** m.

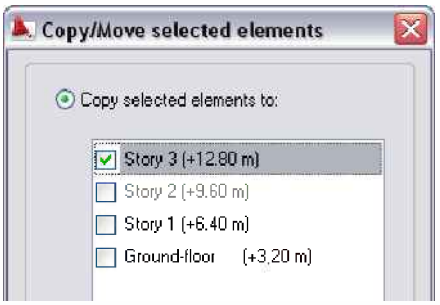
3 Copy selected elements from story 2 to the new story:

- Make Story 2 (+9.60 m) the active view.

- Select walls in axes **2** and **C,** and then select columns at the following intersections: **2A**, **3A**, **3B**, **3C**, **4A**, **4B**, and **4C**.

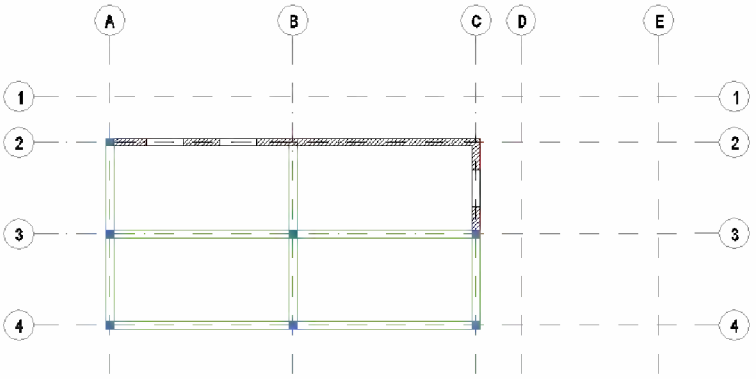
- Click ASD Model ➤ Modify ➤  (Copy / move elements). Alternatively, click Formwork Drawings menu ➤ Modify ➤ Copy / Move elements.

- In the Copy/Move selected elements dialog, select Story 3 (+12.80m) as the destination of copied elements, and then click OK.



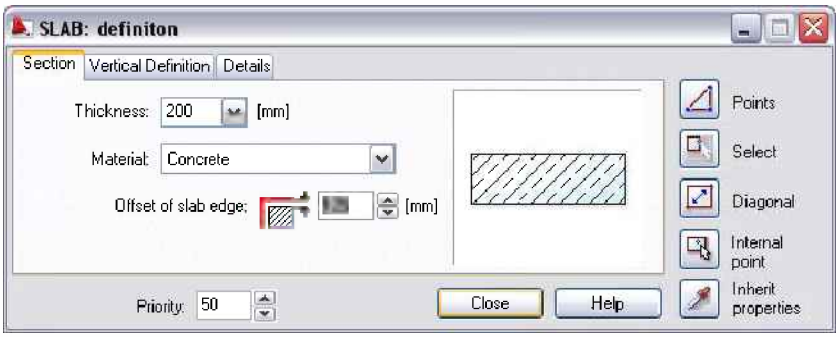
4 Define additional beams on Story 3:

- Make Story 3 (+12.80 m) the active view.
- Insert beams (see **Adding Beams** exercise) **R25x50** between points **2A** and **4A**, **2B** and **4B, 3C** and **4C, 3A** and **3C,** and **4A** and **4C** as shown.

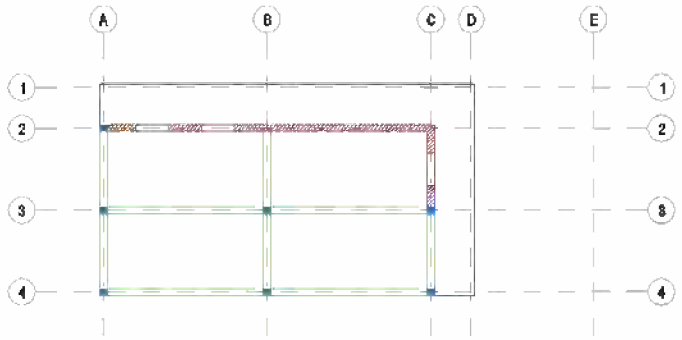


5 Define an additional floor slab on Story 3:

- Insert a slab (see **Adding a Slab** exercise) using the Diagonal method (click ) with the parameters shown below.



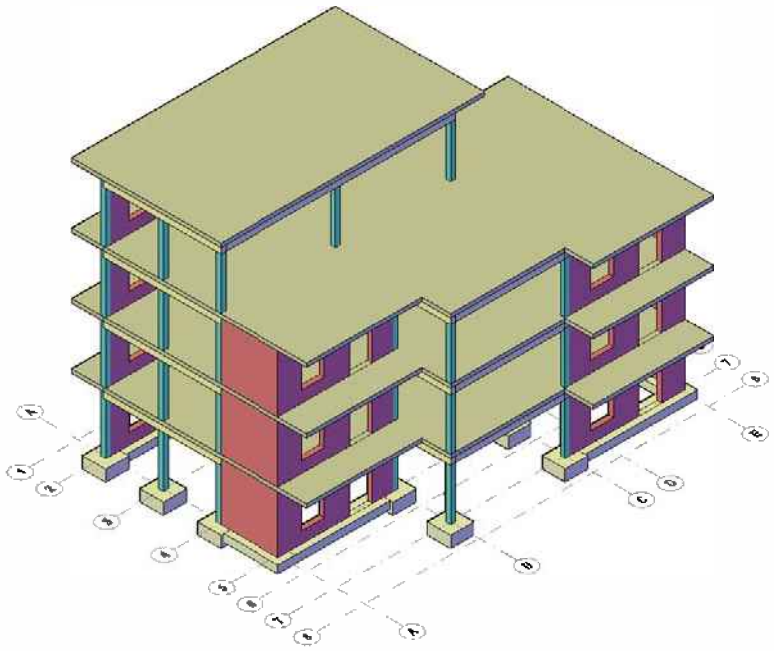
- Click intersection **4A** to specify the slab start point, and intersection **1D** to specify the endpoint.
- Close the dialog.



6 Specify an isometric view of the whole building model:

- Click View ➤ Views ➤ (SW Isometric).
  Alternatively, click View menu ➤ 3D Views ➤ SW Isometric.
- Click ASD Model ➤ Display ➤ (Whole building).
  Alternatively, click Formwork Drawings menu ➤ Display ➤ Show whole building.
- On the command line, type **visualstyles**, and then press **Enter**.

  In the Visual Styles Manager dialog, double click (Conceptual).
  Alternatively, click View menu ➤ Visual Styles ➤ Conceptual.



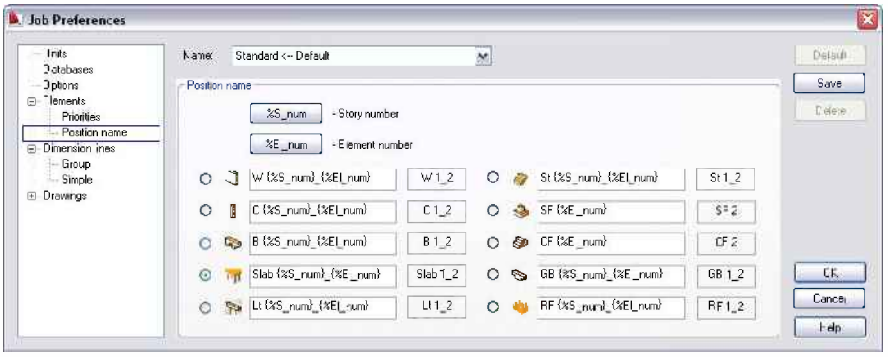
7 Proceed to the next exercise, Auto-Positioning.

