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REVIEW

Discussion on the Main Points of Construction Quality Control of Geological Hazard Management Engineering

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ABSTRACT

In recent years, geological disasters have occurred frequently. This not only has a serious impact on urban construction, but also directly threatens the safety of life and property. In response to this situation, the control of the construction quality of the geological disaster management process must be strengthened to improve the construction quality of the treatment process. This paper mainly introduces the characteristics of geological hazard management engineering, common geological hazards and geological hazard treatment engineering, and expounds the key points and control measures of geological hazard management engineering quality control, so as to improve the construction quality of geological hazard management engineering.

1. Introduction

With the continuous development of modern society and the continuous improvement of infrastructure construction, the geological environment of the site is the key factor affecting the whole treatment project. Geological hazard is a kind of bad geological phenomenon, which directly brings geological environment to the surface and affects daily life. In the process of infrastructure construction, due to the complexity, polygon and inhomogeneity of geological conditions, some geological disasters will be encountered in the construction project from time to time. Construction areas where geological disasters occur must be treated. Therefore, geological hazard management engineering has emerged. Geological hazard management engineering is not a standard construction project. The construction environment is uncertain during the construction, so the effect of geological hazard management depends on the construction quality of the project in addition to the treatment plan. The key points of geological hazard management engineering construction quality control are the key factors determining the construction quality. Therefore, the key points of construction quality control should be studied to improve the construction quality of geological hazard management engineering.

2. Common Geological Disasters

The occurrence and continuation of geological disasters can be studied and analyzed from two aspects. On the one hand, due to the collision and movement of the Earth's

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plate, it is a geological disaster caused by the Earth during its self-development; on the other hand, sudden human geological disasters are caused by humans for certain reasons or specific conditions. According to the causes of geological disasters, geological disasters can be divided into two types: gradual geological disasters and sudden geological disasters. The main geological disasters caused by the former are avalanche, ground collapse, soil erosion, air pollution, etc. The latter mainly causes earthquakes, tsunamis, volcanic eruptions and so on. Sudden geological disasters have unpredictability. Its management is usually passive. Only after the occurrence of geological disasters can the affected areas be treated. Such geological disasters will not only cause serious economic losses, but also often cause casualties. Therefore, it is the focus of geological disaster management. For example, in 2008, the earthquake disaster in Wenchuan caused a large number of building buildings to collapse in the late afternoon, which caused serious damage to urban buildings. For these common geological disasters, with the continuous development of science and technology, relevant geological disaster monitoring departments have already had disaster information before the occurrence of geological disasters. However, only some preventive work can be done urgently, and the impact of geological disasters cannot be completely reduced [1].

3. Characteristics of Geological Disaster Management Engineering

Geological disasters occur in regions with the characteristics of concealment, progressiveness and harsh environment. Therefore, geological hazard management engineering was different from other construction projects.

3.1. Complexity of the Construction Environment

Geological hazard management engineering's construction area features rugged terrain and soft geology. The construction site is narrow and the geological conditions are complex. Therefore, during construction, it has the characteristics of complexity [2].

3.2. The Urgency of the Construction Period

Geological hazard management engineering is urgent because of its short occurrence time and large destruction. When geological disaster management is carried out, it is mainly to control the areas that have already occurred or are producing disasters, and has caused serious impact on construction or regional economy. The impact of geological disasters should be solved in the shortest time to ensure social stability [3].

3.3 Professionalism

Geological disasters have not been taken seriously in the past. With the development of social economy, people gradually realized that the harm caused by geological disasters has begun to affect people's daily life, and began to carry out geological disaster management work against geological disasters. Due to the late start of geological disaster management, the management of different types of geological disasters is not perfect, and there are still many problems. Geology is a specialized subject. A comprehensive understanding of geological hazard management engineering, geological expertise, engineering mechanics and other structural theory knowledge is required [4].

