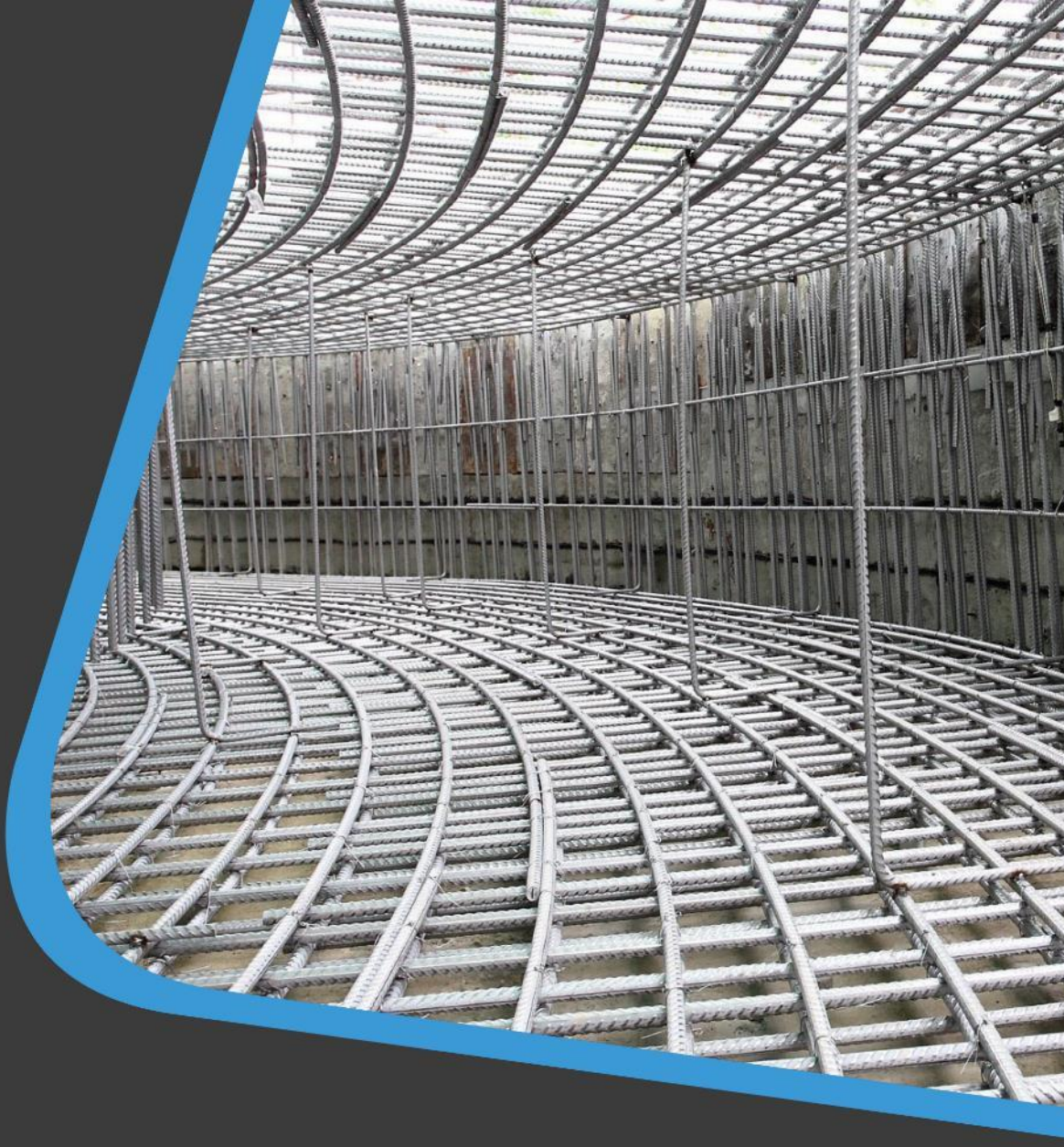


CADS RC
Guide to Bar Shape Creator

CADS
GLOBAL CONSTRUCTION
SOFTWARE AND SERVICES

AUTODESK
Authorised Developer

Microsoft
Partner

Revision history

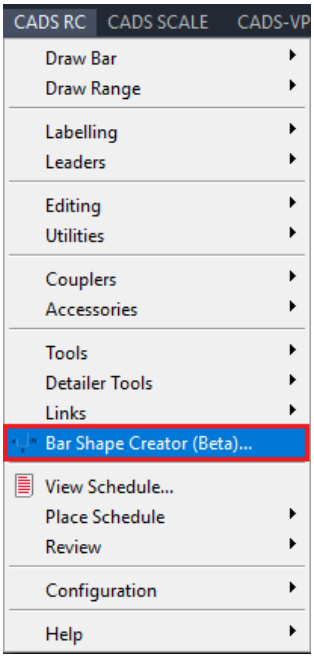
Date	Version	Description
Oct 2025	1.0	Compatible to CADS RC 2026.0

Contents

1 Introduction

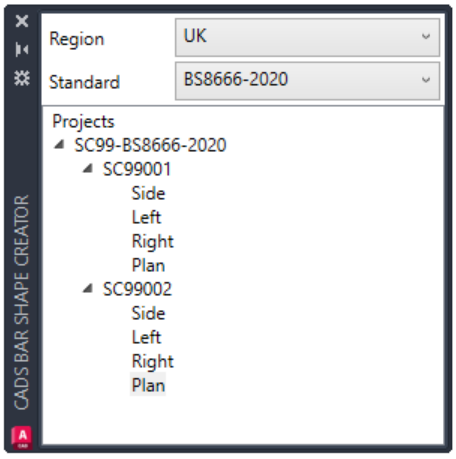
This manual explains how to create your own custom shape code in CADS RC v2026 or higher.

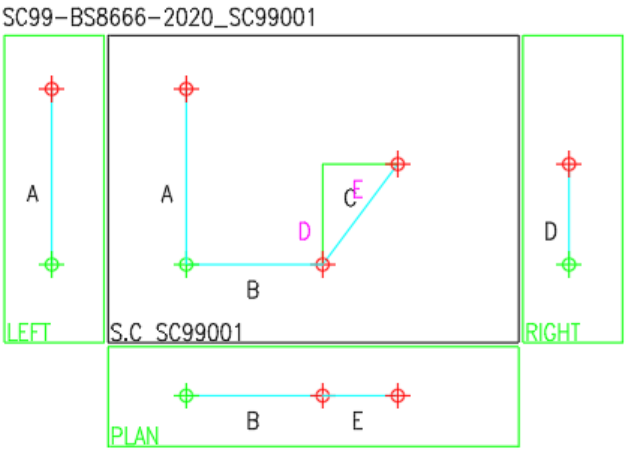
2 Bar Shape Creator Panel

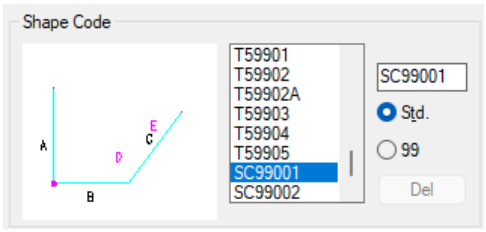


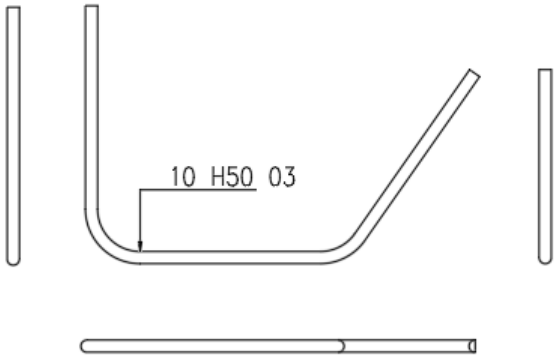
The Bar Shape Creator contains the functionality to create unique Shape Codes within CADS RC. Once the shape code has been drawn, the Bar Shape Creator can validate the shape code and generate a Bar Definition File (BDF) along with shape code sketches and slide diagrams for the schedule. The Bar Shape Creator supports inclined bar legs, hooks, arcs, semi-circles and Couplers.

- Currently the Creator support three international regions UK, USA and India.
- Multiple BDF files can be created, and these are stored in separate project files.
- Each Shape Code can have up to four different views, Side, Left, Right & Plan.
- Functionality exists to combine Bar Definition Files (BDF) where additional shape codes need to be added.
- The Shape Code must be created at 1:1 scale in model space.







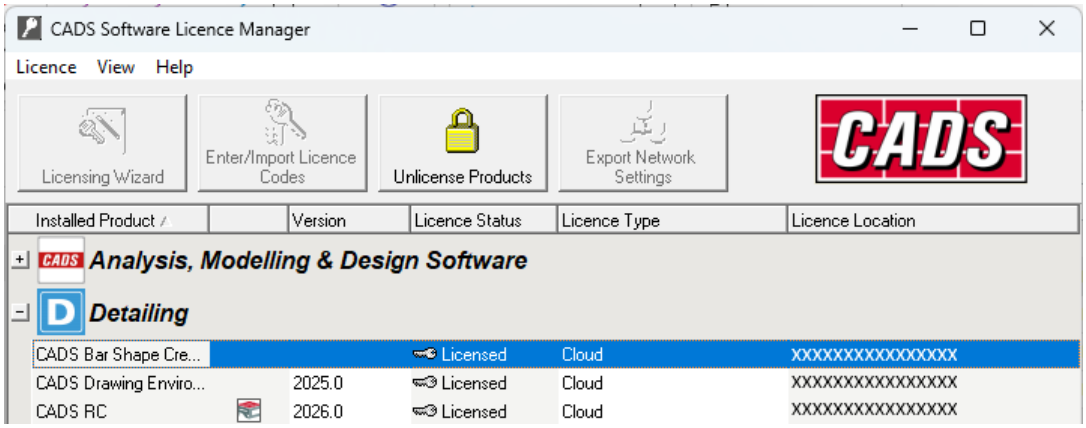


2.1 CADS Bar Shape Creator Installation and Licensing

The Shape Creator is installed as part of CADS Detailing Software. The Installation Sheet will show the CADS Bar Shape Creator on the list of Applications.

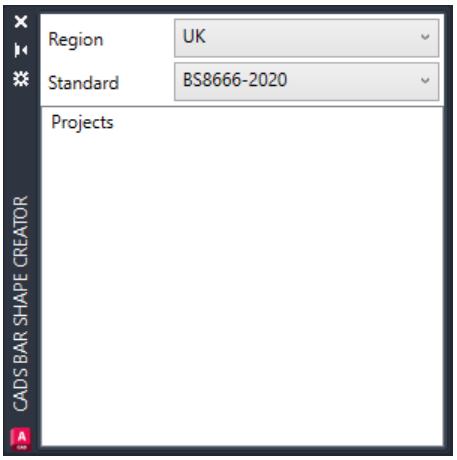
PROGRAM
CADS Drawing Environment
CADS RC
CADS SCALE
CADS Viewport Manager
CADS Bar Shape Creator
CADS RC/RebarCAD Extended Features

The CADS Bar Shape Creator can only be activated with a cloud license inside the CADS Software License Manager. The cloud license will be included with your Installation Sheet and software download details.



3 Bar Shape Creator Dialog

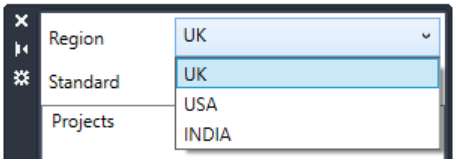
The Bar Shape Creator dialog can be loaded from the CADS RC Ribbon, BDF Panel or from the CADS RC pull down menu – Bar Shape Creator.



The command can also be called from the AutoCAD command line by typing in "CADS_RC_BDFCREATOR"

The dialog contains three options to set the Region, the Detailing Standard and to Create a Project.

3.1.1 Region



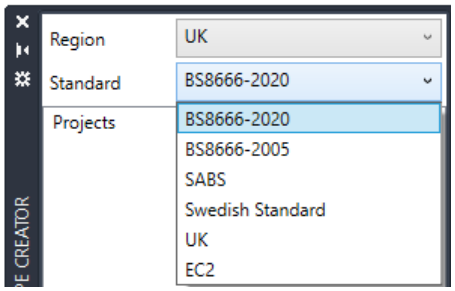
Currently the Bar Shape Creator supports three international regions

- **UK** United Kingdom
- **USA** North America
- **India** India

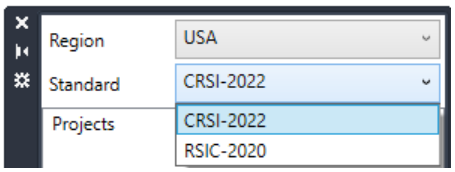
3.1.2 Standard

This option sets the Detailing Standard to be used when creating the Shape Codes.

UK



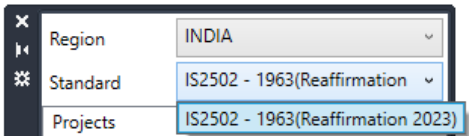
USA



If the region is set to USA, Shape Codes can be created to the following Standards;

- **CRSI 2022** America Standard
- **RSIC 2020** Canadian Standard

INDIA



If the region is set to India Shape Codes can be created to the following Standard;

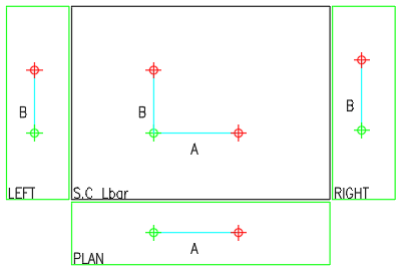
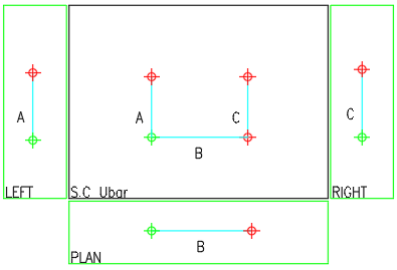
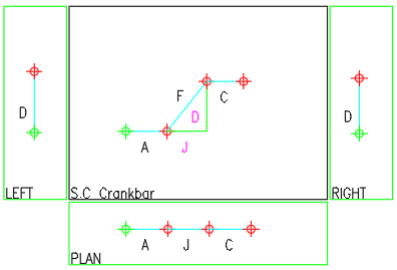
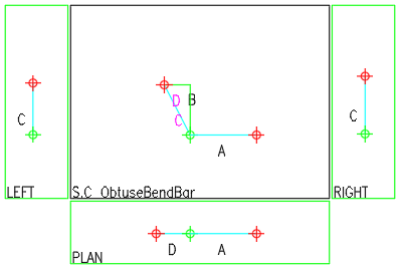
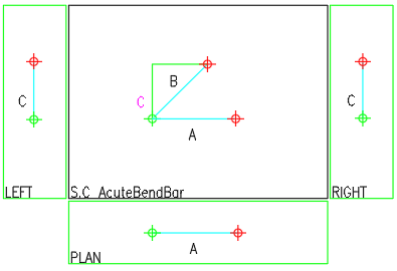
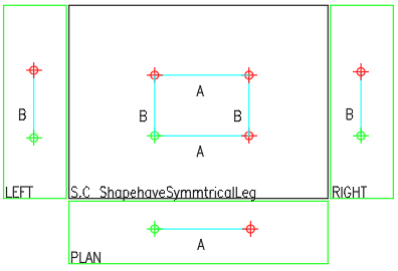
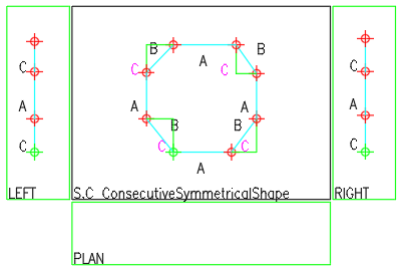
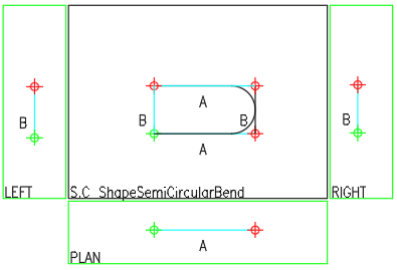
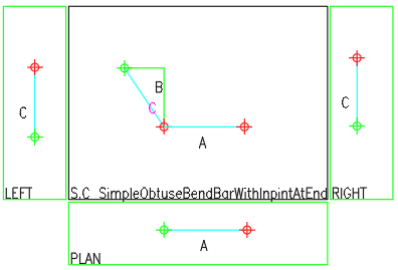
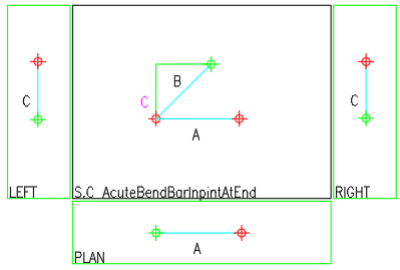
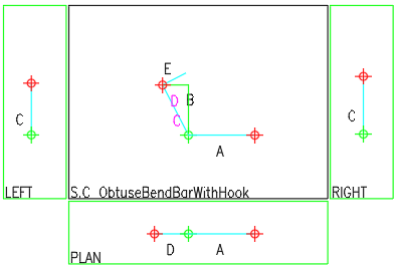
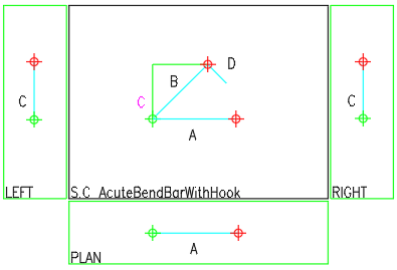
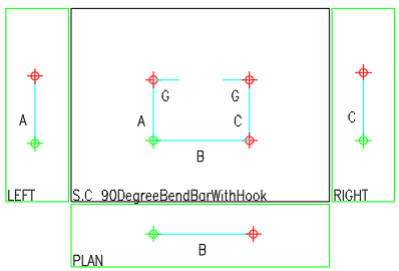
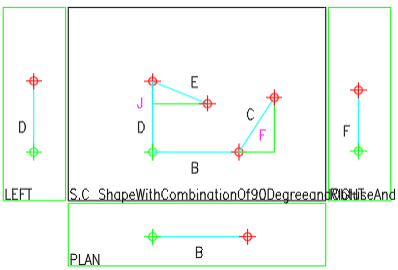
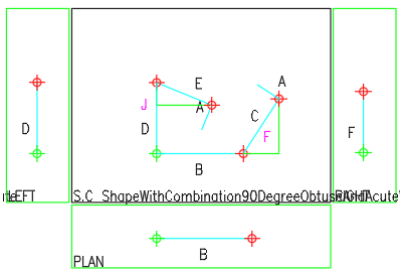
- IS2502 1963 (Reaffirmation 2023) Indian Standard

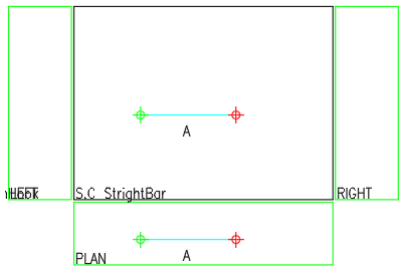
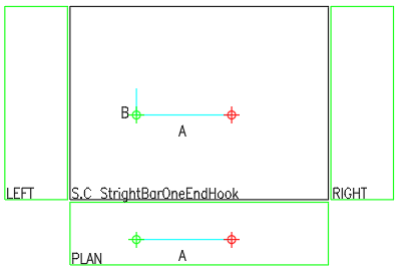
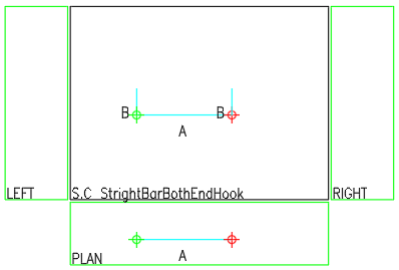
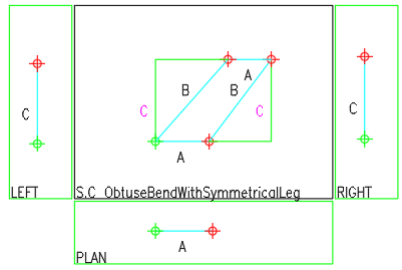
3.2 Limitations

- Create the Shape Codess in Model Space at a scale of 1:1.
- Bar Legs should not be deleted, the whole shape code should be removed using Delete View so the drawing and memory are updated correctly.
- Do not use AutoCAD Undo to restore the Shape Code to the screen only use Restore Deleted Entities or Restore Deleted Shape Codes.

3.3 Supported Shape Codes

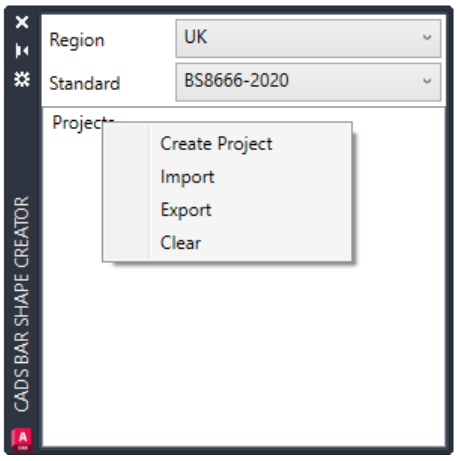
Shown in the Table below are examples of the Shape Codes supported in the Bar Shape Creator.

		
L Bar	**U Bar**	**Crank Bar**
		
Obtuse L Bar	**Acute L Bar**	**Rectangular Symmetrical**
		
Octagonal Symmetrical	**Semi-Circular U Bar**	**Obtuse L Bar, Alt Start Point**
		
Acute L Bar Alt Start Point	**Obtuse L Bar with Hook**	**Acute L Bar with Hook**
		
U Bar with Hooks	**Angled Bar**	**Angled Bar with Hooks**

		
Straight Bar	**Straight Bar with One Hook**	**Straight Bar with Two Hooks**
		
Inclined Symmetrical Shape Code		

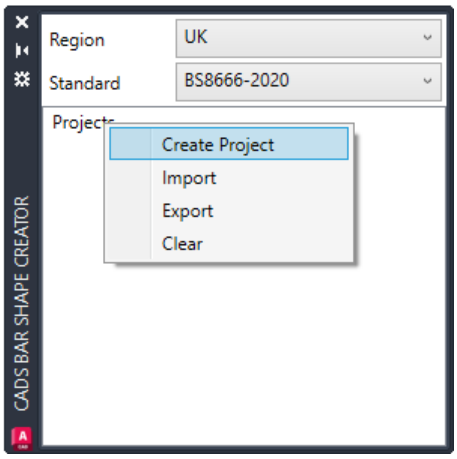
3.4 Project Right Click Menu

The options on the right click menu allow the creation of a New Project, Importing a Predefined Project File (JSON) and Exporting an Existing Project to a File. The Clear option will delete the project and all its associated information.



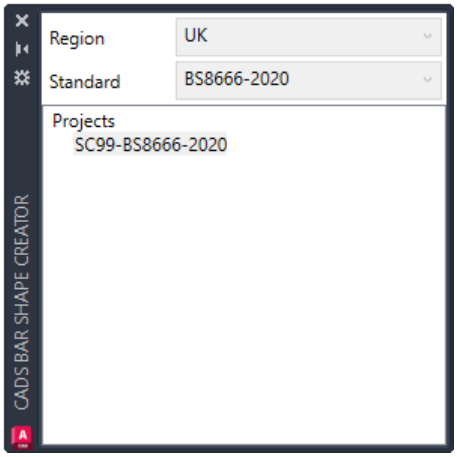
3.4.1 Create Project

The Create Project Option allows the definition of a Project Name that can be associated with a particular project, customer etc.



Multiple projects can be created each with their own unique set of shape codes.

1. **Enter Project Name:** Type in a suitable project name i.e. SC99-BS8666-2020.
2. Once the Project Name has been defined it will appear in the dialog as shown below;



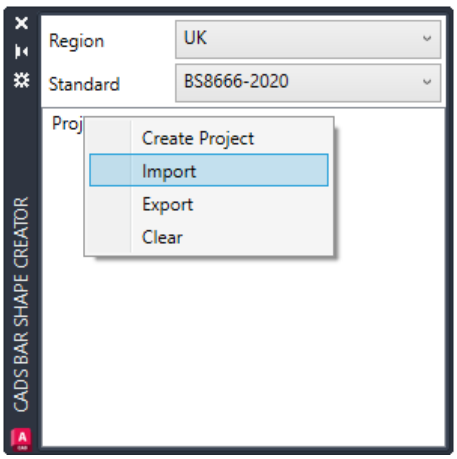
3.4.2 Import

The Import option will load a predefined Project into the Bar Shape Creator dialog.

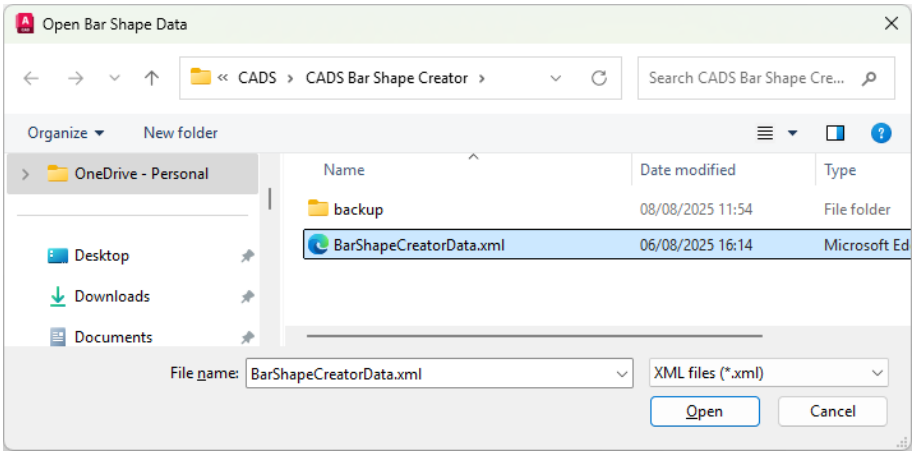
This command can be used to add further shape codes to an existing Project.

The default location for the Project JSON XML file is "*C:\Users\username\Documents\CADS\CADS Bar Shape Creator*" folder.

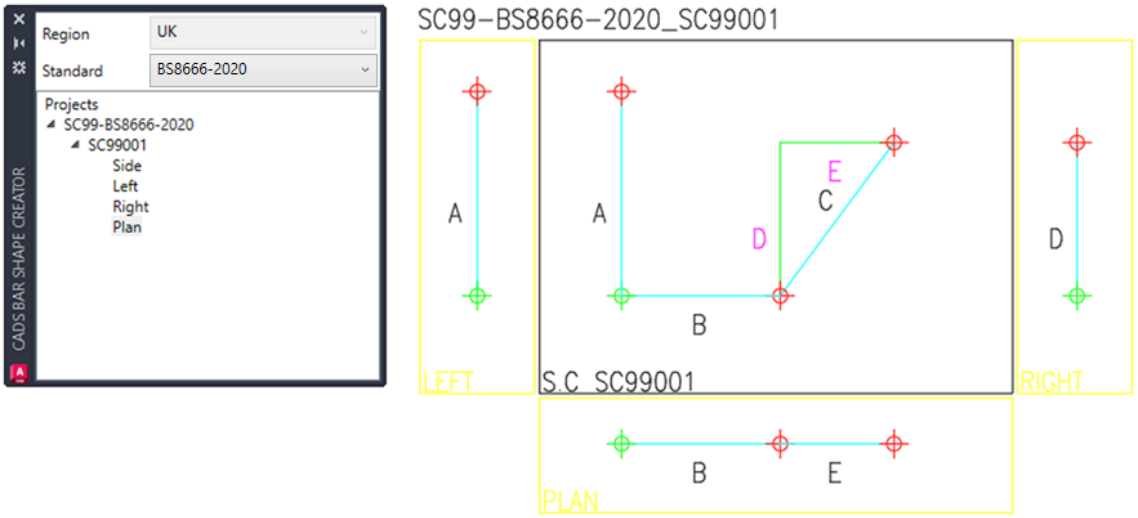
1. Open a new template drawing and then Import the Project XML file.



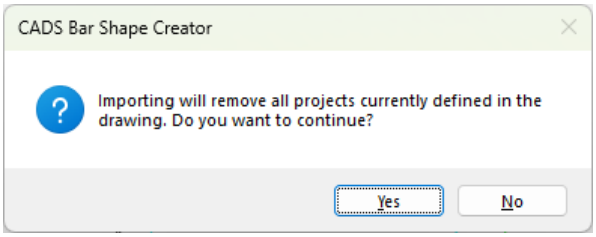
2. Selecting the Import option displays the Open Bar Shape Data dialog, navigate to the appropriate folder and select the predefined Shape Code JSON file that was previously created using the Export command.



3. **Click to select the insertion point where the project should be placed:** Pick a point on the screen to place the predefined shape codes associated with the Project.



The Import option will prompt for confirmation to prevent the accidental deletion of existing projects and shape codes.



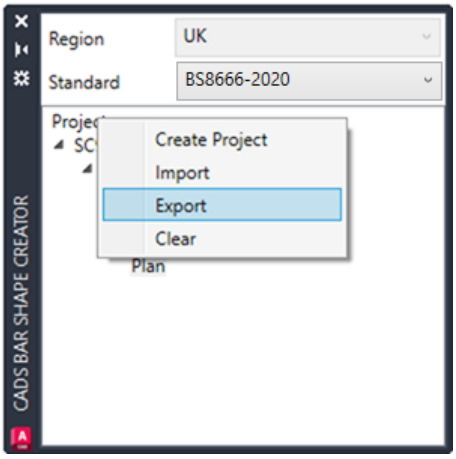
3.4.3 Export

Use the Export option to create a Project JSON file associated with the BDF file. By saving the Project to an JSON it can be imported into a new drawing and further shape codes can be added and a new BDF file generated.

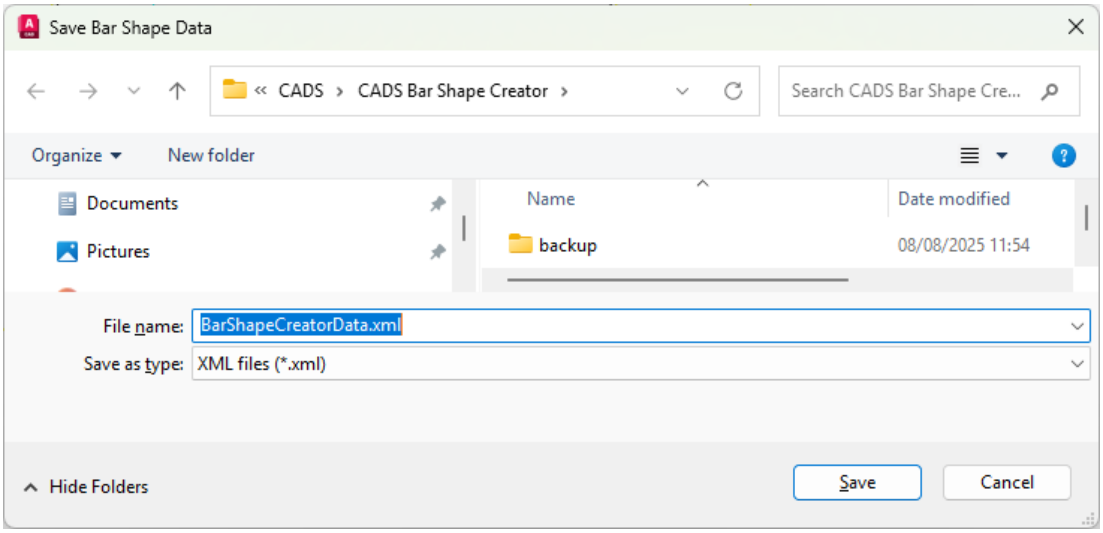
It is recommended to Export to an JSON file after creating each Shape Code.

The default location for the Project JSON file is "*C:\Users\username\Documents\CADS\CADS Bar Shape Creator*" folder.

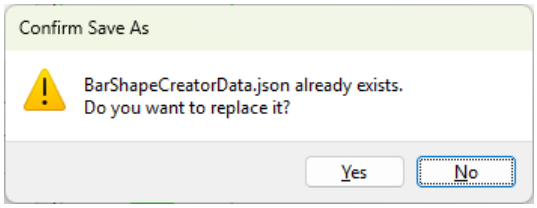
1. Right-mouse click on the Projects Option and select Export.



2. The default folder for Exporting the Project File (JSON) is "*C:\Users\username\Documents\CADS\CADS Bar Shape Creator*"

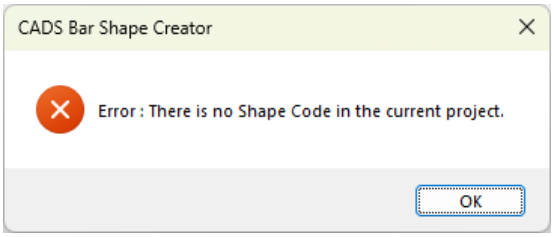


3. Accept the default name or type in your preferred name and click Save. If the file with the same name already exists, this warning message is displayed.