Auto-Positioning

In this exercise, you will automatically assign names (positions) to all model elements. This process is called positioning in AutoCAD® Structural Detailing.

1 Define the syntax of position names:

- Click ASD Model ➤ Settings ➤ (Job preferences). Alternatively, click Formwork Drawings menu ➤ Job Preferences.
- In the left pane of the Job Preferences dialog, select Elements ➤ Position name.
- Change the syntax for slabs ( ): **Slab {%S_num}_{%El_num}**, and then click OK.

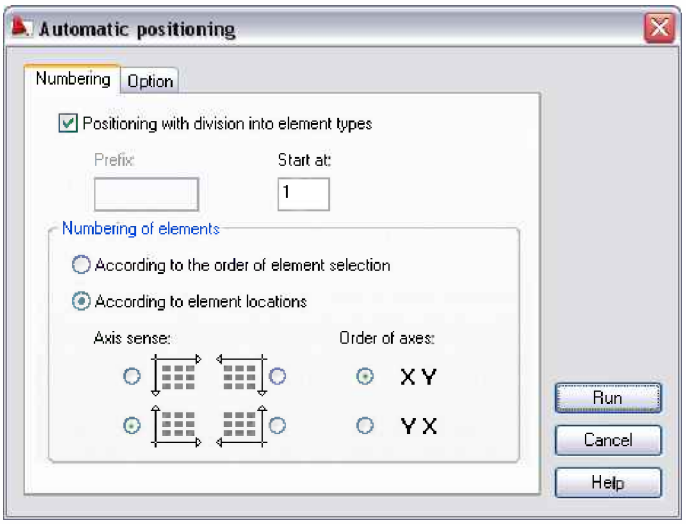


NOTE The Job Preferences dialog lets you define the syntax of names assigned to positions created during automatic positioning of structure elements. After the syntax for an arbitrary structure element is defined, the field to the right of the syntax displays a preview of an element name resulting from the defined syntax.

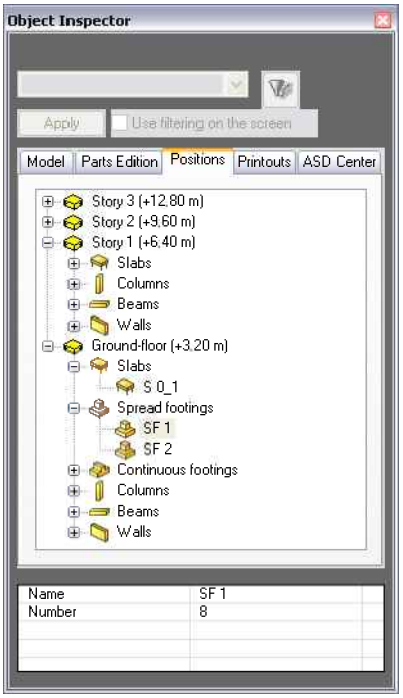
2 Create automatically position names.

- On the Model tab of the Object Inspector, right-click Building, and click Automatic positioning.

- In the Automatic positioning dialog, accept the default parameters, and click Run.



NOTE Positioning gives names to elements (assigns an identifier or position), and detects all identical and differing elements in individual groups. It also counts the total number of identical elements in individual positions. The operation of automatically assigning a position is possible for a whole structure model or for a selected part (a story or an element type, for example).



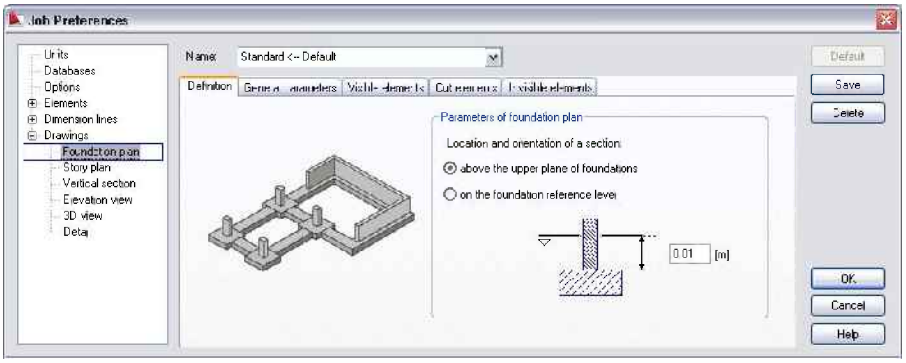
3 Proceed to the next exercise, Creating a Foundations Plan.

Creating a Foundations Plan

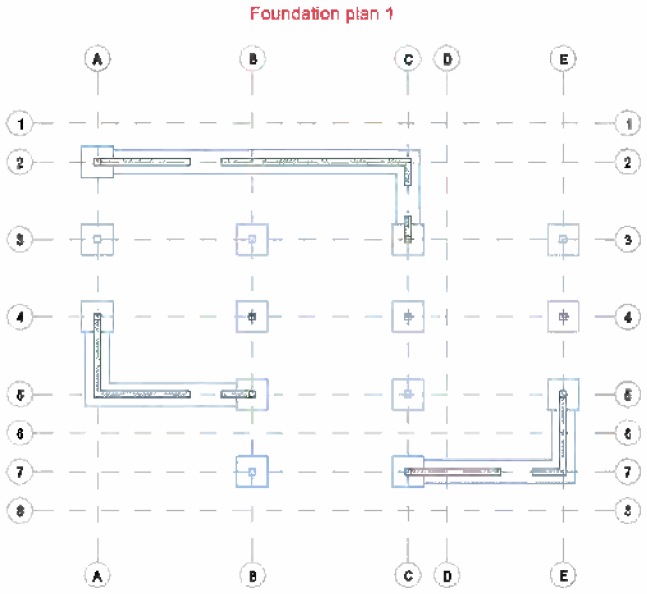
In this exercise, you will automatically generate a foundations plan.

1 Automatically generate a foundations plan:

- Click ASD Model ➤ Settings ➤ (Job preferences). Alternatively, click Formwork Drawings menu ➤ Job Preferences.
- In the Job preferences dialog, select Drawings ➤ Foundation plan, and verify that the parameters on the Definition tab are as shown (default parameters), and then click OK.



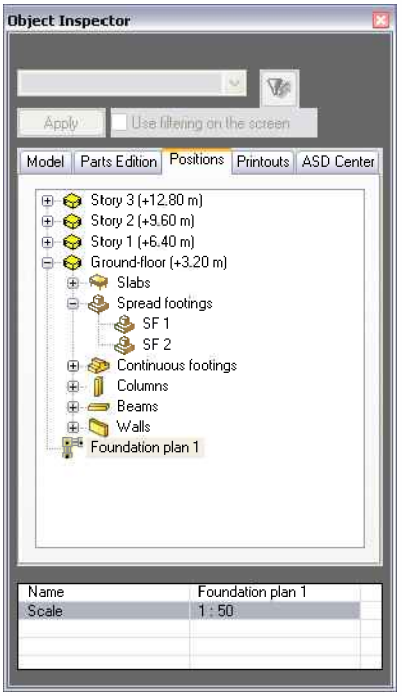
- On the Model tab of the Object Inspector, right-click Building, and click Create foundation plan or, click ASD Drawings ➤ Drawings Generation ➤ (Create foundation plan).



