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Research and Application of Gas Pipeline Planning and Balance Technology of Urban Green Highway

Hui Lu¹, Qinghua He¹, Weijie Yue¹, Chao Chen¹, Zhengkai Li¹, Zhaoming Wang^{2*}

¹ Guangzhou expressway co. LTD, Guangzhou, 510310, China.

² Research Institute of Highway, Ministry of Transport, Beijing, 100088, China.

*Corresponding author's e-mail: wangzhaoming1984@163.com

Abstract Under the background of rapid promotion of green highway construction, while highway construction pursues efficiency, quality and engineering durability, environmental protection. In addition to environmental problems such as noise and dust, urban green highways also face special problems such as pipeline balance, relocation and construction organization. This paper taking Huadu to Dongguan highway as the research object. The author analyses the layout of electric power, water conservancy, network and even military network, puts forward the plan and examines the problems existing in the construction. Finally, the planning and construction drawing design were carried out, and the pipeline movement, change and balance technology were successfully applied.

1. Introduction

Green highway is an important part of green transportation, according to the system theory and the cycle cost thought, overall highway construction resource conservation, ecological and environmental protection, energy saving efficiency and the service, the overall highway planning, design, construction, operation and management of the whole process, with minimal resource usage, the smallest energy consumption using, the lowest pollution emissions, the lightest environmental impact, obtaining the optimal project quality and efficient service, realize the external maximum balance between rigid constraint and supply. However, after several years of green highway construction practice and green highway construction and evaluation standard research, found that although green highway construction has a relatively complete construction program and good expectations, but the proposed green highway construction characteristics, green technology, green concept is difficult to achieve. Especially in the process of green highway construction, prominent environmental problems and illegal construction occur frequently, which fail to reflect the protection of the environment and the restoration of nature. Therefore, this paper combines the environmental problems in the construction process of green highway and the concept of environmental stewardship to realize the environmental supervision during the construction period of green highway and provide scientific basis and effective technical support for the environmental supervision during the construction period of green highway.

The municipal pipeline is the "blood vessel" and "nerve" of the city, and the "lifeline" of urban resource transmission and information transmission. As a highway, especially urban highway, it is inevitable to cross construction with municipal pipeline. In municipal pipeline concentration areas, how to use municipal engineering pipeline comprehensive planning and design technology, reasonable



of underground pipeline project, the floor space position and status, avoid municipal engineering pipeline and urban expressway cross interference, economical use of land, to save time and cost for line balance and change is the key research of this article.

2. Study area

The Huadu-Dongguan expressway project is a key construction project of Guangdong province and Guangzhou city, and it belongs to the seventh important highway in Guangzhou high speed expressway network. The route starts from the south exit of Baiyun airport in Guangzhou and is connected to the airport expressway. It goes east through Renhe town and Zhongloutan town in Baiyun district, Zhongxin city and Jiulong town in Huangpu district, China-Singapore town, Yongning Street, Xiancun town and Shitan town in Zengcheng district, and ends at Shitan town and is connected to Zengguan Shenzhen expressway. The completion of this project will better enhance the traffic capacity of Baiyun international airport and is of great significance to the economic development of Guangzhou airport economic zone, China-Singapore knowledge city and Zengcheng national economic development zone.

The project intersects the Beijing-Hong Kong-Macao expressway (Beijing-Zhuhai expressway) at K12+197.403, and the main design scope is K10+900-K13+095, mainly to solve the rapid transformation of traffic between the Huaguan-Dongguan expressway and the Beijing-Hong Kong-Macao expressway (Beijing-Zhuhai expressway). It intersects the Beijing-Hong Kong-Macao expressway (Beijing-Zhuhai expressway), and the interchange form adopts a hybrid full interconnection scheme. The minimum horizontal curve radius of the main line of the interchange is 2000m, and the maximum longitudinal slope is -2.344%. The minimum radius of ring ramp (B ramp) is 55m, and the minimum radius of other ramps is 80m (E ramp). The maximum longitudinal ramp of ramp was 3.95 % (ramp B).

3. Technical preparation

(1) Technical personnel shall ask for construction drawings from relevant parties, collect all relevant technical documents and relevant standards and specifications, and find out the situation of pipeline passing through the greenbelt or municipal pipeline under the sidewalk in the urban area, light cable covering and so on.

(2) The engineering and technical personnel shall give detailed technical guidance to the construction personnel, make disclosure according to the design and specification requirements, and understand the engineering characteristics, basic construction contents and quality requirements.

