

Discussion on Construction Technology and Reinforcement Measures of Highway Retaining Wall

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Keywords: Highway; Retaining wall; Construction technology; Reinforcement measures

Abstract: With the advancement of society, people's economic level has increased, and the demand for self-level of living has increased, which requires that the hardware implementation in all aspects should be more advanced. As the saying goes, "To be rich, to build roads first". This sentence is still important today in the 21st century.

In the construction drawings of highways, there is an important and difficult step that how to carry out the soil. The most widely used in China is the formation of retaining walls, especially the geological environment built by highways is very complicated in the mountains. This paper takes the construction technology of highway retaining wall as the starting point, explores how to strengthen the reinforcement technology, and proposes rationalization for the construction of highways in China to promote the construction of highway engineering and the development of social economy in China.

In the process of roadbed engineering, the role of the retaining wall is to fix the embankment and the edge of the roadbed, reduce the road surface, and prevent the mountain water from scouring the foundation in the future. It is most common in areas prone to soil and water landslides. During the construction of the road, many of the terrain conditions are very complicated, and the construction is very steep. Therefore, the construction technology and reinforcement measures of the retaining wall are the problems that need to be considered in the current highway engineering in China, and then the discussion of it is put forward to provide reference for highway engineering construction.

1. The Design Principle of Highway Retaining Wall

1.1. Selection principle of Retaining Wall Materials.

In the design of highway retaining wall, the selection of materials is the most basic and critical, and the most appropriate selection should be made according to the situation of the terrain. At present, the choice of masonry stone is more, and it is relatively easy and has no technical difficulties for the construction. It is widely used in the construction of highway engineering. But in the mountainous area with bad terrain, the height of retaining wall is about 10 meters. Most of them are stone resources. They are adapted to local conditions from the point of view of safety, and try their best to meet the needs of saving economic costs^[1].

1.2. Choice of cut-in Position.

In the construction of highway retaining wall, choosing the way of retaining wall at the edge of subgrade can reduce the height of hill slope and reduce the damage degree of surrounding hill, so that the original balance of hill can be maintained while retaining the subgrade, which is more common for steep sections around highway construction. When the terrain is relatively bad and the geological conditions are relatively poor, it is necessary to carry out on-the-spot investigation first, instead of randomly selecting the entry location, and to analyze the specific situation. Most of them will choose the shoulder retaining wall, which will be more economical.

2. Construction Technology of Highway Retaining Wall

2.1. Excavation Technology of Foundation Pit.

Before carrying out the excavation of the foundation pit, it is first necessary to clearly understand the geological conditions of the construction site. In this case, the design of the construction scheme should be carried out according to the terrain, and then the excavation line of the foundation pit should be determined, and the rainwater should be fully considered. The intercepting ditch design reduces the damage of rainwater to the retaining wall. After the excavation line of the foundation pit is clarified, the construction can be carried out according to the designed scheme, and the excavation line according to the designed excavation line should be carried out during the whole construction period. When the rock is encountered during construction, it can be directly laid out according to the slope of the wall. When the upper and lower sections of the retaining wall are simultaneously constructed, the construction of the shoulder wall should be carried out according to the actual situation. The entire construction technology of the subgrade is mainly to excavate the foundation by means of machinery, and assisted by manual trimming, and then the foundation pit is formed by blasting. After the cleaning is completed, the foundation pit is formed ^[2]. In addition, the drainage ditch should be designed in the case of the rainy season to ensure that the base will not be damaged. After the completion of the foundation pit, it is necessary to review it again to ensure that it conforms to the design, so that the foundation pit can meet the requirements.

2.2. Masonry Technology of Wall.

The construction of the wall is the next step after the completion of the foundation pit construction. When the wall is being built, the subsequent completion of the foundation pit should be completed, and the existing foundation should be thoroughly cleaned to ensure that it will not hinder the construction. In the process of the completion of the wall, the wall can be formally built. The other one is that the wall below the wall should not be masonry with the veneer. When the wall masonry is basically completed, the backfilling work should be carried out immediately, as well as drainage works and seepage prevention works to prevent the wall from being soaked by rainwater. The masonry of the wall is the most important step in the design of the retaining wall. The masonry section of the wall is placed in the settlement gap. In the formal masonry of the wall, the design of the fixed plank should be carried out, that is, the placement position of the asphalt board should be set first. The structural section and the position of the settlement joint should be fully considered, and the distance should be calculated in advance, the required building materials should be prepared, and the height of the wall should be fixed in a reasonable range ^[3]. In the masonry construction process of the wall, the most important thing is to pay attention to the intertwining, cross-linking and compaction of the joint materials between the joints.

