

Research on Construction Management and Quality Control of the Baijiahe Land Reclamation Project in Jietoumiao Town, Huanglong County

Lei Shi ^{1, 2, 3, 4, 5, *}, Hongjian Fan ^{1, 2, 3, 4, 5}

¹Technology Innovation Center for Land Engineering and Human Settlements, Shaanxi Land Engineering Construction Group Co., Ltd, School of Human Settlements and Civil Engineering, Xi'an Jiaotong University, Xi'an, Shaanxi, China

²Shaanxi Agricultural Development Group Co., Ltd. Xi'an 710075, China

³Institute of Land Engineering and Technology, Shaanxi Provincial Land Engineering Construction Group Co., Ltd, Xi'an 710075, China

⁴Key Laboratory of Degraded and Unused Land Consolidation Engineering, Ministry of Natural Resources, Xi'an 710075, China

⁵Shaanxi Provincial Land Engineering Construction Group Co., Ltd, Xi'an 710075, China

*Corresponding author

Abstract

This paper takes the Baijiahe Land Reclamation Project in Jietoumiao Town, Huanglong County as the research object, and deeply explores the key points and practical strategies of land reclamation projects in construction management and quality control. Through a detailed analysis of the construction organization design of this project and combined with the research results of related fields, this paper expounds on the specific measures and their effectiveness of the project in construction deployment, progress management, quality and safety assurance, environmental protection, etc., aiming to provide referenceable experience and references for similar land reclamation projects.

Keywords

Land Reclamation; Construction Management; Quality Control; Environmental Protection.

1. Introduction

Land reclamation, as a crucial means to optimize the land use structure, improve land use efficiency, and enhance agricultural production conditions and the ecological environment, plays a vital role in China's rural revitalization strategy and agricultural modernization construction[1-2]. The Baijiahe Land Reclamation Project in Jietoumiao Town, Huanglong County, is large - scale, involving multiple administrative villages and some state - owned lands. Its construction covers many engineering contents such as land leveling, irrigation and drainage, field roads, farmland protection, and ecological conservation[3-4]. Scientific and reasonable construction management and strict quality control are the core guarantees for ensuring the smooth implementation of the project and achieving the expected goals[5]. In - depth research on the construction management and quality control strategies of this project has important practical significance for promoting the development of the land reclamation industry[6-7].

2. Project Overview

The construction scale of the Baijiahe Land Reclamation Project in Jietoumiao Town, Huanglong County, reaches 132.8884 hm² (1,993.33 mu), with a newly increased cultivated land area of 2.4985 hm² (37.48 mu), and a newly increased cultivated land rate of 1.88%. The project construction site is located in the Baijiahe Gully, Jietoumiao Town, southwest of Huanglong County, involving multiple administrative villages and state - owned lands. The main construction contents include land leveling, irrigation and drainage, field roads, farmland protection, and ecological conservation projects. These projects are interrelated and mutually influential, jointly forming a complex systematic project, which poses high requirements for construction management and quality control[8-9].

3. Construction Management Strategies

3.1. Construction Organization Structure

In terms of the organizational structure, the on - site organizational structure is divided into the enterprise support layer, project decision - making layer, project management layer, and construction operation layer. The enterprise support layer is responsible for allocating company resources and solving construction problems; the project decision - making layer coordinates project management; the project management layer is responsible for the management of basic work such as project progress, quality, and safety; and the construction operation layer is responsible for specific construction operations. Each level has a clear division of labor and close cooperation, providing a solid organizational guarantee for the smooth progress of the project.