- In the Object Inspector, click the Positions tab.

  The title of the generated drawing (Foundation plan 1) displays on the Positions tab.

- Select Foundation plan 1, and change the scale to **1:50**.



2 Proceed to the next exercise, Adding Descriptions and Dimension Lines to Foundations Plan.

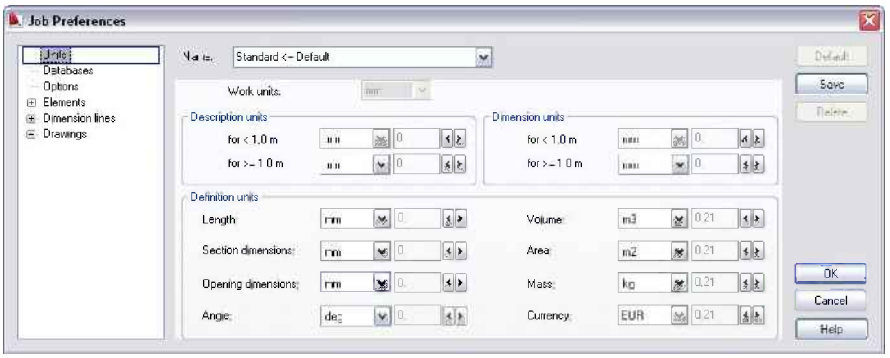
Adding Descriptions and Dimension Lines to Foundations Plan

In this exercise, you will automatically describe elements and create dimensions lines.

1 Automatically describe elements:

- Click ASD Model ➤ Settings ➤ (Job preferences). Alternatively, click Formwork Drawings menu ➤ Job Preferences.

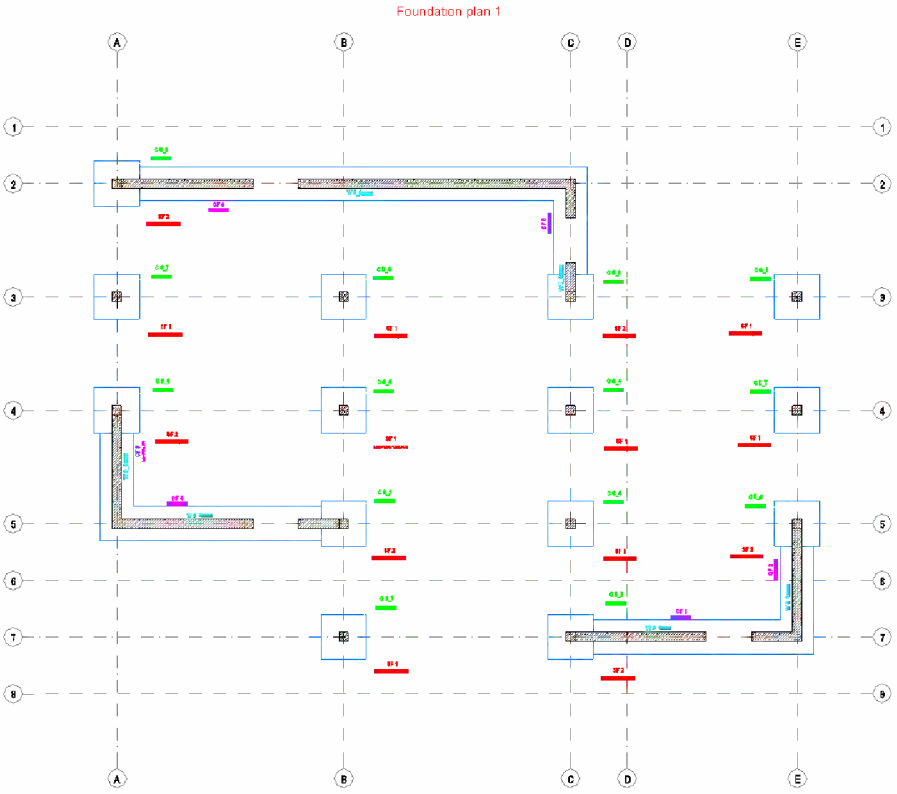
- In the left pane of the Job Preferences dialog, select Units. Define the Description units as shown, and then click OK.



■ Click ASD Drawings ➤ Drawings Edition ➤ Abc (Element description). Alternatively, click Formwork Drawings menu ➤ Element description. Select all structure elements on the foundations plan, and press **Enter**.

NOTE Elements can be selected either by clicking on a chosen element or by using a window to select a group of elements. The latter method enables the description of different types of elements (the software recognizes different elements, such as columns, beams, and spread footings, and describes them automatically).

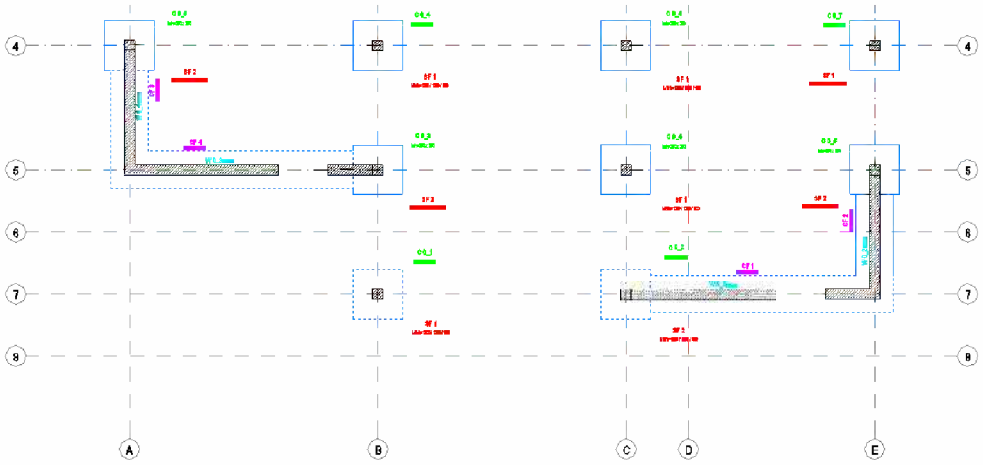
■ Add descriptions to all elements (columns, walls, spread footings, continuous footings, and openings).



2 Add dimension lines:

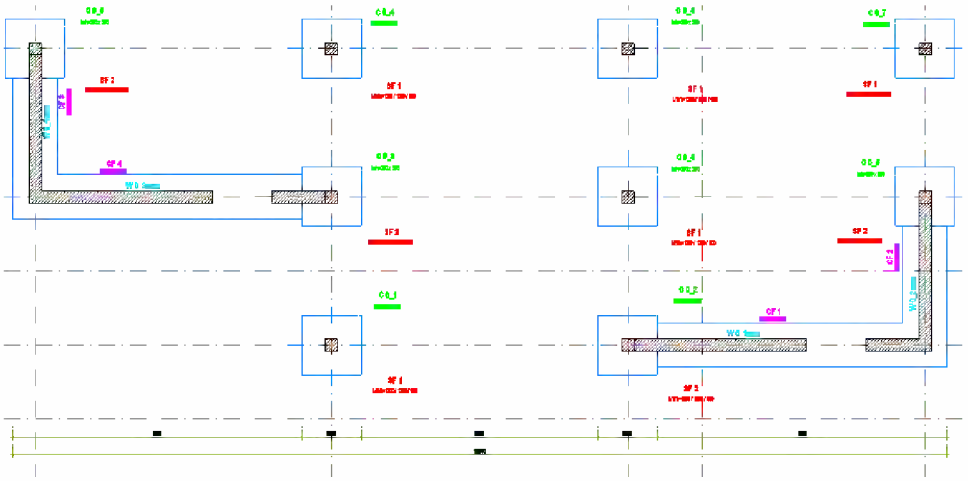
- Click ASD Drawings ➤ Drawings Edition ➤  (Group dimension line). Alternatively, click Formwork Drawings menu ➤ Dimension ➤ Group dimension lines.

