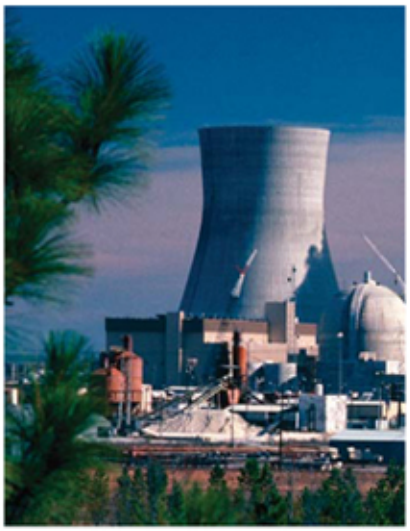
SmartPlant 3D

Practice Labs for Hangers and Supports

Process, Power & Marine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SP3D Hangers &Supports Practice Lab: Placing Supports Positioned by Structure

Placing a Support by Structure:

Place standard support by structure **U Shaped Frame L2x2x1/8 w/o Baseplate,** using the pipe straight feature **2001-P** and the beam on the steel structure that crosses the pipe straight feature **2001-P**. Using **Toggle Connection to Structure**, attach the structure to the bottom surface of the beam. The support should resemble the support in Figure 1.

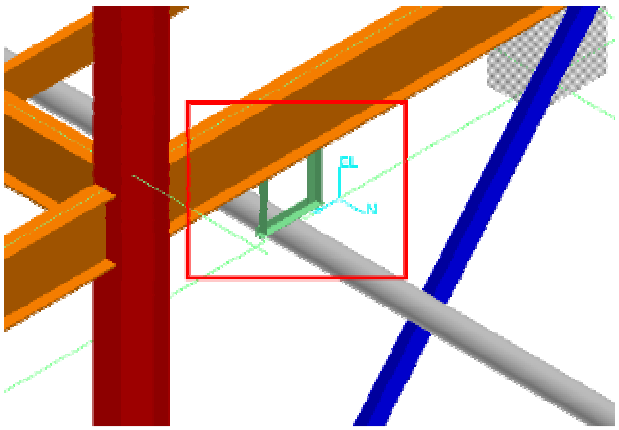

Figure 1: Output- Placed Support by Structure: U Shaped Frame

Steps:

1. Click the **Place Support by Structure** button on the vertical toolbar.
2. In the select straight feature smartstep, select the pipe straight feature **2001-P** that will be supported.
3. Click the **Accept** button on the ribbon to accept the selection and indicate that you have selected the features to be supported.
4. In the select structure smartstep, select the beam that crosses the pipe straight feature **2001-P**.
5. Click the **Accept** button on the ribbon to accept the selection and indicate that you have no more supporting structure for the support being placed.
6. From the **Type** drop-down list, select **U Shaped Frame L2x2x1/8 w/o Baseplate**.
7. Click the **Toggle Connection to Structure** button to attach the structure to the bottom surface.
8. Click the **Finish** button on the ribbon to commit the support to the database.

SP3D Hangers & Supports Practice Lab: Placing Supports Positioned by Point

Placing a Support by Point:

Place a standard **U Shaped Frame L3x3x1/4 w/Baseplate** support supported by the slab **Slab-1-0003** at a specific point on a pipe straight feature of pipe run **U03-10-W-0002-1C0031**. The Standard Support should resemble the highlighted supports in Figure 1.

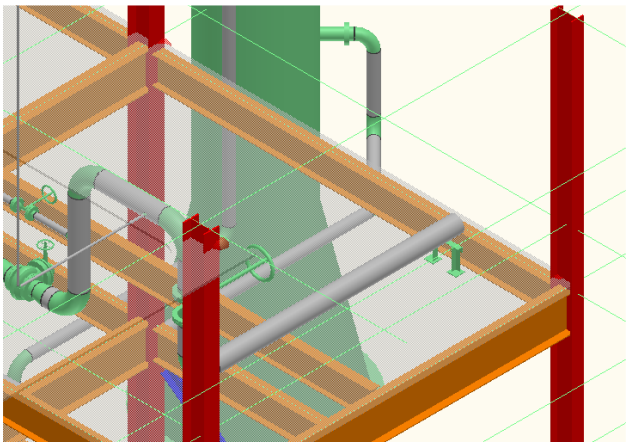

Figure 1: Output: Supports Placed by Point: U-Shaped Frame

Steps:

1. Click the **Place Support by Point** command on the vertical toolbar.

2. In the select feature smartstep, select the pipe straight feature of **U03-10-W-0002-1C0031** that will be supported in an isometric view looking South-East.

