Retraction

Retraction: Research on Application of Top-down Construction Method Based on Computer Technology in Excavation of Urban Deep Foundation Pit (*J. Phys.: Conf. Ser.* **1744** 032072)

Published 16 September 2022

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The authors of the article have been given opportunity to present evidence that they were the original and genuine creators of the work, however at the time of publication of this notice, IOP Publishing has not received any response. IOP Publishing has analysed the article and agrees there are enough indicators to cause serious doubts over the legitimacy of the work and agree this article should be retracted. The authors are encouraged to contact IOP Publishing Limited if they have any comments on this retraction.

Retraction published: 16 September 2022
Research on Application of Top-down Construction Method Based on Computer Technology in Excavation of Urban Deep Foundation Pit

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Abstract. With the development of urban construction in three dimensions, the increase of urban high-rise buildings and the in-depth utilization of underground space, the requirements for the excavation and support of deep foundation pit projects based on computer technology are getting higher and higher. The advantages of reverse method in urban deep foundation pit excavation make it quickly popularized and applied, which has high research value. This paper first introduces the application of the reverse method in the deep foundation pit support, then analyses the design of the reverse method, and finally studies the application of the reverse method in the urban deep foundation pit construction design [1-3].

Keywords: Reverse Construction Method, Deep Foundation Pit Excavation, Urban, Big Data Technology, Computer Technology

1. Introduction
With the rapid development of economy, the process of urbanization in China is accelerating. At present, great achievements have been made in urban construction. From the development of super high-rise buildings to the expansion of underground space, urban construction has achieved three-dimensional development both from buildings and transportation. In the process of urban construction to three-dimensional development, with the increase of high-rise buildings and the in-depth use of underground space, the excavation and support requirements of deep foundation pit engineering are higher and higher. With the complexity of all kinds of underground pipelines around the deep foundation pit project in the dense area of urban buildings and the enhancement of safety requirements, the reverse method plays a role of bearing the weight of the structure body in the reverse structure, It can significantly reduce the cost of construction temporary support column, help to save investment, reduce the working procedure and shorten the working period, so it is more and more widely used in the construction of multi-layer underground space engineering. In this context, it is of great practical significance to study the application of reverse method in urban deep foundation pit excavation [4-5].

2. Application of reversed construction method in deep foundation pit support
2.1. The development of deep foundation pit support by reversed construction method

The traditional excavation of deep foundation pit adopts open construction, or vertical excavation after retaining structure is used, and then concrete is poured. On the one hand, this method of excavation and support of deep foundation pit has a large amount of construction work, and makes it difficult to set the support in the foundation pit. In addition, the traditional excavation and support of deep foundation pit has a large amount of work, resulting in a large investment, and will bring a series of safety hazards such as foundation pit deformation and ground settlement. As shown in Figure 1 below, the diagram of excavation of deep foundation pit support construction by using the reverse method can be seen that the main structure beam plate is used as the support of the reverse method, which reduces the work amount of foundation pit excavation, improves the excavation efficiency, and reduces the potential risks of foundation pit deformation and ground settlement existing in the traditional excavation construction.

![Diagram of reversal construction and excavation](image)

Figure 1. Diagram of reversed construction and excavation.

2.2. Applicability of supporting technology of deep foundation pit with reversed construction method

In the application of reversed construction method for deep foundation pit support technology, there are mainly different types of reversed construction method, semi reversed construction method and partial reversed construction method, as shown in Figure 2 below. The application of reversed construction method in the construction of deep foundation pit is helpful to make the deformation of foundation pit smaller, and it can be applied to the special plane shape layout support, and the stress of the support structure is more reasonable. In addition, the deep foundation pit support based on the reversed construction method has significant advantages in the construction of multi-layer underground structure, which can significantly shorten the construction period. Because the application of the reversed construction method significantly reduces the amount of earthwork excavation and filling, it also has significant cost reduction advantages.
3. Reverse construction design of deep foundation pit support

3.1. Design content of foundation pit with reversed construction method
The economic feasibility analysis and risk analysis should be carried out in the design of foundation pit with reversed construction method, so as to ensure the feasibility of foundation pit design. First of all, based on the comparative analysis of different schemes, the final design scheme of foundation pit with reverse method should be determined. Secondly, the safety of foundation pit protection should be analyzed to make the waterproof and impermeability meet the engineering requirements. Third, it is necessary to calculate the quantities and determine the excavation quantities. Finally, the strength analysis and verification of the foundation pit support structure with the reversed construction method should be carried out to meet the requirements of environmental protection audit and supervision. In addition, the reversed construction method foundation pit engineering design shall focus on several aspects as shown in Figure 3, and solve special technical problems.

3.2. Reverse construction procedure
The design and implementation process and procedures of the reverse method in the deep foundation pit project will not only affect the project quality, but also have an important impact on the project investment and ecology. Therefore, it is necessary to strengthen the scientific and standardized construction procedure management. First of all, the supporting structure and system of deep foundation pit should be determined, and the composite stress structure should be constructed. Secondly, the steel tube column is used to support and then the concrete is wrapped. Then, the beams and slabs of underground reinforced concrete are poured, and the basement earthwork is transferred. Finally, the soil model is made after compaction and modification. In addition, the construction scheme of reversed construction method includes half reversed construction scheme and combination
of reversed construction and reversed construction construction scheme. It is necessary to select the appropriate construction scheme according to the actual conditions of the project, so as to ensure the construction results. When selecting the reverse method, it is necessary to consider various factors such as the full use of underground space, the determination of the depth of underground space, the construction safety, the protection of ecological environment and the guarantee of investment return, so as to comprehensively carry out the planning and implementation, so as to maximize the construction benefit.

4. Application of reverse construction method in construction design of urban deep foundation pit

4.1. Overall scheme of reverse construction
The overall construction scheme of the reversed construction method will also have an important impact on the project quality, project investment and ecology of the deep foundation pit. Therefore, it is necessary to fully combine the advantages and characteristics of the reversed construction method to solve the problems of foundation pit support and soil transportation. In order to ensure the excavation speed and efficiency, the overall scheme of excavation engineering should be determined first. Secondly, the horizontal support system and the enclosure support system should be constructed. In addition, the control of the key construction technology of the reverse construction method should also be determined, including the interlocking pile wall, the bearing capacity of one column and two piles, the excavation control, the settlement difference control and the enclosure monitoring. In addition, precipitation inside and outside the pit shall be monitored to ensure controlled and even settlement.

4.2. Construction of the underground continuous wall with biting and connecting cast-in-place piles
The underground continuous wall of interlocking cast-in-place pile row is a continuous reinforced concrete wall constructed by punching out a groove and setting up a reinforced cage structure with certain rigidity. So as to ensure the support of the adjacent buildings, as well as the construction of the retaining structure of the foundation pit, and the vibration isolation wall to eliminate the impact of vibration. Only a small amount of concrete work is needed for the construction of the underground continuous wall of the interlocking combined cast-in-place pile row, which can ensure the waterproof and water seepage, and form a continuous whole, thus retaining the soil and preventing the water from pouring the pile row. Finally, the interlocking combined cast-in-place pile row underground continuous wall is constructed.

4.3. Safety measures for reverse construction
First of all, in terms of technical safety, it is necessary to strengthen the monitoring of the construction process to ensure the safety of the excavation process and the drainage safety of the construction process. Secondly, in terms of construction safety, ensure the orderly use of low-voltage electrical equipment arranged and used, as well as the circulation and regulation of air, to ensure the absolute safety during the construction of reverse method. Moreover, in the aspect of safety management in engineering construction, the importance of safety management should be strengthened to ensure long-term safety. In addition, it is necessary to strengthen the environmental protection of foundation pit construction and pay attention to the scheme and design of deep foundation pit support. In order to ensure the construction quality of foundation pit support engineering, the possible displacement and risk should be controlled at the level of pile wall support structure, so as to achieve the maximum economic benefits.

5. Conclusion
With the complexity of all kinds of underground pipelines around the deep foundation pit project in the dense area of urban buildings and the enhancement of safety requirements, the reverse method has
many advantages and characteristics in the reverse construction structure, which makes it more and more widely used in the construction of multi-layer underground space projects. The application of reverse construction method based on computer technology should pay attention to the overall design and implementation of construction procedures and schemes, strengthen safety management, and formulate countermeasures flexibly to maximize the advantages and value of reverse construction method in urban deep foundation pit construction design.

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