

Discussion on practice of green highway construction based on high quality objectives

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Abstract: Creating green roads is an objective requirement for the transformation and development of the transportation industry. It is also an objective requirement for advancing the supply-side structural reform of the transportation industry and building a satisfactory transportation for the people. It is also an objective requirement for achieving a beautiful China. The author puts forward some practical experiences of green highway construction through the construction of the typical demonstration project of the Guangji expressway green highway.

1 Introduction

Through the construction of the typical demonstration project of the green highway of the Guangji expressway, the author deeply realizes that the top-level design is the key to the implementation of the green highway. The green highway construction must be implemented in the entire process and comprehensively. The supervision and management of the soil and water conservation industry is the key, and the significance of typical demonstration lies in the achievement of replicable and popularizable results.

2 Project description

The Guangji expressway is the section from the seventh link of the Shenhai expressway on the national highway network to Putian, Fujian, and Yanling, Hunan (G1517). The project will pass through six counties and districts in three cities including Fuzhou, Ganzhou and Jian. The total length of the route is 189.276 kilometers, and the estimated budget of the project is 12.624 billion yuan.

41.28 million cubic meters of earthwork and stonework for the entire Guangji expressway; 158 bridges with a total length of 35159 linear meters and a bridge ratio of 18.7%; 4 hubs, 11 interchanges, 3 service areas and 1 parking area.

3 Engineering features

The Guangji expressway is located in the over-wet area of the south of the Yangtze river. The geomorphic units are complex. There are red sandstone hilly landforms in the middle of Jiangxi, Laoshan mountainous terrain, and Jitai basin. The number of rainy and foggy days is large, and the water bodies are large. Red gauze is widely distributed along the road, passes through many residential areas and

rivers, and has many air, water and acoustic environment sensitive points. As the *Technical Standards for Highways* was updated, the central divider of nearly 170 kilometers of sections was replaced by New Jersey guardrails, and road landscape coordination and traffic guidance were poor.

The natural environment and ecological environment of the area that the project passes through are beautiful, the Ganjiang river, Meijiang river, and Minjiang river flow through the area, and the tourism resources of "green, red, patina" are rich. Along the line, there are scenic spots such as Qingyuan mountain, Cuiwei peak, and the Baili lotus belt. There are red resorts such as the revolutionary cradle Jinggang mountain, the former site of the Ningdu uprising command, as well as Diaoyuan ancient village, Wugu village, Meigang ancient village, Yangyi ancient Village, cultural monuments such as Ouyangxiu memorial hall and Yan tower in Song Dynasty. The Jinggang spirit and the Soviet union spirit originated here. Luling culture, Hakka culture, and tea culture complement each other here.

4 General layout of the high starting point

4.1. Clear positioning

According to the strategic deployment of the green highway construction and the overall requirements of the experimental zone of ecological civilization, combined with the characteristics of the project, comprehensively coordinate the project construction, overall planning, and scientific positioning, which are used to guide and implement the entire process of the project construction, and strive to create high-quality highway engineering .

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4.2. Project Vision

Guang Chong Ming De, Ji Zhu Model

4.3. Guiding ideology

We must firmly establish five development concepts, implement green road construction, strive to build ecological civilization demonstration roads, and achieve healthy and sustainable development of road construction

4.4. Construction Concept

We want to be intelligent and innovative, green, and creative, and strive for excellence

4.5. Construction goals

We must work hard together, cultivate elites with sincerity, and create excellent products with perseverance

5 High-quality green road construction

5.1. Scientific selection, consolidating the foundation for quality construction

5.1.1. We need to innovate and choose the contractor

5.1.2. We must reasonably divide the construction bids

5.1.3. We must implement general contracting for mechanical and electrical engineering design, construction and maintenance

5.2. Carefully crafted, constructing quality Dalin facilities

5.2.1. Dalin facilities standardization

5.2.2. Precision beam field operation

5.3. Process management, outline quality entity engineering

5.3.1. Taking labor competition as the starting point, and promoting typical approaches to achieve overall excellence

5.3.2. Taking the first demonstration system as the key point to promote standard work across the board

5.3.3. Using concrete appearance as a breakthrough point, carefully create quality engineering

5.4. Learn from others and improve quality construction ability

5.4.1. New equipment for bridge pavement

5.4.2. New method of prestressed engineering

5.4.3. New technology for slope protection

5.4.4. Stone blasting new technology

5.5. Strengthen supervision and create a quality and safe construction site

5.5.1. "Regulations" implementation responsibility

5.5.2. "Civil defense" raises awareness

5.5.3. "Physical defense" strengthens the foundation

5.5.4. "Technical defense" enhancement capability

5.6. Simultaneous measures to help quality engineering construction

5.6.1. Sunlight supervision

5.6.2. Green demolition

5.6.3. Cultural guidance

6 Green road construction experience

6.1. Top-level design is the key to green road implementation

As the main body of the highway project construction, the construction management unit should first start with the overall layout of the high-level project and clearly define the goal, "take the method from the top, only the middle, and the middle, so it goes down." At the beginning of the project design, Guangji expressway was closely linked to the connotation of "green" and "quality", and planned ahead, to make the top-level design. The guiding ideology of "firmly establishing the five development concepts", the construction concept of "smart innovation, green quality, ingenuity, and the pursuit of excellence" were clarified, and the project vision of "Guang Chongmingde, Jizhu Model" was established, and "considered together" "Fine, sincere education of elites, perseverance tree boutique," the goal of construction.