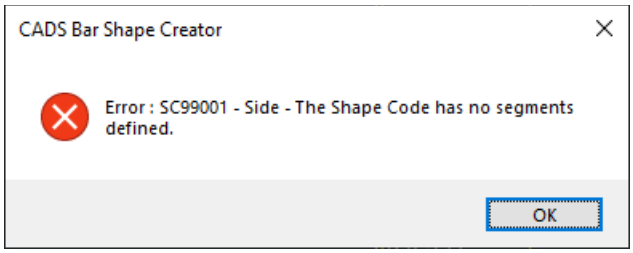


Error messages reported by the Export function

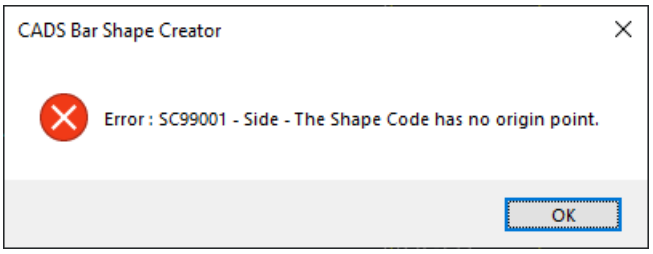
- There must be at least one shape code in the project before it can be exported



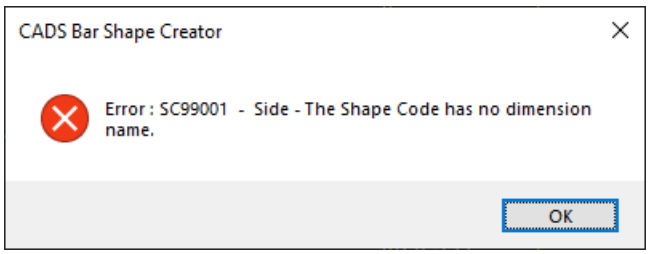
- There must be at least a Side View for every Shape Code created in the Project before it can be exported.



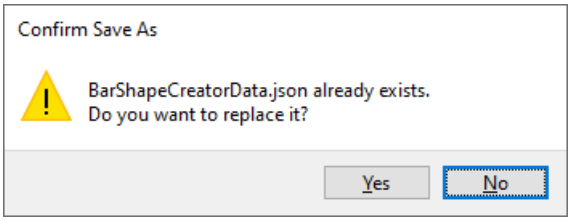
- There must be origin defined for every Shape Code created in the Project before it can be exported.



- There must be leg dimensions assigned for all the segments for every Shape Code created in the Project before it can be exported.

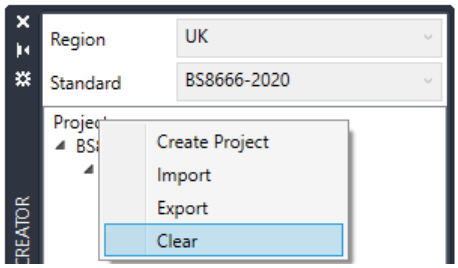


- Warning that an existing JSON file of the same name exists.

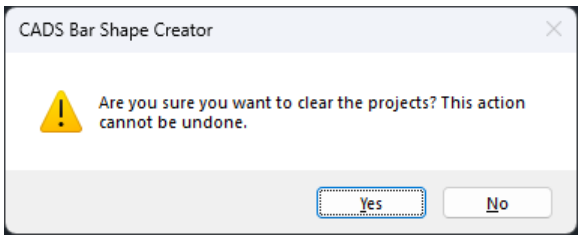


3.4.4 Clear Project

Use the Clear Project option to delete all the Projects, including their shape codes, views and associated drawings from the dialog and the drawing.



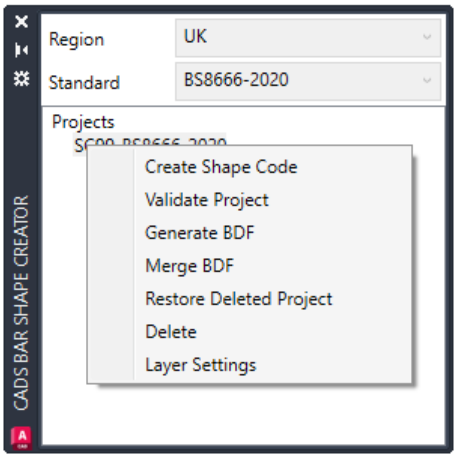
1. Right-mouse click on the Projects Option and select Clear
2. The Clear option will ask for confirmation of the action to prevent accidental deletion.



- **Answering Yes**, all loaded projects, including their shape codes and views, will be permanently deleted from both memory and the drawing.
- **Answering No**, no action is taken, and the dialog is closed.

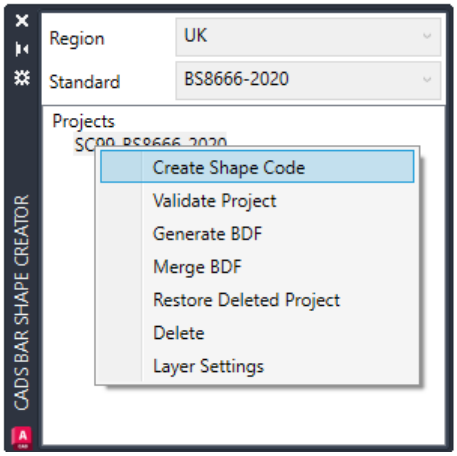
3.5 Shape Code Right Click Menu

Use the Right Click Menu to Create a New Shape Code, validate the project prior to using the Generate BDF option. Existing BDF files can be merged to form one BDF file. The Restore Deleted command can be used to restore entities in the current drawing that have been accidentally deleted or removed using AutoCAD commands. The Layers used by the Bar Shape Creator can be defined using the Layer Settings.



3.5.1 Create Shape Code

1. Add a new ShapeCode to the Project, highlight the Project Name in the list and right click.



2. Select the Creator Shape Code option. The name and the description of the shape code this will be prompted in the AutoCAD command line;

Define Shape Code Name & Description

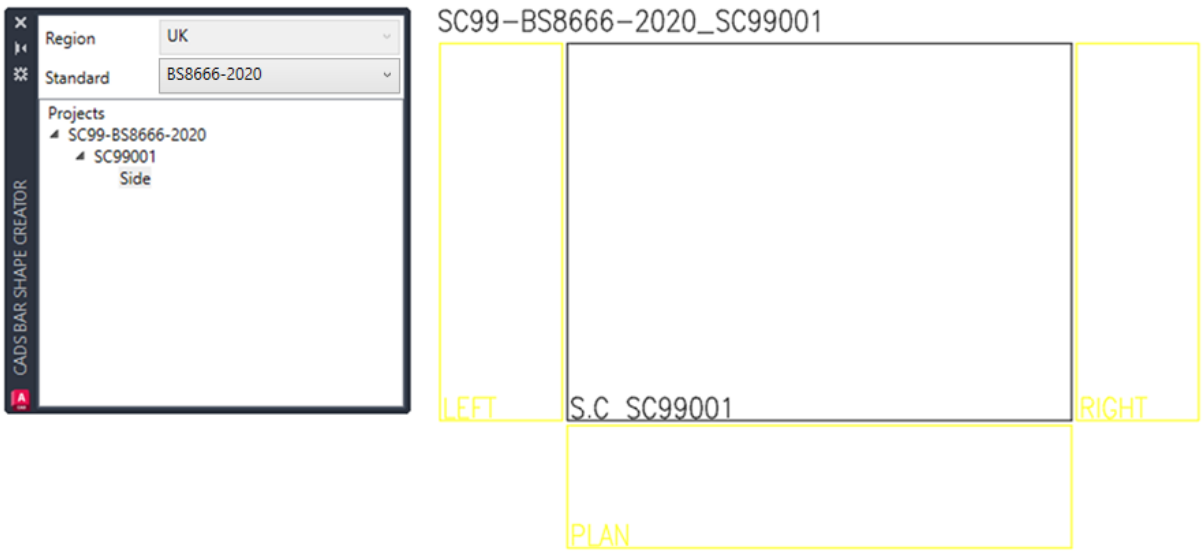
3. **Enter Shape Code Name**: SC99001.
4. **Enter Shape Code Description**: Cranked U Bar.

Note: The use of Special Characters and Spaces are prohibited in the Shape Code name.

5. Once the name has been defined, a shape code definition boundary is generated which needs placing in the positive quadrant of the drawing.
6. The Shape Code Boundary contains the areas to draw the Side, Left, Right and Plan Views of the Shape Code.

Shape Code Definition Boundary

7. **First Corner:** Pick Boundary Insertion Point.

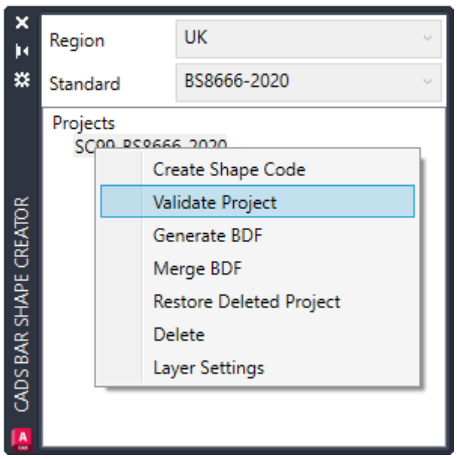


8. The Side View of the Shape Code is added automatically to the Shape Code Name in the Bar Shape Creator dialog.

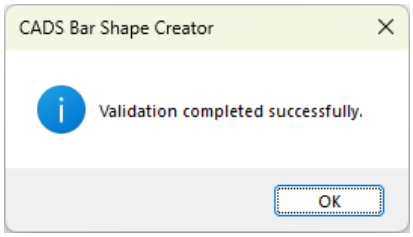
3.5.2 Validate Project

Use the Validate Project command once all the shape codes and their Views have been drawn and defined. The command will report back if there is any incomplete information in the project and will give specific details of each missing item.

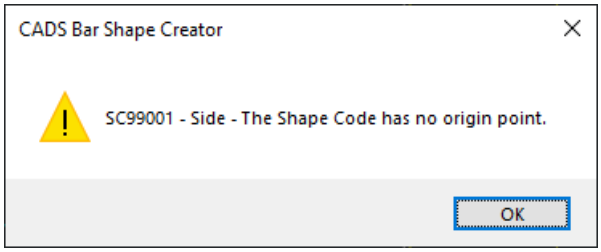
Right-mouse click on the Project Name and select Validate Project.



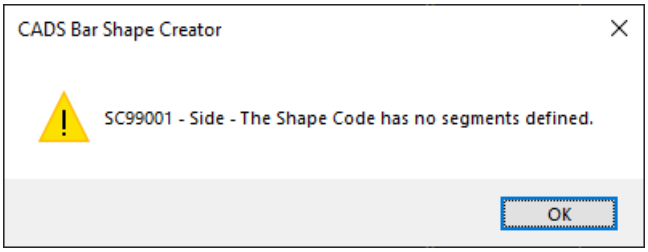
If everything in the Project has been defined and passes the validation the following message is displayed.



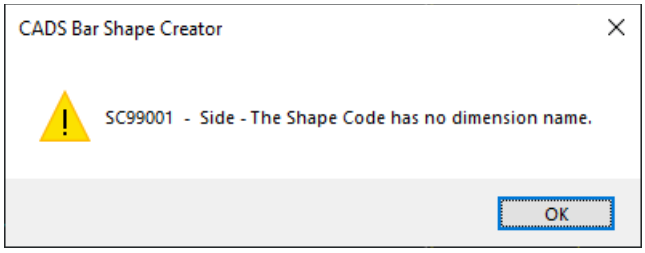
If the project contains any incomplete shape codes, appropriate warning messages are displayed. If the origin is not defined, the following message is displayed.



If the segments are not defined, the following message will be displayed.



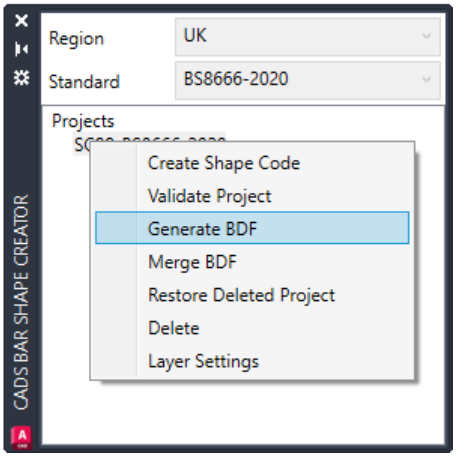
If the dimension names are not defined, the following message will be displayed.



3.5.3 Generate BDF

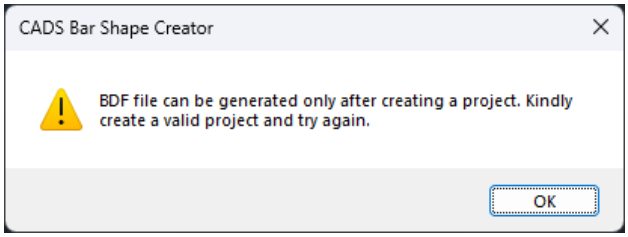
Once the project has been validated and passed, use the Generate BDF command to create a Project Bar Description File.

1. Right-mouse click on the Project name and select Generate BDF.

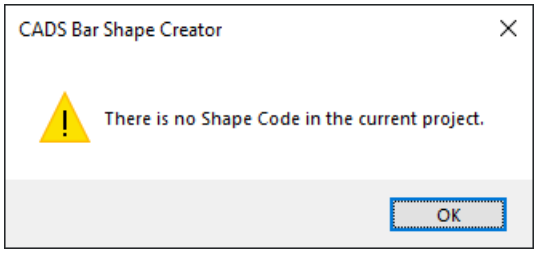


2. If the Validate Project has not been run prior to selecting the Generate BDF command, it will be automatically run. A BDF file cannot be generated until the Project passes validation.
3. The following checks are carried out prior to generating the BDF file;

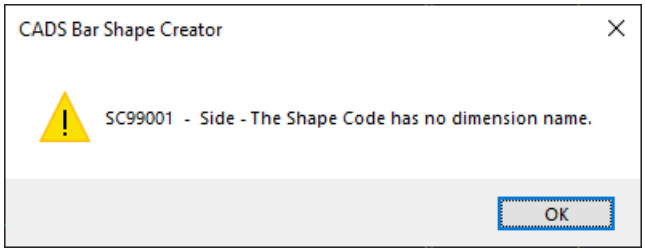
- Has a project been created.



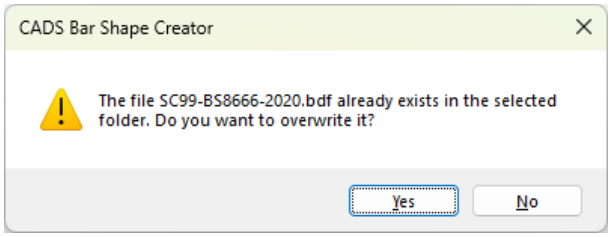
- Does the Project contain at least one Shape Code.



- Do all the shape codes in the project contain the required information such as segments, dimensions and origin points.



4. After this the command will prompt for a folder to be selected in which to save the BDF file.
5. The file will have the extension *.BDF, the default folder for the BDF files is "*C:\Users\username\Documents\CADS\CADS Bar Shape Creator*".
6. If a BDF file of the same name exists a conformation dialog is displayed.



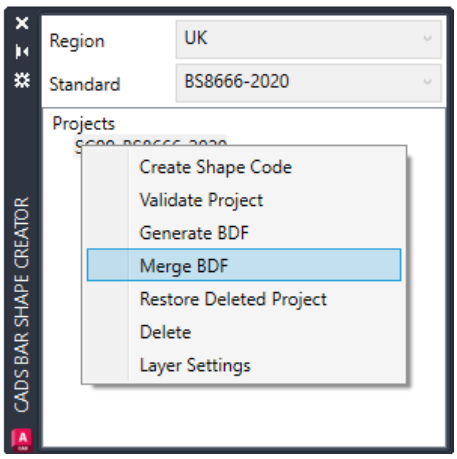
- **Answer Yes** to overwrite the file.
- **Answering No**, will display the folder selection dialog again so another folder can be selected.

A BDF file is created which includes all the program specific variables and the complete formatted content for every shape code in the Project. A Slide Library (*.SLB) file is generated in the same folder as the BDF file, containing images of each Shape Code defined in the BDF file.

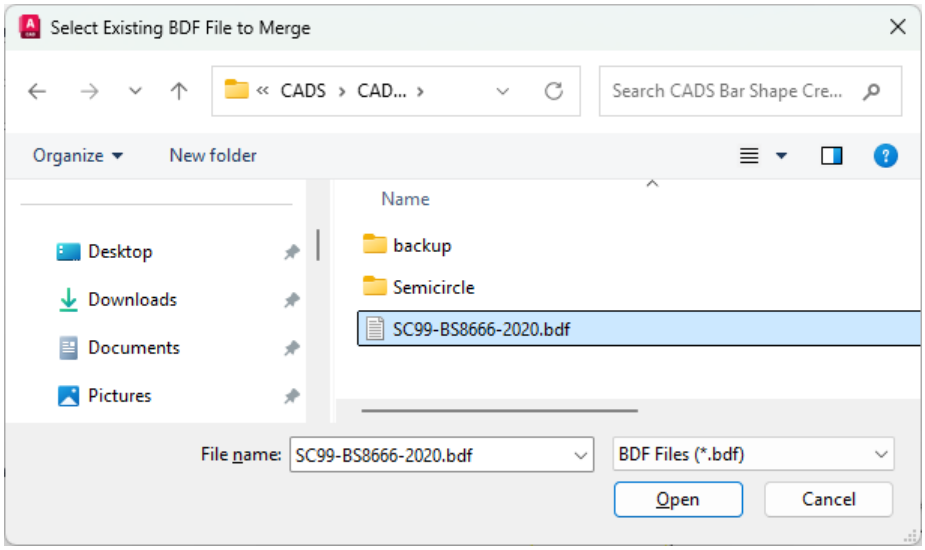
3.5.4 Merge BDF

Use this command to merge the Shape Code defined in the current Project with the selected Project File.

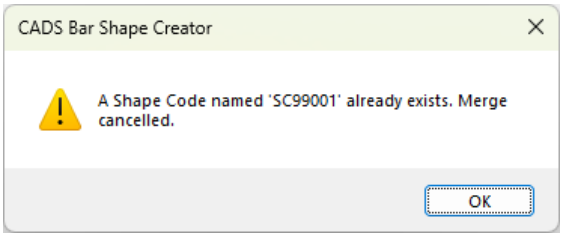
1. Right-mouse click on the Project and select Merge BDF.



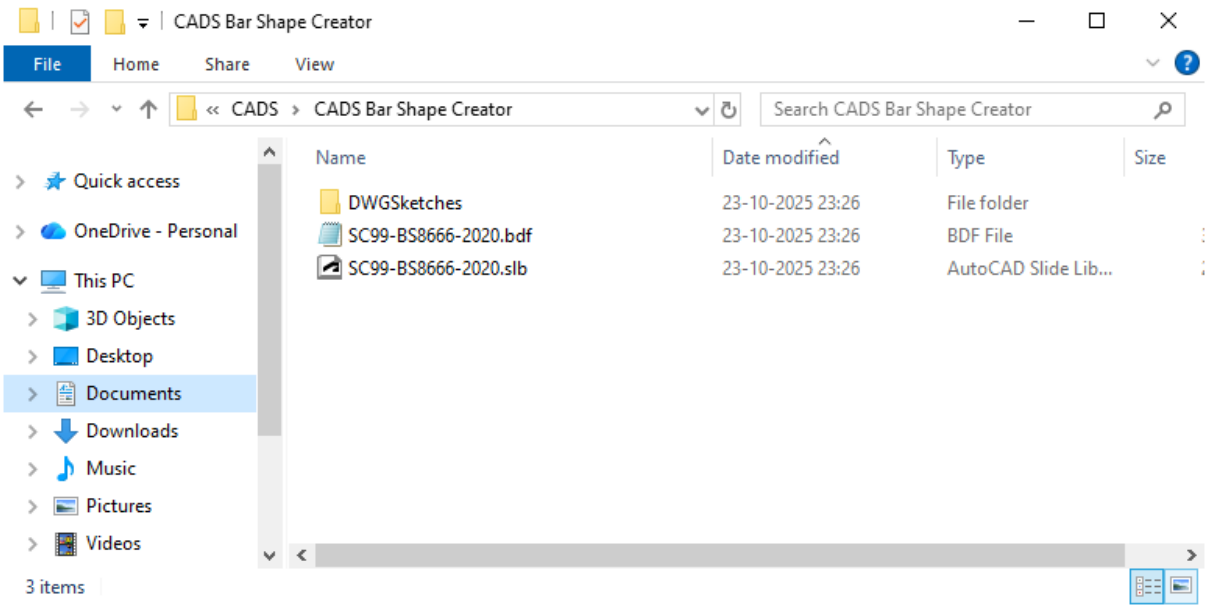
2. Select the Existing BDF file to Merge in the dialog that is displayed and Click Open.



3. If the shape code name in the destination project already exists the following error message is displayed, and the function is cancelled.



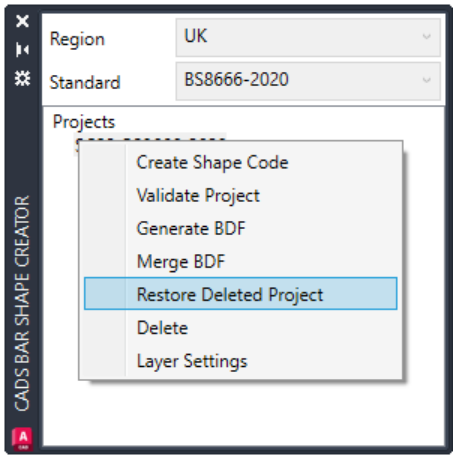
4. Upon merging the project with an existing BDF file, the shape codes are updated in the selected BDF. Subsequently, a .SLB file is generated at the location of the merged BDF file, named according to the project. This .SLB file contains the slide images of the merged project.



3.5.5 Restore Deleted Shape Codes

As all the information relating to the Project is stored in memory the Restore Deleted command feature will restore entities of one or more shape codes in the drawing that have been accidentally deleted or removed.

1. Right-mouse click on the Project Name and select Restore Deleted Project.

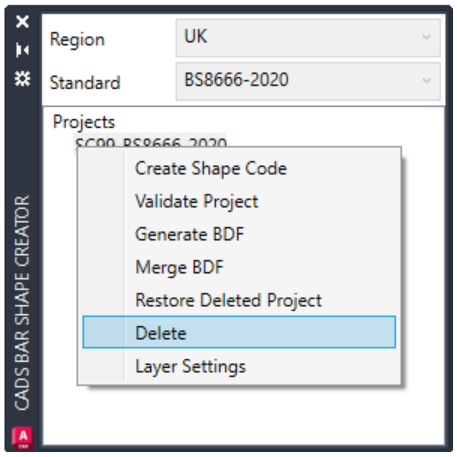


2. Any entities deleted using AutoCAD commands will be restored to the Project and Drawing.

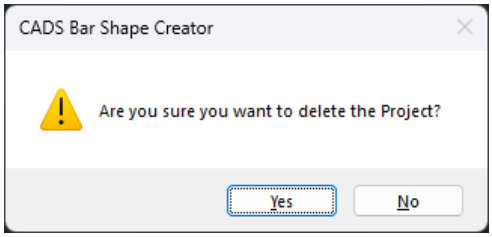
3.5.6 Delete

The Delete option will remove the selected Project from both the system and the drawing including all associated Shape Codes and their entities.

1. Right-mouse click on the Project Name and select Delete.



2. As this command deletes Project Information a confirmation dialog is displayed, this is to prevent accidental deletion of critical project data.

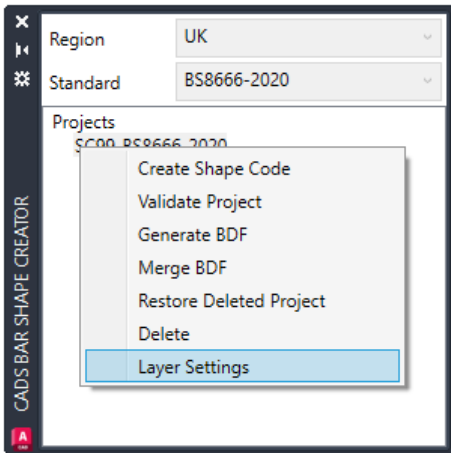


- **Answer Yes** and the Project is Permanently removed from the system and all associated shape codes, entities and data are erased from the drawing.
- **Answer No**, all data is retained in the Project and no changes are made.

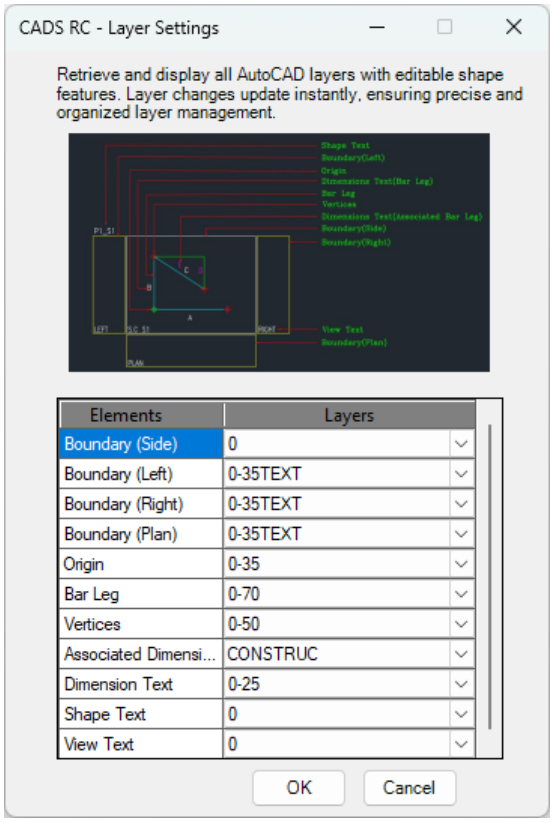
3.5.7 Layer Settings

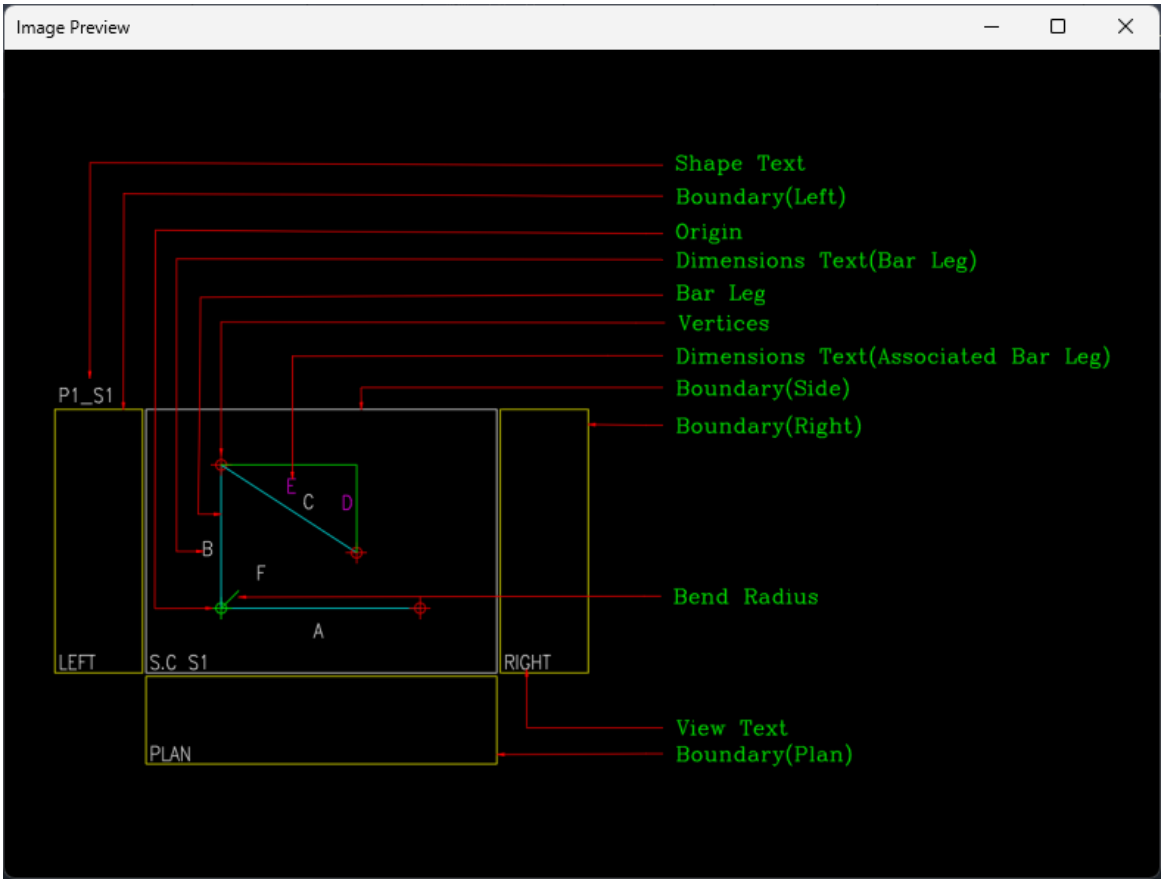
Use the Layer Settings option to define the AutoCAD layers that each of the elements use in defining the Shape Code and the Shape Code Boundary.

1. Right-mouse click on the Project Name and select Layers.



2. The Layers drop down displays the currently defined layers in the drawing.
3. Any changes to layer names for each of the elements are updated as soon as the dialog is closed. Clicking on the image opens the details in an enlarged window for improved visibility.



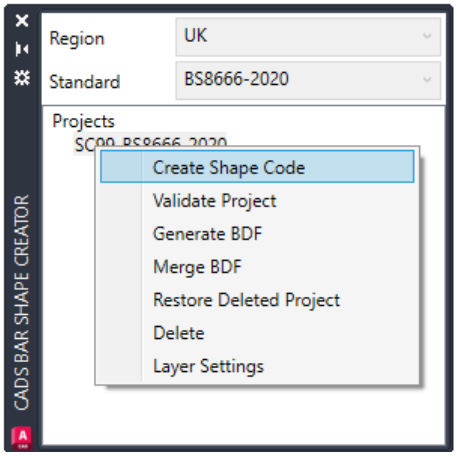


3.6 Create Shape Code

Once the Shape Code Name and Description have been defined the Views of the Shape Code can be added to the drawing along with their Leg Dimensions and the Origin Point.

- The Side View is added automatically when the Shape Code name is defined as every shape code has to have a minimum of a Side View.
- The **Side View** of the shape code **MUST** be defined before any of the other views.
- The Shape Code must be created at 1:1 scale in model space.

1. Right-mouse click on the Project Name and select Create Shape Code.

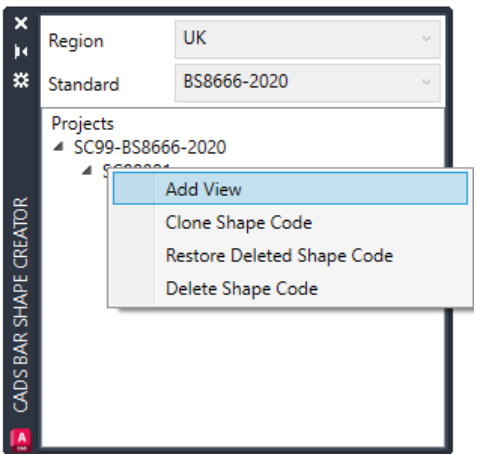


2. **Enter Shape Code Name:** Type in the shape code name without spaces or special characters, press enter to continue.
3. **Enter Shape Code Description:** Type in the shape code description and press enter to continue.
4. Note that the Side View is automatically added when a Shape Code is created, this is the minimum number of view that need to be created for a shape code.
5. See **Chapter 4** for examples of drawing and defining example Shape Codes.

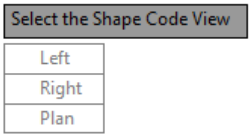
3.6.1 Add View

Use this option to add extra views of the shape code.

1. Right-mouse click on the Shape Code and select Add View.



2. Select the View required from the list.



3. Or, type in the first letter of the view required at the AutoCAD command line.
4. Adding Left, Right and Plan Views is essential when defining more complex shape codes and ensure that the shape codes comply with the BDF Shape Code Standard.

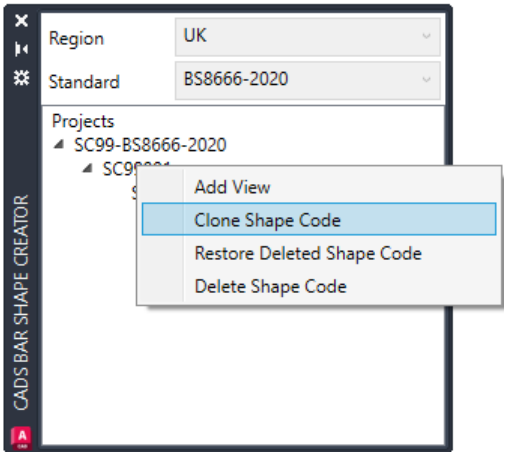
3.6.2 Clone Shape Code

The Clone Shape Code option will duplicate an existing selected shape code on the drawing inside the same Project. The duplicate will retain all the information including segments, vertices, dimensions and view settings. This reduces the amount of work required to produce shape codes that are very similar, as the duplicated shape code can be edited.

The Clone command will run a validation before duplicating the shape code;

- Checking for an Origin point.
- Checking all dimension names have been defined for each segment.
- A new Shape Code name and description is required once the shape code has passed the validation check been completed.

1. Right-mouse click on the Shape Code name and select Clone Shape Code.

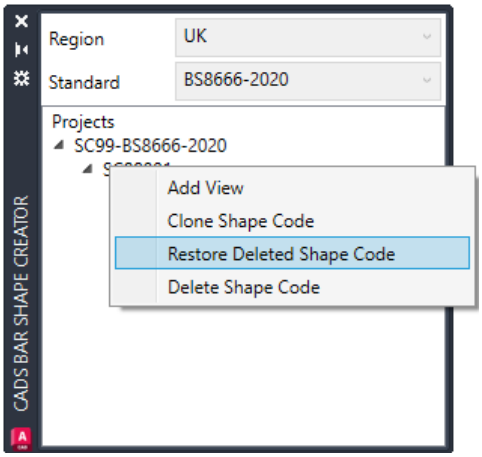


2. **Enter Shape Code Name:** Type in a new Shape Code Number.
3. **Enter Shape Code Description:** Type in a New Description.
4. **First Corner:** Pick a point on the drawing to place the Shape Code Boundary.