4. Importance of the Monitoring of Construction Quality of Geological Hazard Management Engineering

The control engineering of geological hazard is mainly to reduce the damage caused by geological hazard. Therefore, in the construction of urban buildings, it is necessary to strengthen the quality control of geological disaster control engineering construction. During the construction process, construction should be carried out in strict accordance with the standards for preventing geological disasters to ensure that the buildings can minimize the impact of geological disasters when encountering geological disasters. However, through the investigation of current construction projects, the main factors that cause the reduction of genetic hazard management engineering are as follows: First, the geological hazard management engineering was disregarded by the engineers. In most construction teams, engineers are mainly contractors with insufficient professional knowledge and low engineering experience. In the construction of the building, the economic interests of the construction are put in the first place. For the construction materials to cut corners, the construction quality cannot meet the requirements of resisting geological disasters. When urban buildings encounter geological disasters, there are a lot of collapse problems. Second, the construction technology of construction workers cannot meet the construction requirements. To improve the quality of the project, the construction technology of the construction personnel needs to be strengthened. At present, in construction projects, personnel costs are the highest construction costs. Therefore, in order to save construction cost, some construction units recruit technicians whose construction technology is not up to standard, which reduces the construction quality of geological disaster management project [5].

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5. Key Points of Quality Control in Geological Hazard Management Engineering

5.1 Quality Control Before Commencement

The quality control before construction is the pre-control period of geological hazard management engineering quality, and the most critical period of geological hazard management engineering quality control. Only by making a good start can quality management be introduced into the normal track. In this stage, the quality control system needs to be established and improved. For the external factors of geological hazard management engineering, the construction unit was urged to establish a quality control system with clear division of labor, perfect system and actual conditions by reviewing the construction plan submitted by the contractor, application for commencement of construction and qualification of designers, so as to improve the quality awareness and responsibility of the management personnel of the construction unit. Before the construction process, equipment and construction materials were tested, and management records of equipment and materials were saved. For important engineering construction processes, the proportion of various dopants is strictly monitored and audited. For the internal factors of geological hazard management engineering, a comprehensive understanding of the project under management is required. Combined with the characteristics of the governance project, the overall management concept is taken as the foundation to run through the whole construction project. The goal of the control project is to control the type of the project and control the construction quality at the system level. In view of each construction link, a reasonable treatment project plan is formulated, and the detection points are reasonably arranged. The quality control before geological hazard management engineering was strengthened to improve the engineering quality of geological disaster management [6].

5.2 Quality Control during Construction

The quality control in the construction process is the in-process control period in geological hazard management engineering, which is the most important growth period of quality control. During the on-going control period, the key points of quality control should be put in the implementation of on-site management. Through the quality control of different stages of the governance process, the process is connected into a process, so that the local control and the overall control are combined. The quality management system established in the early stage is applied to the construction. The quality management system can effectively supervise the construction process of the contractor, strengthen the inspection of the construction site, formulate a reasonable treatment plan, and clarify the construction steps in key areas. The quality of the construction materials was checked. After geological hazard management engineering was carried out, construction records and other engineering data in the construction process were checked to ensure the accuracy of engineering data and effectively improve the engineering quality of geological hazard management [7].

5.3 Evaluation and Acceptance of Engineering Quality

The evaluation and acceptance of project quality is the period of ex post control in geological hazard management engineering quality and the convergence of key points of quality control. During the post-control period, it is necessary to urge the contractor to inspect the construction quality in accordance with the evaluation and acceptance standards. When the contractor completes the self-inspection, a special assessment and acceptance department is also required to carry out the quality assessment on the completed geological hazard management engineering. When quality problems are found, the contractor shall be informed in time for repair. The acceptance work is divided into two parts: project entity and project file. The engineering entity mainly checks the appearance and quality of the whole project. The focus of engineering archives is to check the engineering data recorded in the construction project, ensure that the engineering data meet the actual requirements, and make a comprehensive evaluation [8].

6. Quality Control Measures for Geological Disaster Management Construction Process

At present, the quality control measures for geological disaster control in China mainly include anchor cable, drainage ditch and anti-slide pile. The following are the specific quality control measures of the three schemes.

6.1 Quality Control Measures for Anchoring Construction

When dealing with geological disasters, if it is slope reinforcement, retaining structure anchoring and landslide control, quality control measures of anchoring construction can be adopted. The following four factors need to be taken into consideration:

(1) Control of materials. The anchor material has high requirements for purchase, and has the characteristics of high strength, strong corrosion resistance and strong waterproof performance. When the material is introduced

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to the construction site, it should be convenient for later installation and processing. Therefore, in the purchase of anchorage materials, manufacturers need to issue a factory certification and quality certificate. Only the anchoring materials that meet the construction requirements can be put into use. At the same time, the experimental work of grouting, cement mortar and other materials was carried out. These materials can only be put into use after the experimental results meet the construction requirements.