- At the bottom of drawing, select the spread footings and continuous footings indicated by the dotted lines in the image below.



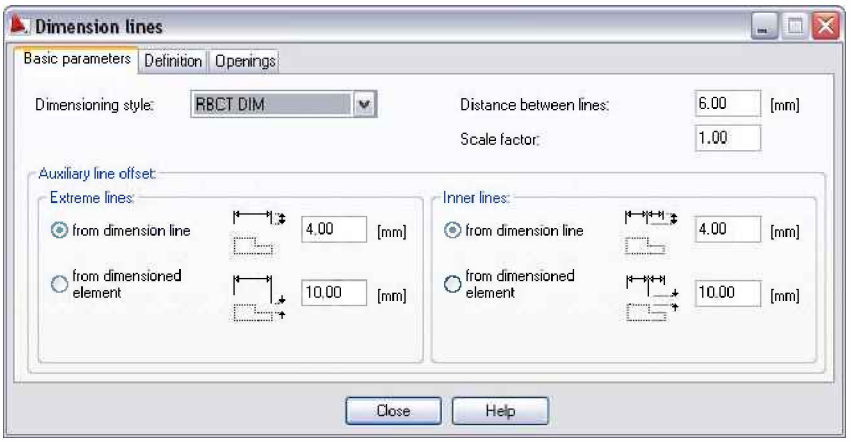
- Click to indicate the start and end points of the dimension line, thus defining its orientation, and then click to specify its location.

NOTE A group dimension line lets you create dimension lines for several structure elements included in a structure plan or view. When you delete certain elements (such as openings) or change their overall dimensions, the modifications are instantly reflected in the relevant dimension chains, so that you do not need to redefine the dimensions.



- Select the group dimension line you just created, right-click, and click Modify.

- On the Basic parameters tab of the Dimension lines dialog, for Distance between lines, type **6.0** [mm], and then click Close.

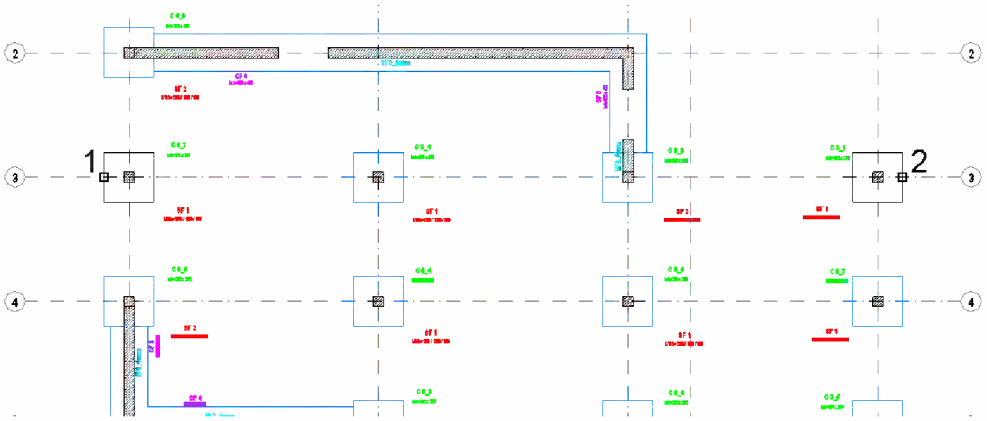


NOTE Parameters of dimension lines can be defined in the above dialog or by clicking Dimension lines ➤ Group in the Job Preferences dialog.

- Click ASD Drawings ➤ Drawings Edition ➤  (Simple dimension line). Alternatively, click Formwork Drawings menu ➤ Dimension ➤ Simple dimension lines.

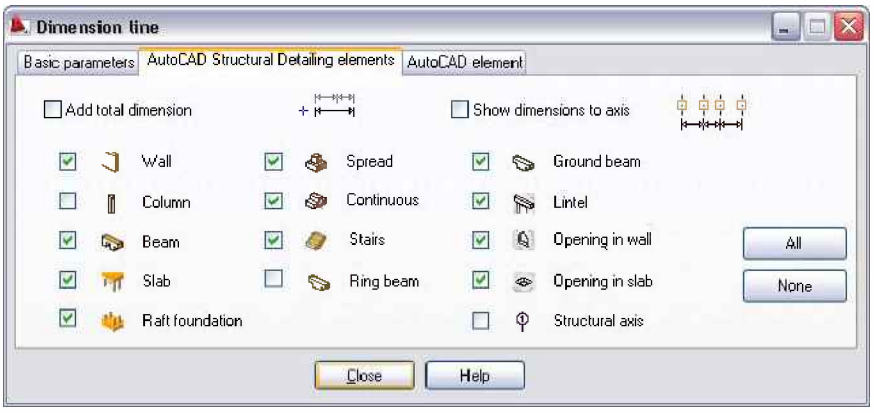
NOTE This option is used to draw dimension lines for single structure elements displayed in created plans or sections of a designed object.

- Using the following image as a guide, click to select point 1 as the dimension line start point, and then click point 2 as the end point. All elements that are intersected by the line will be dimensioned.

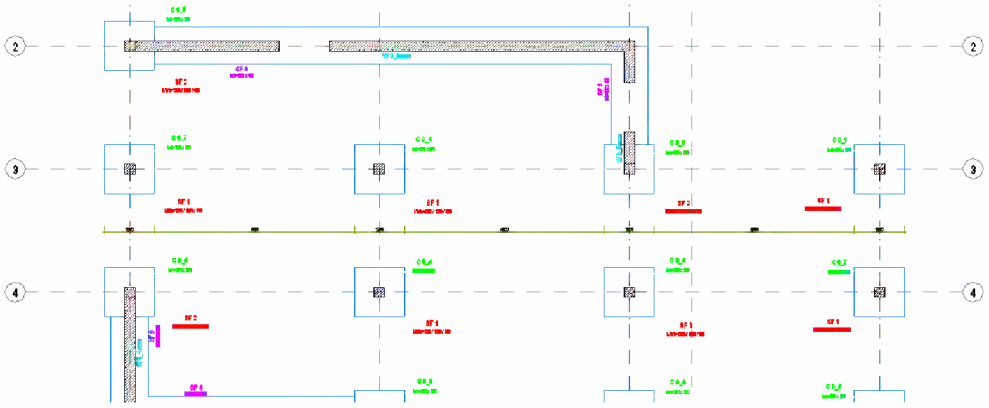


NOTE The software draws the dimension line for the indicated elements, and will group dimension lines appropriately.

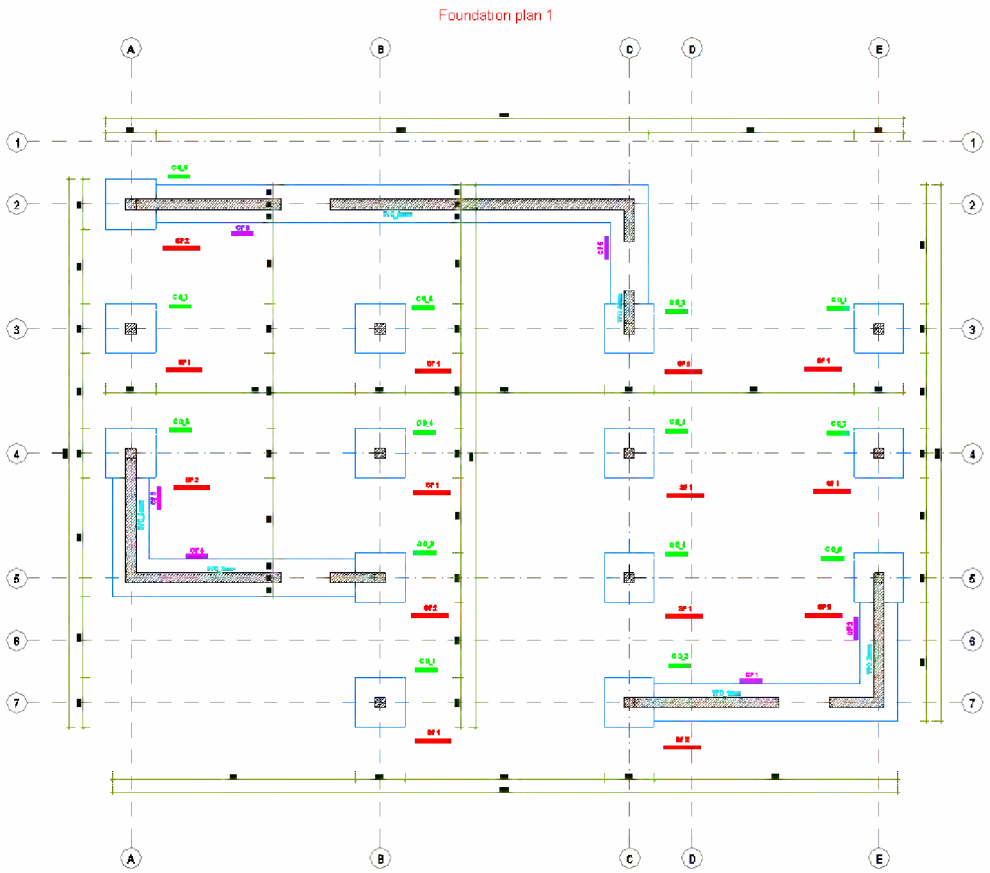
- Select the simple dimension line, right-click, and click Modify.
- On the AutoCAD ® Structural Detailing tab of the Dimension lines dialog, specify the parameters as shown below.



- Click Close.



- Using the same method, add the remaining dimension lines on the foundations plan drawing.



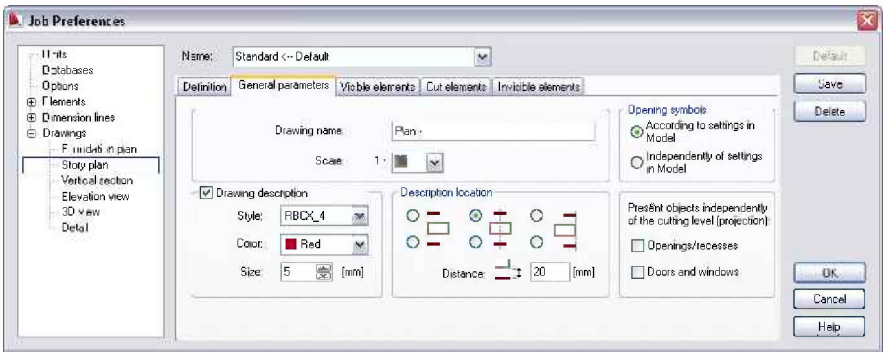
3 Proceed to the next exercise, Creating a Story Plan.

Creating a Story Plan

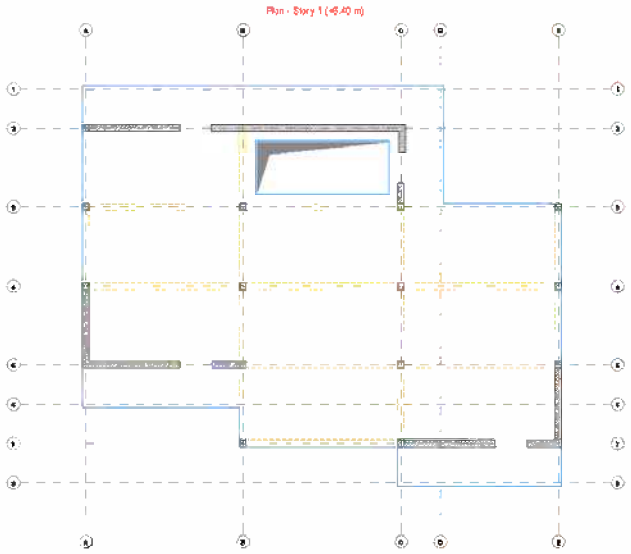
In this exercise, you will automatically generate a story plan, and then will add descriptions and dimension lines.

2 Automatically generate a story plan:

- Click ASD Model ➤ Settings ➤ (Job preferences). Alternatively, click Formwork Drawings menu ➤ Job Preferences.
- In the left pane of the Job Preferences dialog, select Drawings ➤ Story plan.
- On the General parameters tab, specify the parameters as shown below, and then click OK.



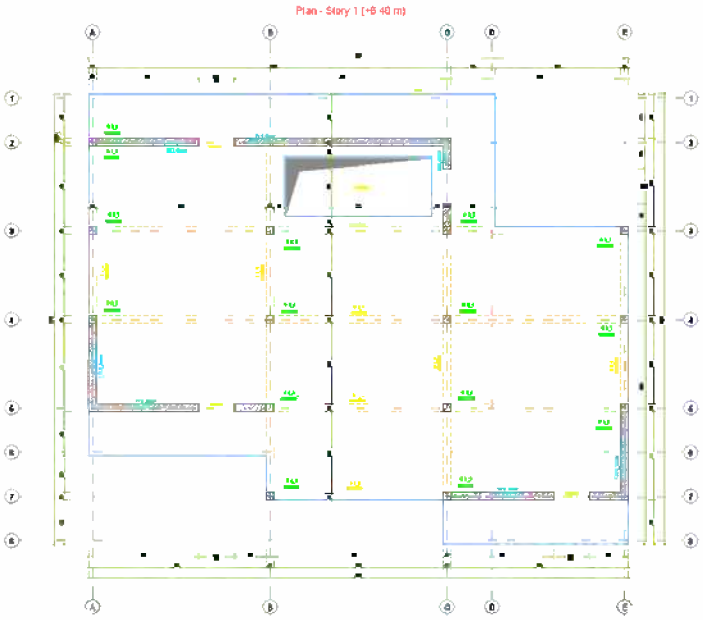
- On the Model tab of the Object Inspector, right-click Story 1, and click Activate story.
- Right-click, and click Create story plan or, click ASD Drawings ➤ Drawings Generation ➤ (Story Plan).



3 Add descriptions and dimension lines to the story plan:

- Click ASD Drawings ➤ Drawings Edition ➤ Abc (Element description). Alternatively, click Formwork Drawings menu ➤ Element description. Select all structure elements on the story plan, and press **Enter**. Descriptions are added to all elements.

- Using the method learned previously (Group and Simple dimension line options), add dimension lines to the story plan.



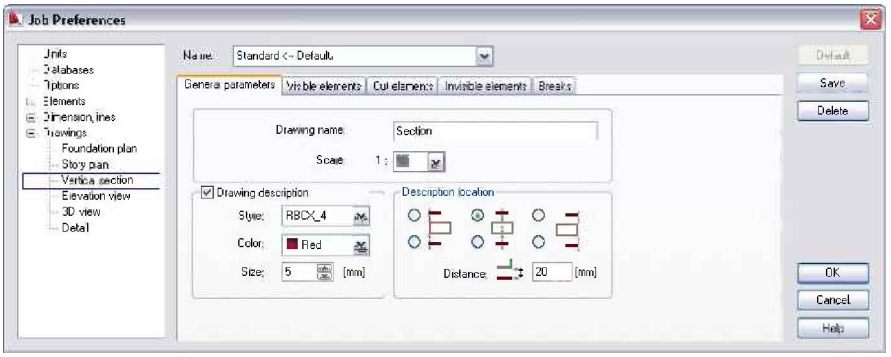
3 Proceed to the next exercise, Creating a Vertical Section.

Creating a Vertical Section

In this exercise, you will automatically generate a cross-section, and then will add elevation marks and dimension lines.

1 Automatically generate a cross-section:

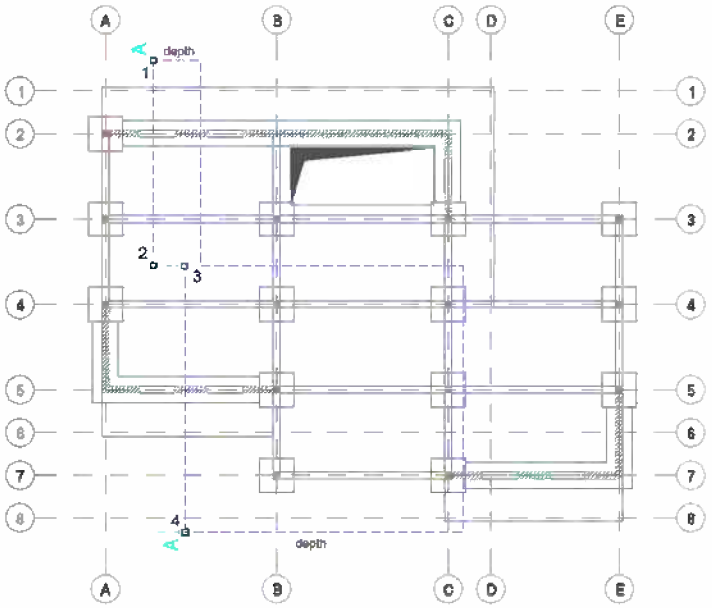
- Click ASD Model ➤ Settings ➤ (Job preferences). Alternatively, click Formwork Drawings menu ➤ Job Preferences.
- In the Job Preferences dialog, select Drawings ➤ Vertical section.
- On the General parameters tab, specify the parameters as shown below, and then click OK.



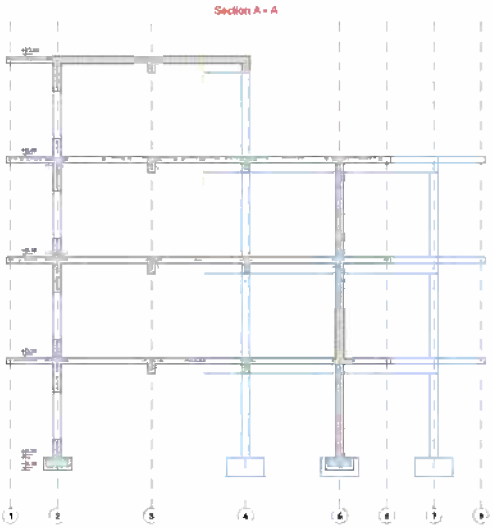
NOTE After you have finished editing a structure model, you can indicate the location where you want to create a vertical section of the model.

- On the Layout/Model Tab Bar, click the Model tab.
- Click View ➤ Views ➤ (Top). Alternatively, click View menu ➤ 3D Views ➤ Top.
- Click ASD Drawings ➤ Drawings Generation ➤ (Create vertical section). Alternatively, click Formwork Drawings menu ➤ Create vertical section.
- In the drawing area, draw lines that intersect the structure model and define the depth (points defining the intersecting line and the depth of the view are illustrated below).

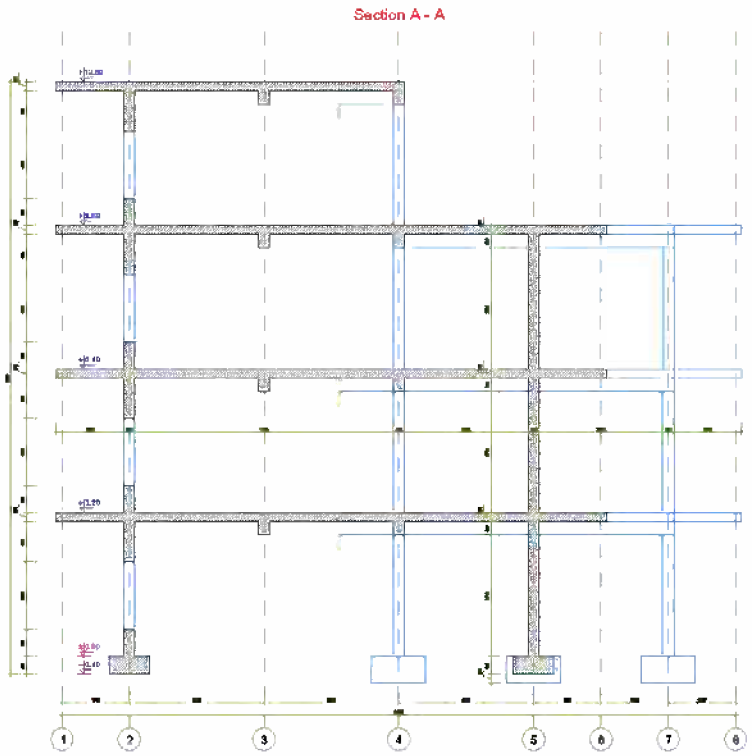
- After you draw the lines, a vertical section is created in the edition layout, and you can then modify the depth of the view using grips. You can have various depths on particular segments in your vertical section as on the image below.



2 Click ASD Drawings ➤ Drawings Edition ➤  (Insert elevation mark). Alternatively, click Formwork Drawings menu ➤ Insert elevation mark. Insert elevation marks as shown below. Just click once to add elevation mark.



3 Using the method learned previously (Group and Simple dimension line options) add dimension lines to the section plan.



NOTE The Add/Delete a division point of a dimension line options are also very useful when you add dimension lines. You can find these options on the Descriptions, dimensions and symbols toolbar.