3.2. Construction Schedule Management

The planned total construction period of the project is 113 calendar days, from July 10, 2018, to October 31, 2018. To ensure the realization of the construction period goal, the project has taken a series of effective measures. In terms of construction organization, a strong project management department was established, the contract responsibility system was implemented, the goals were decomposed to individuals, and a reward and punishment system that linked responsibilities and interests was implemented. In terms of equipment guarantee, a safety operation technical regulation for construction machinery and equipment was prepared, and equipment inspection and maintenance were strengthened to ensure the good operation of the equipment. In terms of construction management, advance preparation work on the construction site was carried out, resources were reasonably allocated, and the coordination and cooperation among different types of work were strengthened. In terms of technical support, network technology was used to control the construction period, and research groups were established for difficult points, fully considering the impact of seasonal factors. Through these measures, the construction progress of the project was effectively controlled, ensuring the timely completion of the project.

3.3. Construction Resource Management

In terms of material supply, the engineering department prepares a material use plan according to the construction plan, and the material department is responsible for procurement information collection, supplier evaluation, and other work to ensure that the quality of materials meets the requirements. After the materials enter the site, strict verification, identification, and sampling tests are carried out. For single - item projects with strong professionalism, although there is no subcontracting in this project, a complete subcontractor evaluation process has been developed. In terms of mechanical equipment management, a supply plan is prepared based on factors such as the construction schedule plan and

construction technology. A variety of advanced mechanical equipment, such as excavators, bulldozers, and loaders, are invested, and daily maintenance and upkeep of the equipment are carried out.

3.4. Difficulties in Farmland Ecological Protection Technologies

The construction of farmland shelterbelts requires reasonable planning of tree species selection, shelterbelt structure, and layout. At the same time, it is necessary to fully consider the coordination with farmland tillage and irrigation to avoid adverse effects on agricultural production. However, in actual operation, due to the comprehensive consideration of many factors, the planning difficulty is relatively large. In the implementation of the crop rotation and fallowing system, it is necessary to fully consider issues such as farmers' economic benefits and land transfer. Currently, a reasonable compensation mechanism and policy support system are still not perfect, which to a certain extent affects the enthusiasm of farmers to participate in crop rotation and fallowing.

4. Quality Control System

4.1. Construction of the Quality Management System

The project established a perfect quality management system in accordance with the requirements of the ISO9001 standard and the company's quality system. Full - time quality inspection engineers and quality inspectors were equipped to form a top - down quality management network. The principle of "whoever produces is responsible for management; whoever constructs is responsible for quality; whoever operates is responsible for ensuring quality" was implemented, and a quality - creating inspection system was established to ensure that quality control runs through the entire construction process. During the construction process, the "three - inspection" system (self - inspection by the work team, re - inspection by the engineering team, and final inspection by the quality inspection department) was strictly implemented, the technical disclosure system was adhered to, and standardized operations were promoted through process control and process control.

4.2. Quality Assurance Measures for Each Sub-project

In the surveying project, experienced surveyors and advanced surveying instruments such as levels and total stations were selected. A detailed construction plan was prepared, and the technical review system was adhered to ensure the surveying accuracy. In the concrete construction, strict control was exercised over the links of raw material quality, steel bar binding, concrete pouring, and maintenance. In the steel bar construction, the quality management points were clearly defined, the technical training of construction personnel was strengthened, and construction was carried out strictly in accordance with the specifications. In the crushed - stone pavement project, the pavement raw materials were strictly selected, the construction of the test section was done well, construction equipment and processes that met the requirements were used, and quality inspection during the construction process was strengthened.

5. Safety and Environmental Protection Measures

5.1. Safety Management System

The project established and improved a safety guarantee system, implemented laws and regulations on work safety, regularly held work safety meetings, and studied and solved work safety problems[10]. Safety responsibility letters were signed at all levels to clarify the safety goals of each level. Regular work safety inspections were carried out, including various forms such as routine inspections and construction site inspections, and potential accident hazards

were dealt with in a timely manner. For work safety accidents, the principle of "three non - lettings - go" was adhered to, and accident analysis methods were used to prevent and control accidents. During the construction process, special safety guarantee measures were formulated for key links such as construction power consumption, mechanical injuries, traffic, slope stability, and fire protection, and on - site organization management, behavior control, and labor employment management were strengthened [11-12].

