Electrical Tutorial

Routing Cableways with Non-Part Specifications

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SESSION 5

Routing Cableways with Non-Part Specifications

Objective

By the end of this session, you will be able to:

- Route a cableway with non-part specification
- Route Duct Banks

Prerequisite Sessions

- Smart 3D Overview
- Smart 3D Common Sessions
- Electrical Overview
- Routing a Cableway

Overview

In an Electrical task, you can route cableways with a non-part specification. Such routed cableways are referred to as cableway Zero-Specs. Cableway with a non-part specification is a spec without parts whereas the corresponding cable tray spec is one which has parts. By using cableway with a non-part specification you can model duct banks, cable bus, vertical dropouts, and bus ducts.

NOTES

- One of the extended uses of a cableway with non-part specification is that you route a cableway to reserve the space in the model, then you change specification by using the property page to a cable tray spec. This allows you to size the tray at a later time, and SP3D will solve for the parts when you flip the spec from a cableway with non-part spec to a cable tray spec. You can also go back to cableways with non-part spec later if you want. It is a reversible process.
- Cableway with non-part specification can also be used to represent a duct bank, cable bus, and bus duct.

This space reservation is intended to reserve space and can report as clashes when the Interference Detection processes the data. You see a hybrid of this effect when you are dealing with a cable tray part spec that has no turn parts. In this case we can route straight sections of tray and the turns will just be space reservations that represent where we think the cable will hang as it passes from one tray straight section to another.

This session will cover the procedures to use a cableway with non-part specification to represent an underground duct bank.

Routing an Underground Duct Bank

Route an underground duct bank using the following specifications:

- Cableway1:

  Width: 3 ft
  Depth: 2 ft
  Length: 15 ft in north direction

- Cableway2:

  Width: 2 ft
  Depth: 2 ft
  Length: 43 ft in north direction

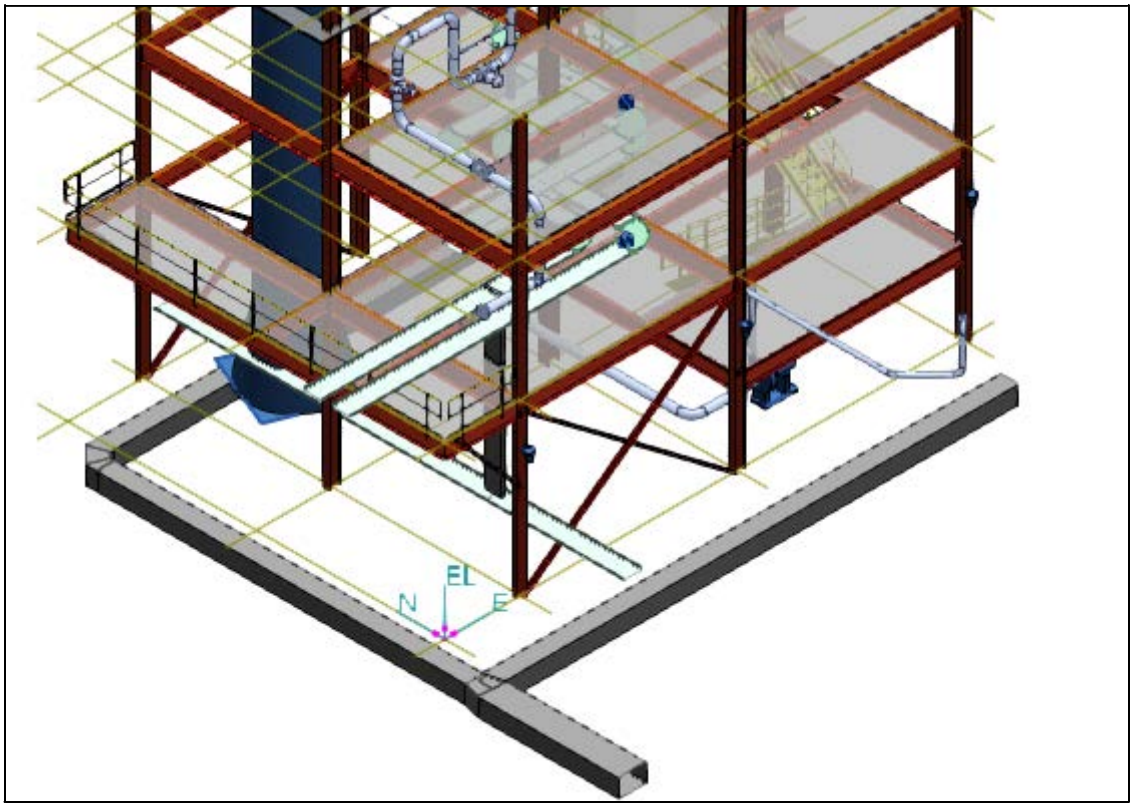
- Cableway3:

  Width: 2 ft
  Depth: 2 ft
  Length: 56 ft in east direction

- Branched Cableway:

  Width: 2 ft
  Depth: 2 ft
  Length: 56 ft in east direction
  Starting Point: E= 0 ft, N= -4 ft, El= -3 ft

The workspace after routing the underground duct bank should resemble this.

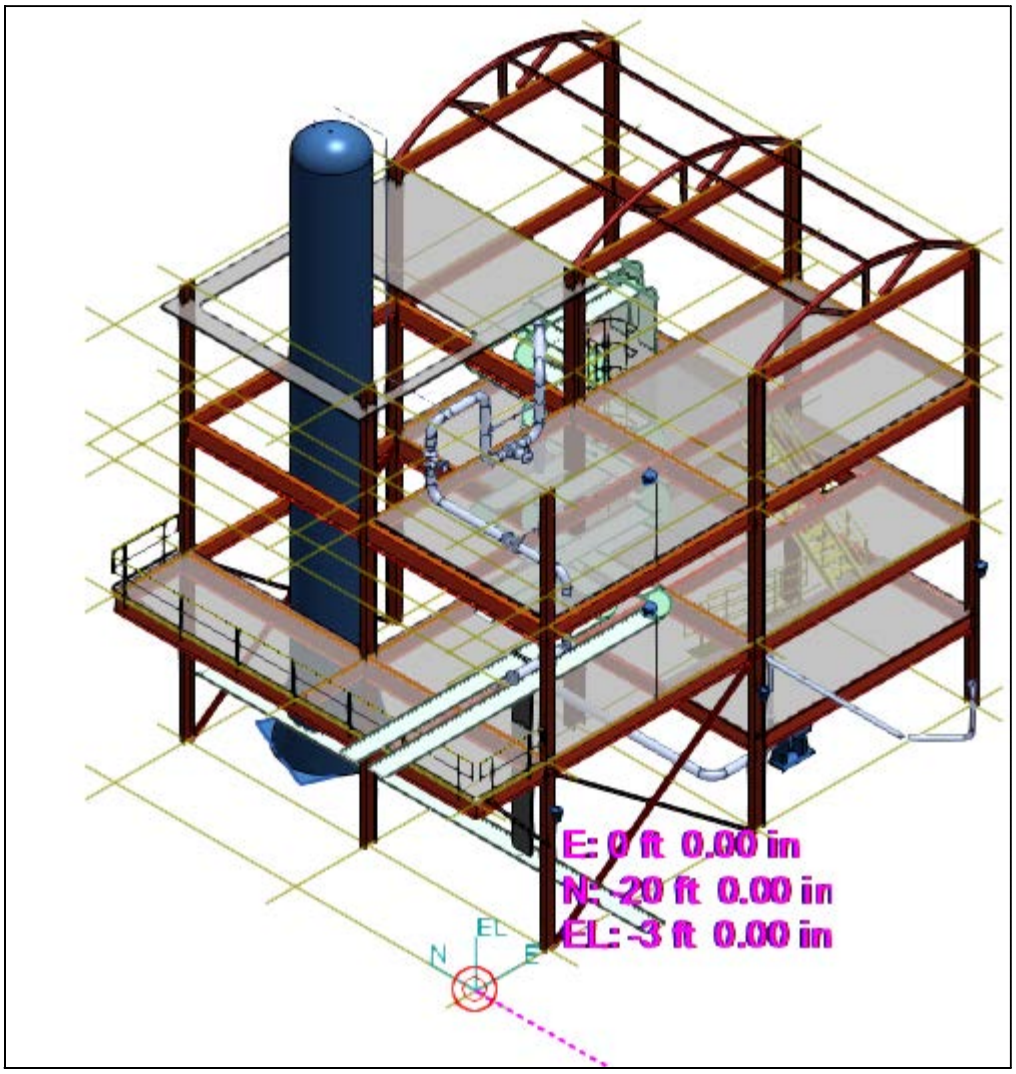


Before beginning the procedure define your workspace to display Unit U03 and coordinate system U03 CS.

1. Make sure you are in **Electrical** task and the **Active Permission Group** is set to **Electrical**.
2. Select **All** from the **Locate Filter** drop-down list.
3. Click the **System** tab on **Workspace Explorer** and expand the **System Hierarchy** to **A2 > U03 > Electrical**.
4. Right click on the **Electrical** system and select **New System > New Electrical System** option on the short cut menu.

   The Property Pages Dialog box appears.
5. Key-in **Duct Bank** as the name in the **Name** field, and click **OK**.
6. Activate **PinPoint** ribbon and set **U03 CS** as active coordinate system.
7. Click **Set Target to Origin** on the **PinPoint** ribbon, to move the target to the origin of the current coordinate system.
8. Click **Route Cableway** on the vertical toolbar.

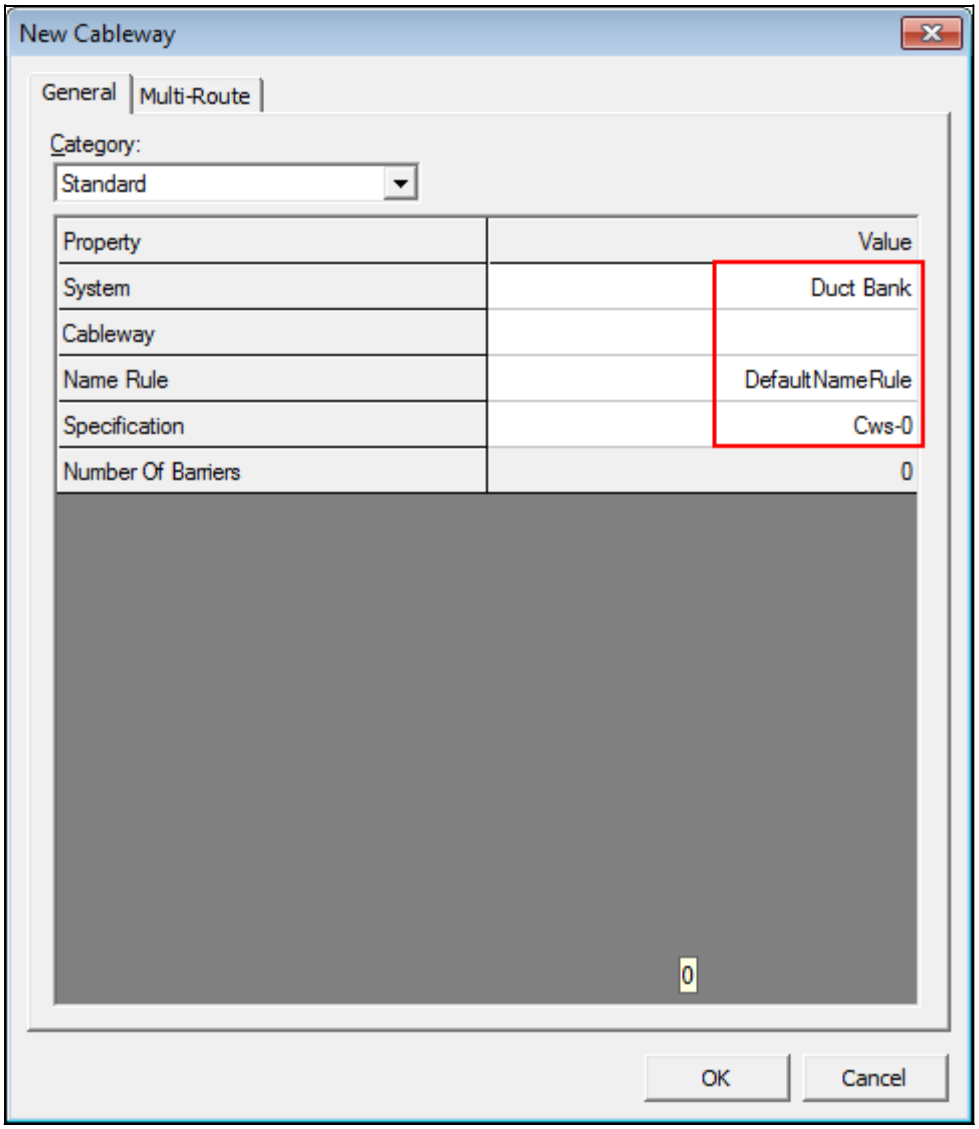
9. Key in 0 ft for easting, -20 ft for northing, and -3 ft for elevation on the **PinPoint** ribbon to specify the starting point for routing the duct bank.



The New Cableway dialog box will appear.

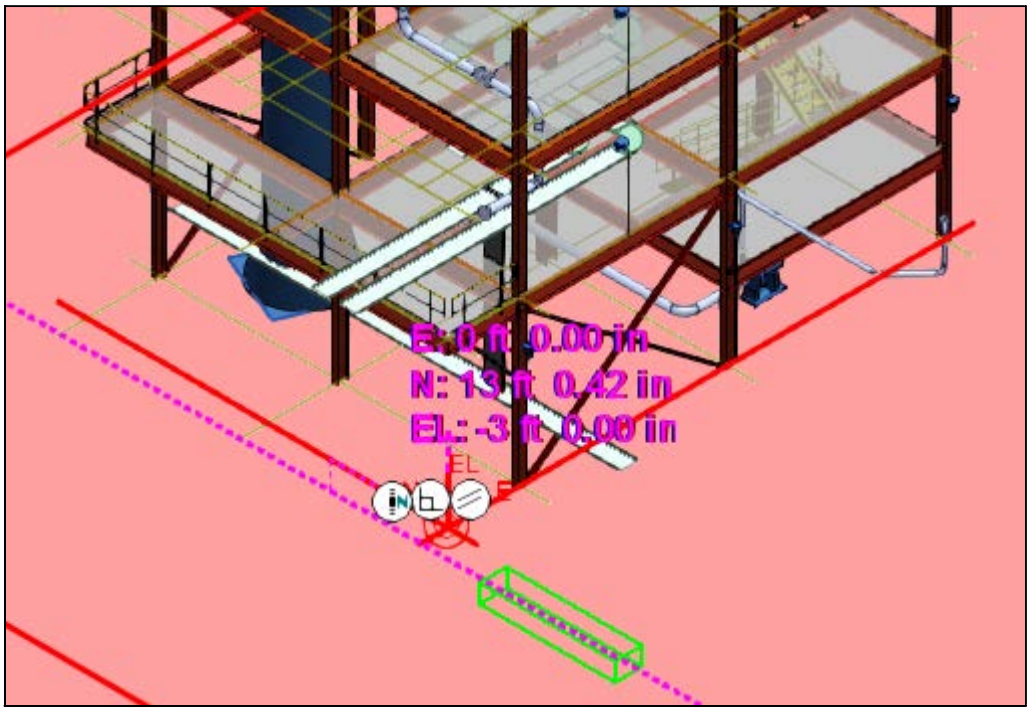
10. Select the following specifications on the **New Cableway** dialog box, and click **OK**.

System: A2 > U03 > Electrical > Duct Bank
Name Rule: DefaultNameRule
Specification: Cws-0

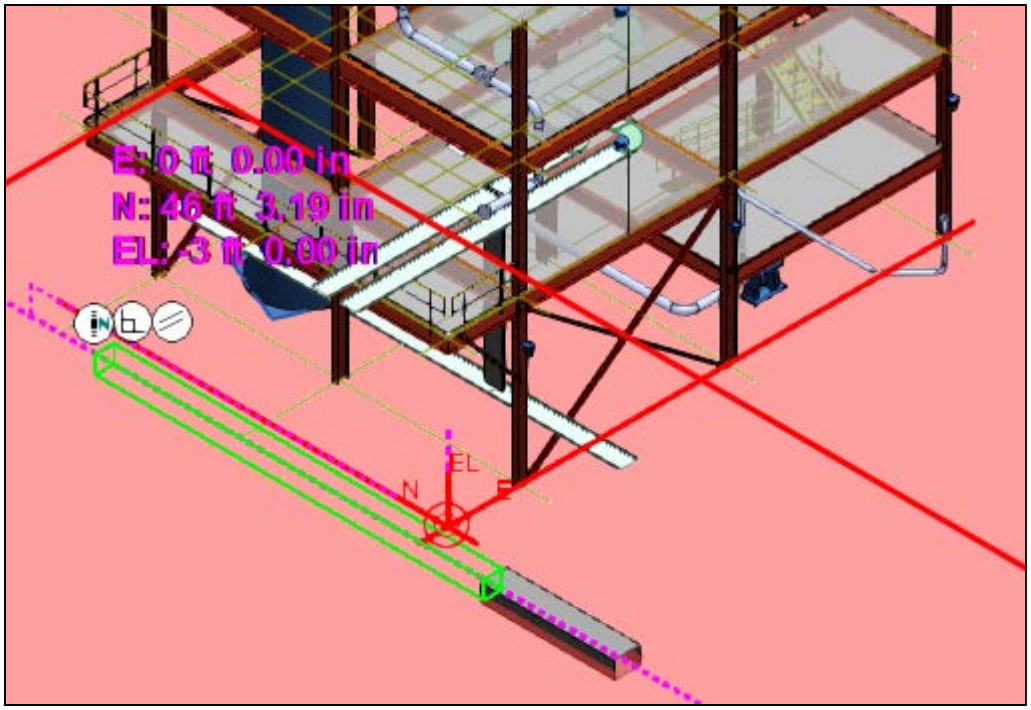


11. Select **Plan Plane** in the **Plane** drop-down list on the Route Cableway ribbon.
12. Select **Rectangle** from the **Shape** drop-down list and key in 3 ft for Width, 2 ft for Depth, and 15 ft for Length on the Route Cableway ribbon.

13. Route the duct bank by pointing towards north direction till the N SmartSketch glyph appears.



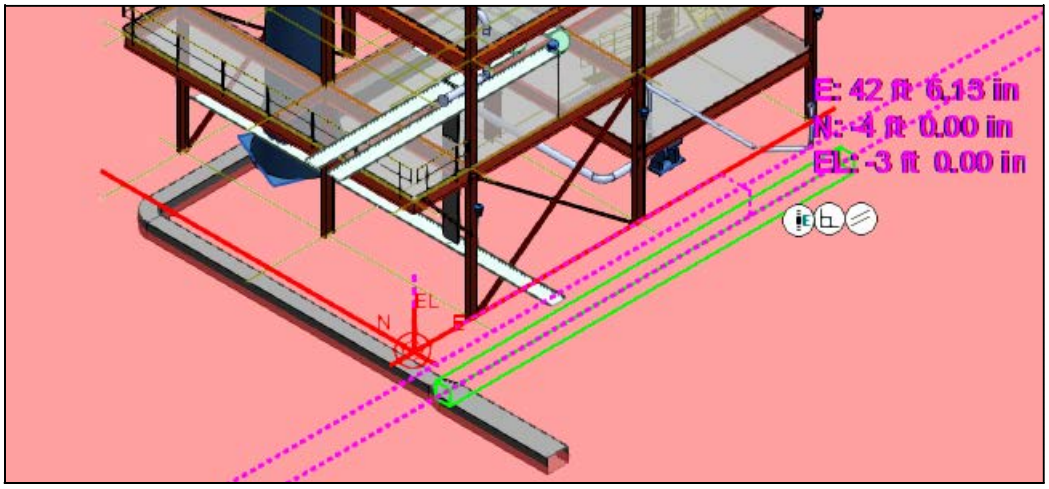
14. Click the graphic view to place the data point.
15. Key in 2 ft as Width, 43 ft as Length, unlock the Angle and position the cursor in north direction to extend the duct bank.



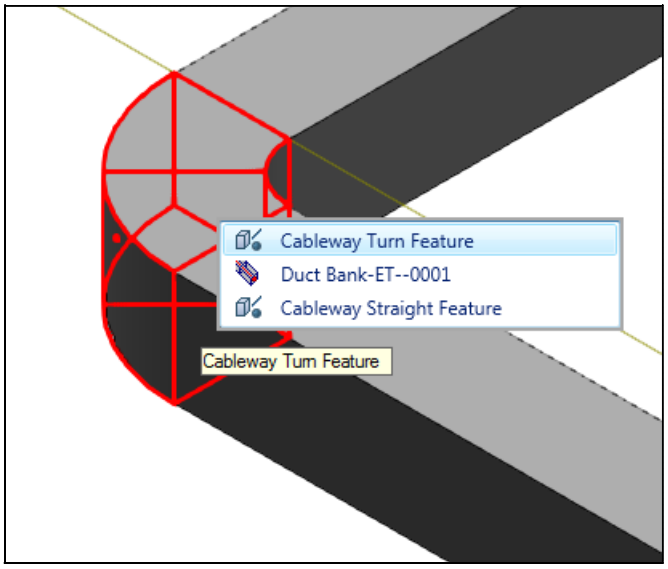
16. Click the graphic view to define the next data point.
17. Position the cursor in the east direction and key in 56 ft in the Length box to route a 56 ft duct bank.
18. Right-click in the view to terminate the command.
19. Click **Route Cableway** on the vertical toolbar.
20. Key in the following coordinates on the PinPoint ribbon and click in the active view.

    East: 0 ft
    North: -4 ft
    Elevation: -3 ft

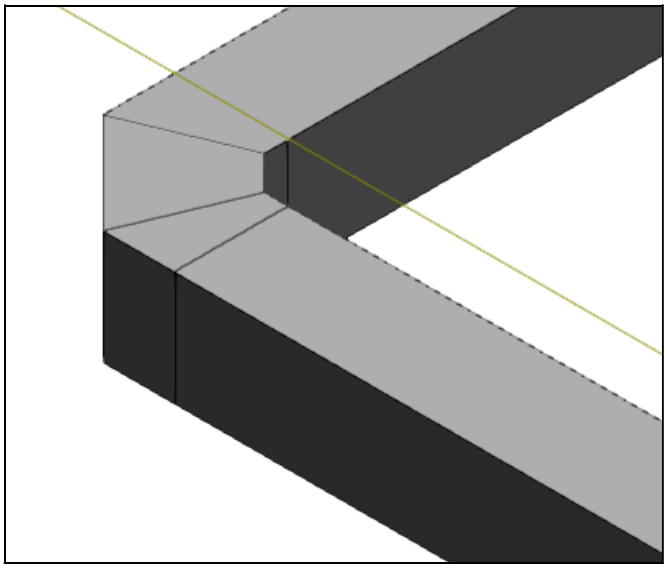
    The New Cableway dialog box will appear.
21. Keep the default last used values, and click **OK**.
22. Position the cursor in the east direction and key in 56 ft in the Length box to create a 56 ft long branch.
23. Right-click in the graphic view to terminate the command.



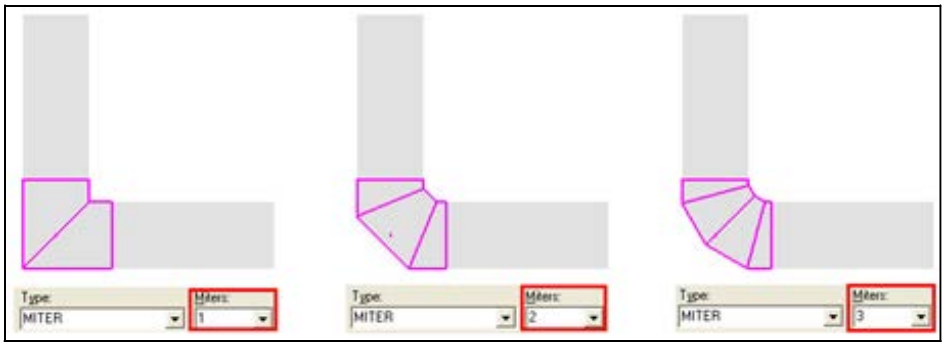
24. Select the turn feature, as shown, to open the Edit ribbon.



25. Change from BEND to MITER on the Type drop-down list on the Edit ribbon. Then, key in 2 to specify the number of cuts for the Miter elbow.



NOTE If the turn feature is a Miter type, then another box appears on the ribbon that allows you to choose the number of cut as shown.

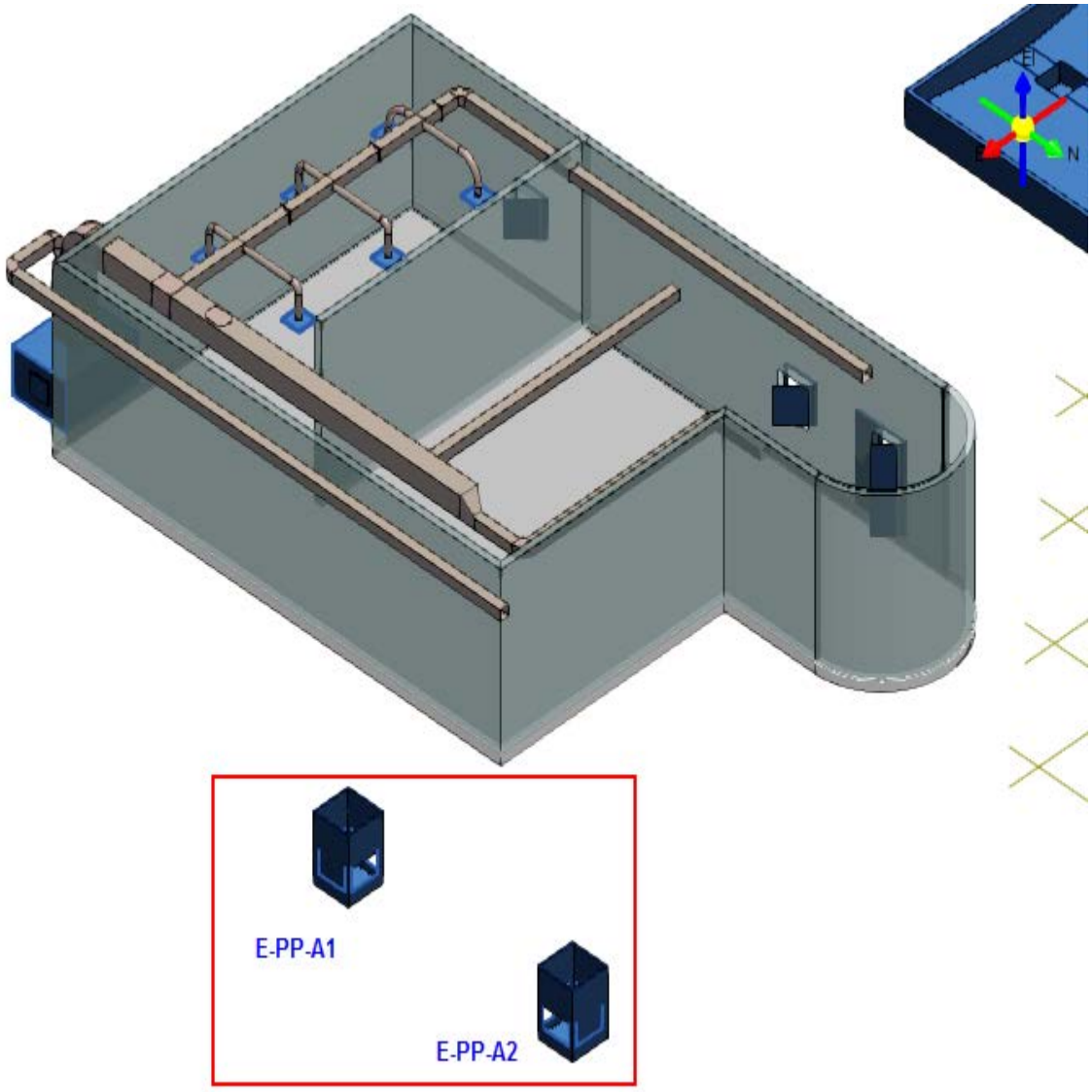


Placing Electrical Pull-Pit

Place two Pull-Pits from the equipment catalog using the following specifications:

Height:	5 ft 11 in
Width	4 ft
Length	4 ft
Thickness	2 in

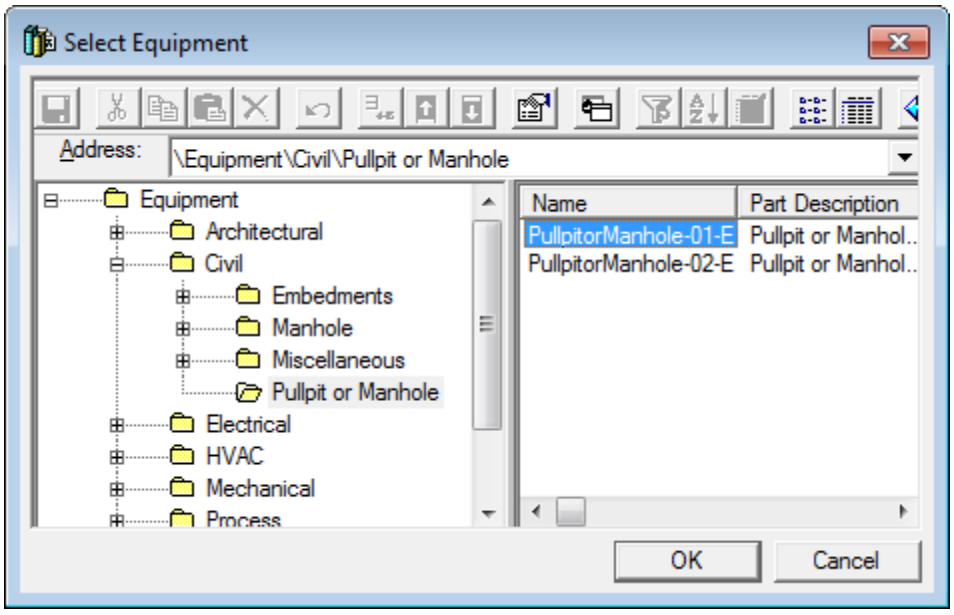
After placing the Pull-Pits the model should resemble the highlighted portion in Figure 12.