3.6.3 Restore Deleted Entities

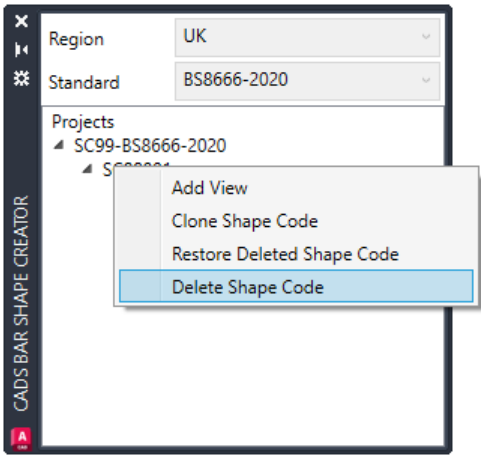
The Restore Deleted command feature will restore shape code related entities in the drawing that have been accidentally deleted or removed using AutoCAD commands.

Right-mouse click on the Shape Code Name and select Restore Deleted Shape Code.

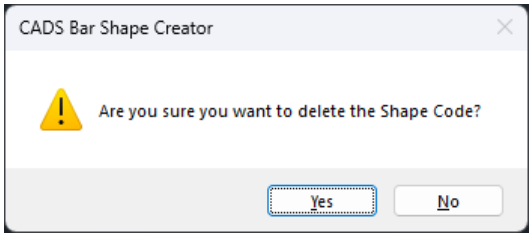


3.6.4 Delete Shape Code

The Delete Shape Code option will remove a selected shape code and all its associated Views from a selected Project.



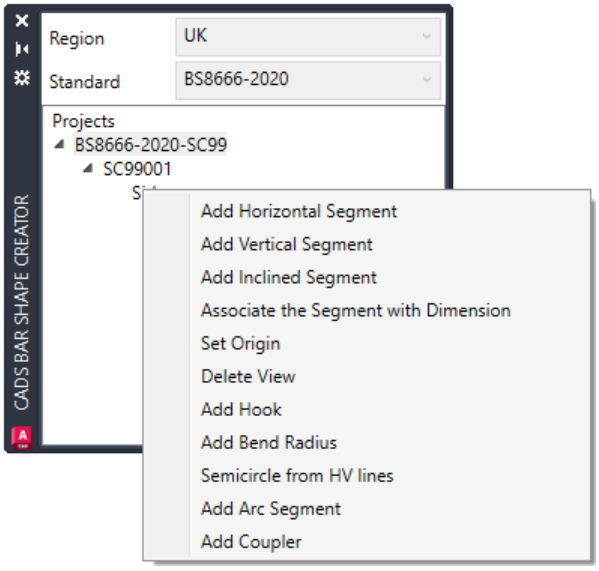
The Delete Shape Code command will ask for confirmation of the action to prevent accidental deletion.



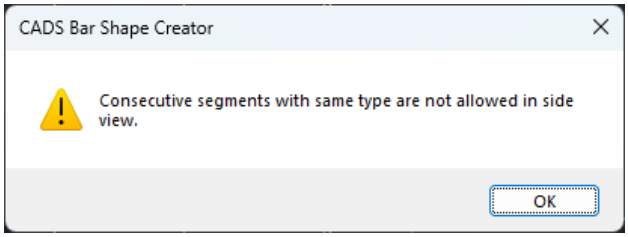
- **If Yes** is selected, the Shape Code and its Views are removed from the drawing and the Project.
- **If No** is selected, the command is cancelled and no changes are made.

3.7 Create View Menu

Right-mouse clicking on the Side View of the Shape Code in the Bar View Creator dialog, displays the tools available for drawing and defining the shape code.



- As mentioned previously, the Side View of the Shape Code must be created first.
- Other Views cannot be added without defining the Side View first.
- When defining the Side View it is not advisable to have consecutive horizontal or vertical segments unless creating a Shape Code with a semicircle as part of its construction.



- The Left, Right & Plan Views can have consecutive segments.
- Define the Views within the rectangles in the Shape Code Boundary.
- Define the Segments of the shape code in the order they are to be picked on the drawing.
- The Shape Code must be created at 1:1 scale in model space.

- Do not attempt to delete a bar leg segment if placed incorrectly. Use the Delete Shape Code command and start again.
- Do not use AutoCAD Undo to restore the Shape Code entities if accidentally deleted use the Restore Deleted commands.

3.7.1 Add Horizontal Segment

Defines a horizontal segment with vertices at each end.

If this is the second or subsequent segment the command will prompt for the selection of a vertex as the first point.

3.7.2 Add Vertical Segment

Defines a vertical segment with vertices at end.

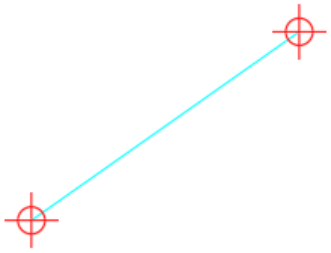
If this is the second or subsequent segment the command will prompt for the selection of a vertex as the first point.

3.7.3 Add Inclined Segment

Defines an Inclined Segment with vertices at each end.

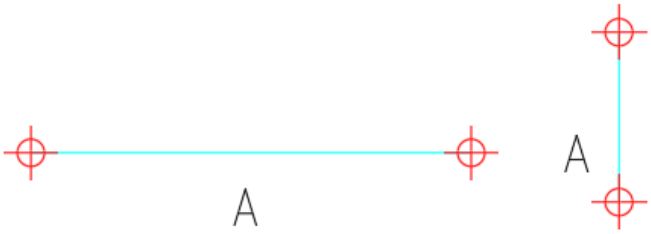
If this is the second or subsequent segment the command will prompt for the selection of a vertex as the first point.

Note: The convention is to define the inclined leg as the second or subsequent segments of the shape code, not as the first segment, refer to the standard shape codes.



3.7.4 Associate the Segment with Dimension

Assigns the dimension letter associated with either Vertical or Horizontal Segments of the shape code. This is an important step to define the geometry clearly and follow the BDF shape code standards.



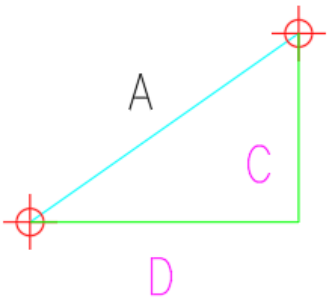
The command prompts the selection of a segment of the shape code and then prompts for the Dimension Name. The supported Leg Letters are A, B, C, D, E, F, G H, I, J, K, L, M, N, O, R & X.

When defining the Dimension Names for an Inclined Leg or an Arc, additional vertical and horizontal dimension names must also be provided.

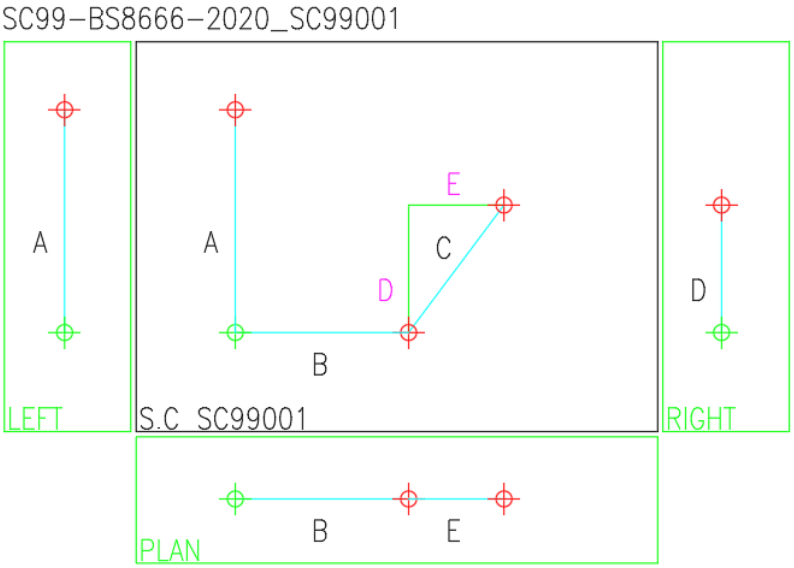
If a Dimension letter is typed in that has been previously defined the command will prompt for the correct dimension letter.

Dimension Inclined Segments

Dimensioning an Inclined Segment will prompt for the Inclined, Horizontal and Vertical Dimensions.

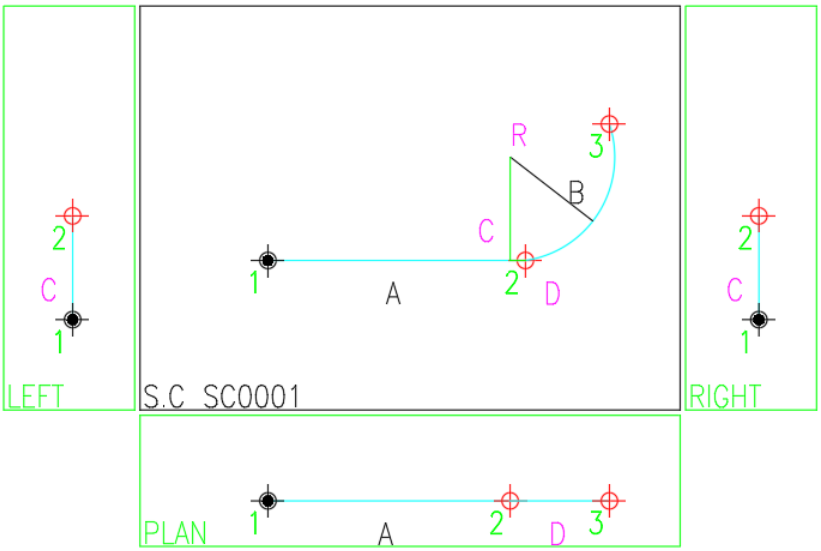


Example of a fully dimensioned linear shape code.



Dimension Arc Segments

The Arc Segment Dimension Tool will prompt for the radius name of the arc.

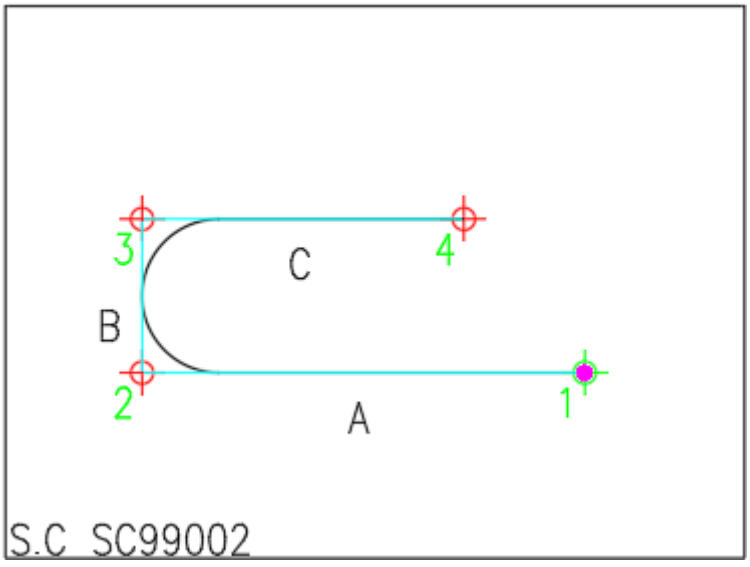


Once all required dimension names have been entered, the command completes the association process and reflects the dimension labels on the corresponding segments in the drawing.

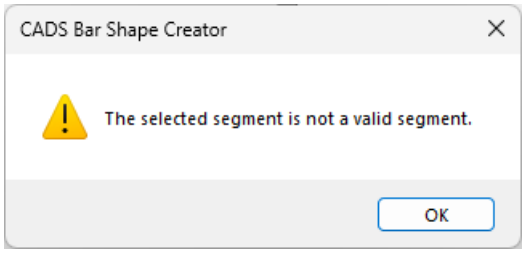
Dimension Semicircular Segments

Add Dimensions to all the Segments that form the Semi-Circular shape code. In the image below this would be Dims A, B & C.

As the Semi-circle has been defined using the Bar Shape Creator when the shape code is drawn the linear segments will be ignored and the semi-circle will be drawn.

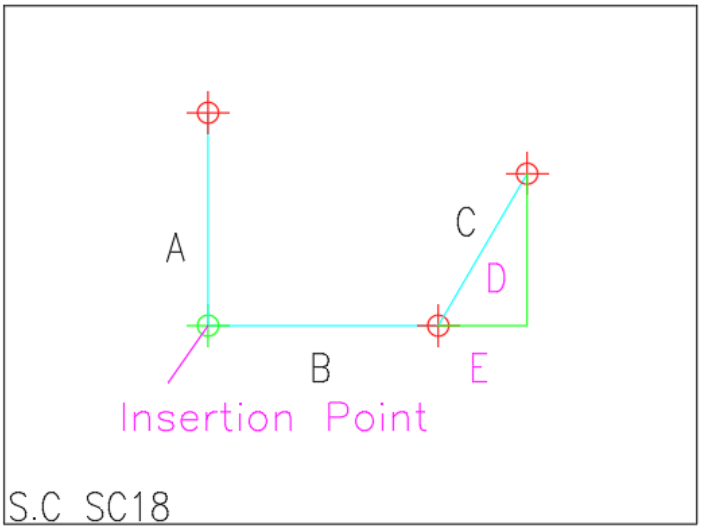


Dimension Error messages



3.7.5 Set Origin

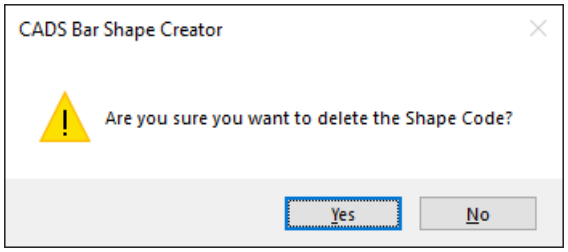
The Set Origin option defines the start point of the shape code. If the origin point is not defined for any shape code view the Validate shape code warning will be displayed “Shape Code has no origin point” warning and the Generate BDF command will not work. The Green Node point in the diagram below illustrates the Origin Point of the Bar View.



3.7.6 Delete View

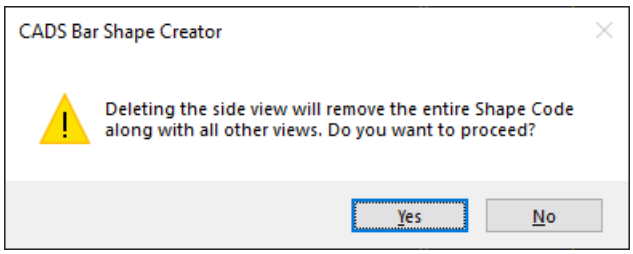
The Delete View command allows deleting a specific view from a shape code without removing the entire shape code.

The command will display a confirmation warning.



- **Answer Yes** and the selected View is deleted from the drawing and the Shape Code Data.
- **Answer No** and the View remains unchanged

Note: Deleting the Side view will display the warning message as shown below:

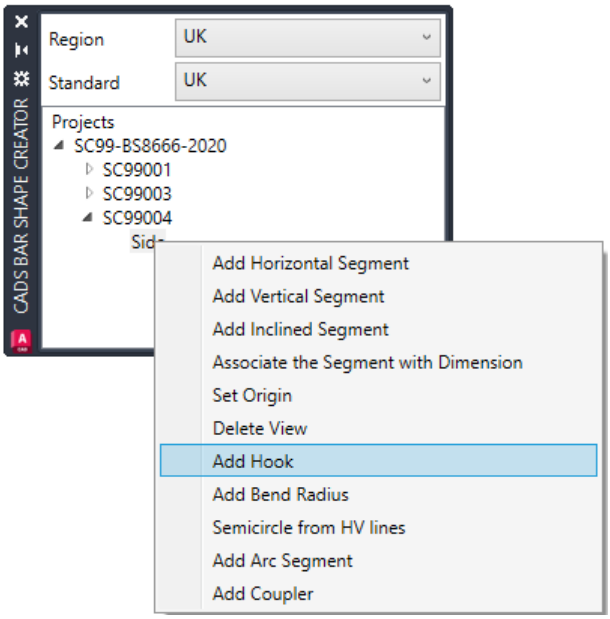


3.7.7 Add Hook

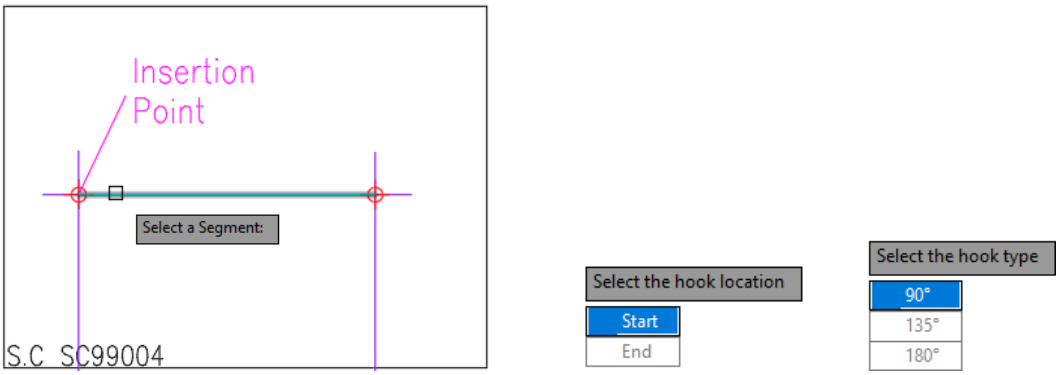
Use the Add Hook command to define Hooks at either the Start or End or both ends of the Shape Code. 90 degree, 135 degree and 180 degree hooks are supported.

To use the command, select the segment to add the hook, choose the hook type and then the hook direction.

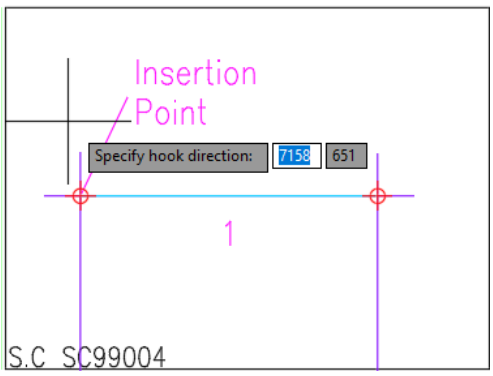
1. Right-mouse click on the View and select Add Hook

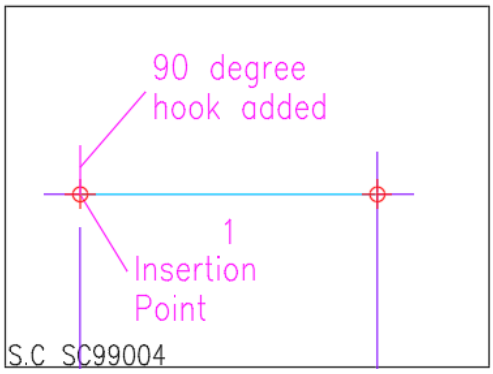


2. Select Segment: Select the Segment
3. Select the Hook Location [Start End]: Select Start

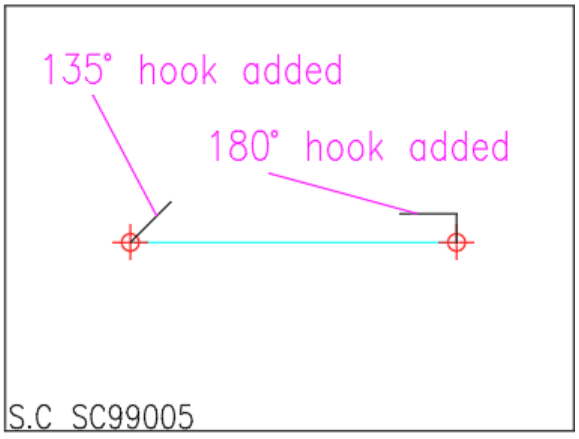


4. Select Hook Direction: Pick above the segment to specify the hook direction.
5. Select Hook Type: Pick the 90 degree hook.

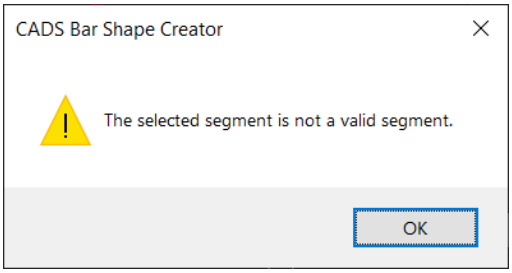




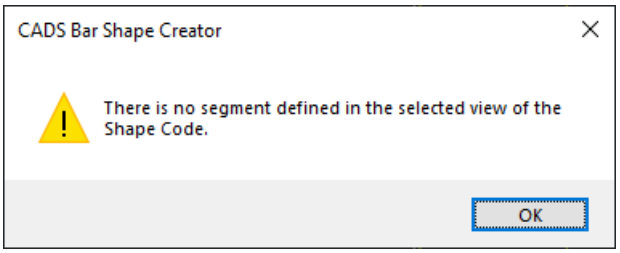
6. The image below shows the 135 and 180 degree hooks added to a straight bar.



Note : If an invalid segment is selected for adding a hook, a warning message will be displayed as shown below:



When no segments are defined and trying to add a hook, a warning message will be displayed as shown below:

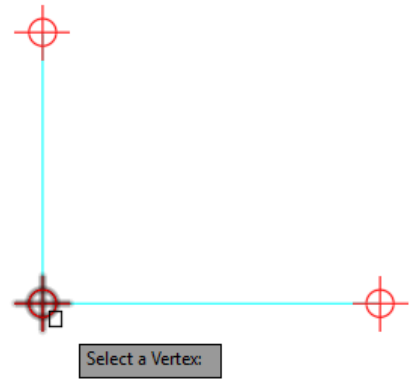


3.7.8 Add Bend Radius

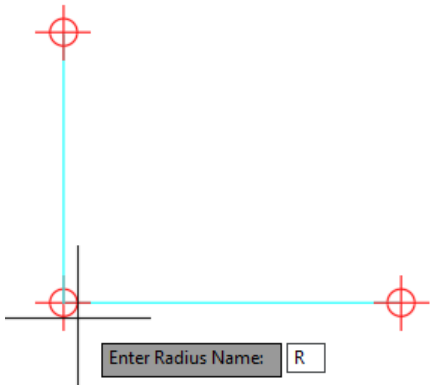
Add a non-standard radius to the Shape Code by selecting the vertex between two segments.

1. Select the command by right-mouse clicking on the View of the Shape Code and picking Add Bend Radius.

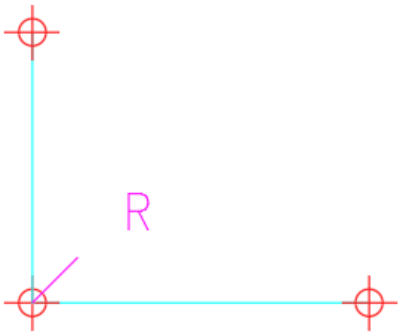
2. **Select a Vertex:** Choose a vertex to add the non-standard bar radius.



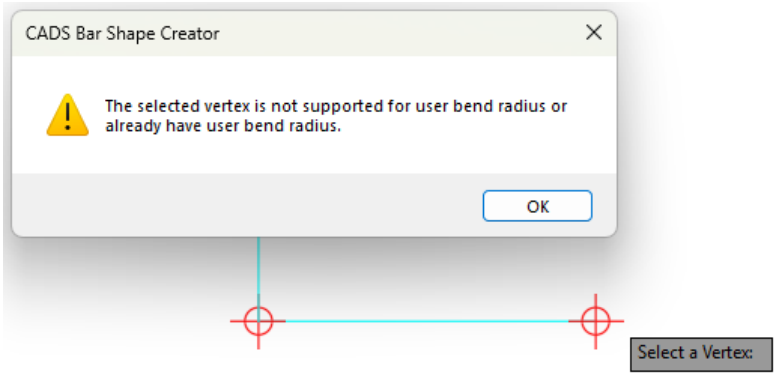
3. If a valid vertex is selected the tool prompts for the Radius Name.



4. **Enter Radius:** R and press enter.



5. If a Vertex at the end of a segment is selected that does not connect with another segment the following message is displayed;



This completes the command.

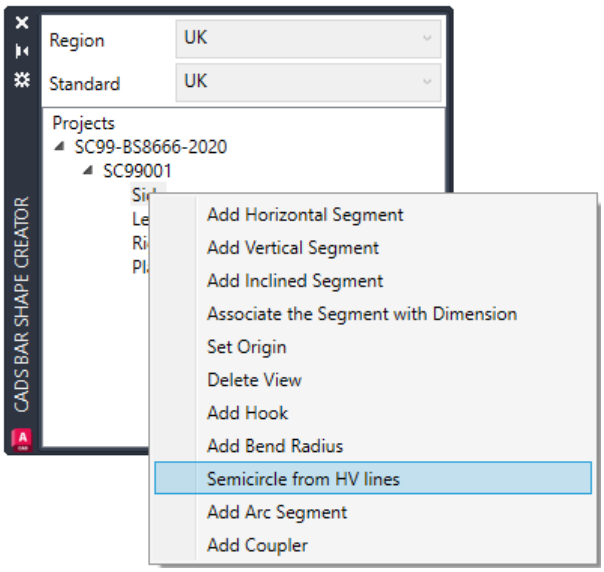
3.7.9 Semicircle from HV (Horizontal & Vertical Segment) Lines

Use the Semicircular from HV Lines to create a 180 degree arc.

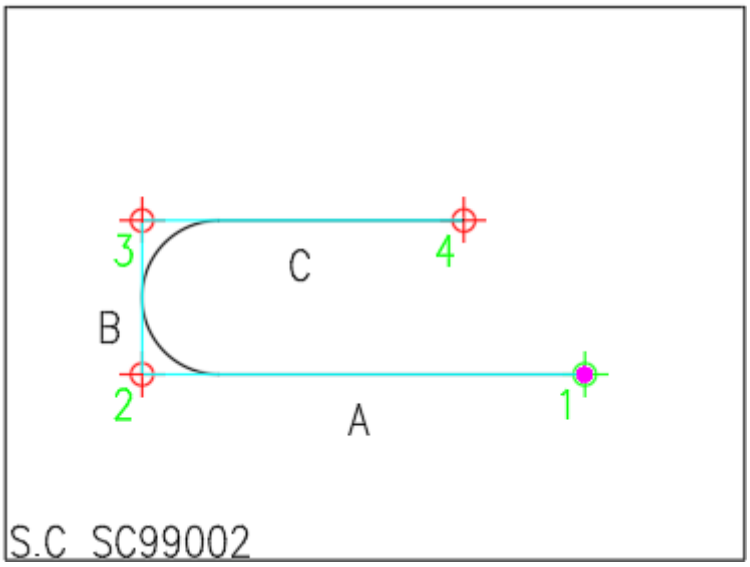
Use the Add Vertical Segment and Add Horizontal Segment to create the three sides of the arc.

In the diagram below Segments A, B & C form the frame of the arc.

1. Right-mouse click on the View and select Semicircle from HV Lines.



2. **Select Start Segment to convert semi circular bend:** Select Segment A.
3. **Select middle segment to convert semi circular bend:** Select Segment B.
4. **Select end segment to convert semi circular bend:** Select Segment C.
5. The command draws a semi-circle on the magenta Construct Layer as shown below;

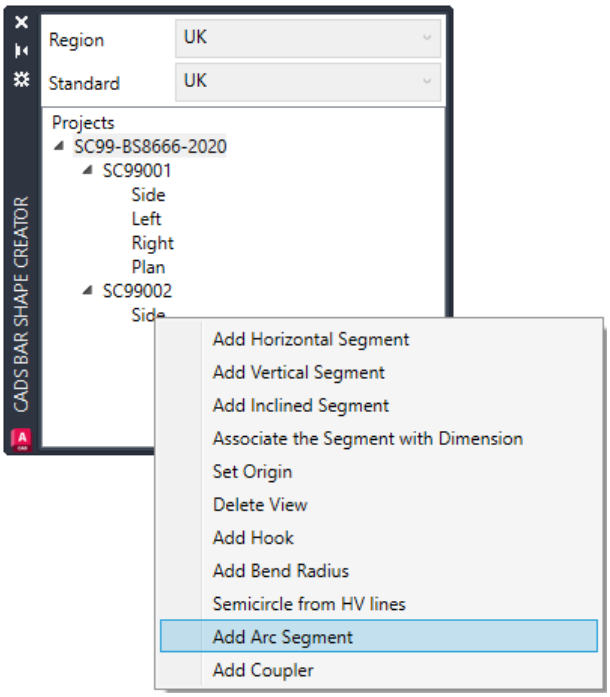


This completes the command.

3.7.10 Add Arc Segment

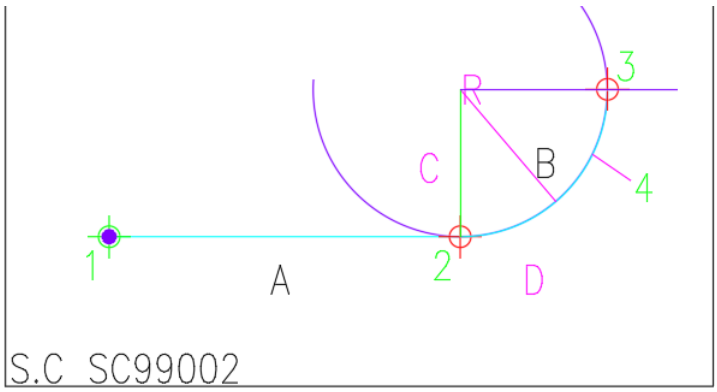
Use the Add Arc Segment to define a curve either at the start, end or the middle of a shape code.

1. Right-mouse click on the View and select Add Arc Segment.



In the example below

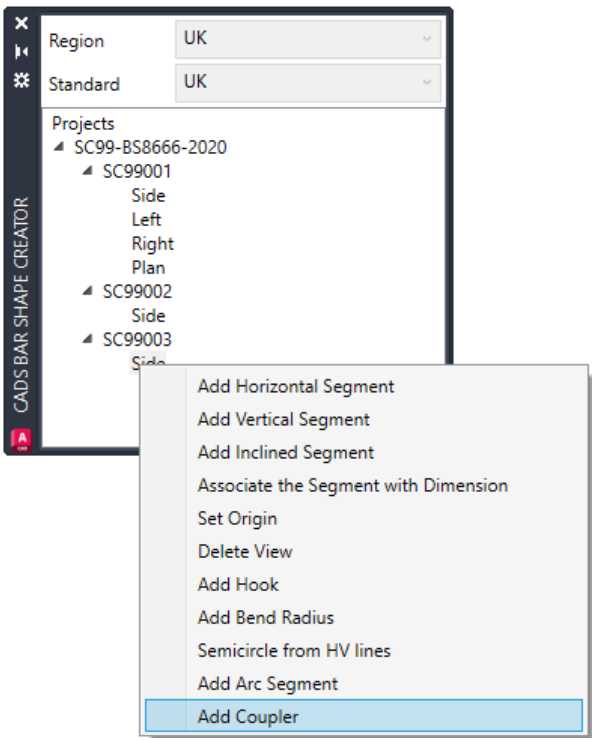
2. **Select a Vertex:** Select the Vertex at the end of Segment A, point 2.
3. **Specify next end point:** Select the end of the arc indicated by point 3.
4. **Specify arc direction:** Select a point on the arc indicated by point 4.



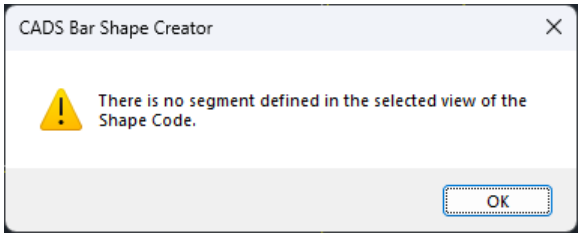
3.7.11 Add Coupler

Use the Add Coupler to create Shape Codes with predefined manufacturer's couplers and threads added.

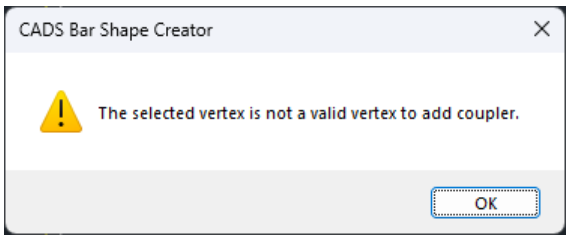
1. Select the Add Coupler command from the right click mouse menu on the View Name.



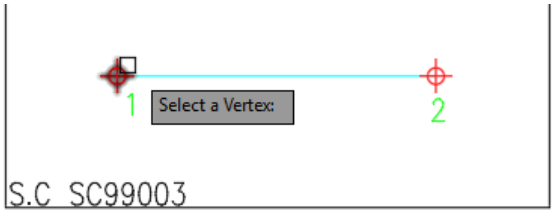
2. If there are no segments available in the selected view of the shape code, the following warning message is displayed;



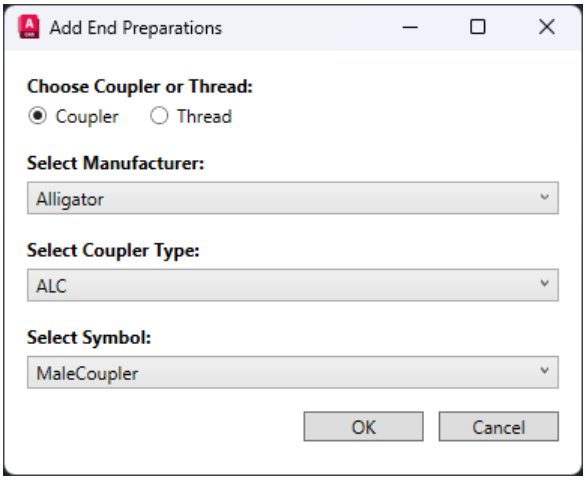
3. If an invalid vertex is selected a warning message is shown.



