

REINFORCED BLOCK

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Abstract: In the work, construction structures, namely building blocks, from which the walls of the building in seismically active areas are constructed, are presented. The scientific result is an increase in the strength and stability of the building built with hollow body reinforced blocks.

Key words: block, reinforcement, armature, frame, seismic.

Introduction

The work is about simple but at the same time about an accurate solution of fortified hollow body with a sloping shell, and its relevance is determined by the increasing requirements for shell systems that modern technology imposes on it. Today, the shell as a structural element is used in civil engineering, shipbuilding, aircraft engineering, and chemical industry.

Thin-walled shells that work in flexure have been characterized by high strength and stability compared to their low weight, which has led to their use in engineering structures.

In recent times, double-curvature shells with large fortified hollow body and a rectangular profile in plan have found great use in civil construction. With its scale, especially in house construction.

The concentration of stresses around the hole what was reflected in the flat tasks was displayed in the works of N.I. Muskhelishvili, D.I. Shermadini, G.N. Savin, and in spatial systems was displayed in the works of A.I. Lurie, G.N. Savini, A.N. Guzi, I.S. Chernyshenko, B.K. Mikhailov, N.V. N.P. Valishvili, N.P. Bullia and others.

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2. Main part

A hollow body reinforced block (Fig. 1) having a rectangular cross-section contains penetrating

round voids (Fig. 2). The block has sockets in the corners and in the middle (Fig. 3) and in these places, the reinforcement is bared, to connect with the adjacent blocks.

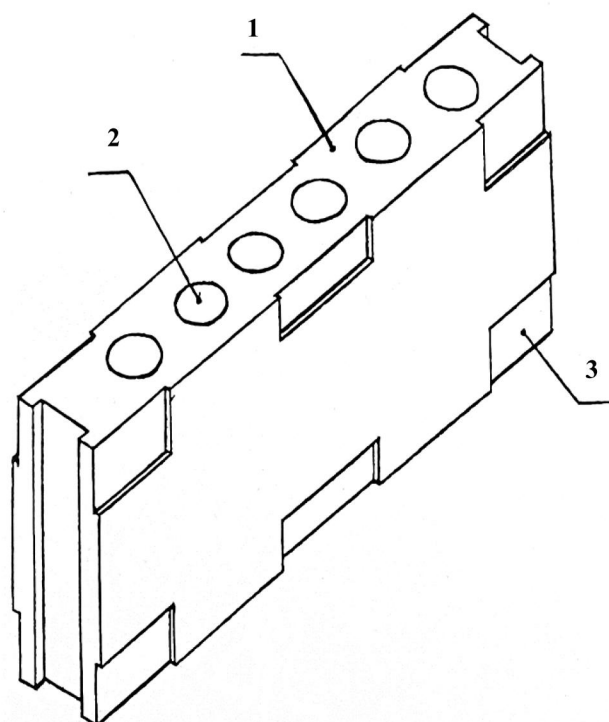


Fig. 1. Reinforced block is outlined. with dimensions 240X90X40.

In construction practice is known, walls built with hollow blocks, without mixture, with laying details are known, but in seismically active areas, such a construction solution is unacceptable, since the laying details installed without mixture will work on cutting on horizontal loads and therefore cannot ensure the stability of the wall.

As another analogy, we offered relatively close technical solution us for the following purpose - increasing the strength and stability of the wall in seismic areas. But the walls consist of small stones arranged in rows with channels to insert the reinforcement in the transverse and longitudinal directions. Such a solution provides seismic protection of the wall, but it requires a lot

of labor when building the wall, at the same time it requires great accuracy to match the channels to each other.

