Tekla Structures Basic Training

Tekla Structures 10.0

April 26, 2004

Contents

13 GA Drawing

In this lesson

We will look more closely at the features of general arrangement (GA) drawings in Tekla Structures. We will create GA drawings, modify and update them. We will also introduce tools for adding details and section views to the drawings.

13.1 General about GA Drawings

A general introduction to GA drawings and an example of creating GA drawings is presented in the Lesson 10 Principles of working with drawings. Also see the help file for more information **Help: Drawing > Getting Started with Drawings > General arrangement drawings...**

13.2 Creating GA Drawings

We will now create general arrangement drawings from the following Basic model 1-2 views:

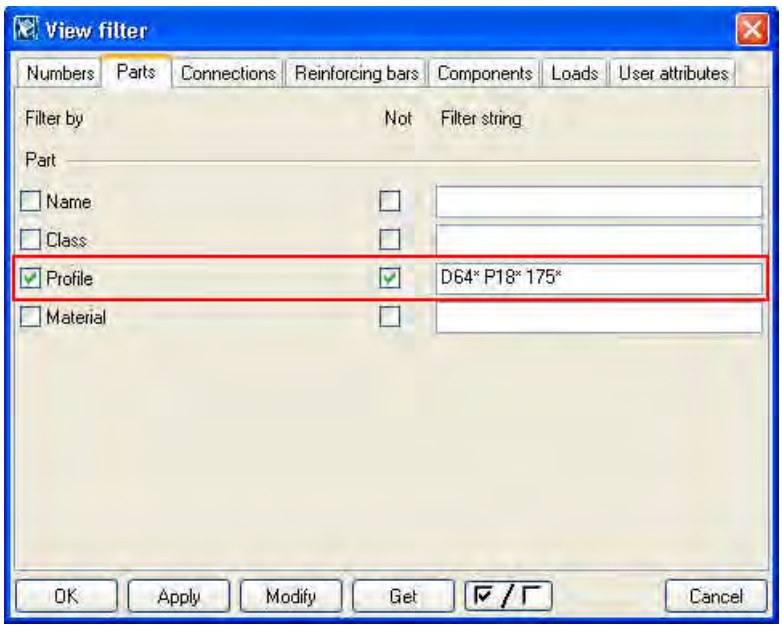
- 3D view
- Elevation views from grids A, F, 1, 4, 7
- Foundation plan
- And add a few details to the GA drawing

Adjust Model Views for GA Drawings

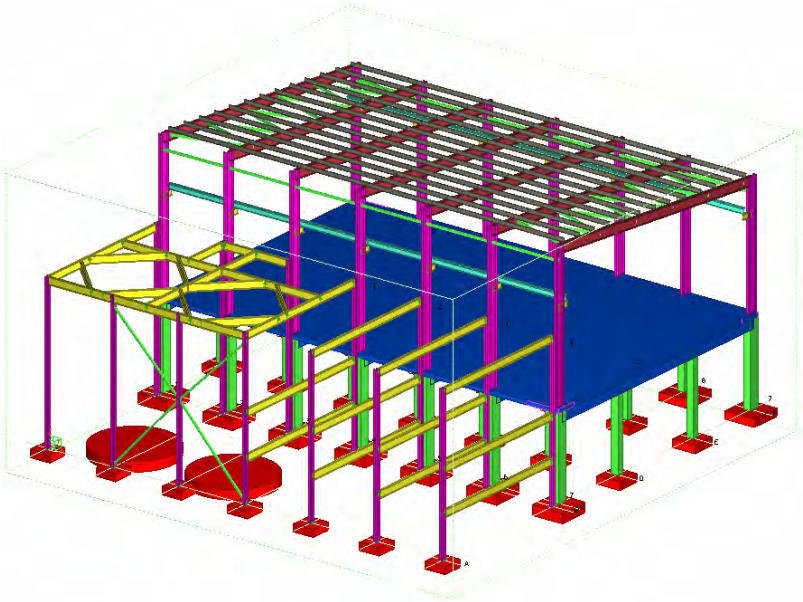
Before we start linking model views to GA drawing we need to review the views and if necessary modify or create new model views:

Modify 3d view

1. Open the 3D view.
2. Double click in the view background and click the **Filter…** button in the **View properties** dialog.



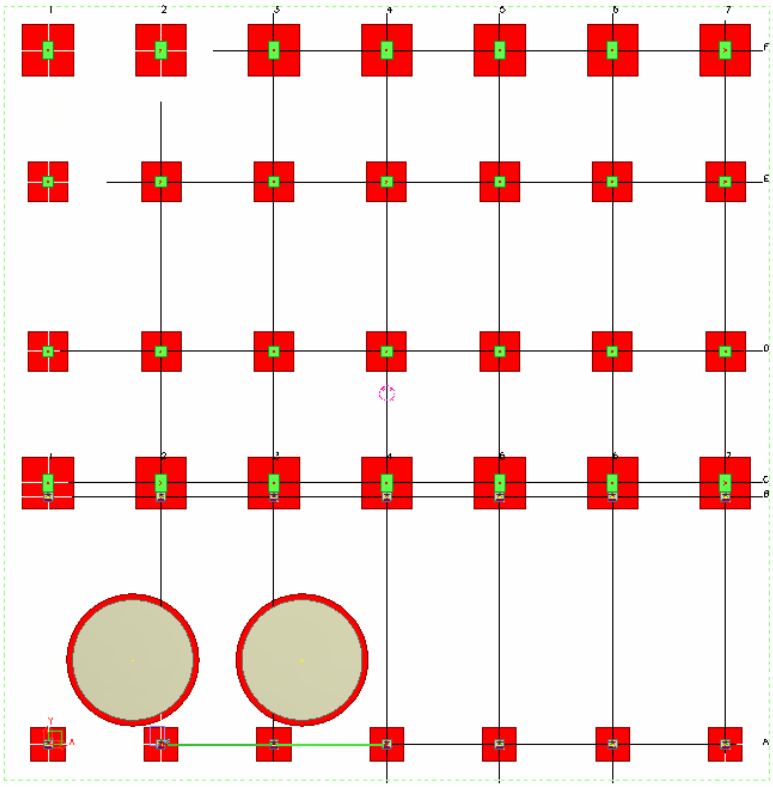
3. Filter out profiles D64*, P18*, 175* -> click **Modify**.
4. Rotate the 3D view to you liking (**Ctrl + middle mouse button**).



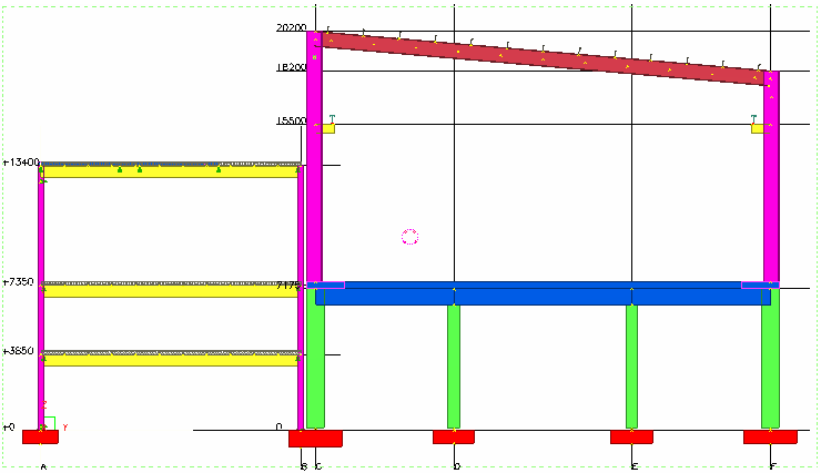
3D view will come to GA drawing in same rotation angle as it is in the model view.

5. Close the view.
6. Check that other model views (grid A, F, 1, 4, 7 and plan 0) are displaying the necessary information:
   - Filter unnecessary parts out.
   - Restrict work area to show only the part of the model you want visible (fit work area / pick work area).
   - Rotate 3D views to your liking.

- Make sure that the plan and elevation views are in 2D mode.