Before beginning the procedure define your workspace to display Unit U05 and coordinate system U05 CS.

1. If you are not in the **Electrical** environment, then select the **Task > Electrical** command.
2. In the **Active Permission Group** drop-down list, select the **Electrical** option.
3. Active the PinPoint ribbon by using the **Tools > PinPoint** command.
4. Set the active coordinate system to **U05 CS** in the **Coordinate** system drop-down list on the PinPoint ribbon.
5. To move the target to the origin of the current coordinate system, select **Set target to Origin** on the PinPoint ribbon.
6. Click **Place Equipment** button on the vertical toolbar.

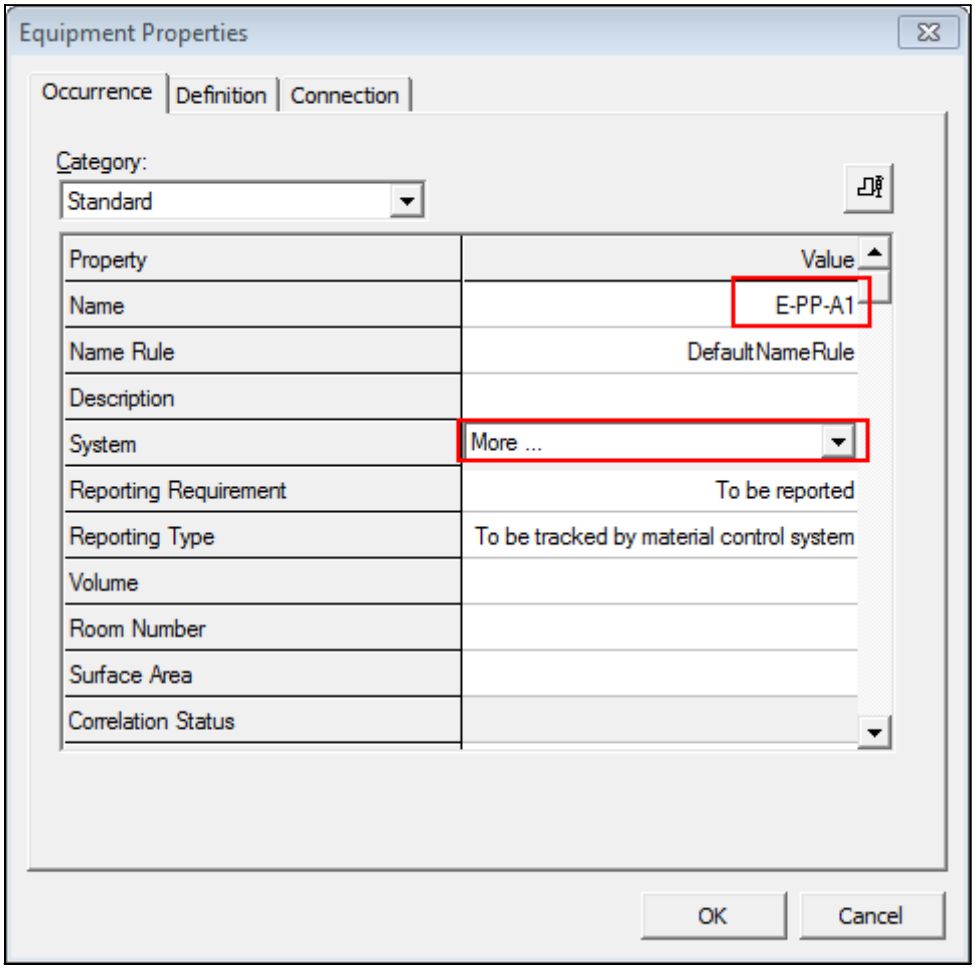
7. In the **Select Equipment** dialog box, expand the folder **Equipment\Civil\Pull Pit or Manhole** until you see the part **PullpitorManhole-01-E**. Select the part, and click **OK**.



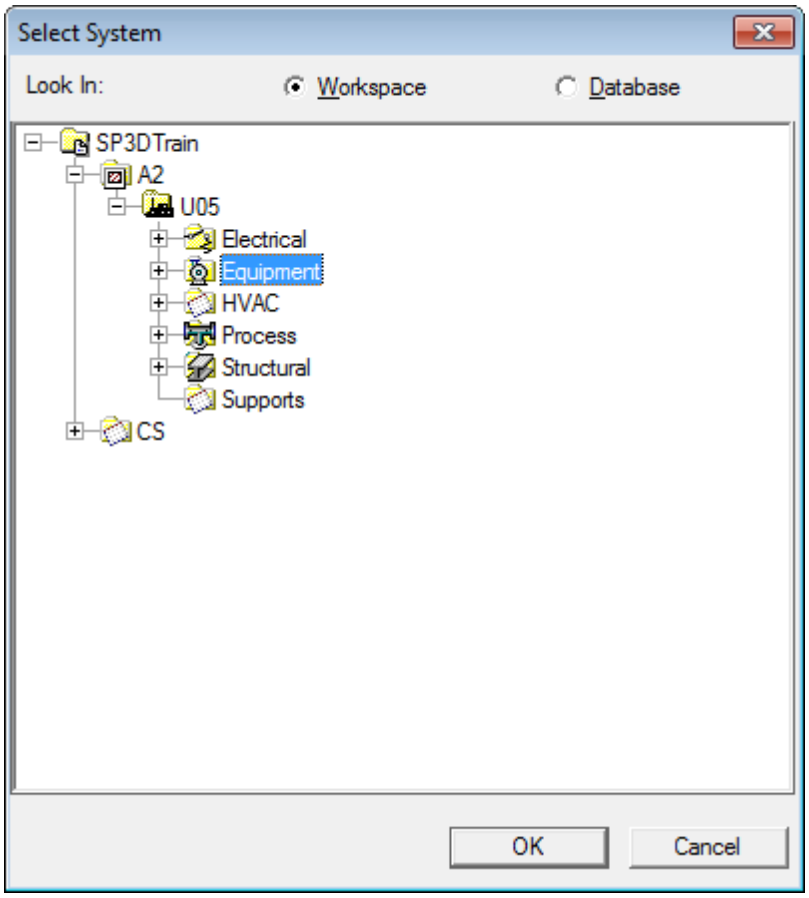
The Equipment Properties dialog box appears as soon as you select PullpitorManhole-01-E part.

8. Key-in E-PP-A1 in the Name field.

9. Click the **System** field and select the **More..** option to specify the system to which the equipment belongs.

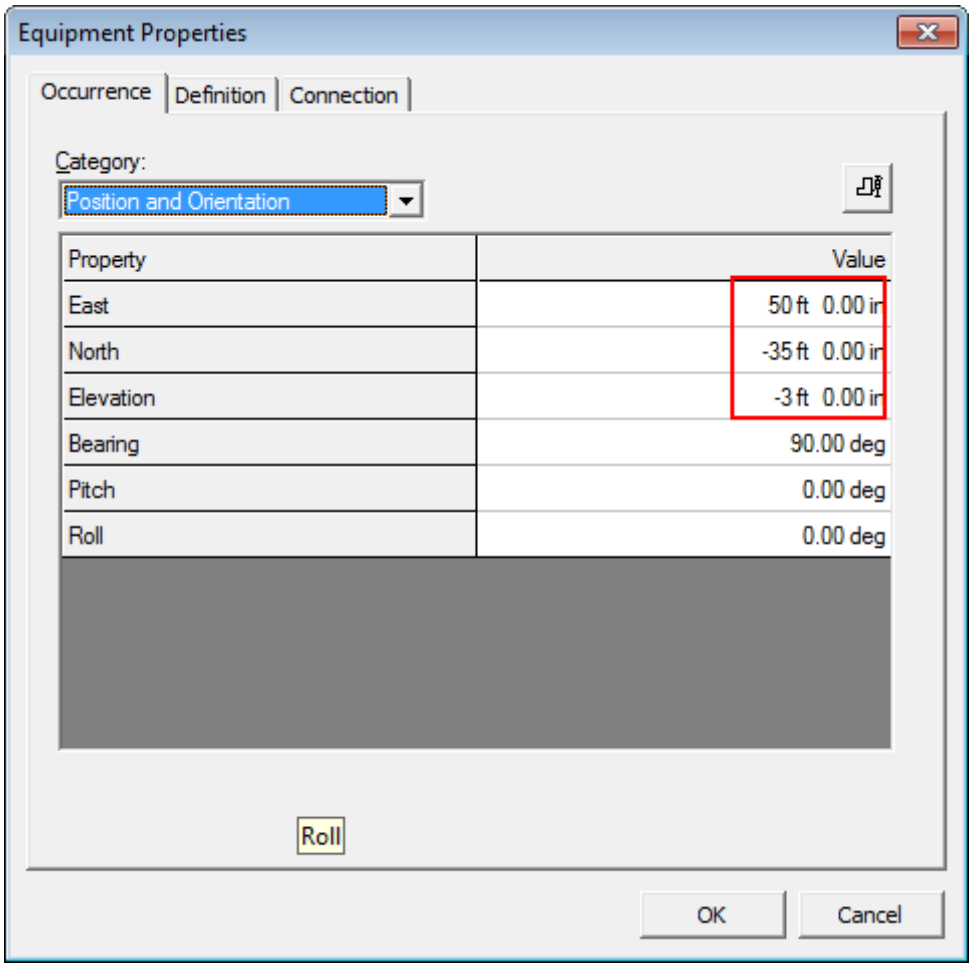


10. Select **Equipment System** under **A2->U05**, as shown below, to indicate where the object will be placed. Then, click **OK**.



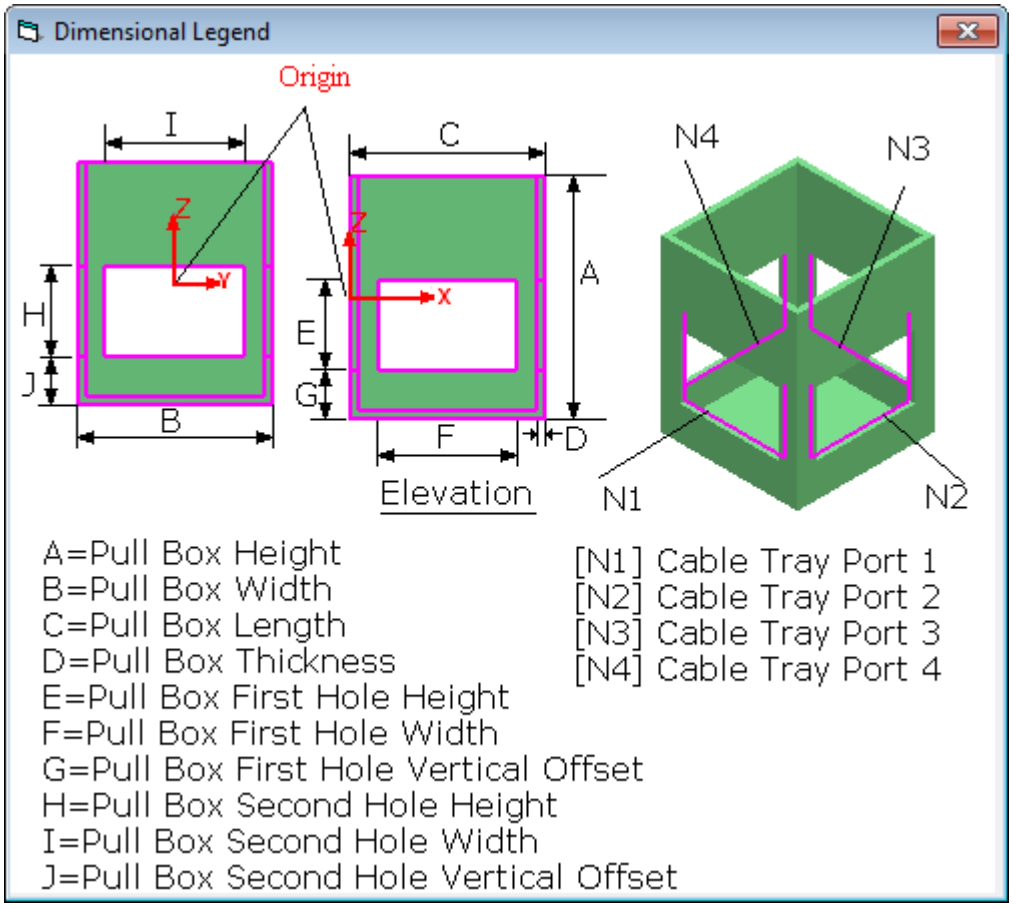
11. To define the position of the object, select the **Position and Orientation** category in the **Category** drop-down list.
12. Key in the followings properties:

East: 50 ft
North: -35 ft
Elevation: - 3 ft

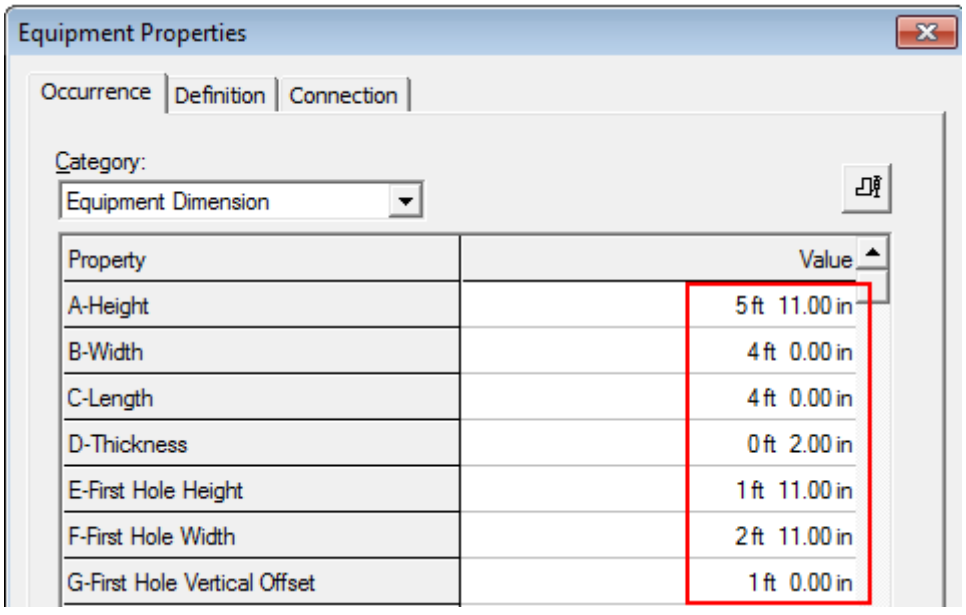


13. Switch to the **Equipment Dimension** category in the **Category** drop-down list.

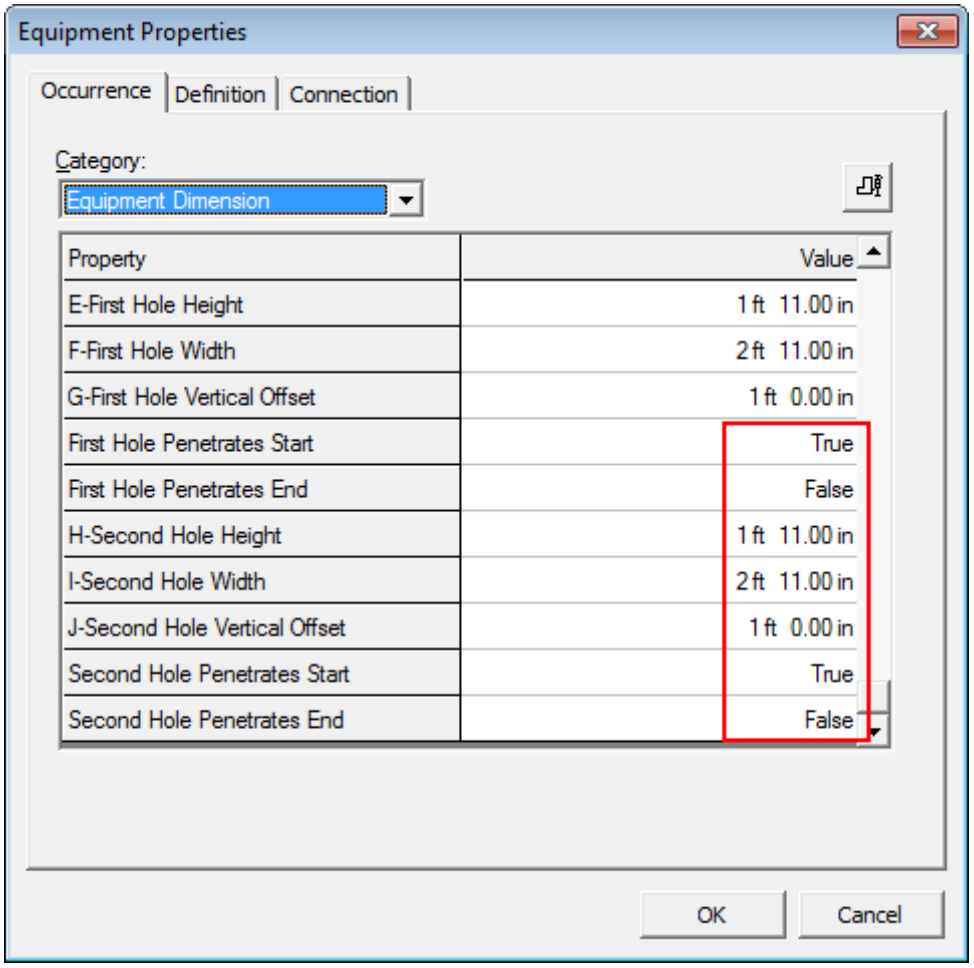
14. Click Preview to display an image of the selected part.



15. Click [x] button to close the previous dialog box and change the dimensions.

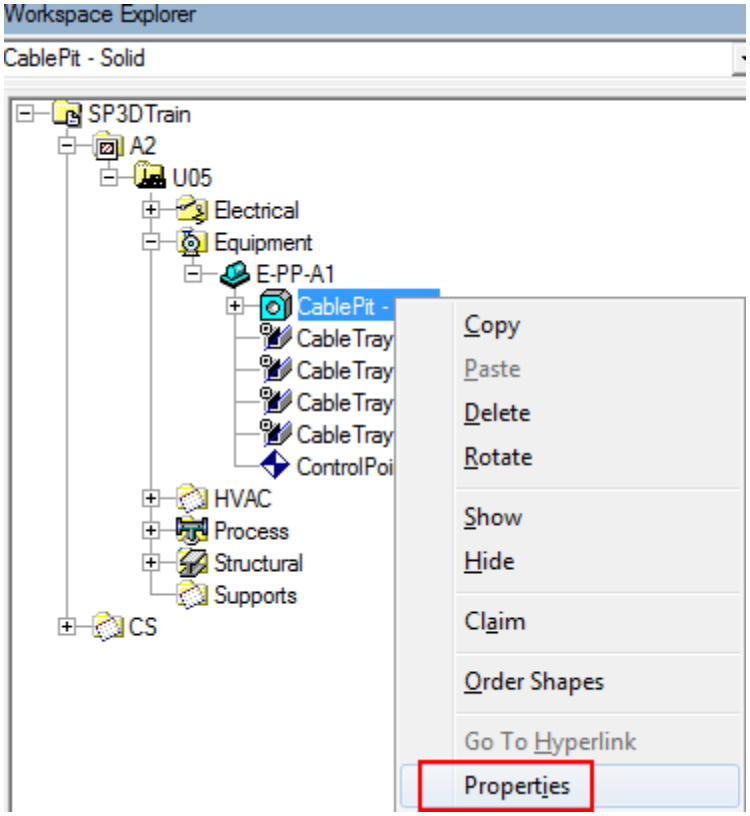


16. Change the **First Hole Penetrates End** and **Second Hole Penetrates End** fields to **False**.



17. Click **OK** on the **Equipment Properties** dialog box to place the **Pull-Pit** in the model.
18. Right-click in the active view to de-select the equipment.
19. Select the **View > Fit** command.
20. Select **All** in the **Locate Filter** drop-down list.

21. Right-click on **Solid (Cable-Pit – Solid)** in the **Workspace Explorer** and select **Properties**.



22. On the **Occurrence** tab, the **Surface Area** and **Volume** properties are shown.

Surface Area	191.86 ft^2
Volume	15.50 ft^3

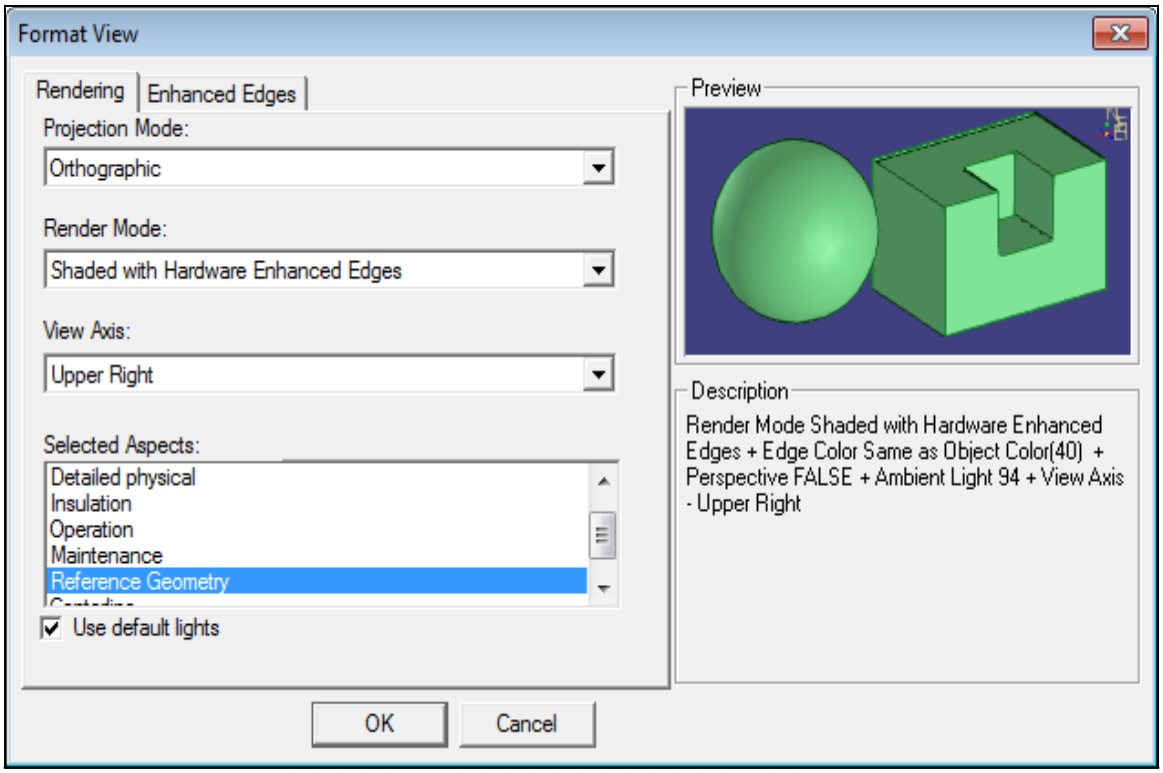
23. The material density is required to compute the weight of a **Solid**. As a result, the density is extracted from the catalog when the user specifies a **Material Type** and **Material Grade**. Set the **Material Name** to **Concrete** and set the **Material Grade** to **Fc 3000**.

Material Name	Concrete
Material Grade	Fc 3000

24. Click **Apply**.
25. Click **Cancel** to close the Properties page.

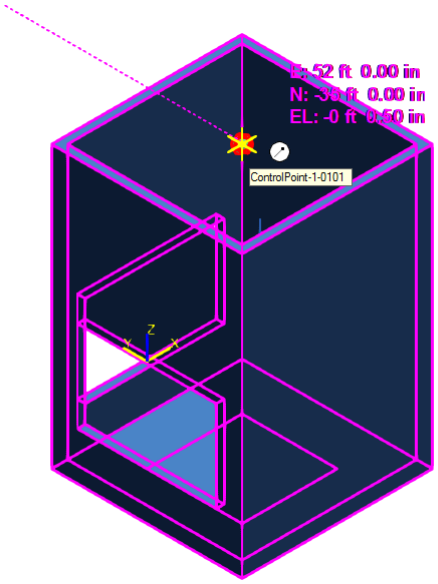
Copying and Pasting the Pull-Pit

1. Select **Format > View** in the main menu to open the **Format View** dialog.
2. Turn on the **Reference Geometry** aspect on in the **Format View** dialog and click **OK**.



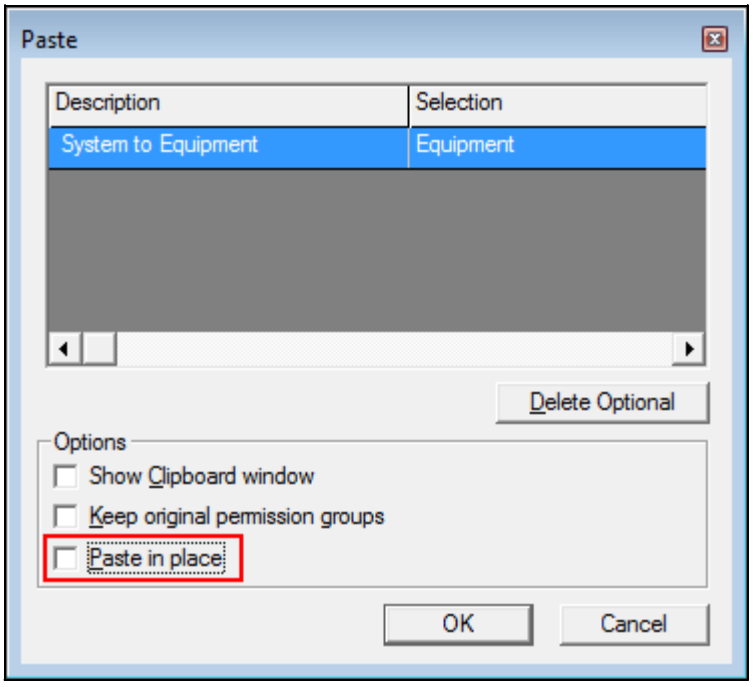
3. Select the **Pull-Pit E-PP-A1** graphically or in the Workspace Explorer. Make sure you select the **Equipment Assembly (Parent)**.
4. Click **Copy** on the **Common** toolbar.

5. When prompted for a reference point, select the **Control Point 3D** at the top center of the Pull-Pit.



6. Click **Paste** on the Common toolbar.

   System displays the Paste dialog. The Equipment system folder is already selected as the new system folder in the Workspace Explorer.