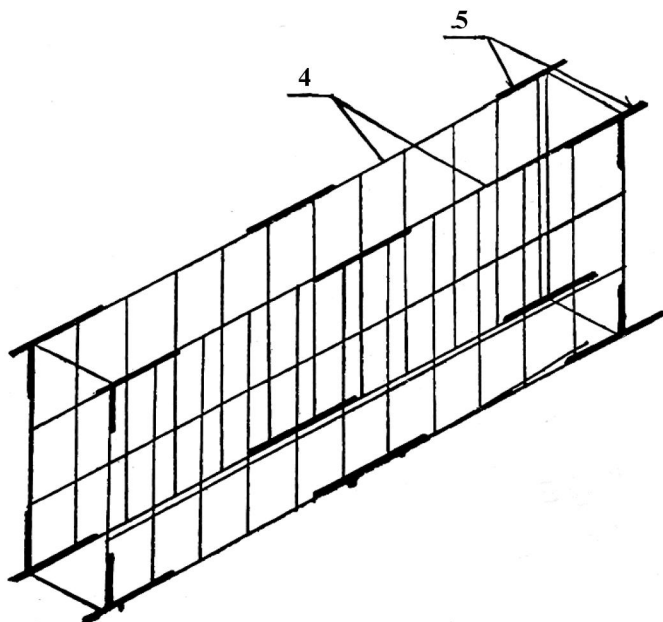


Fig. 2. Reinforcement of this block

In order to eliminate the above-mentioned shortcoming, we have installed a new technical solution for the construction of walls with hollow body reinforced blocks in seismically active areas.

The mentioned technical result is achieved by the fact that the block is provided with cross-cutting round voids, located symmetrically in the plan. The reinforcement is made with a frame, filled with concrete of the thickness of the protective layer, and in these places the reinforcement is bare, without a protective layer, in order to make welding-bonding and with the blocks standing below, above and on the side by means of the remnants of the reinforcement.

The recommended hollow-body reinforced blocks are rigidly welded to each other and to the seismic belt, which guarantees seismic resistance.

Ordinary block - 1 is a reinforced spatial

frame - 4, in which there are 8 rods working reinforcement - 12 mm and distribution 8 mm reinforcement with - 20 mm frame is concreted with light or heavy concrete. e.g. Akhalkalaki pumice stone or heavy concrete or heavy concrete. These blocks have cavities - 2 and sockets - 3 for exposure with subsequent welding of reinforcement.

In the shape of a block, after installing the frame of the armature, a special device from metal pipes is installed. After some time after concreting, pipes are removed and we get a hollow body reinforced block, which then undergoes heat treatment.

Weight loss of block through the voids is 0.25 cubic meters on 1 cubic meter of concrete. In the corners of the block and in the middle part in the places where the block connects with the other blocks standing above, below and on the side.

A wall of these blocks, rigidly connect to each other, is considered as a roof slab rigidly fastened on all four sides, acting in both directions on its own longitudinal load.

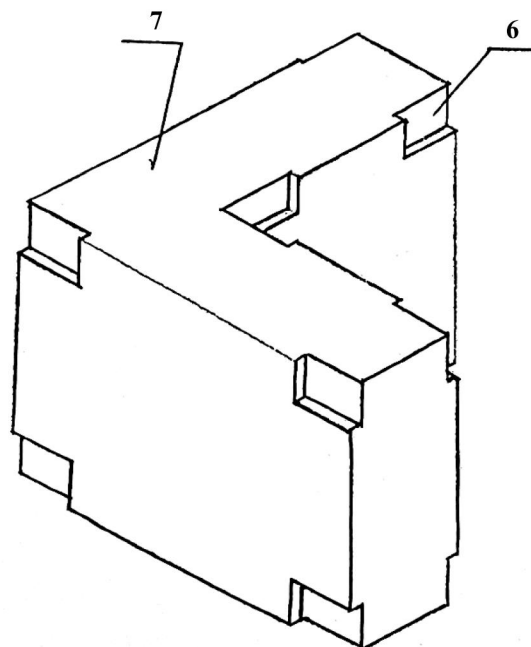


Fig. 3. A corner like "T" reinforced block is given.