E.g. Foundation plane (view Plan 0).



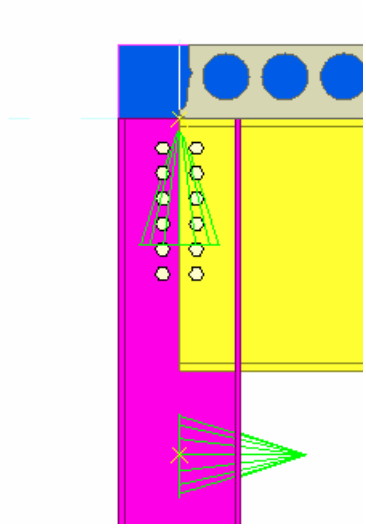
E.g. Elevation at grid line 4.

Create Detail Model Views

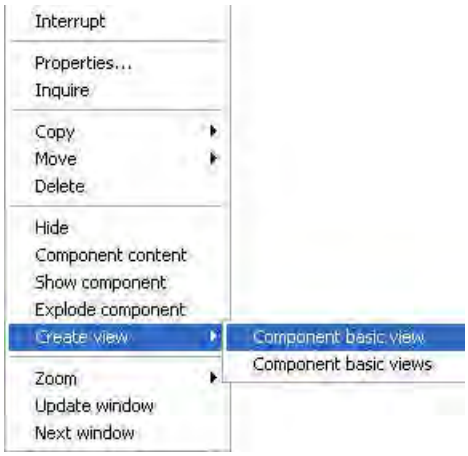
Create connection basic views

We can add any existing view to a GA drawing. We will now create detail views from two connections:

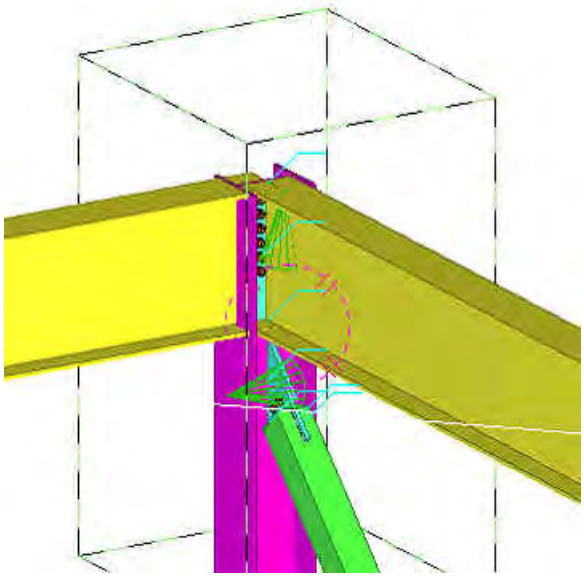
1. Highlight the connection symbols at grid intersection of A/4 at the +13400 elevation.



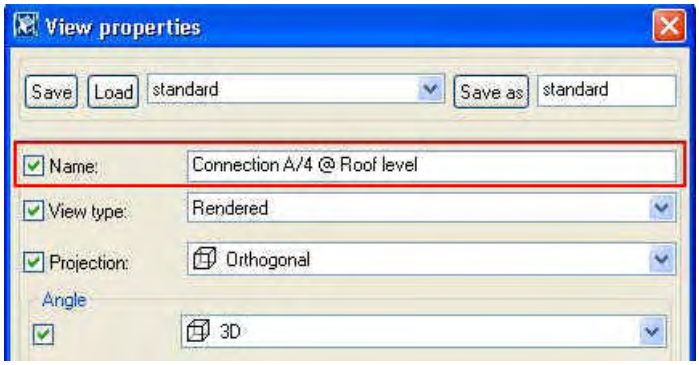
2. Right click and select: **Create view > Component Basic view**.



3. Filter out concrete parts from the view.
4. Rotate the 3D view so that you get the best view of the connections.

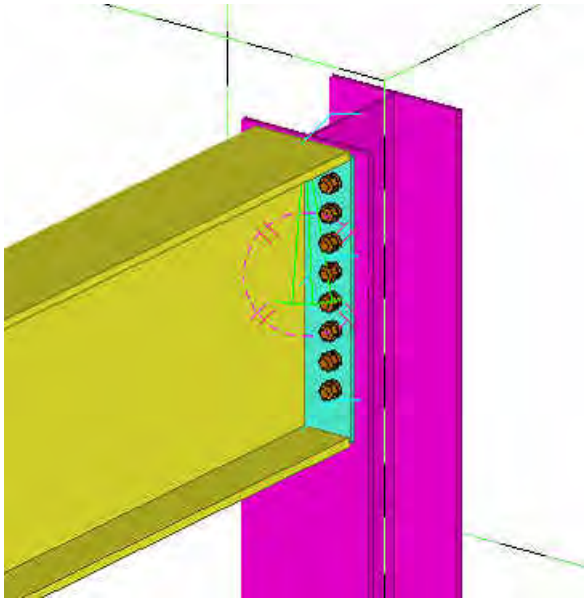


5. Double click the background of the basic view and change the name of the view to (e.g. grid line location) Connection A/4 @ Roof level.



6. Click **Modify**.
7. The view title bar is changed according to the name (Connection A/4 @ Roof level). You should also see this view in the **Open named view** list.

Create a similar detail view from the connection at grid intersection B/4 at the Roof level.



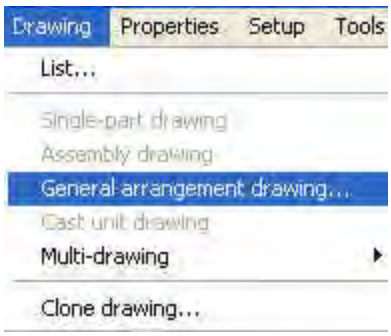
Setup GA Drawing Properties

Set drawing properties

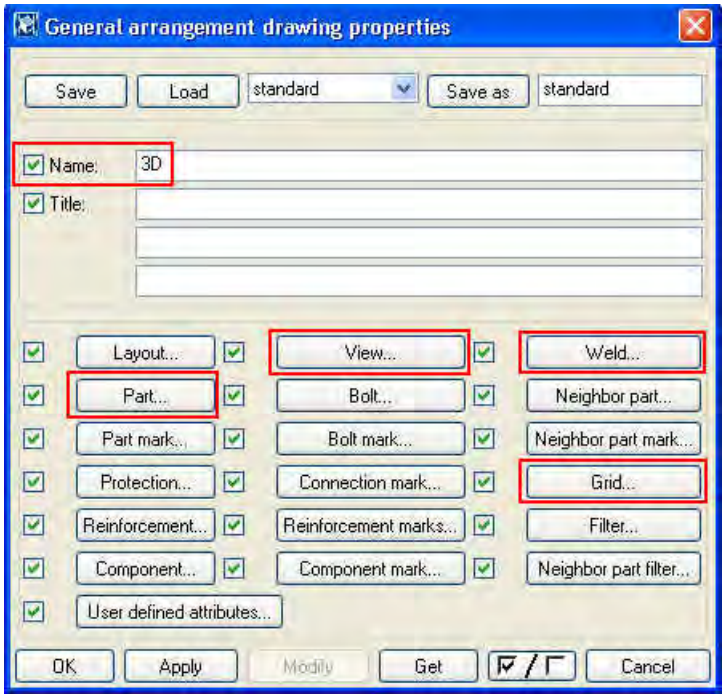
Before we can start creating GA drawings we need to setup the drawing properties. See the online help files for more details.

Help: Drawing > Getting started with Drawings > Drawing reference > General arrangement drawing...