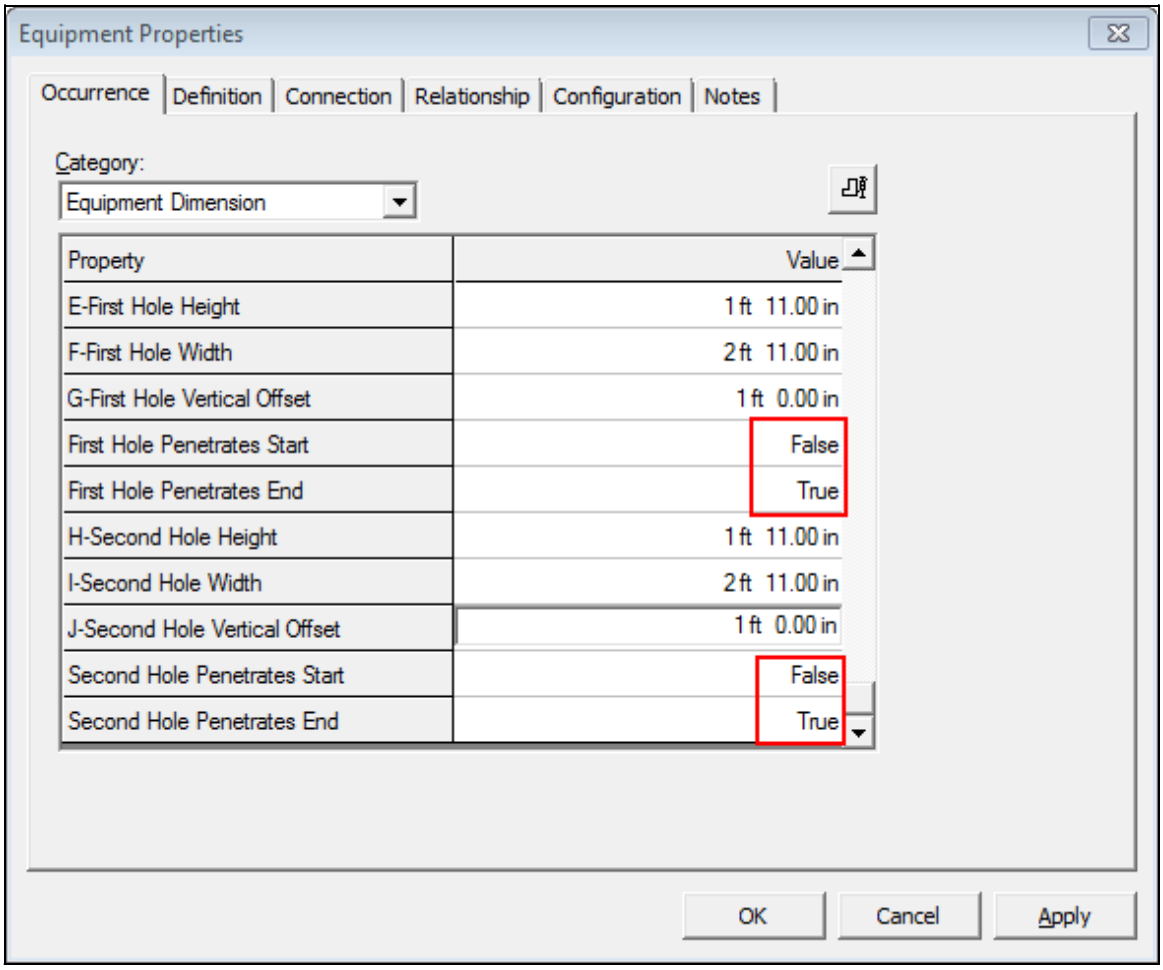


7. Clear the **Paste in place** check box in the **Paste** dialog and click **OK**.
8. Key in the following specification on the PinPoint ribbon and click in the active view to enter the **To** point for the paste operation:

East: 52 ft
North: -10 ft
Elevation: -0 ft 0.5 in

9. Change the name to **E-PP-A2** by editing the name field on the **Equipment Edit** ribbon.

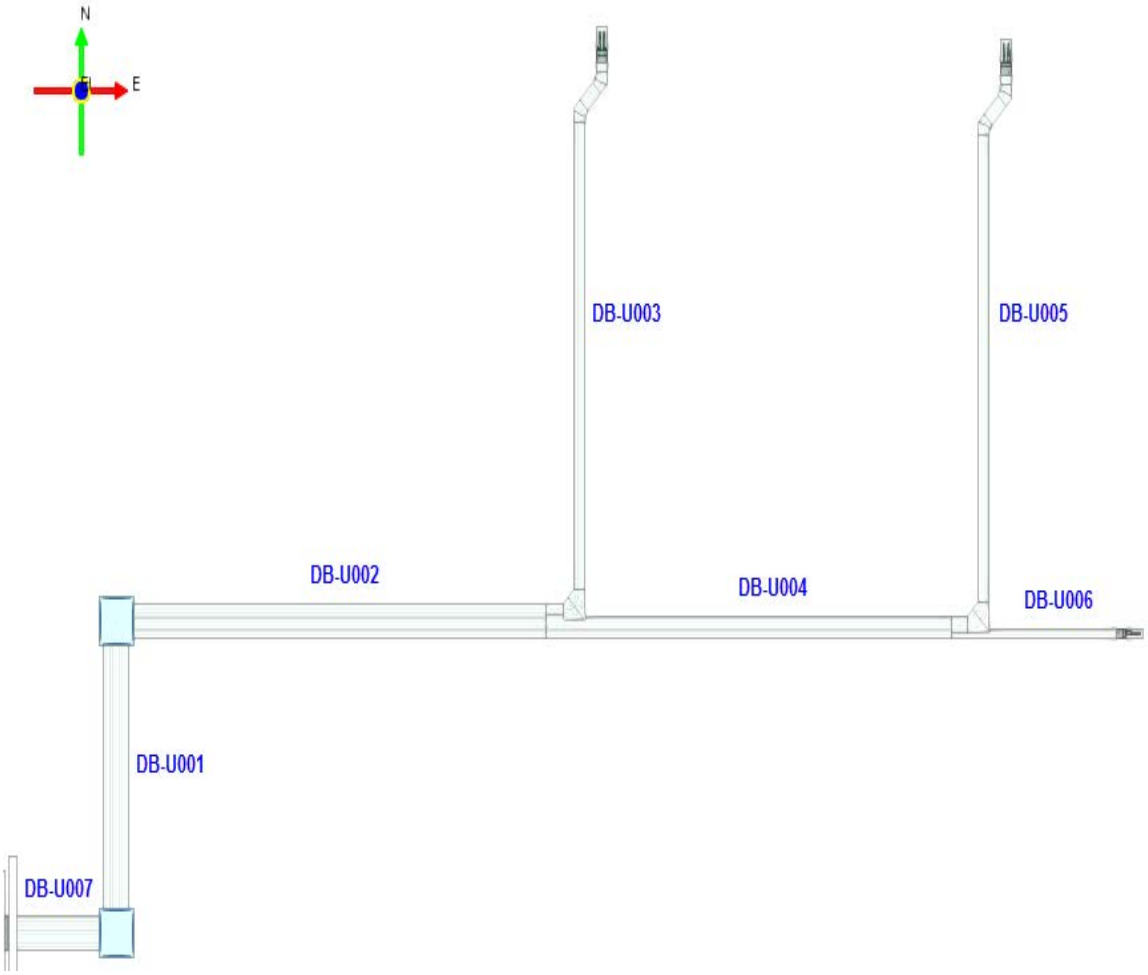
10. Click **Properties** on the **Equipment Edit** ribbon to open the property page.
11. Switch to the **Equipment Dimension** category in the **Category** drop-down list
12. Change the **First Hole Penetrates Start** field to **False** and **First Hole Penetrates End** field to **True**. Similarly, change the **Second Hole Penetrates Start** field to **False** and **Second Hole Penetrates End** field to **True** as shown below.



13. Click **OK** on the **Equipment Properties** dialog box to accept the changes.

Creating a Duct Bank Layout

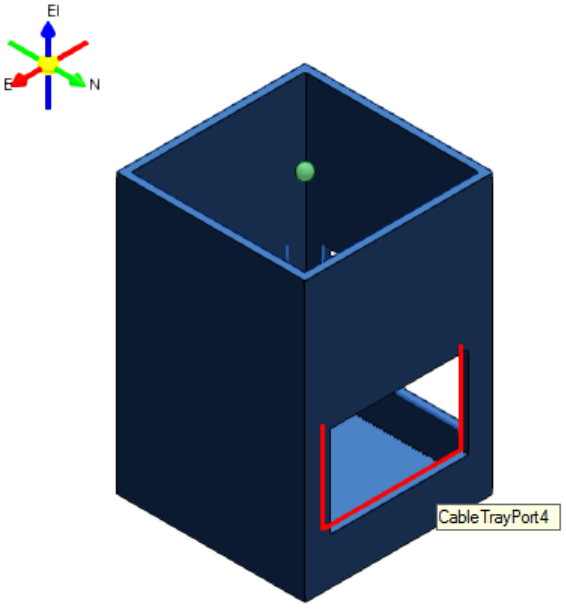
Use the **Route Cableway** command to route a Duct Bank layout. The Duct Banks will be routed between the Pull-Pits placed in the previous exercise such that valid cable path can be created once the connecting runs are defined within Pits. The workspace after routing the duct bank system should resemble this.



You can start routing the first duct bank system from Pull-Pit (1) to Pull-Pit (2).

1. Locate the **Pull-Pit (1)** named **E-PP-A1** in the model.
2. Change the view of the model to **Looking Isometric** by using **Common View** on the **Common** toolbar. This will enable you to get better view of the cable tray ports on the Pull-Pit (1).
3. Click **Route Cableway** from the vertical toolbar.

4. Select **cable tray port4** on the Pull-Pit named E-PP-A1 as the starting point.



NOTE When any command is in a smartstep prompting you to select a point, Smart 3D activates the SmartSketch service. If your cursor is close to a SmartSketch point, the geometric object is highlighted and a small glyph near the cursor displays the specific type of point found. You might have to disable SmartSketch **Point on curve** so that you can more easily locate the cable tray port.

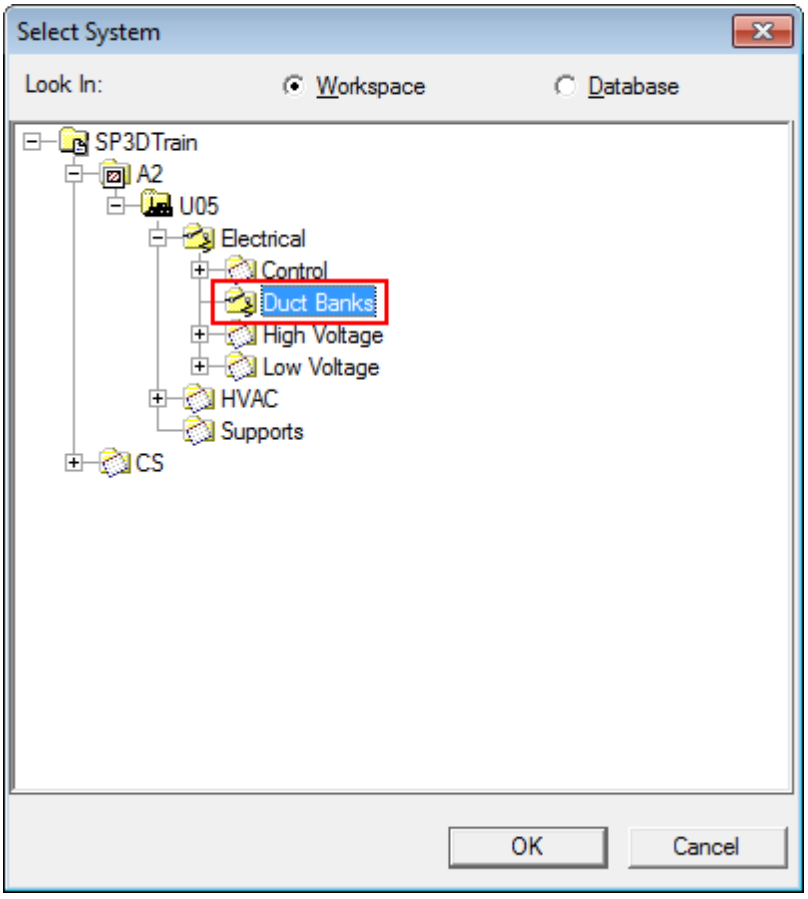
Use the **SmartSketch** tab on the **Options** dialog box or **Tools > SmartSketch Options** to enable SmartSketch points.

*The **New Cableway** dialog box displays.*

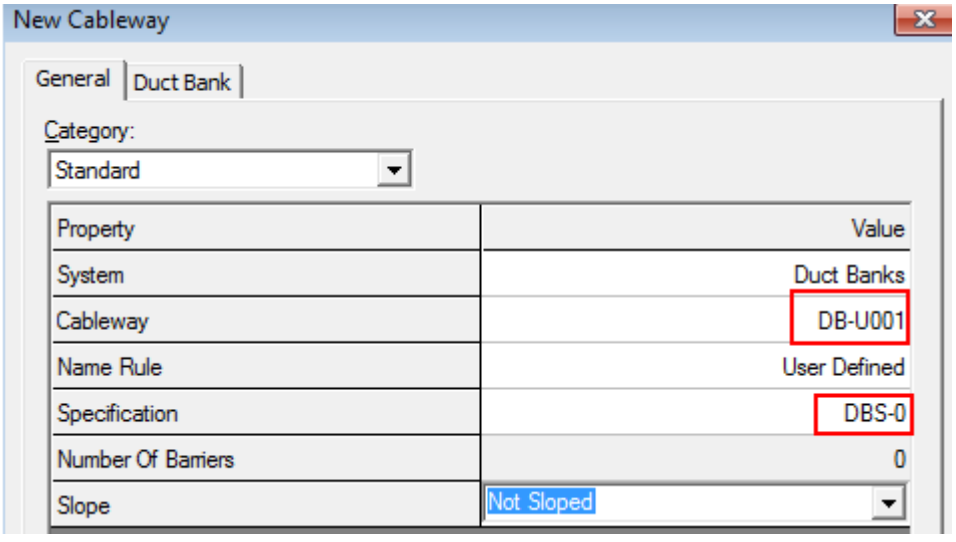
5. Under **System**, select **More...**.

*The **Select System** dialog box displays.*

6. Select **A2 > U05 > Electrical > Duct Banks**, and click **OK**.



7. Set **Cableway** to **DB-U001** and **Specification** to **DBS-0**.

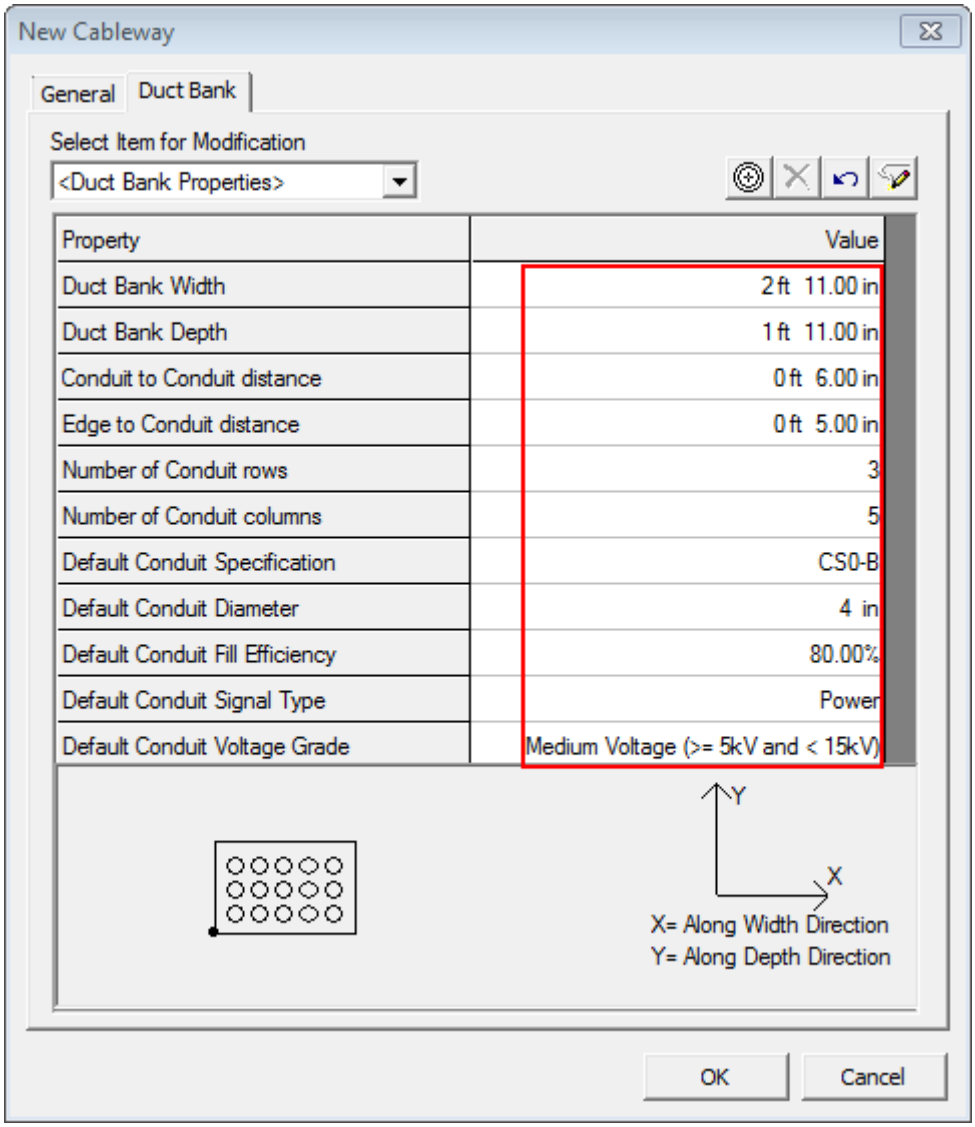


NOTE Smart 3D allows you to route both the concrete casing modeled as a cableway run and the conduits together while routing the duct bank. To route duct banks, you need to set

the duct bank cross section data and other necessary properties under the **Duct Bank** tab. To access the **Duct Bank** tab, you must have a duct bank specification selected in the **New Cableway** dialog box.

8. Switch to the **Duct Bank** tab and define the following values as shown:

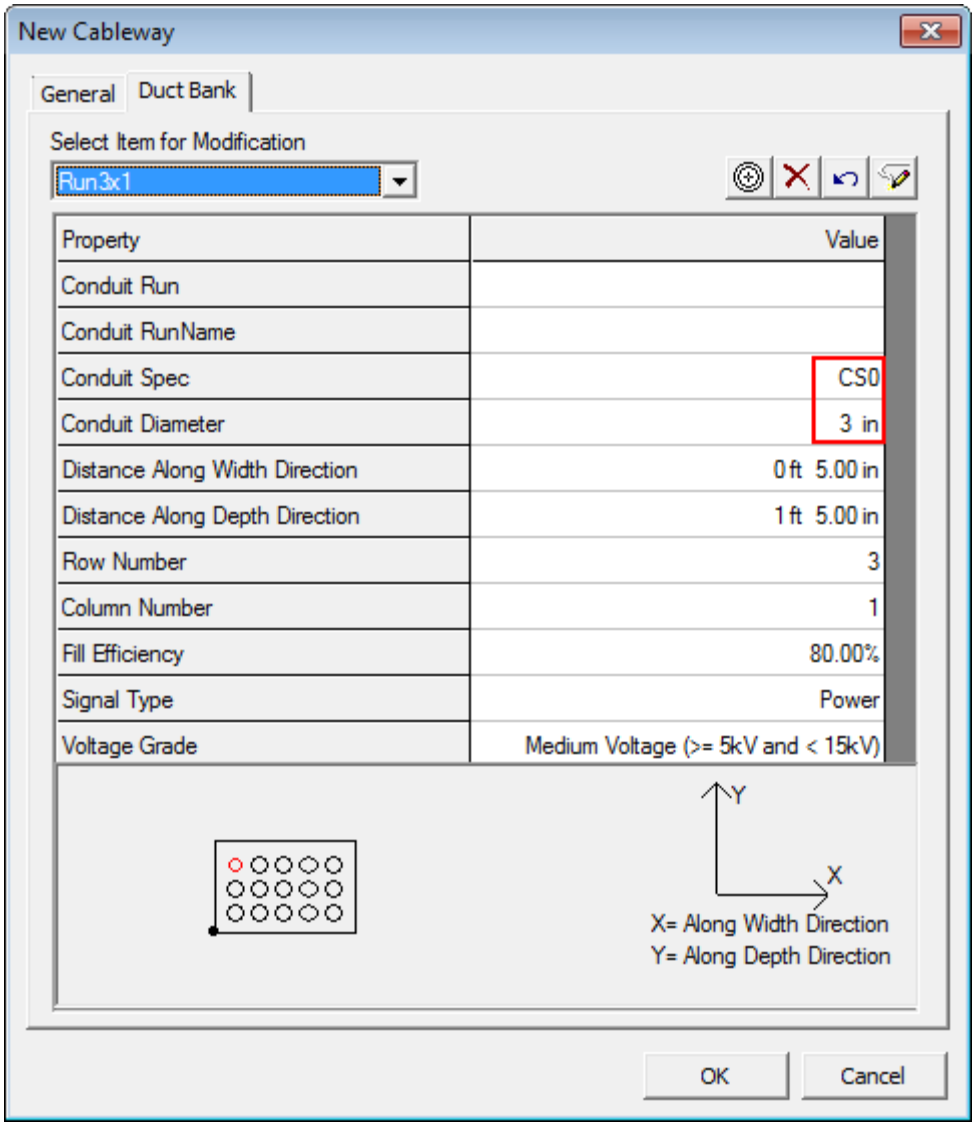
Duct Bank Width: 2 ft 11 in
Duct Bank Depth: 1 ft 11 in
Conduit to Conduit distance: 0 ft 6 in
Edge to Conduit distance: 0 ft 5 in
Number of Conduit rows: 3
Number of Conduit columns: 5
Default Conduit Specification: CSO-B
Default Conduit Diameter: 4 in
Default Conduit Fill Efficiency: 80.00 %
Default Conduit Signal Type: Power
Default Conduit Voltage Grade: Medium Voltage (>= 5kV and <= 15kV)



NOTE If the conduits are not inside the duct bank, an error message displays.

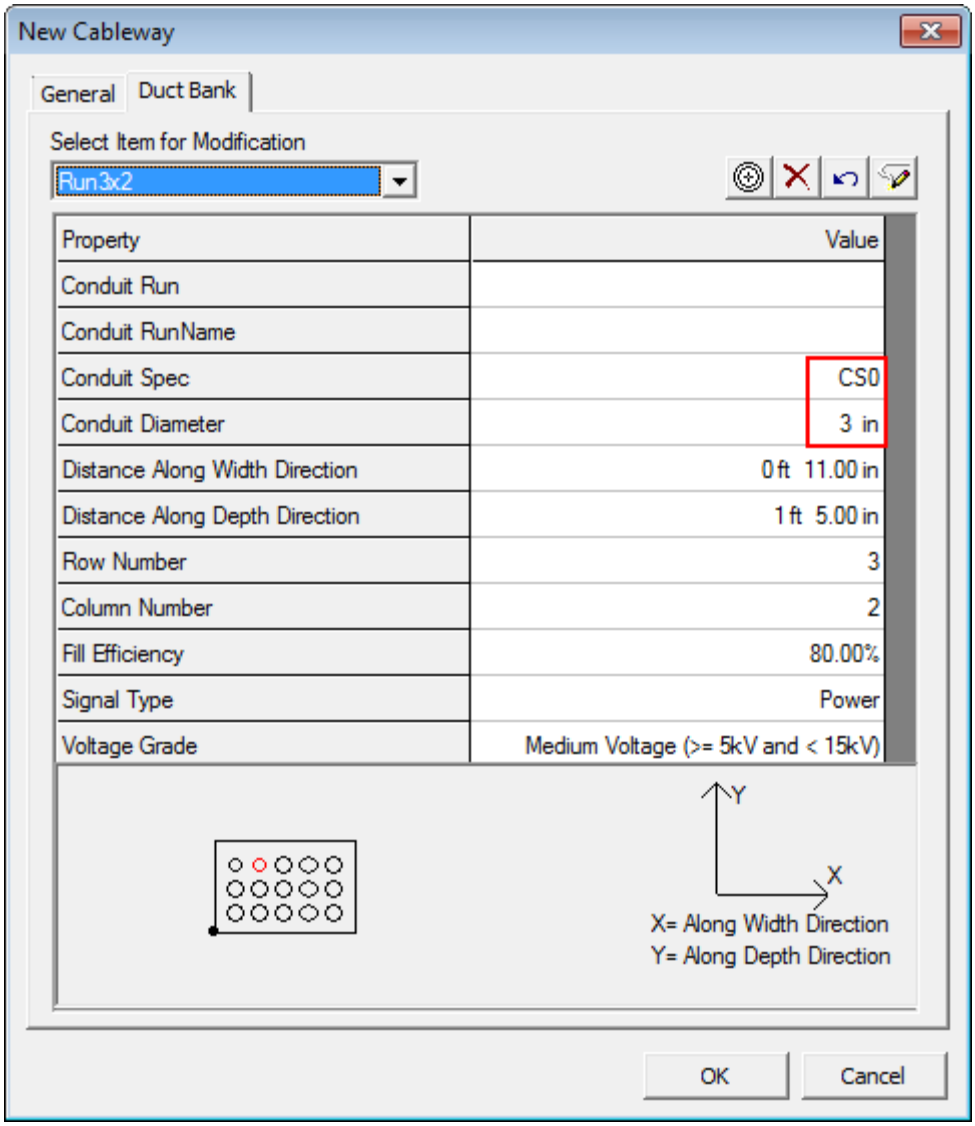
9. Set **Select Item for Modification** to **Run 3x1**, and define the following values as shown:

   Conduit Spec: CS0
   Conduit Diameter: 3 in
   Fill Efficiency: 80 %
   Signal Type: Power
   Voltage Grade: Medium Voltage (>= 5kV and <= 15kV)



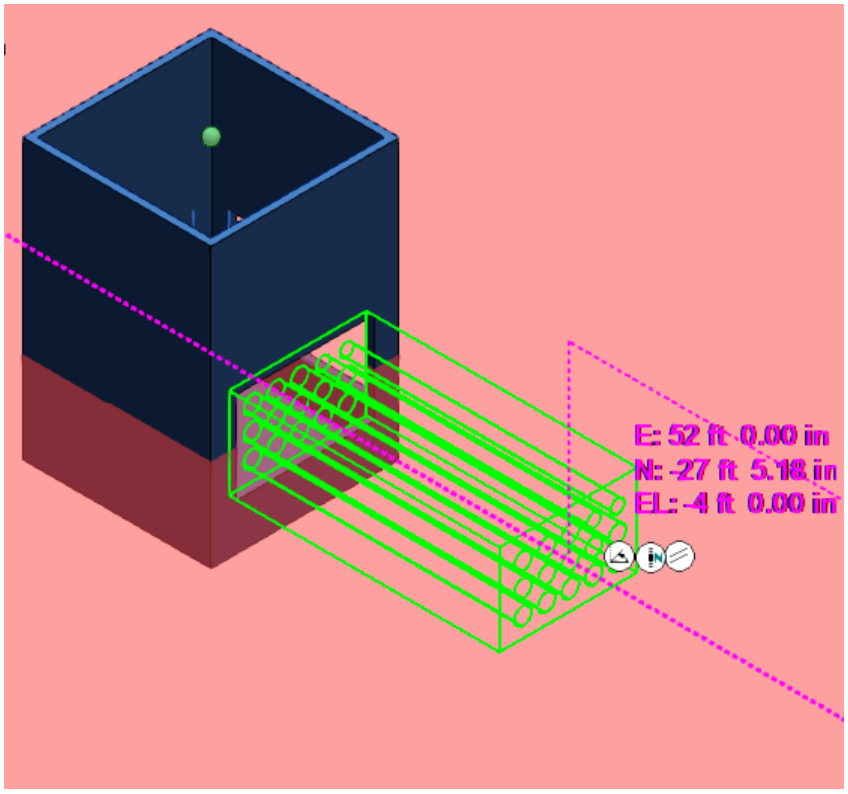
10. Set **Select Item for Modification** to **Run 3x2**, and define the following values as shown:

Conduit Spec: CS0
Conduit Diameter: 3 in
Fill Efficiency: 80 %
Signal Type: Power
Voltage Grade: Medium Voltage (>= 5kV and <= 15kV)



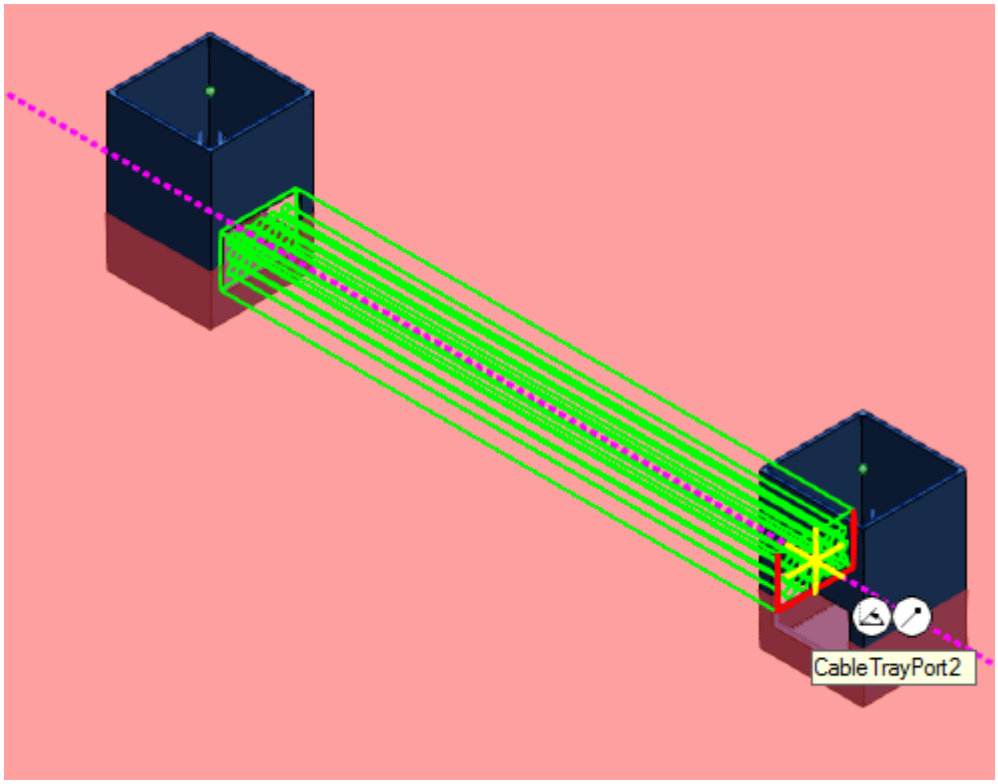
11. Click **OK**.