4. **Select a Vertex:** Pick the Vertex shown by point 1.



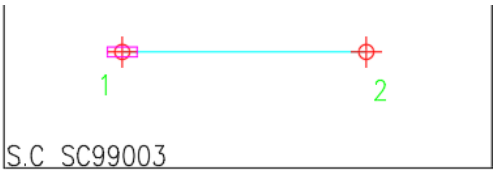
5. The Add End Preparations dialog is displayed when a valid segment is selected.



- Select to apply either a Coupler or Thread by picking the appropriate radio button.
- Select the Manufacturer from the drop-down menu, this will vary depending on the region that was selected when creating the Project.
- Select the Coupler Type from the drop-down menu, this will vary depending on the Manufacturer selected in the previous drop-down menu.
- Select the Symbol to be applied to be applied to the end of the bar segment from the drop-down menu.

6. If Cancel is selected at this stage, the function is terminated.
7. Click ok
8. **Enter end adjustment value:** Type in the Coupler adjustment value and press enter.

After entering the adjustment, a rectangle representing the coupler is drawn at the specified end of the selected segment.



This concludes adding a Coupler.

4 Bar Shape Creator Configuration

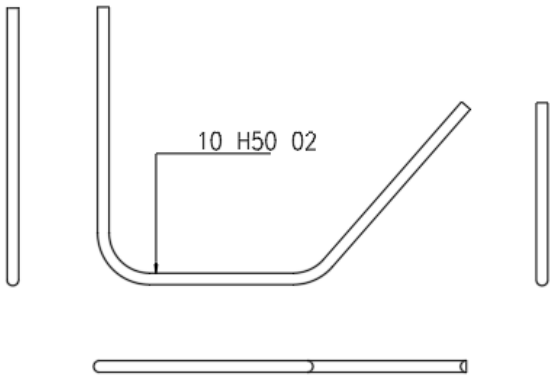
The configuration for the CADS Bar Shape Creator is contained with the “BarShapeCreatorConfig.json” file which is located in the;

“C:\Program Files\CADS\AutoCAD 20xx\CADS RC 20xx.0\Bar Shape Creator\SupportFiles” folder.

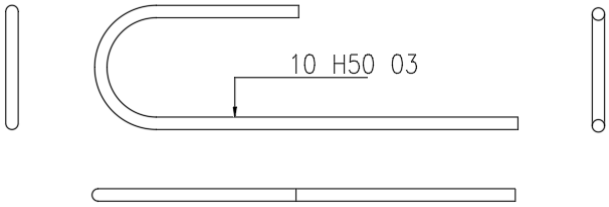
Editing of the file is not recommended.

5 Bar Shape Creator Example Shape Codes

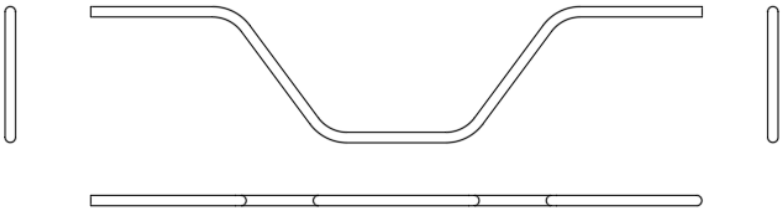
The following chapter details how to use the Bar Shape Creator to create a Project, Generate Shape Codes, Draw, Validate and generate a BDF file using the options provided. Worked examples use all of the functionality available in the CADS Bar Shape Creator.



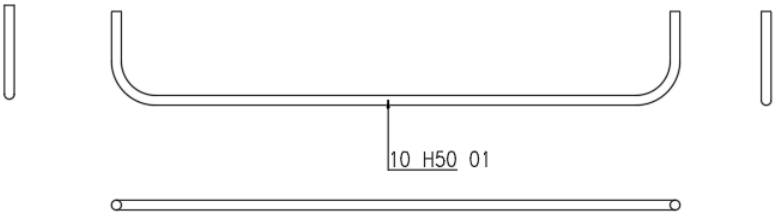
Creating a Straight Bar with a Curved Leg



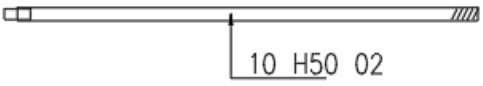
Creating a U Bar with a Semi-Circular Leg



Symmetrical Cranked Bar U Bar

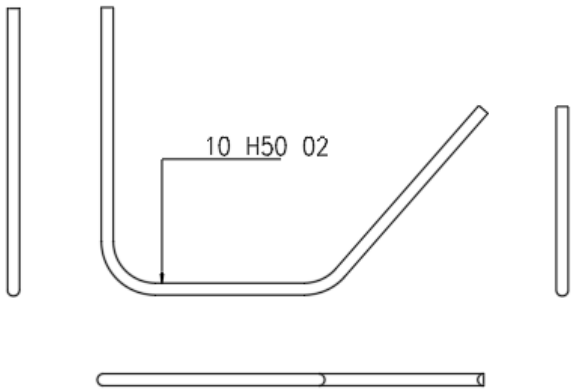


Creating a Straight Bar with Hooks



Creating a Straight Bar with Couplers

5.1 Creating a Cranked U Bar

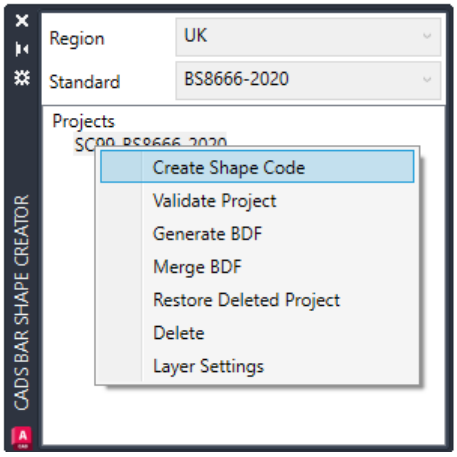


1. Open a new drawing using the CADSISO.dwt template drawing.
2. Load the Bar Shape Creator Dialog  .

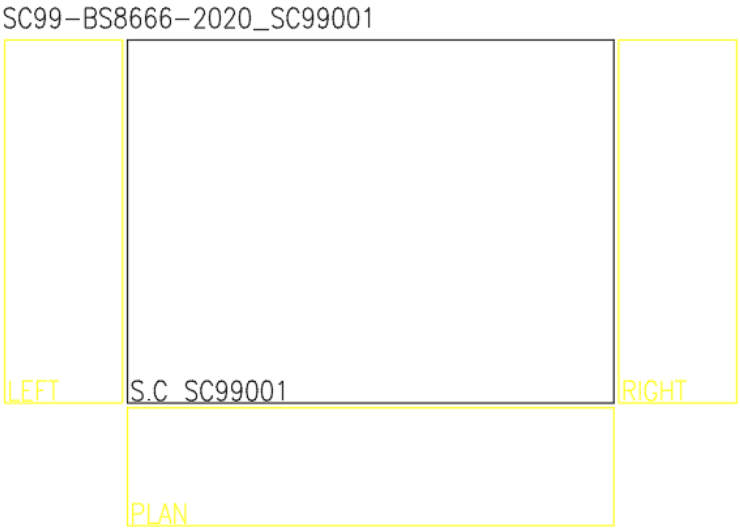
5.1.1 Create Project & Shape Code Name

3. Create a Project, right-mouse click on the Project and select Create Project.
4. Enter Project Name: Type in a project name i.e. SC99-BS8666-2020 and press enter.

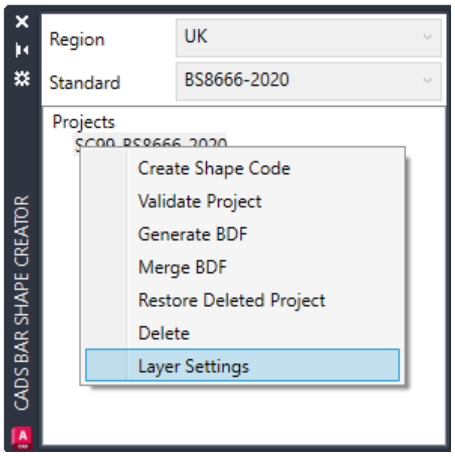
5. Create Shape Code, right-mouse click on the Project Name and select Create Shape Code.



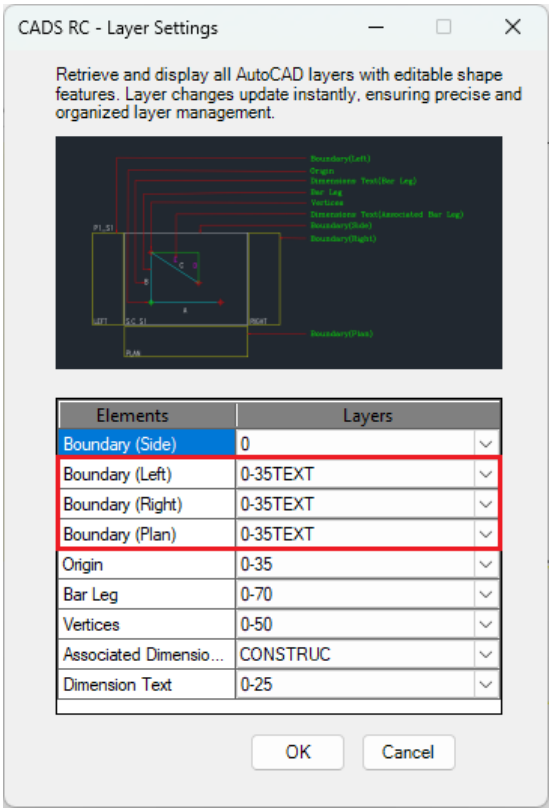
6. **Enter Shape Code Name:** Type in the shape code name i.e. SC99001.
7. **Enter Shape Code Description:** Type in the description i.e. Cranked U Bar.
8. **First Corner:** Pick the Insertion Point of the Shape Code Boundary.



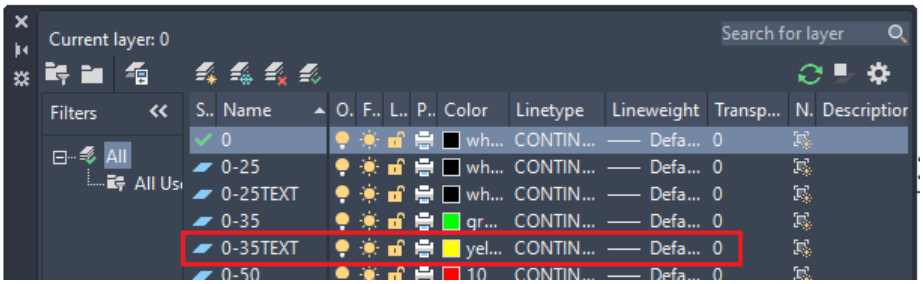
9. Note the Side View is automatically added to the Shape Code Name.
10. Change the Layer Colour of the Left, Right and Plan View Boundaries.



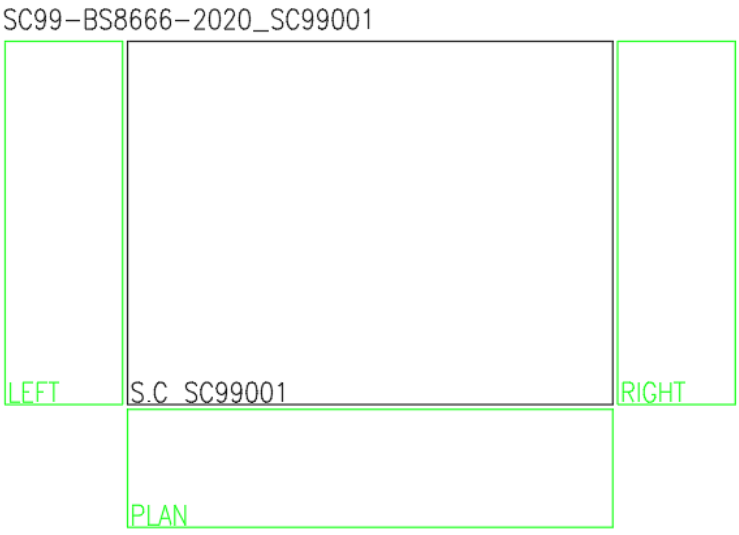
11. Load the Layer Settings dialog by right mouse clicking on the Project.



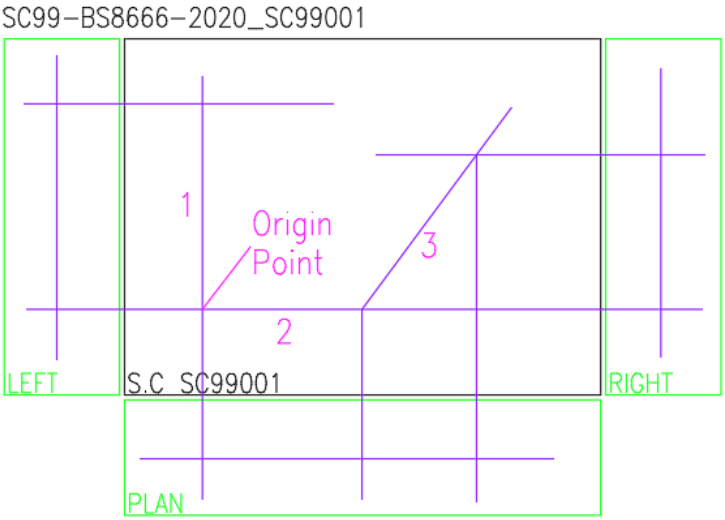
12. The Left, Right & Plan View Boundaries are placed on the 0-35Text Layer, Click OK.
13. Open AutoCAD Layer Control dialog and change the colour of the 0-35Text Layer to Green.



14. Close Layer Control, the boundaries update automatically.

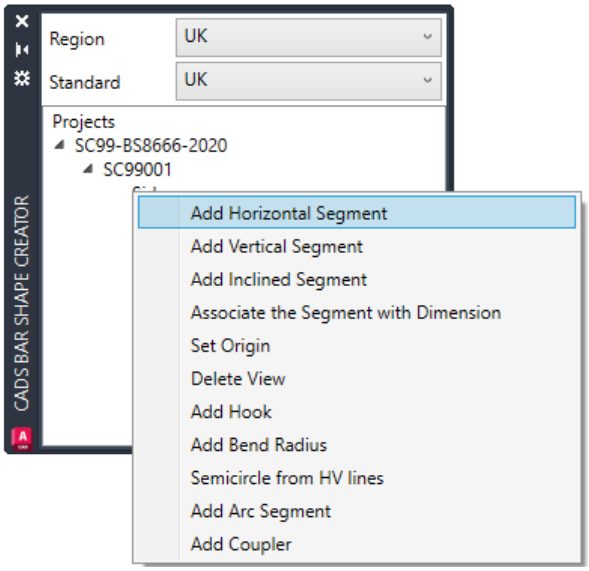


15. Setup Construction Lines to Draw the shape code to aid drawing the Shape Code in each of the View Boundaries to minimize mistakes.



5.1.2 Create Side View

16. Create Side View, right-mouse click on the Side View and select the Add Segments commands, place the segments of the bar in the order that they should be drawn when placing the shape code. The construction diagram indicates the suggested placement.

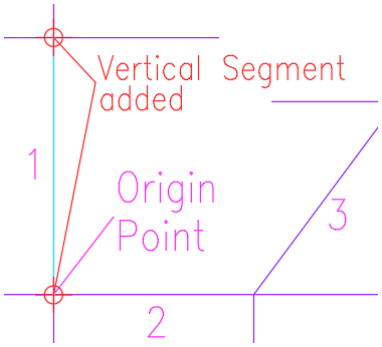


17. Define the Shape Code Segments.

- **Leg 1** – Add Vertical Segment.

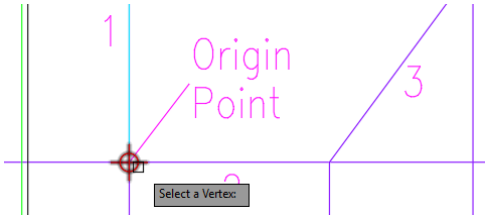
  Select Vertex: Pick the Vertex indicated by the Origin Point.

  Specify next end point: Select the Intersection at the End of Leg 1.

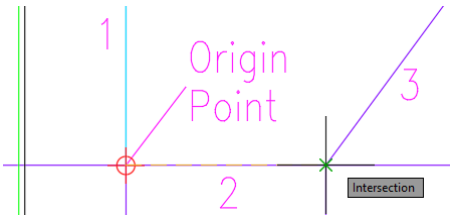


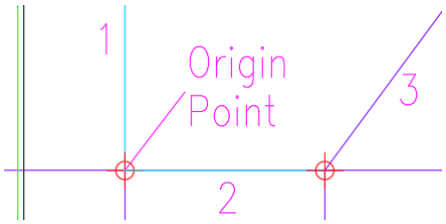
- **Leg 2** – Add Horizontal Segment.

  Select Vertex: Pick the Vertex indicated by the Origin Point.



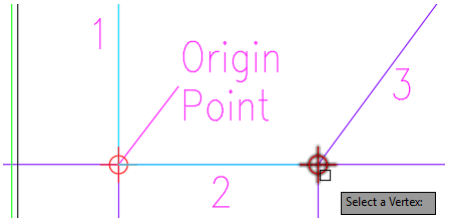
  Specify next end point: Select the Intersection point between Legs 2 and 3.



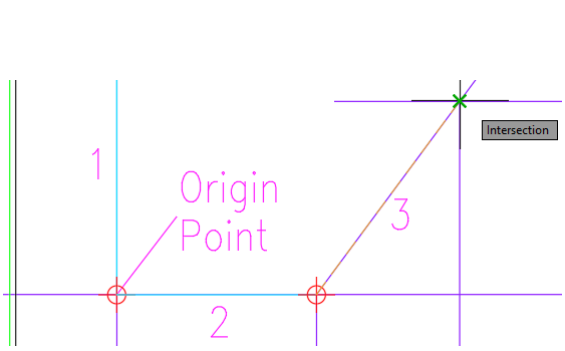


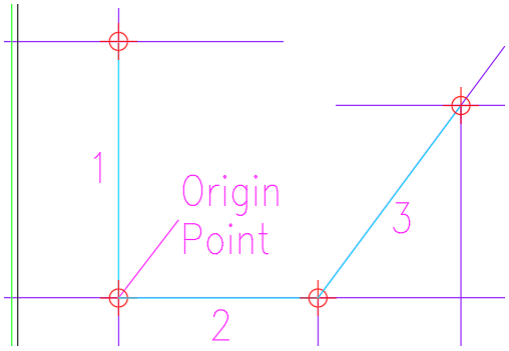
- **Leg 3** – Add Inclined Segment.

  Select Vertex: Pick the Vertex between Legs 2 and 3.

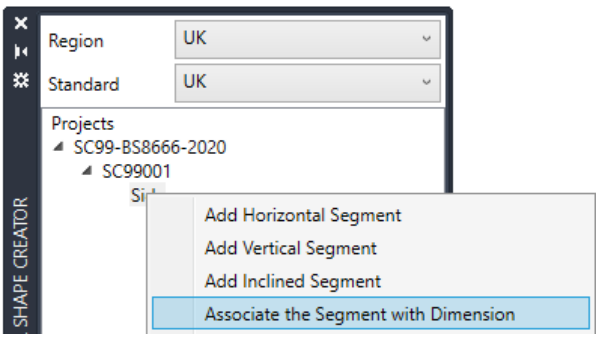


  Specify next end point: Pick the Endpoint of Leg 3

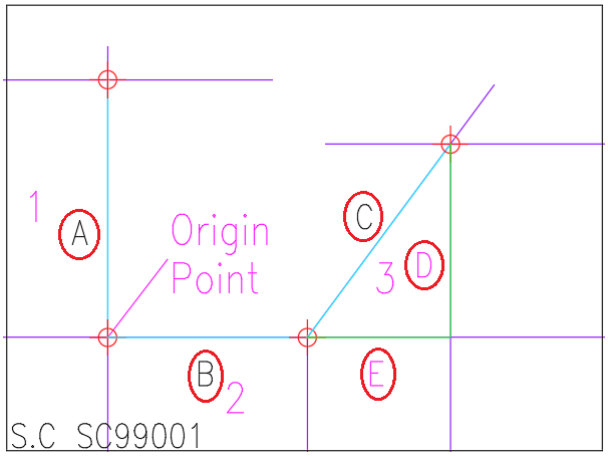




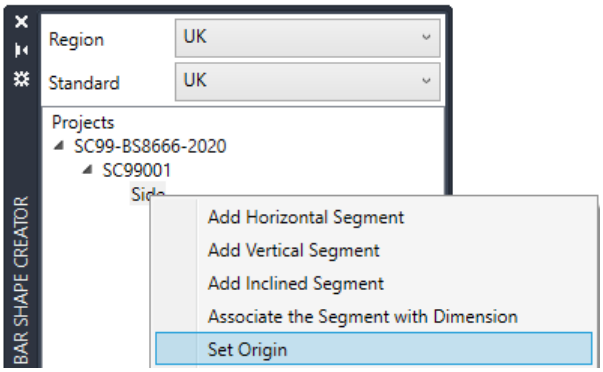
18. Define Dimension Letters, select Associate the Segment with Dimension by right-mouse clicking on the Side View.



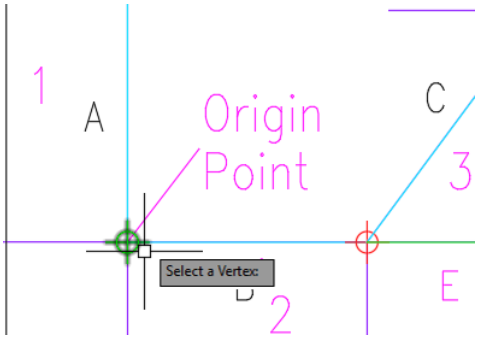
19. **Select Segment:** Select Leg 1 Segment.
20. **Enter vertical associated dimension name:** Type in A and press enter.
21. **Select Segment:** Select Leg 2 Segment.
22. **Enter horizontal associated dimension name:** Type in B and press enter.
23. **Select Segment:** Select Leg 3 Segment.
24. **Enter dimension name for length:** Type in C and press enter.
25. **Enter vertical associated dimension name:** Type in D and press enter.
26. **Enter horizontal associated dimension name:** Type in E and press enter.



27. Define the Insertion Point of the Side View, select Set Origin by right-mouse clicking on the Side View.



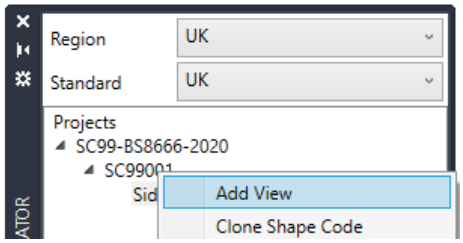
28. **Select a Vertex:** Pick the Vertex between Legs A and B.



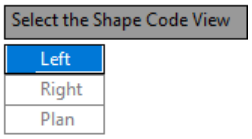
This completes the Side View.

5.1.3 Add Left View

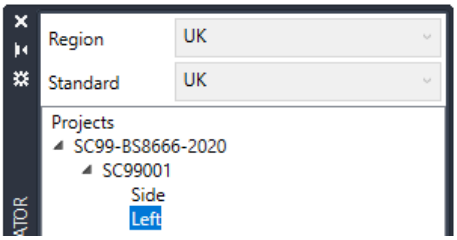
29. Right-mouse click on the Shape Code Name.
30. Select Add View.



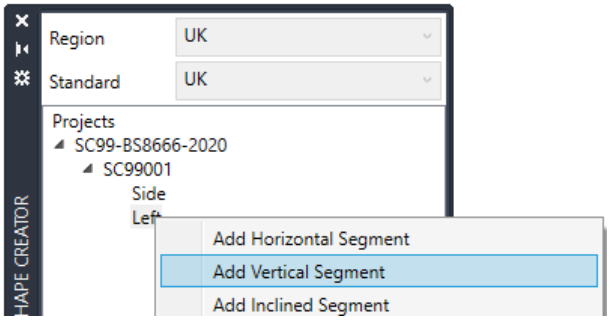
31. Select Left View.



32. The Left View is added to the Shape Code.

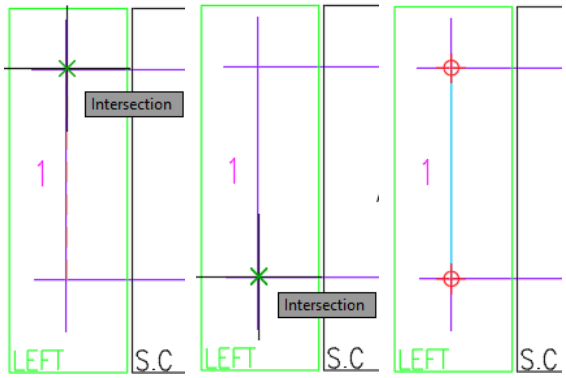


33. Define the Left View Segment, right-mouse click on the View and select Add Vertical Segment.

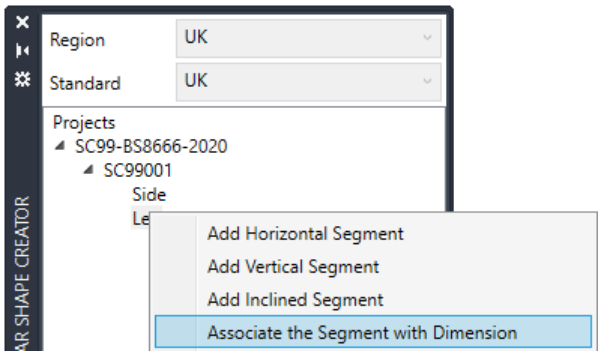


34. **Specify Start Point:** Select the bottom left intersection in the Left View Boundary as

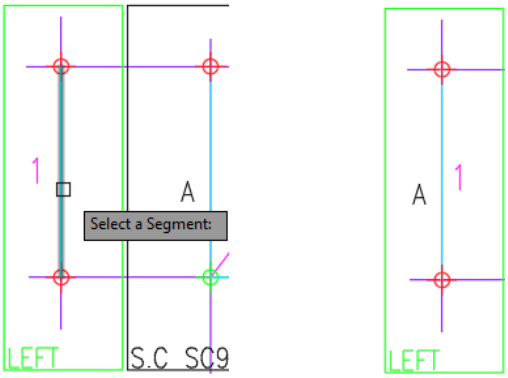
indicated below.



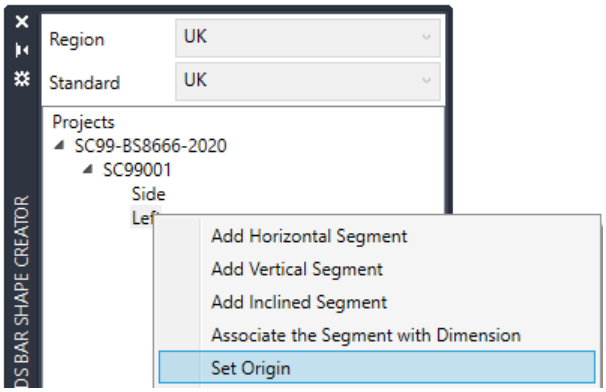
35. **Specify next end point:** Select top left insertion in the Left View Boundary as indicated above.
36. Define Dimension Letter, right-mouse click on the Left View and select Associate Segment with Dimension.



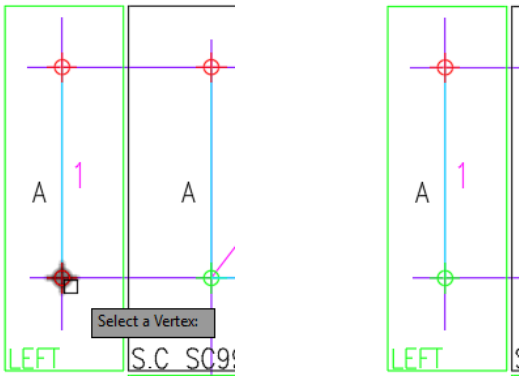
37. **Select a Segment:** Select Segment 1.



38. **Enter dimension name for length:** Type in A and press enter.
39. Define the Insertion Point of the Left View, select Set Origin by right-mouse clicking on the Left View.

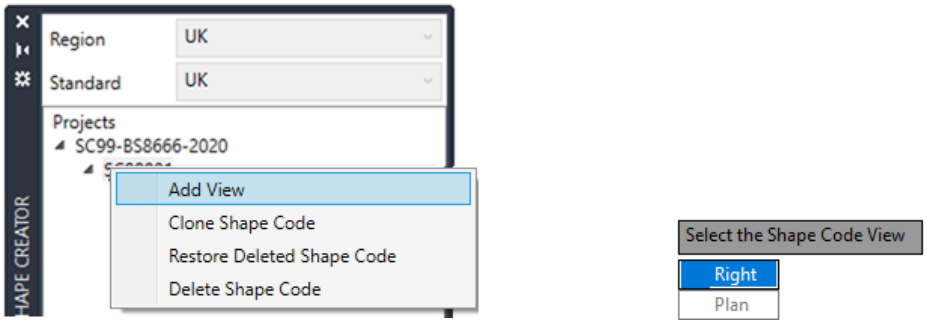


40. **Select a Vertex:** Pick the Vertex at the bottom of the Vertical Segment to set the Insertion Point.



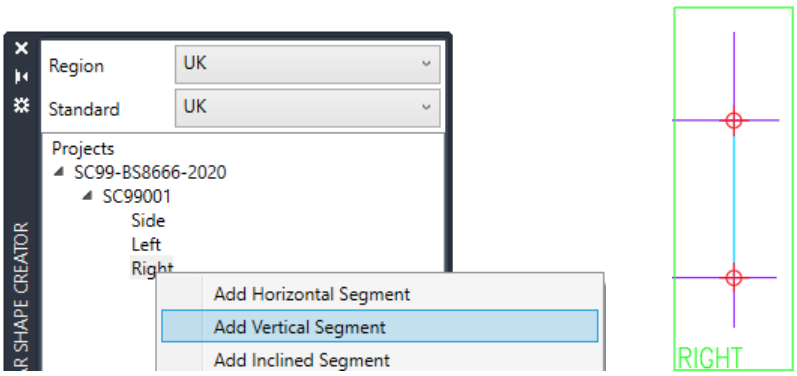
This completes the Left View.

5.1.4 Add Right View

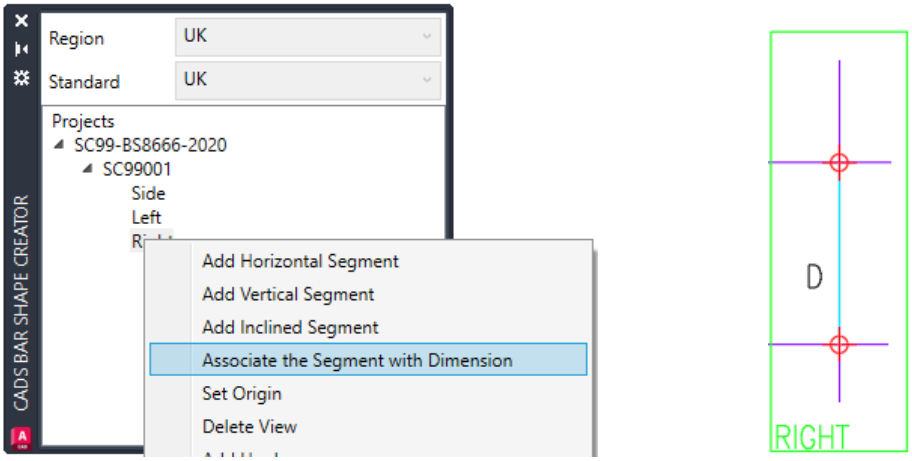


Use the same steps as described in the Left View to define the Right View.

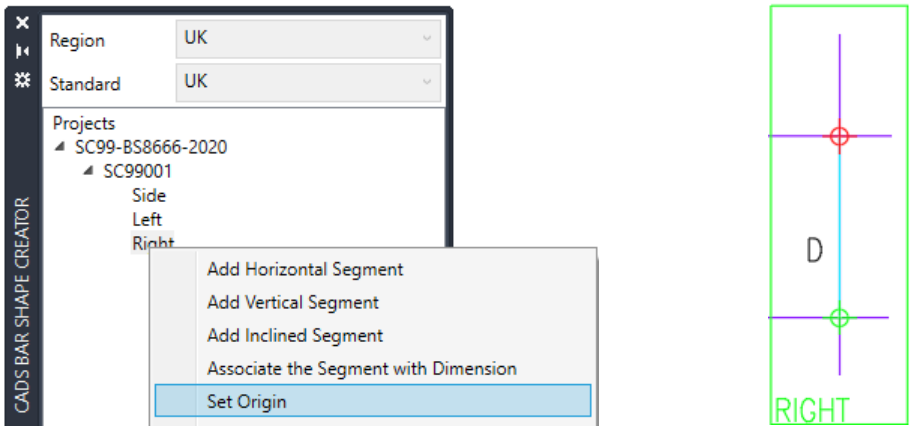
41. Right-mouse click on the Right View and select Add Vertical Segment by picking the two points and place as shown below;



42. Add the Dimension Letter to the Right view, this this case Leg D.



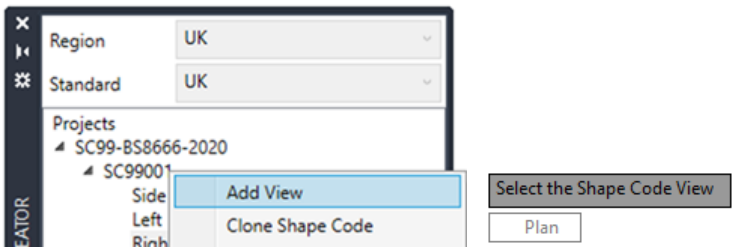
43. Define the Insertion Point of the Right View, select Set Origin by right-mouse clicking on the Left View and pick the bottom Vertex.