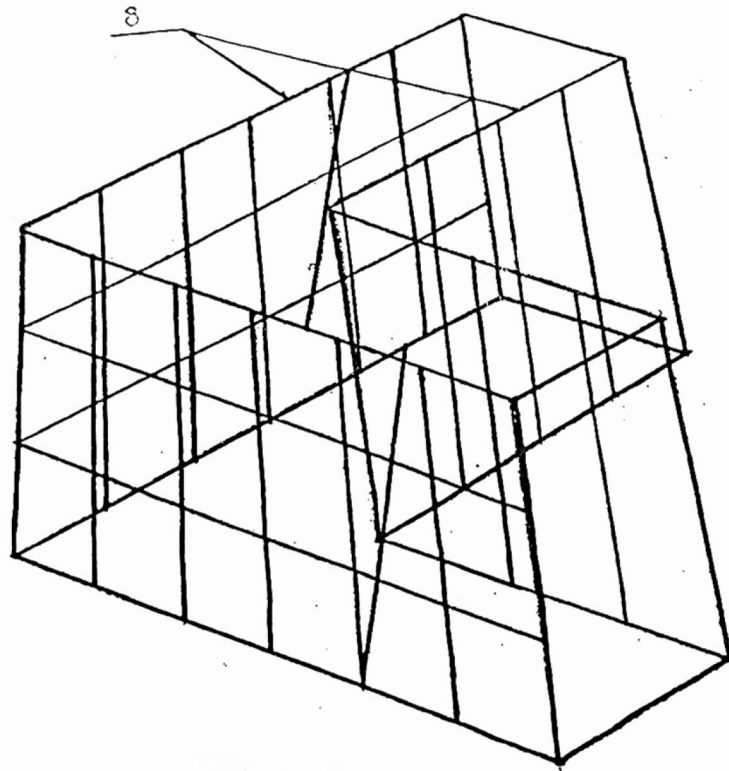


Fig. 4. Corner block reinforcement.