An outline of the duct bank displays in the active view. Smart 3D locks the angle to 0 deg and set the route PLANE to PLAN.

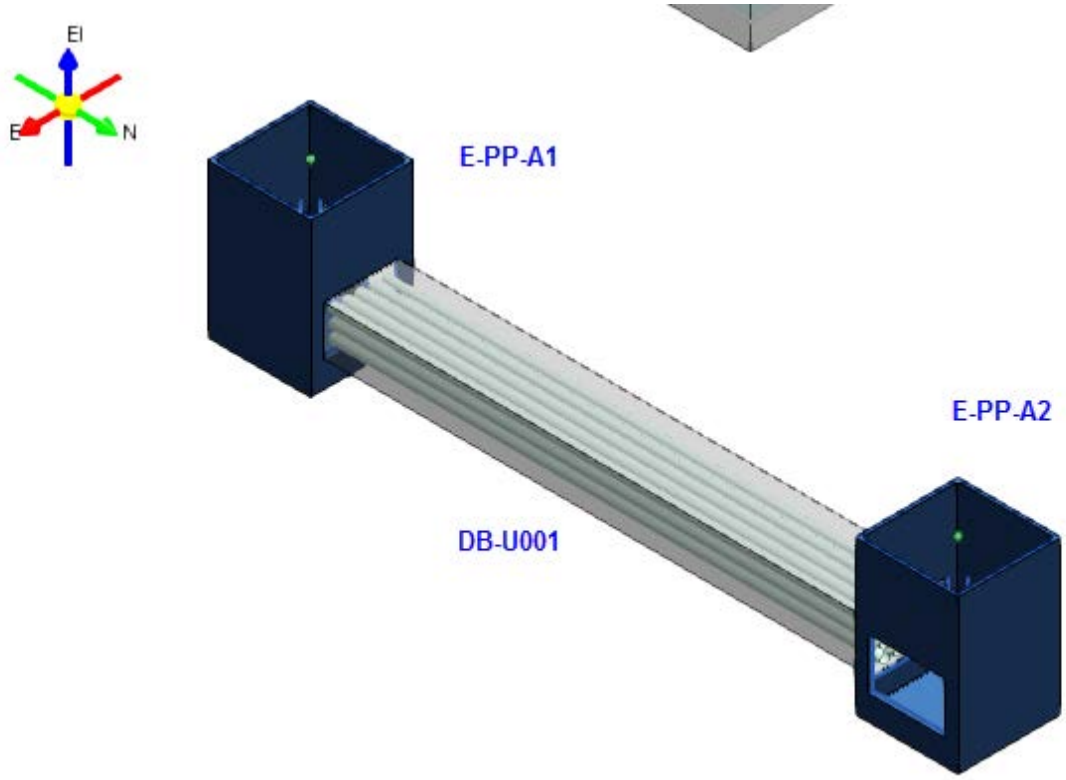


12. Locate the Pull-Pit (2) named **E-PP-A2** in the model.

13. Hover over the **cable tray port2** on Pull-Pit (2) until the **KeyPoint** SmartSketch glyph displays, as shown below.

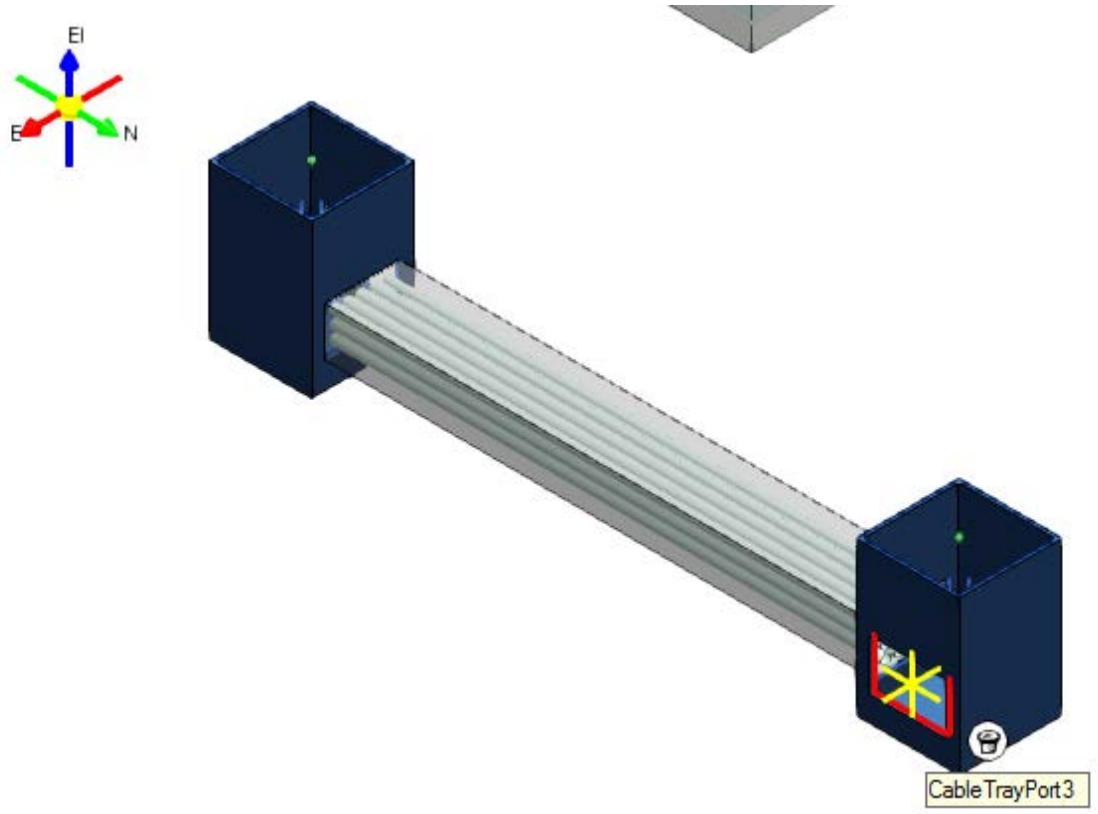


14. Click in the active view to place the duct bank.



15. To route the next part of the duct bank system in the east direction, click **Route Cableway** on the vertical toolbar.

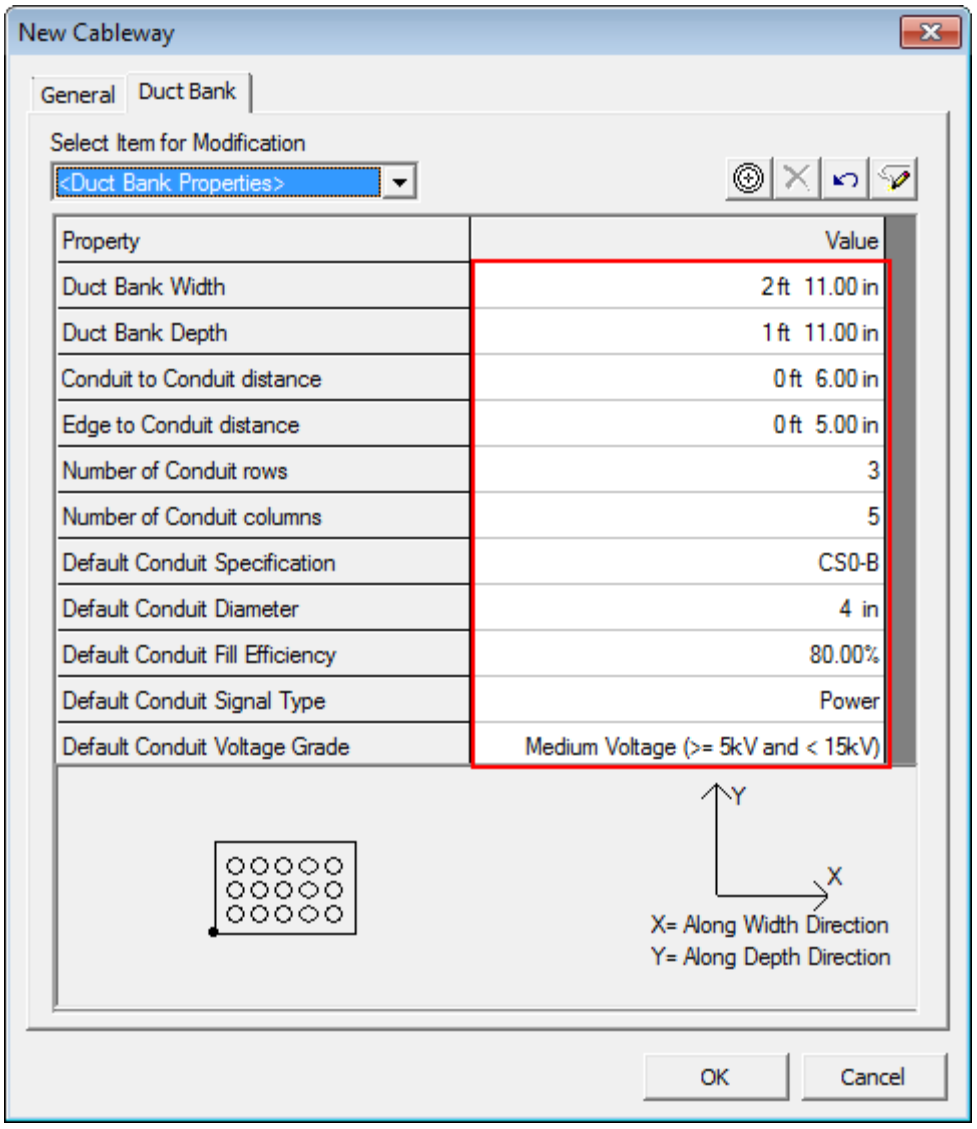
16. Select **cable tray port 3** on the Pull-Pit (2) named (E-PP-A2) as the starting point, as shown below:



*The **New Cableway** dialog box displays.*

17. On the **Duct Bank** tab, define the following values as shown:

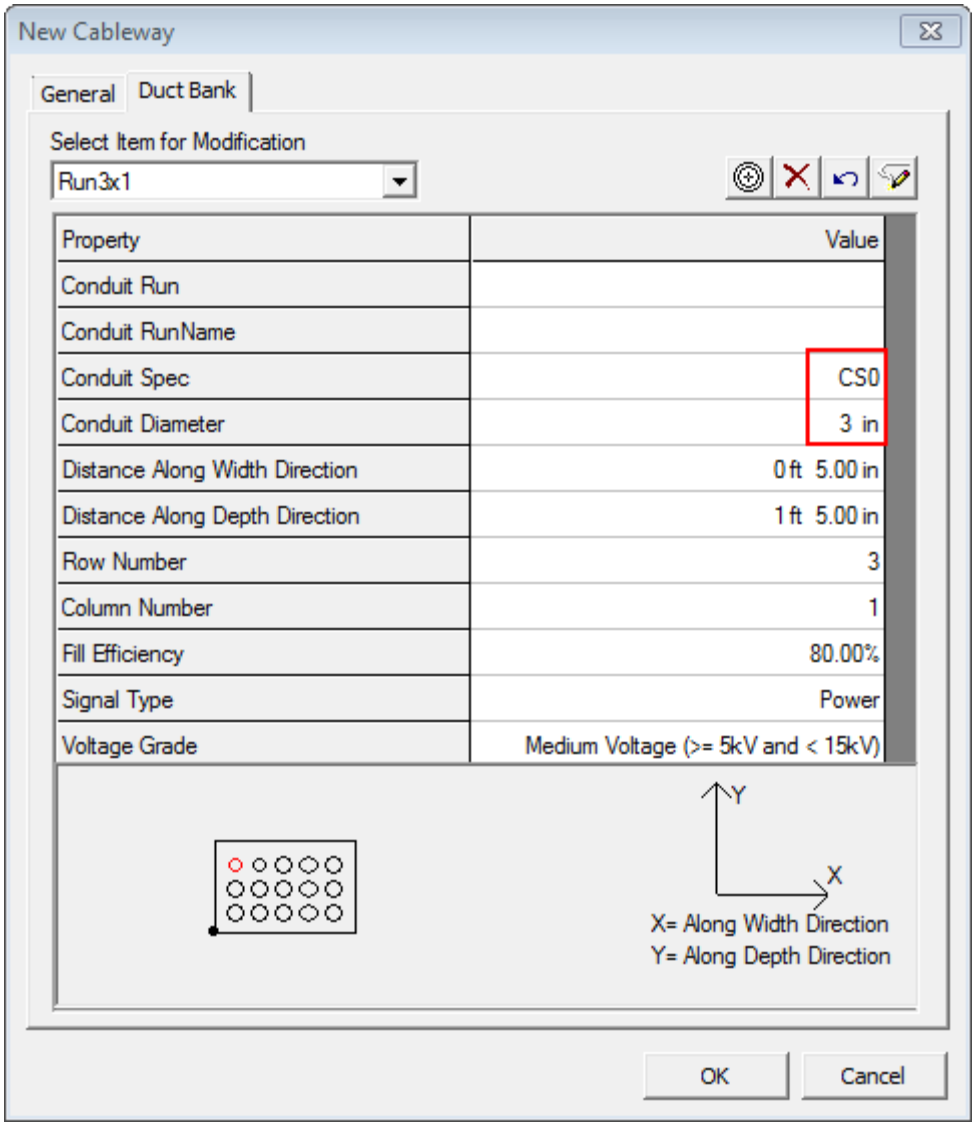
Duct Bank Width: 2 ft 11 in
Duct Bank Depth: 1 ft 11 in
Conduit to Conduit distance: 0 ft 6 in
Edge to Conduit distance: 0 ft 5 in
Number of Conduit rows: 3
Number of Conduit columns: 5
Default Conduit Specification: CSO-B
Default Conduit Diameter: 4 in
Default Conduit Fill Efficiency: 80.00 %
Default Conduit Signal Type: Power
Default Conduit Voltage Grade: Medium Voltage (>= 5kV and <= 15kV)



NOTE If the conduits are not inside the duct bank, an error message displays.

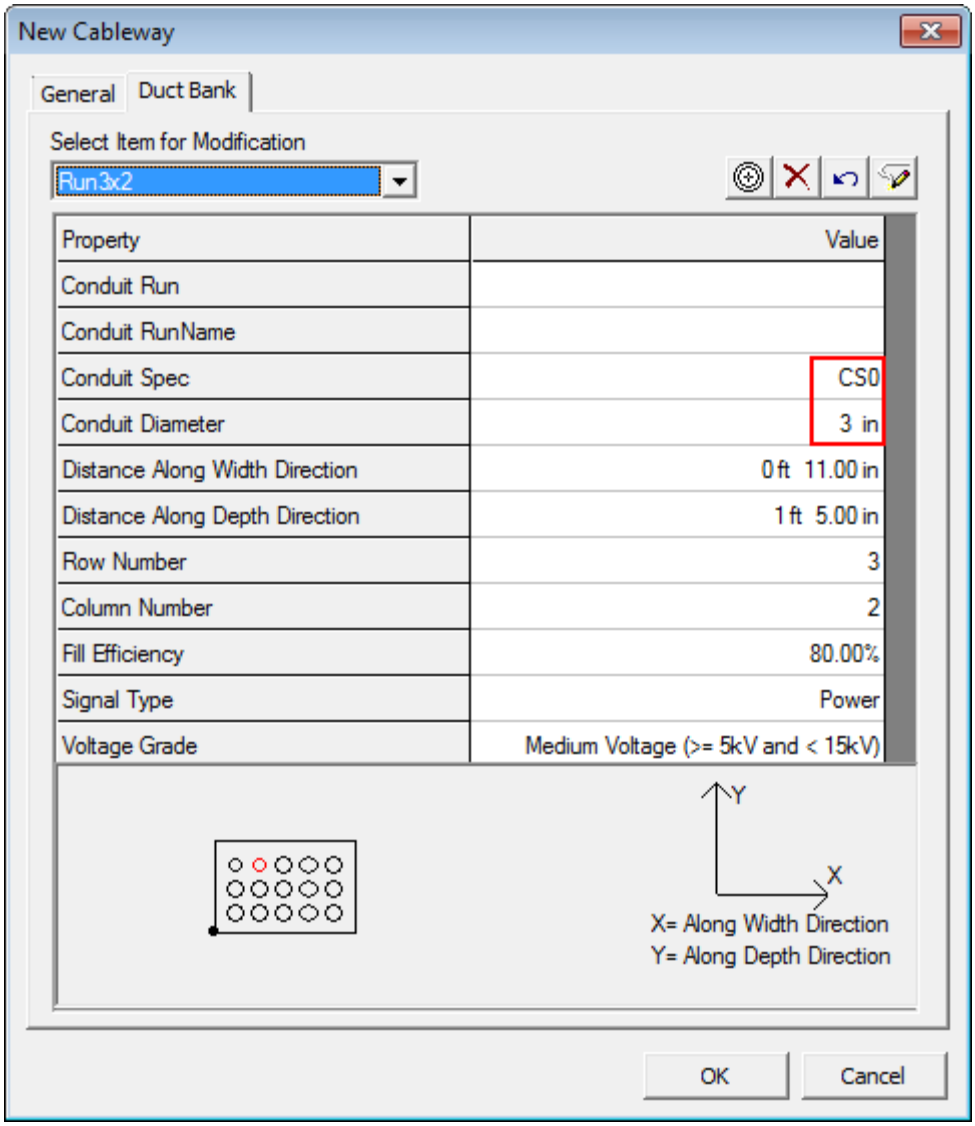
18. Set **Select Item for Modification** to **Run 3x1**, and define the following values as shown:

Conduit Spec: CS0
Conduit Diameter: 3 in
Fill Efficiency: 80 %
Signal Type: Power
Voltage Grade: Medium Voltage (>= 5kV and <= 15kV)

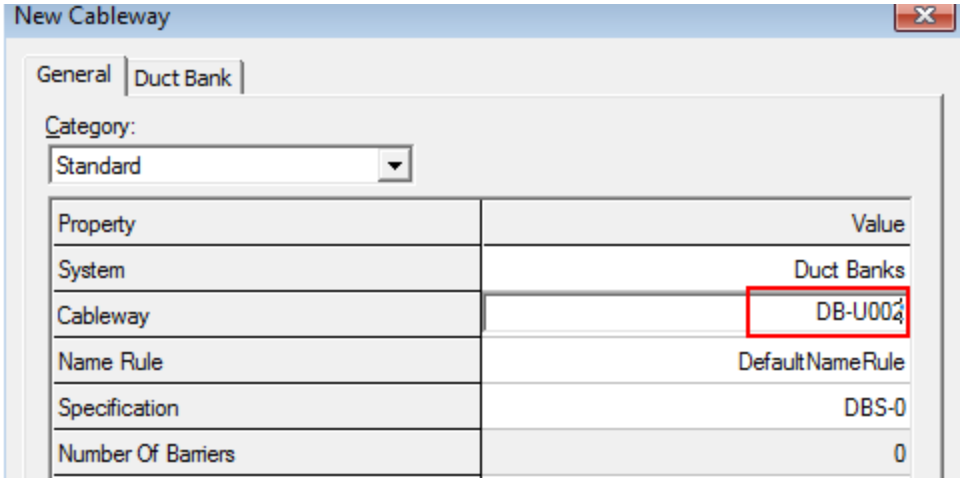


19. Set **Select Item for Modification** to **Run 3x2**, and define the following values as shown:

Conduit Spec: CS0
Conduit Diameter: 3 in
Fill Efficiency: 80 %
Signal Type: Power
Voltage Grade: Medium Voltage (>= 5kV and <= 15kV)

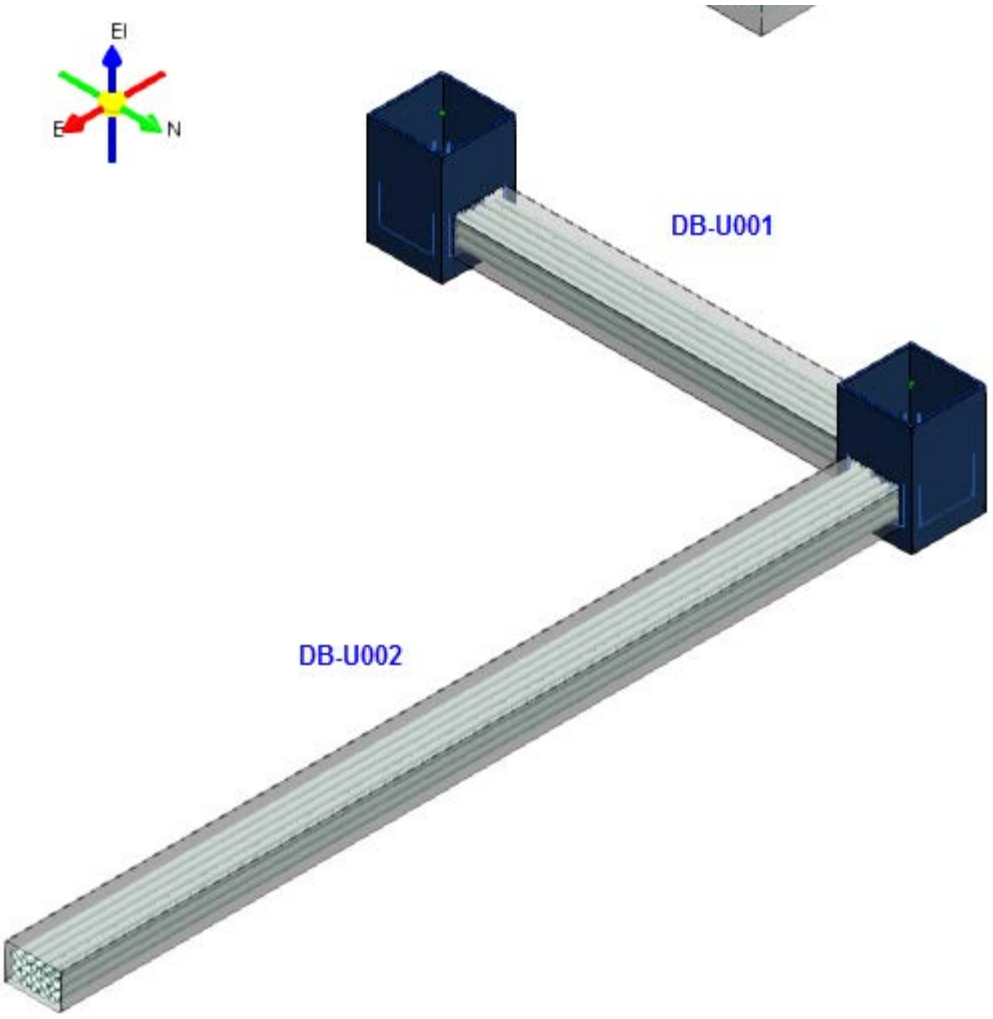


20. Under the **General** tab, set **Cableway** to **DB-U002**, and click **OK**.

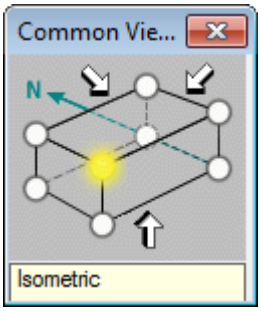


21. On the **Cableway** ribbon, set the **Length** of the duct bank to **45 ft**.

22. Hover over the East direction until the **E** SmartSketch glyph displays. Click anywhere in the active view to place the duct bank.

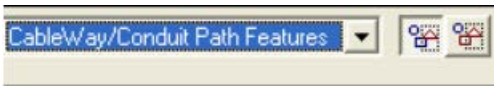


23. Right-click anywhere in the model to close the command.
24. To route the next part of the duct bank system to the North, click **Common View** to change the view of the model to "Looking Isometric."



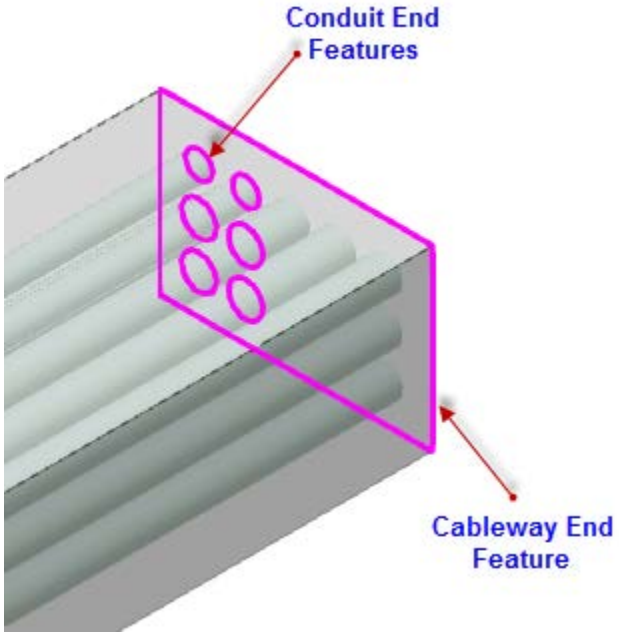
25. Zoom in on the end of the routed duct bank.

26. Under **Locate Filter**, select **Cableway/Conduit Path Features**, and set the fence mode to **Inside**.



NOTE You can also use the **Overlap** fence to select the end features.

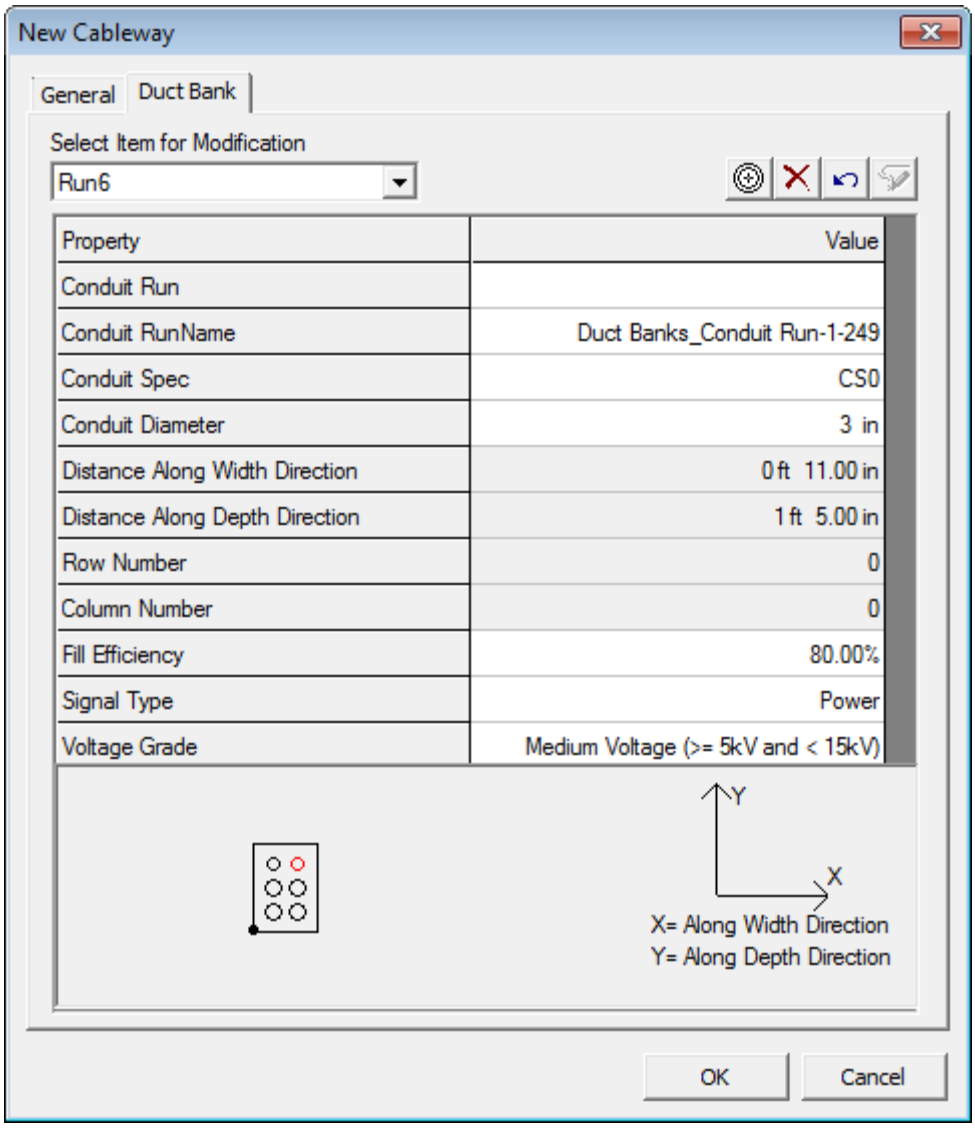
27. Select the end features as shown below:



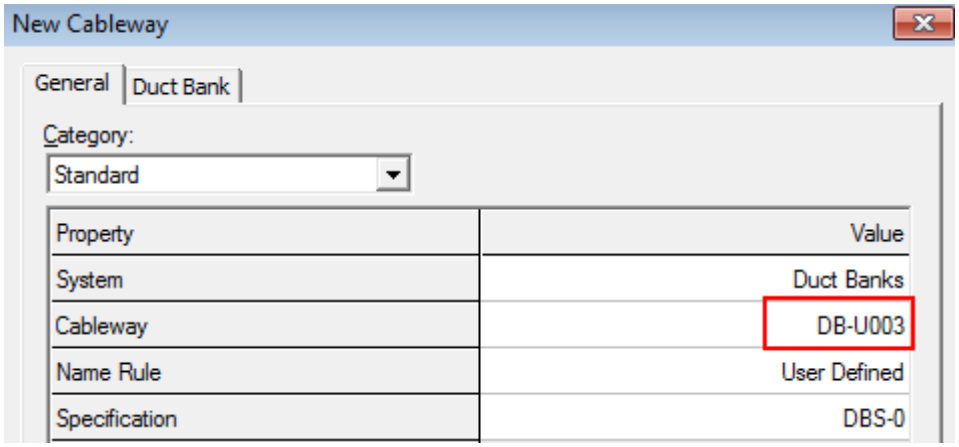
28. Click **Route Cableway** on the vertical toolbar.