This completes the Right View.

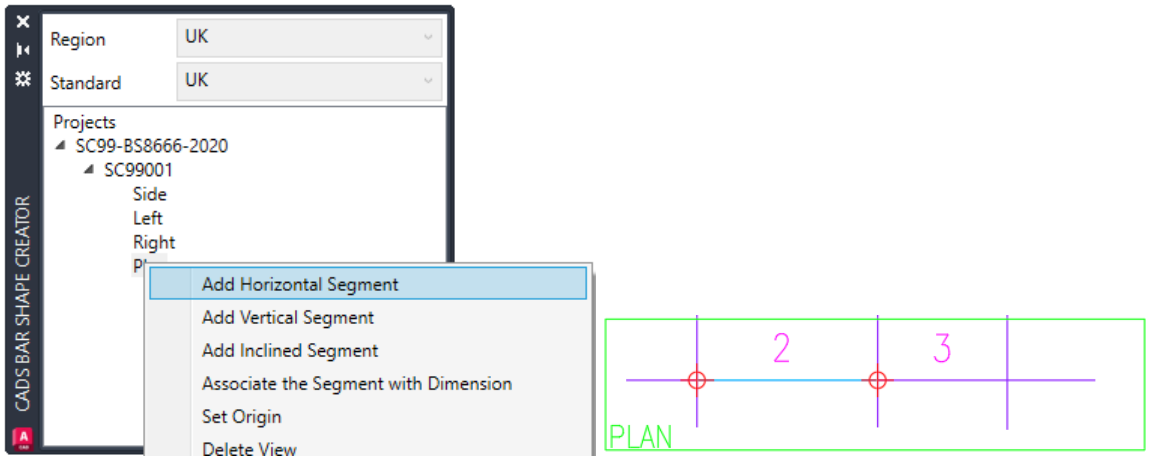
5.1.5 Add Plan View

The Plan View is made up of two horizontal segments Leg B and Dimension E.

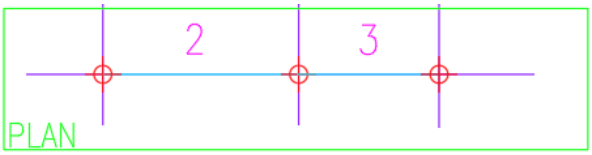


44. Use the same steps as described in the Left View to define the Plan View.

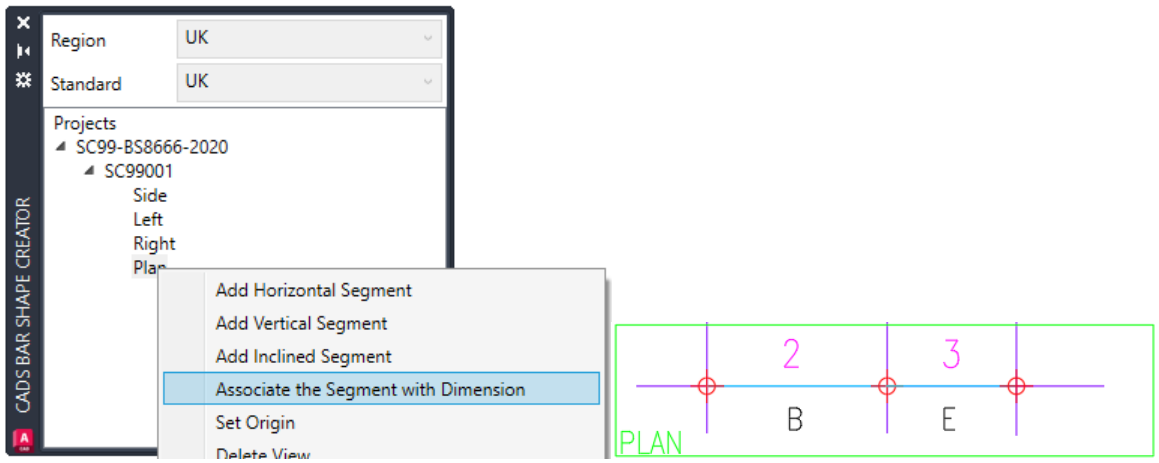
45. Right-mouse click on the Plan View and select Add Horizontal Segment and place for Leg 2 as shown below;



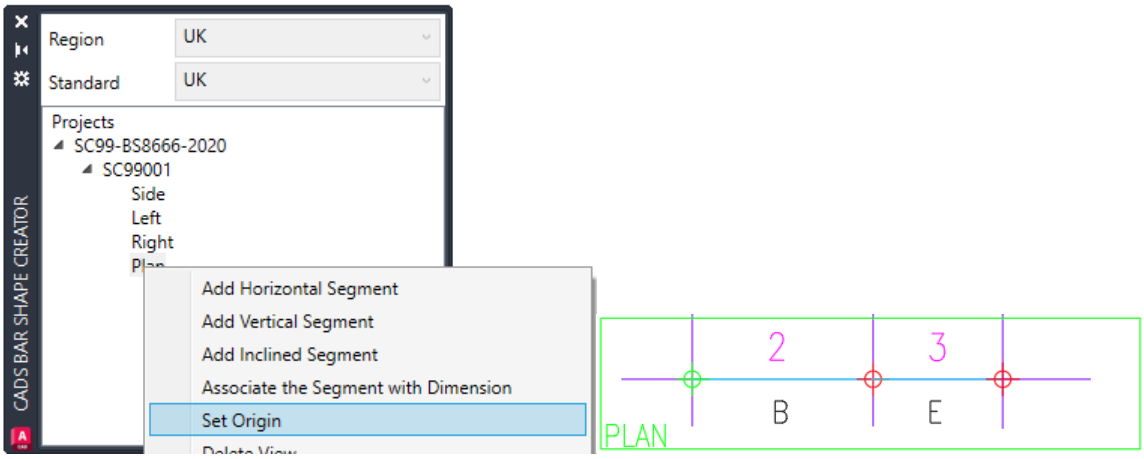
46. Repeat the command to place the segment for Leg 3.



47. Add the Dimension Letters to the Plan view, this this case Legs B & E.



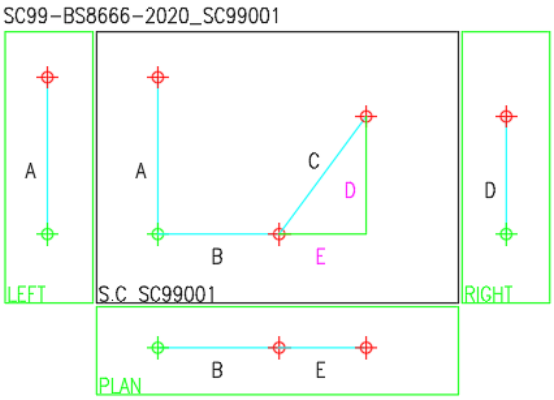
48. Select Set Origin by right-mouse clicking on the Plan View and pick the far-right Vertex on Dim B.



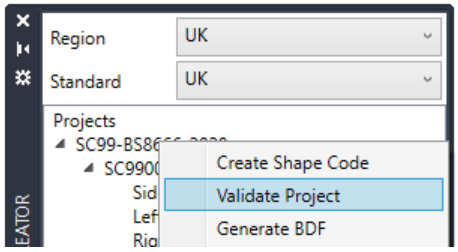
This completes the Plan View.

5.1.6 Validate Project

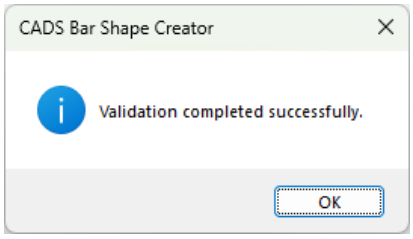
49. Prior to running the Validate Project command either turn off the layer containing the construction lines or delete them. This will ensure the images created as part of the Generate BDF command are clear.



50. Right-mouse click on the Project Name and select Validate Project.



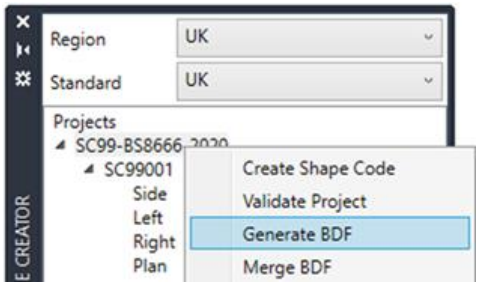
51. If there are no errors in the Project the following dialog is displayed.



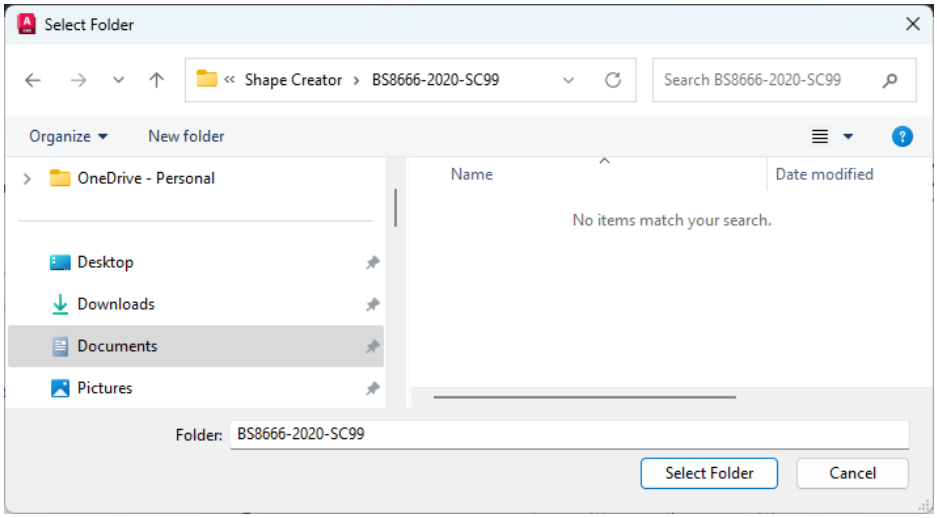
5.1.7 Generate BDF

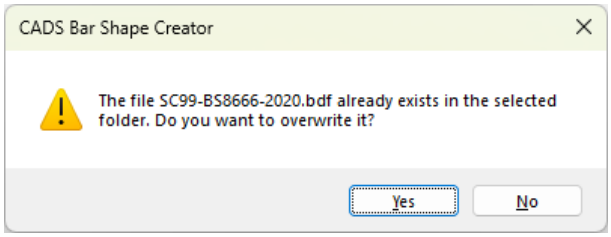
The final step is to generate the BDF file, slides and drawings.

52. Right-mouse click on the Project Name and select Generate BDF File.



53. Select the Folder to store the BDF file, slides and drawings, click Select Folder.

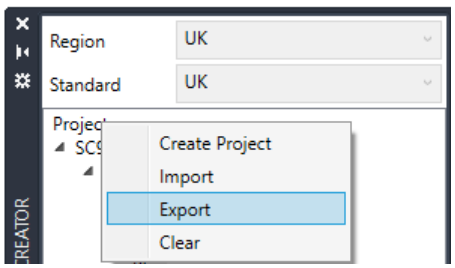




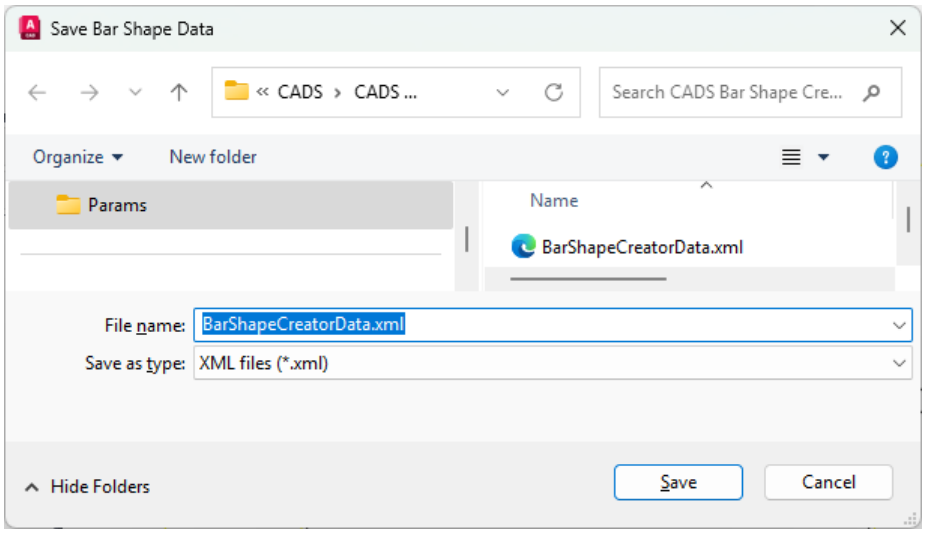
5.1.8 Exporting the Project JSON File

Use the Export option to create an JSON file that stores all of the Project data. The JSON file can then be imported into a blank template drawing and further shape codes can be added to the project.

54. Right-mouse click on Projects and select Export.



55. Save the JSON file to either the default folder or another suitable folder for future reuse.

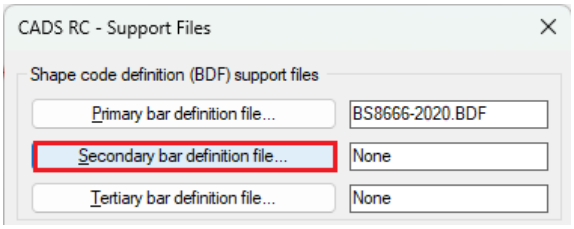


5.1.9 Loading the BDF and supporting files into CADS RC

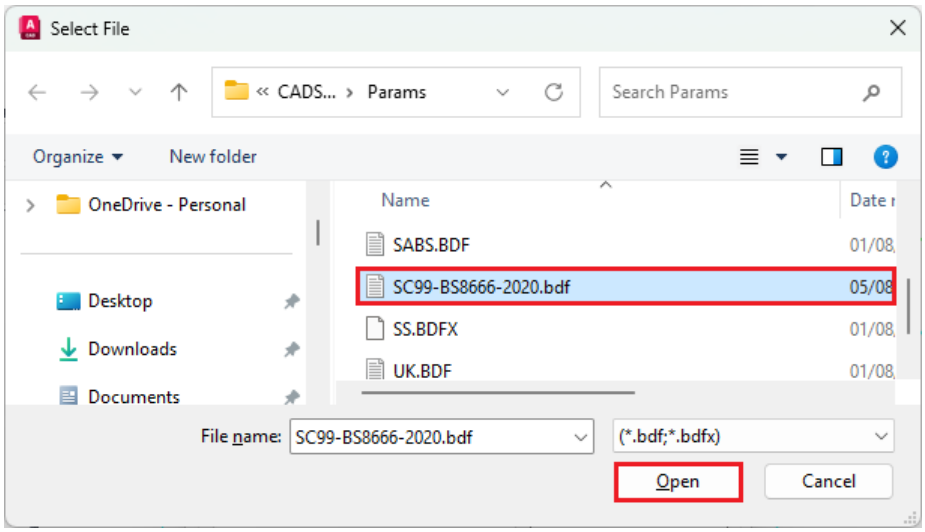
Inside Windows File Explorer navigate to the folder where the BDF & SLB file were saved. The default location is "*C:\Users\username\Documents\CADS\CADS Bar Shape Creator*" folder.

56. The files need to be copied into the "*C:\Program Files\CADS\AutoCAD 20xx\CADS RC 20xxxx\CADS-RC\Params*" folder. You may need to have elevated rights to do so this or ask your IT department.
57. Start a new Drawing inside CADS RC.
58. Open the CADS RC Configuration Centre.

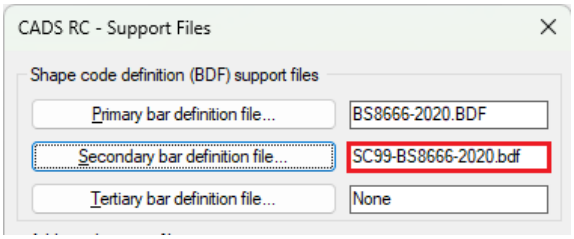
59. Select the Support Files option.



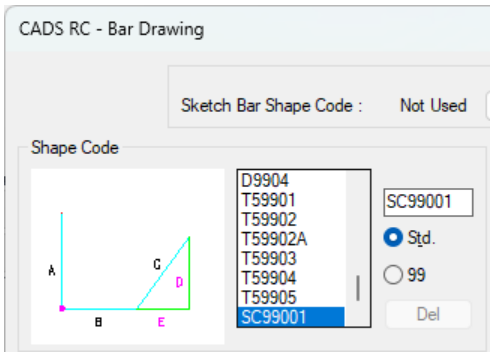
60. Click on the Secondary bar definition file button.
61. Load the BDF file created by the Bar Shape Creator and click Open.



62. Click Ok to close the Support Files and Configuration dialog.

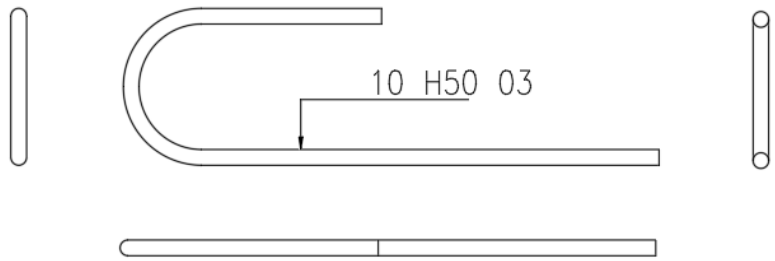


63. The Shape Code created by the Bar Shape Creator will appear at the bottom of the list of shape codes in the Draw Bar Dialog.



This concludes Creating a Cranked U Bar.

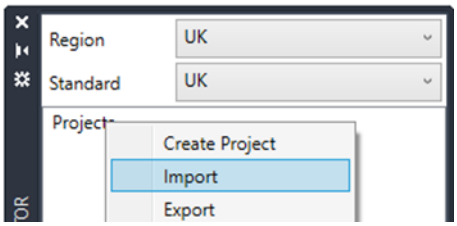
5.2 Creating a U Bar with a Semi-Circular Leg



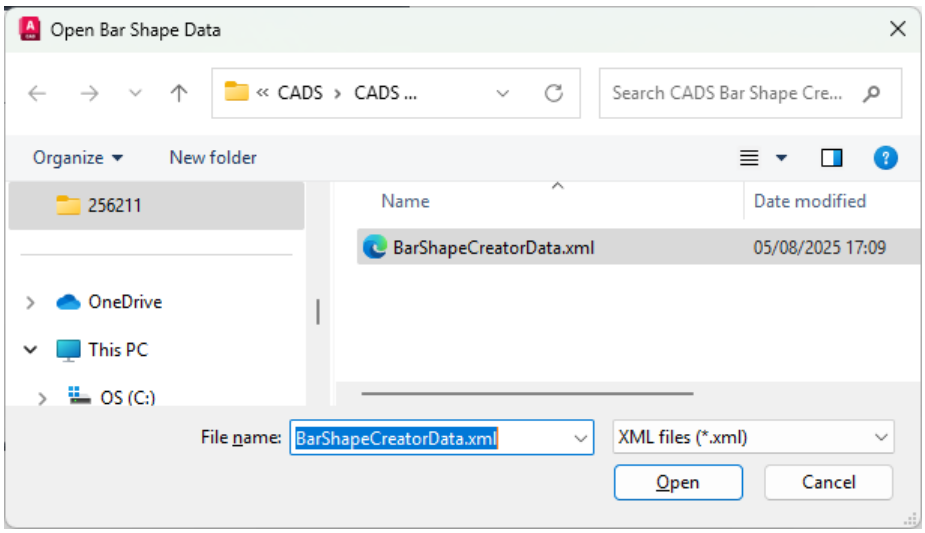
1. Open a new drawing using the CADSISO.dwt template drawing.
2. Load the Bar Shape Creator Dialog.

5.2.1 Create Project & Shape Code Name

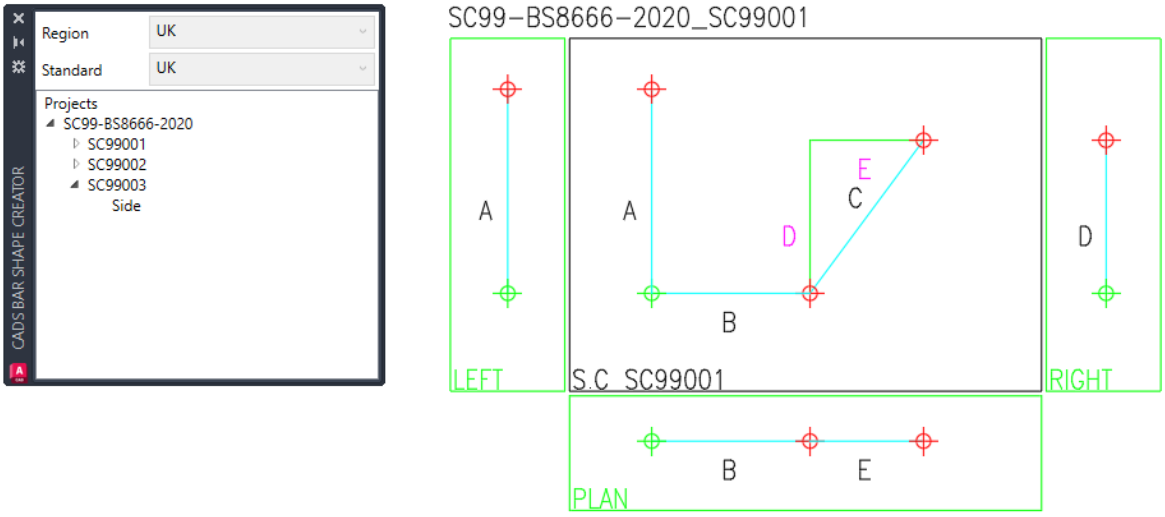
3. If you have an existing Project, you can add the new shape code by loading the Project JSON file into the blank drawing.
4. Right-mouse click on the Projects and select Import.



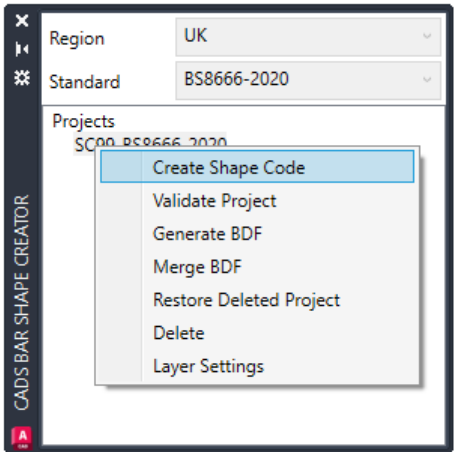
5. Select and open the BarShapeCreator.JSON file.



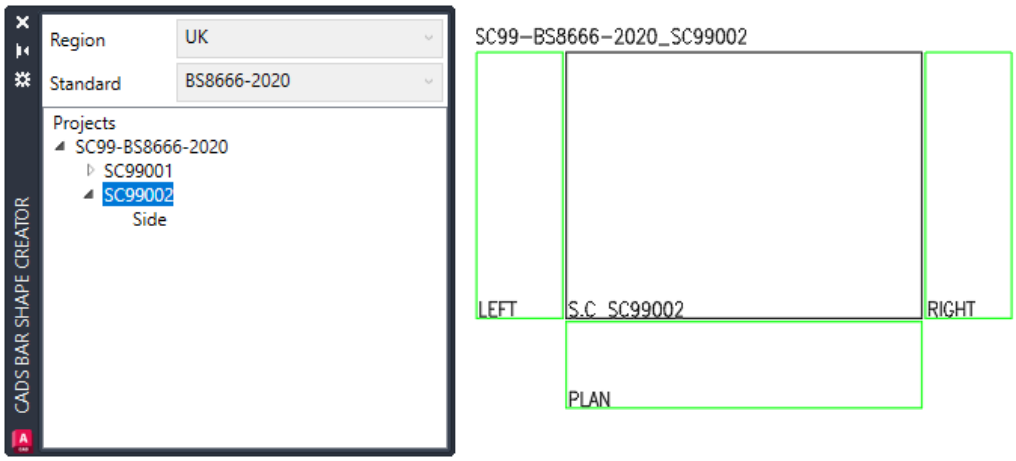
6. The command will prompt for the insertion point of the previously drawn shape codes.
7. **Click to select the insertion point where the project should be placed:** Pick a point on screen.



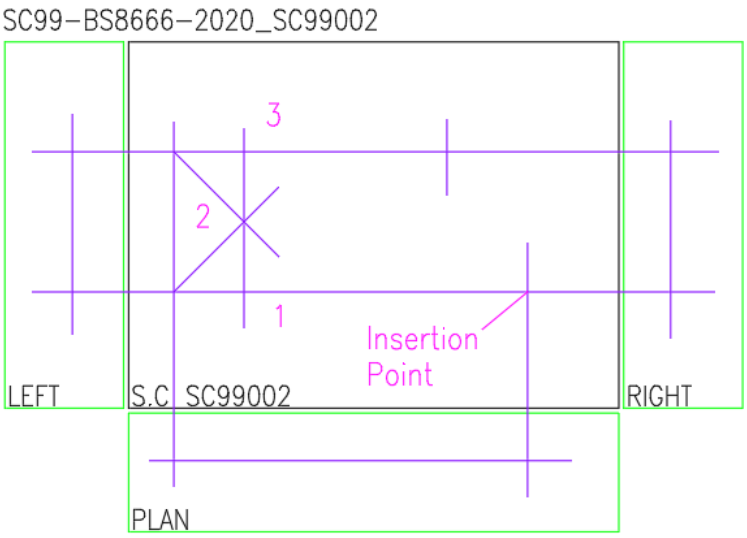
8. Alternatively, you can start a new Project as described in **Chapter 3.4.1**.
9. Create Shape Code, right-mouse click on the Project Name and select Create Shape Code.



10. **Enter Shape Code Name:** Type in the shape code name i.e. SC99002.
11. **Enter Shape Code Description:** Type in the description i.e. U Bar with a Semi-Circular End.
12. **First Corner:** Pick the Insertion Point of the Shape Code Boundary.

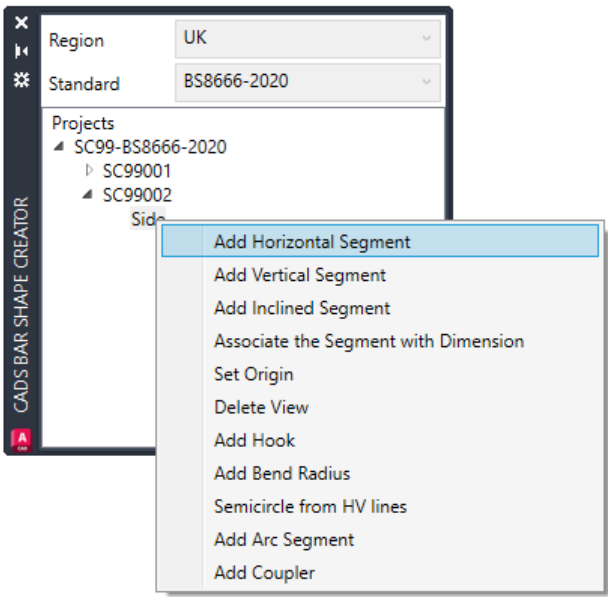


13. Note the Side View is automatically added to the Shape Code Name.
14. Setup Construction Lines to Draw the Shape Code to aid drawing the Shape Code in each of the View Boundaries to minimize mistakes.



5.2.2 Create Side View

15. Create Side View, right-mouse click on the Side View and select the Add Segments commands, place the segments of the bar in the order that they should be drawn when placing the shape code. The construction diagram indicates the suggested placement.

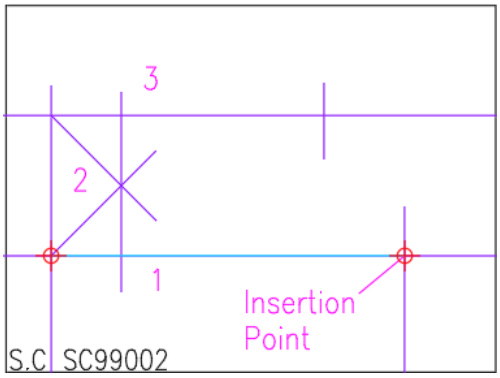


16. Define the Shape Code Segments.

- **Leg 1** – Add Horizontal Segment.

  Select Vertex: Pick the Intersection indicated by the Insertion Point.

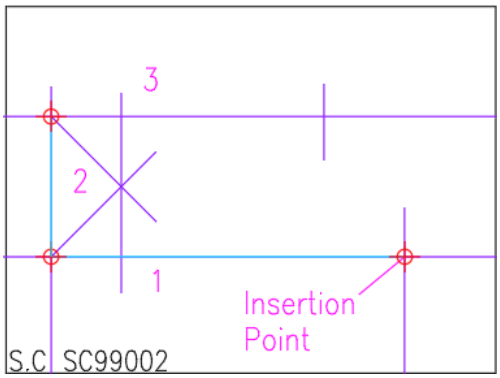
  Specify next end point: Select the Intersection at the End of Leg 1 & 2.



- **Leg 2** – Add Vertical Segment.

  Select Vertex: Pick the Vertex between Leg 1 and 2.

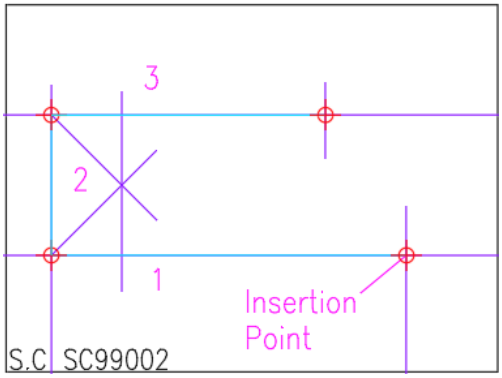
  Specify next end point: Select the Intersection point between Legs 2 and 3.



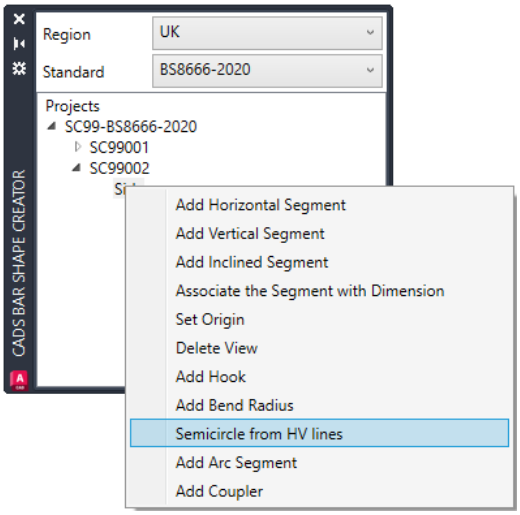
- **Leg 3** – Add Horizontal Segment.

  Select Vertex: Pick the Vertex between Legs 2 and 3.

  Specify next end point: Pick the intersection at the end of Leg 3.



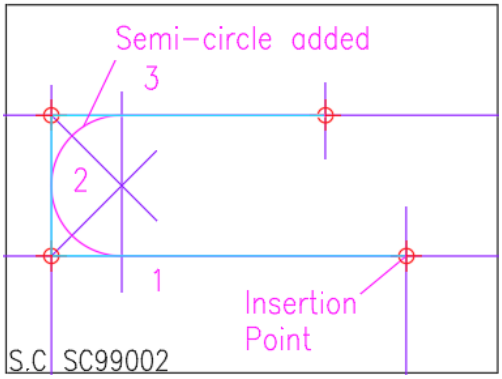
- **Add Semi-Circle** – Select Semicircle from HV Lines.



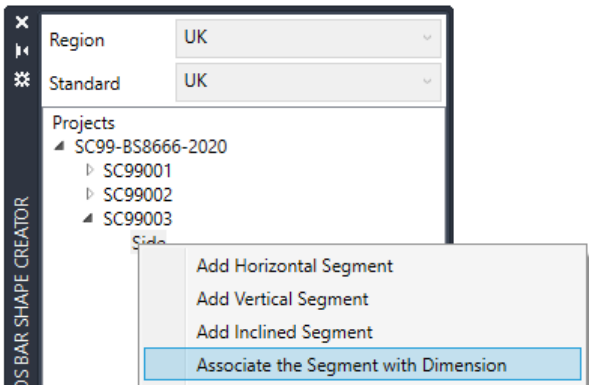
Select Start Segment to convert Semi Circular Bend: Select Segment 1.

Select Middle Segment to convert Circular Bend: Select Segment 2.

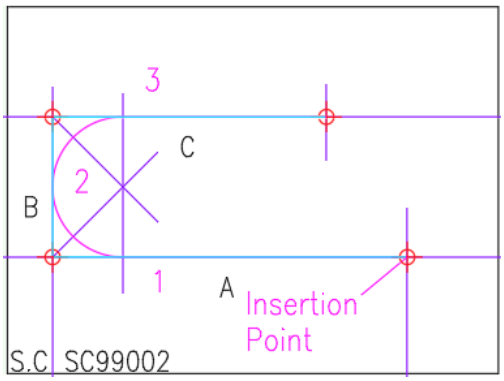
Select End Segment to Convert Semi Circular Bend: Select Segment 3.



