

Study on Cost of Bridge Engineering under Different Pricing Modes

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Abstract. As a result of the different investment and management system, Chinese road and bridge and other basic investment and construction projects are divided into municipal engineering and traffic engineering construction projects, belonging to the Ministry of Housing and Urban and Rural Development and Transportation Department of the two departments for construction and industry management. Correspondingly, in the road and bridge engineering, the formation of the municipal engineering and highway engineering two sets of different pricing model and project cost management model, they each have a set of different pricing methods and estimates, budget estimates, in the cost management and control also have different relevant provisions. According to the results of the project cost analysis of a road and bridge project in Guangdong Province, it is found that the municipal budget of road engineering is 2% -3% higher than that of highway budget. The prefabricated small and medium span bridge municipal budget is basically the same as the road budget cost, and the medium and small span and large span cast Budget is about 3% higher than the road budget cost, but the above cost comparison results will change with various cost factors. The results of the above analysis and research can be used as an important reference for government investment control department, project construction unit, design unit and bid unit in investment control, cost management and cost calculation.

Introduction

According to the National Statistical Yearbook 2010 published by the National Bureau of Statistics, by the end of 2009, the roads and bridges of the city's municipal facilities have a length of 269,000 km, basically all of them for high-grade roads. In 2009, the total output value of civil engineering construction (excluding the value of construction projects and transportation projects) was 229.597 billion yuan, of which a considerable proportion was invested in municipal roads and bridges. Can be seen from the above data, whether Chinese highway engineering road bridge project, or municipal engineering road bridge project, there are a considerable amount of construction and investment scale. Due to the rapid development of Chinese urbanization process, some of the original projects designed by highway road bridges have been unable to meet the needs of urban municipal functions. At present, some highway roads and bridges have assumed the function of municipal roads and bridges, and some roads and roads have been municipal or is undergoing municipalization. And in some areas, according to the region's road and bridge investment and management system, road transport management departments also bear the municipal road bridge construction and management tasks. However, due to the different investment and management system, Chinese road and bridge and other basic investment and construction projects are generally divided into municipal engineering and traffic engineering construction projects, belonging to the Ministry of Housing and Urban and Rural Development and Transportation Department of the two departments for construction and industry management. Correspondingly, in the road and bridge engineering, the formation of the municipal engineering and highway engineering two sets of different pricing model and project cost management model, they each have a set of different pricing methods and estimates, budget estimates, in the cost management and control also have different relevant provisions.

Contrastive Analysis of Municipal and Highway Pricing System of Road and Bridge Engineering

The Ministry of Housing and Urban-Rural Development is the industry department of municipal engineering. The Ministry of Housing and Urban and Rural Construction has set up the standard quota division, the provincial and municipal housing and urban and rural construction hall set up the construction project cost management station (or fixed station), the local city set up a local cost management station (or fixed station), according to the respective management authority and the scope of duties for the management of municipal engineering costs. The Ministry of Housing and Urban-Rural Development is responsible for the publication and interpretation of municipal engineering pricing methods and pricing quotas. The road and bridge engineering by the State Ministry of Transportation industry management, the provincial and municipal transport offices set up the transportation project cost management station (or highway quota station), the local city set up the local transportation project cost management station (or highway Fixed station). The Ministry of Transport is responsible for issuing and interpreting road pricing methods and pricing quotas. But also bear the highway engineering industry large or key construction project budget estimates, estimates and adjustments.

From the project proposal estimate, the project feasibility study investment estimation, the preliminary design budget to the construction plan budget and other cost of the various stages of preparation, municipal engineering and highway engineering each have a set of different cost management basis, with a relatively large Distinction, not universal, but there is a certain internal relationship. Estimation and Feasibility Study of Municipal Engineering Project Estimates The basis of valuation is mainly to establish the "Urban Engineering Investment Estimation Preparation Method" and to establish the "Urban Engineering Investment Estimation Index". Some provinces and municipalities are based on the local municipal engineering budget quota, the calculation of municipal engineering sub-projects of the sub-project estimates. Estimated and Feasibility Study of Highway Engineering Project Estimates Basis for Estimating Valuation Based on the "Estimation of Investment Estimation of Highway Capital Construction Project" published in 1996 and the estimated quota of supporting indicators can not meet the actual situation of the current project and need to be resumed as soon as possible Revised. Municipal engineering projects generally do not compile the budget estimates, so the preliminary design of the municipal project estimates and construction plans are mostly budget provinces and municipalities to complete the municipal engineering quota (or unified base price table), as well as provinces and municipalities of municipal engineering pricing method for the valuation basis, Is the basis of different quotas and valuation. (JTG B06-2007), and the preliminary design budget stage using the "highway project budget quota" (JTG / T B06), the preliminary design budget and construction plans design budget is a unified "highway project capital construction project budget preparation method" - 01-2007); construction plans budget settlement using "highway project budget quota" (JTG / T B06-02-2007). In the provinces and cities nationwide, highway projects are the basis for the implementation of the above pricing. At the same time provinces and cities in order to adapt to the actual situation of the province's traffic construction projects, according to the above-mentioned ministerial highway project cost basis, supplement and improve the province's highway construction cost basis and pricing method. Provinces and cities highway engineering quota, pricing procedures are basically the same, but the supplementary quota and the fees will be different.