*The **New Cableway** dialog box displays.*

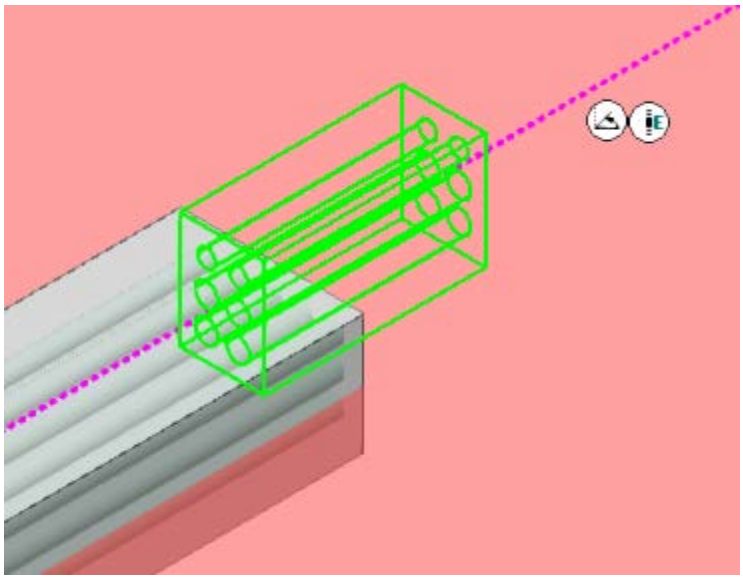
29. Select the **Duct Bank** tab and verify the properties of the conduit runs as shown (Run5 and Run6):



30. Select the **General** tab and type **DB-U003** in the **Cableway** field.

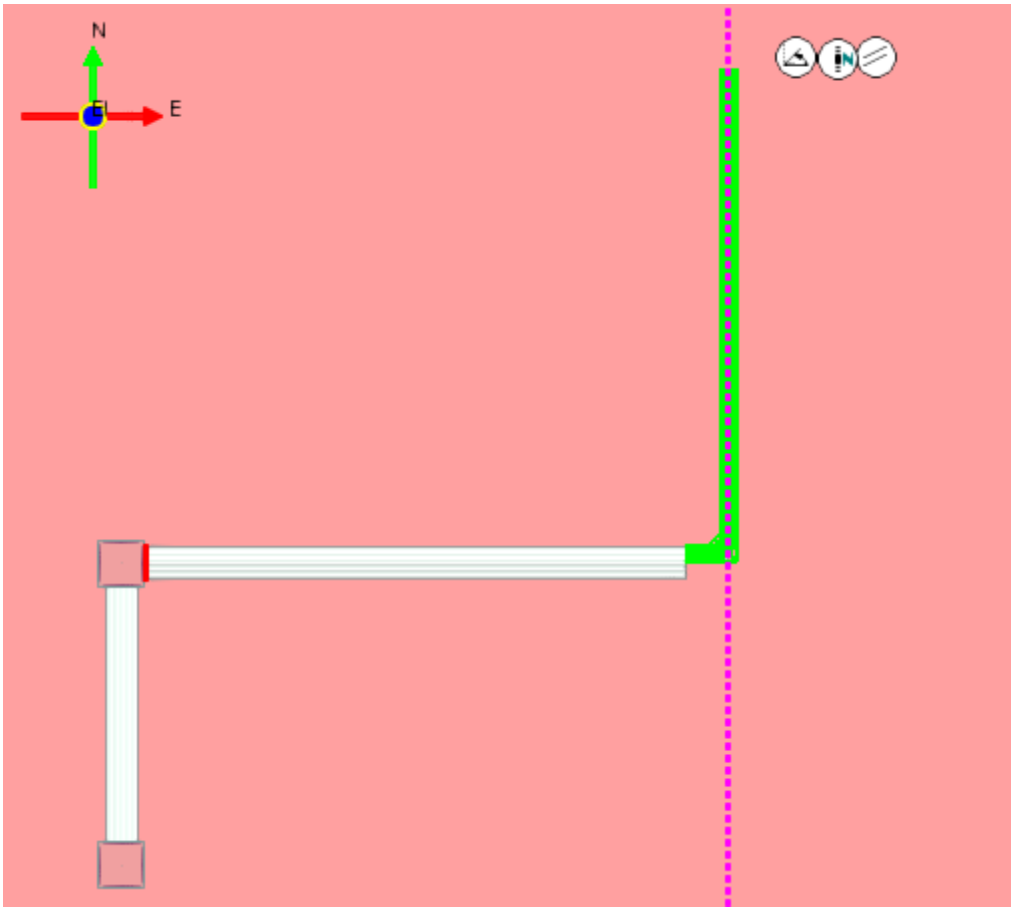


31. Click **OK**.
32. On the **Cableway** ribbon, set the **Length** to **3 ft 6 in**.
33. Hover over the east side of the end features until the **E** SmartSketch glyph appears, and then click anywhere in the active view to place the duct bank.



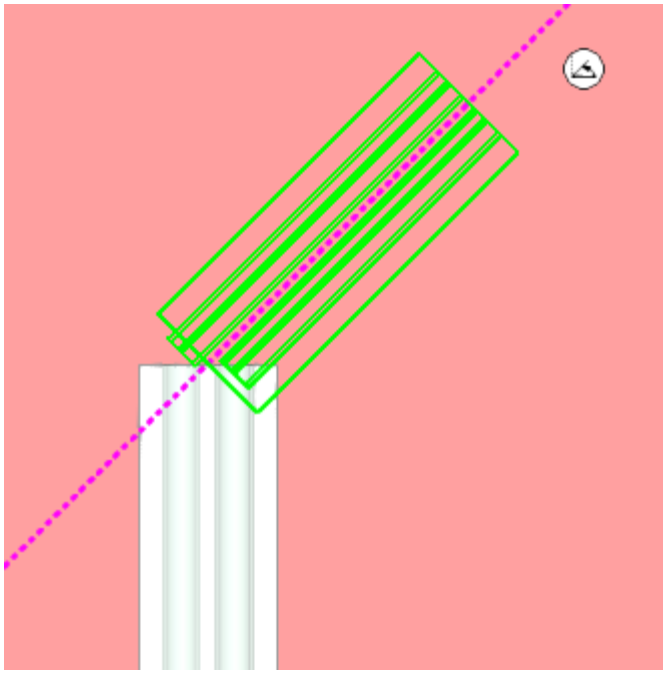
34. On the **Cableway** ribbon, set the **Length** to **40 ft**.

35. Hover over the Northing direction until the **N** SmartSketch glyph displays, and then click to accept the placement of the duct bank.

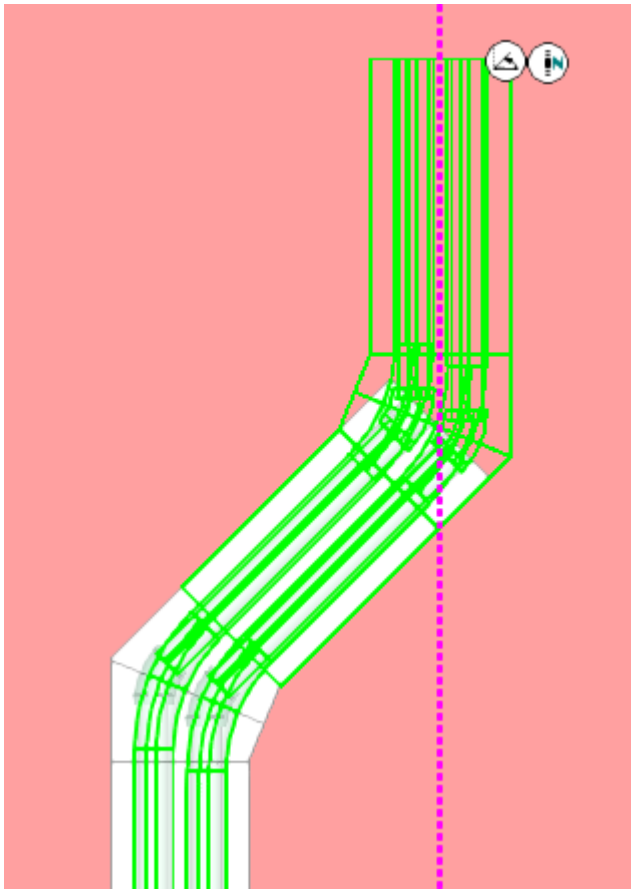


36. Use **Common Views** to change the view of the model to “Looking Plan.”
37. On the **Cableway** ribbon, set the **Length** to **3 ft 6 in** and the **Angle** to **45 deg**.

38. Hover over the North-East direction and click to place the duct bank.



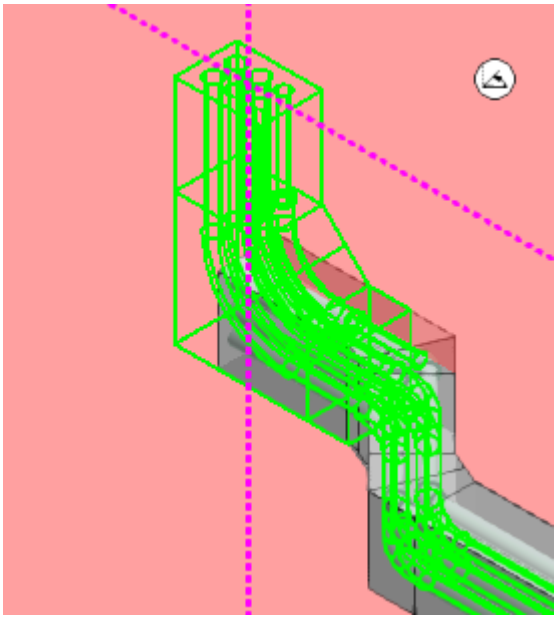
39. Hover over the North direction and click to continue placing the duct bank.



40. Right-click anywhere in the active view to close the command.
41. Use **Common Views** to change the view of the model to “Looking Isometric.”
42. Select all the end features of the duct bank.
43. Click **Route Cableway** on the vertical toolbar.
44. Set the route plane to **North-South**, and set the **Angle** to **90 deg** on the **Cableway** ribbon.
45. Select **Tools > PinPoint**.

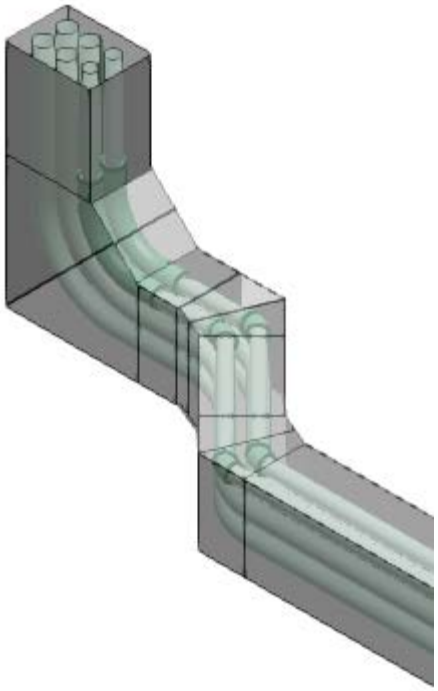
    *The **PinPoint** ribbon displays.*
46. Set the **Coordinate System** to **U05 CS**.
47. Click **Set target to Origin**.
48. Set the **Elevation** to **0 ft**.

49. Click in the active view to place the duct bank.



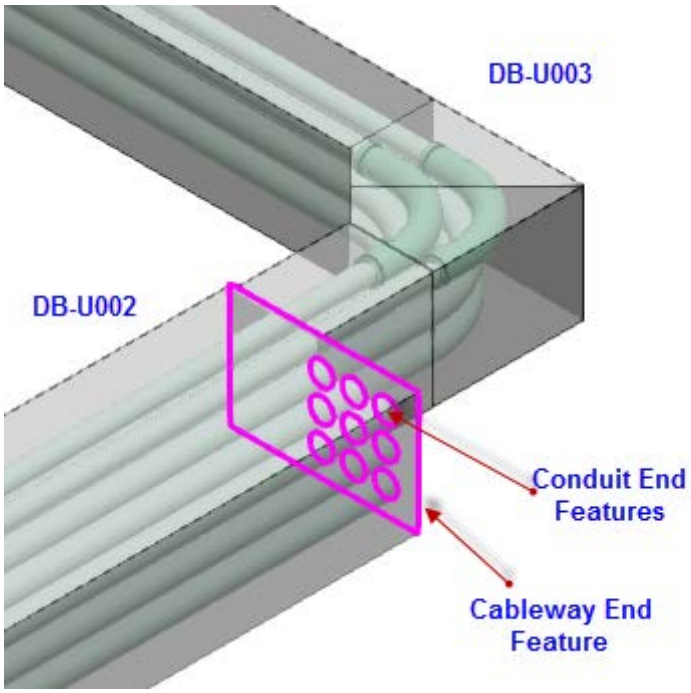
50. Right-click to close the command.

    The view of your model is shown below:



51. Zoom in on the branch point of the routed duct bank to continue to route the duct bank system to the east.

52. Set the **Locate Filter** to **Select Cableway/Conduit Path Features**, and select the end features as shown below:



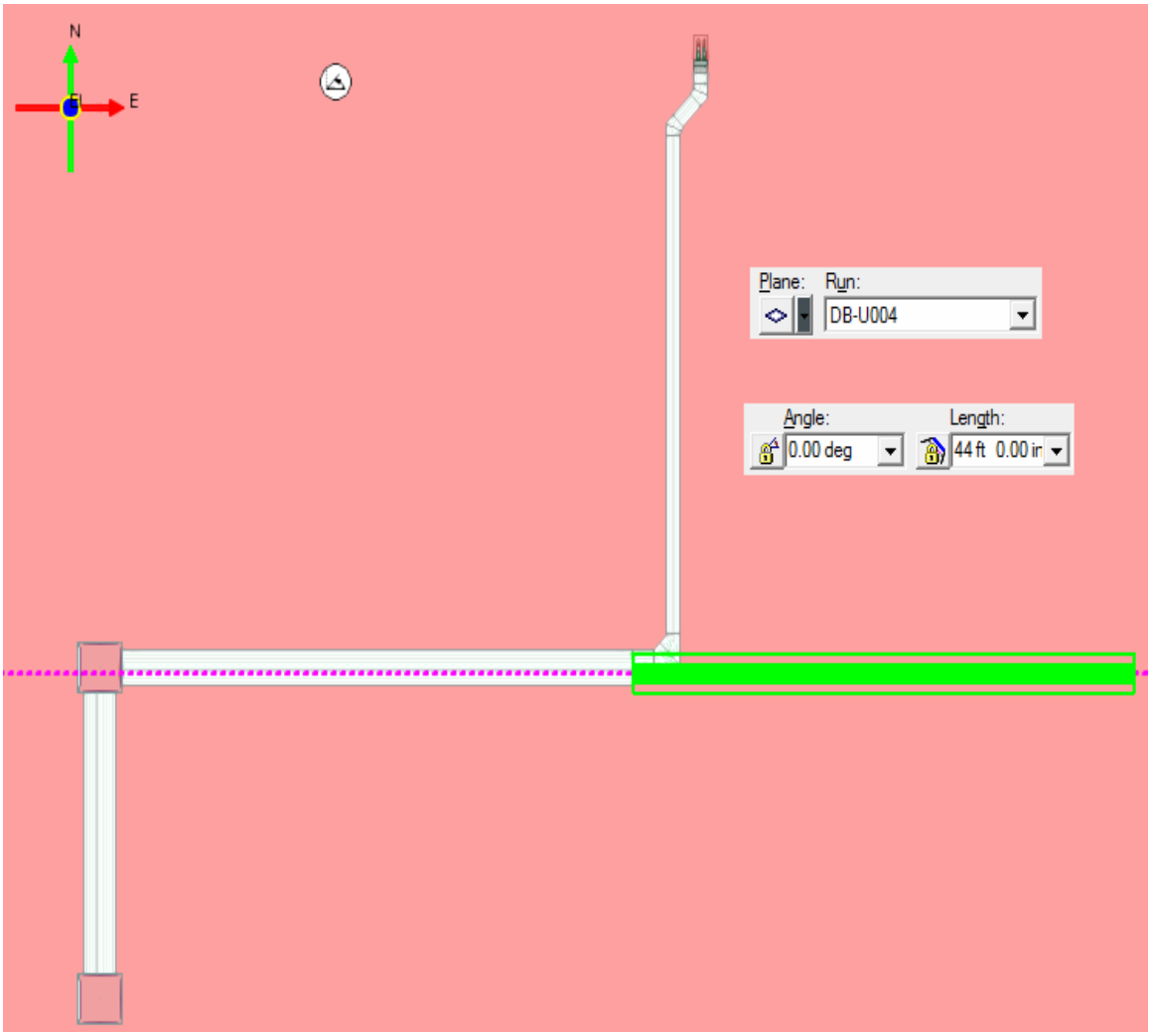
53. Click **Route Cableway** on the vertical toolbar.

    *The **New Cableway** dialog box displays.*

54. Under the **General** tab, set **Cableway** to **DB-U004**, and then click **OK**.

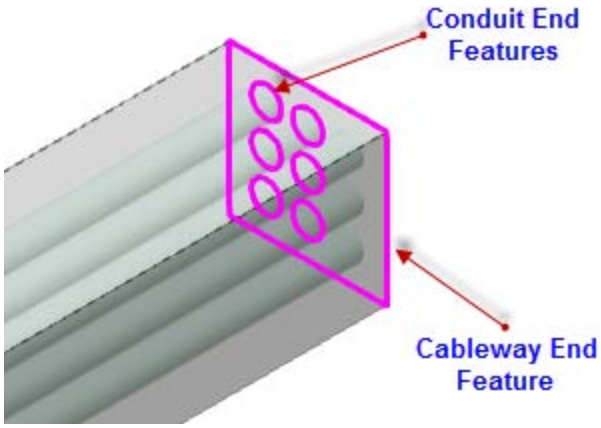
55. Set the route plane to **Plan** <>, Width to and set the **Length** to **44 ft** on the **Cableway** ribbon.

56. Hover over the East direction until the **E** SmartSketch glyph appears, then click in the active view to place the duct bank.



57. Right-click to close the command.
58. Zoom in on the end of the routed duct bank to start routing the next part of the duct bank system to the north.

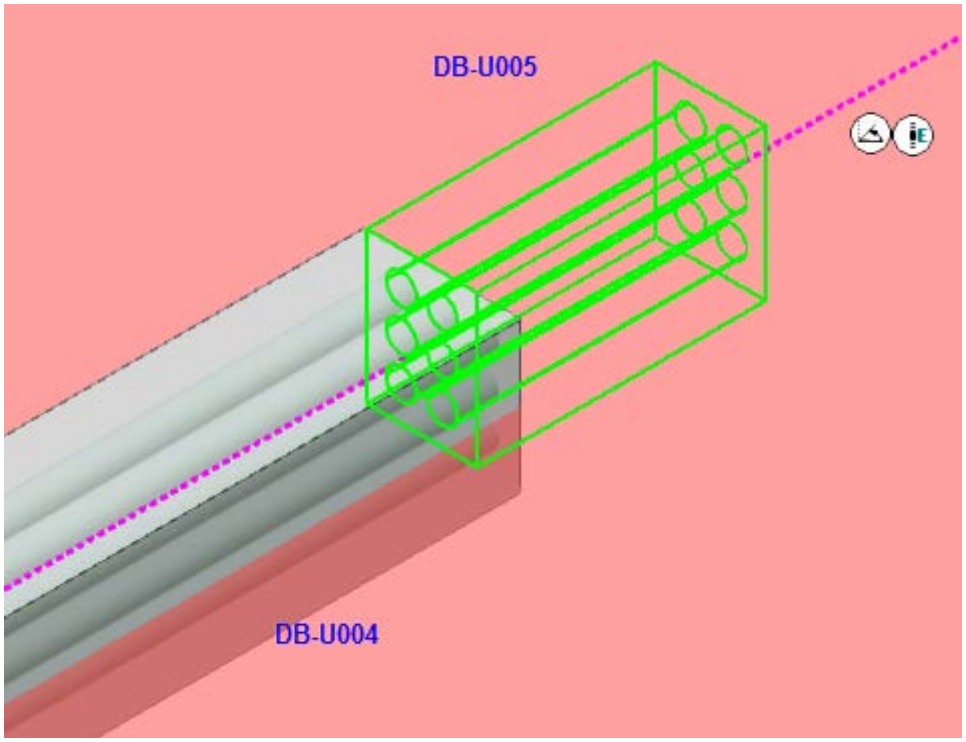
59. Set the **Locate Filter** to **Select Cableway/Conduit Path Features**, and select the end features as shown below:



60. Click **Route Cableway** on the vertical toolbar.

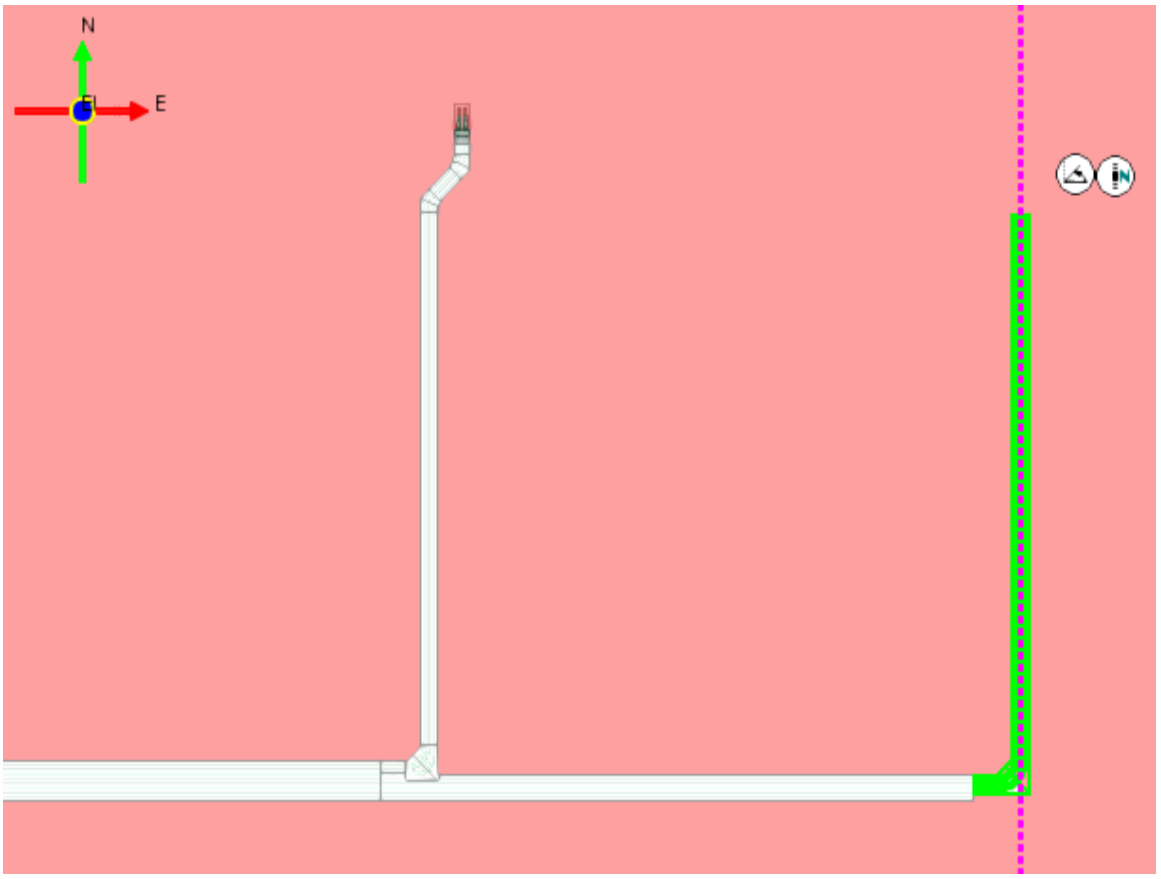
    *The **New Cableway** dialog box displays.*

61. Under the **General** tab, set **Cableway** to **DB-U005**, and then click **OK**.
62. On the **Cableway** ribbon, set the **Length** to **3 ft 6 in**.
63. Hover over the east direction until the **E** SmartSketch glyph displays, and then click in the active view to place the duct bank.



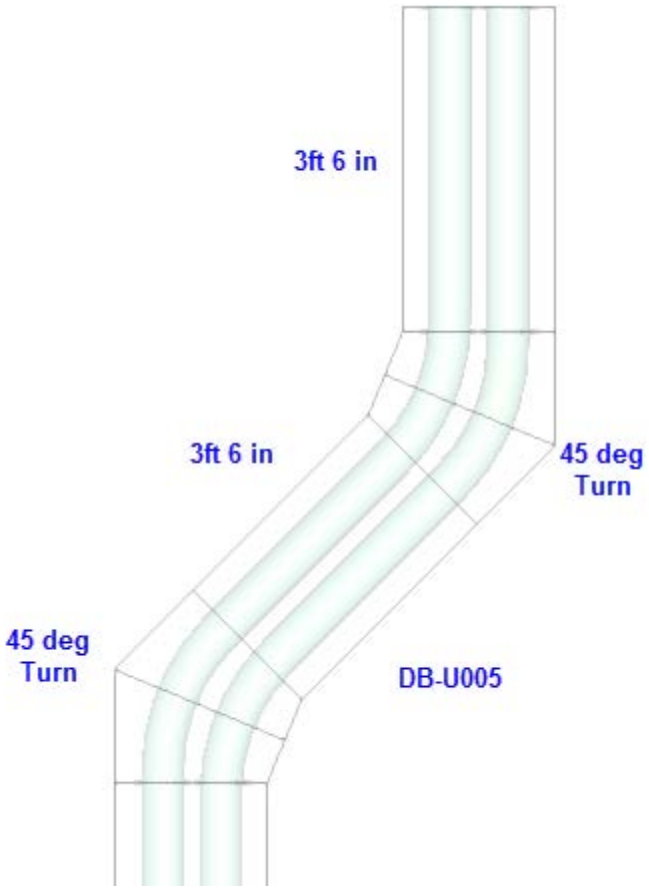
64. On the **Cableway** ribbon, set the **Length** to **40 ft**.

65. Hover over the North direction until the **N** SmartSketch glyph displays, then click in the active view to place the duct bank.



66. Use **Common Views** to change the view of the model to “Looking Plan.”
67. On the **Cableway** ribbon, set the **Length** to **3 ft 6 in** and the **Angle** to **45 deg**.
68. Hover over the north-east direction and click in the active view to place the duct bank.

69. Hover over the north direction and click in the active view to place the duct bank.

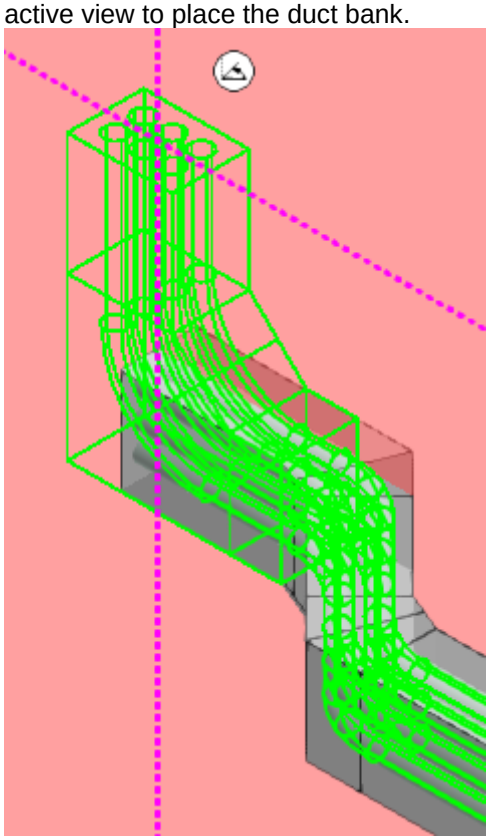


70. Right-click to close the command.
71. Use **Common Views** to change the view of the model to “Looking Isometric - East/North.”
72. Select all the end features of the duct bank.
73. Click **Route Cableway** on the vertical toolbar.

