

## Routing Cable Trays

### Objective:

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

- Route cable trays in SP3D

### Overview:

This lab is focused in getting proper technique on how to create a cable tray network in buildings.

- Route Stacked cable trays using top of steel elevation
- Branch from a straight section
- Manually insert components
- Place "Zero-Specs" cableway to connect cable trays
- Group disconnected cable trays into one cableway

### Creating Cable Tray Network:

Create a cable tray network by routing the cable trays from the coordinate points **E: 43 ft, N: 1 ft 8 in, EL: 15 ft 6 in** in Unit U02. Place two reducing tees on the top cable tray and then connect the top cable trays with the bottom cable trays using a connecting cableway. Extend the free end of the cable trays by an offset from the top of the steel. All trays and connecting cableway must have "Power" as the signal type for each run. The routed cable trays should resemble Figure 1.

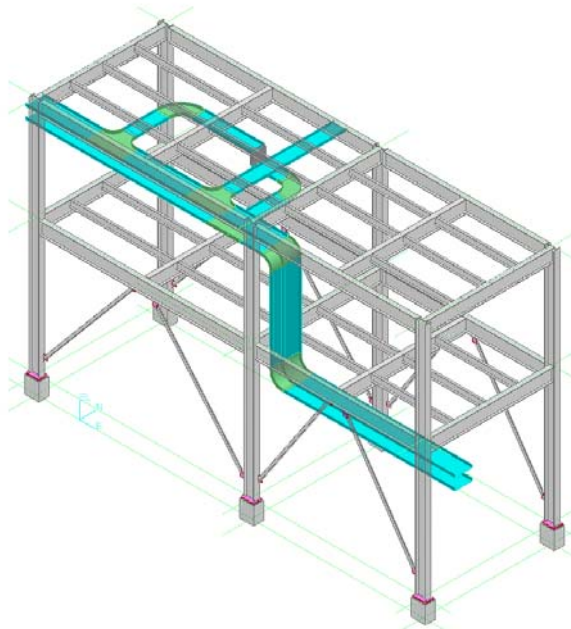


Figure 1: Routed Cable Trays

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Before you start routing the cable trays, define your workspace to show Unit **U02**.

1. If you are not in the **Electrical** task, select the **Tasks > Electrical** command.
2. Make sure the Active Permission Group is set to **Electrical**.
3. Activate the **PinPoint** ribbon and set the active coordinate system to **U02 CS** on the **PinPoint** ribbon.
4. Click the **Set Target to Origin** option on the **PinPoint** ribbon, to move the target to the origin of the current coordinate system.
5. Click the **Route Cableway** button on the vertical toolbar.
6. Key in the following coordinates on the **PinPoint** ribbon and click in the graphic view to accept the starting point:

**E: 43 ft**  
**N: 1 ft 8 in**  
**El: 15 ft 6 in**

7. The **New Cableway** dialog box appears. Select the **More ...** option in the **System** drop-down list of the dialog box to specify the system where you want to place the cableway.
8. In the **Select System** dialog box, select **A2 > U02 > Electrical > Low Voltage > CT** and click **OK**.
9. In the **New Cableway** dialog box, verify the following cableway specifications:

**System: CT**  
**Name Rule: DefaultNameRule**  
**Specification: CB-S1-L6-12B**

10. Select the **Cable Fill** option in the **Category** drop-down list and verify the following specifications:

**Fill Efficiency: 60%**  
**Signal Type 1: Power**

11. Switch to Multi Route tab.
12. Make the following changes:

**Mode: Along Depth**  
**Cableways above Master Run: 0**  
**Cableways below Master Run: 1**  
**Vertical Distance between Trays: 1 ft**

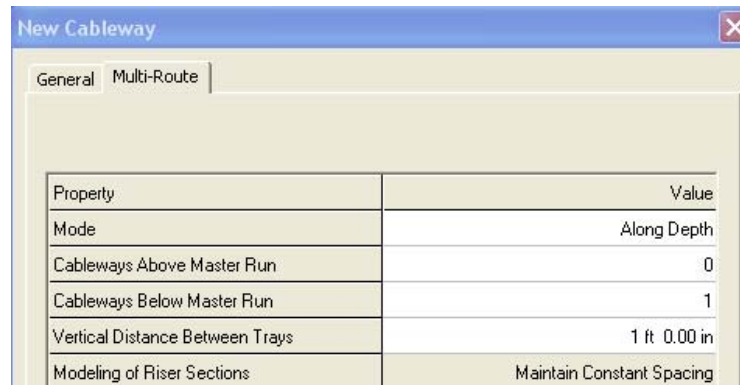


Figure 2: Multi-Route Tab

- Set the offset reference by **External** and key in **3 ft** in the **Offset** drop-down list in the **Set Offset Reference** dialog box.