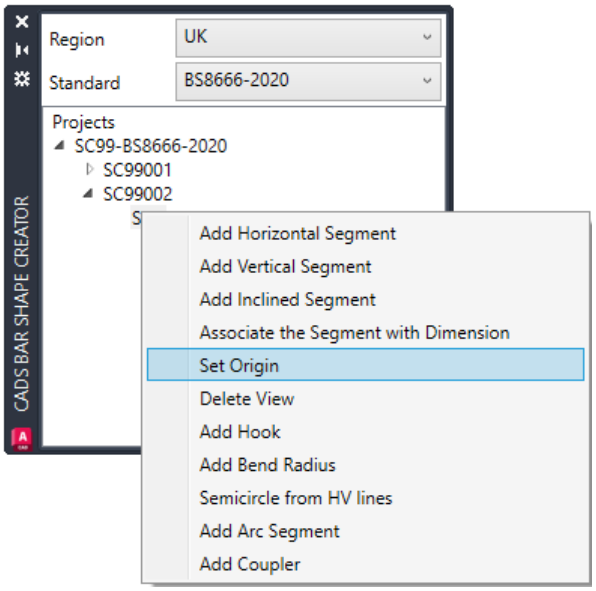
17. Define Dimension Letters, select Associate the Segment with Dimension by right-mouse clicking on the Side View.

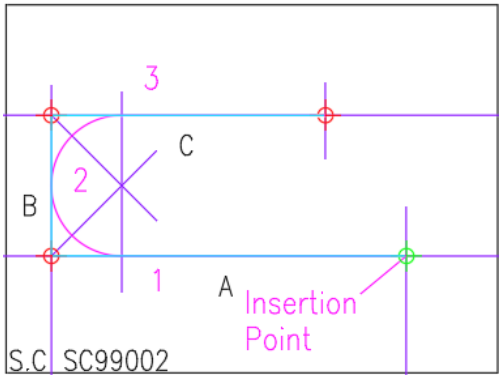


18. **Select Segment:** Select Leg 1 Segment.
19. **Enter horizontal associated dimension name:** Type in A and press enter.
20. **Select Segment:** Select Leg 2 Segment.
21. **Enter horizontal associated dimension name:** Type in B and press enter.
22. **Select Segment:** Select Leg 3 Segment.
23. **Enter vertical associated dimension name:** Type in C and press enter.



24. Define the Insertion Point of the Side View, select Set Origin by right-mouse clicking on the Side View.



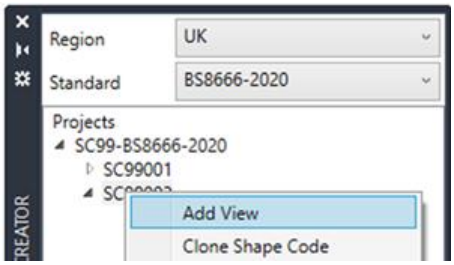


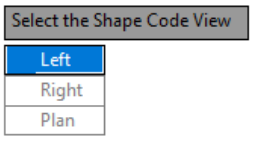
25. **Select a Vertex:** Pick the Vertex on the right-hand end of Leg A.

This completes the Side View.

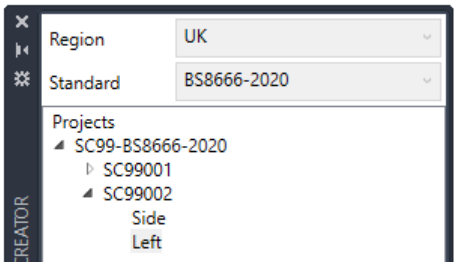
5.2.3 Add Left View

26. Right-mouse click on the Shape Code Name & select Add View.

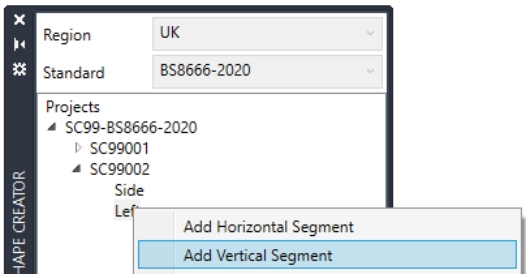


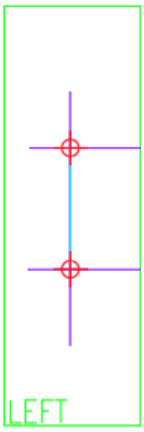


27. Select Left View.

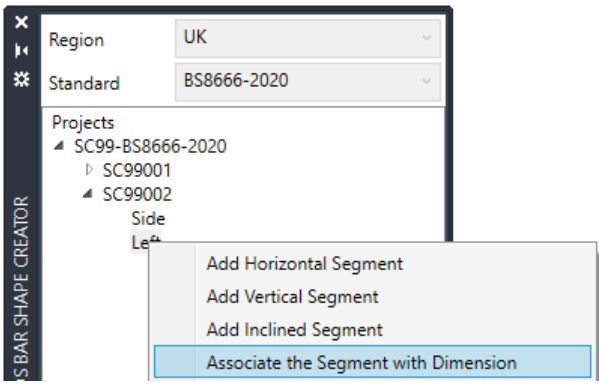


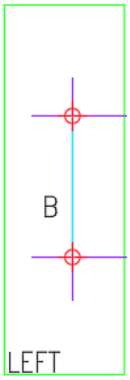
28. The Left View is added to the Shape Code.
29. Define the Left View Segment, right-mouse click on the View and select Add Vertical Segment.



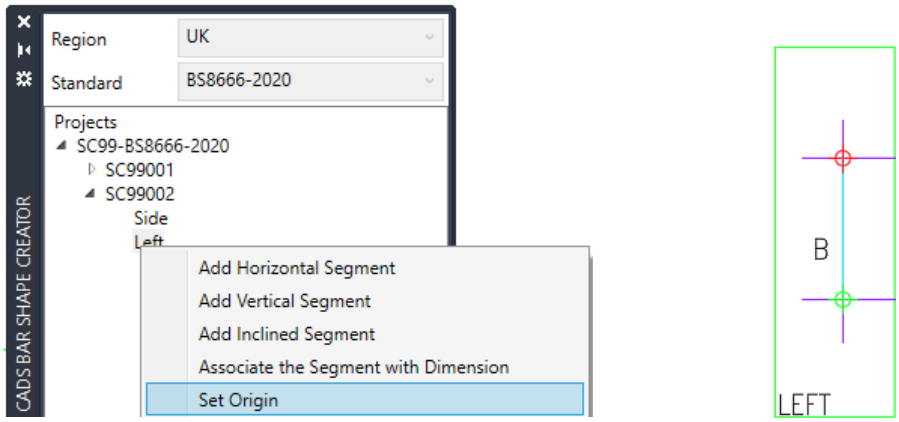


30. **Specify Start Point:** Select the bottom left intersection in the Left View Boundary as indicated above.
31. **Specify next end point:** Select top left insertion in the Left View Boundary as indicated above.
32. Define the Dimension Letter, right-mouse click on the Left View and select Associate Segment with Dimension.





33. **Select a Segment:** Select the Vertical Segment.
34. **Enter dimension name for length:** Type in B and press enter.
35. Define the Insertion Point of the Left View, select Set Origin by right-mouse clicking on the Left View.

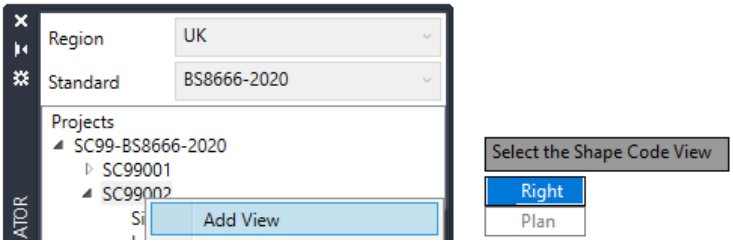


36. **Select a Vertex:** Pick the Vertex at the bottom of the Vertical Segment to set the Insertion Point.

This completes the Left View.

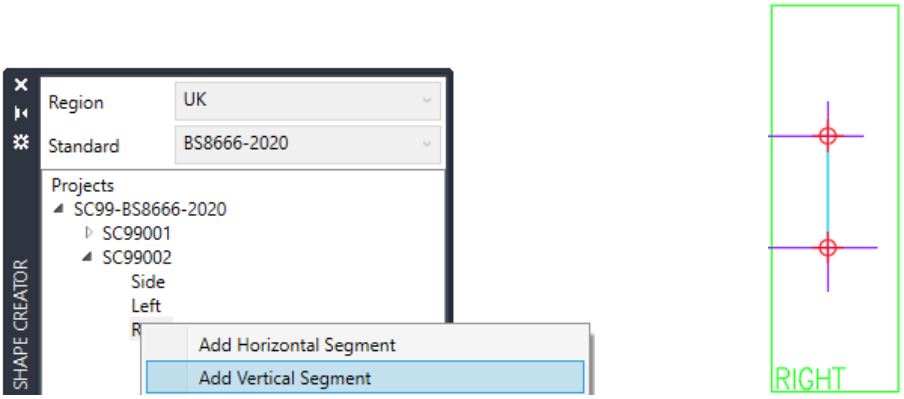
5.2.4 Add Right View

37. Right-mouse click on the Shape Code Name & select Add View.

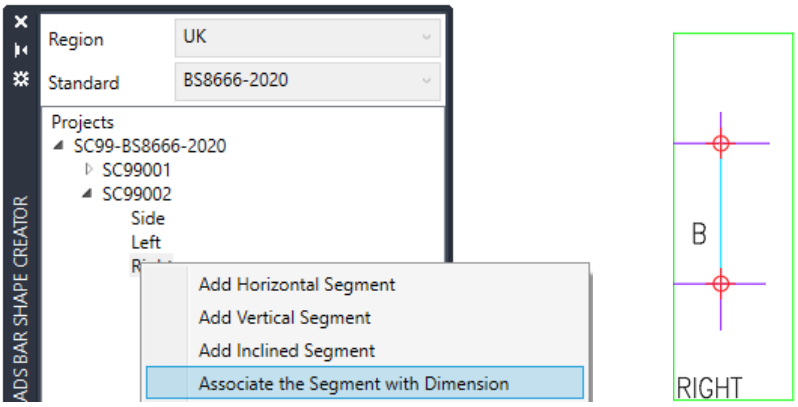


38. Select Right View.

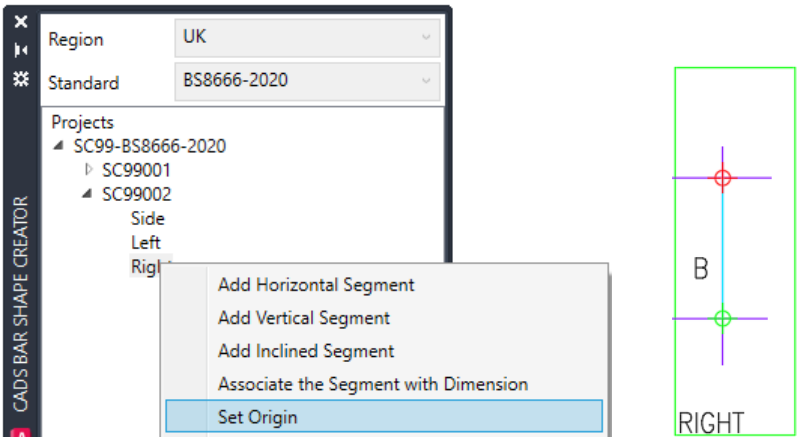
39. The Right View is added to the Shape Code.
40. Define the Right View Segment, right-mouse click on the View and select Add Vertical Segment.



41. **Specify Start Point**: Select the bottom left intersection in the Right View Boundary as indicated above.
42. **Specify next end point:** Select top left insertion in the Right View Boundary as indicated above.
43. Define the Dimension Letter, right-mouse click on the Right View and select Associate Segment with Dimension.



44. **Select a Segment:** Select the Vertical Segment.
45. **Enter dimension name for length:** Type in B and press enter.
46. Define the Insertion Point of the Left View, select Set Origin by right-mouse clicking on the Left View.



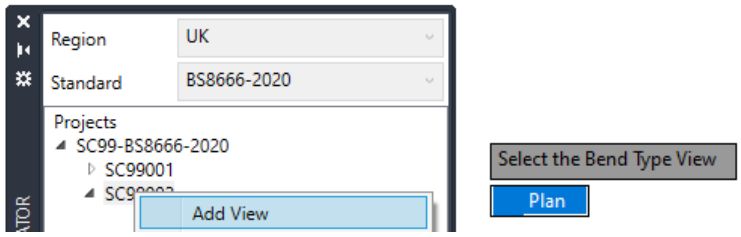
47. **Select a Vertex:** Pick the Vertex at the bottom of the Vertical Segment to set the Insertion Point.

This completes the Right View.

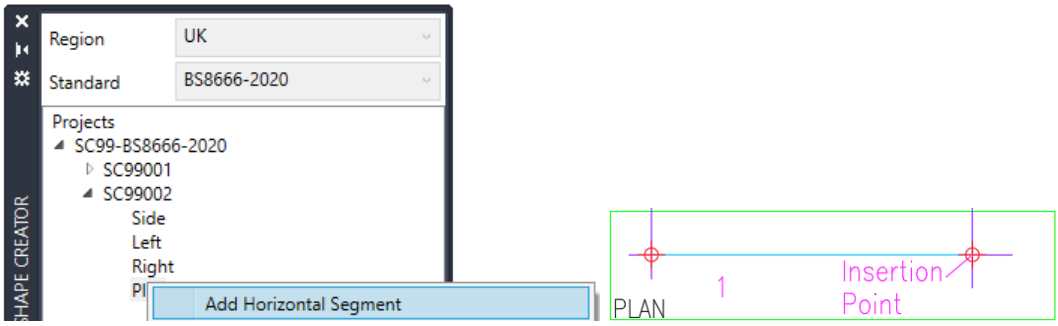
5.2.5 Add Plan View

48. The Plan View is made up of one horizontal segment.

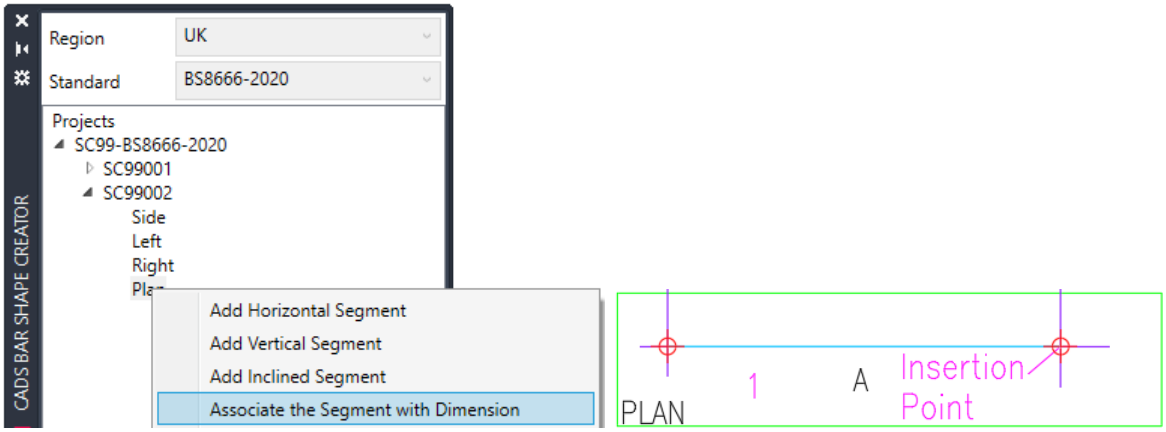
49. Add the Plan View by Right Clicking on the Shape Code and select Add View.



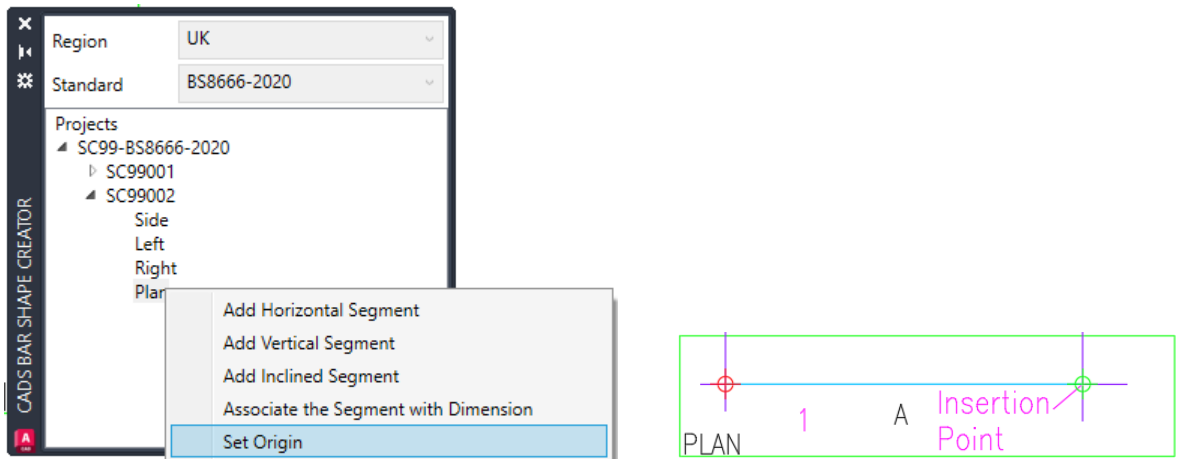
50. Right-mouse click on the Plan View and select Add Horizontal Segment and place for Leg 1 from right to left as shown below;



51. Add the Dimension Letters to the Plan view, this will be Leg A.



52. Select Set Origin by right-mouse clicking on the Plan View and pick the far-right Vertex on Dim A.



This completes the Plan View.

5.2.6 Validate Project

Refer to **Chapter 5.1.6**.

5.2.7 Generate BDF

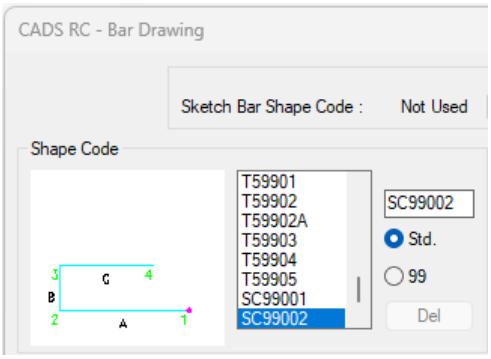
Refer to **Chapter 5.1.7**.

5.2.8 Exporting the Project JSON File

Refer to **Chapter 5.1.8**.

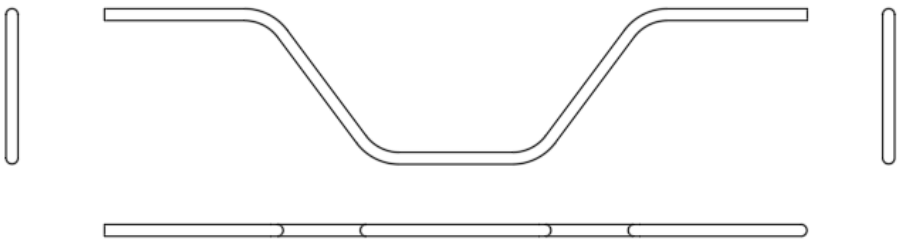
5.2.9 Loading the BDF and supporting files into CADS RC

Refer to **Chapter 5.1.9**.



This completes the U Bar with Semi-Circular Leg.

5.3 Creating a Symmetrical Cranked Bar U Bar

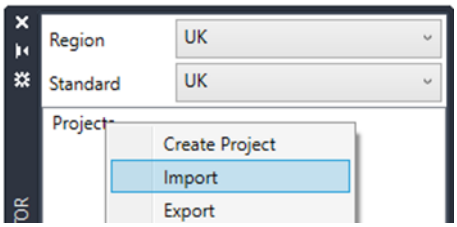


1. Open a new drawing using the CADSISO.dwt template drawing.
2. Load the Bar Shape Creator Dialog.

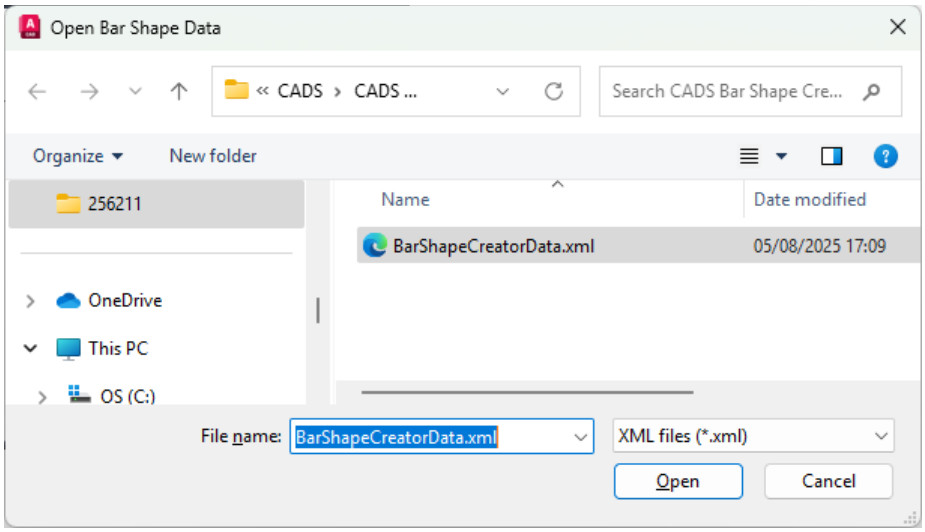
5.3.1 Create Project & Shape Code Name

3. If you have an existing Project, you can add the new shape code by loading the Project JSON file into the blank drawing.

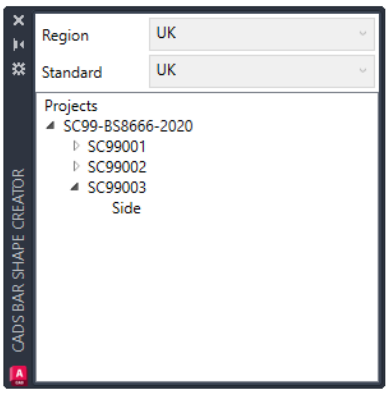
4. Right-mouse click on the Projects and select Import.

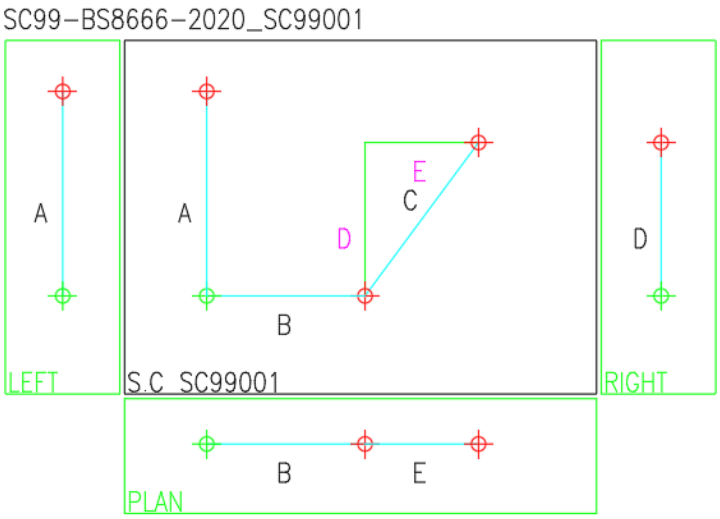


5. Select and open the BarShapeCreatorData.JSON file.

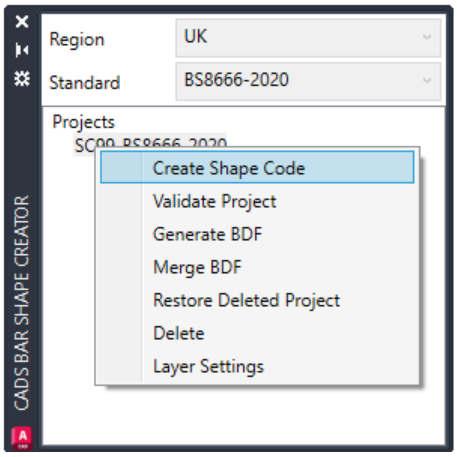


6. The command will prompt for the insertion point of the previously drawn shape codes.
7. **Click to select the insertion point where the project should be placed:** Pick a point on screen.

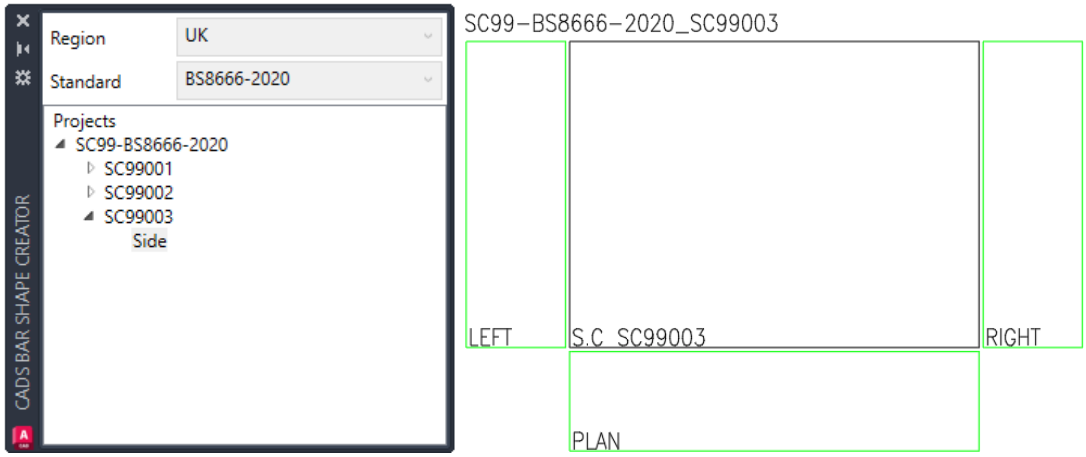




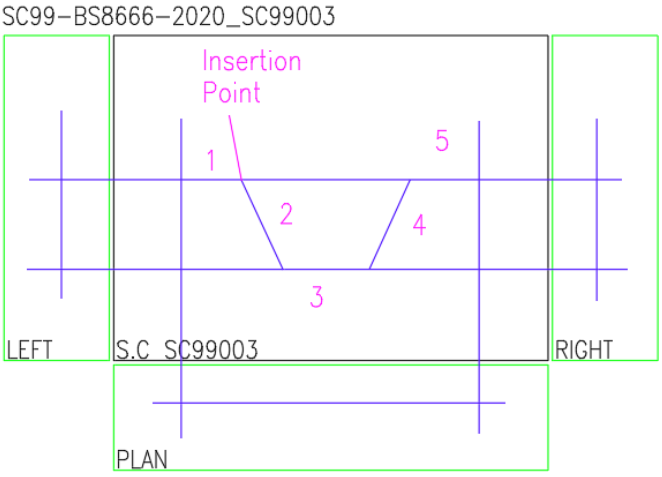
8. Alternatively, you can start a new Project as described in **Chapter 3.4.1**.
9. Create Shape Code, right-mouse click on the Project Name and select Create Shape Code.



10. **Enter Shape Code Name:** Type in the shape code name i.e. SC99003.
11. **Enter Shape Code Description:** Type in the description i.e. Symmetrical Cranked Bar U Bar.
12. **First Corner:** Pick the Insertion Point of the Shape Code Boundary.

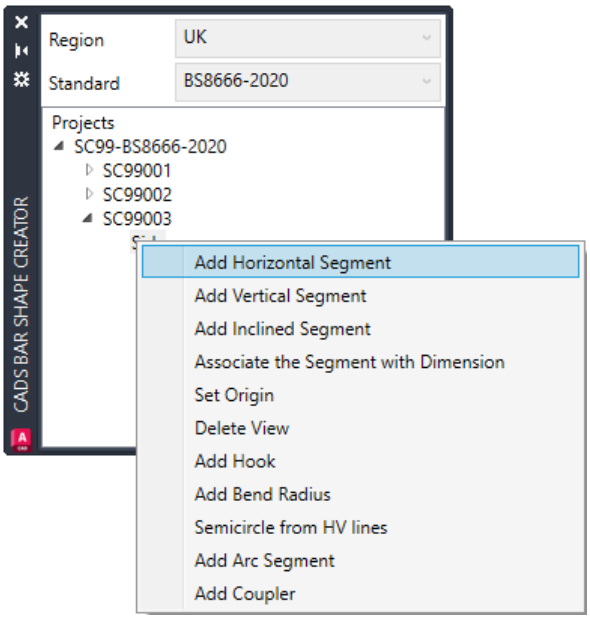


13. Note the Side View is automatically added to the Shape Code Name.
14. Setup Construction Lines to Draw the Shape Code to aid drawing the Shape Code in each of the View Boundaries to minimize mistakes.



5.3.2 Create Side View

15. Create Side View, right-mouse click on the Side View and select the Add Segments commands, place the segments of the bar in the order that they should be drawn when placing the shape code. The construction diagram indicates the suggested placement.



16. Define the Shape Code Segments.

- **Leg 1** – Add Horizontal Segment.

  Select Vertex: Pick the Intersection indicated by the Insertion Point.

  Specify next end point: Select the Intersection at the End of Leg 1.

- **Leg 2** – Add Inclined Segment.

  Select Vertex: Pick the Vertex between Leg 1 and 2.

  Specify next end point: Select the Intersection point between Legs 2 and 3.

- **Leg 3** – Add Horizontal Segment.

  Select Vertex: Pick the Vertex between Legs 2 and 3.

  Specify next end point: Pick the intersection at the between of Legs 3 and 4.

- **Leg 4** – Add Inclined Segment

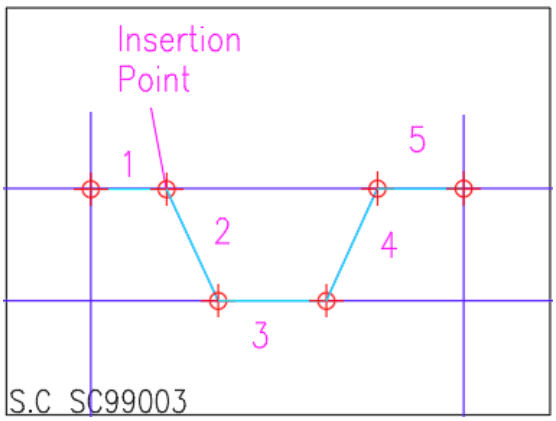
  Select Vertex: Pick the Vertex between Legs 3 and 4.

  Specify next end point: Pick the intersection at the between of Legs 4 and 5.

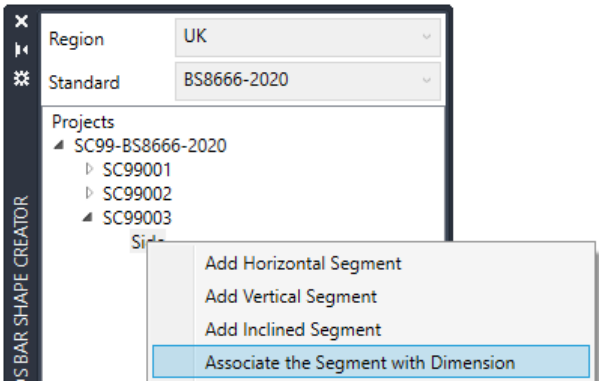
- **Leg 5** – Add Horizontal Segment.

  Select Vertex: Pick the Intersection Between Legs 4 and 5.

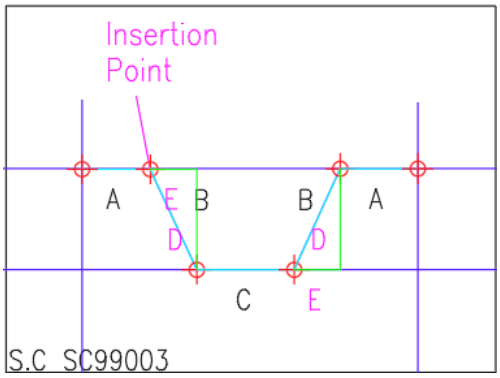
  Specify next end point: Select the Intersection at the End of Leg 5.



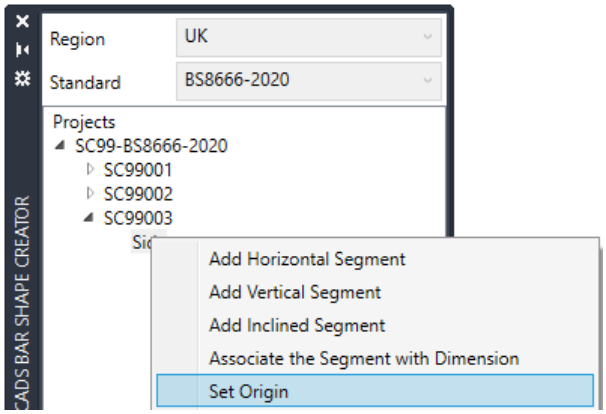
17. Define Dimension Letters, select Associate the Segment with Dimension by right-mouse clicking on the Side View.

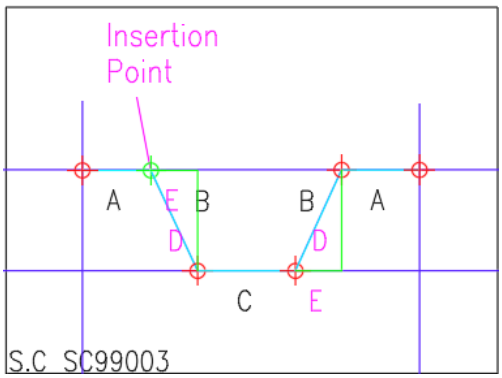


18. **Select Segment:** Select Leg 1 Segment.
19. **Enter horizontal associated dimension name:** Type in A and press enter.
20. **Select Segment:** Select Leg 2 Segment.
21. **Enter inclined associated dimension name:** Type in B and press enter.
22. **Enter vertical associated dimension name:** Type in D and press enter.
23. **Enter horizontal associated dimension name:** Type in E and press enter.
24. **Select Segment:** Select Leg 3 Segment.
25. **Enter vertical associated dimension name:** Type in C and press enter.
26. **Select Segment:** Select Leg 4 Segment.
27. **Enter inclined associated dimension name:** Type in B and press enter.
28. **Enter vertical associated dimension name:** Type in D and press enter.
29. **Enter horizontal associated dimension name:** Type in E and press enter.
30. **Select Segment:** Select Leg 5 Segment.
31. **Enter horizontal associated dimension name:** Type in A and press enter.



