Analysis of existing problems and influencing factors of construction industrial engineering quality

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Abstract: Building industrialization, promote the industrialization of the world architecture development, promoted the pace of urbanization construction, in the aspect of building industrialization in China started late, so under the background of industrialization, in the course of the construction of construction engineering quality management experience a slight lack of current industrial construction project quality management of construction was still in the stage of research and practice, this article mainly through to the building industrialization construction quality has carried on the detailed analysis of existing problems, and combined with the traditional construction project quality management method, analyses the construction quality control factors of industrialization, It will provide some research data for future research on engineering quality control methods.

1. Introduction
The construction industry refers to the material production department engaged in survey, design, construction and maintenance of original buildings in the national economy. As one of the 13 branches of national economy, construction industry consists of three categories: civil engineering construction industry; Wiring, piping and equipment installation, survey and design. The function of the construction industry is mainly to carry out construction and installation activities of various building materials and components, machinery and equipment, etc., to build productive and non-productive fixed assets for the national economy.

With the rapid development of urbanization, the country is attaching more and more importance to the development of the construction industry. According to the Government Work Report of various places, in 2017, the government not only paid more attention to the construction industry, but also had more content related to the development of the construction industry in the Government Work Report than in previous years. So it is no exaggeration to call 2017 a "pivotal year" for the transformation of the construction industry. In particular, the emergence of prefabricated buildings has brought new development to the construction industry. In addition, many places have also linked the development of the construction industry with "One Belt And One Road". All provinces and cities are seizing the opportunity and stepping up construction under the guidance of national planning.

But the rapid development of construction industry, will inevitably expose some disadvantages existing in current Chinese traditional architecture, such as high energy consumption of the building resources, resource utilization is low, cannot guarantee the engineering quality and safety quality, production efficiency is low, the artificial increasing labor cost, serious pollution problems, and so the state Ministry of Finance, the ministry departments are put forward to strengthen the green building in the standard specification, technology, industrial support capacity building. The Sustainable Development Research Group of Chinese Academy of Sciences put forward that the transformation and
upgrading of China's construction industry is an inevitable trend, and building industrialization is a new, green and sustainable way of building production, so it is particularly urgent to carry out building industrialization.

2. Analysis of problems existing in the quality of construction industrialization project

As building industrialization calls for more and more high, much attention has been paid to the quality problem of the construction industry, many scholars at home and abroad through research points out that the construction project quality decide that it can gain a foothold in the market, at the same time, industry determines the construction of industrialization can be accepted, and improve the quality of engineering is also significant, it not only safeguard the people's production and life, also is the lifefood of enterprise survival and development, more influence on the progress of the national economic construction. At present, the traditional construction engineering quality management and production technology is mature, also formed a set of complete quality management theory, but the building in our country is still in the initial stage of industrialization, industry engineers is lack of experience on industrialization project quality management, at present has not yet formed a complete quality management system. The following article analyzes some defects existing in domestic construction industrialization projects.

2.1 Design issues

Design is the first stage of architectural construction, which is the manifestation of architectural thought and soul. The coordination of design, depth involved and so on will affect all aspects of subsequent architectural construction. A complete design process is shown in the figure1 below.

However, due to the late development of architecture industrialization in China, domestic designers still lack of complete design. In every professional prefabricated buildings, to coordinate each other closely, and in the process of design, designers often in architecture, structure, water supply and drainage, ventilation, air conditioning, electrical and other factors to consider are not comprehensive, and on the casting, all kinds of pipeline perforation, reserved holes, are due to be thoughtless of products don't match.

2.2 Production problems

The quality problems of precast concrete components generally occur in the process of factory manufacturing or site construction. The accuracy of reserved holes, the maintenance of concrete, the setting of pipe lines such as water supply and drainage, electricity, and the setting of hanging points of prefabricated parts will affect the quality of concrete components.
Figure 1 design process of construction project
2.3 Problems in the transportation of components
In addition to the possible impact on the quality of components in factory production and field construction, there is also an easy to ignore problem is the transportation process of components, during the transportation process of turbulence and the impact of lifting process will lead to cracking or damage of prefabricated components. Therefore, the setting of the lifting point of prefabricated components, the configuration of transport vehicles and lifting equipment, and the planning of transport lines must be considered as a whole.

2.4 Construction problems
The factors in the construction process have the most influence on the quality of construction projects. The e first is the experience of the construction personnel, at present the domestic prefab building construction personnel is seriously lack of on-site construction personnel to prefab building understanding is not deep, not familiar with the construction process, on-site hoisting, installation is not coordinated and other problems commonly exist.