(3) Organize technicians to learn and master the contents of engineering construction drawings, technical requirements, construction acceptance standards and the spirit of relevant documents.

(4) Organize relevant technical personnel to step the construction site, understand the specific situation of the construction site of this bidding section, and ensure the construction scheme is reliable, feasible, reasonable and scientific. Compile construction organization design and relevant construction work instruction according to site survey. Prepare construction plans for special sections and crossings, and examine and approve them according to the prescribed procedures.

4. Construction preparation

(1) Making clear the division of construction tasks and allocating construction equipment.

(2) Conduct ideological education for construction personnel, and require every manager and construction personnel to establish a good image of pipeline workers, and reflect the spirit and appearance of contemporary builders from the aspects of life style and social morality.

(3) Conduct HSE education for all construction personnel, and educate the staff to establish the ideology of "safety first" and the consciousness of environmental protection according to the special conditions of the project construction, geographical conditions and geographical environment.

(4) Organized trainings for various types of work and training on posts. Organize management personnel, technical personnel, crew leaders, surveyors and other personnel to carry out technical

training and skill competition. Only those who pass the examination can participate in the construction of the project.

(5) Organize special job training and training. Conduct training and practical training for all welders, anticorrosive workers, riggers, plumbers and manipulators who plan to participate in the construction, and learn relevant process rules and standards. In particular, the welder and the anticorrosive worker shall participate in the qualification examination organized by the owner, and only after passing the examination can they participate in the construction of this project.

(6) Carry out maintenance and repair in batches according to the equipment configuration plan, and determine self-inspection, self-repair or in-plant maintenance according to the equipment status. According to the construction requirements of pipeline engineering, the main construction equipment and tools our company provides for this section include mobile power station, pipe bender, large-displacement pressure fan, external interface device, etc. For details, please refer to the equipment list of main equipment and tools. The company has arranged maintenance personnel to overhaul all the machines and equipment, so that each machine and equipment is in good condition and can be delivered to the construction site in time after winning the bid.

(7) In order to ensure the machines and equipment in the construction are in good condition, a special repair and maintenance team is established to be responsible for the maintenance of all construction machines and equipment on the construction site. The maintenance team will earnestly implement the company's equipment inspection system, equipment maintenance system and oil and water management system, establish a commonly used parts warehouse, prepare sufficient spare parts, and ensure the site equipment in good condition.

5. The construction plan

(1) General highway construction scheme. When excavating a highway by means of detour and detour, the terrain of crossing point should be examined first and proper detour direction should be selected. The footpath is 150-200m long. Or a detour can be made by using the existing or abandoned nearby roads, which can be repaired if necessary. The detour road shall be constructed by bulldozers and rollers. Subgrade must be solid, in the construction of thin land section should be pulled gravel fill subgrade.

(2) Farmland construction plan. Most sections of this section cross farmland cultivation area, and the first consideration of line crossing farmland construction is to minimize the damage to farmland. According to the previous construction experience, the construction scheme of mechanical piping and trench welding can minimize the occupation. Construction procedure: construction preparation survey lay-out pavement construction trench excavation pipe laying welding backfilling and geomorphologic restoration three piles burying.

(3) Pipeline construction scheme across woodland and cash crop .In the densely forested area, the width of construction belt should be compressed as far as possible to reduce the damage to fruit trees, trees and vegetation, and the use of trench-bottom pairs should be mainly considered. Meanwhile, in the whole construction process, all working procedures should pay special attention to the safe use of fire to prevent fire. During the cleaning process of the construction work belt, the fruit trees, trees and other plants in the construction work belt that seriously affect the construction work must be removed; Do not affect the construction of low plants, as far as possible to reduce the amount of damage. The principle of clearing the vegetation in the operating zone is "no moving, no moving, no cutting and no pushing", so as to reduce the damage to the ecological environment caused by the construction. Firmly put an end to the construction equipment, machinery and tools beyond the operation with random digging, random pressure, and disorderly walking phenomenon. According to the actual situation analysis, and my company in the construction of similar projects in the past experience, in cooperation with related departments, the local government through positive and reasonable to help farmers along the economic crops, give decent compensation, then construction group of welding way under the ditch can guarantee the construction work belt width control in the design scope.

6. Conclusions

Pipeline comprehensive balance technology was conducted before the construction of the comprehensive analysis and validation of technical measures, the construction drawing of the simulation is used to study problems and contradictions that exist in the pipeline construction, can improve the efficiency of construction management, and maximize the protection of all construction units operating space and time, in short, the end result is to improve the efficiency of engineering in application of this technology and benefits.

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