1. Select **Drawing > General arrangement drawing…**

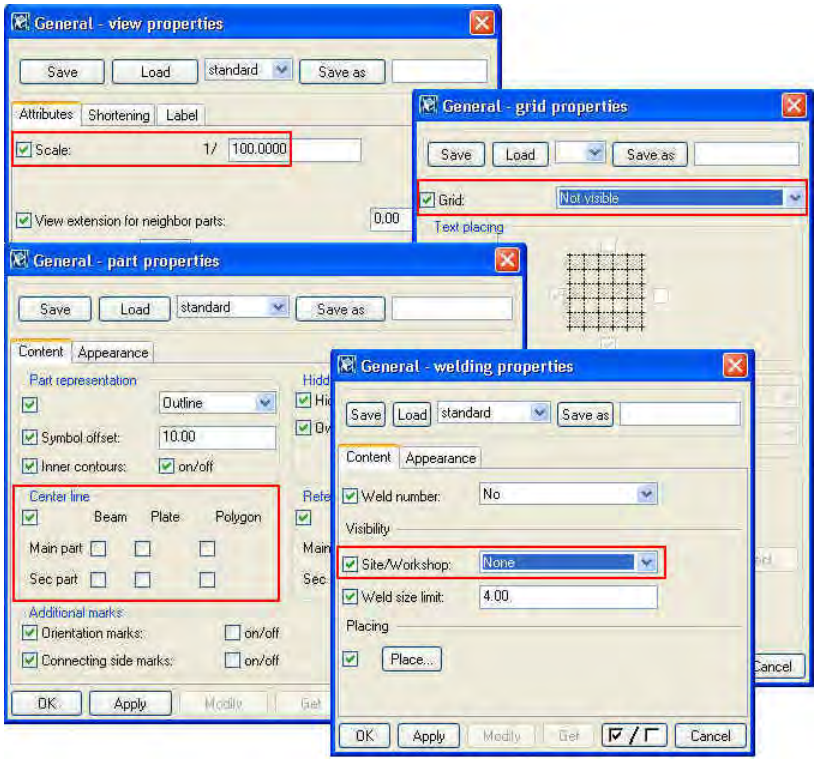


2. In the **Create general arrangement drawing** dialog box click **Drawing properties…**



3. Change the following attributes for the 3D GA drawing:
   - Change name to 3D (**Name** field)

- View scale to 1:100 (**View…** button)
- Turn off grid lines (**Grid…** button)
- Turn off center lines (**Part…** button)
- Turn off welds (**Weld…** button)



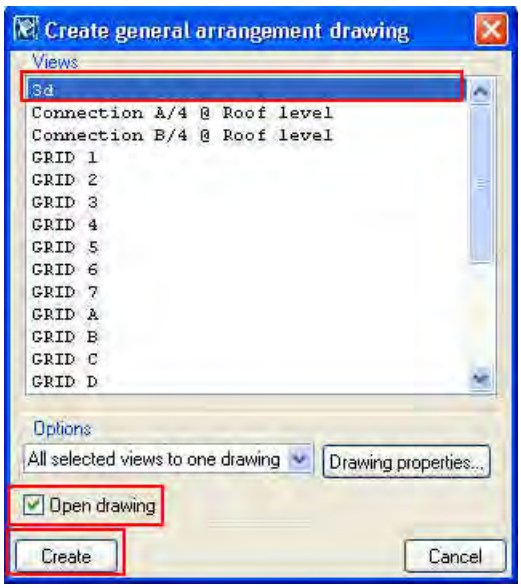
4. Click **OK** in each child dialog box to lock the settings. And then click **OK** to in the main GA drawing properties dialog to lock all the settings.

Create GA Drawing from One Model View

We will create a general arrangement drawing from the 3D model view using the drawing properties set in a previous chapter.

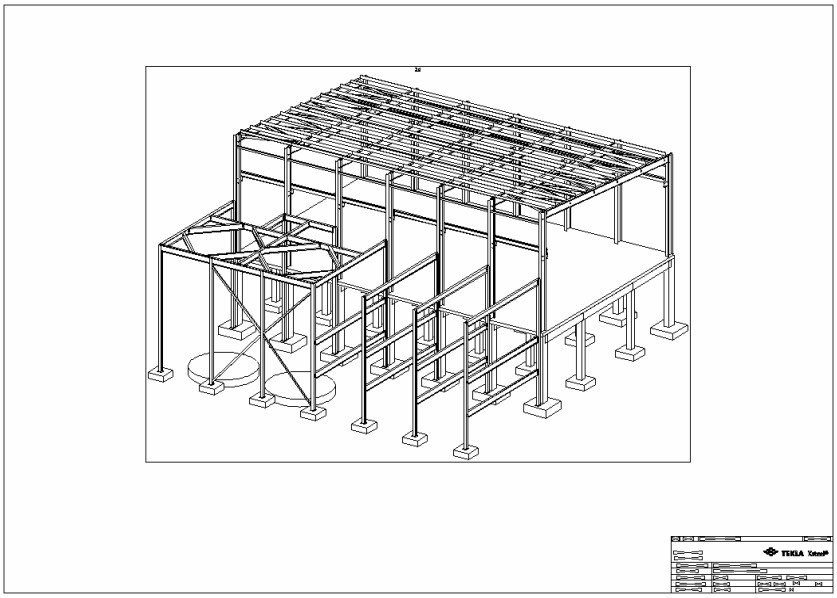
Create drawing out of 3D view

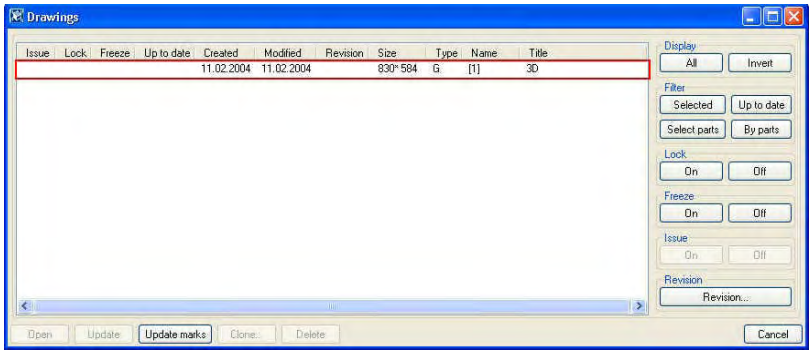
1. Select **3d** view from the **Create general arrangement drawing** dialog.



2. Check mark **Open Drawing**.
3. Click **Create**.

In few moments Tekla Structures opens a drawing created from the 3D view.





Create GA Drawing Using More Than One Model View

Now we will create another GA drawing using more than one model view and automatically bring those views into the GA drawing.

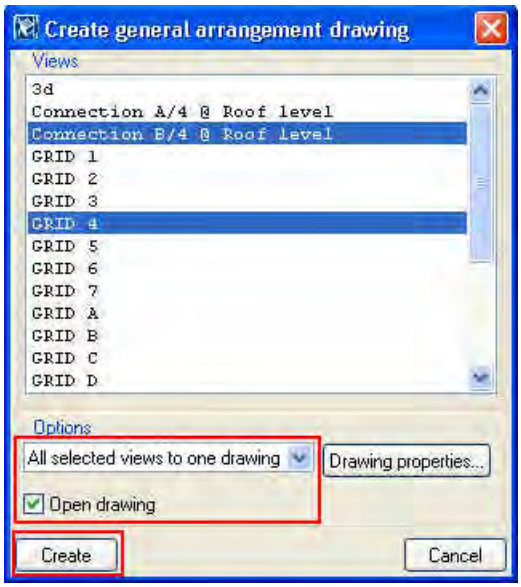
Adjust drawing properties

1. Click the **Drawing properties…** button in the **Create general arrangement drawing** dialog, and change the following:
   - Change the name to Elevation @ Grid 4 (**Name** field)
   - Change drawing size to 830*287 (**Layout…** dialog)
2. Click on **OK** for each of the dialogs to lock the settings.