3. Click the **Accept** button on the ribbon to accept the selection and indicate that you have selected the features to be supported.

4. In the select structure smartstep, select the indicated slab **Slab-1-0003** under the pipe straight feature of **2003-P**.

5. Click the **Accept** button on the ribbon to accept the selection of the slab **Slab-1-0003** and indicate that you have no more supporting structure for the support being placed.

6. From the **Type** drop-down list, select the **More…** option to select the support to be placed from the Catalog.

7. The **Select Support** dialog box appears. In this dialog box, select the support part with the part description **U Shaped Frame L3x3x1/4 w/Baseplate** and click **OK**.

8. In the position smartstep, click to enter the exact placement point along the feature. The point you enter is projected minimum distance to the feature. You can use any of the precision point tools, PinPoint, PointAlong, or SmartSketch keypoints to define your placement point.

   In this case, position the support at a distance of 6 inches from end of the pipe.
   - Activate PinPoint and reset the target to the end of the pipe.
   - Use the function key F7 to activate the North dimension and key-in 0.6 in.
   - Click anywhere in the graphic view.

9. Click the **Finish** button on the ribbon to accept the placement of the first support.

10. The command will now cycle to the Position smartstep defaulting to all options you previously selected. You can change any options you wish and repeat step 8 to place another support.

11. Terminate the **Place Support by Point** command by right-mouse click or picking the select command. The second support shown in dynamics will not be placed.

SP3D Hangers & Supports Practice Lab: Building Designed Supports

Creating a Designed Support by Adding a Part to a Standard Support:

Place a standard support by structure (of type **U Shaped Frame L2x2x1/8 w/o Baseplate**), by selecting the indicated pipe straight feature and structure beam, as shown in Figure 1. Place a support part, **Anvil_FIG137_12**, choosing the standard support as the parent. The resulting designed support is highlighted in Figure 1 (Isometric view **Looking South-West**).

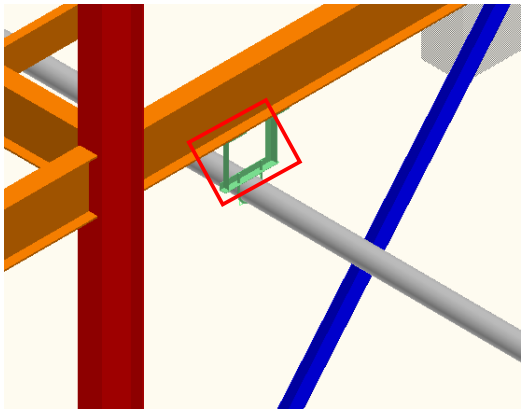

Figure 1: Output: Placed Designed Support U Bolt Anvil_FIG137_12

Steps:

1. Place the standard support **U Shaped Frame L2x2x1/8 w/o Baseplate** by structure, using the indicated pipe straight feature on pipeline **2001-P** and the indicated steel beam that crosses the pipe straight feature.

2. Click the **Place Part** button on the vertical toolbar.

3. Select the standard support, **U Shaped Frame L2x2x1/8 w/o Baseplate,** in which you will place the new part, a U-bolt. The system prompts you with a message. When you click **OK**, the system displays the **Select Part** dialog box.

4. In the **Select Part** dialog box, select the part **Anvil_FIG137_12** to add it to the support.

5. Position and orient the selected part, **Anvil_FIG137_12**.

Creating a Designed Support and then Adding Parts to the Designed Support:

Place a designed support on pipeline **2001-P** and then manually select and position the individual parts of the support. The resulting support will resemble Figure 2 in standard Isometric view **Looking North-East**.

