The issue was only raised in 1991. The restoration however was delayed for many reasons: the building was desolated for a while. Then it was made into a confectionary.

Active restoration work began in 2003 with the blessing of Metropolitan Philaret, who was then in power. The author of the new project was the architect Domogarov Mikhail Illarionovich.

In July 7 the first dome of the temple was installed.

In October 14, 2004 during the celebration of the Intercession of the blessed virgin Mary the Restored sanctuary was sanctified and put into operation [3].

Fig. 2. The Church of the Intercession of the Blessed Virgin Mary. Modern look

The Church of the Intercession of the Blessed Virgin Mary has a tragic history: it suffered from a large number of fires and rebuilding's. But in spite of everything in the 21st century, Pokrovsky temple performs its educational mission, helping many people find Pease and joy.

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RIGID REINFORCEMENT EFFICIENCY IN STRENGTHENING OF STRIP FOUNDATIONS

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The article focuses on the main advantages of rigid reinforcement in the strengthening of strip foundations. The analysis of constructive solutions providing the collaboration of existing foundation elements and those of the reinforcement is done. The main results of research work on the bearing capacity of foundation piling of reinforcement foundation by rigid reinforcement are presented.

When designing the strengthening it's necessary to use to the maximum the existing foundation, providing its collaborative work with the reinforcement's elements [1, p. 131].

Collaborative work of reinforcement's elements of strip foundations with existing construction is provided by several methods:

1) by the installation of concrete keys, projections in cavities of the existing foundation or bearing structures of a building;

2) by the installation of anchors embedded in the body of existing foundations;

3) by the installation of through armature;
4) by the welding of armature of elements of spread with exposed armature of reinforcing foundation;
5) by means of special support elements: braces, unloading metal or reinforced concrete beams.

When using rigid reinforcement, metal-rolling profile will create rigid connection between existing foundation and construction of reinforcement that gives the possibility to reinforcement's elements to put into the operation immediately, without initial deformations that can negatively affect existing foundation. The use of rigid profile when reconstruction works and strengthening of foundation has significant advantages in comparison with the above mentioned methods of ensuring of collaboration:

1. Rigid profile let elimination of attenuation of construction that on the contrary needs to be reinforced. Using this method of strengthening it's possible to avoid attenuation of foundation in those places where the implementation of element of reinforcement under the sole of existing foundation is planned. It's also possible to refuse making keys and cavities, using this method of reinforcement collaboration of new and old concrete will be provided thanks to rigid rod and surface of reinforcing construction with made notch that will let both reduce the cost of reinforcement, and avoid excessive attenuation of existing foundation as well.

2. The use of rigid profile, in comparison with anchors made of steel reinforcing rod let avoid even small displacements and deformations of reinforcement's element with respect to existing structure, that can't be fully performed by anchor made of steel reinforcing rod embedded in the body of reinforcing foundation.

3. When using rigid profile, the hole in the foundation body is arranged with help of diamond crown that does not provoke vibration load to the foundation body and does not result in accidental deformations, and the hole is completely filled by concrete mixture and it's not the area of attenuation, after completion of reinforcement works. When doing through-hole bores for reinforcement bars, installed with the use of perforator, there is vibrational load spread the whole body of the foundation that can lead to undesired attenuation. Besides performed aperture cannot be completely filled during concreting, that's why it's a place of low coherence after completion of reinforcement works.

4. The proposed method using rigid reinforcement is more cost-effective than using installation of different constructions with braces and metal distributing beams along the entire length of the reinforcing foundation. Saving is done due to the fact that there is no need to use installation of metal-rolling distributing elements. Rigid rods are installed in increments when the compression zones disjoint and therefore destructions of compressed concrete are eliminated that allows exclusion of distribution beams.

5. Method of strengthening of strip foundations using rigid reinforcement is more mechanized and less dangerous, as there is no need to attenuate the foundation to install reinforcement construction under the sole of foundation, there is also no need to install keys and cavities in existing foundation that allows not to attenuate reinforcing structure and avoid injury while performing of work. The proposed method does not allow the collapse of construction and it can be performed without full development of a ground up to the base of foundation that eliminates pile heave and violation of hydrogeological conditions under existing foundation.

6. This method makes it possible to transplant strip foundation to jack piles, bored piles or inclined piles situated on one or both sides of the strip foundation. When strengthening using transplantation of strip foundation on piles it's possible to eliminate almost completely development of deformations and foundation settlement, because bearing capacity of shaft bearing pile is of 200 – 400 kH, bearing pile – 800 – 1000 kH.

To ensure a durable adhesion between new and old concrete the surface of existing foundation should be purified from soil, old waterproofing layer, chemicals, as well as from incoherent solution, concrete, they should wash and dry, perform notch of contact surface [2, p. 228].

In order to study strength and deformation properties of interface node with rigid armoring a number of experimental tests using almost natural samples were carried out.

For the initial test sample was taken foundation block series FSB 9-6-3. With the help of diamond crown, in the middle of the block in transverse direction there was done hole to insert there rigid rod. Diameter of made hole is of 160 mm.

For reinforcement there were chosen two rigid rods - channel № 6,5 for sample № 1 and flanged beam (welded of two channels № 6,5) for sample № 2, and, for comparison, when reinforcement of the sample № 3 it was used reinforcement cage of four rods with a diameter of 16 mm and reinforcement class S240. All rods of carcass are identical and equal; distance between lower and upper pairs of rods was of 96 mm and distance between right and left rods of 35 mm. For transverse reinforcement of carcass there were taken 3 clamps of armature of class S240 with diameter of 6 mm. The cross section of carcass has been chosen so that the geometric characteristics of carcass coincide with the geometrical characteristics of the cross section of two channels welded by walls.

Load transfer from foundation block (existing foundation) when reinforcement using rigid armoring is performed using rigid rod and concrete additional part of foundation (banquets). Size of banquet for the test was adopted of 300 × × 300 × 600. Moreover, foundation block, as of concrete elements of reinforcement (banquets), is leveled up to 100 mm.

There were taken 3 blocks for the test that will let to compare efficiency of use of rigid reinforcement with appliance of different sections of reinforcing elements.

For concrete pouring there was used concrete of class C30 / 37, which was further proved by results of test of selected control samples of concrete. Spud vibrator was used to condense and compress concrete mix.

Demolding of reinforcement elements was performed after 3 days; tests were performed after 28 days after execution of concrete works. Preventive maintenance of concrete was executed by saving humid environment of surface of construction that was in contact with open air.

For testing there were installed 12 strain gauges (ICH – 10) in places of the greatest by size displacements of one point in regard to another.

For the first sample there was taken foundation block FBS 9-6-3 reinforced by use of rigid rod – channel № 6, 5. Ready sample was placed under press and it was installed on a layer of cement-sand mortar. Alignment of sample was performed on support site of press. Geometrical center of foundation block was determined, to provide central loading and exclusion of irregular compression of sample. Load was applied in steps of 5 tons.

Breaking load, for sample №1, attained 68 tons. The first micro-cracks appeared at load of 20 tons at base of foundation block near sensor №3. With further loading the same cracks began to appear near sensor №9. Finally destruction of concrete element of reinforcement took place that delicately deteriorated due to punching by rigid rod - channel. Appearance of test sample №1 after test is shown in figure 1.

Fig. 1. General view of sample №1 after test

For the second sample there was taken foundation block FBS 9-6-3 reinforced by using rigid rod - flanged beam (welded of channels № 6,5). Ready sample was placed under press with its installation on layer of cement-sand mortar. There was executed alignment of sample on support site of press. Geometric center of foundation block was determined to provide central loading and exclusion of irregular compression of sample. Load was applied in steps of 5 tons.

Breaking load, for sample №2, amounted to 103 tones. The first micro-cracks appeared at load of 40 tons at the base of foundation block near sensors №9 and №12. Cracks in the length of the test were not significantly increased. Finally destruction of concrete of foundation block took place due to cutting force of rigid rod that demonstrates effectiveness of such reinforcement. With significant crack growth and destruction of foundation block there were also cracks on one of the elements of reinforcement. Appearance of sample №2 after test is shown in figure 2.

Fig. 2. General view of sample №2 after test

For the third sample there was taken foundation block FBS 9-6-3 reinforced using prefabricated reinforcement cage. Ready sample was placed under press with its installation on layer of cement-sand mortar. There was performed alignment of sample on support site of press. Geometric center of fundamental block was determined, to provide central loading and exclusion of irregular compression of sample. Load was applied in steps of 5 tons.

Breaking load, for sample №3, amounted to 82 tones. The first micro-cracks appeared at load of 40 tons on the top of foundation block. Cracks during all time of test were in progress and increased. Finally destruction of concrete of foundation block took place due to cutting force of reinforcing element. Although nature of destruction of samples №2 and №3 matches, but rigid rod as a result could support load of 20 tons more than reinforcement cage, which also witnesses of effectiveness of rigid reinforcement.

Appearance of sample №3 after test is shown in figure 3.

Fig. 3. General view of sample №3 after test

After undertaken test of foundation elements reinforced with use of channel, flanged beam and frame of rod armature we can conclude that use of rigid profile is more effective than carcasses, it can be seen from diagrams of deformation of experimental samples, which are displayed in figures 4 and 5.

