PROBLEMS OF COMPRESSED ELEMENTS

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The elements loaded with longitudinal force are pillars, walls and rods. They are compressed and tensile stressed. The force acting on them can be centric or eccentric. Compressive stressed elements can be slender or not. For slender elements ($\lambda>25$) there is a risk of deflection, while this danger with short elements ($\lambda<25$) does not exist. Due to the risk of deflection in the calculation of the required reinforcements applied a coefficient k, in the range from 0.250 to 1.0, which is depends on the element slenderness ratio and the eccentricity of the force [1]. The slenderness length depends on the boundary conditions. The compressed elements from the beginning are not perfectly straight as they have been designed with the project. They have imperfections. Initial imperfections can be geometric or static origin. Geometric imperfections are the result of incorrect construction. Static imperfections are the consequence of bending moments along the axis of the element, depending on the change in static size, boundary conditions, presence of transverse load andslenderness. The consequences of bending is deflection. The deflection can be significant and should not be neglected. Under long-lasting compressive loads plastic deformations is produced in concrete. There are many bad influences that act on the structure during its lifespan. Mechanical, biological, chemical, and other damaging influences can provide condition of construction when it have damaged sections. Problems like reduction in bearing capacity or big elements deflection under pressure are even more pronounced with the elements of the damaged, incomplite section. Damaged elements have the highest bearing capacity if they are centrally stressed. In the case of a damaged model there is a shift and inclination of neutral axis. Cause of this, part of section is tensile stressed. In this part all strains are taken over by the reinforcement. Reduction in bearing capacity depends mostly on the type of damage.The big problem with damaged construction under pressure is that this field isn't still enough explored and it's hard to modeling the damages and stress deformed state of such structures.

Referenses

1. Radić J. Betonske konstrukcije 4 Sanacije/ Radić J. // Hrvatska sveučilišna naklada Građevinskog fakulteta u Zagrebu. – Zagreb, 2010. – pp.27-35, pp.325-329.