2.3. Technology of Backfilling and Jointing.

In the construction process of retaining wall, backfill is needed in the upper and lower retaining sections, and the requirement of this construction part is that backfill should be carried out in time while masonry is carried out, and follow-up filling should be done well. Its main construction technology is the use of small press for frog compaction, and for the case where the pressure machine cannot be used because of the terrain, manual compaction is required. The operation of hook joint is carried out after the completion of wall masonry. The technique of jointing is carried out with M10 mortar, which is beautiful and economical.

2.4. Design technology of Drainage Hole.

One of the construction techniques of the road retaining wall can not be forgotten, that is, the setting of the drainage hole. When designing the construction, the drainage factor should be designed, and the function of the drainage wall should be used to ensure the service life of the retaining wall. In the process of laying the wall, the distance design of the drainage hole on the wall should be paid attention to and arrange the drainage hole at a certain length to ensure that there is no

water in the retaining wall and the location of the hole placement must also be paid attention to. The requirement is that the soil near it must be tamped and not easily washed away. At the same time, the position of the upper and lower drainage holes should be staggered, and the drainage holes should be blocked to prevent the animals from entering the drainage hole for hollowing out, resulting in the collapse of the shoulder of the retaining wall.

3. Reinforcement Measures of Highway Waterproof Wall

3.1. Improving the Stability of Retaining Wall.

The reinforcement measures of highway retaining wall can reinforce some foundations to ensure the stability of retaining wall. It can set steps on the wall, and the width of the steps is about 20 centimeters. In this way, the retaining wall can be widened, and the compressive stress on the base can be shared and buffered, to improve the stability of the retaining wall. In addition, suitable materials can also be used to fill in-depth in the foundation of retaining wall. For example, gravel, sand, slag and other materials can be used, so that the effect of this measure is to disperse the compressive stress of the foundation and maintain stability.

3.2. Setting of Settlement Joint and Expansion Joint.

Setting of settlement joints is mainly to avoid cracking of retaining wall caused by uneven settlement of foundation. Therefore, reasonable settlement joints should be set according to the height of wall and the change of foundation properties of retaining wall. Similarly, the expansion joints are designed to reduce the effect of shrinkage hardening and temperature caused by weather conditions on the retaining wall, and the expansion joints are set according to the local natural climate and weather conditions.

When the settlement joints and expansion joints of the retaining wall need to be set together, the main thing is to set one joint at every 10-15 meters of the wall position, and its width should be designed between 2-3 centimeters, referring to the top of the wall from top to bottom to the base ^[4]. The materials used in the joints should also conform to the construction technology of the retaining wall. The relatively elastic materials such as asphalt flocculent, asphalt bamboo fleece or asphalt wood board should be used, and the materials should be filled along the inner, outer and top sides of the retaining wall, and the filling depth should be greater than 15 cm, to play a reinforcing role in the retaining wall.

3.3. Connection of Wall Top and Road Surface.

Retaining wall is a very important measure in highway engineering. If the retaining wall is unstable and not strong enough, it will have a direct impact on the road, and traffic congestion will occur. In severe cases, landslides will cause life danger. Therefore, the connection between the retaining wall and the road is very close. When the wall width of the retaining wall is greater than the width of the shoulder of the road, the part of the retaining wall invading the highway shoulder should be reserved for paving the road. At the same time, C20 concrete should be used to pour 2 cm below the top of the shoulder wall, and steel bars should be embedded in advance, and anti-collision walls or fences should be set up to protect the highway retaining wall.

4. Conclusion

In order to improve the rapid development of the economy, it is inseparable from the construction of highway engineering. The road is the carrier of transportation and the strip that transports the characteristics of various places. Therefore, the highway is the witness of the formation of the new era. Construction engineering technology is the main point of discussion, and highway retaining wall is an important step of construction. The highway retaining wall is a structure used to support the foundation or the hillside soil to prevent the filling or the deformation of the soil. In general, highway retaining walls are an important part of highway engineering. They are irreplaceable in highway construction, especially in areas with relatively harsh topographical

environments. When constructing techniques and reinforcement measures for retaining walls, it is necessary to take measures according to local conditions, design reasonable plans and select appropriate materials, and improve the construction quality of the retaining wall and save economic costs, thus promoting the development of the highway retaining wall.

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