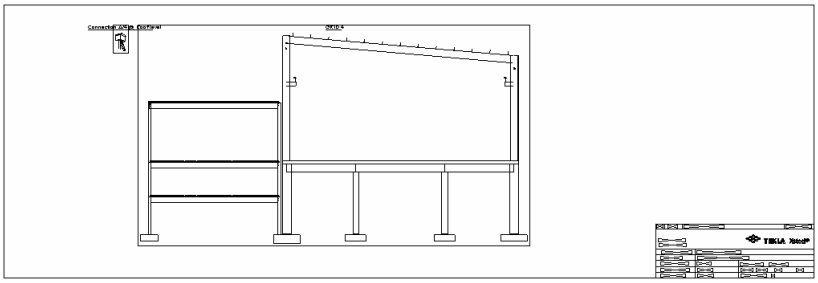
Create drawing out of Grid view and detail

To create GA drawing using more than one model view:

1. Highlight views GRID 4 and Connection A/4 @ Roof level.
2. Select **All selected views to one drawing**.
3. Check mark **Open drawing**.
4. Click **Create**.

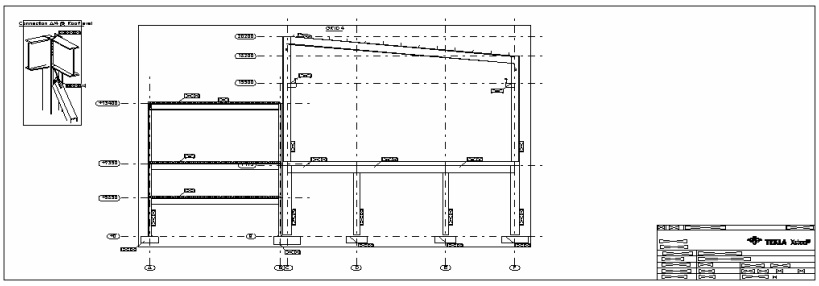


In few moments Tekla Structures opens the GA drawing with the selected model views.



5. Double click the blue border of the main view. In the **View properties** dialog box, change the following:
   - Turn on the grid lines (**Grid…** button)
   - Set the part marks visibility to distributed (**Part mark… > General**)
   - Turn off the part marks out of the view plane (**Part mark… -> General**)
6. Double click the blue border of the detail and change the following:

- Change the scale to 1:20 (**Scale** field)
- Change the bolt mark visibility to distributed (**Bolt part… -> General**)



7. Close the drawing.

If part or bolt mark visibility properties are set to something other than **None** and another view is added to drawing, all the deleted part marks will reappear.

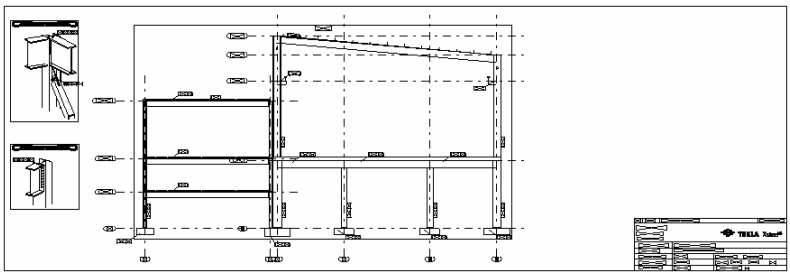
Add Another Model View to Existing GA Drawing

We will now create another detail for the Grid 4 drawing using the same view properties as the existing detail.

Link another model view to GA drawing

1. Open a model view at the connection at B/4 @ Roof level.
2. Open GA drawing Elevation @ Grid 4.
3. Double click the **Create view from model view** icon to open the view properties.

4. Click **Interrupt** (**right mouse click > Interrupt**).
5. Highlight the border of existing detail.
6. Click **Get** on **View properties** dialog.
7. Click **OK**.
8. Activate the **Create view from model view** command again by clicking the icon.
9. Minimize the drawing.
10. Pick the Connection B/4 @ Roof level view.
11. Maximize the drawing and the detail will have appeared at the bottom left hand corner of the drawing.
12. Move the view from bottom left hand corner to a better location.



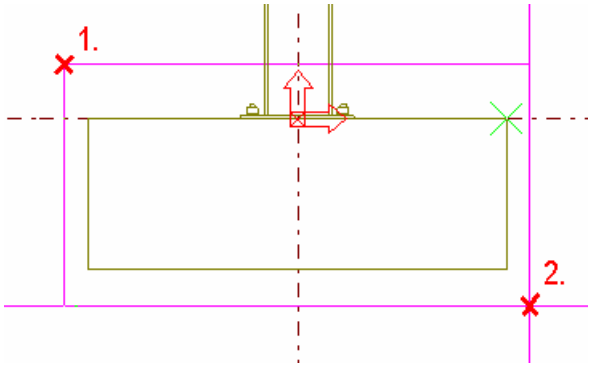
Create Detail from Drawing View

Now we create one more detail for the Grid 4 drawing, so keep the drawing open.

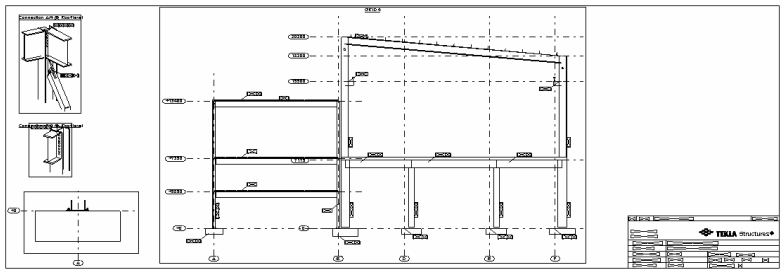
Create another detail

1. Double click the **Create view from view** icon.

2. In **View properties** dialog change the scale to 1/20.
3. Click **OK**.
4. Select an area near the footing at grid line A as shown below.



5. Detail should now appear on the drawing.
6. Right click and select **Place views**, or place the view manually.



7. Close the drawing.

If existing drawing view is in a 3D view then picking of the area is difficult. Usually, it is easier to create another view in the model and link that model view to a drawing as explained earlier.

Create Multiple GA Drawings Automatically

Now we will create multiple general arrangement drawings automatically using grid views A, F, 1 and 4.

Change drawing properties

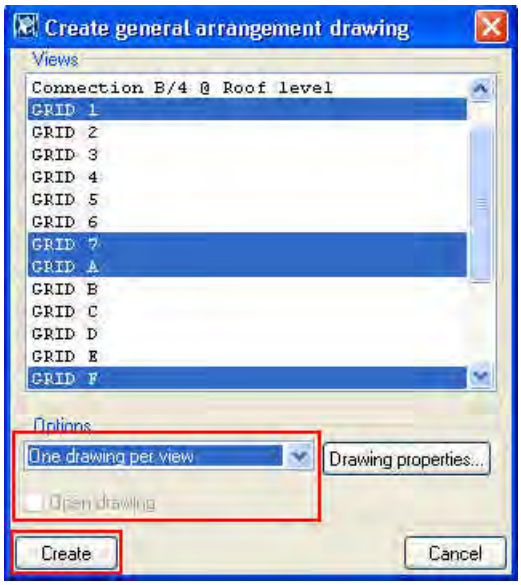
1. Click the **Drawing properties...** button in the **Create general arrangement drawing** dialog and change the following:
   - Change the name to Elevation @ Grid (**Name** field)
   - Turn on grid lines (**Grid...** button)

2. Click **OK** for each of the dialogs to lock the settings.

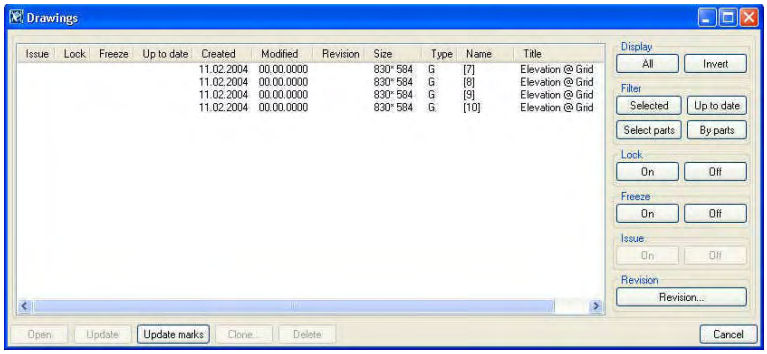
Create GA drawings out of Grid views

To create multiple GA drawings out of multiple model views:

1. Highlight views GRID A, GRID F, GRID 1 and GRID 7.
2. From the list box, select **One drawing per view**.
3. Click **Create**.