32. Define the Insertion Point of the Side View, select Set Origin by right-mouse clicking on the Side View.

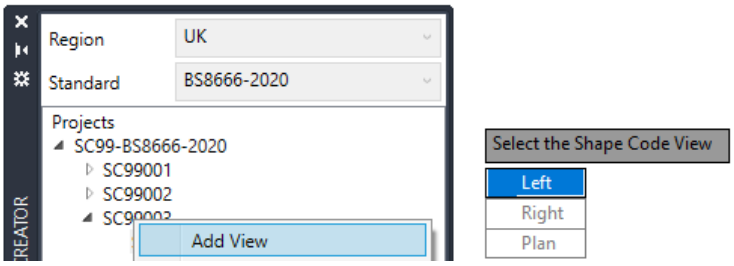




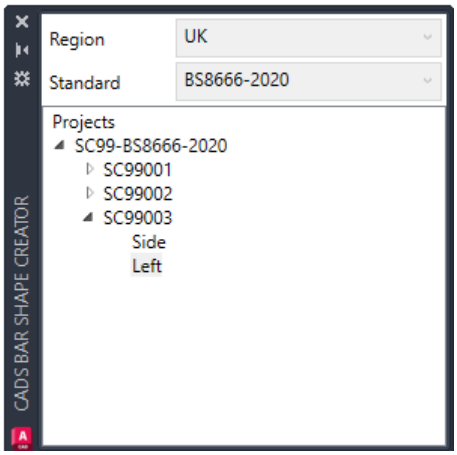
This completes the Side View.

5.3.3 Add Left View

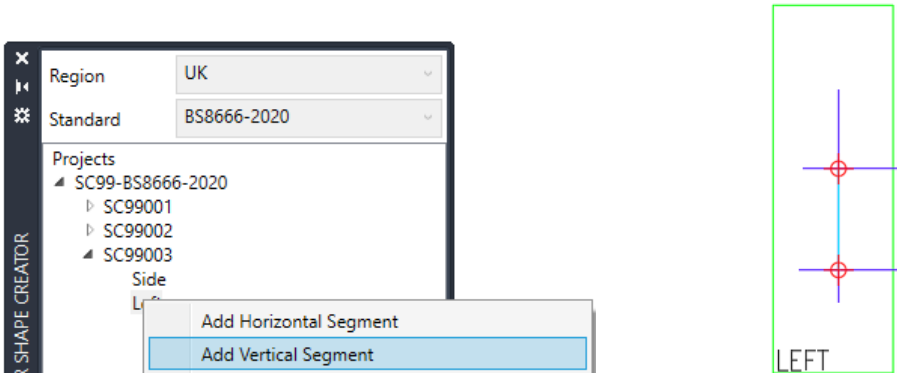
33. Right-mouse click on the Shape Code Name & select Add View.



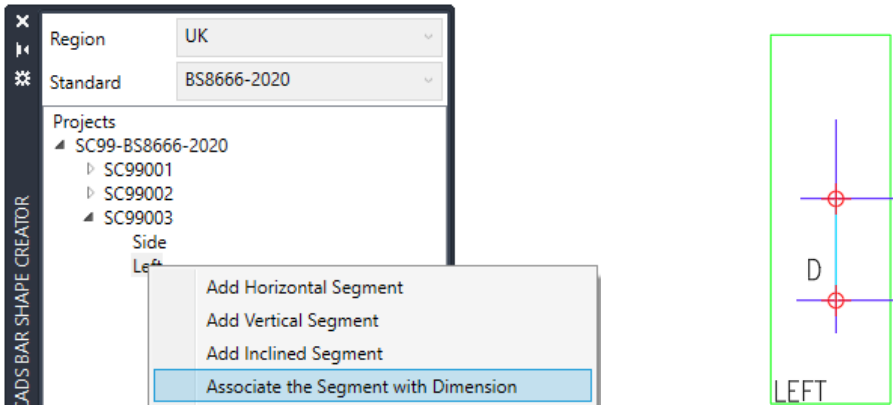
34. Select Left View.



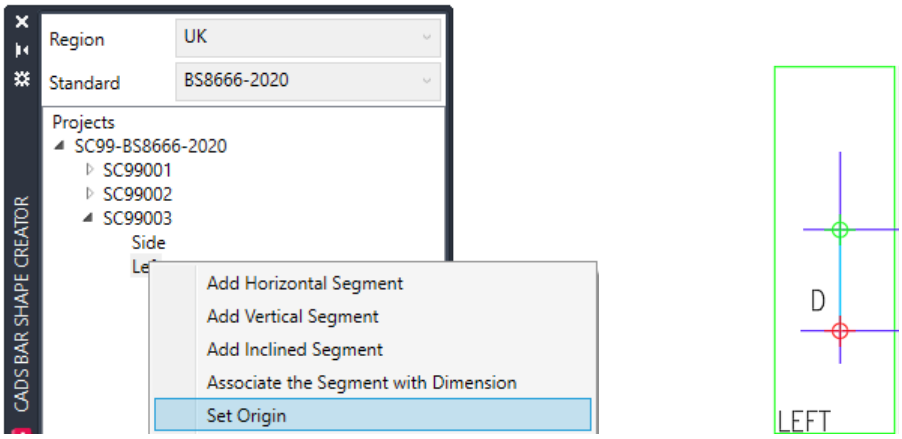
35. The Left View is added to the Shape Code.
36. Define the Left View Segment, right-mouse click on the View and select Add Vertical Segment.



37. **Specify Start Point:** Select the bottom left intersection in the Left View Boundary as indicated above.
38. **Specify next end point:** Select top left insertion in the Left View Boundary as indicated above.
39. Define the Dimension Letter, right-mouse click on the Left View and select Associate Segment with Dimension.



40. **Select a Segment:** Select the Vertical Segment.
41. **Enter dimension name for length:** Type in D and press enter.
42. Define the Insertion Point of the Left View, select Set Origin by right-mouse clicking on the Left View.

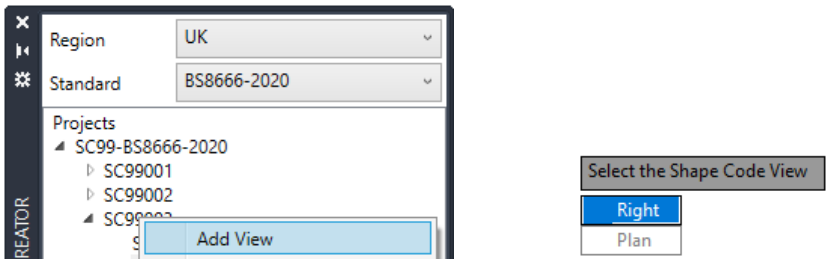


43. **Select a Vertex:** Pick the Vertex at the top of the Vertical Segment to set the Insertion Point.

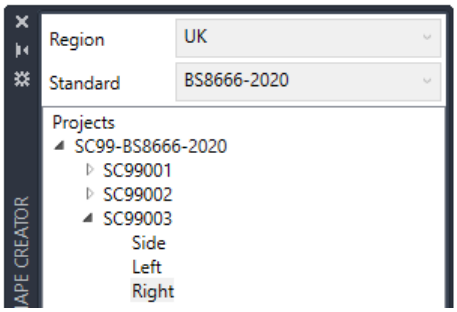
This completes the Left View.

5.3.4 Add Right View

44. Right-mouse click on the Shape Code Name & select Add View.

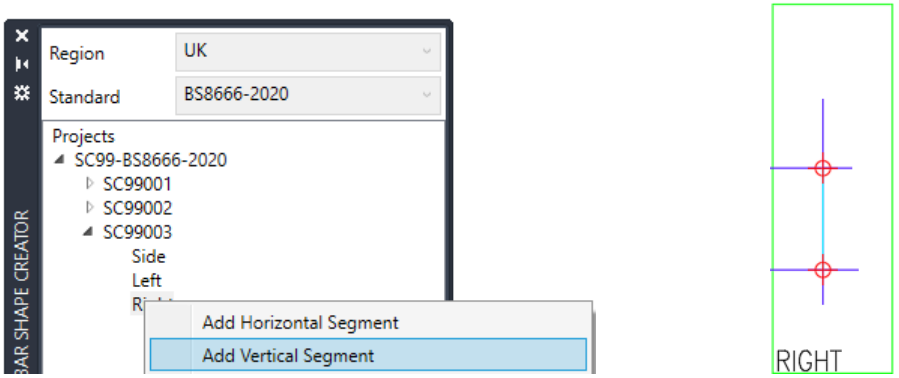


45. Select Right View.

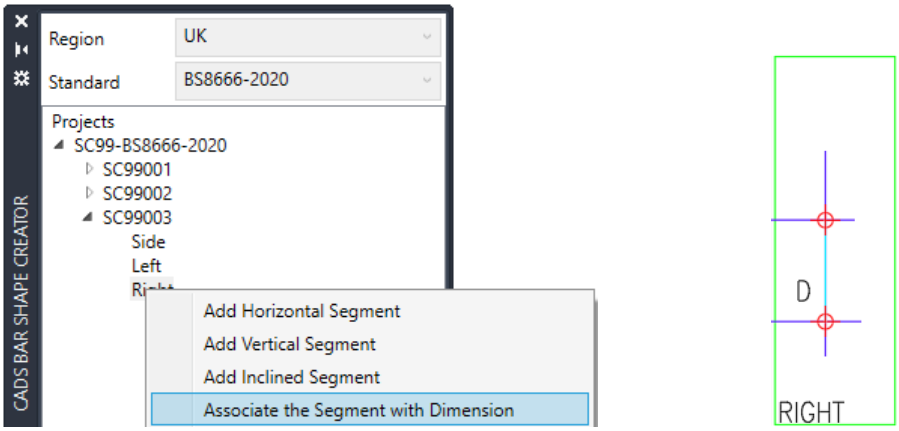


46. The Right View is added to the Shape Code.

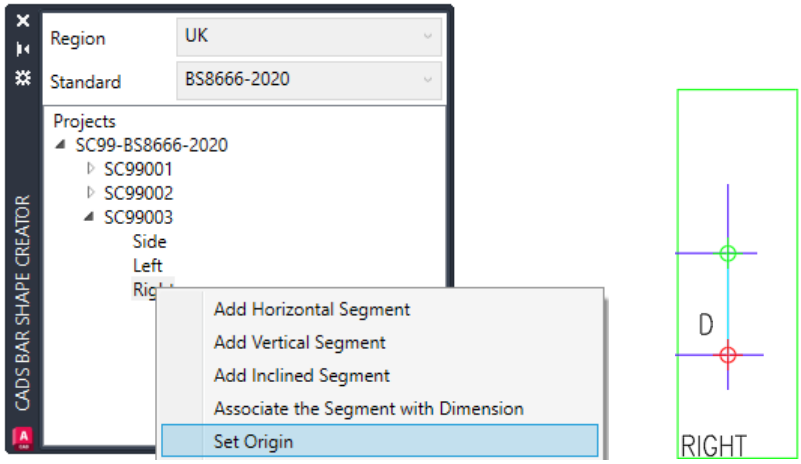
47. Define the Right View Segment, right-mouse click on the View and select Add Vertical Segment.



48. **Specify Start Point:** Select the bottom intersection in the Right View Boundary as indicated above.
49. **Specify next end point:** Select top intersection in the Right View Boundary as indicated above.
50. Define the Dimension Letter, right-mouse click on the Right View and select Associate Segment with Dimension.



51. **Select a Segment:** Select the Vertical Segment.
52. **Enter dimension name for length:** Type in D and press enter.
53. Define the Insertion Point of the Right View, select Set Origin by right-mouse clicking on the Left View.

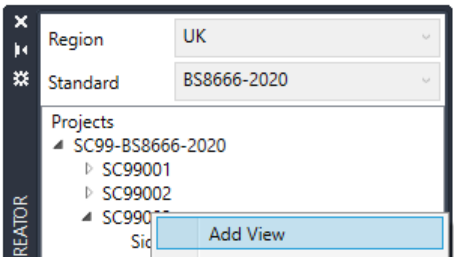


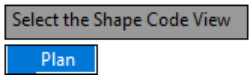
54. **Select a Vertex:** Pick the Vertex at the top of the Vertical Segment to set the Insertion Point.

This completes the Right View.

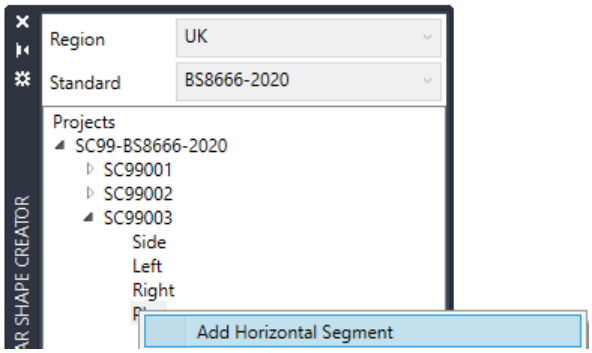
5.3.5 Add Plan View

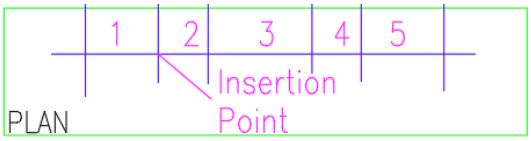
The Plan View is made up of five horizontal segments.





55. Add the Plan View by Right Clicking on the Shape Code and select Add View.





56. Right-mouse click on the Plan View and select Add Horizontal Segment and place for Leg 1 from right to left as shown above;

- **Leg 1** – Add Horizontal Segment.

  Specify Start Point: Pick the Intersection indicated by the Insertion Point.

  Specify next end point: Select the Intersection at the End of Leg 1.

- **Leg 2** – Add Horizontal Segment.

  Select Vertex: Pick the Vertex between Leg 1 and 2.

  Specify next end point: Select the Intersection point between Legs 2 and 3.

- **Leg 3** – Add Horizontal Segment.

  Select Vertex: Pick the Vertex between Legs 2 and 3.

  Specify next end point: Pick the intersection at between of Legs 3 and 4.

- **Leg 4** – Add Horizontal Segment

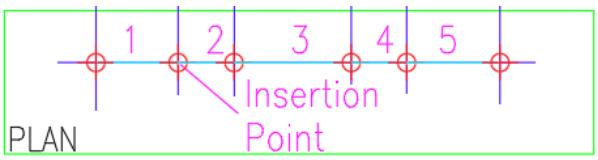
  Select Vertex: Pick the Vertex between Legs 3 and 4.

  Specify next end point: Pick the intersection at the between of Legs 4 and 5.

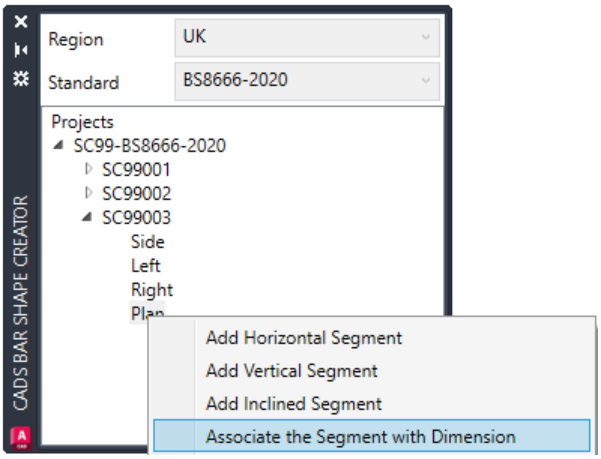
- **Leg 5** – Add Horizontal Segment.

  Select Vertex: Pick the Intersection Between Legs 4 and 5.

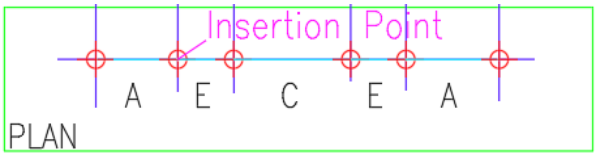
  Specify next end point: Select the Intersection at the End of Leg 5.



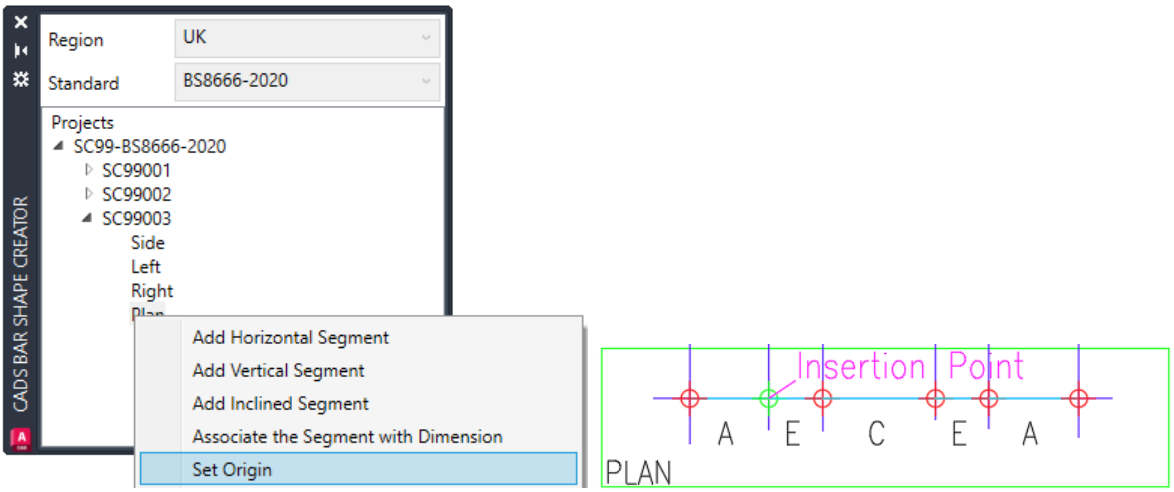
57. Add the Dimension Letters to the Plan view



58. **Select a Segment:** Select Segment 1.
59. **Enter dimension name for length:** A
60. **Select a Segment:** Select Segment 2.
61. **Enter dimension name for length:** E
62. **Select a Segment:** Select Segment 3.
63. **Enter dimension name for length:** C
64. **Select a Segment:** Select Segment 4
65. **Enter dimension name for length:** E
66. **Select a Segment:** Select Segment 5.
67. **Enter dimension name for length:** A



68. Select Set Origin by right-mouse clicking on the Plan View and pick the far-right Vertex on Dim A.



This completes the Plan View.

5.3.6 Validate Project

Refer to **Chapter 5.1.6.**

5.3.7 Generate BDF

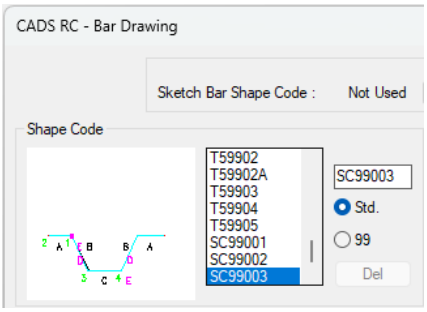
Refer to **Chapter 5.1.7.**

5.3.8 Exporting the Project JSON File

Refer to **Chapter 5.1.8.**

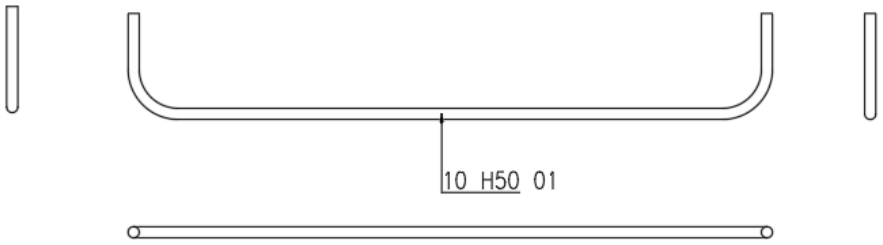
5.3.9 Loading the BDF and supporting files into CADS RC

Refer to **Chapter 5.1.9.**



This completes the Symmetrical Cranked Bar U Bar.

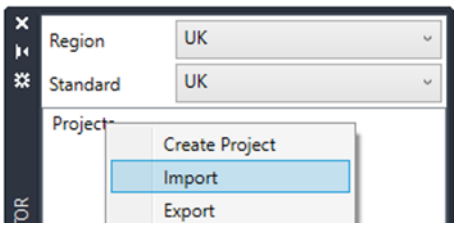
5.4 Creating a Straight Bar with Hooks



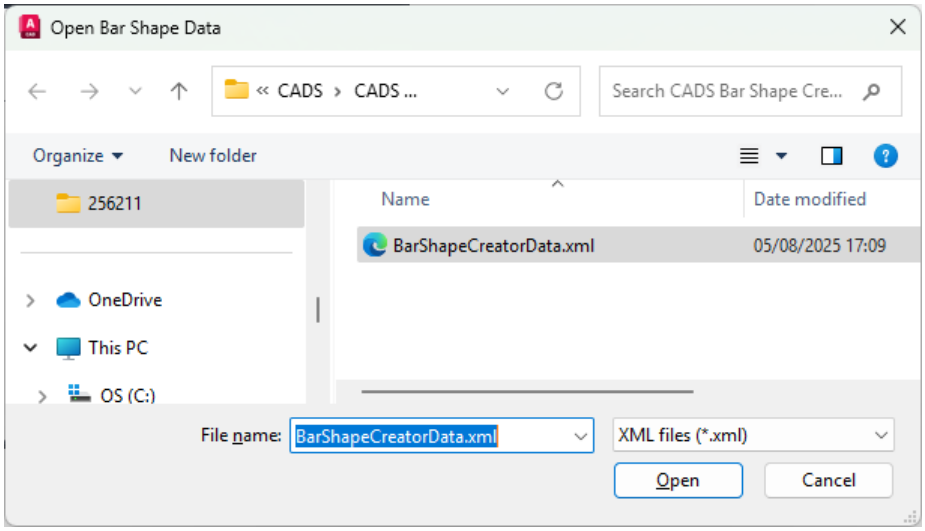
1. Open a new drawing using the CADSISO.dwt template drawing.
2. Load the Bar Shape Creator Dialog.

5.4.1 Create Project & Shape Code Name

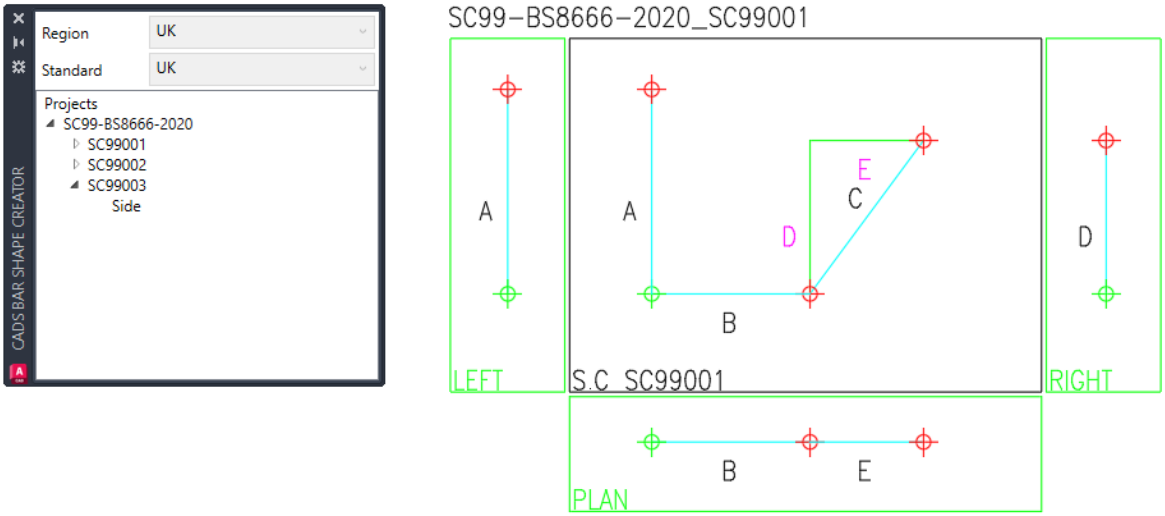
3. If you have an existing Project you can add the new shape code by loading the Project JSON file into the blank drawing.
4. Right-mouse click on the Projects and select Import.



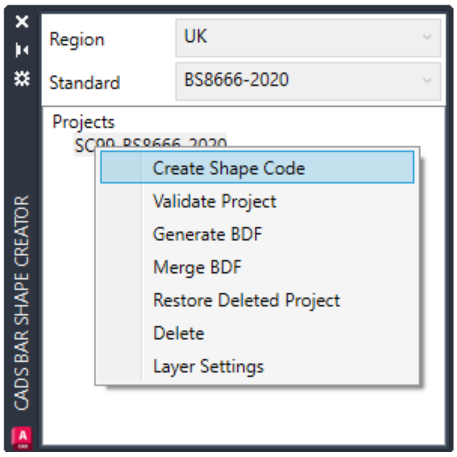
5. Select and open the BarShapeCreatorData.JSON file.



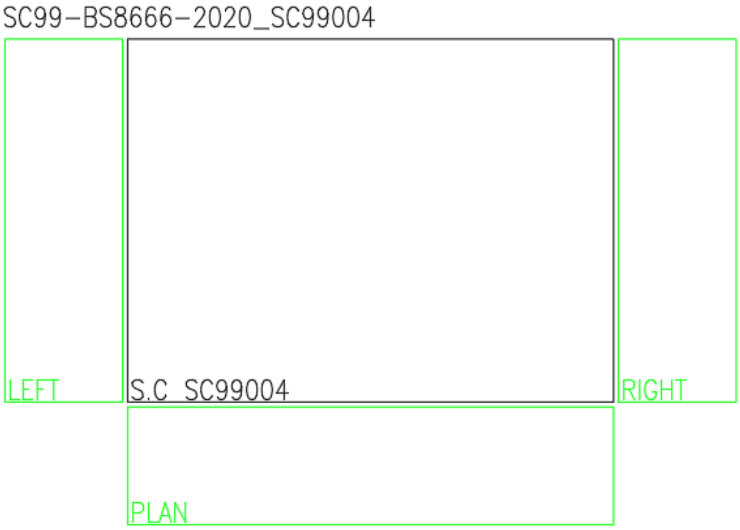
6. The command will prompt for the insertion point of the previously drawn shape codes.
7. Click to select the insertion point where the project should be placed: Pick a point on screen.



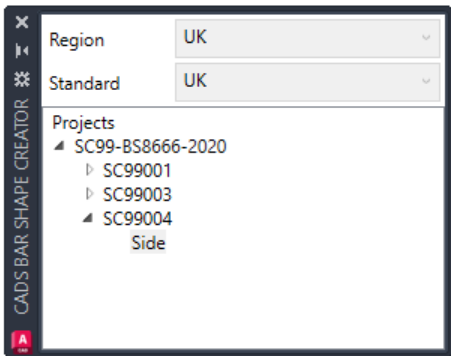
8. Alternatively, you can start a new Project as described in **Chapter 3.4.1**.
9. Create Shape Code, right-mouse click on the Project Name and select Create Shape Code.



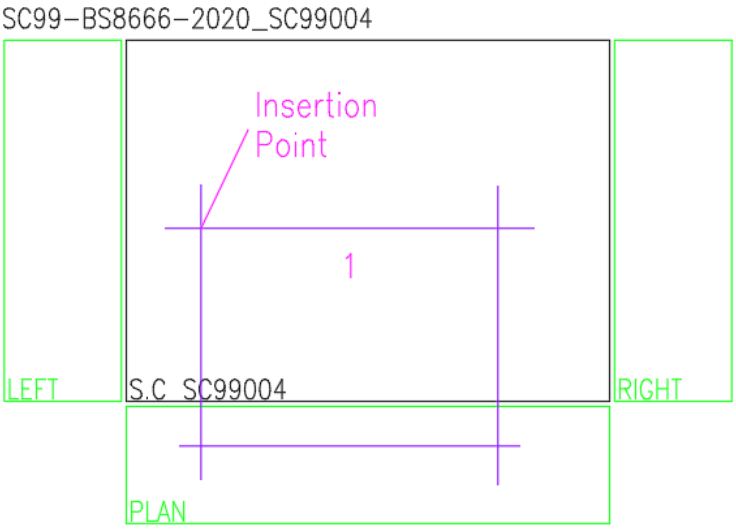
10. **Enter Shape Code Name:** Type in the shape code name i.e. SC99004.
11. **Enter Shape Code Description:** Type in the description i.e. Straight Bar with Hooks.
12. **First Corner:** Pick the Insertion Point of the Shape Code Boundary.



13. Note the Side View is automatically added to the Shape Code Name.

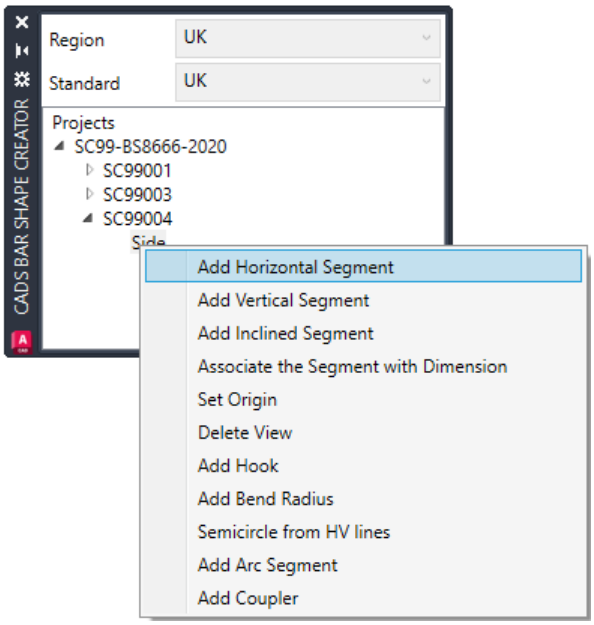


14. Setup Construction Lines to Draw the Shape Code to aid drawing the Shape Code in each of the View Boundaries to minimize mistakes.



5.4.2 Create Side View

15. Create Side View, right-mouse click on the Side View and select the Add Segments commands, place the segments of the bar in the order that they should be drawn when placing the shape code. The construction diagram indicates the suggested placement.

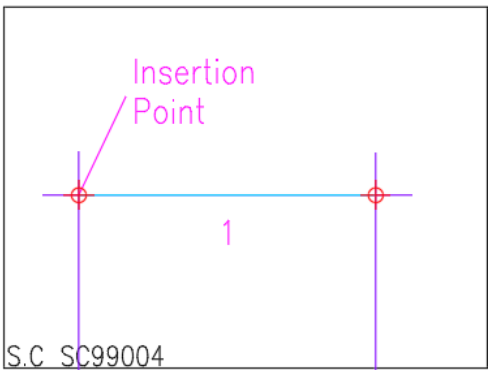


16. Define the Shape Code Segments.

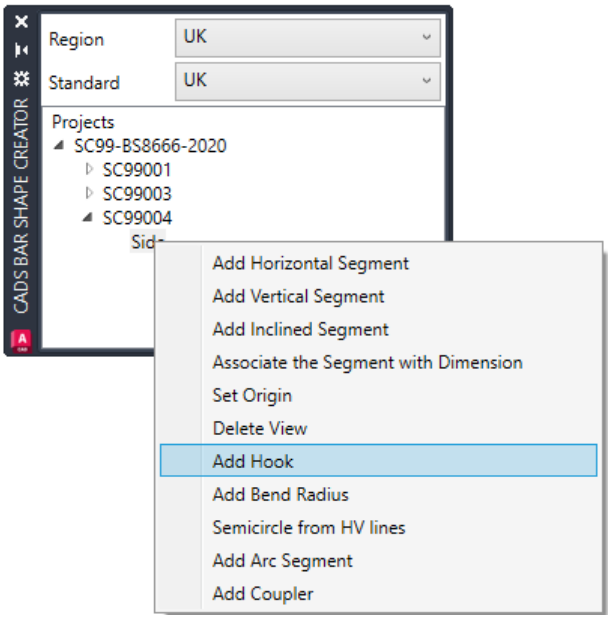
- **Leg 1** – Add Horizontal Segment.

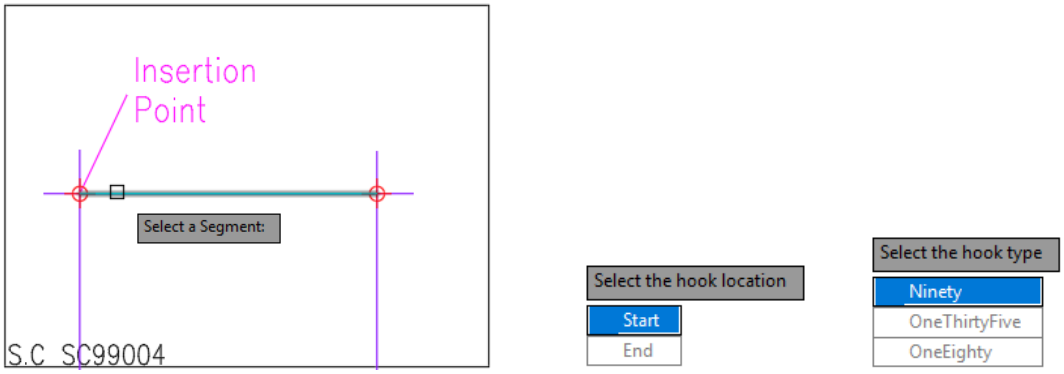
  Select Vertex: Pick the Vertex indicated by the Insertion Point.