    *The **New Cableway** dialog box displays.*
74. Set the route plane to **North-South**.
75. On the **Cableway** ribbon, set the **Angle** to **90 deg**.
76. Select **Tools > PinPoint**.

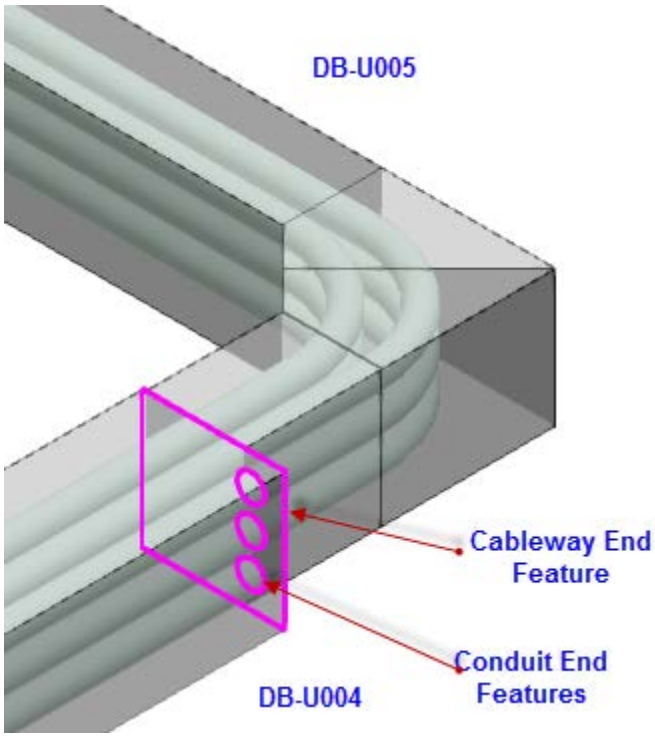
    *The **PinPoint** ribbon displays.*
77. Set the coordinate system to **U05 CS**.
78. Click **Set target to Origin**.

79. Set the **Elevation** to **0 ft**.
80. Hover over the Up direction until the **U** SmartSketch glyph displays, and then click in the active view to place the duct bank.



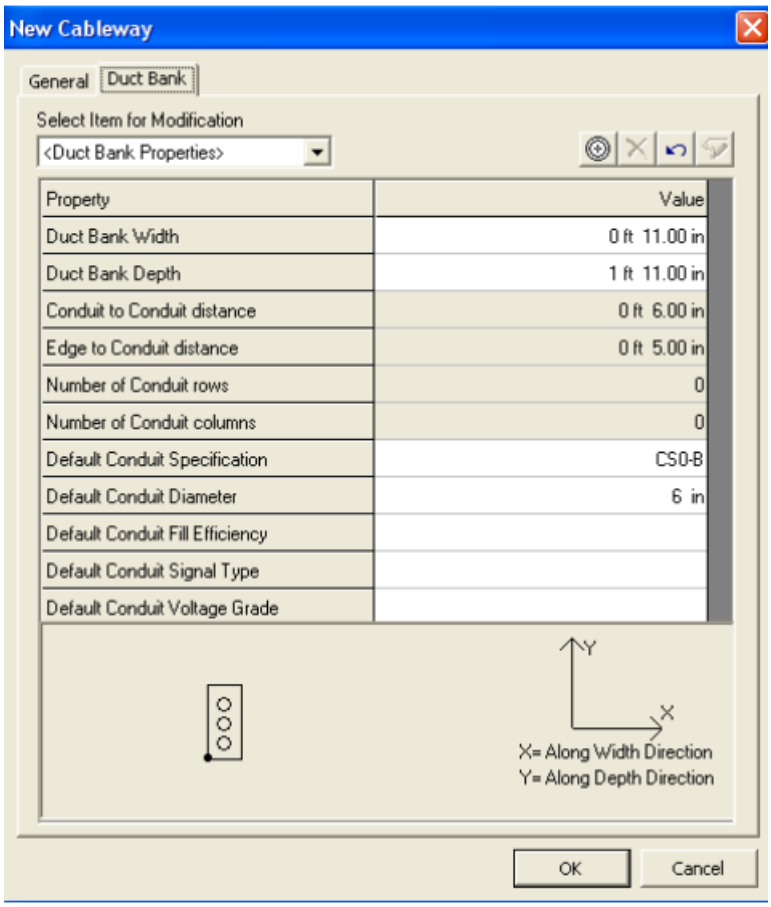
81. Right-click to close the command.
82. Zoom in on the second branch point of the routed duct bank to continue routing the duct bank system in the east direction.

83. Set the **Locate Filter** to **Select Cableway/Conduit Path Features**, and select the end features as shown below:

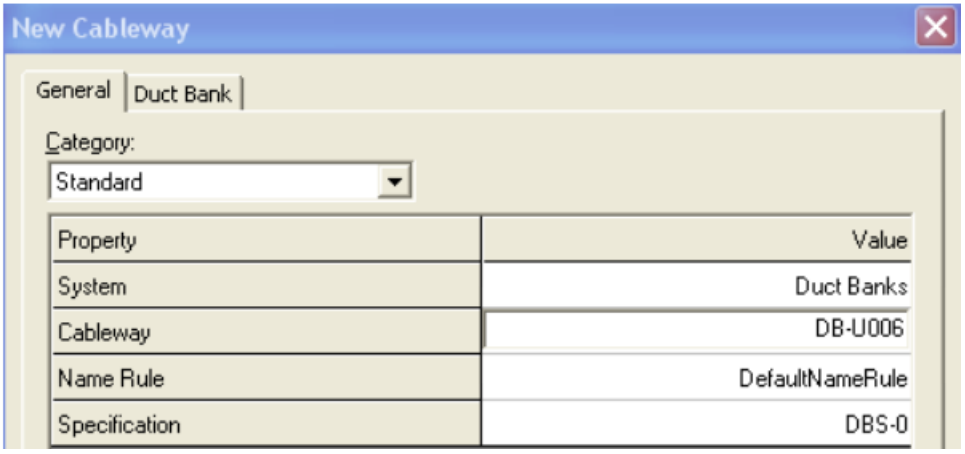


84. Click **Route Cableway** on the vertical toolbar.

*The **New Cableway** dialog box displays.*

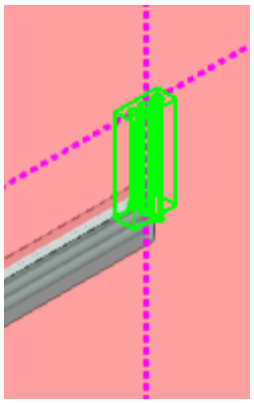


85. Under the **General** tab, type **DB-U006** in the **Cableway** field, and then click **OK**.



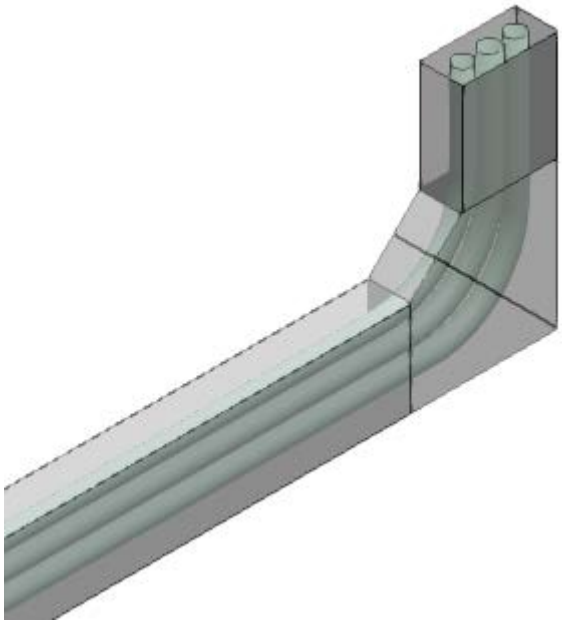
86. Set the route plane to **Plan** and set the **Length** to **20 ft** on the **Cableway** ribbon.
87. Hover over the East direction until the **E** SmartSketch glyph appears, then click in the active view to place the duct bank.

88. Set the route plane to **East-West** .
89. On the **PinPoint** ribbon, set the **Elevation** to **0 ft**.
90. Click in the active view to place the duct bank.



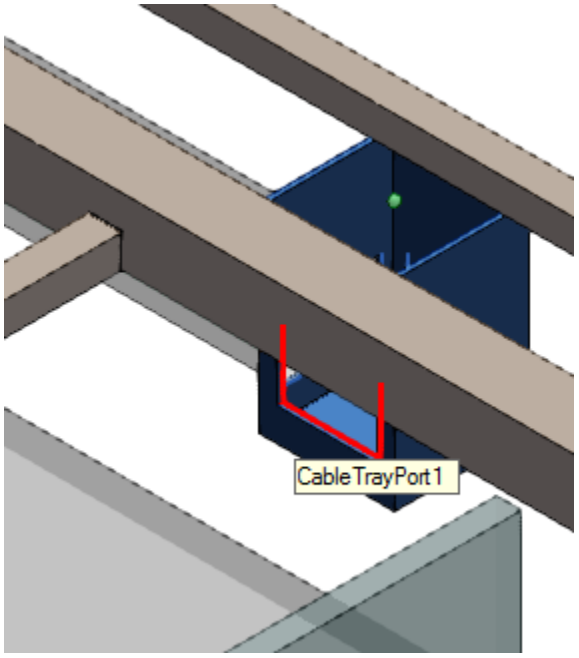
91. Right-click to close the command.

    The view of your model should resemble below:



92. Set the **Locate Filter** to **All**, and then select the **Wall System** of the building.
93. Use **Hide** to hide the wall of the building.
94. Set the **Locate Filter** to **Cable tray Nozzles**.

95. Select **Cable tray port 1** on Pull-Pit (1) named E-PP-A1 as shown below:

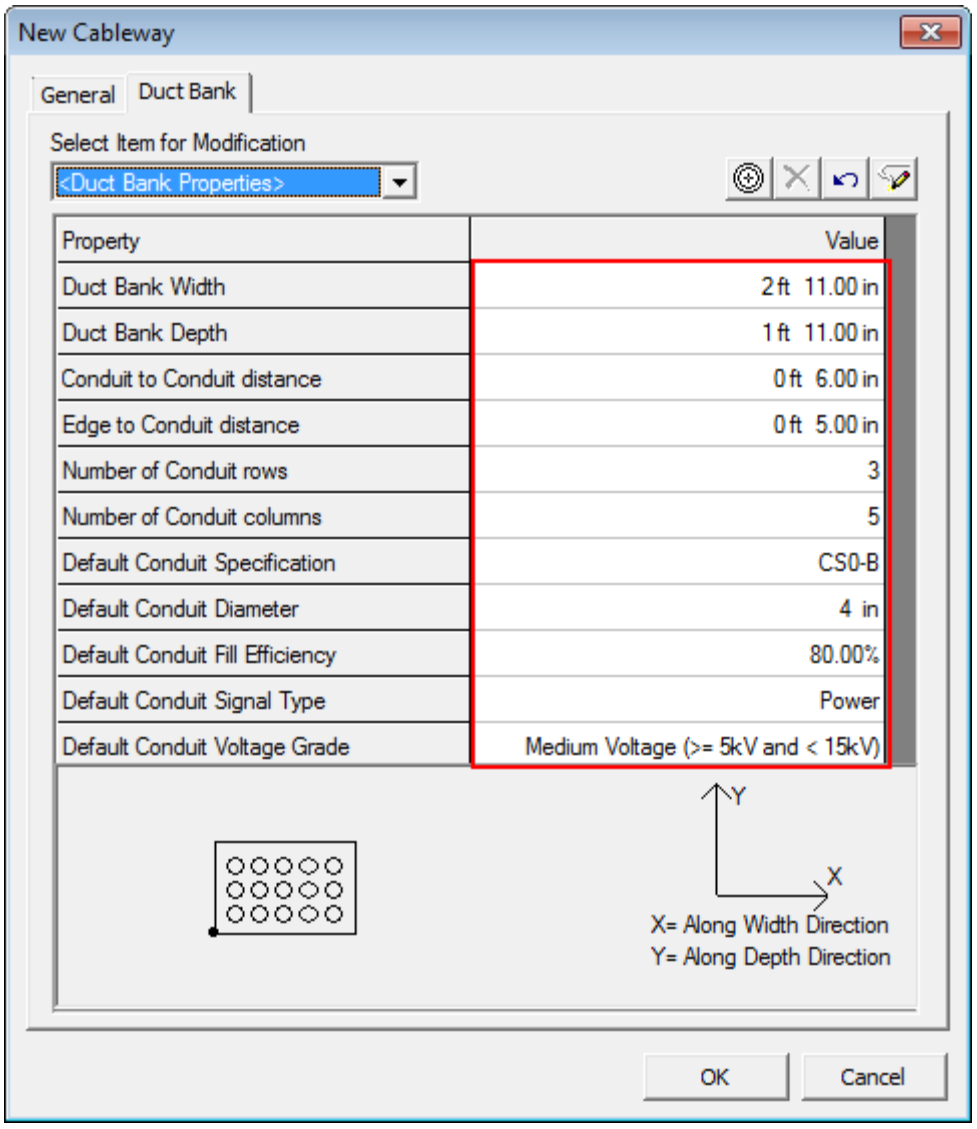


96. Click **Route Cableway** on the vertical toolbar.

    *The **New Cableway** dialog box displays.*

97. On the **Duct Bank** tab, define the following values as shown:

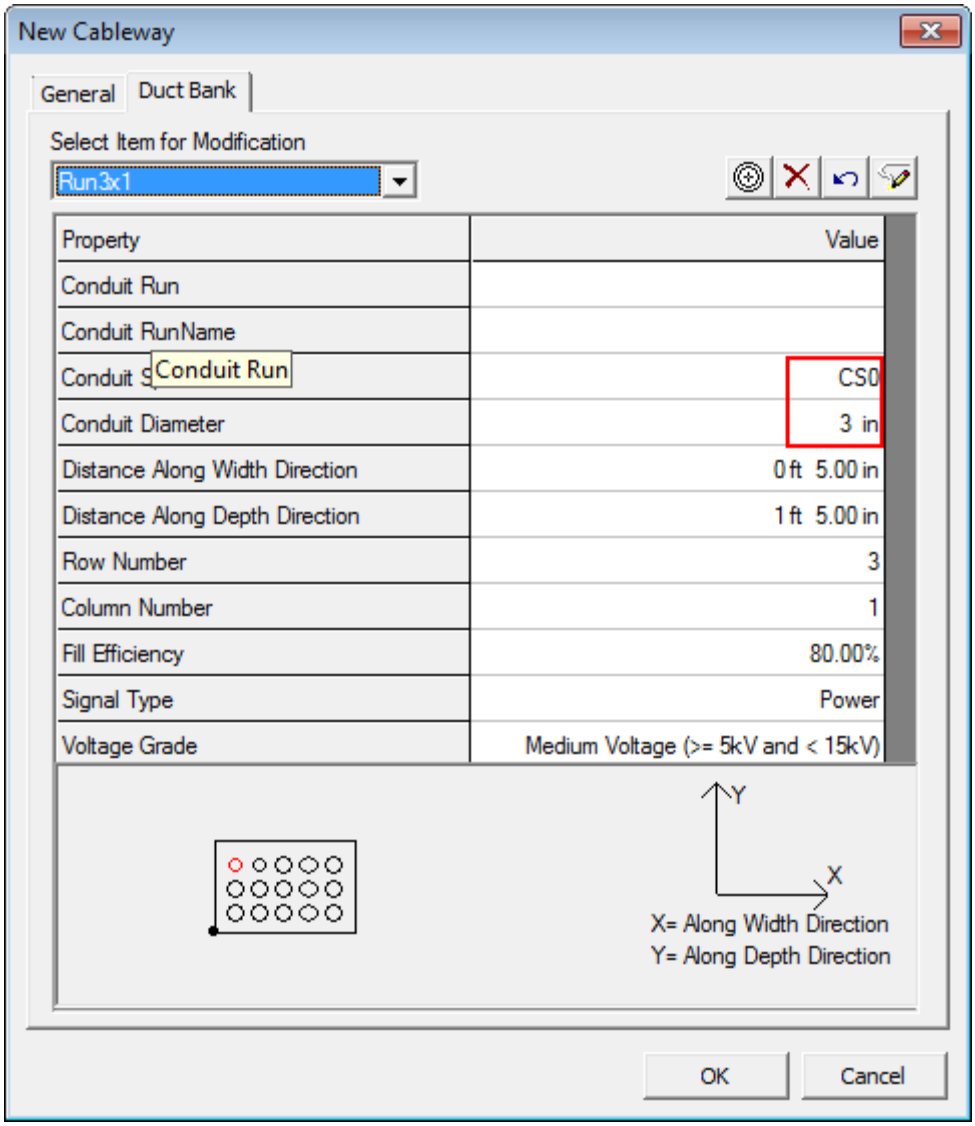
Duct Bank Width: 2 ft 11 in
Duct Bank Depth: 1 ft 11 in
Conduit to Conduit distance: 0 ft 6 in
Edge to Conduit distance: 0 ft 5 in
Number of Conduit rows: 3
Number of Conduit columns: 5
Default Conduit Specification: CS0-B
Default Conduit Diameter: 4 in
Default Conduit Fill Efficiency: 80.00 %
Default Conduit Signal Type: Power
Default Conduit Voltage Grade: Medium Voltage (>= 5kV and <= 15kV)



NOTE If the conduits are not inside the duct bank, an error message displays.

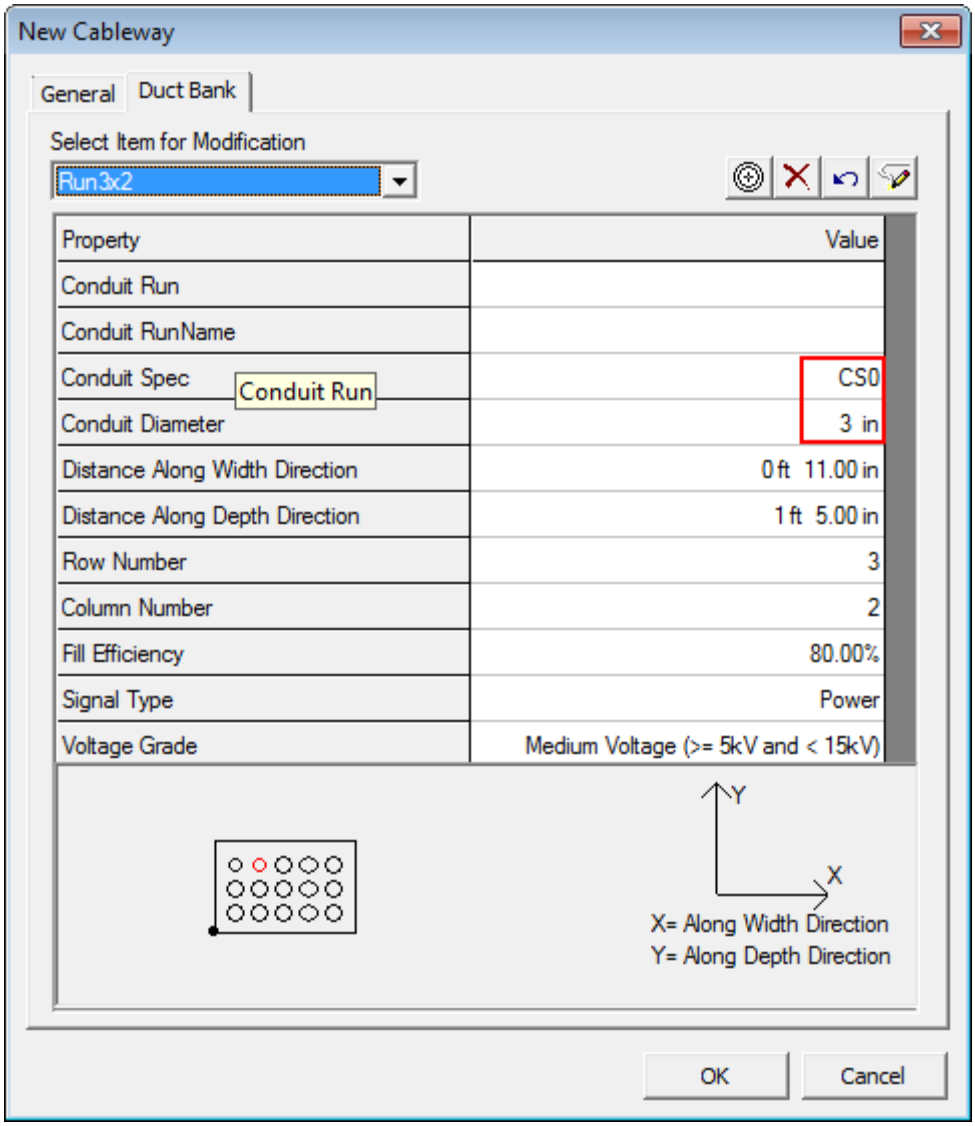
98. Set **Select Item for Modification** to **Run 3x1**, and define the following conduit specifications:

Conduit Spec: CS0
Conduit Diameter: 3 in
Fill Efficiency: 80 %
Signal Type: Power
Voltage Grade: Medium Voltage (>= 5kV and <= 15kV)



99. Set **Select Item for Modification** to **Run 3x2**, and define the following conduit specifications:

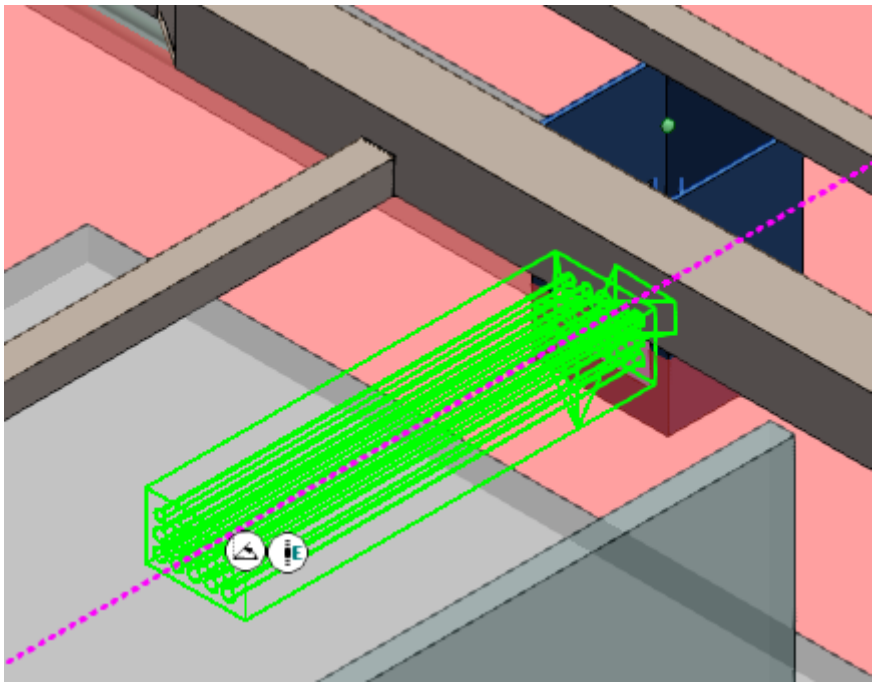
Conduit Spec: CS0
Conduit Diameter: 3 in
Fill Efficiency: 80 %
Signal Type: Power
Voltage Grade: Medium Voltage (>= 5kV and <= 15kV)



100. Under the **General** tab, type **DB-U007** in the **Cableway** field, and then click **OK**.

101. On the **Cableway** ribbon, set the **Length** to **12 ft**.

102. Hover over the west direction until the **E** SmartSketch glyph displays, and then click in the active view to place the duct bank.



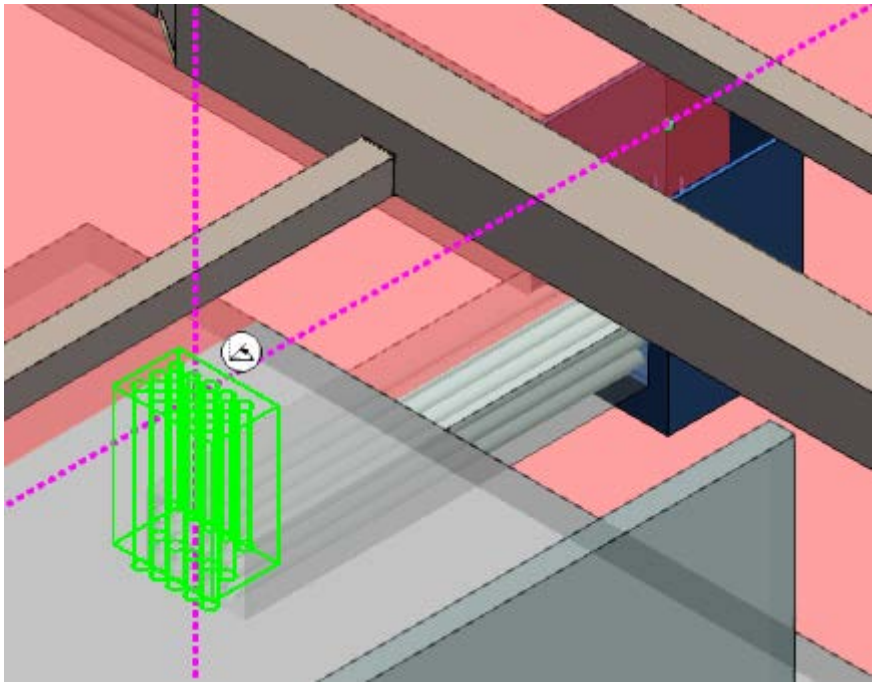
103. Use **Common Views** to change the view of the model to “Looking North.”

104. Click **Unlock** .

105. Set the route plane to **East-West** .

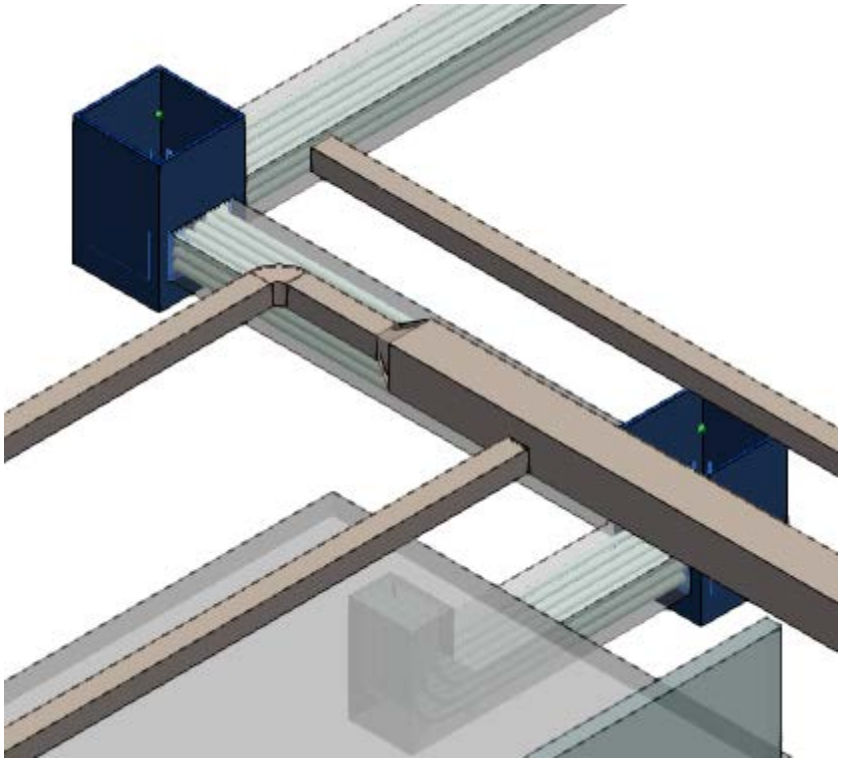
106. On the **PinPoint** ribbon, set the **Elevation** to **0 ft**.