4 Proceed to the next exercise, Creating an Elevation View and a 3D View.

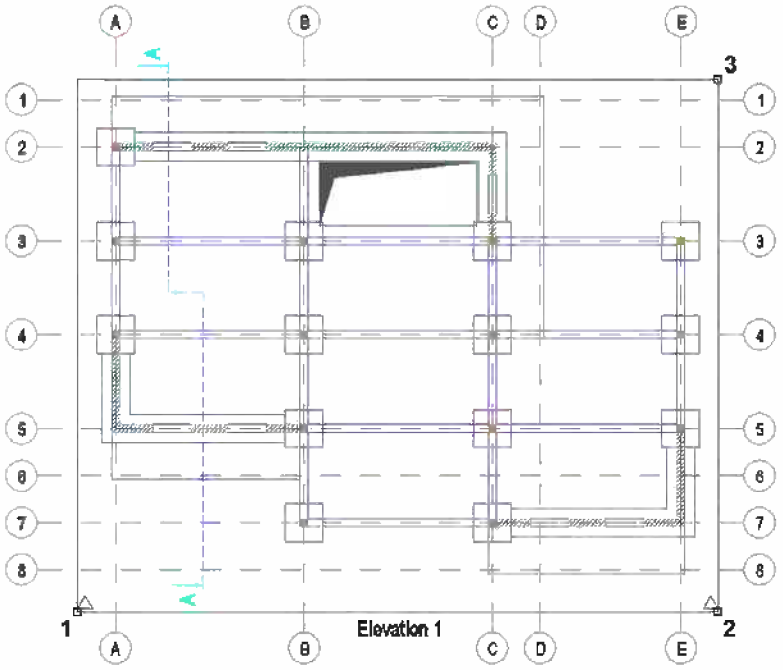
Creating an Elevation View and a 3D View

In this exercise, you will automatically generate an elevation view and a 3D view.

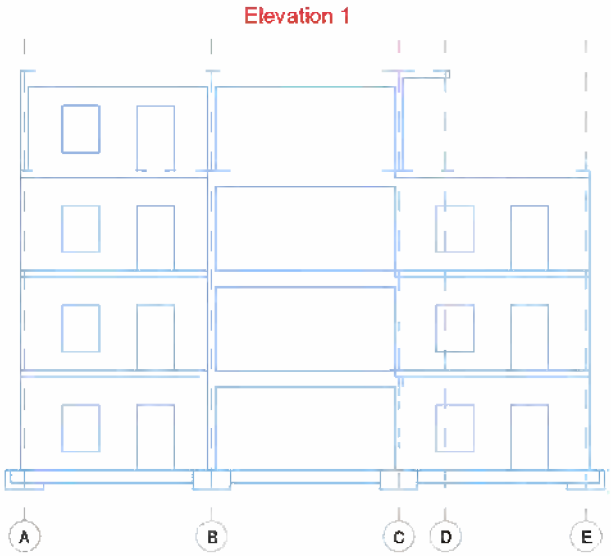
1 Generate an elevation view:

- On the Layout/Model Tab Bar, click the Model tab.
- Click View ➤ Views ➤ (Top).
  Alternatively, click View menu ➤ 3D Views ➤ Top.
- Click ASD Drawings ➤ Drawings Generation ➤ (Create elevation view). Alternatively, click Formwork Drawings menu ➤ Create elevation view.

- Using the following image as a guide, click points 1 and 2 to indicate the front of the elevation, and then click point 3 to define the depth of the elevation view.

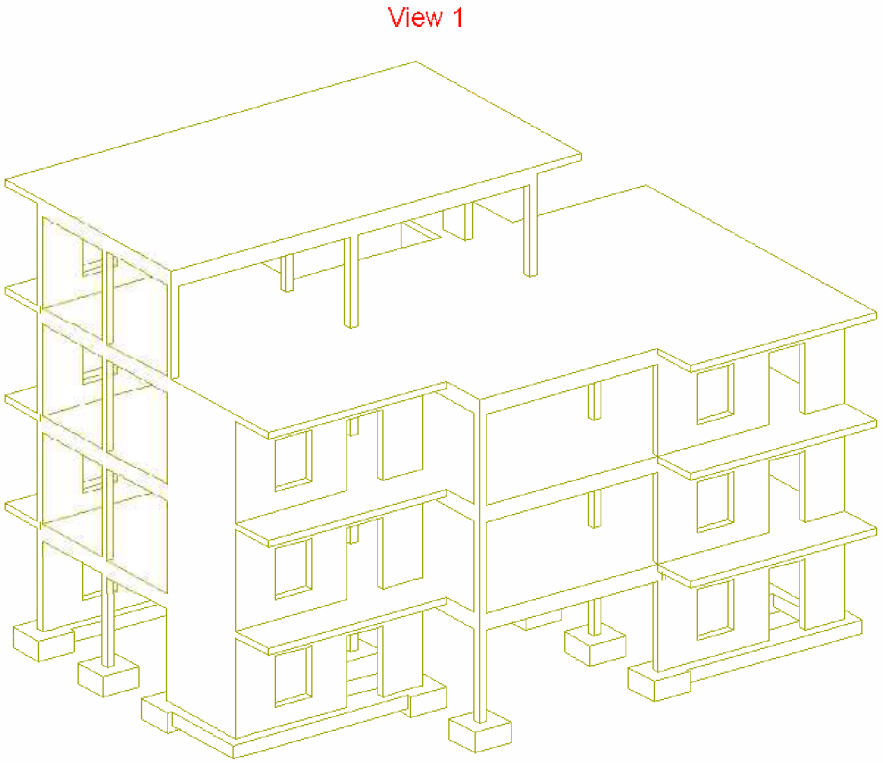


- The elevation should display as shown below.



2 Generate a 3D view:

- On the Layout/Model Tab Bar, click the Model tab.
- Click View ➤ Views ➤  (Free Orbit).
  Alternatively, click View menu ➤ Orbit ➤ Free Orbit.
  Try to set the 3D view as on the image below.
- Click ASD Drawings ➤ Drawings Generation ➤  (Create 3D view).
  Alternatively, click Formwork Drawings menu ➤ Create 3D view.
- On the Positions tab of the Object Inspector, select the generated 3D view – View 1, and change the scale to **1:100**.



3 Proceed to the next exercise, Preparing a Printout.

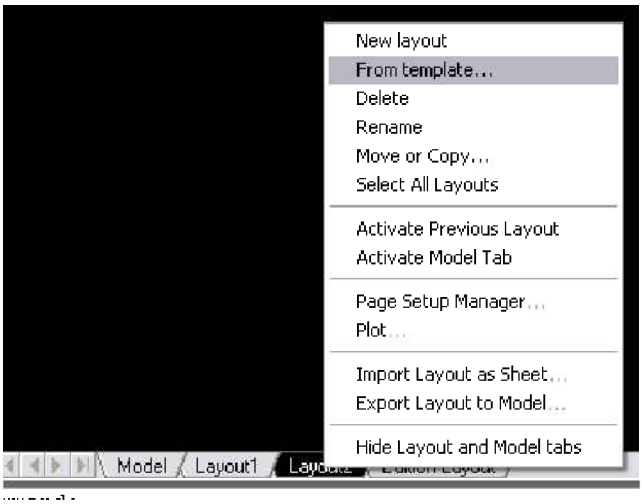
Preparing a Printout

In this exercise, you will create the final drawing. In this stage of every project, all operations are performed in printout layouts.

1 Add a sheet:

- On the Model/Layout Tab Bar, right-click the AutoCAD layout tab, and click From template.

NOTE A printout layout is an object of the AutoCAD ® program, and is used for the composition of a final printout. For each printout layout, there is one printout. When you lay out elements on the printout, you are working with views. When you change the scale of a view, it also affects the final drawing.