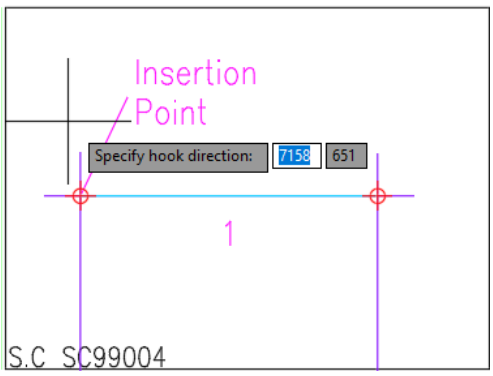
  Specify next end point: Select the Intersection at the End of Leg 1.

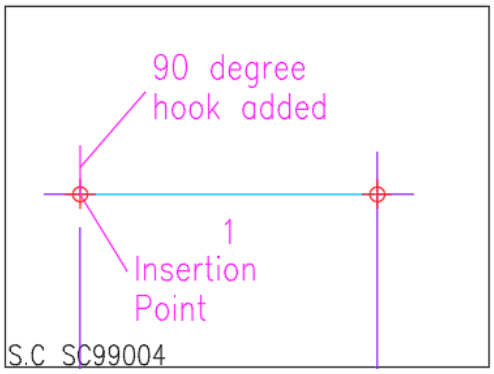


17. Add Hooks - Add 90 Degree Hook to Start of Bar.
18. Right-mouse click on the Side View and select Add Hook.
19. **Select a Segment:** Select the horizontal leg.
20. **Select the Hook Location:** Pick Start from the list.
21. **Select the Hook Type:** Pick 90 from the list.
22. **Specify the Hook Direction:** Pick above the horizontal segment.

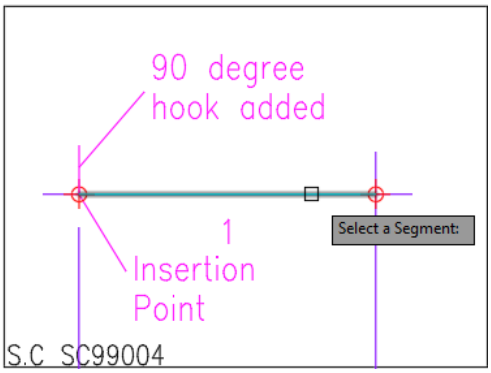


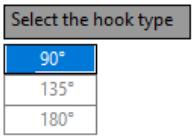


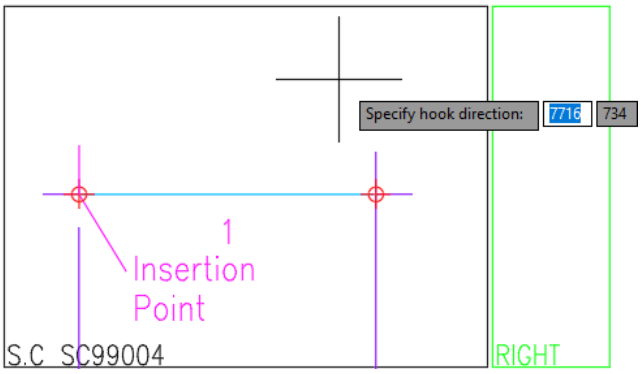




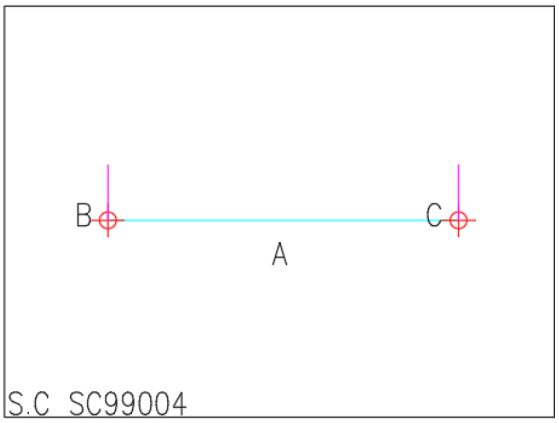
23. Add a 90 Degree Hook to End of Bar.



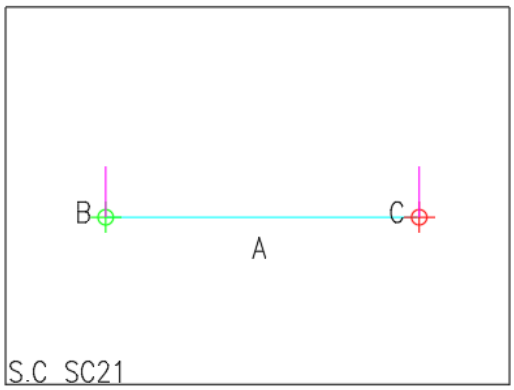




24. Define Dimension Letters, select Associate the Segment with Dimensions by right-mouse clicking on the Side View.
25. **Select Segment:** Select Leg 1 Segment.
26. **Enter horizontal associated dimension name:** Type in A and press enter.
27. Continue and add Dimension Letters to Leg B & C as shown below;



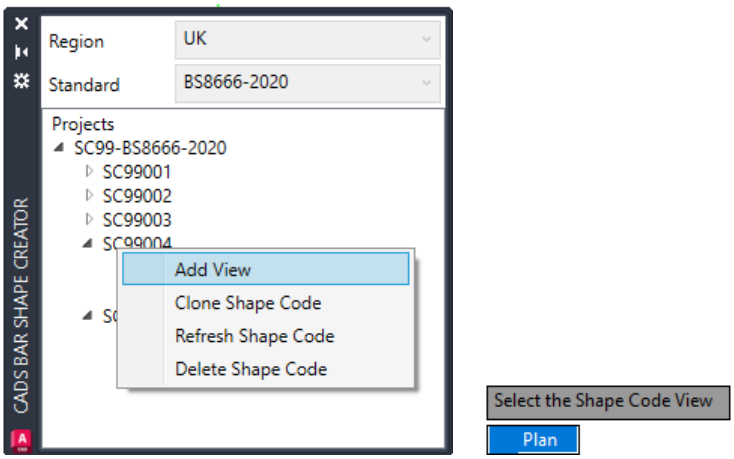
28. Define the Insertion Point of the Side View, select Set Origin by right-mouse clicking on the Side View.



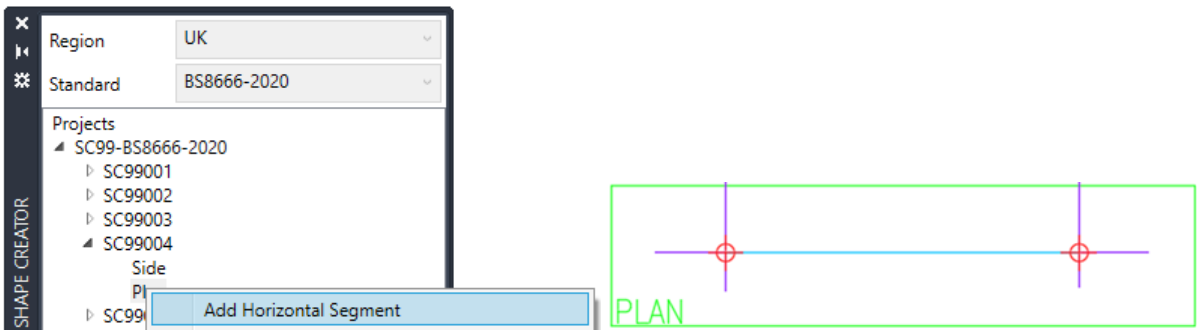
This completes the Side View.

5.4.3 Add Plan View

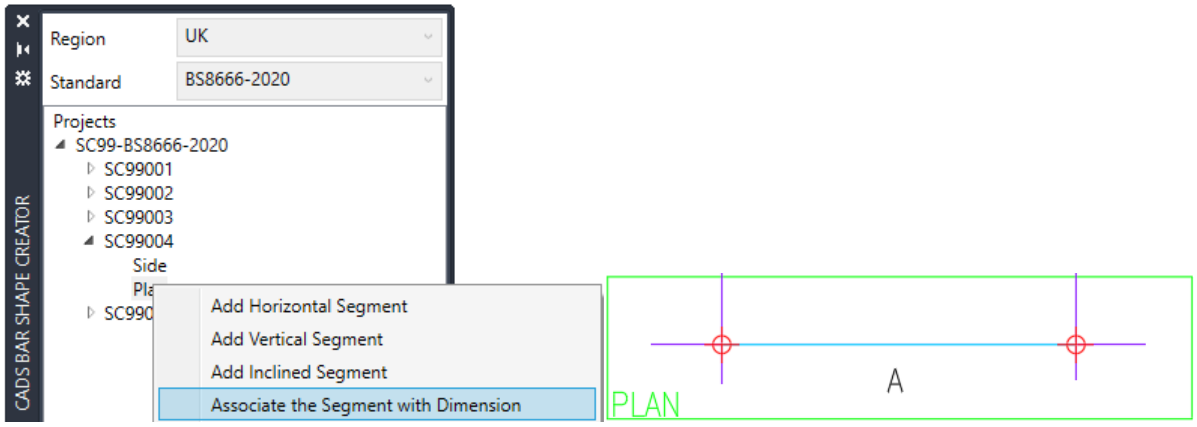
29. Use the same steps as described in the Left View to define the Plan View.



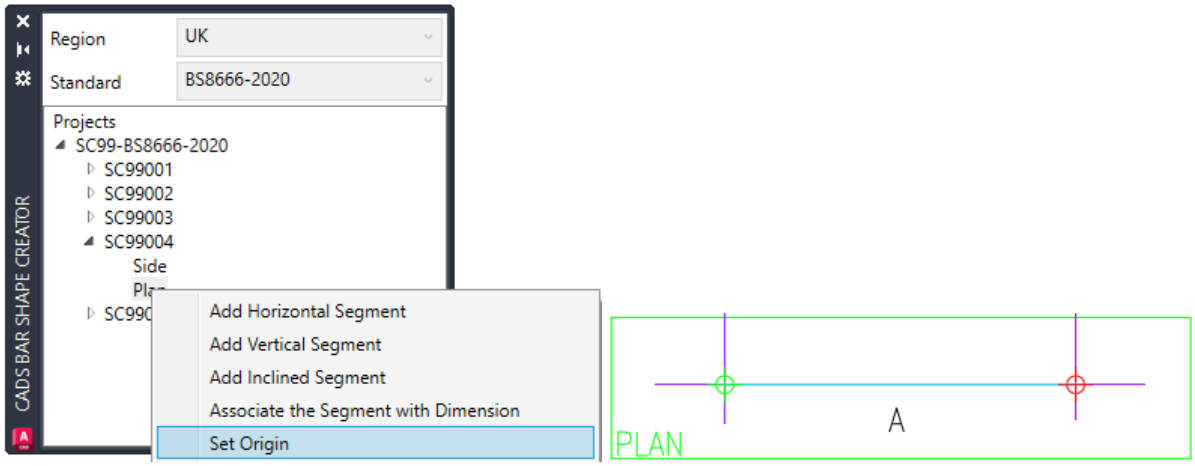
30. Right-mouse click on the Plan View and select Add Horizontal Segment and place for Leg 1 from right to left as shown below;



31. Add the Dimension Letter to the Plan view



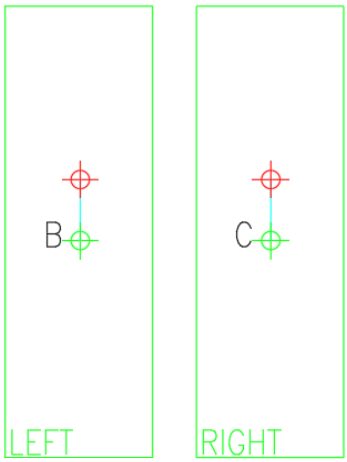
32. Select Set Origin by right-mouse clicking on the Plan View and pick the far-left Vertex on Dim A.



This completes the Plan View.

5.4.4 Add the Left & Right Views

Following the Instructions for the Plan View add the Left and Right Views to the Shape Code using the Add Horizontal Segment, include the Dimensions and Set the Origin.



5.4.5 Validate Project

Refer to **Chapter 5.1.6.**

5.4.6 Generate BDF

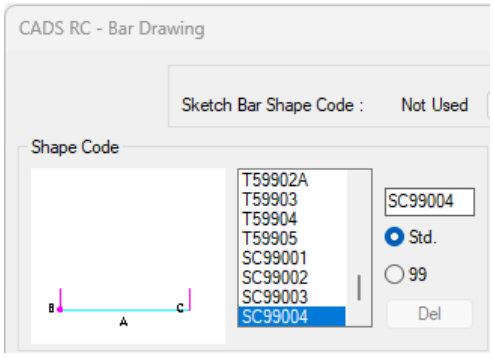
Refer to **Chapter 5.1.7.**

5.4.7 Exporting the Project JSON File

Refer to **Chapter 5.1.8.**

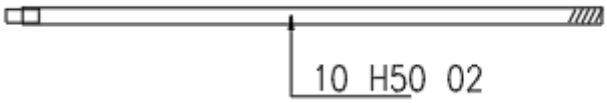
5.4.8 Loading the BDF and supporting files into CADS RC

Refer to **Chapter 5.1.9.**



This completes the Straight Bar with Hooks.

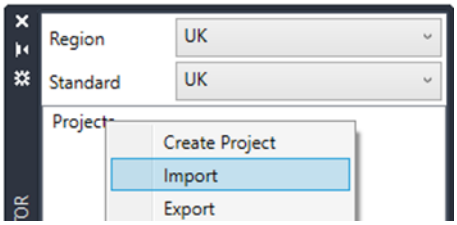
5.5 Creating a Straight Bar with Couplers



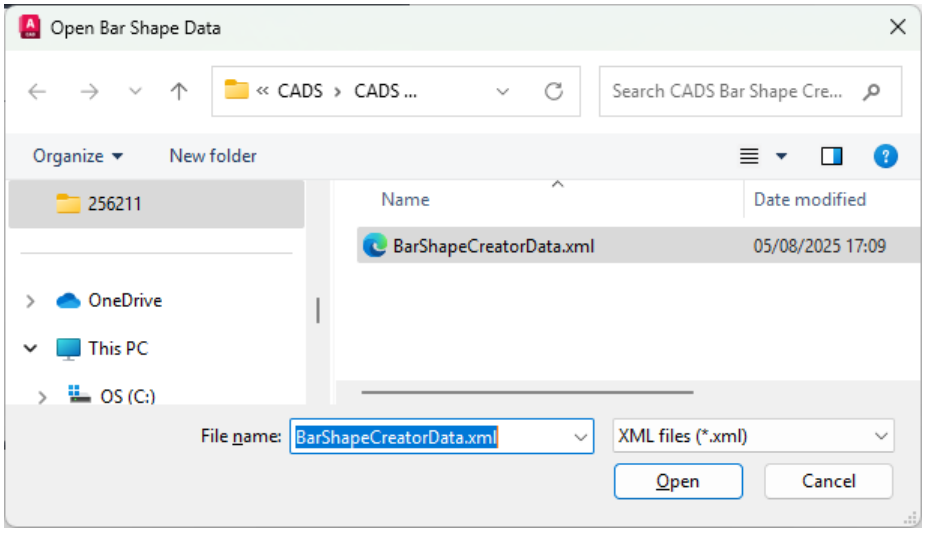
1. Open a new drawing using the CADSISO.dwt template drawing.
2. Load the Bar Shape Creator Dialog.

5.5.1 Create Project & Shape Code Name

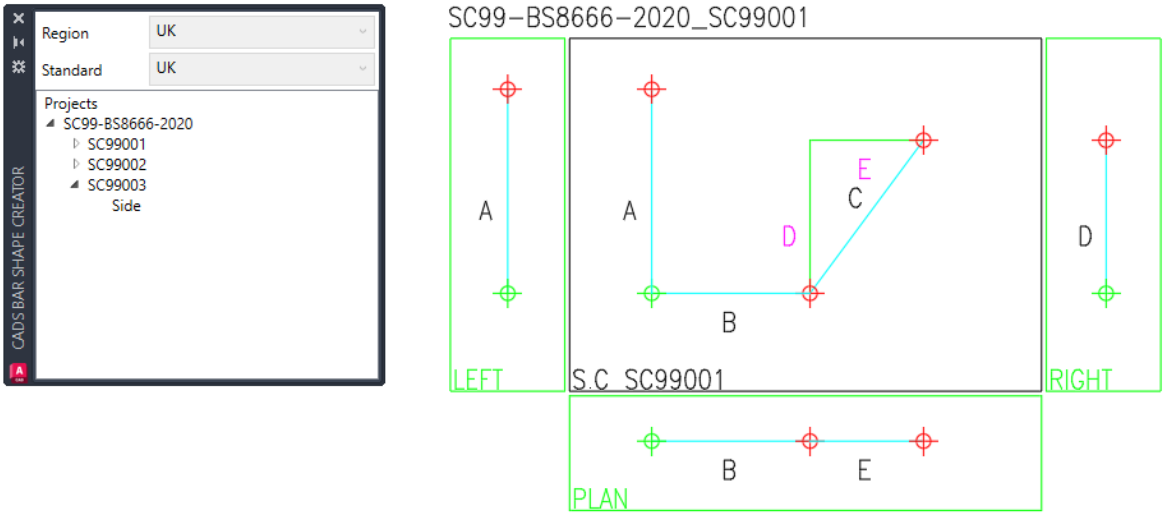
3. If you have an existing Project you can add the new shape code by loading the Project JSON file into the blank drawing.
4. Right-mouse click on the Projects and select Import.



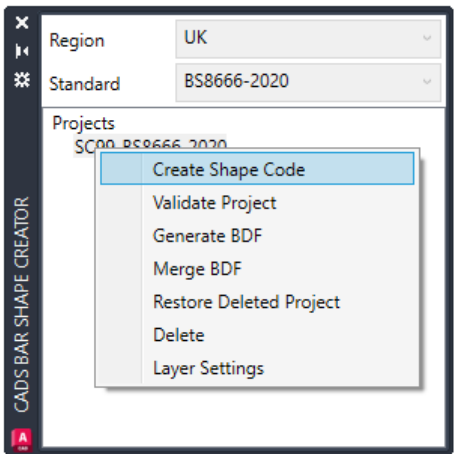
5. Select and open the BarShapeCreatorData.JSON file.



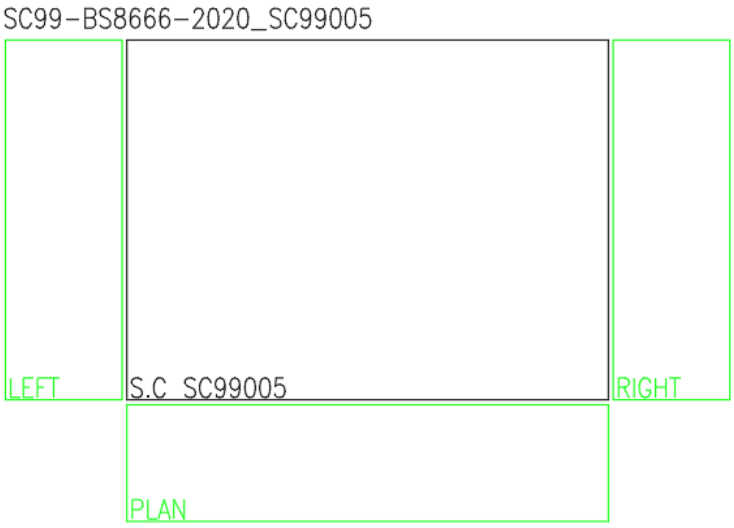
6. The command will prompt for the insertion point of the previously drawn shape code.
7. Click to select the insertion point where the project should be placed: Pick a point on screen.



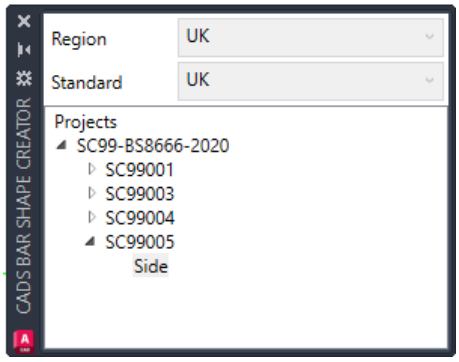
8. Alternatively, you can start a new Project as described in **Chapter 3.4.1**.
9. Create Shape Code, right-mouse click on the Project Name and select Create Shape Code.



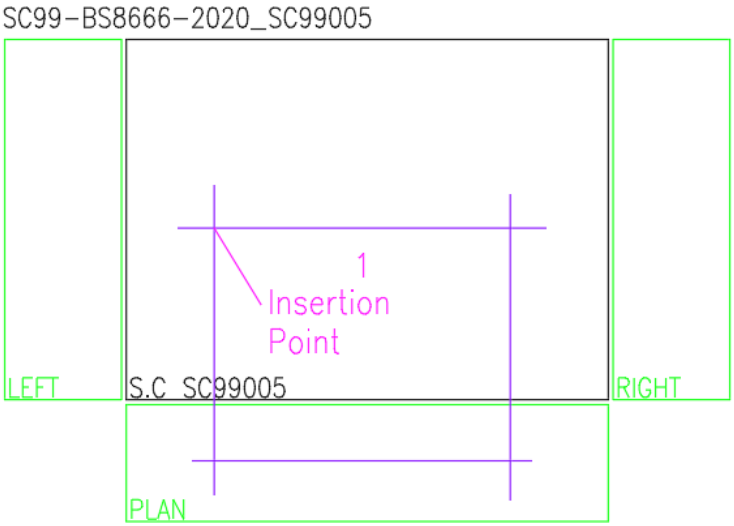
10. **Enter Shape Code Name:** Type in the shape code name i.e. SC99005.
11. **Enter Shape Code Description:** Type in the description i.e. Straight Bar with Coupler & Thread.
12. **First Corner:** Pick the Insertion Point of the Shape Code Boundary.



13. Note the Side View is automatically added to the Shape Code Name.

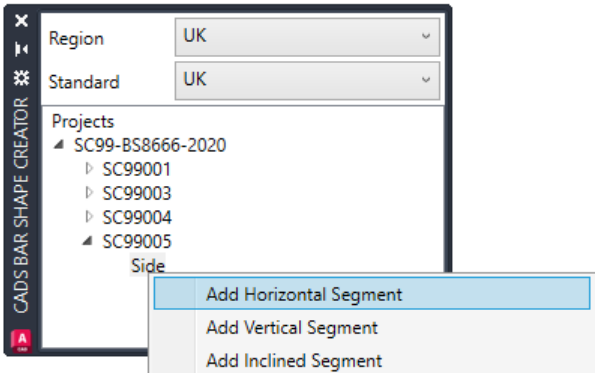


14. Setup Construction Lines to Draw the Shape Code to aid drawing the Shape Code in each of the View Boundaries to minimize mistakes.



5.5.2 Create Side View

15. Create Side View, right-mouse click on the Side View and select the Add Segments commands, place the segments of the bar in the order that they should be drawn when placing the shape code. The construction diagram indicates the suggested placement.

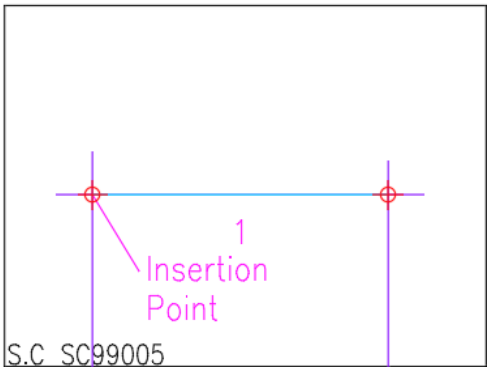


16. Define the Shape Code Segments.

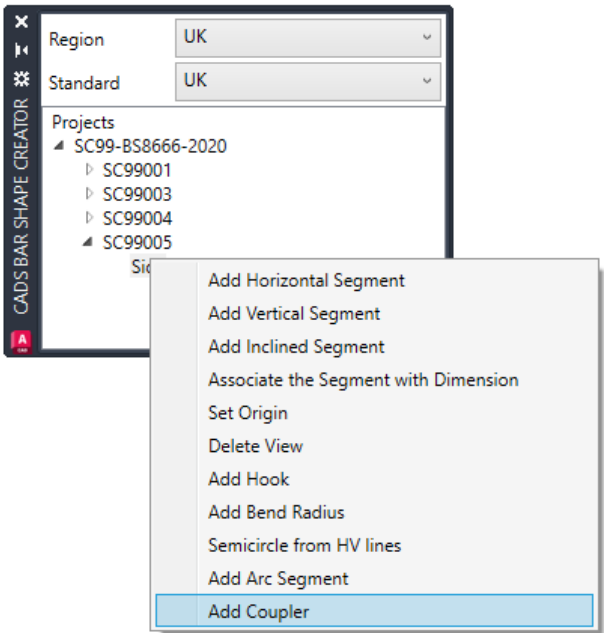
- **Leg 1** – Add Horizontal Segment.

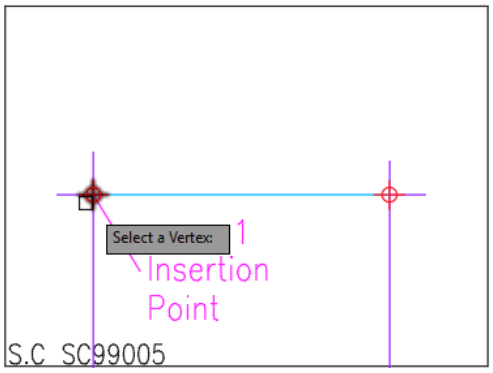
  Select Vertex: Pick the Vertex indicated by the Insertion Point.

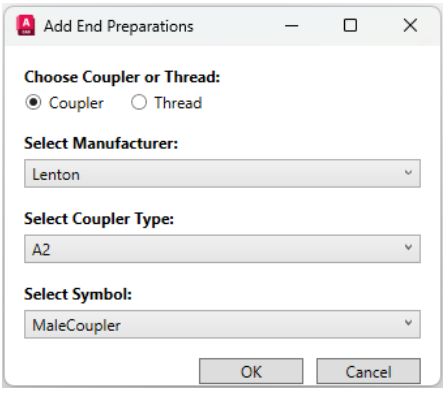
Specify next end point: Select the Intersection at the End of Leg 1.



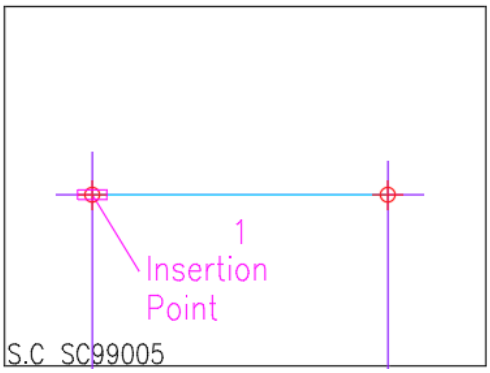
17. Add Coupler to Insertion Point of Bar.
18. Right-mouse click on the Side View and select Add Coupler.



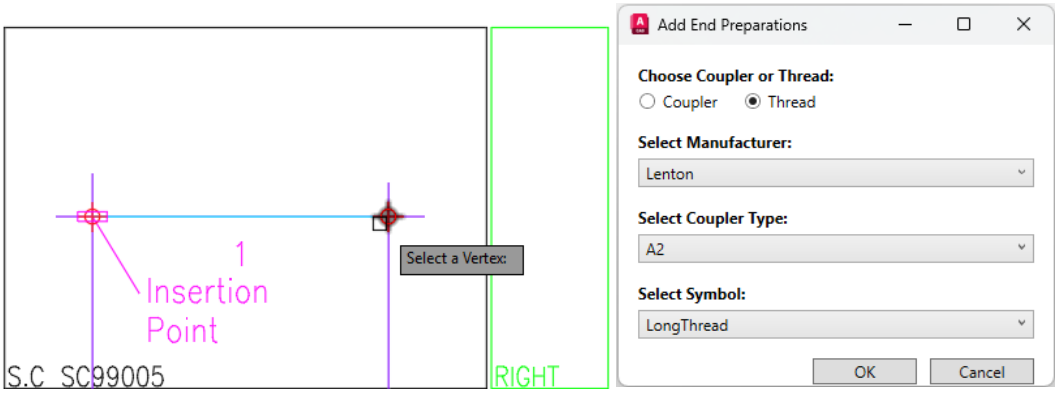




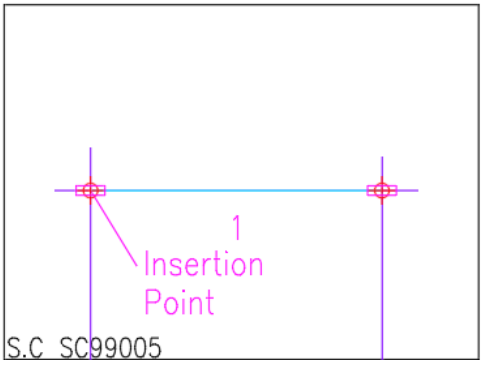
19. **Select a Vertex:** Select the Vertex at the Insertion Point.
20. In the dialog select Coupler, Lenton as the Manufacturer A2 as the Coupler Type and Male Coupler as the Symbol, click OK**.**
21. **Enter end adjustment value:** Type in the value and press enter.



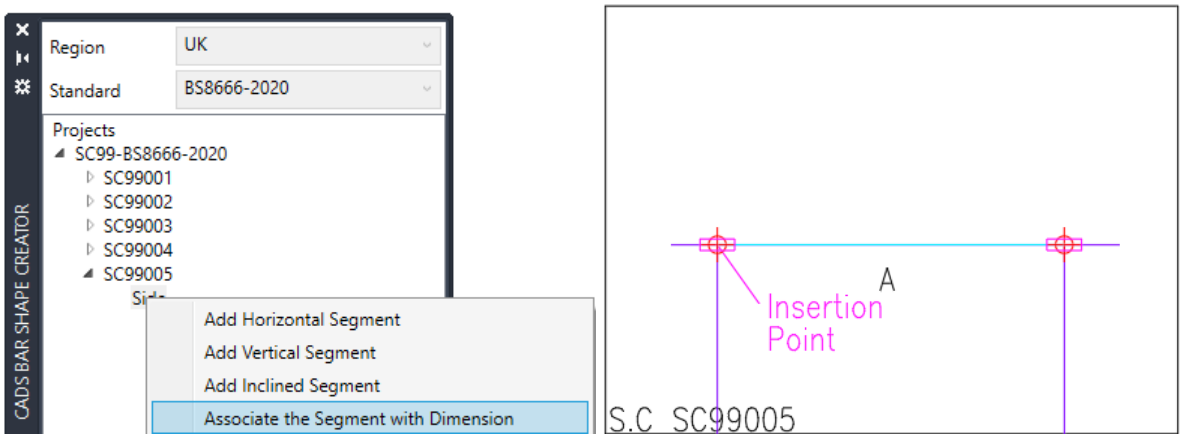
22. Add Thread to End of Bar.
23. Right-mouse click on the Side View and select Add Coupler.



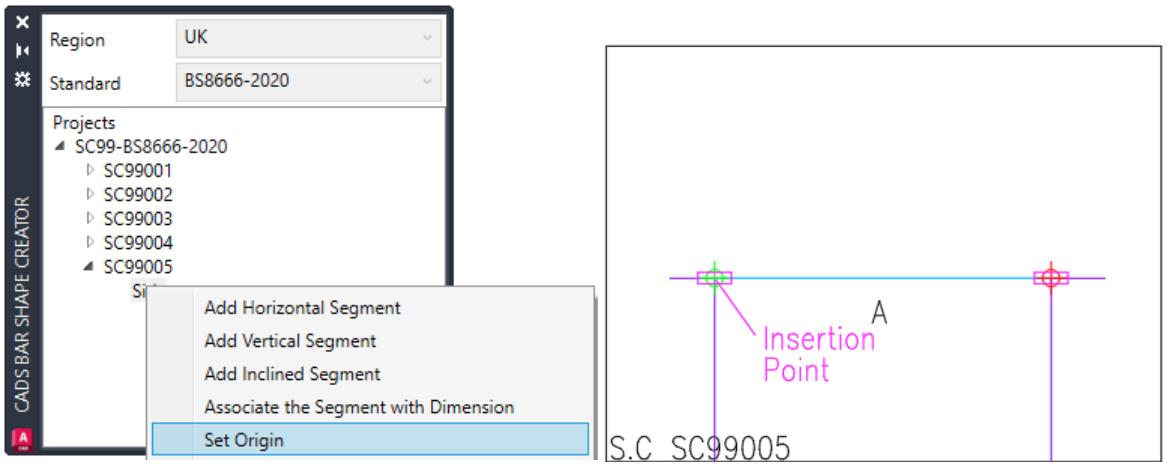
24. **Select a Vertex:** Select the Vertex at the right hand end of the segment.
25. In the dialog select Thread, Lenton as the Manufacturer A2 as the Coupler Type and Long Thread as the Symbol, click OK.
26. **Enter end adjustment value:** Type in the value and press enter.



27. Define Dimension Letters, select Associate the Segment with Dimension by right-mouse clicking on the Side View.



28. Define the Insertion Point of the Side View, select Set Origin by right-mouse clicking on the Side View.



This completes the Side View.

5.5.3 Validate Project

Refer to **Chapter 4.1.6.**

5.5.4 Generate BDF

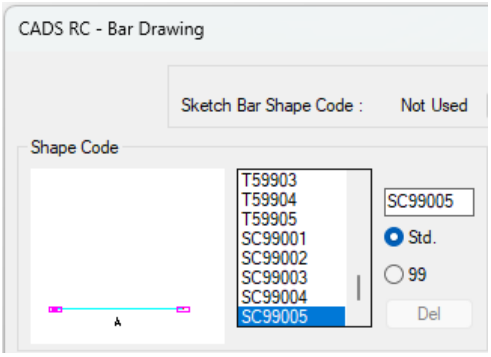
Refer to **Chapter 4.1.7**.

5.5.5 Exporting the Project JSON File

Refer to **Chapter 4.1.8**.

5.5.6 Loading the BDF and supporting files into CADS RC

Refer to **Chapter 4.1.9**.



This completes the Straight Bar with Couplers.