Municipal and highway projects in the road and bridge quota, the sub-purpose of the division, the relevant fixed sub-head work content, fixed measurement units are not exactly the same, the following specific instructions: Highway bridge project budget fixed quota, Steel box cofferdam, suspension bridge and cable-stayed bridge, mobile mold installation and dismantling, cable hoisting equipment, steel truss girder bridge installation, cable suspension bridge installation, suspension bridge cable system installation, cable-stayed bridge cable system installation, steel arch bridge arch, sling rod, steel vertical and horizontal beam production and installation of the project quota, the above fixed on the bridge in the current municipal engineering quota is not the main and the previous highway engineering and municipal engineering scale and the nature of the project, but the

city municipal cross-river bridge is to large-scale, beautiful, multi-functional direction, the lack of municipal fixed suspension bridge, cable-stayed bridge, steel arch bridge and other large span, beautiful shape, carrying capacity bridge type is increasingly becoming the urban municipal engineering commonly used in the form of bridge structure, to do these municipal bridge when the operator needs to adopt appropriate highway bridge quota of labor, materials, Jixietaiban consumption development of supplementary quotas, quotas or direct the use of highway engineering budgetary estimate documentation to meet the needs of municipal bridge the cost of documentation. The roadway project budget includes CFG pile treatment of soft soil foundation, surcharge and vacuum preloading, slope planting grass, shotcrete slope protection, anchor slope protection, anchor plate retaining wall and other projects, the above items are mainly Adapt to the nature of highway engineering. At present, with the rapid development of urbanization process, the rapid expansion of urban scale, many municipal road projects in the suburbs to the development of the city, these projects are more and more common in municipal engineering, to do these municipal road project budget need to use the road quota corresponding to the project of artificial, material, mechanical class consumption of the preparation of supplementary quotas to meet the municipal road cost document preparation needs. Highway and municipal quota of the same fixed sub-head, the quota units are not the same, such as paving asphalt concrete pavement, municipal quota measurement unit is 100m³, and highway quota measurement unit is 1000m³; paving cement concrete pavement, municipal quota. The unit of measurement is 100m³, and the highway quota unit of measurement is 1000m².

Municipal engineering fixed steel production and installation projects, in addition to bored pile reinforced steel cage, the general does not distinguish between structural parts, different structural parts of the same application of the same reinforcement quota. The road construction quota of steel production and installation projects, generally according to different structural parts, such as platform, piers, abutment, tray, pagoda, cast-in-place concrete beam, prefabricated hollow board, prefabricated small box girder, deck pavement, sidewalks and other different locations, respectively, apply the corresponding structural parts of the steel quota. Highway engineering in the swing and diving drill pile drilling project, divided into land drilling and water platform drilling two different types of fixed sub-head, respectively, apply the corresponding quota. In the municipal engineering quota, do not distinguish between these two different construction methods, need to apply the same quota.

According to the above price comparison table, we can see that the D1200 bored pile list project adopts the municipal quota price and the highway quota group price are different: (1) In the municipal engineering quota, the drilling and pouring of the drilling pile which is included in the same quota, and in the highway engineering quota, the drilling and pouring concrete of the drilling pile are divided into different fixed subheads, and different quotas are applied respectively. (2) In the municipal engineering, (1) the municipal engineering quota has the number of mud transport quota, and the highway project quota does not have this, and the road engineering quota has the following: (4) highway construction pouring concrete into the hole quota already contains the work of the pile head, and municipal works do not contain this work content, need to apply the corresponding quota project to calculate the cost separately; (5) highway quota, the drilling pile Drilling According to the difficulty of drilling, the soil is divided into sand, clay, gravel, gravel, pebbles, soft stone, sub-stone, stone four categories, and were prepared Should quota. While the municipal engineering quota is only calculated into the rock increase fee, the soil is unified for the weak, micro-weathered rock and weathering rock two different categories.

Municipal engineering fixed sub-head generally integrated a variety of construction methods and mechanical specifications models, and highway engineering many fixed sub-head according to different construction methods or mechanical specifications models to quantify the sub-division. For example, in 2010 the Guangdong Province municipal engineering comprehensive quota D2.2.14 'mechanical paving cement crushed stone (gravel)' project, according to the construction method and the use of mechanical models to determine the number of subheads; and in the corresponding 2007 municipal engineering budget quota 2-1-9 'mechanical paving plant mixed

grass-roots stabilized soil mixture' project, respectively, according to grader paving and paving shop paving, and further by the level of power and paver width division of the sub-head. The list of road works does not include the list of these measures in the municipal works. Therefore, the list of municipal engineering quantities is simple and clear, and it is convenient for project measurement and payment. However, it should be noted that, due to the absence of the above list of measures, the project list of road works in the technical specifications and measurement of payment terms, it should clearly indicate the list of items included in the entity and the contents of the work, and measurement of payment method and engineering quantity calculation rules, so as to avoid unnecessary engineering payment and payment of the cost of the dispute.

Conclusion

This paper first analyzes the differences between the cost management system of the road and bridge engineering in the municipal and highway projects, the basis of the cost pricing, the composition of the cost items and the pricing procedures, the engineering quota and the bill of quantities. And then select a representative road and bridge project, according to municipal engineering and highway engineering two different pricing model respectively, the preparation of bill of quantities, project budget, and according to the results of the calculation of municipal and highway projects and budget Price level for further comparative analysis.

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