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Difference between Rectangular & circular Column Design to General Column Design.

Joep - 2017-06-09 - 0 Comments - in C11:Rectangular column design

There is some overlap in their design scope, but the General Column Design module stands out (as its name implies) for its ability to design columns of any general shape. However, its ability to design complex geometries does not necessarily make it the best tool for all situations.

The Rectangular and Circular Column Design modules use the simplified design procedure presented in the codes. It works well for rectangular column sections with relatively small aspect ratios (less than 1:4) and circular columns (designed as square columns of equivalent size). However, one cannot use this procedure for designing irregular-shaped columns, e.g. L-shaped columns and columns with rainwater pipes. The General Column Design module bridges this constraint.

Comparing design results

The different design approach of the General Column Design module (compared to Rectangular and Circular Column Design) may yield different design results for similar column input. The difference can be significant in some cases. This is true especially for slender columns, and mainly due to the following factors:

- The General Column Design module calculates the additional moment about the weakest axis only. Using the code method, additional moments are added to one or both main axes.
- The General Column Design module uses a rational approach to determine the concrete and reinforcement stress distribution throughout the column section. In comparison, the design procedure in some codes simplifies the situation by using an inflated effective design moment about one of the main axes.

Recommended use of the column design modules

You can use the General Column Design module to design any shape column, including simple rectangular and circular columns. However, for such simple cases, it may be better to use the Rectangular and Circular Column Design modules instead for the following reasons:

- The Rectangular and Circular Column Design modules follow the simplified design procedures set out by the various codes. The Calcsheets set out every step of the

design, making auditing of your design calculations quite easy.

- When using the General Column Design module, you need to enter the reinforcement during the input phase already. (The program requires knowledge of the size and position of each bar for the section analysis.) You may also need more than one attempt at designing the column before you feel satisfied with the results, potentially making it a time-intensive exercise. This is not the case for the other two modules where you enter the concrete geometry without reinforcement, and arrive at the required reinforcement immediately after analysis.
- You can use General Column Design to create bending schedules for columns with irregular shapes. However, when detailing rectangular and circular columns, several more steps are needed to place rebar in the section compared to when using the Rectangular and Circular Column Design modules. In the interest of productivity and easy auditing, it is usually best to use the Rectangular Column Design and Circular Column Design modules for “normal” columns, and reserve General Column Design for the special situations.