

# Research on Management Innovation of Repair Engineering of College Building in the New Era of China

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**Abstract:** In order to improve the service life of college buildings and guarantee the effectiveness of teaching, strengthening the repair engineering management of college building is an important subject in the field of college building engineering in the new era. Because of the special attributes of college, there are many individual characteristics in the management of maintenance and renovation of college buildings. In view of the various problems existing in the management of repair projects in colleges, this paper puts forward the innovation suggestions of bidding management, contract management, construction management and protection management to provide some references for the relevant researchers.

## 1. Introduction

In recent years, with the improvement of the level of running a school, the funds of various colleges and universities for projects such as infrastructure, housing renovation, energy saving and emission reduction are increasing [1]. In order to pursue good use effect, most of the projects are no longer simple repair, but decoration and renovation at the same time of maintenance, involving maintenance funds of tens of millions of yuan. How to improve the efficiency of capital use and improve the management of repair projects is an urgent problem for university logistics workers. College buildings are mostly to meet the needs of teaching, scientific research, administrative office and college students' campus life, through the transformation of the natural and human environment, and the formation of artificial space. In addition to the general architectural function, University historical buildings also have the special function of inheriting school history and culture. These historic buildings not only witnessed the development process of the school, but also reflected the architectural characteristics of different times, the political and cultural background of the construction era, and the construction ideas and guiding ideology of the policy makers and builders at that time. After infrastructure construction, with the use of these infrastructures and buildings, there are aging phenomena. In order to ensure that students' learning and living needs are not affected, it is necessary to repair these problems, aging infrastructures and buildings. The scale and quantity of infrastructure maintenance projects are increasing. However, there are many problems in the management of infrastructure maintenance projects, which affect the management of infrastructure maintenance projects. Compared with other infrastructure projects, infrastructure maintenance projects have certain particularities. There are great differences between capital maintenance projects and new construction projects in college expansion [2].

## 2. Main Problems of Repair Engineering Management of College Building

### 2.1 Bidding Management Problem

The problems of non-openness and non-transparency in the management process of bidding and bidding for renovation projects in colleges. As the Education Department of our country attaches great importance to the renovation project of the national universities every year, our country invests a lot in the renovation project of the universities. This is of great economic benefit to the repair

engineering construction company. Therefore, whenever there are some buildings to be repaired in colleges, these construction companies will do everything possible to get the contractual rights of repair projects. There is a disconnection in the management of the renovation project in colleges. Because the traditional engineering management method in our country will distribute the project management into several small departments for independent management, which leads to few links between the various management links, so that our repair engineering management department cannot grasp the dynamic tracking and control of the whole life cycle of the project construction as a whole. The incomplete construction drawings make it difficult to compile the bill of quantities. Because the repair works are complex and involve many specialties, many projects actually have no complete construction drawings or only simple indication winter. For large-scale capital construction projects, survey and design units are involved in the early stage, and the scope of construction is clearly defined; for renovation projects, any school renovation project management department does not have the professional category of the design institute and the professional level of designers. Once a complete construction plan is required, professional design must be entrusted. Even if entrusted with professional design, due to the difference between the repair project and the new project, it is not a blank paper, which can be fully developed by the designer. Designers also find it difficult to fully understand all the facts and to be able to truly reflect them on the drawings [3].

## **2.2 Contract Management Problem**

Contracts and their management are closely related to the smooth progress of maintenance projects in colleges, so we must pay more attention to them. In the process of construction of Engineering projects, if we do not attach importance to contract management or the level of contract management is not high, it will affect the standardization of maintenance project management. As far as the construction industry is concerned, there are some deficiencies in the definition of market supervision and contract illegal acts, besides the provisions of *Criminal Law of the People's Republic of China* [4]. At the same time, many units have not formed a systematic and perfect contract management process. The procedures of contract formation, performance, termination, alteration and termination are not standardized and scientific. Contract management itself requires the leader to have a professional technical foundation, but also must understand the relevant laws and regulations and have the ability to overall plan. Many units are related functional department personnel rather than professional personnel to manage the contract. Not only that, some managers are weak in contract consciousness and regard the contract as only a procedure. Once it is concluded, they put it on the shelf, fail to submit the contract, and pay little attention to the later performance management. The contract text is defective, the content is not rigorous enough and the documents are not filed in time. Generally speaking, the change refers to the increase or decrease or other changes in the content of the contract text. Some maintenance contract texts do not use normative texts, and some contracts have defects, such as imprecise writing, incomplete terms, unclear responsibilities, and no effective provisions for breach of contract, alteration, etc. In addition, there are also improper wording, contradictions and errors in the contract text itself. At the same time, we do not attach importance to the signed contracts and fail to timely sort out and file them.

## **2.3 Construction Management Problem**

Colleges have been running for a long time. The old buildings, roads, hydropower and other buildings are aging. Most of the infrastructure needs to be repaired. Only in this way can we meet the requirements of running colleges and universities and learning and living needs. Every year, the logistic management departments of colleges and universities need to apply to the financial departments of colleges and universities for the maintenance budget of the school infrastructure. However, due to the limited funds of colleges and universities and other factors, the maintenance work of the school infrastructure maintenance project cannot be arranged and constructed in accordance with the plan. Infrastructure maintenance engineering is also sudden, which adds many uncertainties to the infrastructure maintenance engineering, making it difficult to complete the infrastructure maintenance project in a planned way. In addition, the influence of other factors makes

the management and maintenance of the infrastructure maintenance engineering unable to achieve the desired results, and also unable to complete the maintenance work on time. With the expansion of colleges and universities, new construction projects are increasing year by year, and the construction period is short. In order to catch up with the progress of construction, the construction units and construction units of new foundation projects do not have enough management of some details in the later construction, which makes the later maintenance work more difficult. In the management of infrastructure maintenance engineering, the common faults of buildings will appear, which will increase the workload and difficulty of the maintenance department of infrastructure maintenance engineering. At present, the maintenance contents of university infrastructure maintenance project include transformation, decoration, repair, greening and so on. The workload of these projects is very large, there are many kinds of work, and the maintenance project is zero. It can be said that they are distributed in the whole university and there are many construction points. Because there is no professional maintenance design, the time of maintenance construction is relatively concentrated, and the vacation time is used for the maintenance of capital construction maintenance projects. At the same time, the maintenance personnel of the capital construction maintenance project do not have a thorough understanding of the construction technology, construction technology, construction equipment and so on, and the maintenance quality of the capital construction maintenance project cannot meet the construction requirements.

## **2.4 Protection Management Problem**

At present, there are some deviations in the concept and understanding of the protection and maintenance of historic buildings in many colleges and universities in China. The deviation is mainly reflected in the confusion of the maintenance concepts of historical buildings and modern buildings, focusing only on functional and practical restoration, while ignoring the protection of their historical and cultural characteristics, which destroys the cultural value of historical buildings. The restored building is like a brand-new antique building, which not only loses its original form in external form, but also loses its original spirit in internal charm. The workload of protection and maintenance of historic buildings in Colleges and universities in China is very large, and the cost of construction of historic buildings is generally higher because of the complex facade shape and decoration technology, the high degree of protection and maintenance, and the high price of artificial materials. In addition, the funds for demonstration design, purchase of special materials and labor for special types of work for protection and maintenance will increase their investment quota. Universities in this area mainly rely on state funding, and the state can be used for special maintenance of historical buildings is very limited, so it is very difficult to carry out this work. Traditional technology, technology and materials are often used in the protection and maintenance of historic buildings, but at present some traditional technologies have been lost or no longer used. There are few craftsmen of special types of work, and the special materials needed are also difficult to buy. The maintenance management departments of colleges and universities themselves lack professional and technical management personnel in this regard. Therefore, difficulties will be encountered in the establishment, design, supervision, construction and acceptance of historical building protection and maintenance projects. At present, in the face of a large number of historical buildings in colleges need to be protected and maintained, in addition to the above problems, there are also problems of system guarantee. Relevant laws and regulations at the national level are not sound enough, and there is a lack of systematic planning and forward-looking plans at the school level [5].

## **3. Management Innovations of Repair Engineering Management of College Building in the New Era**

### **3.1 Bidding Management Innovation**

The stage of building maintenance and reconstruction project in colleges plays an important role in the implementation and cost control of the whole project. In the stage of project establishment, the

project name, construction site, purpose and significance of maintenance and transformation, content description of reconstruction project, source of construction funds, budget estimate and schedule of implementation of the plan should be determined. Only in this way can schools decide the necessity and feasibility of project implementation based on these materials, and then make appropriate approval. After project approval, the project entered the bidding stage. For projects with simple structure, small scope of maintenance and transformation, and low investment budget, the project can directly enter the bidding or commissioning stage of the construction unit. For projects with complex structure, large scope of maintenance and transformation, high standard level and high investment budget, it is necessary to determine the design unit through bidding and start the design of construction drawings. In this stage, the design unit should try its best to control the cost in the stage of commissioned design according to the requirements of the design task power of attorney of the construction unit and the provisions of the design contract in the formulation of the design plan and the selection of materials. The design of the scheme or construction drawing should meet the design requirements of building renovation, seismic reinforcement, building safety and other engineering projects issued by the state and the relevant departments in the locality. At the same time, the project budget should be made according to the relevant quota management and budget management requirements in the locality. After the determination of the construction drawing and the project budget, the project can enter the bidding work of the supervision unit and the construction team. At present, colleges and universities also use the construction drawing budget as the main reference basis for determining the contract price of the project. According to the situation of the school's approval of funds, the price of the main materials used in the renovation project is limited. Based on this, the construction units are selected according to the quotation of each bidding unit. It can be seen that design bidding or construction unit bidding will play an important role in the cost control of the whole maintenance and transformation project in the bidding stage.