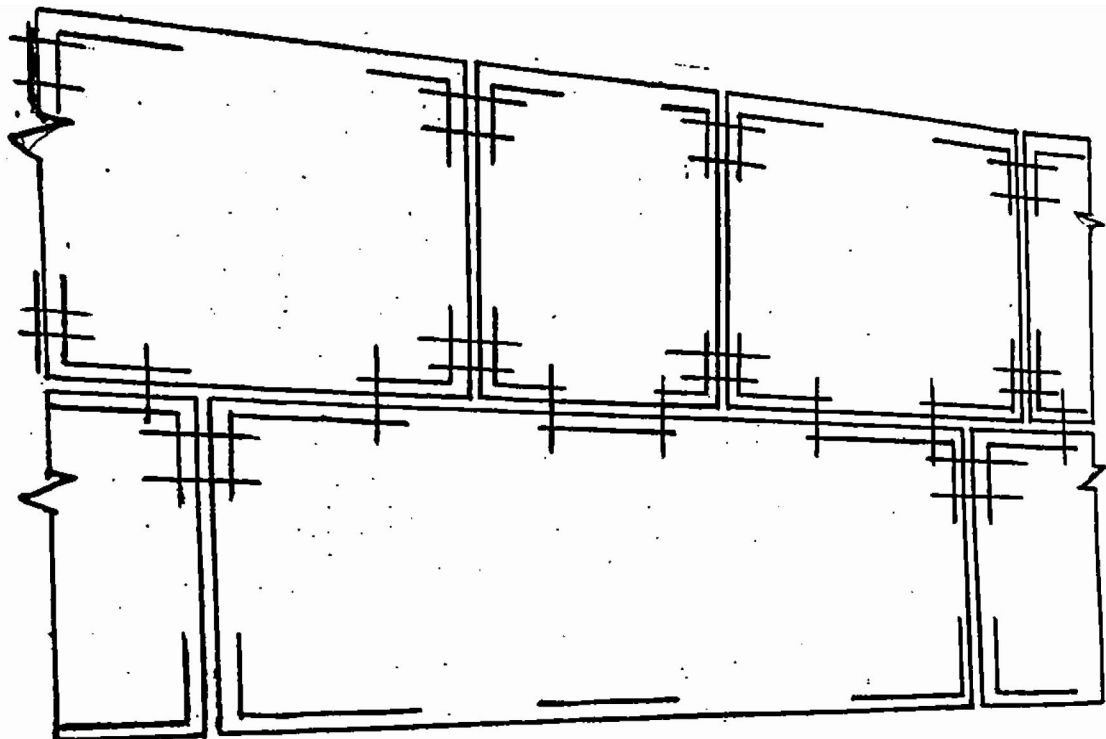


Fig. 5. Connecting the blocks together

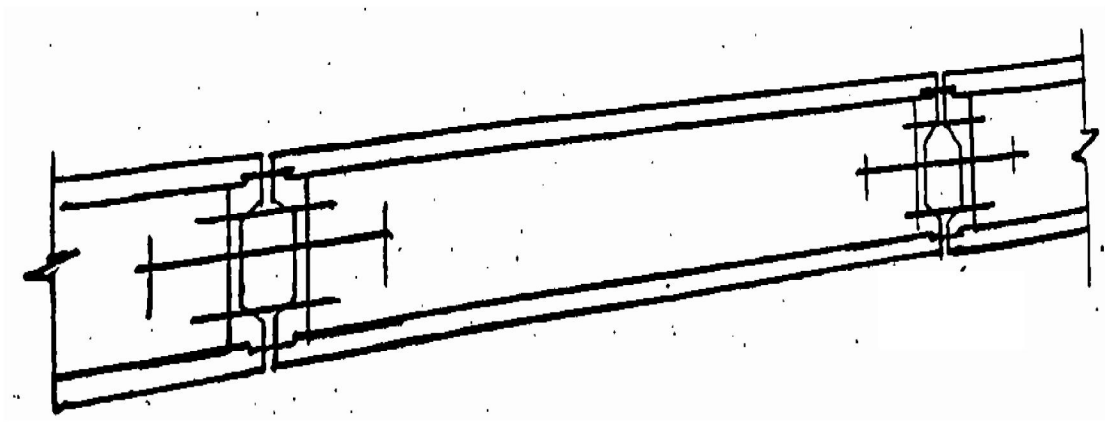
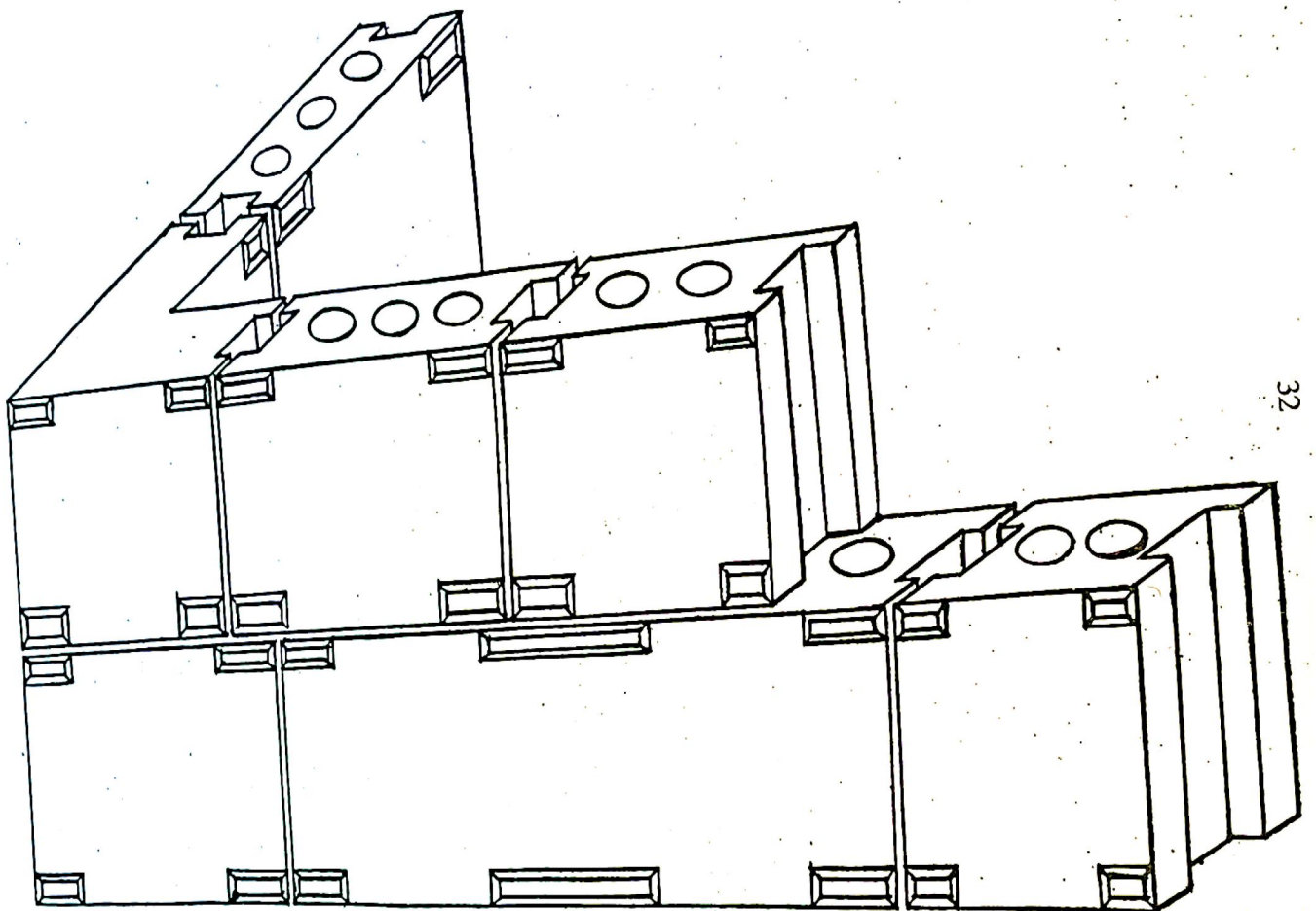