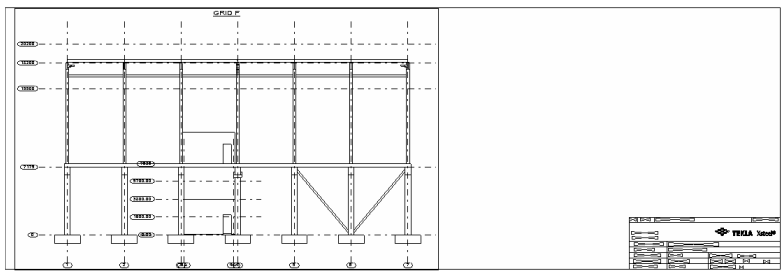


You will get 4 GA drawings.

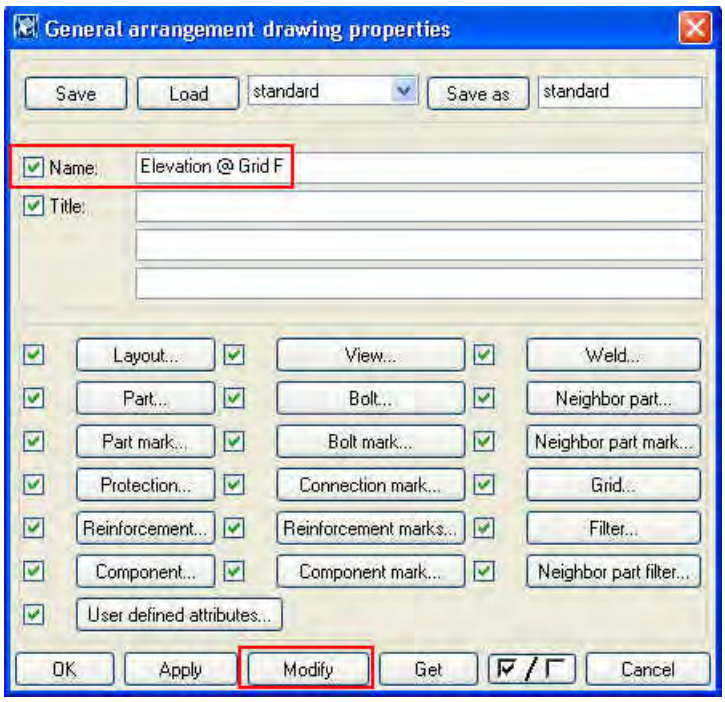


We still need to modify the GA drawing names.

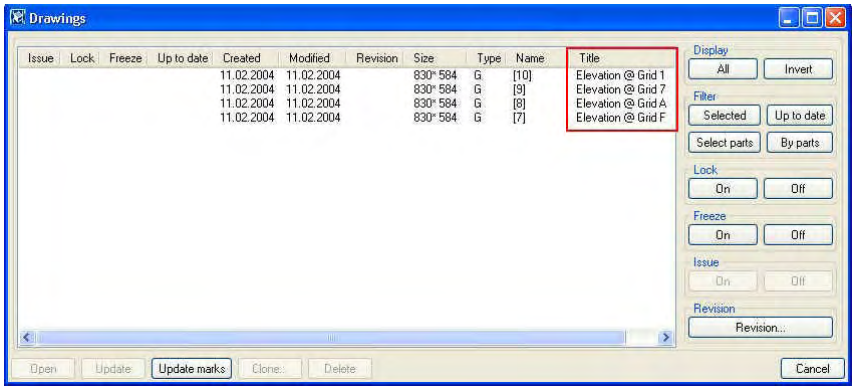
1. Open the first drawing on the list.



2. Check the view title to see which grid line it represents.
3. Double click the background of the drawing to open drawing properties.
4. Change the name to e.g. Elevation @ Grid F.



5. Click **Modify** and the name changes on the list.
6. Repeat for the rest of the drawings.



Create Empty GA Drawing and Add Model Views Interactively

In certain situations (multi-user for example) it is necessary to first create empty GA drawings and later link the model views interactively. By using this method each user can have GA drawings reserved for their use.

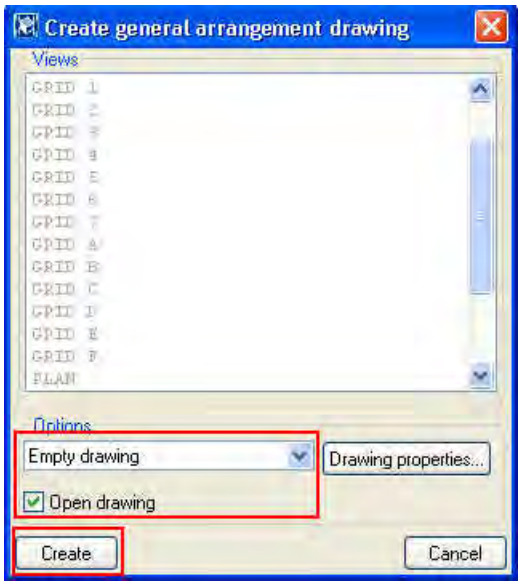
Change drawing properties

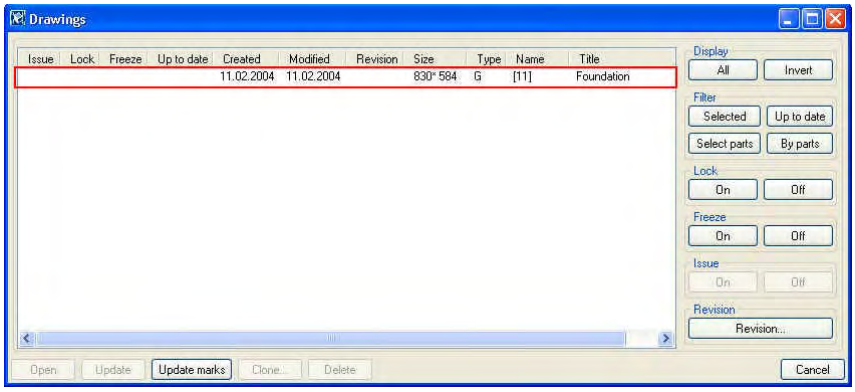
1. Click the **Drawing properties…** button on **Create general arrangement drawing** dialog, and change the following:
   - Change the name to Foundation (**Name** field)
   - Change the drawing size to 830*584 (**Layout…** dialog)
   - Set the part marks visibility to none (**Part mark… -> General**)
   - Set the part marks out of view plane not visible(**Part mark… -> General**)
2. Click the **OK** button for each of the dialogs to lock the settings.

Create empty GA drawing

To create an empty GA drawing and add the model view interactively:

1. Open the model view, Plan +0.
2. Open the GA drawing creation dialog, **Drawing > Create general arrangement drawing**.
3. Select **Empty drawing** from the drop down menu.
4. Check mark **Open drawing**.
5. Click **Create**.

