

Penyederhanaan rumus perancangan untuk kolom tampang lingkaran

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20406668&lokasi=lokal>

Abstrak

Column of circular cross section is favourable to most people for its cool looking and may create image of important place. In addition, the spirally stirrups and the evenly distributed longitudinal reinforcement, embedded in such a column, are amongst favourable characteristic demanded by structural engineers since those increase ductility as well as strength in all direction. Determining distances of the reinforcement to neutral axis as well as the centre of gravity of concrete in compression are amongst problems found in designing a circular cross section column. Whitney and Whitney-Hognestad formula as quoted by Wang and Salmon (1979) resolve the problems by converting the circular cross section into squared cross section and by arranging the position of reinforcement.

This research studied the effectiveness of the simplified formula proposed by Priyosulistyo (2007) on various material qualities and amount of reinforcement. The results of the study are presented graphically in the form of interaction diagrams and are compared to the diagram of exact solution, the Whitney and the Whitney-Hognestad solutions. On the same diagram the straight lines, established from simplified design formula (Priyosulistyo, 2007) connecting to the point of maximum axial load at zero moment to balance point as well as connecting point of maximum flexural moment at zero axial load to balance point, are developed.

This research showed that Whitney formula is conservative at compression control region, but excessively over estimate at about balance and tension control regions, although the application is limited to low ratio of steel to concrete cross sections (less than 1%) and become excessively overestimate along with the increase of the steel to concrete ratio, therefore, one should carefully consider the range of the applicability. The simplified formula as proposed by Priyosulistyo (2007) herein is consistent and reliable enough in any region (compression, balance and tension regions), although the results tends to be conservative. Since columns of building, in accordance with SNI-03-2487-2002 code, should be designed stronger than that the beams connecting to them the conservative performance resulting from the simplified formula is still acceptable.