Fig. 6. Topview



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Fig. 7. Placement of blocks

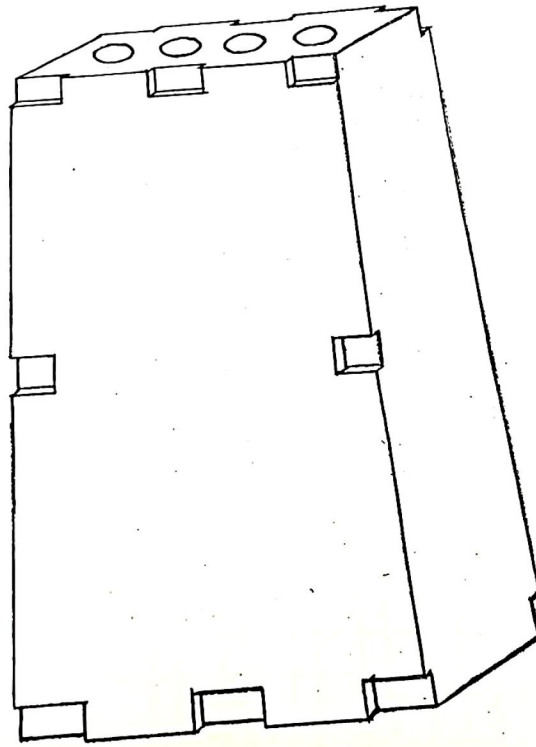


Fig. 8. Large-sized hollow-body reinforced block with dimensions. 2,40X1, 20X0,40

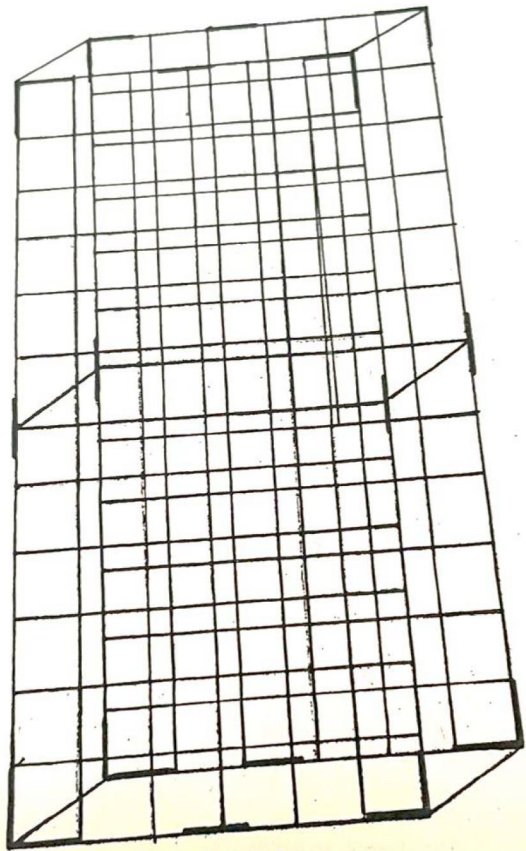


Fig. 9. Large block frame

Conclusion

The recommended block meets all seismic standards for load-bearing walls at 7, 8 and 9 score. Moreover, seismic standards take into account wall reinforcement.

Taking into account all the requirements of the recommended blocks, walls can be built in seismically active areas, both residential and public buildings, with full guarantee.

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