Unreliable second improper lifting and installation, and the structural connections is also often appear problem, because in prefabricated hoisting, installation and temporary support have a certain risk (see figure2), component assembling positioning difficulty is big, construction personnel if insufficient attention in the construction process for installation quality, or cause errors, the wallboard has a larger deviation, or improper assembly sequence, assembly quality is not high will seriously affect the quality of the project.

Figure 2 Schematic diagram of vertical structure connection process of prefabricated building

Third, node grouting construction problems, due to excessive template turns, plate seam is bigger, easy to leak slurry, especially when the node template connection size is not enough precise, and grouting quality is not high, grouting is close-grained, not leak slurry, and inadequate curing time remove the template and support, will cause serious component quality problem such as craze.

Fourth, in terms of earthquake resistance, prefabricated buildings have higher requirements for construction compatibility, but on-site practical coordination shows frequent failures, and insufficient attention is paid to structural measures such as the overall earthquake resistance of the structure. Operation with only theory and no practical experience is a weak link in project quality control.

Fifth, the supervision is the quality control of the construction process. In the construction process of prefabricated buildings, if the supervision work lacks pertinence, lacks operability, lacks process control and fails to deal with on-site problems in a timely manner, it will lead to continuous mistakes in component assembly.

3. Analysis of factors affecting the quality of construction projects
At present, there are few studies on the quality influencing factors and quality management of construction industrialization projects at home and abroad, and no effective research system, system and
method for the quality management of construction industrialization has been formed. However, studies on the quality influencing factors and quality management of traditional construction engineering projects have been very mature. Therefore combining the existing mature construction project quality factors and quality management theory to study the construction industrialization project quality factors and quality management issues.

3.1 Analysis of influencing factors in the formation stage of quality
Different stages of construction project have different effects and influences on the formation of engineering quality. Project feasibility study and the influence of the decision-making stage on the engineering quality is mainly to determine the quality target and level that the engineering project should achieve, which also directly determines the design quality of the engineering project.

The quality of engineering design is the key link to determine the quality of engineering. What kind of plane layout and space form, what kind of structure type, what kind of materials, components and equipment are used, etc. are all related to the safety and reliability of the main structure of the project and whether the project can realize the planning intention. Therefore, the design of the strictness, rationality and feasibility, also become the decisive factor of the project construction, is the project safety, reliable, economic, beautiful, environmental protection, to meet the use of the requirements of the guarantee.

The construction process is a necessary means to realize the design intention. To a certain extent, the construction process is the decisive link to form the quality of the project entity. Is the final project completion acceptance, it is by checking the evaluation about the quality of the project construction stage, commissioning, appraisal of project quality whether meet the design requirements is in line with the decision-making stage to determine the quality of the target and level, and through the inspection to ensure the quality of the project, so the project completion acceptance is the essential means to ensure the quality of building products finally.

3.2 Quality of the main responsibility factor analysis
Project quality can be divided into automatic control subject and monitoring subject according to different implementers. The former refers to the workers engaged in quality formation, while the latter refers to those who monitor the quality ability and effect of others, mainly including five aspects: project quality control by the government, quality control by the construction unit, quality control by the project supervision unit, quality control by the survey and design unit, and quality control by the construction unit.

3.3 Control the quality management system
The international organization for standardization (ISO) established TC176 (technical committee on quality management and quality assurance) in 1976 to study the development of internationally adhered quality management and quality assurance standards. In 1987, ISO/TC176 issued the world-renowned ISO9000 series standard, and China issued the corresponding GB/T10300 series standard in 1988, which was "equivalent adopted". The quality management system is also the system standard that the construction industrialization should follow in the project quality management.

Enhance staff awareness, motivation and participation by promoting the quality policy throughout the organization and promoting the realization of quality objectives; Ensure that customer requirements are addressed throughout the organization; Ensure that appropriate processes are in place to meet customer and other stakeholders and achieve quality objectives; Ensure the establishment, implementation and maintenance of an effective and efficient quality management system to achieve these quality objectives; Ensure access to the necessary resources; Regularly review the quality management system; To decide on measures relating to the quality policy and quality objectives; To decide on measures to improve the quality management system.
4. Conclusion

Building industrialization, promote the industrialization of the world architecture development, promoted the pace of urbanization construction, in the aspect of building industrialization in China started late, so under the background of industrialization, in the course of the construction of construction engineering quality management experience a slight lack of current industrial construction project quality management of construction was still in the stage of research and practice, this article mainly through to the building industrialization construction quality has carried on the detailed analysis of existing problems, and combined with the traditional construction project quality management method, analyses the construction quality control factors of industrialization, It will provide some research data for future research on engineering quality control methods.

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