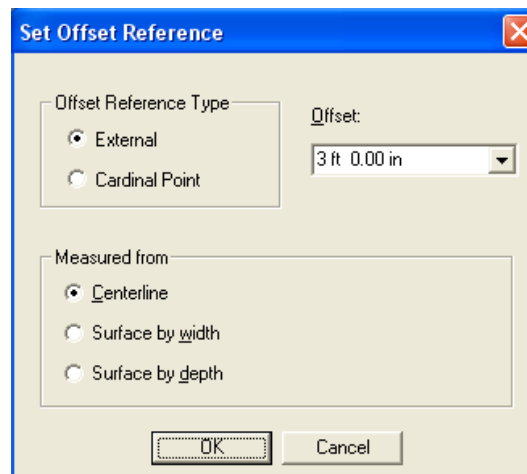


Figure 3: Set Offset Reference Dialog

- Select the **Rectangle** shape in the **Shapes** drop-down list and key in the following specifications on the **Route Cableway** ribbon to specify the width and depth of the cross section:

**Width: 2 ft**  
**Depth: 0 ft 4 in**

- Change the view of the model to "**Looking North**" by using the Common Views dialog.
- Select the **East-West Plane** option in the **Plane** drop-down list on the **Route Cableway** ribbon.
- Route the trays as shown below. Pay attention to the offset values from top of steel and column.

## Note

To find the offset point, move the cursor over the **Column** until the offset glyph appears and move slowly away from **Column** until perpendicular **projection line** is displayed.