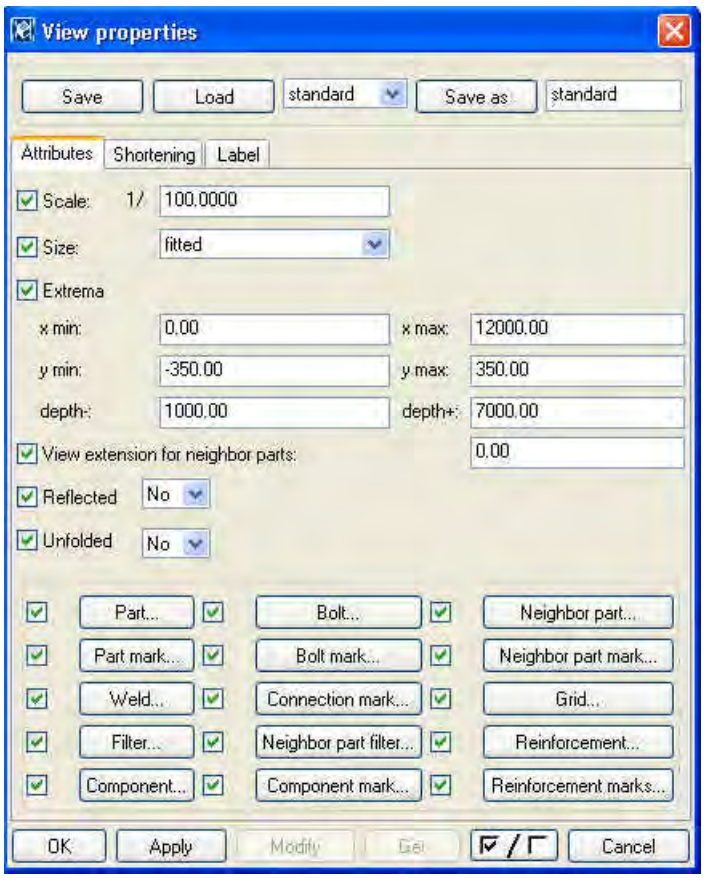




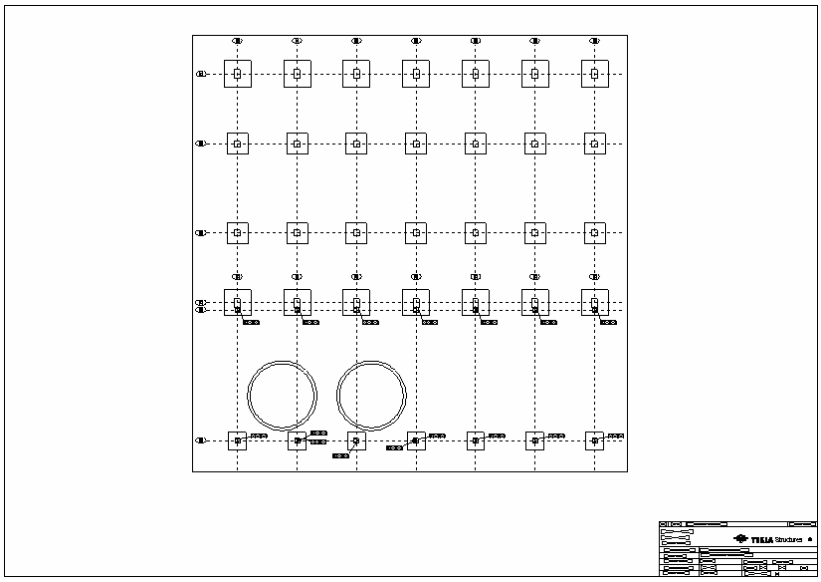
Link model view to drawing

1. Open the drawing.
2. Minimize the drawing.
3. Double click the **Create view from model view** icon.

4. Change the scale to 1/100.
5. Click **OK**.



6. Pick the model view.
7. Maximize the drawing and the model view has been placed on the drawing.
8. Right click and select **Place views**.



Create Detail Using Area Select

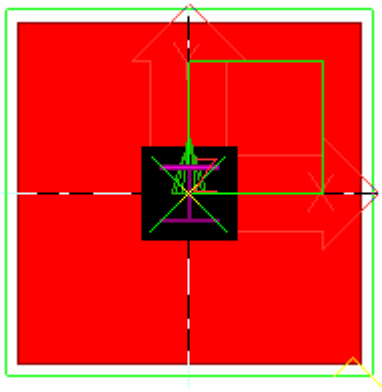
We will now create detail from the footing at A/1.

Create detail

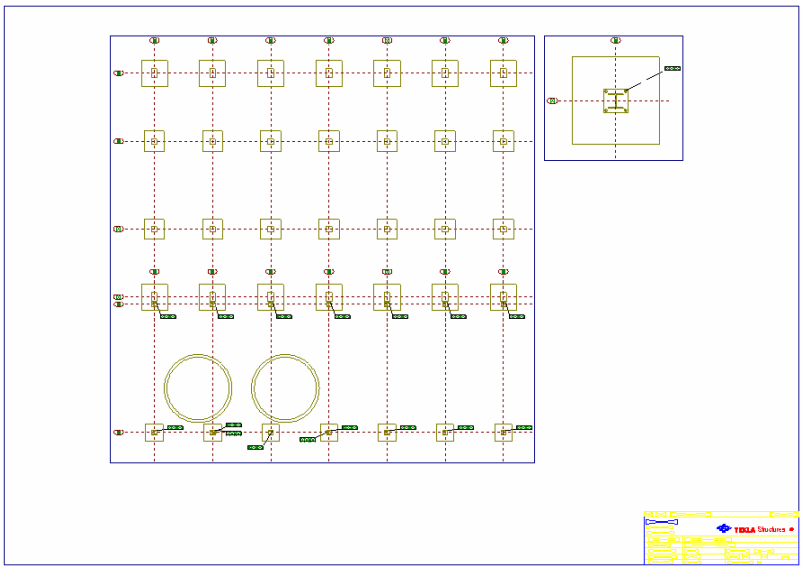
1. Minimize the drawing again.

2. Double click the icon **Create view from model by area**.

3. Change scale to 1/20.
4. Click **OK**.
5. Pick area around the footing at grid intersection A/1.



6. Maximize the drawing and the view will have been placed on the drawing.
7. Right click and select **Place views**.



Create Section View Out of the Detail

Now we will create section view from the footing detail that we created earlier.

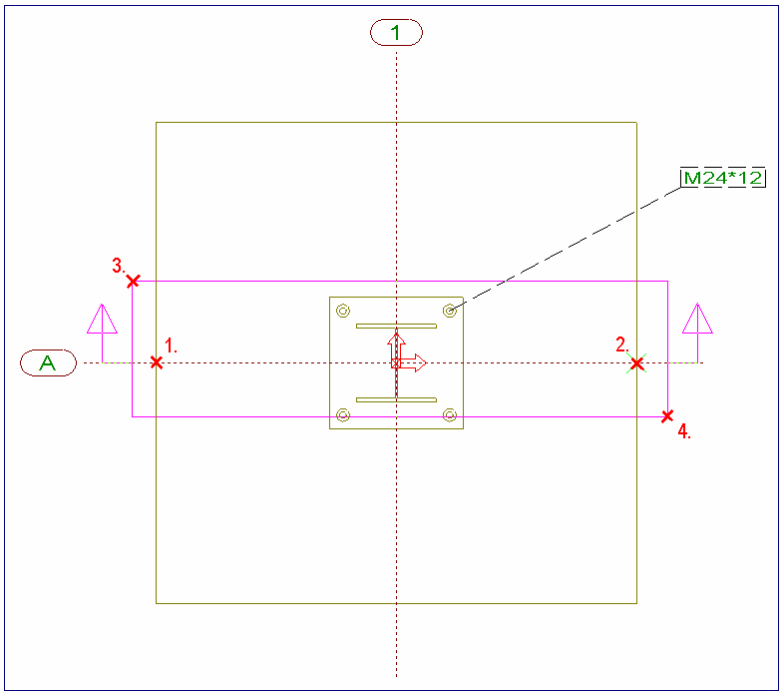
Create section view

1. Double click the icon **Create section view**.

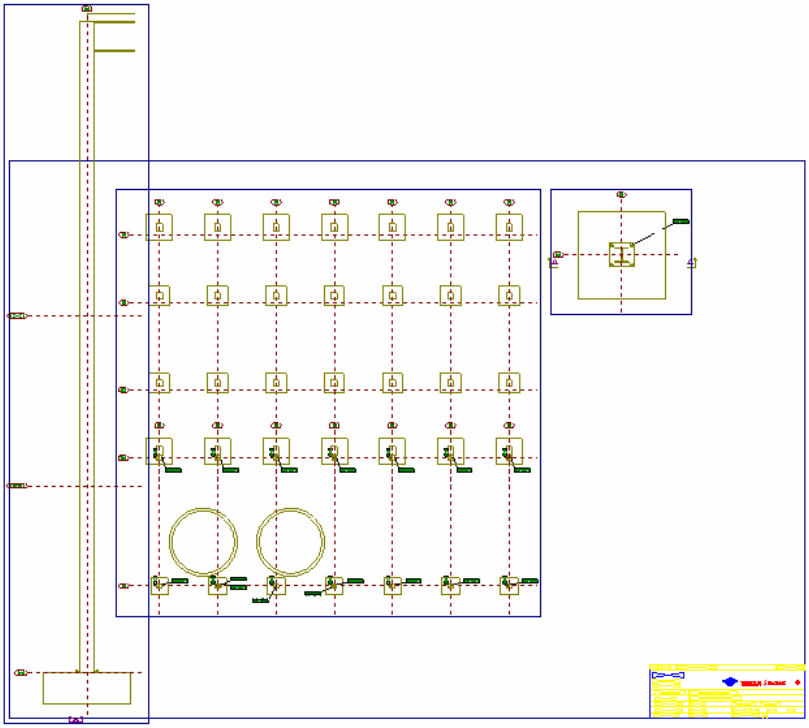
2. Change scale to 1/20 in the view properties dialog.
3. Click **OK**.

