

Use of Bored Injection Piles Ert as Recessed Building Structures for Pit Fencing

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ABSTRACT

The problem of increasing the bearing capacity of foundations is always a pressing issue in modern geotechnical construction. It is of particular importance when constructing on landslide-prone slopes. At the same time, both designers and customers make irreparable mistakes when developing design documentation for retaining recessed structures when constructing objects on such sites. All the mistakes made are mainly due to the lack of proper control by the technical customer over the production of pre-design work, including engineering and geological surveys. This article describes a negative case from the geotechnical practice of designing and constructing a residential complex on a landslide slope. The article is a review.

Keywords: Retaining Buried Structures, Geotechnical Construction, Electric Discharge Technology Ert, Bored Injection Pile Ert, Reinforced Concrete Grillage

Construction of important facilities on rugged terrain with slopes, ravines and other uneven surfaces involves the construction of either recessed floors or retaining building structures [1-7]. In this case, all technical and technological solutions to ensure the stability of the foundations of constructed buildings and surrounding development objects must be substantiated by geotechnical calculations [8,9]. Often, in real construction practice, technical failures occur related to the reliable operation of retaining structures [9,10]. In such complex geotechnical cases, it becomes necessary to secure the existing enclosing structures.

Bored-injection piles ERT (RIT, FORST, ERT) manufactured using electric discharge technologies are harmoniously suited as retaining structures for such cases [11]. Electric discharge technology, possessing a number of technical and technological advantages, is widely used in geotechnical practice of constructing both pile fields and piles for strengthening foundation bases, securing foundation bases, slopes, when installing dowels, etc. [8-11].

The article under consideration presents the experience of using bored-injection piles ERT with ERT soil anchors in combination with retaining walls.

Object No. 1. Deformed monolithic corner (see Figure 1) reinforced concrete retaining wall pos. 1 in the Raduzhny microdistrict in Cheboksary. The horizontal displacement of the existing wall reaches 200.0 mm to 1000.0 mm. Further deformations threatened the trouble-free operation of the existing engineering structures. In order to stabilize the deformation, it was decided to construct an additional retaining monolithic reinforced concrete retaining wall pos. 2, erected on the heads of ERT (RIT, FORST, ERT) bored piles. The newly erected retaining wall is additionally secured with monolithic reinforced concrete buttresses pos. 3 and ground anchors.

Object No. 2. Deformed monolithic reinforced concrete retaining wall (see Figure 2) pos. 1 as a soil stop in the pit as a stop of the deformed pit enclosure made of bored piles pos. 2. It should be noted that the bored piles served as a pit enclosure to ensure the stability of the eight-story large-panel residential building. To ensure the stability of the existing wall, monolithic reinforced concrete buttresses were designed and erected on

monolithic reinforced concrete grillages pos. 4. The grillages are based on ERT (RIT, FORST, ERST) bored piles placed under the buttresses according to the pile cluster scheme. At present, the 15-story public facility has been put into operation.

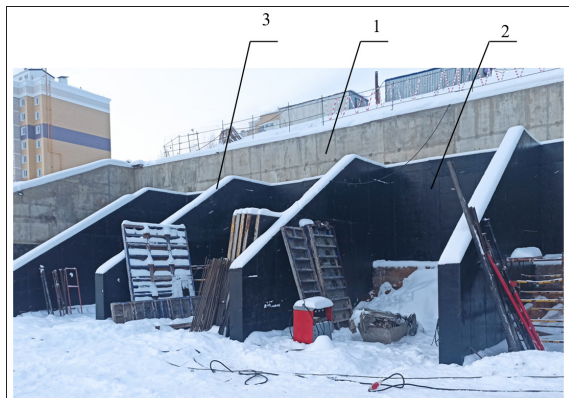


Figure 1: Monolithic reinforced concrete corner retaining wall with buttresses as a retaining recessed building structure of a deformed retaining wall: 1 - existing monolithic reinforced concrete corner retaining wall; 2 - monolithic reinforced concrete corner retaining wall with buttresses 3

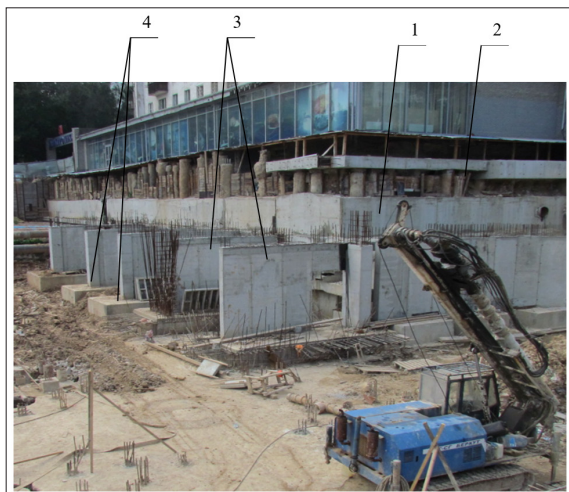


Figure 2: Monolithic reinforced concrete buttresses on bored piles ERT (RIT, FORST, ERST) as a stop of a deformed retaining wall in Nizhny Novgorod: 1 - existing monolithic reinforced concrete retaining wall as a stop of a deformed pit enclosure made of bored piles 2; 3 - monolithic reinforced concrete buttresses on monolithic reinforced concrete grillages 4

Object No. 3. The pit fencing as a retaining retaining wall made of two rows of bored-injection piles ERT (RIT, FORST, ERT) (see pos. 2, Figure 3) in Nizhny Novgorod was designed and erected for the construction of the Ministry of Internal Affairs polyclinic as a pit fencing and retaining structure of the existing two-story object pos. 1. A monolithic reinforced concrete strapping belt pos. 3 with reinforcement releases was erected along the ERT pile heads for the subsequent construction of the outer wall of the building under construction.

Object No. 4. The fencing of a pit made of bored-injection piles ERT (RIT, FORST, ERST) (see pos. 1, Figure 4) in Nizhny Novgorod serves as a structure as the external walls of a two-story basement. For this purpose, a monolithic reinforced

concrete strapping belt pos. 2 was erected along the pile heads with reinforcement outlets both along the upper and lower edges of the belt, used for the construction of enclosing structures and strapping of a flat reinforcement frame for the purpose of concreting the surface along the cleaned surfaces of the RIT piles (see pos. 3).



Figure 3: Retaining wall made of two rows of bored piles ERT (RIT, FORST, ERST) as a pit enclosure in Nizhny Novgorod: 1 - reinforced object; 2 - pit enclosure made of two rows of bored piles ER T (RIT, FORST, ERST); 3 - monolithic reinforced concrete strapping belt

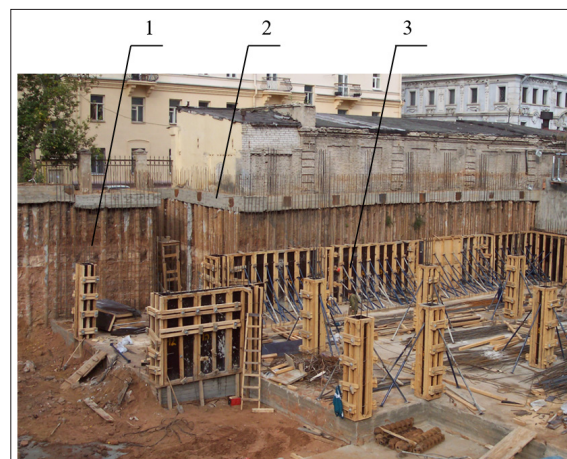


Figure 4: Excavation pit fencing made of bored piles ERT (RIT, FORST, ERST) in Nizhny Novgorod: 1 - excavation pit fencing made of two rows of bored piles ERT (RIT, FORST, ERST); 2 - monolithic reinforced concrete strapping belt; 3 - formwork

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