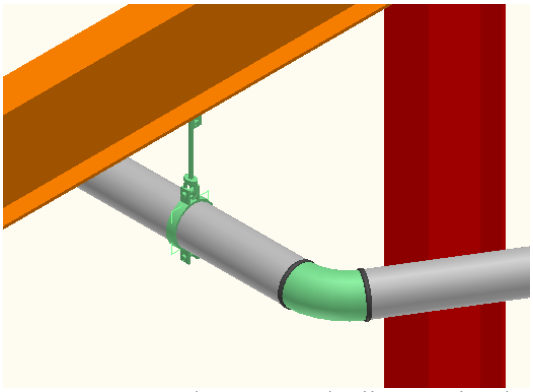

Figure 2: Output - Designed Support with All Parts Placed Manually

Steps:

1. Click the **Place Support by Structure** button, select the **Design** check box, and then locate the same straight feature in pipeline **2001-P** that you selected for the support in the previous exercise.

2. Select the crossing beam and accept the one selection. The highlighted green rectangle is the graphic for the designed support. Click **Finish** to commit the designed support to the database.

3. Click the **Place Part** button on the vertical toolbar and then, select a pipe clamp, **Anvil_FIG212_12** for the **6 in** diameter pipe.

4. Position the pipe clamp at the designed support location and use the **Rotate** command to orient the part on the pipe.

5. Click the **Place Part** button and select a rod fitting.

6. Position relative to the appropriate key point on the pipe clamp.

7. Click the **Place Part** button and select the rod, **Anvil_FIG140_4**.

8. Enter two points to place the rod. One point on the pipe clamp and one point in space vertically above the first point (locate the vertical axis with SmartSketch and click).

9. Click the **Place Part** button and select the beam attachment, **Anvil_FIG66_4**. Position the beam attachment directly over the rod, at the bottom surface of the beam.

10. Select the rod and then select the **Stretch** smartstep on the **Edit** ribbon. Select the key point on the beam attachment to define a new length for the rod.

Manipulating Parts in a Designed Support:

Place a lug on an elbow that is rotated relative to the unit's auxiliary coordinate system. The example is chosen to illustrate the manipulation of the part's position using the **Move** and **Rotate** commands and the key points of the part. The end result of the designed support and single part placement is shown in Figure 3.

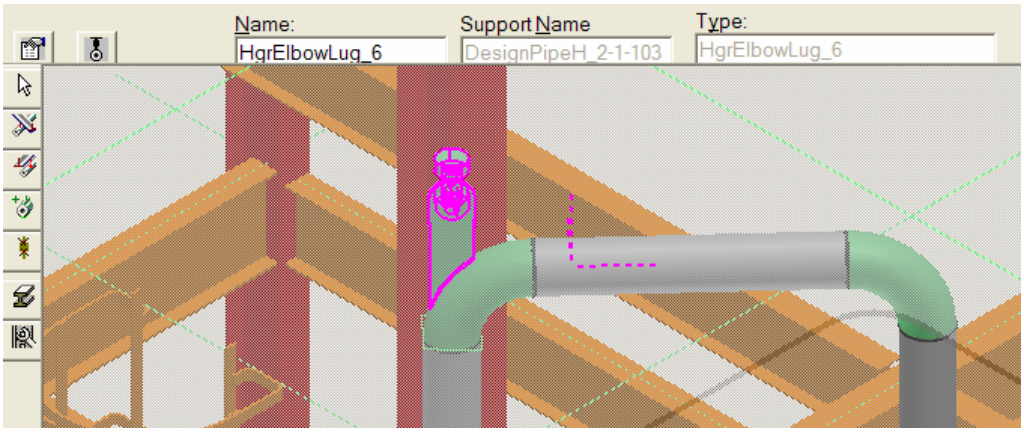

Figure 3: Final Position of Elbow Lug

1. Define your workspace to include system **A2 > U03** and **U03 CS** (including nested objects).

2. Make sure you are in the **Hangers and Supports** task.

3. Place a designed support by point selecting the elbow on pipeline **U03/Water/300-W**.

4. Select the slab as the supporting structure.

5. Position the designed support at the vertical port face of the elbow.

6. Create a temporary coordinate system for PinPoint by using the **By Three Points** method and align the Easting (x) axis with the plane of the turn and the elevation in the global vertical.

7. Click the **Place Part** button, select the designed support you just created, and then select the **Parts/Utility/Miscellaneoous/HgrElbowLug** part class.

8. Click the **Support Properties** smartstep on the placement ribbon and enter the radius of the long-radius elbow (1.5 x NPD = 16.125 in) in the **Bend Radius** dimension property of the lug.