5.2. Environmental Protection Measures

With the increasing emphasis on environmental protection in society, environmental protection work during the project construction process is of great importance. This project developed a reasonable sectional construction and traffic guidance plan to protect the underground pipelines along the project. An environmental protection leading group and an environmental protection system with the project manager as the person in charge were established to clarify the responsibilities of each department. In terms of noise control, low - noise mechanical equipment was selected, and sound - absorbing and sound - insulating measures were taken for major noise sources. Night construction required a permit. In terms of vibration control, appropriate construction machinery and methods were selected according to the location of sensitive points. In terms of water pollution control, measures were taken to ensure that wastewater met the discharge standards, and sedimentation tanks and special oil and dye storage facilities were set up. In terms of air pollution control, measures such as sprinkling water to reduce dust and reasonably arranging the construction site were taken. In terms of solid waste management, a reasonable soil - stacking site was selected, and construction waste soil and garbage were timely removed.

6. Conclusion and Prospects

Through scientific and reasonable construction management and strict quality control, the Baijiahe Land Reclamation Project in Jietoumiao Town, Huanglong County, has achieved good results in terms of construction period, quality, safety, and environmental protection. The successful implementation of the project has laid a solid foundation for local agricultural development and ecological environment improvement, and also provided valuable experience for other land reclamation projects. In future land reclamation projects, more efforts should be made to strengthen scientific and technological innovation, introduce advanced construction technologies and management methods, and improve the economic, social, and ecological benefits of the projects. At the same time, attention should be paid to talent cultivation to create a high - quality professional team for land reclamation and promote the sustainable development of the land reclamation industry.

Acknowledgments

This work was supported from the projects of "The Natural Science Basic Research Plan in Shaanxi Province of China (Program No. 2024JC-YBQN-0329)".

References

- [1] Li Liurong. Introduction to construction site management of land remediation project[J]. China Science and Technology, 2011, 000(023):110-110. DOI: 10.3969/j.issn.1671-2064.2011.23.078.
- [2] Pang Liguang. Several suggestions on construction management of land improvement projects [J]. Commodity and Quality-Construction and Development, 2014, 000(001):577-577.
- [3] Huang Qiongzong. Commonalities and characteristics of construction design for regional land improvement projects in Lingshan County, Qinzhou City[J]. China Science and Technology Journal Database Industry A, 2023.

- [4] LI PICK-PO, ZENG Li-Zhi, LONG Wen-Qin. Effective path of construction site control for land remediation projects[J]. Chinese Science and Technology Journal Database (Full Text Edition) Engineering Technology, 2022(4):4.
- [5] ZHANG Yan, LU Zhe. Study on construction conditions of land remediation project in Heihe County-Taking the land remediation project of Lazishan Village, Wuliangdian Town, Heihe County as an example[J]. Heilongjiang Science and Technology Information, 2013(19):1.
- [6] Huang Yingfeng. Project planning research on land comprehensive improvement project in She Tianqiao Township[D]. Hunan University, 2013.
- [7] Guo Yun. Design and Construction of Irrigation and Drainage System for Rural Land Improvement Project in the Rim of Dongting Lake Area - An Example of the Major Project of Rim of Lake in Hanshou County, Changde City [J]. Resource Information and Engineering, 2018.
- [8] TD/T 1041-2013, Quality inspection and assessment protocol for land remediation projects [S].
- [9] Zhou Shengxiong. A few points of understanding of construction safety of land remediation project [J]. Science and technology rich guide, 2014(18):2.
- [10] Li Shiwei. Analyzing the management method of construction site of land remediation project[J]. Rural practical science and technology information, 2014, 000(002):52-52.
- [11] Chang Sha. Research on construction management of engineering quality of land remediation project[J]. 2021.
- [12] Liu Cheng. Introduction to the construction site management of land remediation project [J]. Brick and tile world, 2019, 000(020):134.