FACTORS AFFECTING THE BEARING CAPACITY OF ELEMENTS MADE OF HEAVY CONCRETE DURING THE RECONSTRUCTION OF OBJECTS

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Abstract

Consider various types of beams with concentrated loads, with a uniformly distributed load on the top of the beam, with longitudinal horizontal reinforcement, with and without prestressing. We also present an analysis of experimental data for short cantilevers and short beams. Column brackets for various types of reinforcement: horizontal, inclined, vertical clamps and bends. When changing the cross-section of elements.

Kewords:

loads, experimental data, horizontal, cross-section.

Introduction

It is necessary to assess the strength characteristics of concrete. On the basis of testing cubes with dimensions (10x10x10, 15x15x15, 20x20x20), the characteristics of concrete compressive strength (R_b) and axial tension (R_{bt}) are established

$$R_b = (0{,}8 - 0{,}0001\,R)\,R$$

$$R_{bt} = \frac{50R}{450+R}$$

The most numerous group of reconstructed parts of buildings are slabs. Their bearing capacity depends on the work of the concrete itself, longitudinal reinforcement and engagement forces, the mutual influence of moments and shear forces over a wide range of changes in the basic characteristics of the elements. Shear reinforcement beams are of great practical use. Their bearing capacity depends on the pitch of the clamps, diameter, steel grade, as well as on the distance from the support to the load a / h_0 .

Prestressed beams without clamps are rarely used in practice. Usually prestressed beams are made with clamps and the prestressing itself affects the bearing capacity of the element along the inclined section. With the additional installation of clamps, the beams also collapse along normal sections. This question was investigated by A.S. Zalesov and I.N. Old man [2].

In stress-free beams with a uniformly distributed load, the bearing capacity depends on the ratio l / h_0 (span, working height), the number of longitudinal reinforcement, concrete classes.

A uniformly distributed load creates more favorable conditions for such beams, therefore, an increase in the bearing capacity along an inclined section when installing transverse reinforcement or prestressing leads to the destruction of these beams along a normal section.

T-section beams with transverse reinforcement, with a change in the dimensions of the flanges in height and width, the use of various classes of concrete, the number of longitudinal and transverse reinforcement; by changing the distance from the support to the load (a / h_0), it is possible to assess the effect of compressed shelves on their bearing capacity [1]. T-beams without transverse reinforcement are almost never used, since compressed flanges without clamps do not have a sufficient effect on the bearing capacity of the element along inclined sections.

I-beams are used with and without transverse reinforcement. Beams without transverse reinforcement with relatively small flanges and a sufficiently thick wall collapse along inclined sections.

Beams with developed flanges, reinforced with closed frames, with a thin wall and strong transverse reinforcement. The bearing capacity of such beams is related to the work of the walls. These beams are used in practice with prestressed reinforcement.

The presence of prestressing, reinforced developed flanges and transverse reinforcement increase the bearing capacity along the inclined section, and also the beams are destroyed mainly along the wall or along the normal section [1].

Short elements - column consoles. Their bearing capacity is determined by the relative distance from the load to the support section a / h 0 , the class of concrete, the angle of inclination of the compressed edge of the console.

In short cantilevers with transverse reinforcement (in the form of horizontal clamps, inclined clamps, vertical clamps), the bearing capacity can be changed in accordance with the operation of the transverse reinforcement.

Short consoles are reinforced with longitudinal reinforcement. During the reconstruction, it is possible to use prefabricated beams, slabs, blocks as permanent formwork and then the device of monolithic reinforced concrete. The bearing capacity of short beams depends on changes in the amount of longitudinal reinforcement and the class of concrete [3].

Conclusion

The load-bearing capacity of reinforced concrete elements during operation and reconstruction is influenced by the type of loading; classes of concrete; stress-strain state; types of reinforcement, etc.

References:

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