

Feasibility Analysis of Mining Granite Mine for Facing in Zhashui County

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Abstract

The use of granite has a long history and represents nobility and classics. Granite is widely distributed on the surface and is one of the earliest natural rocks discovered and used by mankind. This paper conducts a feasibility analysis on the location and natural geographic conditions, mining technology, ore quality and construction conditions of the Shangluo facing granite mine in Shaanxi. The research results will provide the necessary reference for similar projects.

Keywords

Granite; mining technology; construction conditions; feasibility.

1. Introduction

My country is rich in granite. The main producing areas are Mount Tai and Laoshan in Shandong. At the same time, it is produced in Huangshan Mountain in Anhui, Xishan Mountain in Beijing, Fujian, Henan, etc., such as Shandong Laizhou Red, Laizhou White, Laizhou Black, Beijing's Baihujian, Hubei It can be said that the granite is the most widely distributed local material.

At present, granite products still play an important role in large and important buildings. Rough ground plates are used for walls, steps, pedestals, monuments, tombstones, and nameplates in buildings. Polished plates have colorful luster and patterns. , Blooming on the indoor and outdoor walls, floors and columns, the irregular slabs and stones after granite processing have also been skillfully used by architects to pave courtyard paths with pebbles and slabs, using the stone itself. The color and shape make the material, design and environment achieve a harmonious unity, thereby obtaining unexpected artistic effects.

2. Market Positioning of Granite Products

In recent years, with the continuous expansion of urban and rural construction scale and the continuous improvement of people's living standards, the demand for granite stone in urban and rural areas has rapidly expanded. The first is that large and medium-sized cities have changed the past sidewalk tiles to granite natural stone in the past two years, which are characterized by green environmental protection, high-end atmosphere, high-grade, durable, and also change the image of the city; secondly, curbstones, urban squares, and sidewalks. With granite as the main material, the market share of granite is rapidly expanding. Moreover, 30% of the exterior wall decoration of newly-built buildings in the city is mainly made of granite slabs, and the proportion is increasing year by year, which gradually expands the market share of granite.

As the starting point for the construction of the Silk Road along the Belt and Road, Shaanxi Province has rapidly developed economic construction in the west and has a broad market for building materials. The granite production areas in Shaanxi Province are mainly concentrated in Lueyang and Mianxian counties in Hanzhong City, Shaanxi Province, Huaxian and Huayin counties in Weinan City, and Shangzhou District, Zhashui County and Shangnan County in Shangluo City. Throughout the development and utilization of granite in Shaanxi, the north of

the Qinling Mountains has been gradually shut down due to the influence of the Qinling Natural Ecological Reserve. The granite mining enterprises in Hanzhong and Shangluo in southern Shaanxi have been in short supply due to insufficient investment. The halted or semi-stopped state has not formed a large scale of production and is far from meeting the ever-expanding market demand. The granite market supply in the province depends on the supply from other places such as Fujian and Henan, but the transportation distance is long and the cost is high.

3. Location and status of mining site

The Caiyuyao Niangnianggou Veneer Granite Mine in Zhashui County, Shaanxi Province is located in Yinwangou, Caiyuyao Town, Zhashui County. The administrative division is under the jurisdiction of Caiyuyao Town, Zhashui County. The mining area is located directly east of Zhashui County. , It is directly 17.20km away, 14km away from Provincial Highway 307, and there are highways passing through the mining area in the area, so the transportation is relatively convenient. The mining area is located on the southern slope of the Qinling Mountains. It has a temperate to cool subtropical transitional climate. It belongs to a low-middle mountainous area. The terrain is high in the north and low in the south. The terrain is steep, the slope angle of the terrain is generally 15°-25°, the cutting is deep, and the vegetation is developed.

The mining area belongs to the Ganyou River system, a tributary of the Han River in the Yangtze River Basin, with abundant water resources. The mining area is a secondary tributary of the seasonal river Ganyou River, which passes from the east of the mining area and flows from north to south, and is mainly recharged by atmospheric precipitation.