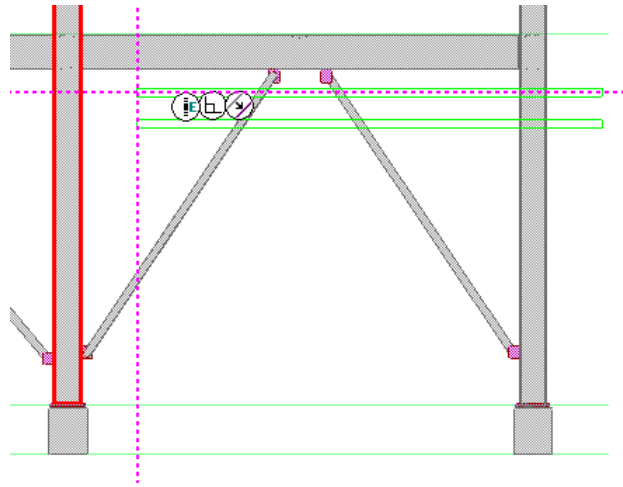


Figure 4: Projection Line Indicating 3 ft Offset from Column

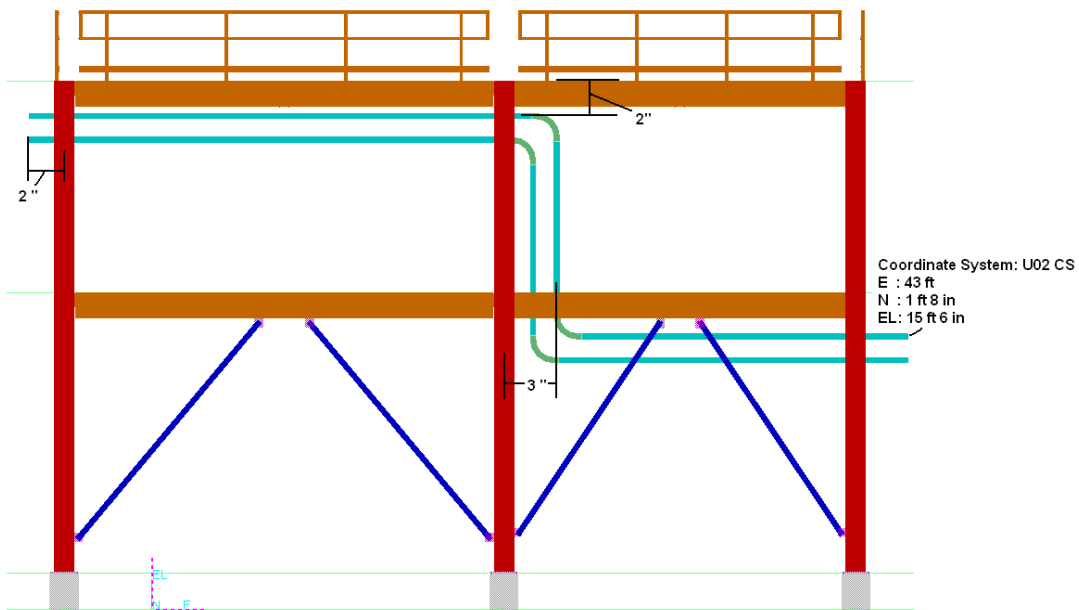


Figure 5: North Elevation View

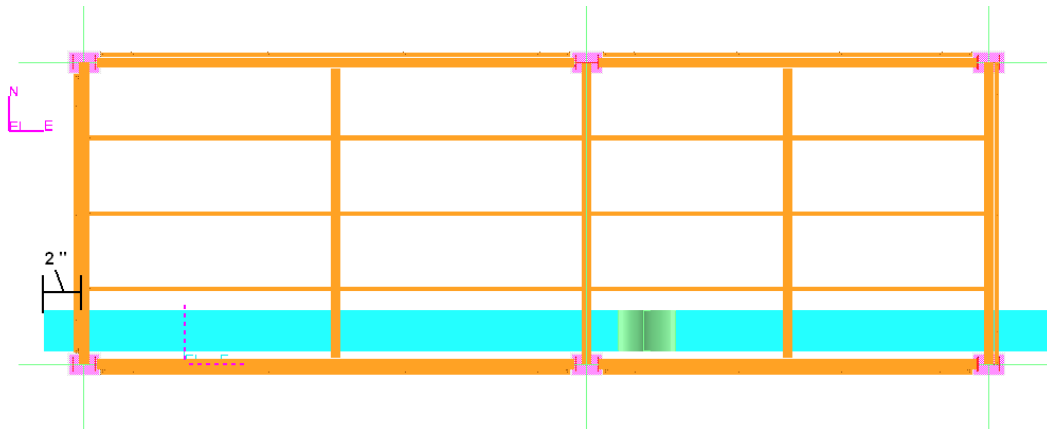


Figure 6: Plan View

18. Continue to route the trays with the following configuration. This is the plan view of the building to give better perspective of the extent and offset of the trays.

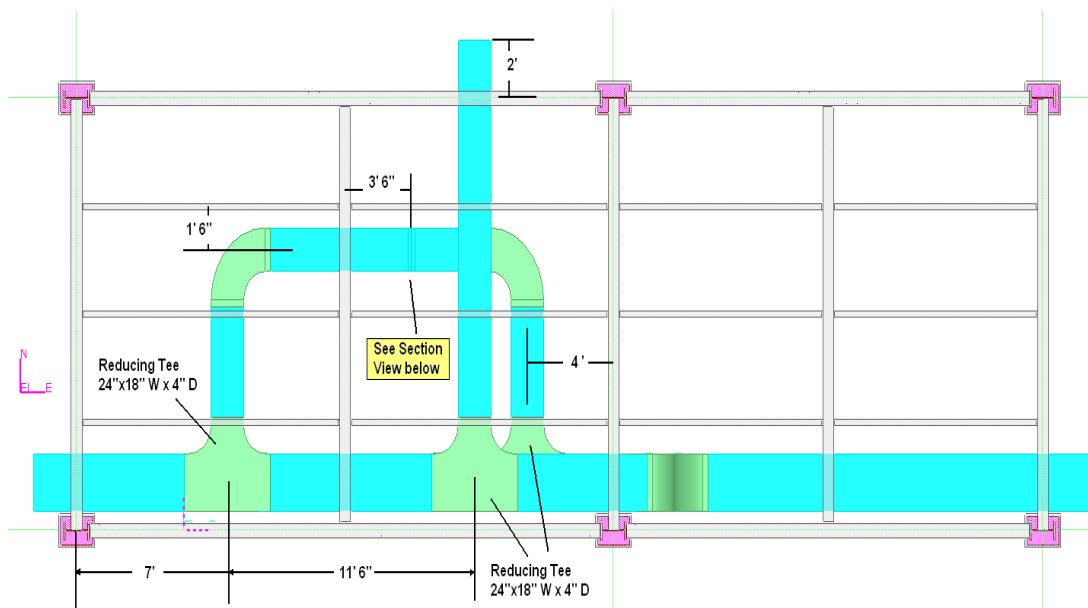


Figure 7: Routed Cable Trays

19. Below is the section view of the elevation change between the stacked trays. Place a "Zero-Specs" cableway section to connect the two trays using the Auto Connect command.

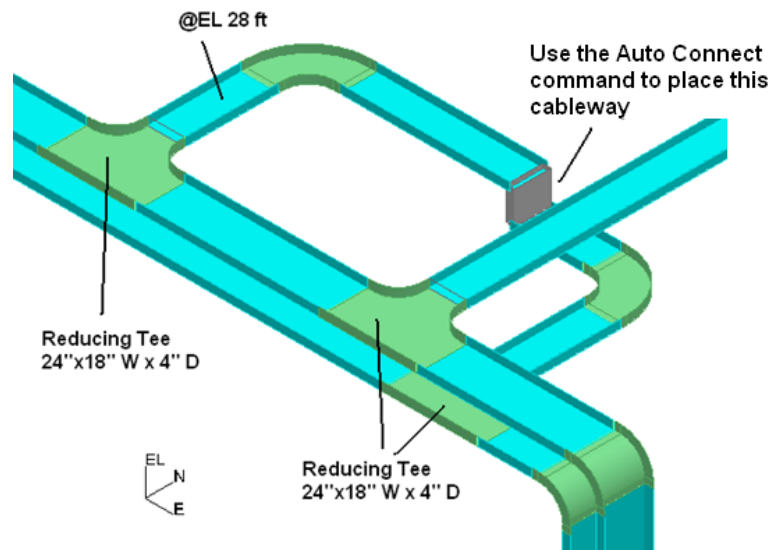


Figure 8: Section View - Cableway section

Create a second cable tray network by routing the cable trays from the coordinate points **E: 9 ft, N: 1 ft 10.60 in, EL: 29 ft** in Unit **U03**. Place fittings in these trays and then connect both cable trays networks. Extend the free end of the cable trays by an offset from the steels. All trays and connecting cableway must have "Power" as the signal type for each run. The routed cable trays should resemble Figure 9.