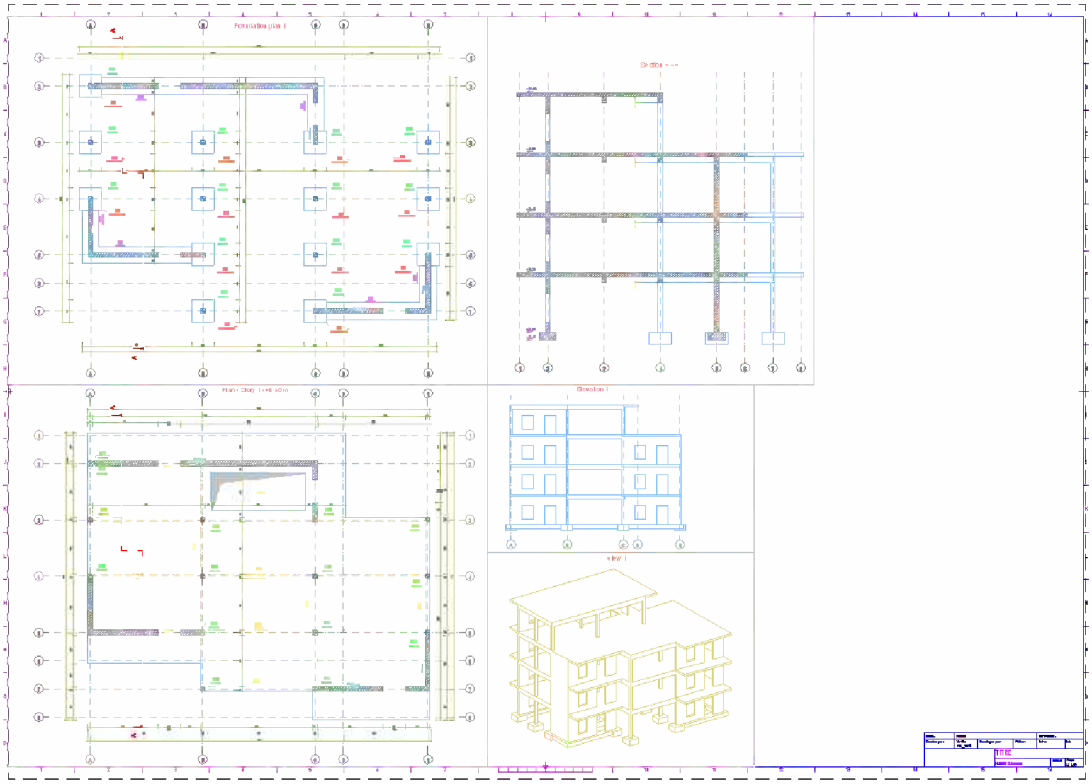


- In the Select Template From File dialog, select an A0 format template (for example, A0 ASD 033.dwt).
- In the Insert Layout(s) dialog, click OK.

2 Add views to the printout:

- Click on the newly created tab, A0 ASD.
- On the Positions tab of the Object Inspector, select Foundation plan 1.
- Right-click, and click Add to current Printout.
- In the drawing area, click to specify the base point.

- Repeat for the remaining views so that the final layout is as shown.

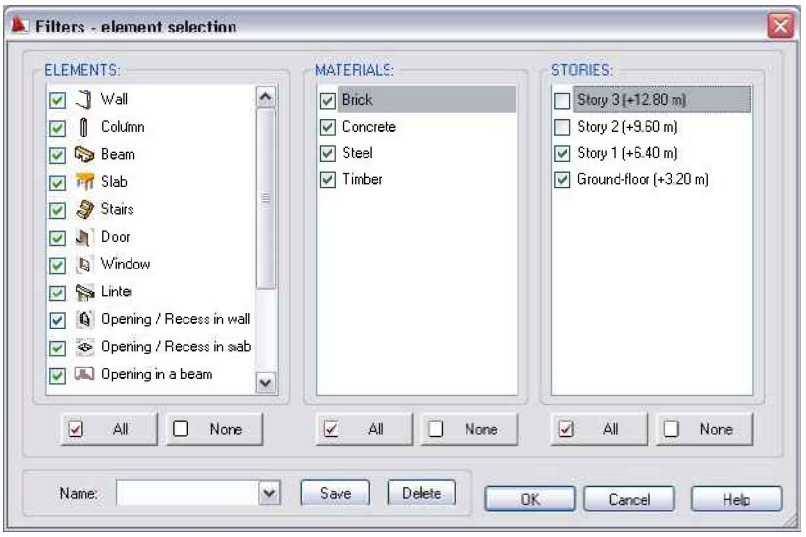


3 Add material takeoffs:

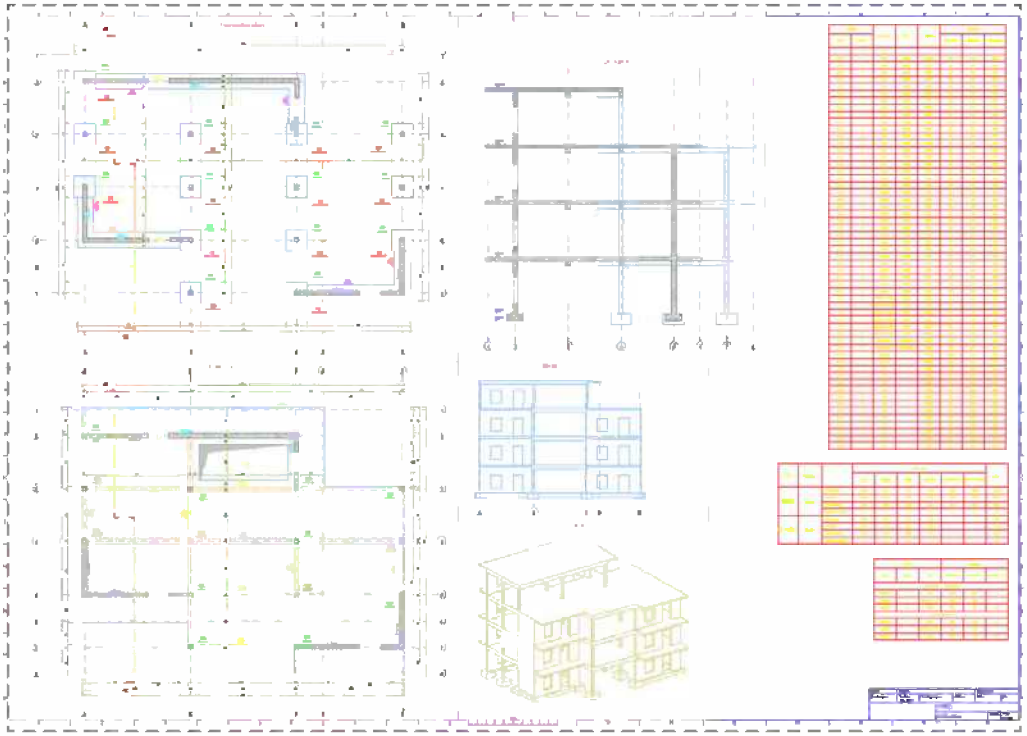
NOTE The table may be added only to a created template (generated drawing). It cannot be inserted to a structure model or to the edition layout.

- Click ASD Drawings ➤ Tables ➤  (Detailed - Elements). Alternatively, click Formwork Drawings menu ➤ Tables ➤ Detailed – elements. Right-click and click filter_Elements.

- In the Filters – element section dialog, specify the parameters as shown below, and then click OK.



- In the drawing area, click to define the table insertion point.
- Do the same with the Summary elements and Detailed – openings tables, which are also available on ASD Drawings ➤ Tables.



You have completed the AutoCAD ® Structural Detailing 2010 Formwork Drawings Module Getting Started Guide.