4. Pick the section view area as shown below:

   - With points 1 and 2 you will show the location and direction of the cut line.
   - Then with points 3 and 4 you will show the depth and width of the section view, so a pick box which is big enough that all of the necessary parts fit inside.

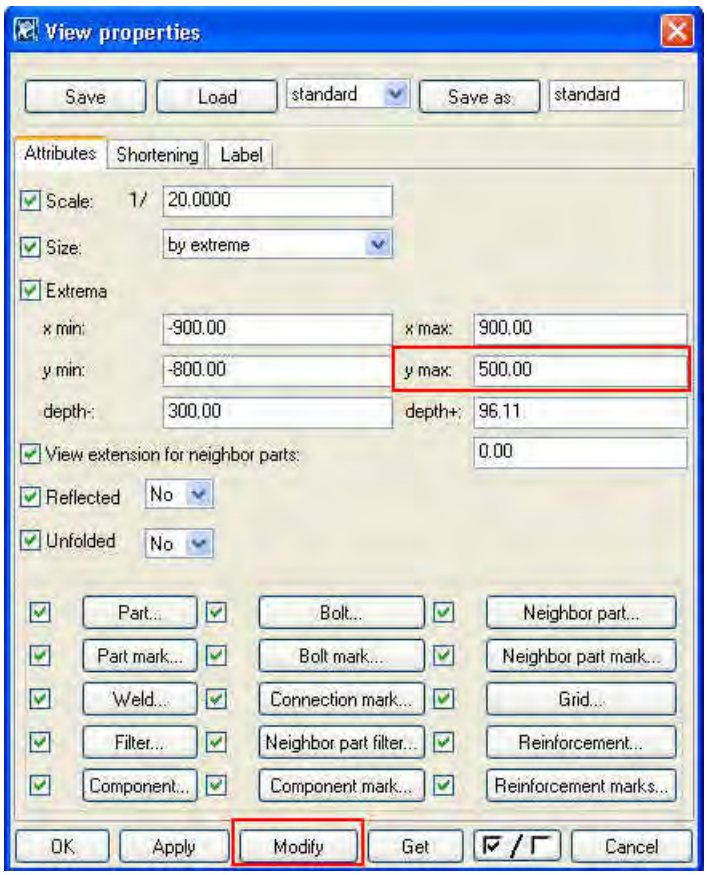


The section view and cut symbols will appear.

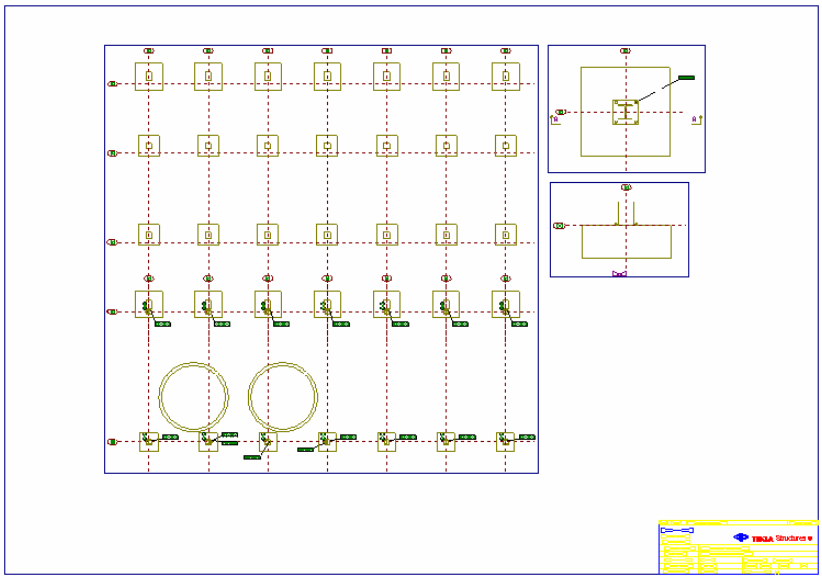


The section view height is same as model height.

1. Double click the section view blue border.
2. Change the height by changing the y max: value from 13400 to 500.



3. Click **Modify**.
4. Left click the background of the drawing once and then right click and select **Place views**.



13.3 Editing GA Drawings

Next we will do some editing to the GA drawings. Most of the editing is done exactly like it is done in other types of drawings see: **Help: Drawing > Editing Drawings**.

Interactive Dimensioning

For more information about the different dimensioning tools, see: **Help: Drawing > Dimensioning > Manual dimensioning**.

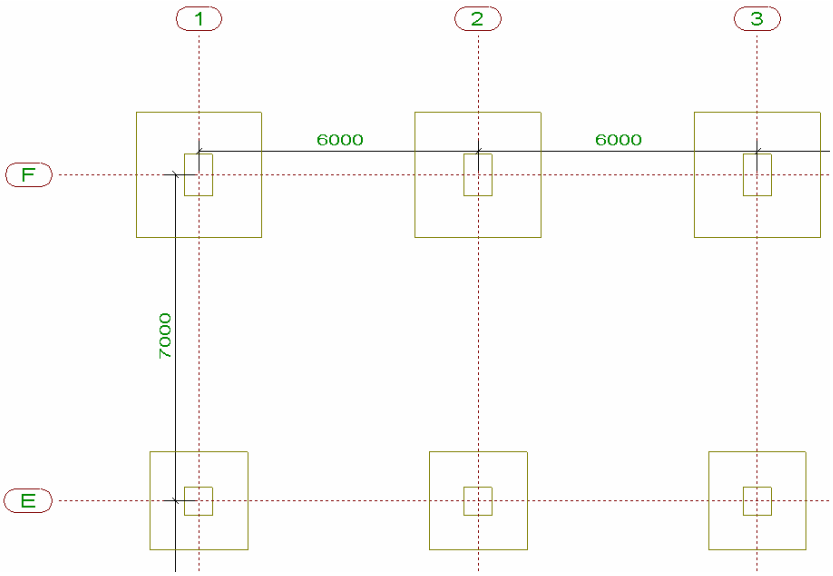
Automatic Grid Dimensions

Grids can be dimensioned with just couple of clicks:

Dimension grids

5. Open the Foundation GA drawing.
6. Go to **Create > Dimension > Grid**.

7. Pick the main drawing view.
8. Grid dimensions will appear.
9. You can pick and move dimension lines anywhere you want them.

