Title (en)

METHOD FOR IMPROVING THE STRUCTURAL STABILITY OF AN EXISTING BUILDING CONSTRUCTION

Title (de)

VERFAHREN ZUR ERHÖHUNG DER STRUKTURELLEN STABILITÄT EINES BESTEHENDEN BAUWERKS

Title (fr)

PROCÉDÉ POUR AMÉLIORER LA STABILITÉ STRUCTURELLE D'UN BÂTIMENT EN BÉTON ARMÉ EXISTANT

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Application

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Abstract (en)

[origin: WO2015063738A2] Currently it is believed that with the current seismic rules, which provide even the thickening of the stirrups of the pillars and beams near the nodes, one is sufficiently protected from earthquakes in the new building constructions and above all one takes care of intervening on the existing building constructions, mainly with wrapping, ringing, stiffening systems and other outside the nodes. It is believed that this safety is a huge error for all, both new and existing, constructions of reinforced concrete (hereinafter r.c.) as it does not take into consideration in a suitable way the structure situation in the dynamic phase thereof determined by the seism. Upon starting and increasing the seismic pushes, and the corresponding oscillations of the building construction, the neutral axis starts entering the section and, when there is the tilting on the right of the construction, the left side of the section, with respect to the neutral axis, is tensioned whereas the right one is compressed. In the subsequent tilting on the left of the building construction the situation is reversed and the right portion of the section is tensioned whereas the left one is compressed. Upon still increasing the horizontal seismic pushes the neutral axis moves more and more towards the edges of the section until going out of them, by causing larger and larger slits on the tensioned portion and higher and higher compressions on the compressed portion. This because in those subsequent oscillation moments the gravity force, and therefore the weight of the pillar section, do not disappear but continue to act. For example, if one consider the instants, the second fractions, wherein the neutral axis, in a section of a pillar with side of cm. 30 with load of 75,000 (75 thousand) Kg., it lies progressively at 2.5 cm. - 0.5 cm. - 1 mm. from the edge, equal to 75 - 15 - 3 cm2., respectively, of compressed concrete (cnr), there is a compression on the cnr respectively of 1,000 Kg/cmq. - 5,000 Kg/cmq. - 25,000 Kg/cmq.; these compressions are not sustainable whatever system is adopted for increasing the resistance. The section is destroyed starting from the outside towards the inside, that is from the edges towards the centre, which is the most resistant one due to the geometrical-physical aspect itself of the section. Then, it is necessary to invert the current tendency of the art and to reinforce even the section centre. The subsequent reinforcements, from the periphery towards the centre, reduce considerably, among other things, the oscillations (by 30-40%) and consequently the damages even related to the plants, by allowing to continue to benefit from home-property. Currently only the vertical irons are put near the edges so that the irons, on the opposite sides, have the greater distance (the arm) and then they can be exploited in the whole tensile strength thereof. But upon doing that only a contrast, stopping structure is arranged, which is considered stronger than the disruptive capability of the earthquake. Therefore, there is no the adaptation which the living organisms have, for example the trees, which apart from the more external rings have even the innermost ones which, during the wing push, cooperate and contribute to reduce the disruptive action of the most external rings and when these gradually cede they take over with all resistance capability thereof. With the addition of the central reinforcements the structural collapse is further prevented, the duration of the r.c. is lengthened (analogously to the regeneration of the outer portions in the living organisms) and there is a protection from magnetic fields. The present invention applies, with different methods, both to the existing structures in r.c. and to the new building constructions.

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