This area has a transitional climate between subtropical and warm climates. The annual average temperature is 11°C, the frost-free period is 209 days, and the annual sunshine is 1,860.2 hours. The annual average precipitation is 742mm. There are heavy rains in summer, accompanied by flash floods, summer droughts, and continuous rain in autumn. The mining area is located in Niangnianggou, Caiyuyao, Zhashui County. The mining area is a low-mid-mountain landform, with deep topography. The terrain is generally high in the north and low in the south.

The water system of the mining area belongs to the Ganyou River system, a tributary of the Han River in the Yangtze River Basin. The ore bodies are all above the local minimum erosion base level. The terrain of the mining area is steep, which is conducive to surface runoff discharge.

4. Ore quality

The mineral composition of the ore is simple, mainly gray-white black stone monzonitic granite, with an SiO₂ content greater than 70%. According to the results of ore chemical analysis, the major elements in ore mainly include Na, K, Ca, Mg, Fe, Si, Al, etc. Its chemical composition content is as follows: SiO₂: >70%, Al₂O₃: 13%-15%, CaO: 0.70%, MgO: 0.40%-1.11%, KO: 8.04%-8.33%, KO: 1.14%-2.21%, Fe₂O₃: 0.11 %-0. 37%, the loss on ignition is 37.87%-41.74%. The physical and technical properties of the granite mine for Niangnianggou facing in Caiyuyao, Zhashui County, have been tested: specific gravity of 2.62-2.65 (g/m³); water absorption rate of 0.60%-0.65%; uniaxial compressive strength of 900-1100 (kg/cm²); the flexural strength is 154-177 (kg/cm³). At present, the verified technical performance and various indicators of granite ore for veneer meet the quality requirements of granite slabs for veneer, and the market prospect is good.

The decorative performance of the decorative stone ore is that it has a certain color, pattern and gloss after processing, and the decorative stone above the mid-range requires pure color,

harmonious pattern and high gloss after processing. ("Specifications for Geological Prospecting of Facing Stone Minerals (DZ/T0207-2002)")

The ore in this area is gray-white black cloud monzonitic granite, with granite structure and massive structure. The polished surface (finished surface) is off-white, and its color tone and pattern are more uniform, coordinated, and stable, which is well received by customers. In general, the pattern of the product is relatively strong, the polishability of the plate is relatively strong, and the gloss is above 80 degrees, which is a mid-range variety.

5. Technical conditions for mining deposits

The main ore body of this deposit is located above the local erosion base level. The topography of the mining area is conducive to natural drainage. Part of the surface of the ore body develops weathered fissure water. The main source of replenishment is rainfall. In non-rainy seasons, drainage can be used for normal mining. The water-filled rock layers in the mining area are dominated by fissures, and the hydrogeological conditions are simple types. The complexity of hydrogeological exploration in the mining area is classified as Category III.

The rock mass in the mining area is dominated by magmatic rock, the structure of the rock mass is relatively uniform, and the strength varies greatly. The stability of the rock mass mainly depends on the integrity of the granite porphyry and the development of cracks. The engineering geological conditions of the mining area belong to the simple type, and the engineering geological exploration type of the mining area is classified as category III.

The earthquakes that occurred in the history of the mining area have low magnitudes and are not very destructive. The vegetation is well developed and the air quality is good. There are no factories around, the groundwater and surface water are not polluted, and the water quality is good. Due to artificial blasting and open-pit mining, there are artificial landslides and collapses in local sections of the stope slope, which may cause local landslides, debris flows and other external geological disasters. The environmental geological quality of the deposit is medium.

6. Conclusion

The project conforms to the national industrial development policy, and has important strategic significance for promoting industrial development, optimizing industrial structure, improving corporate efficiency, local economic prosperity, and achieving sustainable development.

The project unit can guarantee the needs of project construction in terms of organization and management, technical strength, and supporting funds. At the same time, the construction of the project is strongly supported by the People's Government of Shangluo City, and has a good development environment, which has laid a good foundation for the implementation of this project.

Through the evaluation of the economic and social benefits of the project, the basic data for the benefit evaluation is objective and fair, in line with the actual situation, the evaluation method is scientific, and the project's profitability and fiscal and tax contributions are relatively high.

According to research and analysis, the construction unit of this project has good construction advantages, the products of this project are required by the market, the construction basis is sufficient, the construction plan is feasible, the construction conditions and opportunities are mature, and the benefits are good. Therefore, the construction of this project is necessary and feasible.

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