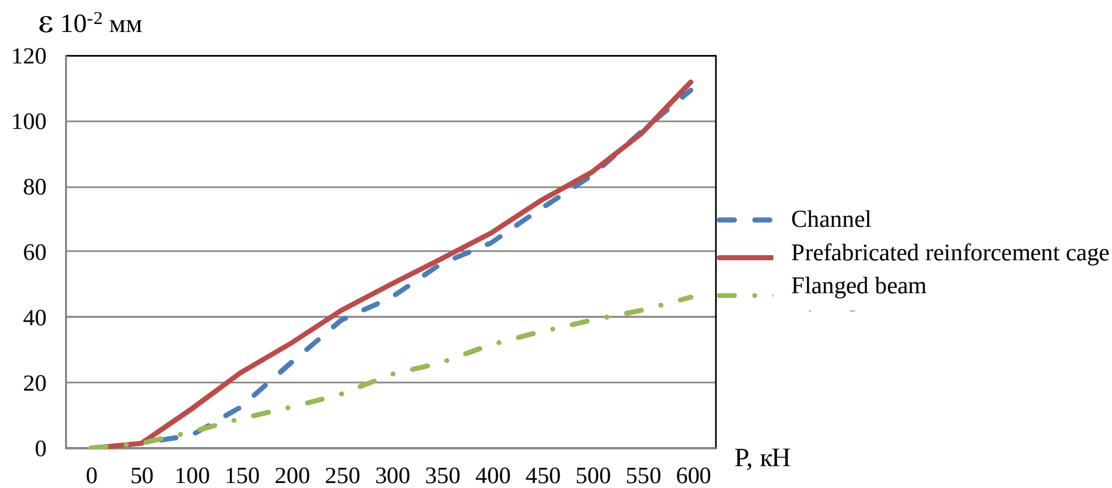

Fig. 4. Diagrams of deformation (vertically) of experimental samples when central compression

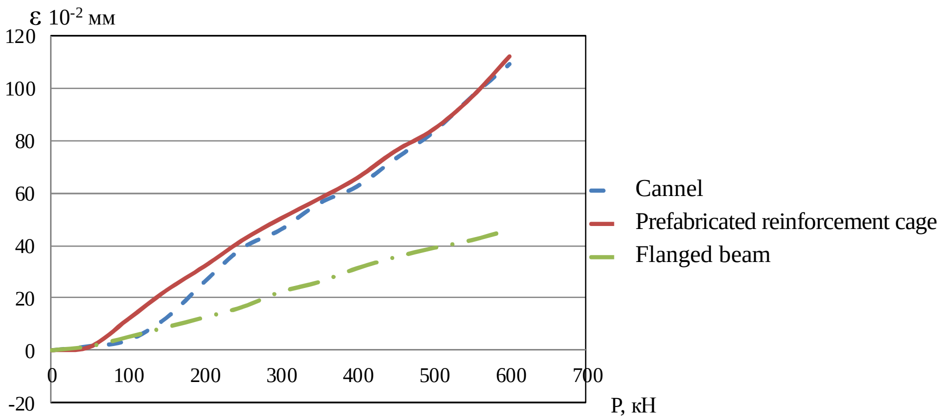

Fig. 5. Diagrams of deformation (horizontally at base of concrete footing) of experimental samples when central compression

From the graphs, it can be seen that displacements both in horizontal and vertical positions with the use of I-beam are significantly less than in other variants of the reinforcement. Consequently, the use of rigid rod in the reinforcement significantly increases the rigidity of junction of the reinforcement element and the existing foundation. It can also be noted that the use of rigid rod not only reduces deformability, but also increases bearing capacity of the whole construction what is also a significant factor when choosing a method of reinforcement.

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PLANT FOR INTEGRATED STUDY OF SIMPLE BENDING, RESTRAINED TORSION, TORSION BENDING

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The article deals with an experimental plant designed for the integrated study of simple bending, restrained torsion and bending torsion of different elements and constructions. The authors introduce a schematic diagram of the plant with a description of its constituent elements, as well as some testing points of the constructions.

The plant is designed for the integrated study of simple bending, restrained torsion and bending torsion of different elements (Point. 7) and constructions, made of these elements: prismatic bars (Fig. 2a), closed cross-section (Fig. 3a, б), open profile (Fig. 3 в, г, д), pre-stressed strut frames (Fig. 2 б), bents, trusses, roof and floor slabs. The materials of the studied elements and constructions are reinforced concrete, steel, duraluminium, plastic.

The plant consists of two rigid rectangular frames (Point. 1; channel No. 40), rest upon four bases (Point. 2). The bases are fixed to the bed with six anchor bolts 24 mm in diameter each. The angles are fixed to the upper part with bolts (Point. 5) and expand spatial rigidity of the installation and serve as fastening elements of the vertically placed constructions. I-beams (Point 4) are placed on the lower cross-channels No. 40 (Point. 3); there are hydraulic jacks on the beams (Point. 8) which generate the vertical bottom-up load up to 500 kN on each jack.