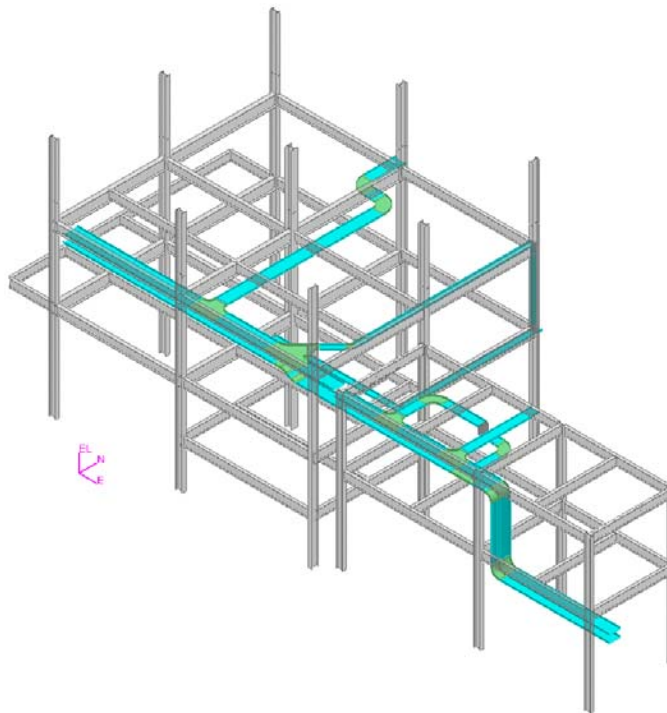
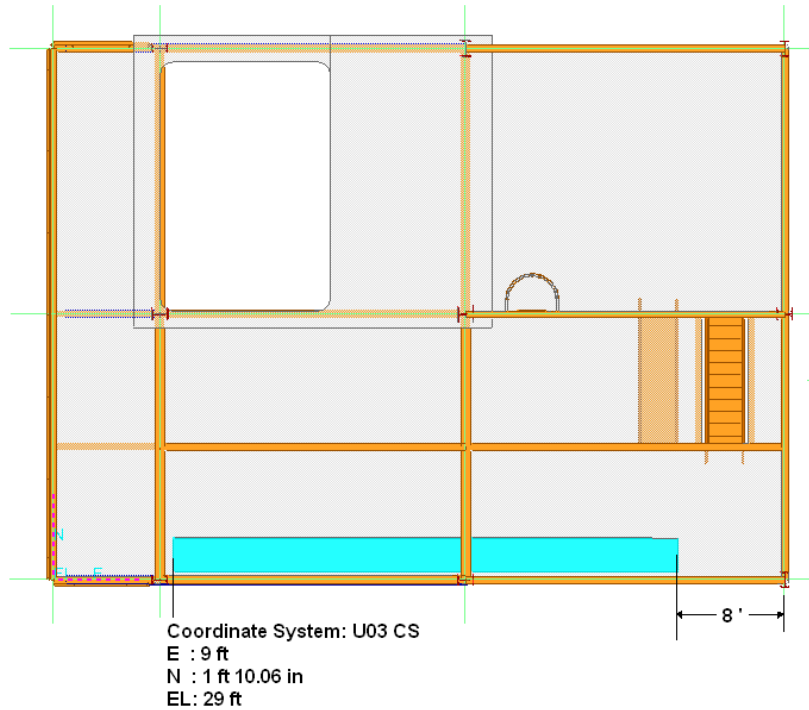


Figure 9: Routed Cable Trays

20. Re-define your workspace to show Unit **U03**.
21. Activate the **PinPoint** ribbon and set the active coordinate system to **U03 CS** on the **PinPoint** ribbon.
22. Click the **Set Target to Origin** option on the **PinPoint** ribbon, to move the target to the origin of the current coordinate system.
23. Click the **Route Cableway** button on the vertical toolbar.
24. Key in the following coordinates on the **PinPoint** ribbon and click in the graphic view to accept the starting point:  
**E: 9 ft**  
**N: 1 ft 10.60 in**  
**El: 29 ft**
25. The **New Cableway** dialog box appears. Select the **More ...** option in the **System** drop-down list of the dialog box to specify the system where you want to place the cableway.
26. In the **Select System** dialog box, select **A2 > U03 > Electrical > Low Voltage > CT** and click **OK**.
27. In the **New Cableway** dialog box, verify the following cableway specifications:  
**System: CT**  
**Name Rule: DefaultNameRule**  
**Specification: CB-S1-L6-12B**
28. Select the **Cable Fill** option in the **Category** drop-down list and verify the following specifications:  
**Fill Efficiency: 60%**  
**Signal Type 1: Power**
29. Switch to Multi Route tab.
30. Make the following changes:  
**Mode: Along Depth**  
**Cableways above Master Run: 0**  
**Cableways below Master Run: 1**  
**Vertical Distance between Trays: 1 ft**
31. Set the offset reference by **External** and key in **8 ft** in the **Offset** drop-down list in the **Set Offset Reference** dialog box.
32. Select the **Rectangle** shape in the **Shapes** drop-down list and key in the following specifications on the **Route Cableway** ribbon to specify the width and depth of the cross section of the cable:  
**Width: 2 ft 6 in**  
**Depth: 0 ft 4 in**
33. Change the view of the model to "**Looking Plan**" by using the Common Views

dialog.