(2) Quality control of construction hole. At present, the construction of geological disasters in the construction process mainly uses three kinds of machinery, namely, auger, impact drill and rotary drilling rig. In the hole making operation, the following basic elements need to be controlled: depth of the hole, diameter, angle, and pitch of the hole. After the hole is formed, the hole forming effect should be checked to ensure that the depth of the hole is higher than the depth of the initial design. The diameter error should be controlled at 10mm, and the deviation of the pitch should be controlled within 150mm. In the actual hole-forming construction, it is necessary to record the data of each hole to facilitate the later data monitoring.

(3) Anchorage grouting. Before grouting, the grout shall be proportioned according to the grout plan made at the initial design stage, and the grout shall be stirred sufficiently. In the process of slurry stirring, it is necessary to control the amount of slurry stirred each time. In anchoring grouting, the unimpeded flow of the grouting pipe needs to be maintained. When the slurry overflows the pipe, the construction should be stopped immediately. In the process of grouting, when the amount of slurry is not enough, it needs to be supplemented and the filling coefficient of slurry needs to be controlled. The slurry cannot be filled too much at one time. When the reinforcement is in the original position after grouting, the pipe is pulled out.

(4) Testing. When the grouting construction is completed, if the mortar strength is greater than 60%, the strength of the cement needs to be checked. The commonly used inspection method is the drawing test. The cement needs to be cured before the drawing experiment. Different types of cement require different curing times. The curing time of common cement is more than one week. During the drawing experiment, the construction shall be carried out in strict accordance with the design requirements [9].

6.2 Quality Control of Drainage Ditch Construction

(1) Construction setting out. According to the analysis of geological hazard management engineering, a reasonable design scheme of drainage ditch was formulated. According to the design of the drainage ditch, the edge of the slip surface of the landslide body should be clarified first. Then, the reference point and the control point are established around it, and the excavation can be carried out after being inspected by the supervisor. Before the trench is excavated, the height of the edge and the height of the bottom of the trench must be measured. The garbage in the bottom of the ditch shall be cleared by specialized cleaning personnel, and the drain shall be tamped down and then constructed.

(2) Masonry. The main construction materials used for masonry are rebar and concrete. During construction, the quality of reinforced concrete shall be guaranteed to meet the construction requirements. In addition, the control elements of grouted stone masonry and retaining wall are maintained at all times, and a reasonable slope of trench bottom is developed to reduce the influence of long-term precipitation.

(3) Backfill. After the completion of the masonry construction, the two sides of the canal shall be backfilled. In the backfilling, it is necessary to control the depth of the backfill so that it does not affect the laying of the later drainage system. After backfilling, it is also necessary to tamp it to improve the strength of both sides of the canal. In the later maintenance, the cleaning personnel need to clean the debris in the canal to ensure that the drainage effect meets the requirements [10].

6.3 Quality Control of Anti-slide Pile Construction

The quality control of anti-slide pile construction is mainly for excavation pile and retaining wall construction. First, the position of each pile position needs to be clarified before opening. The positioning pile is then placed outside the pile. When installing the retaining wall formwork, the locating pile is used to correct the position. Before opening the hole, the hidden danger around the hole is removed, and the internal anti-seepage work is done. When opening the hole, it is necessary to set a warning sign in the construction area. The wall of the orifice is raised by 500mm and used as a lock. When pouring against the pile, the concrete must pass through the chute. In addition, when the height of the anti-slide pile exceeds 3.5m, the stringer is used for pouring, and the strength of the anti-slide pile is improved to achieve the quality control of anti-slide pile construction.

7. Conclusion

To sum up, geological hazard management engineering is carried out in most regions of China at the present stage. It can not only reduce the degree of damage caused by

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geological disasters, but also improve the quality of life. However, in the actual geological hazard management engineering construction, there are still many problems. Therefore, this paper mainly analyzes the importance of common geological disasters, geological hazard management engineering and geological disaster management engineering construction quality monitoring, and clarify the quality control measures of geological disaster management construction process and the quality control points of geological hazard management engineering, so as to improve the construction quality of geological disaster management.

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