

## عنوان مقاله:

Construction of Underground and Multi-story Car Parks in High-density Urban Areas

## محل انتشار:

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## خلاصه مقاله:

In modern megacities, every day, people are faced with the problem of finding a place to park the cars, this problem is especially acute in the city center. The number of existing parking spaces is sorely lacking in view of the rapid growth in the number of cars. Therefore, the optimal solution for the construction and reconstruction of buildings in large metropolitan areas is the rational use of underground space, namely the construction of underground parking lots. The present work is an analysis on construction of underground and multi-story car parks in large cities through a case on the city of St. Petersburg, Russia. It considers optimal solutions for construction of underground car parks in complex geotechnical conditions using Plaxis 2D program. The purpose of the study is to develop technological solutions for the construction of underground parking lots in complex engineering and geological conditions of large megacities with the use of sheet pile fencing. Input data were collected from available engineering and geological surveys datasets obtained from construction sites. The methodology used was 2D design diagrams and a nonlinear Mohr-Coulomb model was used, which made it possible to assess as accurately as possible the geotechnical conditions in the construction area by analyzing horizontal and vertical displacements of the sheet pile wall, soil settlement at the bottom of the excavation, and the maximum settlement of a building located near the excavation. As a result, professional recommendations were developed for construction of underground and multi-storey car parks in complex geotechnical conditions: it is necessary to carry out complex geotechnical support of construction; when constructing a pit in difficult engineering and geological conditions, construct a pit with metal spacer systems (open pit); when constructing a pit near existing buildings and structures, it is very important to take into account the relative position of the base of the foundation and the pit being constructed; accurately and reliably perform calculations in the design and implementation of the construction of underground parking as part of new construction or reconstruction of previously constructed buildings in difficult engineering and geological conditions. The authors of the article have developed new technological solutions that are of great scientific and practical significance to improve the reliability and safety of preserved architectural monuments during the construction of underground parking lots, as well as the safety of ... neighboring buildings tha

## کلمات کلیدی:

Construction, metropolitan areas, Underground car parks, Multi-story Car Parks, special methods, sheet piling, Complex Geotechnical Conditions