Further optimize and improve the engineering design according to the concept of green highways, and lay a

solid foundation for the implementation of green highways. Through the design optimization in the two stages of preliminary design and construction drawing design, the project's permanent land use has been reduced by 1,600 mu, of which 264 mu of arable land has been reduced and basic farmland has not been occupied. Earthwork volume has been reduced by 3.7 million cubic meters; 15 uranium or rare-earth mines or mining areas have been bypassed or basically bypassed, 4 ecologically sensitive areas such as Ningdu Meijiang National Wetland Park, Qingyuan Mountain Provincial Forest Park, and water source protection areas such as the source river (Fujiang) protection area or fetching water Mouth 15. The third is to implement high standards and standardized management, formulate relevant management systems, introduce corresponding incentive mechanisms, and concretize the concept of green highways, and make them executable and inspectable. Guangji expressway combined with the project characteristics to compile a programmatic document for project management— "one outline and five volumes", which are: project management outline, safety management manual, quality management manual, integrity work manual, standardized management implementation manual, and green highway construction A practical manual that systematically clarifies the project's management concepts, systems, systems, and processes, refines the management details of green highways and quality engineering construction, and lays a solid foundation for achieving green highways and quality engineering.

6.2. Green road construction should be implemented in the entire process and in all directions

Different from the typical demonstration projects with clear themes in the past, green highway construction is more about exploring how to provide better products and services for the masses of people under the constraints of social needs, ecological environment and natural resources. Therefore, in the construction process of green roads, on the one hand, it should start from the planning and research of the project, covering the entire process of design, construction, operation and management, and encourage all participants in the design, supervision and inspection, construction, scientific research and other parties to participate and work together. Starting from the details, let the green road be built in a little bit. On the other hand, the implementation content should cover all aspects of resource conservation, ecological protection, quality construction, service improvement and innovation drive, including not only the highway itself, but also the surrounding environment involved in the highway, and the hardware facilities provided for operations, etc. consider.

6.3. Green construction is a key link in building green highways

Compared to the design stage, it is more important to

implement the concept of green highways during the construction process. Actively promote the construction of green highways through measures such as land conservation, material conservation and recycling, and environmental protection. The design is just a "blueprint", but the construction is really "earthmoving", and there is still much room for improvement in the construction of green highways. In order to implement the concept of green highway in the construction stage, the Guangji project proposed the "green construction" goals, including the content of Yonglin combined with land conservation, special management of soil extraction and abandonment, engineering wounds near natural ecological restoration, environmental (water) protection monitoring and improvement, green production technology for asphalt pavement, etc.

6.4. Actively participate in environmental (water) protection industry supervision and management

Under the guidance of the "five development concepts", ecological environment protection has mentioned a more important position. The environmental protection (water) protection industry's requirements and standards for road construction are also getting higher and higher. The environmental (water) protection acceptance is also the completion of the project. The key link. Rather than passively accept, take the initiative. The first is to actively invite or entrust the environmental (water) insurance supervision or monitoring unit to supervise and monitor the construction unit during construction, and timely feedback if there are problems; the second is to actively organize the construction unit to regulate construction according to relevant requirements and protect the surrounding environment; the third is to take the initiative to rectify illegal acts during the construction process.

6.5. Innovation-driven is an important productivity of green highway

Science and technology are the primary productive forces, and green highway construction is no exception. The innovation drive of green highways is: first, to carry out technological innovation and application according to engineering needs; second, to encourage front-line personnel to carry out micro-innovation by the masses; and third, to expand the application of "Internet +". During the construction of the Guangji expressway, the "Internet +" function was expanded to realize the informationization of project management and the intelligentization of quality control. The mobile time and attendance, engineering progress monitoring, subgrade compaction monitoring, video monitoring and other systems were launched, which was implemented in all road marking sections. Real-time monitoring of the construction process of transportation, modification processing, mix ratio, paving, and rolling of pavement construction; 3 bids were selected to explore the concrete mix ratio, prestressed tension, and prestressed pipe

grouting for precast beam production Real-time monitoring.

6.6. The significance of typical demonstration lies in the achievement of replicable and scalable results

Typical demonstrations are typical approaches, demonstration applications, and the goal of overall progress is achieved through "comparison, learning, catching up, and exceeding". Therefore, the significance of the typical demonstration lies in: first, to solve difficult engineering problems and provide successful experiences for other projects; and second, to form standards so that other projects can be copied and learned. During the construction of the Guangji project, emphasis was placed on experience summarization and technology promotion. One was to compile the evaluation system and construction guidelines for green highways in Jiangxi Province. The other was to revise *the Guidelines for Survey and Design of Expressways in Jiangxi Province* based on the "green highway" and "quality engineering" concepts. The third is to formulate industry or local standards for new technologies such as rubber powder modified asphalt pavements, drainage pavements, green service areas, and foamed lightweight soils.

7 Conclusion

Building green roads is an objective requirement for the transformation and development of the transportation industry. It is also an objective requirement for advancing the supply-side structural reforms of the transportation industry and building a satisfactory transportation for the people. It is also an objective requirement for achieving a beautiful China. Therefore, green road builders should improve their standing. Think in other words, jump out of the industry and look at the industry. First, the "going out" of highway projects to learn from the successful experience of other industries will help to enrich the connotation of "green highways" and improve the quality of highway construction. The "green buildings" in the construction industry have great inspiration and help on how we build "green highways". The standardized construction of high-speed rail projects has also greatly promoted the standardized construction of expressways.

Second, the construction of highway projects involves many industries, such as environmental protection, soil and water conservation, and project auditing, which have important impacts on project construction and completion acceptance. These industries have their own industry standards. How to coordinate and strive for support is crucial for green highway construction.

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