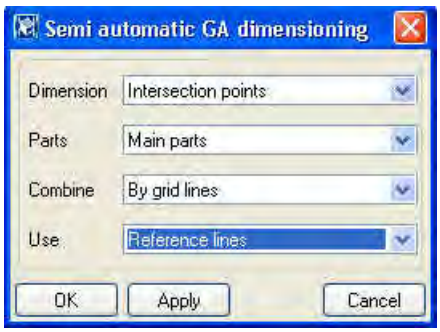


Semi-automatic GA Dimensioning

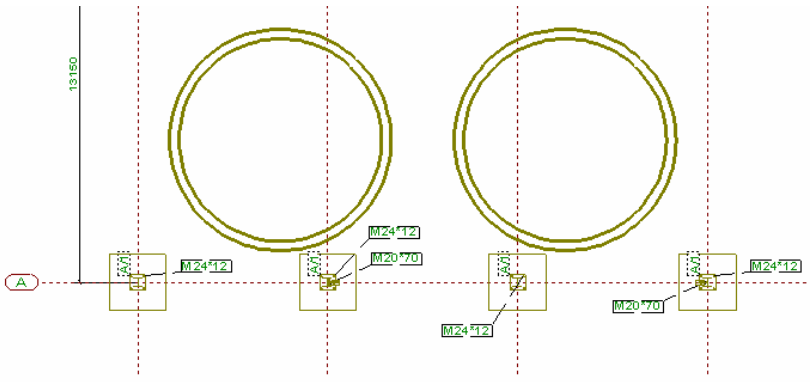
See the online help file for more information about setting up dimensioning properties **Help: Drawings > Dimensioning > Dimension reference > Setup > GA dimensioning**.

Dimension Silos

1. From the menu select **Setup > GA dimensioning…**
2. Set the properties as shown below:

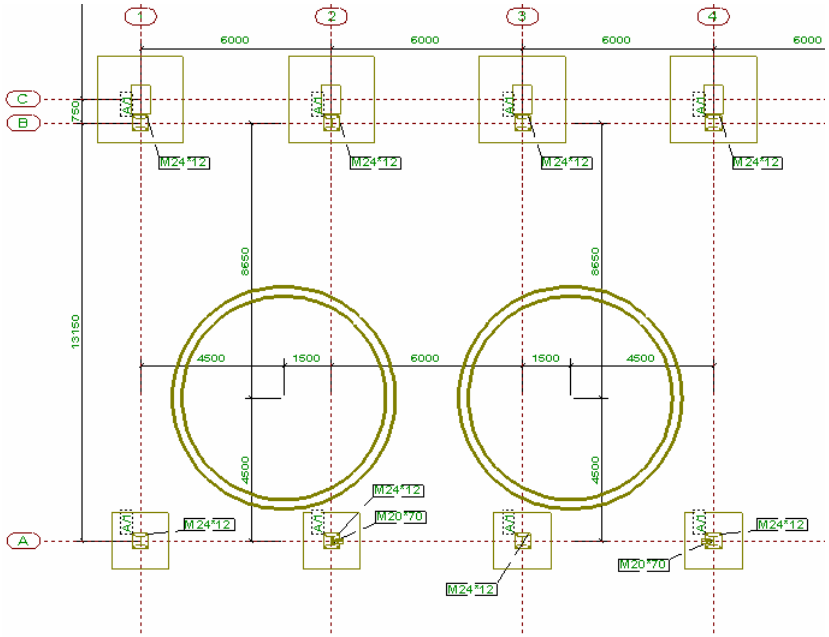


3. Select the silos.



4. Right click and select **Dimension Parts XY**.

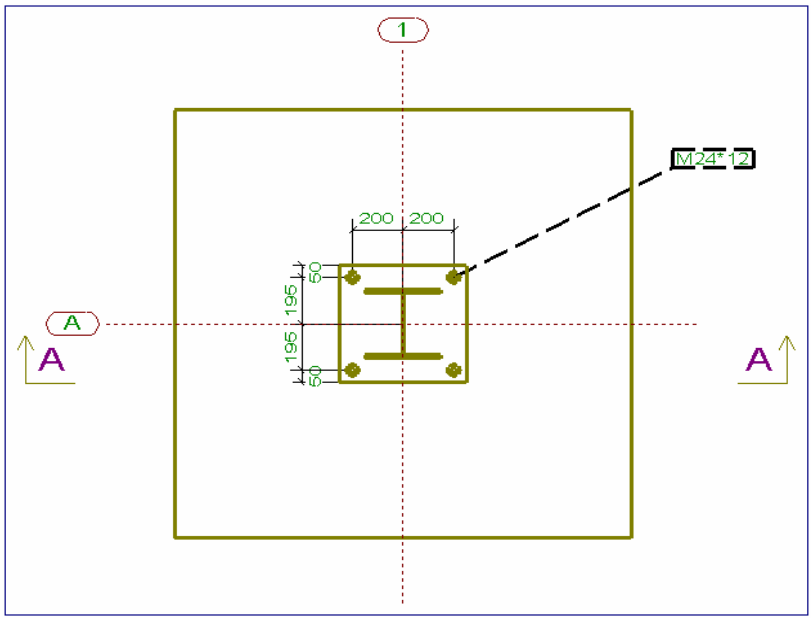
5. Dimension lines from the silos to grid lines should appear.



In same fashion we can also dimension the anchor bolts:

Dimension anchor bolt detail

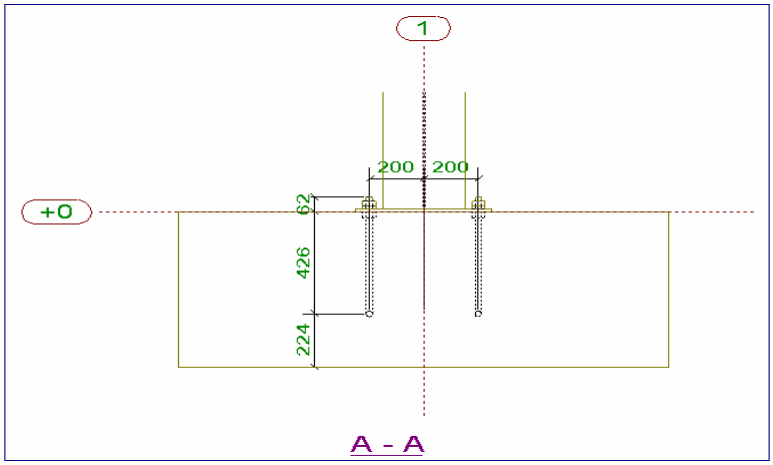
1. Highlight the parts in anchor bolt detail.
2. Right click and select **Dimension Parts XY**.



And in the section view:

Dimension anchor bolt cut view

3. Double click the blue border to open the view properties.
4. Click the **Part…** button, check mark Hidden lines: to on and click **Modify**.
5. Highlight just the anchor bolts and the footing.
6. Right click and select **Dimension Parts XY**.



7. Close the drawing.

Creating a Level Mark

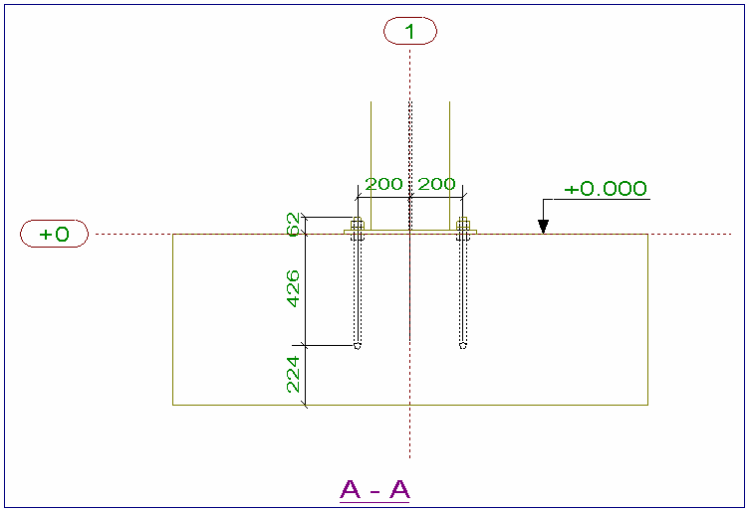
Level mark can be inserted at any picked point in the drawings and it will automatically give you the elevation of that point.

Create level mark

1. Click the **Create level mark** icon.

2. Right click and use the **Near** snap override pick a point at the top of the foundation.

3. Free pick another point to set the direction of the level mark.
4. The level mark will appear at the selected location.



13.4 Updating GA Drawings

GA drawings are automatically updated when you make changes to the model. However, GA drawing marks are not automatically updated. You need to update these by pressing the **Update marks** button in the drawing list before opening the drawing.