### **3.2 Contract Management Innovation**

The core of contract management lies in the relevant laws. It is suggested that the existing laws and regulations of contract management should be improved, and a more perfect and reasonable contract management system and system should be built. At the same time, the management and filing of contract data and related supervision work must be strengthened. Contract management should run through the maintenance project, strengthen control, ensure the good and orderly progress of the project, and improve the management level of the maintenance project. At the same time, it can effectively avoid the losses caused by claims and disputes, reduce costs and safeguard rights and interests. Strengthen the authority of the contract and improve the quality of personnel. Once the contract is concluded, it is serious and authoritative, and it is an important basis for maintenance engineering construction, management and quality guarantee. Therefore, the maintenance management departments of colleges and universities should formulate relevant rules and regulations of economic contracts according to the actual situation of colleges and universities. When signing contracts, they should strictly follow the procedures for signing and approving them. Maintenance and management personnel must attach great importance to ideologically, improve professional quality, strengthen contract legal awareness, contract management awareness, and manage according to the contract. At the same time, the contract management and execution cannot be separated from the participation of the project manager of the contractor. It is necessary to strengthen the restriction and requirements on the personnel of the important positions of the contractor, make them strictly perform the contract, participate in the whole process of contract management, and establish the guarantee system of contract implementation, so as to better promote the construction of maintenance projects. In order to regulate the management and to bind both sides of the contract, it is suggested that colleges and universities choose the formatted contract text. Because of the diversity of maintenance projects, the types of contracts selected are different, and the contract clauses of maintenance projects which conform to their own characteristics are signed in the special terms of the contract.

### **3.3 Construction Management Innovation**

After confirming the construction unit through project bidding, it has entered the concrete implementation stage of the project. This stage is the key stage of project cost control. The construction of university building maintenance project is different from the construction of new construction project. There are many uncertainties in the maintenance and transformation project, the amount of project is difficult to calculate, and the original data is insufficient or missing. All these increase the difficulty of cost control of the project. Therefore, colleges and universities should strictly strengthen the supervision and management of the whole construction process and contract management in the maintenance and transformation project. The characteristics of maintenance and renovation project make engineering design easy to appear inconsistent with reality, so engineering negotiation often occurs in the construction process. This requires designers to know as much as possible about the original information and underground information of the renovation building at the stage of scheme design. In the process of construction, they should often go deep into the construction site, so that they cannot negotiate without negotiation, without additional funds and without additional funds. Construction units should also strengthen contacts and communication with designers, seek solutions to problems together, avoid large proportion of cost increases, so that the cost of the project runs out of control. Supervising units should fully perform their duties, strengthen the management of construction site, strictly control the construction quality and cost management, and strengthen the audit and supervision of the consultation during construction so as to create conditions for reducing waste and saving expenditure. At the same time, the visa for concealed projects appearing in the construction process can provide authentic and reliable technical information for the settlement of projects after completion. The school should also send special professionals to strengthen the management of construction site and engineering changes in cooperation with supervision units and construction units.

### **3.4 Protection Management Innovation**

Through protection and maintenance, its architectural features are more distinct, and its cultural and educational functions are more prominent. It restores the original appearance of the large roof tile roof, restores and redraws the paintings under the eaves to make it more eye-catching. In order to prolong its service life, new technologies and materials are used. It is better than wooden doors and windows in use function, fire prevention, energy saving, appearance and durability. According to the use needs, the facilities of indoor power distribution, water supply and drainage, network information and so on have been reformed and perfected, making the use function more perfect. Measures should be taken to improve the fire safety performance of buildings. For example, the wood roof truss of the roof is strengthened and coated with fire retardant paint, the insulation material is changed from slag sawdust to cement perlite, the distribution line inside the door roof is rebuilt and dismantled, and the hidden danger of fire is eliminated. Above all, it is called a very successful example of maintenance and renovation of historic buildings by experts of engineering acceptance team. Historic buildings are cultural relics, so protection and safety must be put in the first place in the process of maintenance. Maintenance plans must be carefully, repeatedly and adequately demonstrated. The new technology, new material and new technology must be mature. Otherwise, it must be tested to prove that this measure will not damage the historical and artistic value of historical buildings before it can be implemented. Historic buildings are first and foremost buildings, which should have the function of use. Therefore, in the case of the tension of land use and teaching and research rooms in colleges, we should keep pace with the times in the protection and maintenance of historic buildings in colleges, so that historic buildings can meet the needs of teaching and scientific research under the new situation. Especially, we should do a good job in the renovation of water, electricity, heating and ventilation, information technology and so on, in order to give full play to the practical functions of historical buildings.

#### 4. Conclusion

With the increase of running time in colleges in China, the aging problem of infrastructure in colleges is becoming more and more serious, which needs to be repaired. Because of the particularity of the university capital construction maintenance project and the difficulty of the maintenance construction, there are some problems in the university capital construction maintenance construction, and the present situation of the university capital construction maintenance project management is not optimistic. In the new era, in order to improve the management status of university building maintenance projects, we should put forward corresponding innovative measures from different aspects. At the same time, we also need to adopt different management methods for different buildings in different colleges.

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