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Consideration and Discussion on Green Highway Construction in Urban Area

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Abstract: Green highway construction is the concrete action of the highway industry to continuously improve the development concept. It is the inheritance of green and mysterious low-carbon highway in the new period. Green highway is the use of energy saving, low-carbon and environmental protection technology in the new period. Urban roads are crisscrossed, pipelines such as gas, electricity and water conservancy are densely distributed. The sensitive points such as villages and hospitals are widely distributed, and land pressure is high. These complex characteristics make construction difficult. Therefore, it is of great significance to focus on the construction of the urban road green transportation technology demonstration project with the theme of "green construction and safety first" and build a green highway with urban characteristics.

1. Introduction

Green highway is an important part of green transportation. According to system theory and cycle cost theory, the main purpose of green highway is to use the least resources and have the least impact on the environment. Green highway's construction runs through the whole cycle, including planning, design, construction and operation.

Urban green highway is faced with pipeline balance, pipeline relocation and other work. Meanwhile, due to the pressure of land shortage, green highway design is faced with the design of land saving and intensive green construction. Due to the particularity of urban highway environment, the road construction process is faced with the characteristics of dense distribution of sensitive points of noise, and effective measures should be considered in the construction process. In addition, the construction process should also consider dust and other environmental issues. Therefore, these problems have put forward very high construction requirements to the urban green highway.

Green highway is an important part of green transportation. According to cycle cost thought, highway planning, design, construction, operation and management of the whole process, with minimal resource usage.

However, after several years of green highway construction practice and green highway construction, the author found that green highway construction has a relatively complete construction program and good expectations. 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.



2. Construction significance

(1) Green highway is a way which can save resources, protect environment and reduce pollution in the urban area.

(2) Urban green highway construction should consider the prevention and control of urban noise, dust pollution, pipe network regulation and sewage treatment needs to be carried out simultaneously.

3. The main problems in the construction of green highway are as follows

(1) In the process of highway construction, supervision is more about the construction quality and construction management. The environmental protection issues are provided by environmental supervision and environmental monitoring units with some reports and data. During the construction period, environmental monitoring cannot supervise the construction process in real time for the passive measures that have produced or are producing pollution. Even when monitoring the occurrence of pollution events, there are basically no repair and treatment measures. The supervision of ecological and environmental problems in the construction process is basically absent.

(2) Especially in urban highways, Dust is easy to spread in the air, often did not wait until the inspectors arrived at the scene has spread, and it is difficult to monitor the scene.

(3) During the construction period, the noise mainly comes from civil construction, bridge construction, demolition and relocation construction and transportation vehicle noise, etc. Especially the old road digging, building demolition, bridge pile foundation construction and concrete pouring, which has a significant impact on the public (especially the close-range sensitive buildings) along the road.



Fig. 1 Dust removal by water spraying in the excavation process



Fig. 2 The exposed ground after excavation was covered in time

4. Green highway measures in urban areas

(1) Aerial photography of construction process is carried out regularly by unmanned aerial vehicles. Supervision frequency is customized according to actual conditions to summarize and reflect construction status and construction environment problems.

(2) Through fixed-point environmental monitoring, the sensitive areas of construction environmental pollution are monitored, such as the schools and hospitals near the highway for real-time monitoring of air quality and noise, and the monitoring data are analysed.

(3) The surrounding of the construction site shall be no less than 2.5m high. It shall be firm, smooth, clean and beautiful.

(4) Construction enclosure appearance beautification, lighting, "civilized tree new style" public service advertising area accounted for more than 80%.

(5) Dust screen shall be used to cover the exposed ground on the construction work surface, or temporarily stored for a long time or more than one day, or adopt greening and solidification measures. The weft density of dustproof mesh shall be greater than 3 pieces/cm.

(6) Fine particle building materials which are easy to produce dust should be stored or covered in a closed way. Other construction materials should be classified and neatly arranged according to relevant requirements.

(7) Effective dust control measures, such as covering or temporary greening, shall be taken on the bare land of the site where construction has stopped (**Fig. 1**).

(8) For earthwork, wet methods such as dust removal by fog gun and water spraying by sprinkler are adopted in the excavation process. The exposed ground after excavation shall be solidified or covered in time (**Fig. 2**).

(9) In the construction site, a special person is responsible for the sanitation and cleaning, increasing the frequency of sprinkling water, keeping the ground moist and ensuring that there is no floating dust.

(10) The temporary installation, enclosure and garbage of the construction site must be cleaned up in time, and effective dust removal measures must be taken during the cleaning.

(11) The main roads in the construction site shall be hardened, and the surface materials shall be concrete, fine stone and steel plate after the earth layer is compacted.

(12) Material storage area, large template storage area and other sites flat compaction, surface materials with concrete, fine stone, etc.

(13) The main entrances and exits of earthwork construction sites in the region are equipped with a car wash basin to prevent vehicles from entering and leaving the site with mud on the road.

(14) "Three guarantees" (including cleanliness, order and beautification) will be implemented on both sides of the 100m pavement at the exit of the mixing station and the rebar processing plant. Special personnel will be responsible for washing and cleaning to ensure "no dust discharge, no dirt on the road surface, no mud on the vehicle and no dust on the surrounding area".

5. Conclusion

With the rapid development of economy, China has gradually increased the construction of urban roads and other infrastructure, which plays an important role in the development of urban economy and the improvement of residents' living conditions. However, in the process of road construction, it will inevitably cause adverse effects on the surrounding environment, especially noise and dust pollution. With Huadu to Dongguan road construction noise and dust control increasingly strict, the traditional noise and dust pollution prevention and control measures. Based on the measures should further more effective noise reduction of dust suppression, to protect the environment on the construction site, to minimize the city highway construction noise and dust pollution. To provide the public with quiet. To promote the coordinated development of national economy and social environment. Development trend of green highway should comply with the environmental protection, carry out green-housekeeping service mode to help enterprises reduce environmental risks, promote environmental awareness and management level. To promote the overall environmental management level of ascension, truly maximize economic, social and environmental benefits.

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