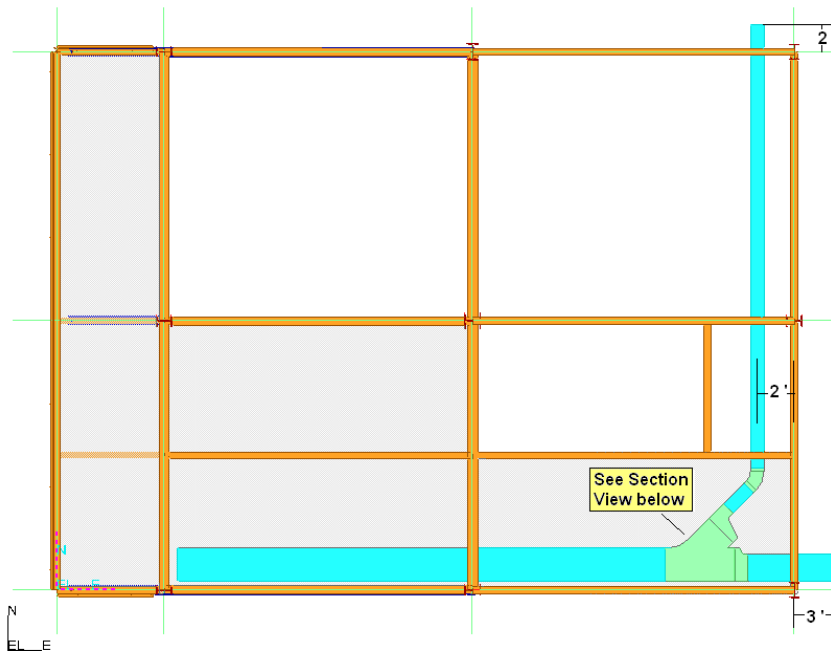
34. Select the **Plan Plane** option in the **Plane** drop-down list on the **Route Cableway** ribbon.
35. Route the trays as shown below. Pay attention to the offset value from top of steel.



*Figure 10: Plan View*

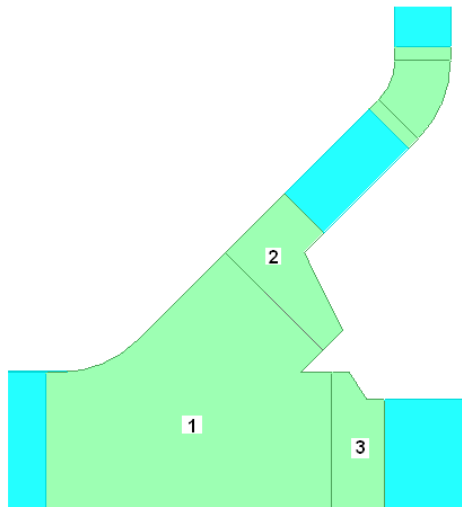
36. Finish the top tray routing as shown in Figure 11.





*Figure 11: Routed Top Cable Trays*

37. Below is the section view of the components placed using the Insert Component command.



- 1 Horizontal WYE left 24' Rad (30" W x 4" D) - Placed by origin
- 2 Left Reducer (30" x 4" to 12" X 4")
- 3 Right Reducer (30" x 4" to 24" x 4")

*Figure 12: Section View*

38. Continue routing the trays with the following configuration:

## Note

Cable tray modeling without fitting is a common practice in the industry. All Elevation values are measured from centerline of the trays.

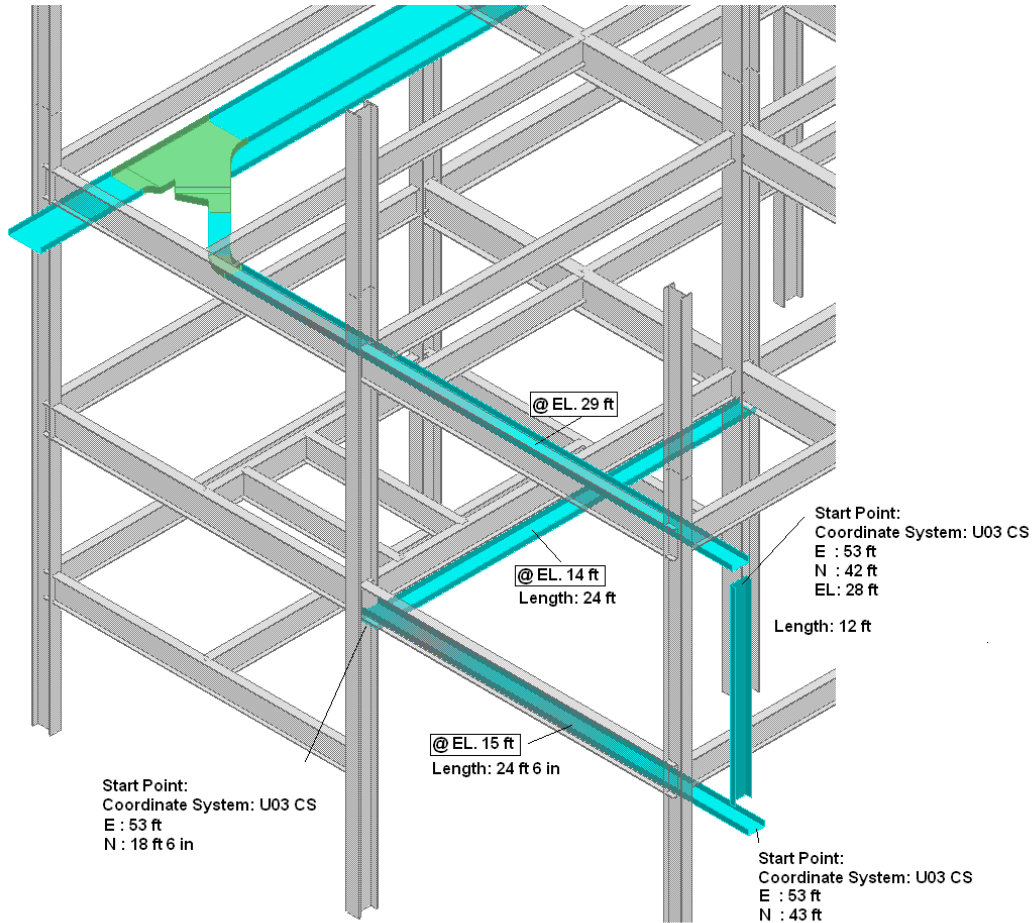


Figure 13: Routed Disconnected Trays

39. Group the three trays into the same cableway run as show in Figure 14. To do this, select all three straight features (disconnected trays) and use the **"Select Graphically"** option in the edit ribbon to select the existing run you want to group.

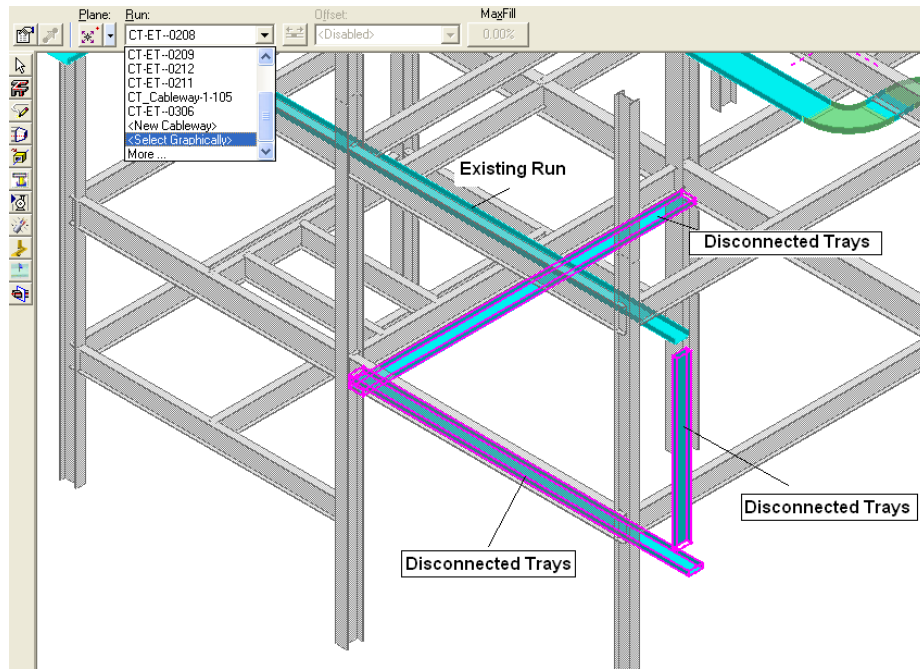


Figure 14: Routed Second Cableway

40. Connect the trays using "Zero-Specs" cableway for cable routing to be possible in this cableway. The Auto Connect command can be used to create the connecting cableways as shown in Figure 15.

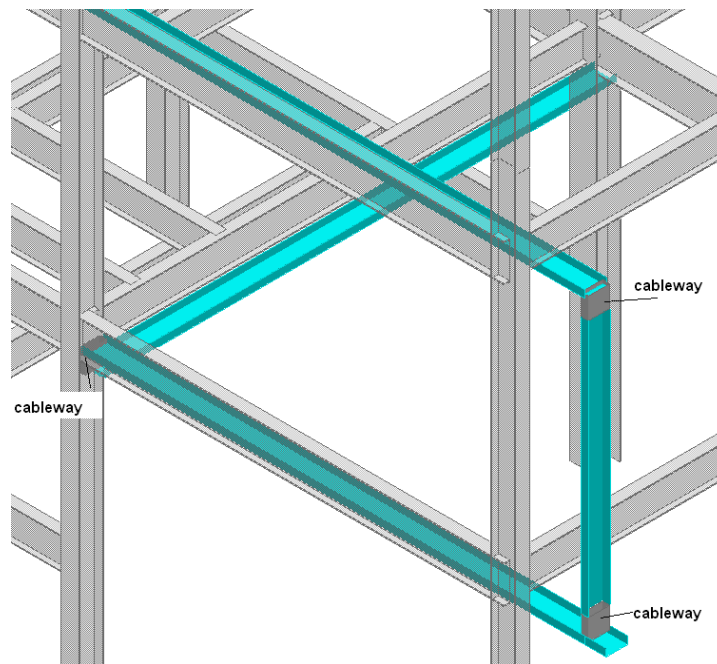
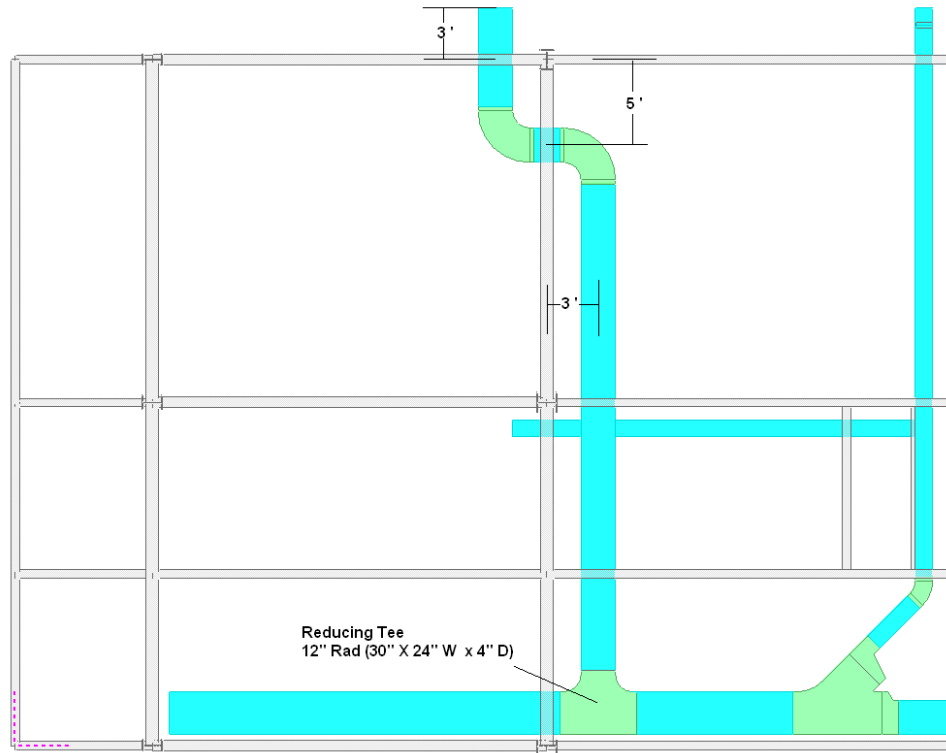


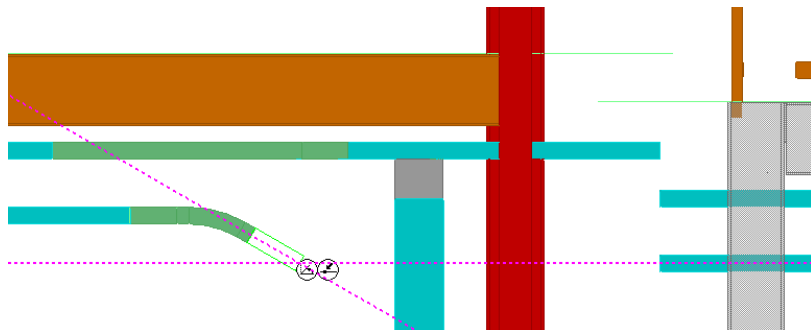
Figure 15: Routed Second Cableway

41. Now click the **Route Cableway** button on the vertical toolbar.
42. Continue to route the top trays with the following configuration:

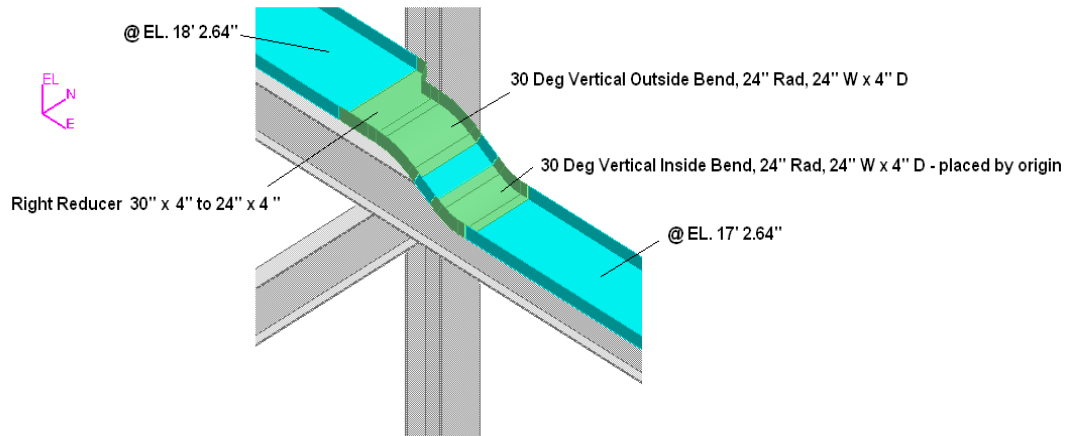


*Figure 16: Cableway End Feature*

43. Re-define your workspace to display U02 and U03 Units.
44. Connect the bottom trays between the two Units as shown below. To do this, place first the right reducer and the 30 deg vertical outside bend using the insert component command. Then, start routing from the 30 degree bend, and route to same elevation as the bottom tray in U02 Unit. Place the 30 deg vertical inside bend by its origin using the insert component command. Complete the path using the route cableway command.

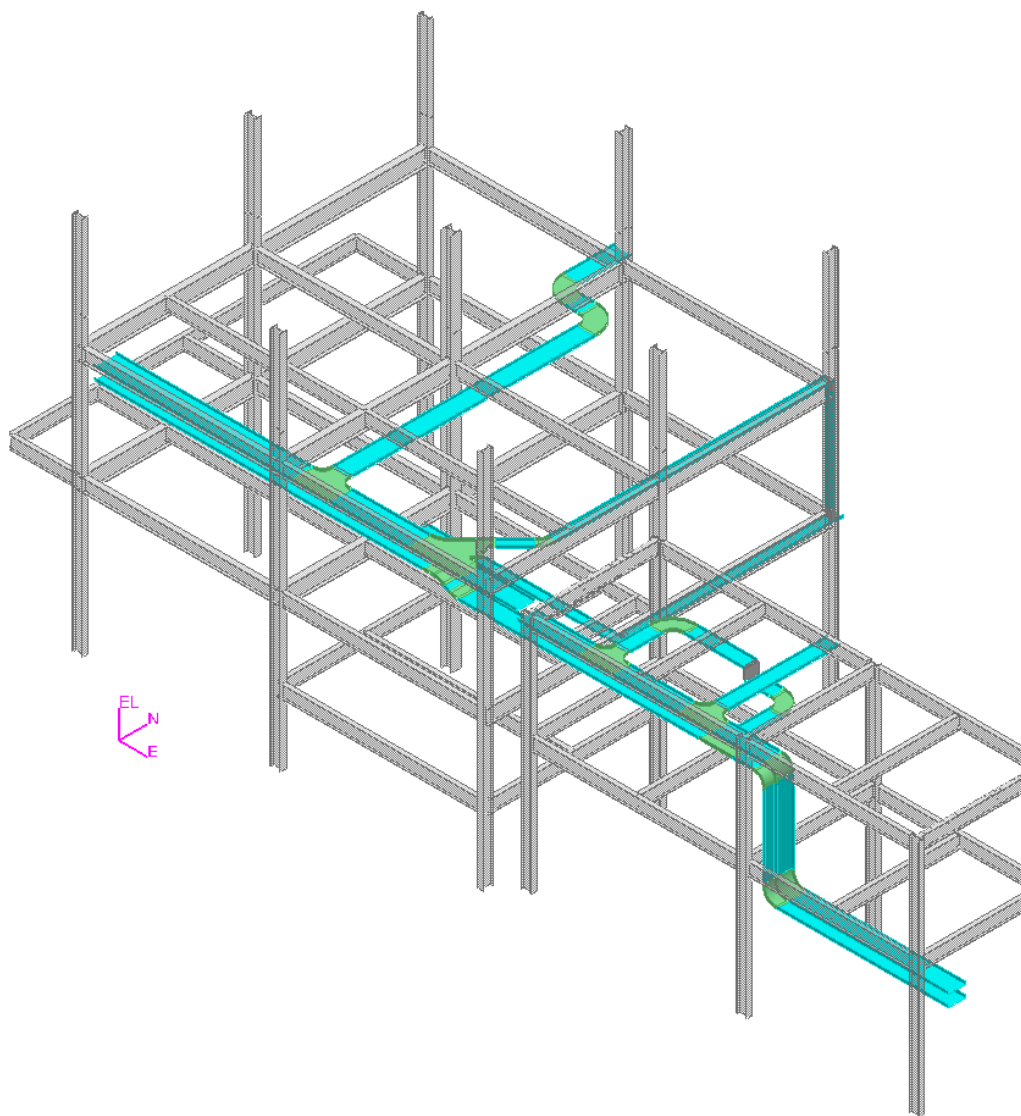


*Figure 17: Projection Line Indicating the Elevation of the Bottom Tray in U02 Unit*



*Figure 18: Cableway End Feature*

45. After inserting the bends and connecting the trays, the routed cable trays should resemble Figure 19.



*Figure 19: Routed Cable Trays in U02 and U03 Units*