9. Toggle the key point being used for placement from the center of radius to the point that corresponds to the horizontal port of the elbow.

10. Click the **Rotate** button on the **Common** toolbar to rotate the part into position. The default rotation point is the origin of the part's local coordinate system. In this case, this is not the desired rotation point. Select the **Axis Position Point** toggle to move the rotation point.

11. Select the port of the elbow (or the end of the straight feature) as the rotation point.

SP3D Hangers & Supports Practice Lab: Editing Supports

Adding Supported Features to a Support:

You will copy/paste pipe run **U02-6-P-0001-1C0031** to create pipe run **U02-6-P-0101-1C0031** in pipeline **2001-P** in Unit **U02**. You will then extend the U-frame pipe support, **U Shaped Frame L2x2x1/8 w/ Baseplate**, to include an additional pipe. After the new pipe is created and the support is extended, it will resemble the highlighted support in Figure 1.

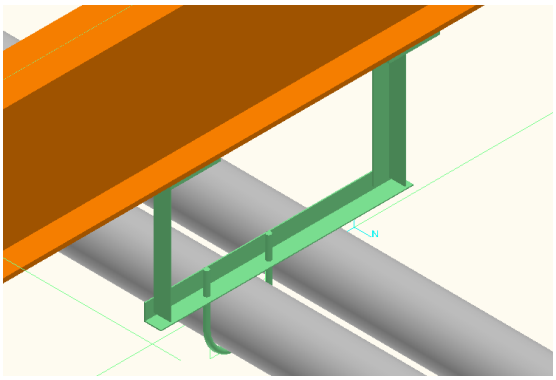

Figure 1: Output: Support Extended for Additional Pipe

Steps:

1. Copy run **U02-6-P-0001-1C0031** and paste it at a distance of **10 in** west from original location. This will create run **U02-6-P-0101-1C0031**.

2. Select the standard U-frame support that is nested under designed support, select the select straight feature smartstep, and select the straight feature of the new pipe run to add it to the support. Accept the selection and click **Finish**.

3. Click the **Settings** option on the **Support Placement** ribbon to edit the properties of the support.

4. The **Support Properties** dialog box is displayed. Change the span of the support to **2 ft**, and click **OK**.

Copying and Pasting Supports:

You can copy and paste an entire support or just a support part. Copy the U-bolt in the designed support of the previous exercise to the adjacent pipe, as shown in Figure 2.

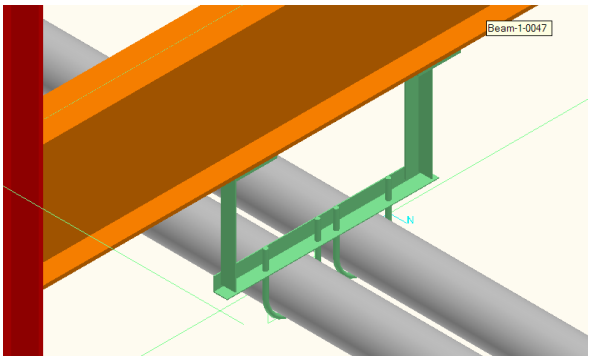

Figure 2: Output: Pasted Support

Steps:

1. Select the U-bolt (part number **U Bolt Anvil_FIG137_12)**.
2. Click the **Copy** command.
3. The **Copy** command prompts you to select the reference point within the selected set of objects. Select the key point located where the pipe and the support touch.
4. Click the **Paste** command to paste the objects.
5. The **Paste** dialog box appears. In this dialog box, you define inputs needed by the objects you are pasting. All design objects will at least require a system parent. In this case, paste the U-bolt to the same parent designed support system.
6. Paste the U-bolt using the keypoint of the U-frame support located where the pipe and the support touch.

Deleting Supports in a Model:

Steps:

Delete the designed support you have just created.

1. Select the **Support** option in the **Locate Filter** drop-down list.
2. Position your cursor over the U-frame support and pause. The **QuickPick** dialog box displays. Highlight the options and select the designed support. The designed support is the system parent of the U-frame assembly and the two U-bolt parts.
3. Click the **Delete** button on the Common toolbar to delete the designed support and all objects nested in the system hierarchy under it.
4. Set your select filter to **All** and pick the pipe run you created in this exercise and delete it.