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Study on Construction Quality Control of Yunnan Minority Rural Buildings

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Abstract: *Based on the significance of rural construction quality control in yunnan minority rural areas, this paper discusses the current situation of rural construction quality problems, analyzes the internal causes, and gives constructive countermeasures, in order to provide reference for the future practice of rural construction engineering in Yunnan. There are a large number of ethnic minorities in Yunnan province. Of the 56 ethnic groups in China, 26 live in Yunnan. At the same time, Yunnan province is a large agricultural province, and most of its population comes from vast rural areas. The happiness and well-being of the rural population is an important part and difficult link in the great unity and rejuvenation of the nation. Yunnan province has a long border and many transnational border areas. The excellent quality of rural buildings has the practical significance of stabilizing border people and expanding national power.*

Keywords: *rural architecture, ethnic minorities, quality control, construction process*

1. The significance of quality control of rural building construction in yunnan minority rural areas

Yunnan is located at the junction of the Eurasian plate and the Indian Ocean plate, and earthquakes occur frequently. According to statistics, there are several earthquakes of different magnitudes every year. In history, there have also been major earthquakes like qujiang earthquake. Earthquake damage is a serious threat to the safety of rural people's lives and property. If the construction quality of rural buildings fails to meet the quality standards, the earthquake damage will become more serious.

Yunnan rural areas have a wide area and active geological structure movement, resulting in complex and changeable geological conditions, including sapropelic soil, sedimentary soil, sandy soil, rock base, laterite, karst and so on. In the course of history, most rural houses built in mountainous areas of Yunnan were located at the top of mountains, ridges and mountainsides, and this landform also increased the difficulty of building quality.

Although yunnan's rural areas are vast in territory and abundant in resources, they are inconvenient in transportation, slow in economic growth, and many remote and backward areas. Limited by economic conditions, rural people in Yunnan should pay more attention to the quality of housing construction in order to avoid the increase of investment caused by quality accidents.

At present, the Chinese government attaches great importance to agriculture, rural areas and livelihood projects and vigorously promotes the rural revitalization strategy. As an important part of the rural revitalization strategy, rural architecture is the foothold for people to live and work in peace and contentment, and is also a top priority in poverty alleviation work.

2. Analysis of the construction quality of rural buildings in Yunnan province

2.1 Improper site selection of rural buildings in Yunnan threatens the overall safety of buildings

Since the implementation of the homestead policy in China's rural areas, the choice of the address of the self-built housing by farmers is greatly constrained, and they cannot arbitrarily acquire land for self-built housing. As the rural homestead in Yunnan is located in high mountain and canyon area, a new problem is put forward. Construction site selection should be carefully treated, but rural residents who do not understand engineering geology will often choose some geological unfavorable areas to

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build houses. Such as geological fault zone, soft soil layer, karst development section, underground river, debris flow area, landslide collapse section, etc.

2.2 Improper foundation treatment of rural buildings in Yunnan resulted in partial cracking of buildings

The distribution of soil in laterite plateau is changeable, so the bearing capacity of foundation needs to be screened. If the strength of foundation is not enough, the natural foundation needs to be treated, either by increasing the buried depth of foundation, building the foundation surface directly to the hard soil layer, or expanding the area of foundation bottom surface, reducing the additional stress of foundation. But the current situation is that the construction team based on experience and the capital of the owner, probably estimate the foundation buried depth, with great randomness. Most of the basic materials choose local materials, sintering bricks and rocks used more. Some foundation masonry is unreasonable, for example, the bottom of some brick foundation is laid with vertical bricks, and some stones are simply stacked together when the foundation is laid with rocks, and sand is used to fill the seams without concrete bonding in the middle. These wrong construction methods seriously affect the overall strength of the foundation and lay hidden dangers for future construction [1].

2.3 Reinforced concrete frame structure engineering, concrete mix ratio is improper, steel configuration is unreasonable

With the advantages of large bearing capacity and durability, reinforced concrete frame structure has become one of the most important structural types of rural buildings in Yunnan province. Concrete composition, optional collocation makes the aggregate gradation, sand cement without of careful weighing measuring mixing, causing poor workability of concrete, the construction is difficult, mixture segregation layer, concrete porosity is high, lead to concrete strength to meet the use requirement, brings to the structure safety threat. Reinforcement diameter, spacing, configuration, welding, binding and other core processes do not meet the quality requirements of reinforced concrete frame structure construction, the thickness of the protective layer is not enough, the construction schedule is slow to lead to steel corrosion and so on, making concrete members appear leakage and other adverse phenomena.

2.4 Brick and concrete structure engineering, the quality of wall masonry is not up to standard

When building a wall, according to the regulations, "the corner of the brick masonry and the junction should be built at the same time, it is strictly prohibited to have no measures of separate construction of the internal and external walls. For temporary discontinuities that cannot be laid at the same time and must be maintained, a croucher shall be laid "[2]. Where there is a structural column, the horse's teeth are not properly set or simply not set.

2.5 The project planning and design is missing, and the project fails to meet the functional requirements after completion

Rural residents should have been built to obtain its space use function, at the same time, lighting, ventilation functions. Due to the lack of formal engineering drawings, the functions of the house failed to achieve the desired results. If certain room is too small, furniture puts a problem, some space is too big, cannot get reasonable use.

3. Cause analysis of construction quality problems in Rural Yunnan

3.1 Shortage of rural construction talents

In the vast rural areas of Yunnan, there are few professionals who really understand architecture. Every person who knows a little construction skills or participates in construction training to obtain skill certificates has become an active construction team leader in the rural construction market. Although these people have participated in some construction skills training, the structure of construction professional knowledge is not systematic, and there is no overall quality control ability. When designing a house for the owner, I always look for ideas from the projects I have participated in. How to build it elsewhere can be copied here. The other members of the construction team are

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temporary employees, busy with agricultural production with a sickle, idle with a knife to become construction workers. The building owner himself also does not have the professional knowledge, about the house design either listens to the contractor, or refers to the nearby building, is not strong to the building quality consciousness, the plan is convenient, saves the cost, the rush period has become the comparison option.

3.2 Poor government supervision of rural building materials market and machinery leasing market

Building material quality is the key to rural building quality. Due to the limitation of capital investment, when choosing building materials, owners often buy nearby building materials such as steel bar, cement and red brick on the grounds of low building height and small building area. The construction materials produced by these small local factories generally fail to meet the current national standards in terms of raw material selection, production procedures and material qualification testing methods. Rural building materials market is generally far away from the county, the government supervision force is difficult to do constant detection and screening.

3.3 Improper construction technology and method

Housing construction projects are single, and the project quality is hidden, while the project quality control is mainly in the construction process. Once the quality problem is formed, the cost of rectification in the later stage is quite high and even cannot be changed. Therefore, the construction technology and methods are very important to the construction quality. Such as foundation engineering construction, must be completed while acceptance to ensure its quality. During the construction of concrete works, concrete can be poured only after the acceptance of reinforcement works such as reinforcement configuration and protective layer reservation is completed. The formwork can be removed only when the concrete strength reaches the strength of the formwork. Reasonable housing design scheme and construction scheme is a strong guarantee of project quality, which can not only improve the quality of construction, but also save investment and speed up the progress.

3.4 Impact of natural environment and social environment of construction

Rural construction engineering construction is carried out in the outdoor environment, which is inevitably affected by the natural environment, such as weather, humidity, temperature, rainfall, water quality, etc. The natural environment is generally given enough attention, while the influence of social environmental factors will be ignored. Householders' demand for building houses will be influenced by their surrounding relatives and friends, and they will have the heart of keeping up with the Joneses. They always think that the house should be "big, wide and high" to be decent, while ignoring the house functions they need. The rising cost of materials and labor will also affect the decision of homeowners. Weak consciousness of legal contract. Paper contracts are often not signed between the owner and the construction team, but are agreed orally. Once there is a difference of opinion, there is no basis to follow, which is easy to cause complex contract disputes.

4. Conclusions

4.1 Introduce the incentive mechanism of township construction talents and establish the township construction technician system

Most of the colleges and universities in Yunnan province have set up civil engineering majors, providing talent reserve for the township construction technician system.

4.2 Carry out necessary training for construction personnel and improve the construction level of construction teams

At the same time, the qualification of construction personnel should be strictly tested to ensure the professionalism of rural construction personnel [3].

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4.3 Strengthen the supervision of rural building materials market to prevent substandard products from being sold on the market

The supervision and punishment system of rural building materials market shall be established, market inspections shall be intensified, the quality of building materials (especially steel bars, cement and red bricks) shall be randomly checked and tested regularly, and the sales of products that do not meet the national standards shall be stopped immediately. Dealers and manufacturers who sell fake and shoddy construction materials will be given heavier penalties.

4.4 Strengthen government publicity to improve the quality awareness and legal concept of homeowners

In today's society with advanced information technology, quality concepts are publicized through major social platforms (such as Douyin, wechat and Tencent), current rural construction policies are released, and construction teams with excellent engineering quality and typical engineering cases are publicized. At the same time, in the form of cases, vigorously publicized "construction law", "Construction project quality management regulations", "housing quality guarantee certificate", "housing instructions" and other laws and regulations and regulations.

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References

[1] Jiang Xiaowei, SHEN Qisheng. Analysis on the Causes of Quality Problems of Rural Housing Construction Projects [J].China Construction Information, 2005 (18): 48-50.
[2] Ma Huchen, Ma Zhenzhou et al. New Rural Housing Construction Technology and Quality Prevention and Cure of Common Problems [M]. China Architecture and Building Press, First edition, September 2007.
[3] Chen Xiancheng. Analysis of rural building engineering quality management problems and Countermeasures [J]. Building Materials Development Orientation, 2018 (01) : 315.