

Analysis of Geological Survey Technology in Building Engineering

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Abstract: During the process of building construction, the role of geological survey is most important and it can be the factor that determines the success of an entire building construction project. Only if the geological survey is valued and related investigation record works is done prior to building construction, and ensures that the integrity and accuracy of the records, then only a scientific construction design can be made and assure the stability of the construction building. It can also promote the success of building construction; keep the harmony of the natural environment of construction site and to establish a good foundation for the sustainable development of building construction. Therefore, this paper mainly analyses the geo-logical survey technique in building construction engineering.

Keywords: Building engineering; Geological survey; Technology

Introduction

The geological survey in building engineering is mainly research and evaluates the geological conditions of the construction site, which specifically including geological mapping, exploration, experiments and tests. Typically, engineering geological conditions are mainly referred to the topography of construction site, geomorphology, lithology, geological structure and hydrogeological conditions. In the basis of completely control of each of the conditions, with the combination of the actual situation of building design, to predict the mode of action, characteristics and scale of both of them. Through the accurate and scientific evaluation to improve the stability, safety and reliability of the building. The geological survey report of building engineering provides reliable data, analysis and proposes solution in building engineering design.

1. Geological survey technique in building engineering

1.1. Global positioning method

Global positioning method is referring to the use of Global Positioning System (GPS) to locate the geographical area of the construction site accurately, to find the exact location of the construction site, and to develop a detailed construction plan according to the local geological environment. In simplified, the principle of operation of the global positioning method is the application of advanced satellite positioning technology, to obtain the detailed data between the destination and receiver and specific geographical location of the destination can be obtained through integrated data from multiple satellites. As there are many advantages such as the technology has monitored for a long time, has high

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accuracy in positioning, operation of equipment is simple, and time needed is short. Therefore it is often used in geological survey and it is also a very important technical means in geological survey.

1.2. Geological remote sensing method

Geological remote sensing method is a detection means that combine many functions, and it has been widely used at the present stage geological survey. Its main operation principle is to determine and identify target through the transmission of information from the electromagnetic waves from the sensor. And relevant equipment to handle the information contained in the electromagnetic wave is required. Geological remote sensing method uses the remote sensing technology to survey the geological environment of the construction site and to map out the detailed terrain and topography of the construction site based on the survey data. The method also provides precise guidance to carry out the construction survey work, and it has wide survey area, fast access to information, low cost and many other advantages. And these can improve the efficiency of geological survey work, save some time in geological survey, and hence provides certain conditions for building construction and early completion of construction work.

1.3. Digital photogrammetry method

Digital photogrammetry method is one of the important branches of photogrammetry and it has accurate, efficient, stable, fast and many other advantages. And the most important advantage is that it is free from the constraints of geological conditions, the measurement device is easy to carry and this helps to implement the survey work smoothly.

2. Analysis of the application of geological survey technology

2.1 Enhance technical support, ensure the efficiency of survey

In the development of science and technology, survey technology has been improved. And in field survey, it is possible to give full play to the technical advantages to obtain better survey results. The geological survey work is constantly getting deepened, construction workers should choose the technical means carefully, enhance the technical support, to take advantage of the new and efficient technology. It's to improve the survey efficiency. The widely use of computer has established a good foundation in technology innovation. Construction workers can take advantage of the advanced information technology and geological survey data, with the combination of the actual situation to establish specialized information database. And through this way, to conduct a comprehensive management towards the parameters, indicators and all kinds of information obtained from survey. The actual construction situation is also a key concern in geological survey. Start with mathematical geology, construction workers can grasp the possible existing problems, and hence develop a reasonable mission control team. In the analysis of geological conditions in building construction site, geological data has to be calculated and identify the rock types, simulated using statistical computer, and store related information.

2.2. Selection of technology based on the combination of geological conditions and science technology

In the geology survey work of building engineering, there are many types of geological conditions, so construction workers should determine the geological information during survey, and then select the geological technology to be used. In general, the geological conditions will be different according to the area where the project located, therefore the technology to be used will also be different. In order to ensure the accuracy and efficiency of survey work, a reasonable survey technique has to be selected in field survey. For example, both drilling and pitting are commonly used survey method. The former one is universally stronger and is applied better in various projects, while pitting method is more

focused on the field, and direct measurement, which give a real investigation feeling to surveyor. However, pitting method takes longer time and higher cost. Construction workers should select the reasonable and suitable survey technology with the combination of case analysis. For example, during geotechnical survey, drilling method is the main choice. However, in the project which the ground water depth is deep and investigation depth is relatively small, exploratory well is more often used, thus bring a better effect. During site visit, for relatively loose formation, construction works should apply static sounding, or Dynamic Cone Penetrometer. And through these tests, the geological conditions can be analyzed better and obtain accurate survey results. If the ground water depth in the construction site is relatively deeper, and the soil particle is larger, the method described above shall not be used because this could reduce the efficiency in survey. Therefore, the construction workers shall combine the actual situation, to optimize the selection of reasonable survey method, to enhance the overall survey results.

2.3. Strengthening survey effort and enhance the accuracy of geological parameters

In geological survey work, field trip is the basis for all project, staff shall combine the content of the field trip in the selection of survey method. Staff shall base on the terrain and topography features, to carry out site division. For projects with uneven and inconsistent terrain features, different survey method shall be used. For example, for site with undulating terrain, seismic method or electrical method shall be used to drill hole during bedrock characteristics survey, to grasp the main points of survey. For project in valleys, the first thing to be done is to determine the exploration line layout, then ensure the terraces are extending perpendicular to the line. And in particular slope at site, analysis shall be focused on the natural site, and lastly carry out the hole pit design if the site is located in an area which is relatively flat and open. Hydrogeological survey shall be carried out in the basis of which the geological structure is grasped, to determine the data information of the construction work, and ensure the quality of the survey.

In short, the construction works have developed better due to the promotion of economic development and there is growing emphasis on survey work. In medium and large scale construction projects, survey work has an important role and construction works shall carry out survey work prior to drawings design. From the analysis of the actual work, geological survey conditions will directly the construction design and inspection work, to establish a better foundation for construction. The selection of geological survey in project is also a detail that the constructions workers shall be focused on, especially in complex geological conditions, scientific survey technology have to be applied, to ensure the accuracy of the survey results.

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