

Long term deformation of beams and columns of high performance concrete

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Abstrak

The columns of a building must be stronger than the beams. The aim of this study is to obtain the cause of the long-term deformation difference by shrinkage between the beams and columns of high performance concrete with compressive strength of 60 MPa. This research was done experimentally in Indonesia during 410 days. Specimens measuring 150 mm × 150 mm × 600 mm were used, 3 pieces for the beams and 2 pieces for the columns. Deformation was obtained by using an embedded vibrating wire strain gauge for each specimen. The difference of long-term deformation in columns and beams is in their autogenous deformation behavior. This is because during the autogenous phase, swelling abnormally occurs in the column before shrinkage occurs. The abnormal swelling is caused by the press of its own weight. This phenomenon does not occur in beams. In the age range of 1 to 200 days, the behavior of the beam deformation has a similar pattern to the deformation behavior of the column with a high deformation rate. After that, at 200–410 days, column deformation changes to a very slow deformation rate. Long-term deformation in columns is lower (64%) than in the beams at 410 days age.