107. Click in the active view to place the duct bank.



108. Right-click to cancel the command.

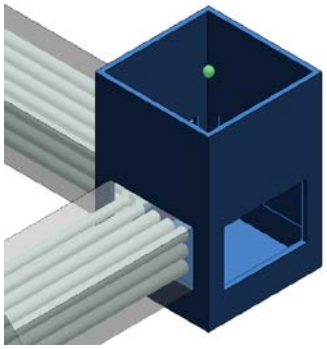
The view of your model displays:



Connecting Duct Banks within Pull-Pit

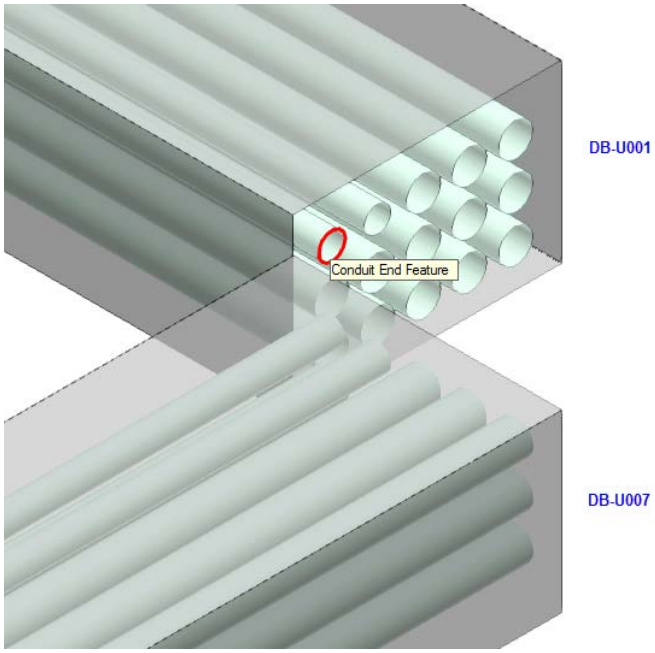
To route cable paths where two or more duct banks meet at a pull-pit, the cable paths must be continuous. Conduits that need to exchange cables need to be connected by a non part specification cableway. A cableway with a non-part specification is also referred to as "Zero-Spec". **Cableway Auto Connect** allows you to create the connecting cableways.

1. Locate the Pull-Pit (1) **E-PP-A1** in the model and zoom in close to it.
2. Under **Locate Filter**, select **Equipment**.
3. Select Pull-Pit (1), and then select **Hide**.

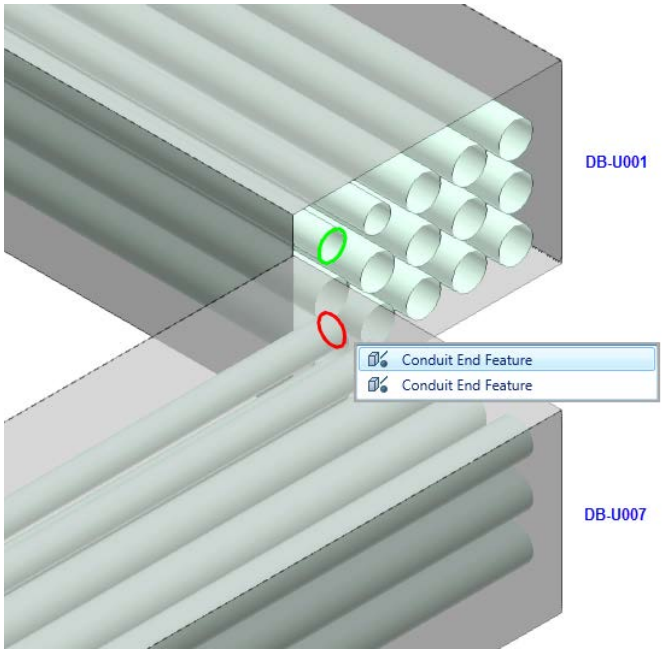


4. Click **Auto Connect** from the vertical toolbar.
5. Set the **Locate Filter** to **Conduit Features**.

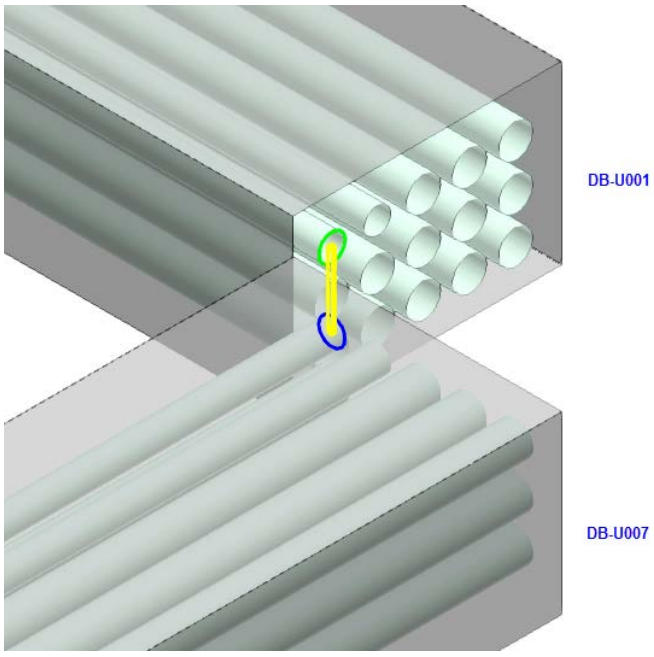
6. Select the enclosed 3" conduit end feature on duct bank DB-U001 as shown below:



7. Click **To Run** .
8. Select the enclosed 3" conduit end feature on duct bank DB-U007 as shown below:



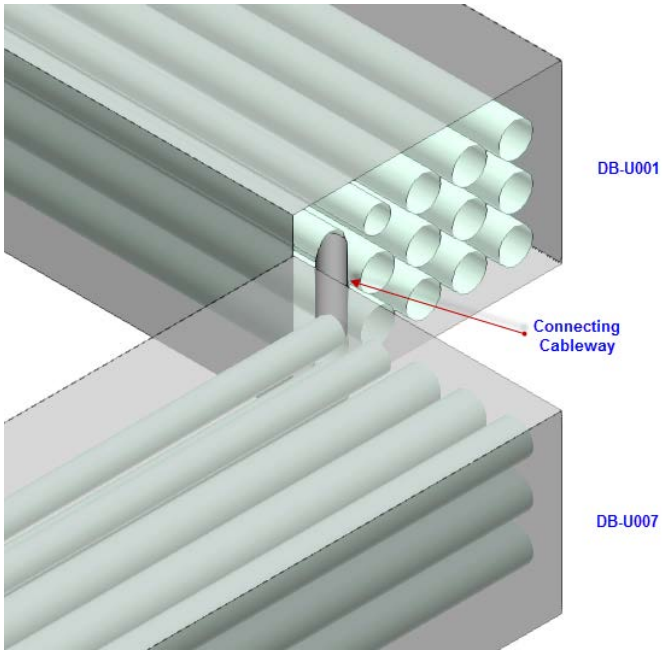
The connecting cableway between the selected conduit end features displays:



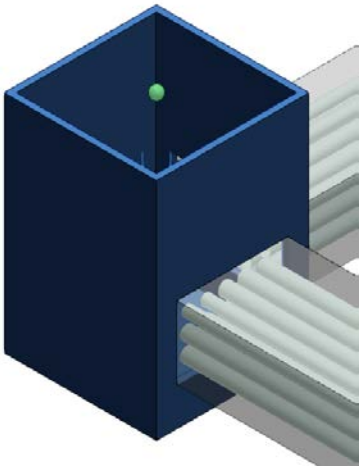
9. Click **Finish** to place the connecting cableway.

10. Right-click to cancel the command.

    The connecting cableway is placed:

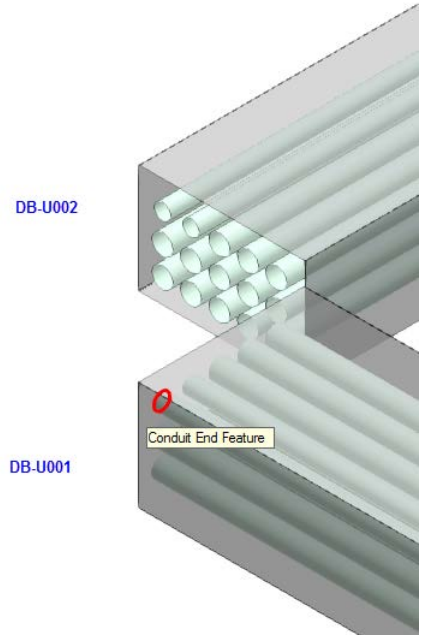


11. Locate the Pull-Pit (2) **E-PP-A2** in the model and zoom in close to it.
12. Select Pull-Pit (2), and then select **Hide**.

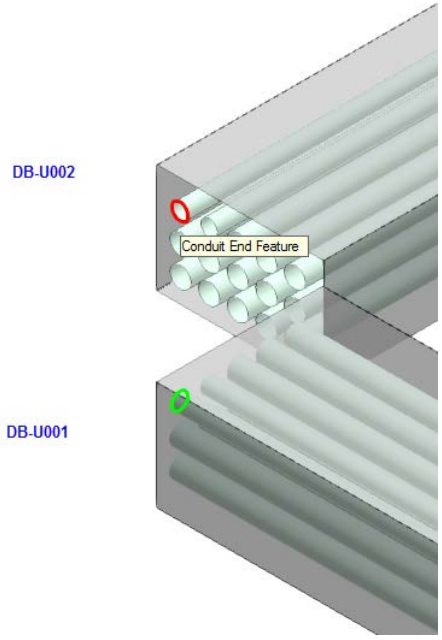


13. Click **Auto Connect** from the vertical toolbar.
14. Set the **Locate Filter** to **Conduit End Features**.

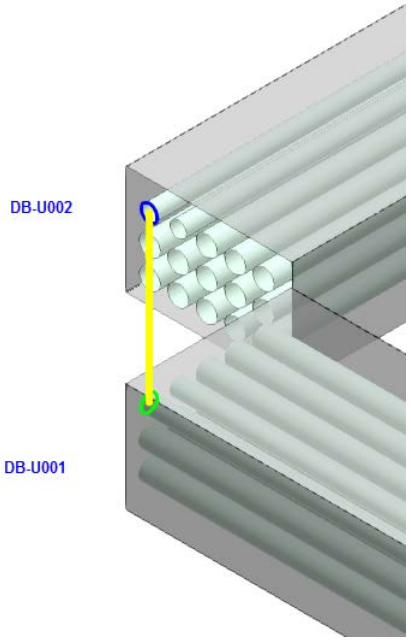
15. Select the enclosed 3" conduit end feature on duct bank **DB-U001** as shown below.



16. Click **To Run** .
17. Select the enclosed 3" conduit end feature on duct bank DB-U002 as shown below:



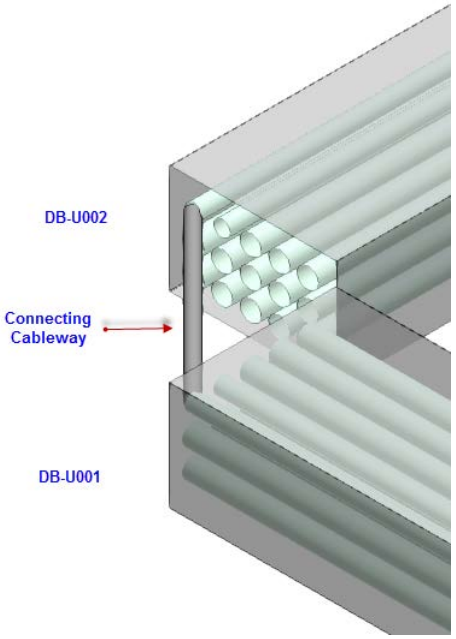
The connecting cableway between the selected conduit end features displays:



18. Click **Finish** to place the connecting cableway.

19. Right-click to cancel the command.

    The connecting cableway is placed:



20. Select **Tools > Show All** to show all objects in the view.

21. Select **View > Fit** to fit the model in the active view.

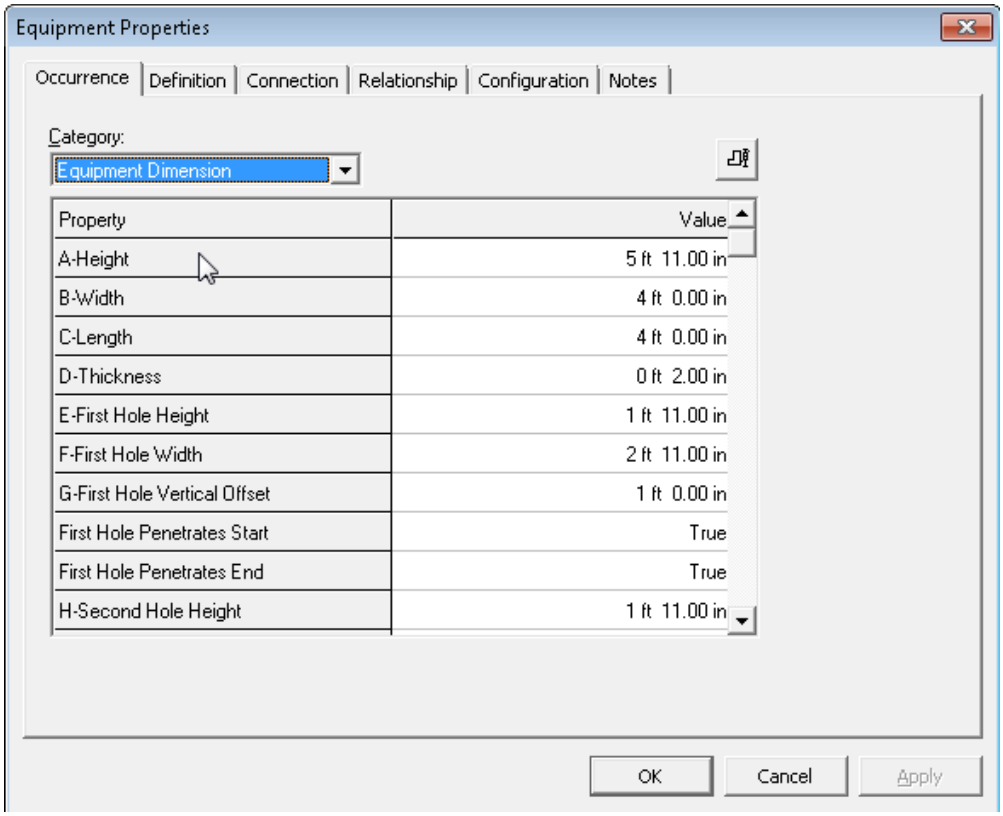
For more information related to routing cableway specifications and inserting transitions, see *Routing Cableway: An Overview* and *Insert Transitions: An Overview* in the *Smart 3D Electrical User's Guide*.

Placing Sloped Duct Banks

To place sloped duct banks in the model, the slope's properties must be defined in the **New Cableway** dialog box.

1. Set the active coordinate system to **Global**.
2. Locate the Pull-Pit (1) **E-PP-A1** in the model.
3. Copy **E-PP-A1**, and paste its copy near the original in the model. Name the copy **E-PP-A3**.
4. Copy and paste **E-PP-A1** again, and name the second copy **E-PP-A4**.
5. Right-click **E-PP-A1** and select **Properties**.

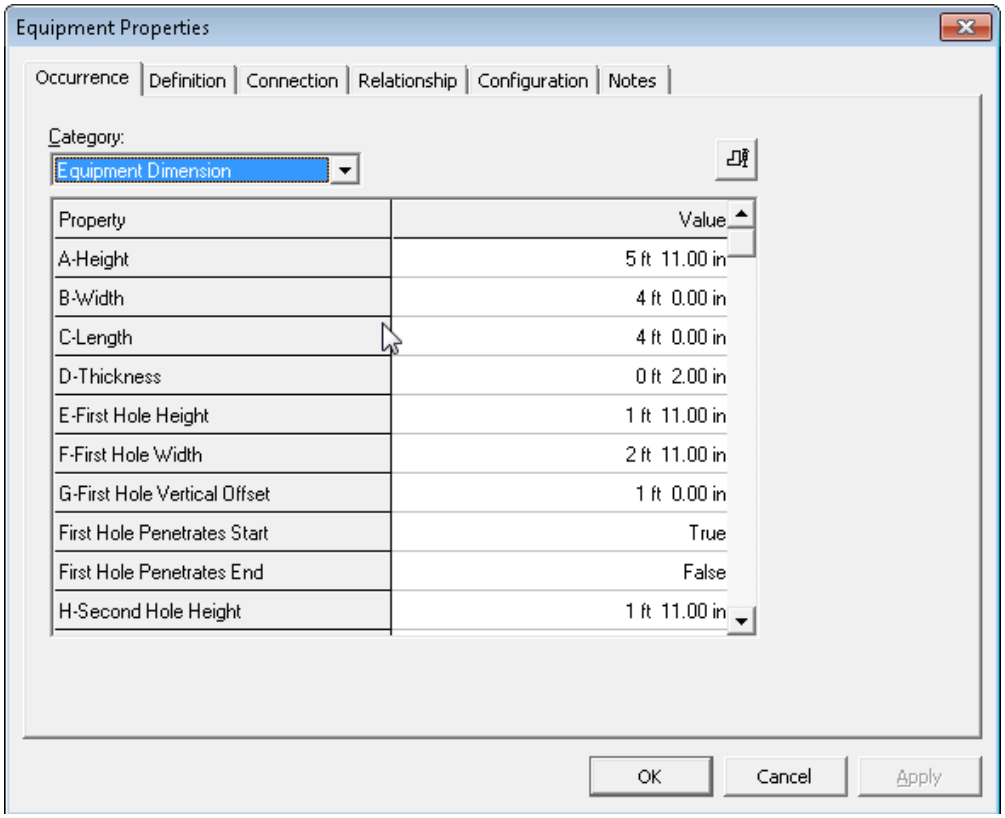
   *The **Equipment Properties** dialog box displays.*
6. Under the **Occurrence** tab, set the **Category** to **Equipment Dimension**, and set **First Hole Penetrates End** to **True**.



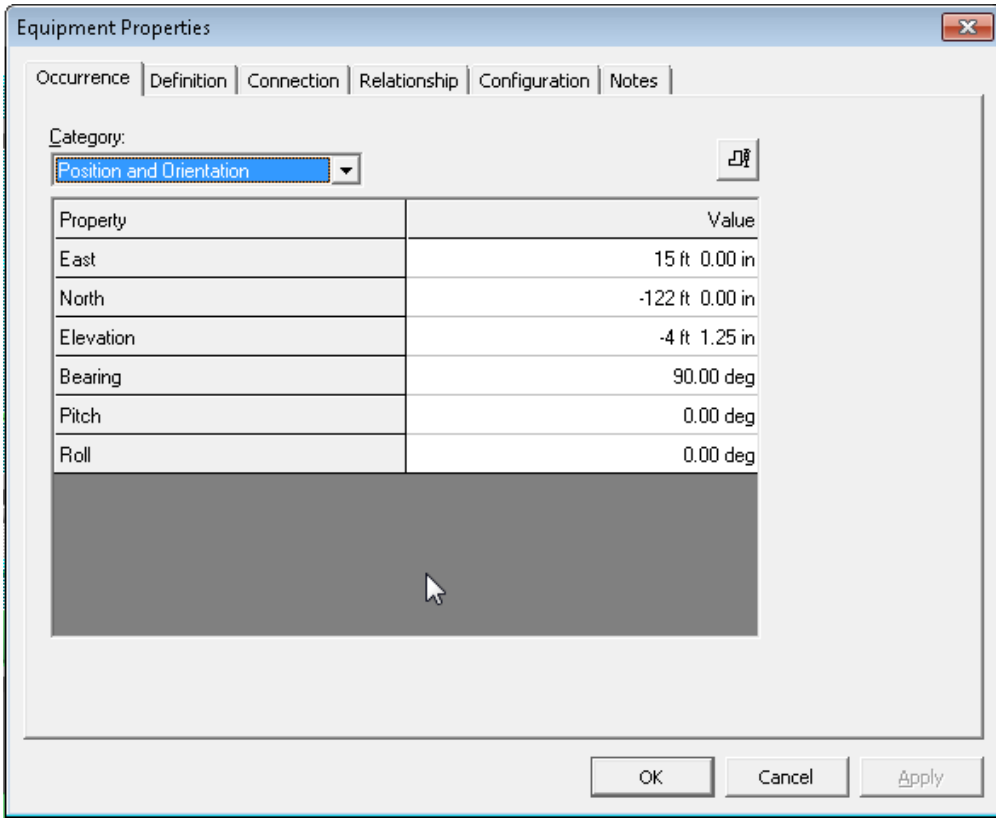
7. Click **OK**.
8. Right-click **E-PP-A3** and select **Properties**.

*The **Equipment Properties** dialog box displays.*

9. Under the **Occurrence** tab, set the **Category** to **Equipment Dimension**, and set **First Hole Penetrates End** to **False**.



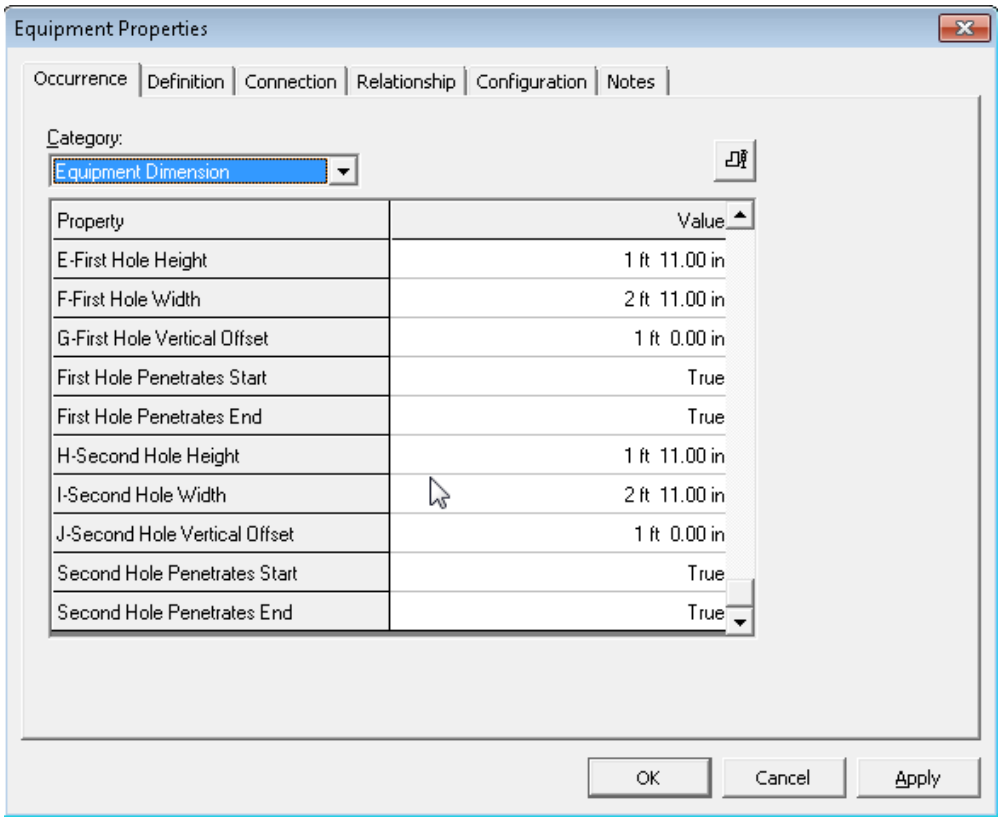
10. Set the **Category** to **Position and Orientation**, and define the properties as shown:



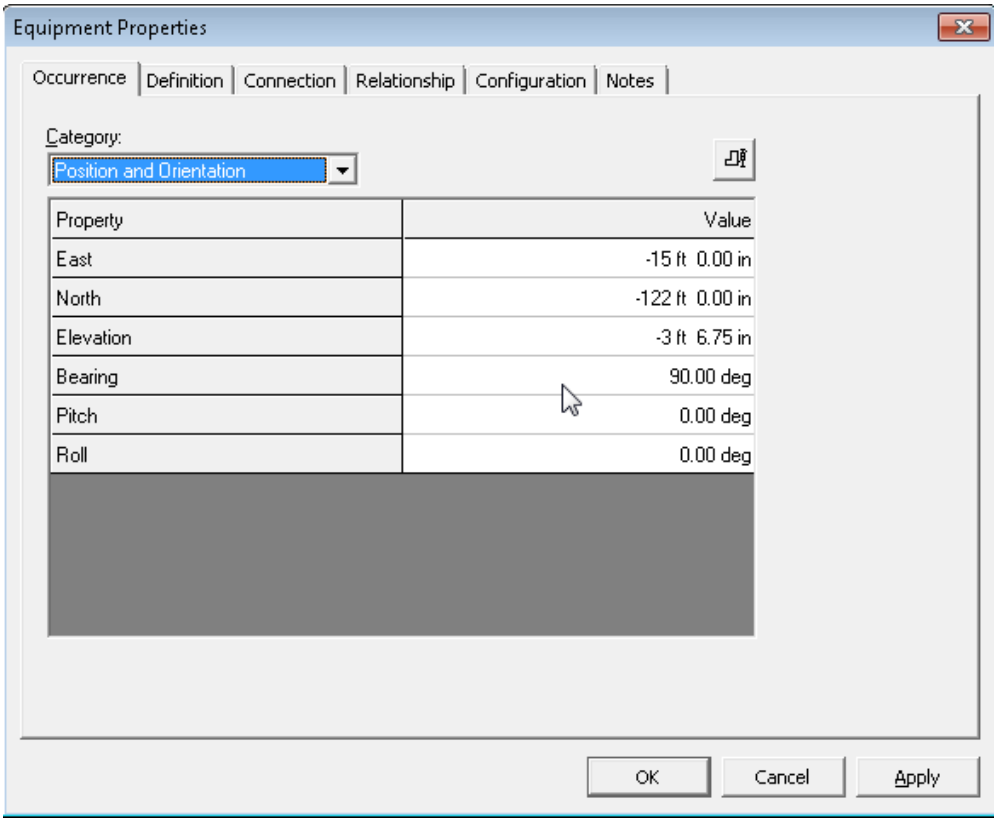
11. Click **OK**.
12. Right-click **E-PP-A4** and select **Properties**.

    *The **Equipment Properties** dialog box displays.*

13. Under the **Occurrence** tab, set the **Category** to **Equipment Dimension**, and set **First Hole Penetrates End** and **Second Hole Penetrates End** to **True**.

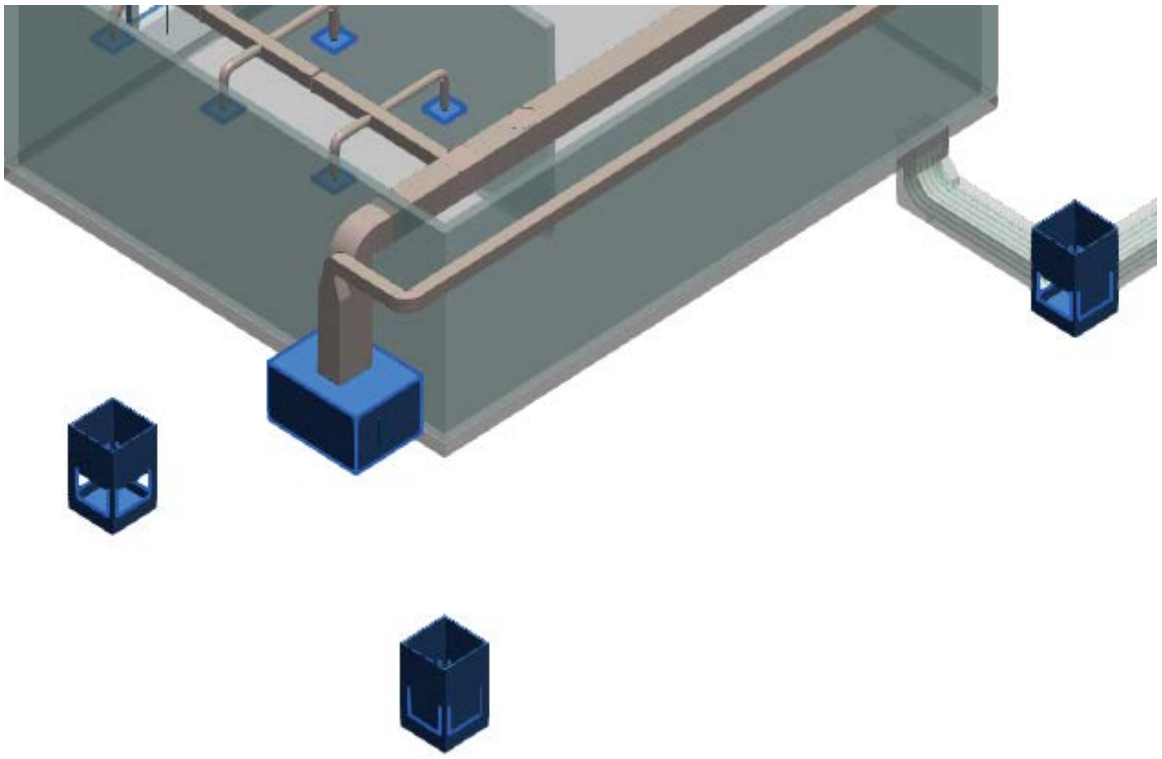


14. Set the **Category** to **Position and Orientation**, and define the properties as shown:

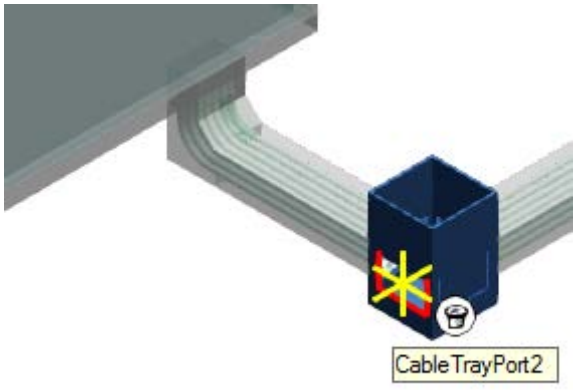


15. Click **OK**.

16. Click **Common View** and change to an isometric view and zoom in on the three pull-pits.

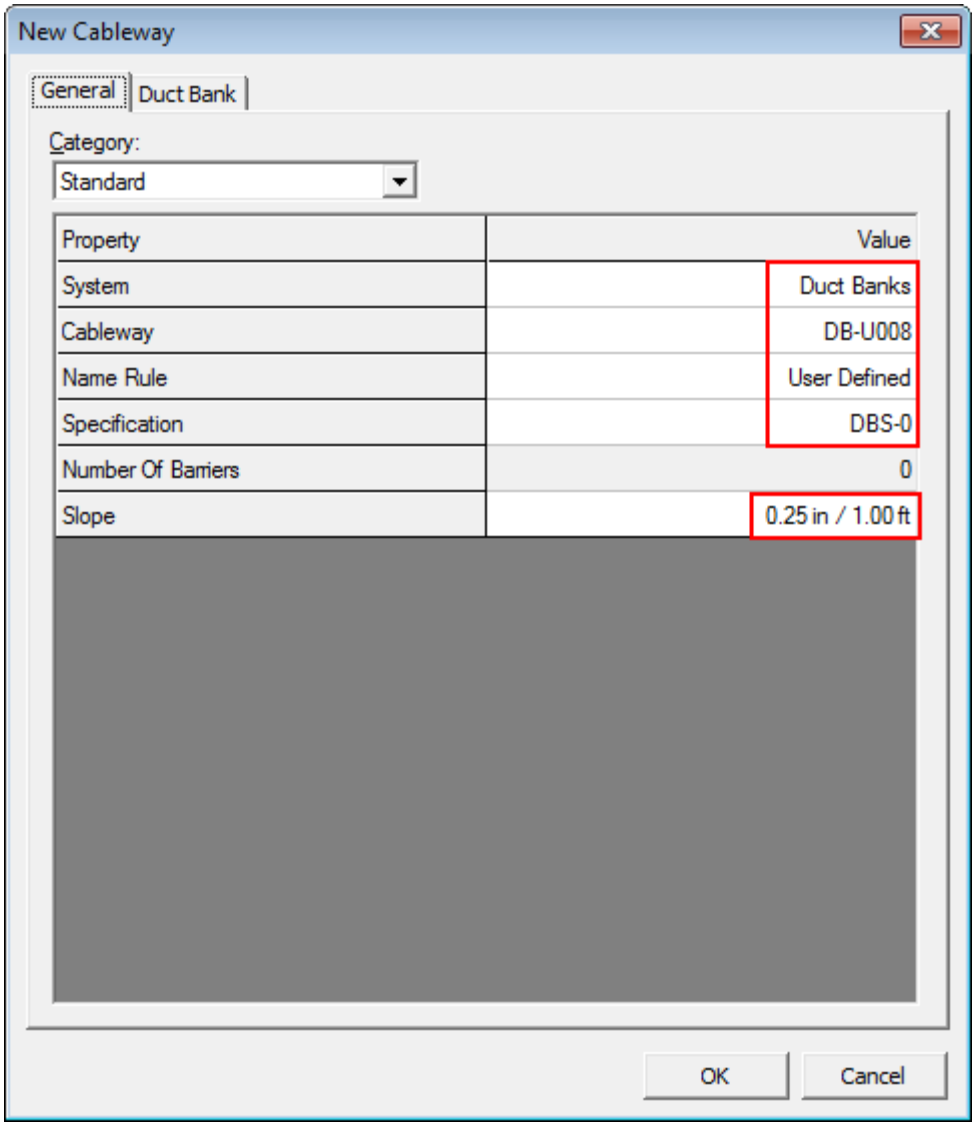


17. Click **Route Cableway**.
18. On **E-PP-A1**, select **Cable Tray Port 2** as the start point of the duct bank.

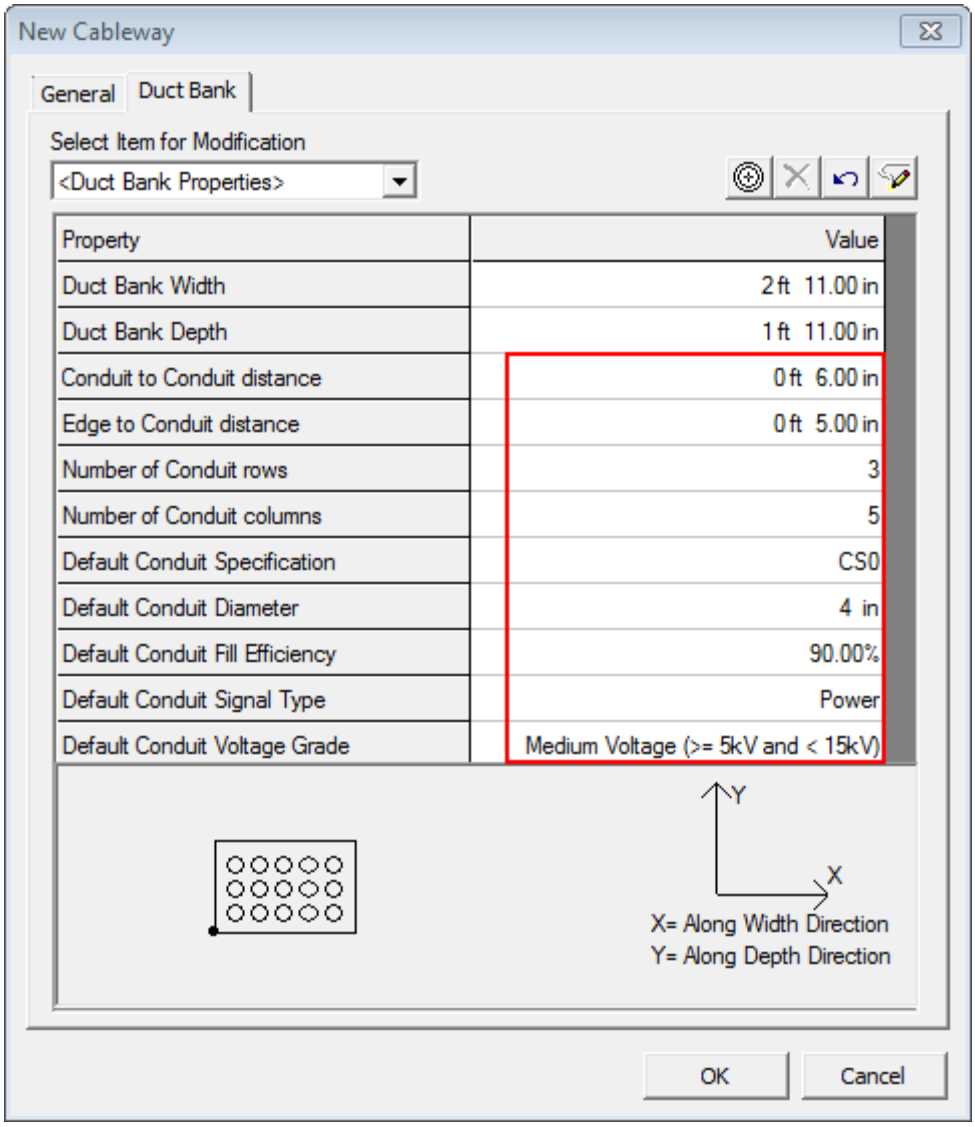


*The **New Cableway** dialog box displays.*

19. Define the property values for as shown:



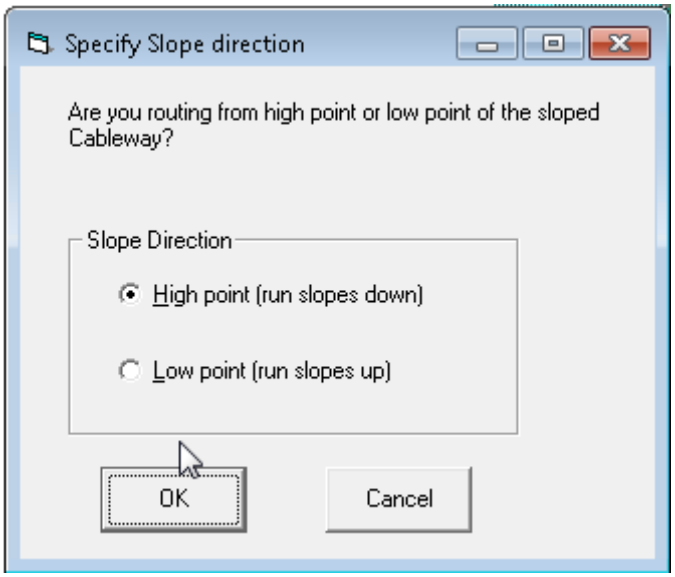
20. Select the Duct Bank tab and enter properties as below



21. Click **OK**.

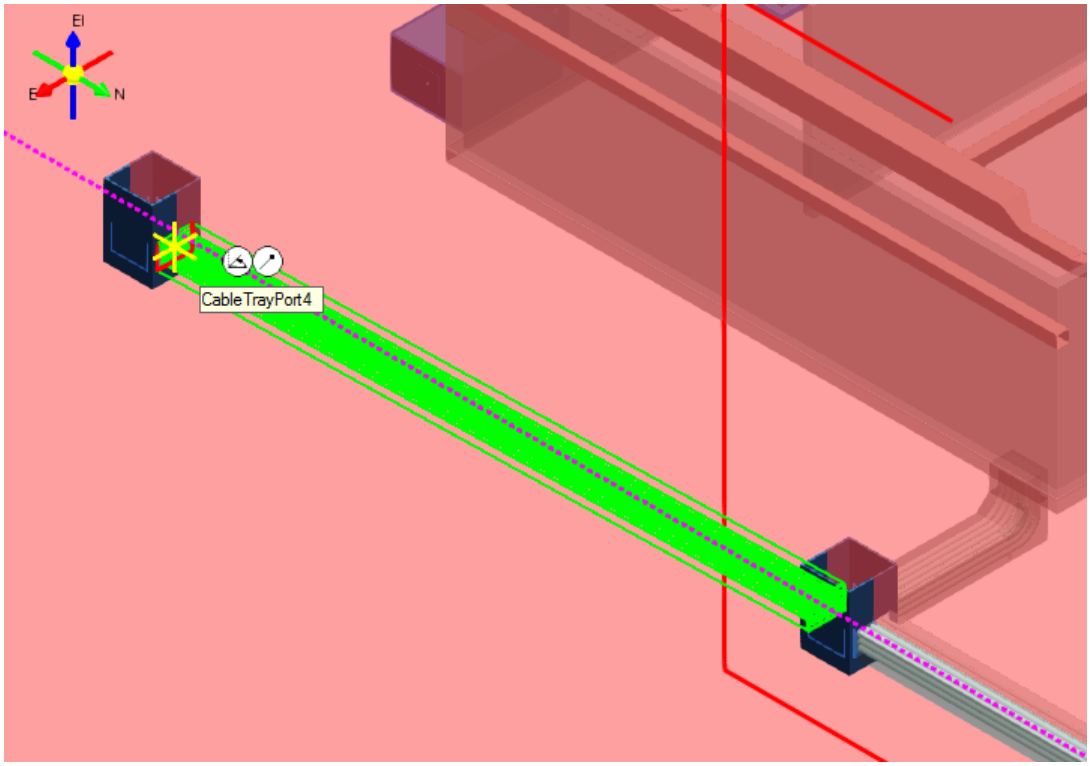
    *The **Specify Slope direction** dialog box displays.*

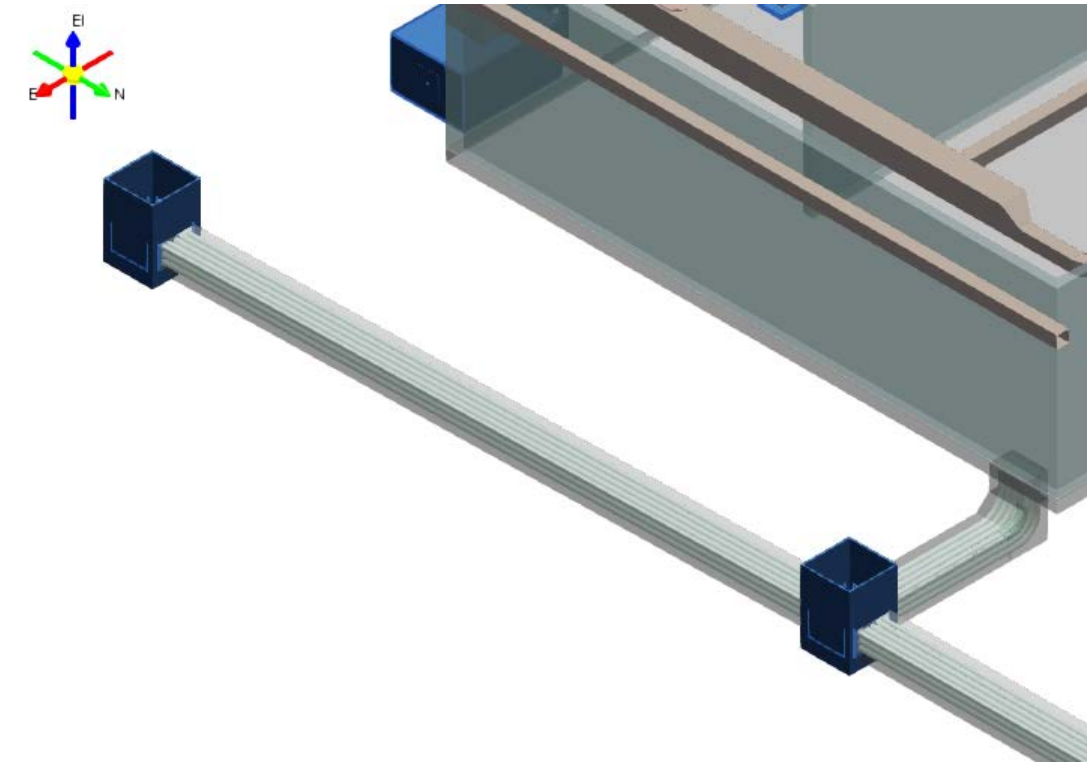
22. Select **High Point (run slopes down)** and click **OK**.



23. Set the route plane to **North-South** .

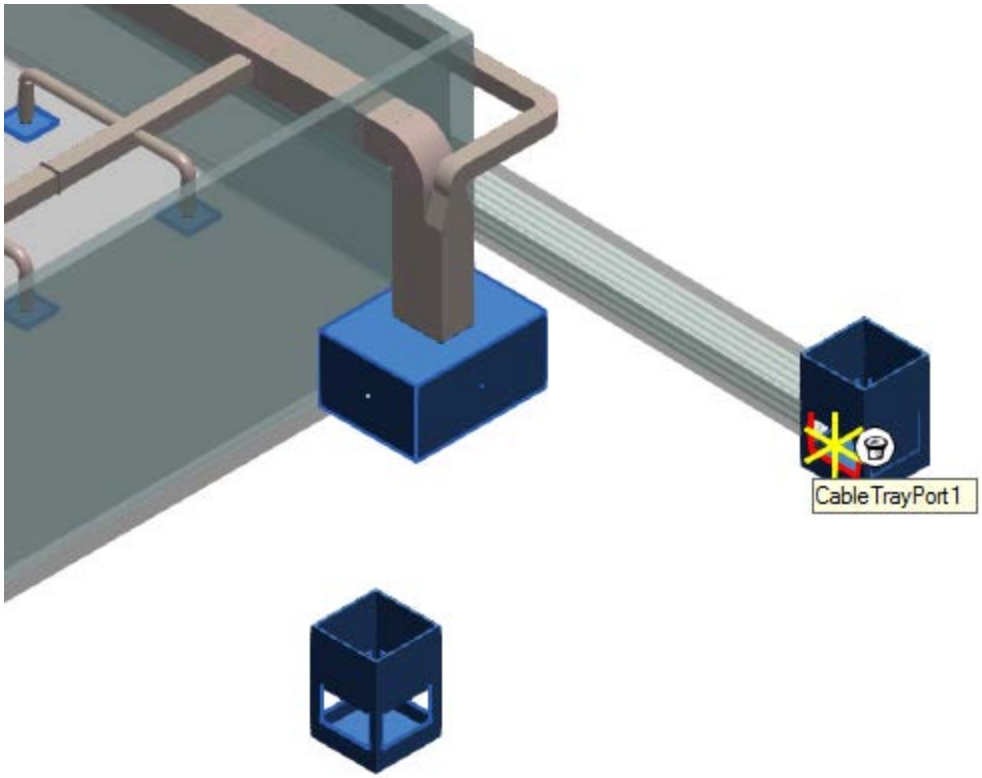
24. Route the duct bank to **cabletrayport4** on **E-PP-A3**.





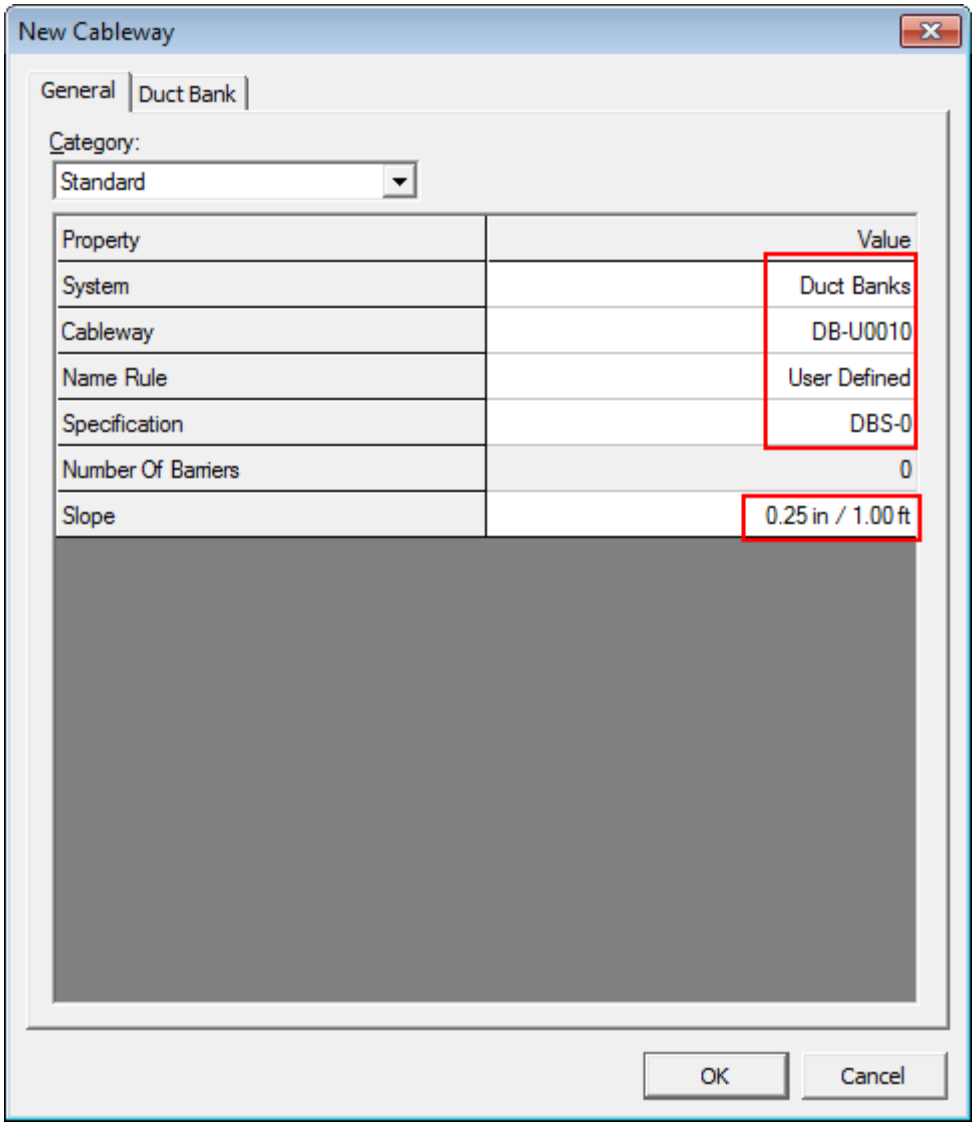
25. Click **Route Cableway** .

26. On E-PP-A3, select **Cable Tray Port 1** as the start point of the duct bank.

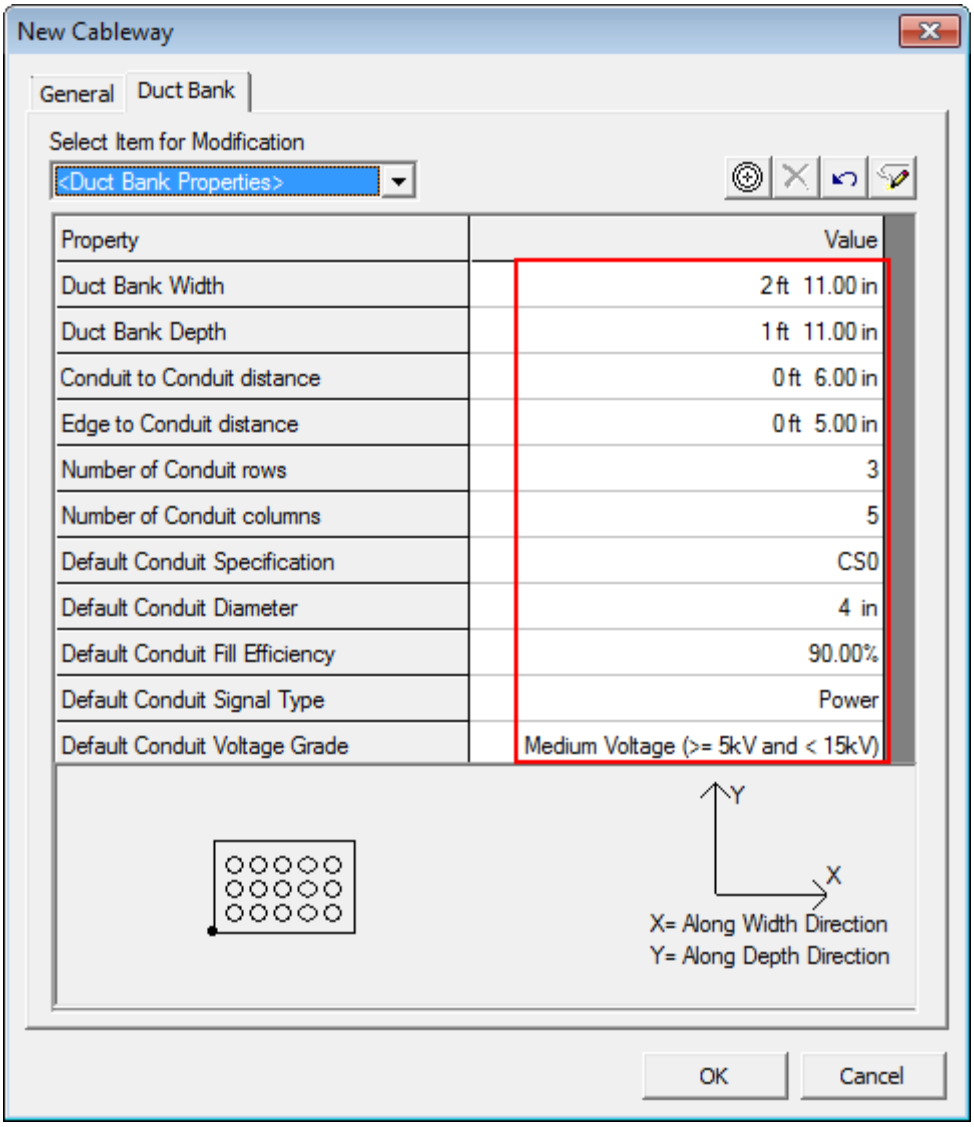


*The **New Cableway** dialog box displays.*

27. Define the property values for the duct bank as shown



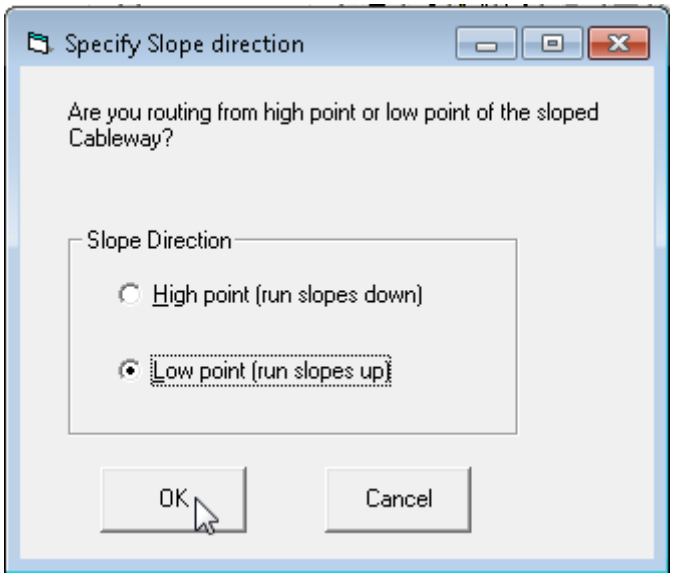
28. Select the Duct Bank tab and enter values as shown



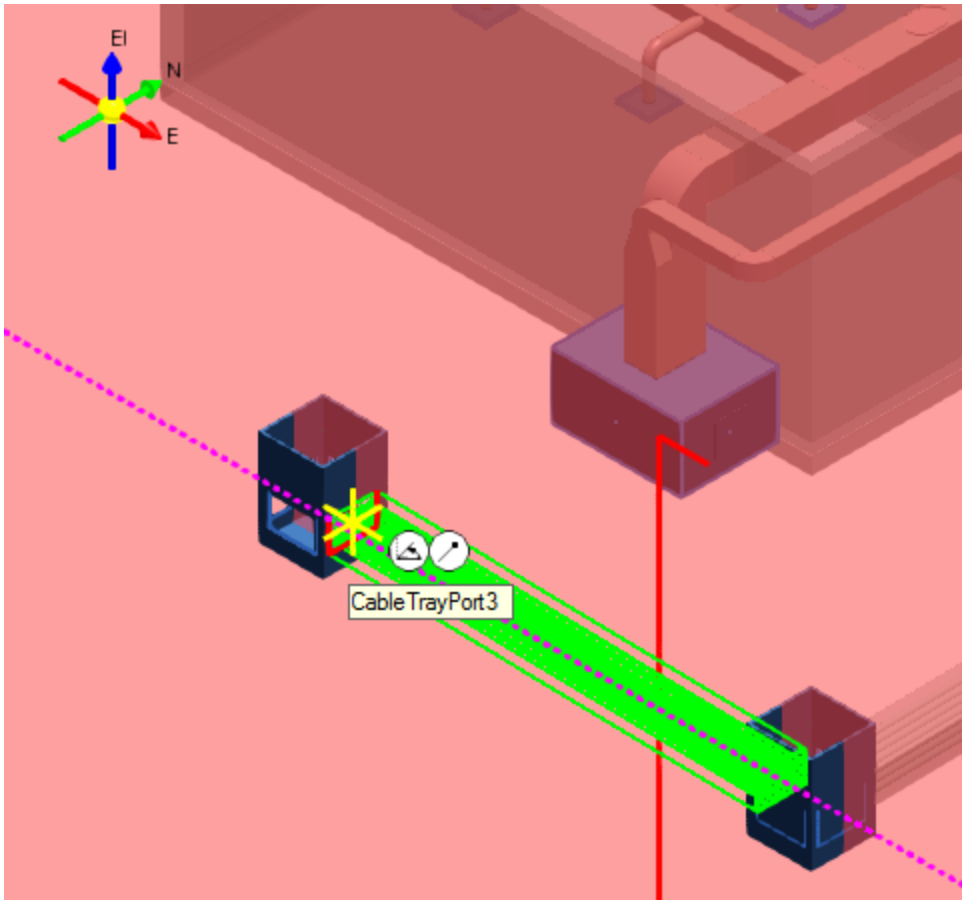
29. Click **OK**.

    *The **Specify Slope direction** dialog box displays.*

30. Select **Low Point (run slopes up)** and click **OK**.



31. Set the route plane to **East-West** .
32. Route the duct bank to **cabletrayport3** on **E-PP-A4**.



The sloped duct banks are routed in the model: