Pier and Spandrel Labeling and Design

Wall Pier Labeling

A suggested pier labeling scheme for walls with openings is given in Figure 1:

![Figure 1 - Pier labeling scheme]

- Additional information is available through Help > Documentation > Shear Wall Design > General Design Information.

Note the following about the wall pier labeling scheme shown in Figure 1a:

- Wall piers are always associated with the story level directly above them. Thus, in Figure 1a, the upper level wall piers are associated with the Roof level and the lower level wall piers are associated with the 2nd level. Because the wall piers are associated with story levels, wall pier labels can repeat at different levels, as shown in the figure.

- When we refer to wall pier P1 at the Roof level in Figure 1a, we are referring to the pier across the entire width of the wall that is made up of the five area objects given the pier label P1. Similarly, pier P2 at the Roof level is made up of the two area objects to the left of the door opening.

- Wall pier design is performed at the top and bottom of each pier. Thus, for wall pier P2 at the Roof level, design is performed at the top and bottom of the door opening. No design is performed near the midheight of the door opening because the design is done at the top and bottom of the wall pier, not the top and bottom of each area object that makes up the wall pier.

- Wall pier forces are reported at the top and bottom of each pier. Thus, for wall pier P2 at the Roof level, wall pier forces are reported (printed) for locations at the top and bottom of the door opening. For graphic representation on the model, the forces are plotted at the top and bottom of the pier and connected with a straight line. For this reason, pier label shall not be assigned to wall elements when their top or bottom joints are not aligned horizontally. In other words, top and bottom joints must have the same z coordinates, respectively.

If, for example, you are not interested in either design or output forces for wall piers P1 and P5 at the Roof level, do not provide wall pier labels for those area objects.

Wall Spandrel Labeling
In Figure a, the upper wall spandrel label S1 is associated with the Roof level and the lower S1 is associated with the 2nd level. The upper wall spandrel label S2 is associated with the Roof level, the middle spandrel made up of two area objects labeled S2 is associated with the 2nd level, and the lowest S2 spandrel is associated with the Base level. Because the wall spandrels are associated with story levels, wall spandrel labels can be repeated at different levels, as shown in the Figure 3.

- Wall spandrel forces are output at the left and right ends of wall spandrel elements.
- Wall spandrel design is only performed at stations located at the left and right ends of wall spandrel elements. Spandrel label shall not be assigned to wall elements when their left or right joints are not aligned vertically. In other words, left and right joints must have the same x and y coordinates, respectively.
- Each area object that makes up a part of a wall may be assigned one spandrel label (and one pier label).
- Multiple wall spandrel labels cannot be assigned to a single area object. Wall spandrel labels are used to identify wall spandrels.
- After a wall spandrel has been assigned a label and an analysis has been run, forces can be output for the wall spandrel and it can be designed.

Tip:

If you need to mesh an existing area object to define a wall spandrel or pier, you can select the area object(s) and use the Edit menu > Mesh Areas command.

Refer to video below for further information: