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Application of Surveying Technology in Land Reclamation Projects

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Abstract

China is rich in resources, involving various types including mineral resources, land resources, hydropower resources, etc. With the continuous expansion of economic construction scale, the land utilization rate has increased. In the context of the widespread application of land resources, in order to promote comprehensive social development, relevant personnel need to rely on advanced science and technology to achieve scientific remediation of land resources. Land remediation projects have become an important link in social and economic development. In order to improve the accuracy of land consolidation work, construction personnel need to fully utilize the advantages of surveying and mapping engineering technology to carry out consolidation work. In modern social construction, surveying and mapping engineering technology is a key driving force. The content of land consolidation work is complex and requires relevant personnel to have high-level professional knowledge and skills to improve the quality of land consolidation work from various aspects, avoiding waste of human and material resources due to low work quality.

Keywords

Surveying and mapping engineering technology; Land consolidation project; Technical application.

1. Introduction

Under the current economic development situation, land consolidation work has received widespread attention from society, and more and more construction units and related personnel have paid attention to the practical significance of surveying and mapping engineering technology. Land resources have different types of roles in different stages of development and construction. In order to meet the different needs of social development, relevant personnel need to scientifically and reasonably plan land.

2. Overview of Land Consolidation and Surveying Engineering Technology

Land consolidation work involves multiple aspects and has become a complex and diverse task. Correspondingly, it requires technical personnel to comprehensively improve their comprehensive quality, be able to conduct efficient land information surveys in practical work, and scientifically and reasonably plan land resources based on actual construction situations, in order to achieve the goal of high-quality application of land resources. Relevant personnel first need to combine development reality and strictly follow corresponding standards and norms to increase the intensity of land consolidation work. In the process of land planning, a series of problems lacking rational planning are often encountered. Management personnel should approach planning and management work with a scientific and rigorous attitude, achieve comprehensive handling of various issues, and improve the level of land transformation and remediation.

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In the context of modernization, the society is developing in a diversified direction. Surveying and mapping technology has many advantages such as progressiveness, so it is widely used in various fields, such as the current geological survey drawing design, various types of construction projects of building engineering, and surveying and planning in construction. The efficient use of surveying and mapping engineering technology has improved the construction efficiency. With the development of science and technology, surveying and mapping engineering technology has also made extensive progress, and land resources have been scientifically allocated in practical applications. Surveying and mapping engineering technology has become a key technology in land consolidation projects.

3. Key points of surveying and mapping technology application in land consolidation projects

In the process of carrying out land consolidation projects, in order to ensure the smooth progress of the project and promote the improvement of quality and efficiency, technical personnel should first design scientifically standardized cadastral maps based on the construction site conditions. This requires relevant personnel to strengthen the application of cadastral surveying technology and collect data information from relevant locations. Drawing cadastral maps requires technical personnel to deeply analyze the surrounding environmental conditions of the local area, combine them with the information of the measured land, and achieve the drawing of land area and ownership boundaries. Land surveying technology is based on the application of computer technology, and uses relevant equipment to assist in collecting and organizing the measured data information according to actual needs. When carrying out various projects, relevant personnel need to apply corresponding cadastral surveying techniques for different geographical environments to meet different surveying requirements and improve the accuracy of surveying information in practical applications.

In the process of applying engineering surveying technology, relevant technical personnel need to have rich professional knowledge in surveying and mathematics, and be able to carry out surveying work in different processes according to different engineering requirements in actual construction projects. The measurement requirements vary with the environment of the construction site, and technicians should use advanced technology to meet the corresponding measurement requirements during land development and leveling construction.

4. Application of Surveying and Mapping Engineering Technology in Land Consolidation Projects

4.1. Application of surveying and mapping technology in the preliminary preparation stage

In the current land consolidation project, technical applications are involved in various aspects, and relevant personnel need to carry out analysis work based on the actual situation of local land consolidation. However, when using measurement tools, there is often a lack of accuracy, which hinders the data collection process and largely violates the standard specifications for land consolidation project construction. Therefore, in order to improve the construction quality of land consolidation projects, technical personnel should make standardized selections of surveying and mapping techniques to ensure that the applied techniques comply with the construction regulations and are suitable for the actual situation. For example, the application of land survey and measurement techniques should be taken as a key link to improve the level of technical application. At the current stage of development, technicians often choose GPS measurement technology and survey methods for actual construction sites when carrying out exploration work. Due to the wide range of fields involved in land planning, technical personnel

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should conduct in-depth analysis of the work content in different fields in order to choose corresponding methods. For example, when planning the application of land, relevant personnel need to comprehensively consider factors such as land decision-making, earthwork calculation, and preliminary budget. In order to prepare for surveying and mapping technology, reasonable control of land area and length should be carried out.

In addition, in the preliminary preparation work, it is necessary to analyze the design work such as various operational processes, site selection projects, and special planning in the land consolidation project. In order to design a more intuitive and accurate working base map, technicians can use GPS technology to obtain corresponding remote sensing images through RS technology. GPS technology has multiple application advantages, enabling efficient positioning and facilitating step-by-step measurement of terrain points during the preparation phase of a project, thereby improving work efficiency and quality. In order to improve the effectiveness of land consolidation, technicians can flexibly use remote sensing technology and rely on drones to drive low altitude remote sensing surveying technology. In practical projects, remote sensing surveying technology is often affected by objective weather conditions, and can adapt to harsh weather conditions. In the application process of drone low altitude surveying technology, technicians are beneficial for scientifically optimizing the corresponding land consolidation work, achieving data supplementation with aerospace high-altitude remote sensing, and promoting the overall quality of land consolidation projects and the improvement of surveying accuracy. From a cost perspective, the application of surveying and mapping engineering technology can reduce corresponding labor costs while meeting construction needs, and obtain scientific data information in land development and remediation. Technicians can continuously optimize their technology and work efficiency through the precise application of data information.

4.2. Application of Surveying and Mapping Technology in the Implementation Phase of Land Consolidation Projects

The land consolidation project includes various aspects. In order to provide guarantees for the application effect of land resources, technical personnel need to fully utilize the advantages of surveying and mapping technology in each engineering link, and promote the overall land use efficiency to adapt to the trend of social development. The drawing of any engineering project is an important component, which requires relevant surveying and construction personnel to follow the design content of the drawings and carry out the construction process. The construction drawings should include the geographical and topographical conditions of the construction area, and ensure the quality of construction layout work to meet the corresponding construction standards. Technicians need to pay attention to the application efficiency of surveying and mapping technology. Firstly, in terms of team building, the construction unit should ensure that the construction personnel understand the content of the drawings and the design intent, follow the corresponding norms and guidelines, and avoid any violations. In the process of applying surveying and mapping technology, technicians need to clarify the procedures of frequent measurement, precision, and retesting. Before carrying out each step, high-level measurement and analysis of the relevant data applied should be carried out. According to the actual construction application requirements, the accuracy of the data should be ensured, and repeated or encrypted measurements are needed. In order to ensure that various surveying and mapping products meet application requirements, relevant personnel need to master the design and measurement specifications. In the measurement process, errors often occur due to subjective and objective factors. In order to reduce the probability of errors, technical personnel need to supervise each link and repeat measurements after the measurement is completed to improve the accuracy of data information and ensure the smooth progress of subsequent projects.

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In the implementation of land consolidation projects, the final stage is the acceptance work, which has a direct impact on whether the overall construction quality of the project meets the standards. In this stage, technical personnel need to conduct a detailed analysis of the completion drawings drawn after the project is completed. The completion drawings should fully reflect the effectiveness of the overall consolidation work. Relevant technical personnel need to conduct topographic measurements on the completion drawings, and the construction unit should provide accurate reference materials to the undertaking unit.

5. Conclusion

In summary, in the entire process of carrying out land consolidation work, relevant personnel need to first clarify the content and goals of land consolidation work in the current era, innovate construction concepts, widely apply surveying and mapping engineering technology to practical work, improve the level of technical application, summarize and analyze the problems that arise in actual work, formulate corresponding technical application strategies, and improve the quality of consolidation work.

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