

The Technology Development Trend Of Chinese Architecture

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Abstract. As like other industries, China's national economy since the reform and opening in China's construction industry has experienced a rapid development, the process of construction, the industry remain the state of continuous expansion, this article from the development of China's construction achievements, problems and challenges facing three aspects to discuss the expansion of China's construction industry development present situation, at the same time, in-depth analysis of the current construction industry for the future development trends put forward good prospects.

Introduction

To speed up the process of China's programming, the urban population density is very serious, very few residential average lands, therefore, the development towards high-rise building, it demands for building foundation construction is very important, as the basis of building the bottom component project, under the full load of the building, and pass the load to the foundation [1]. If the building foundation engineering quality problems will cause the whole building settlement, deflection, so building safety accidents will occur and cause serious consequences. Therefore, studies and discusses the cause of the accident foundation projects, and take effective prevention and control measures of foundation engineering accidents.

Present situation of China building technique development

The end of last century, Chinese architecture gowns up step by step on the path of urbanization in China. Therefore, the ministry of construction issued the guidelines of green building technology, this series of technical regulations on construction, evaluation system and evaluation standard come on stage in succession, not only to clear the definition of the construction, and in view of the green building planning design, construction, intelligent, operations management, and other technical points also puts forward the guiding opinions [1]. Thanks to the green building theory research, many big cities in China such as Beijing, Shanghai, Guangzhou, Shenzhen, Hangzhou and other key technology combining with the characteristics of itself actively carry out the green building system of theoretical research and practical application, created such as energy-saving demonstration area, ecological community.

Industry sustainable development ability is insufficient. Construction remains largely depends on the rapid growth of the scale of investment in fixed assets and extensive development mode, industrialization, information, standardization level is low, management lags behind; Building resources consumption, and carbon emissions are prominent [1]. Most enterprises of science and technology spending are low, patents and proprietary technology, have fewer? The lack of qualified inter-disciplinary talent, line workers, and technical level is not high.

Market main body behavior is not standard. Construction units in violation of legal construction process, avoid the bidding, false bidding, arbitrary compression period, malicious demand, not strictly implement the mandatory project construction standards, and so on and so forth are more common, Construction companies sell, loan qualification, standard, series standard, subcontract, illegal subcontracting are still outstanding [2]. The subject duty not to carry out the construction projects, some construction enterprise quality and safety of production inputs, the construction site management confusion, some supervision enterprises are not legal responsibilities seriously, some certified personnel responsibility implementation does not reach the designated position, engineering quality and safety accidents have occurred.

Short construction personnel. At present, more than 3400 of the construction industry practitioners in China is more than 2300 migrant workers, college degree or above accounted for only 3% [1]. In addition, in recent years, the enterprise benefit is not ideal; the brain drain is serious, duds.

The system has not yet formed the benign innovation mechanism. In technological innovation, for example, China's construction industry technical contribution rate was only 25-35%, while developed countries is 70-80%; National patent authorized more than 60000 a year, but form a production capacity of more than 10000, only about 80% of the patented technology is idle [2]. This is mainly due to the current technology innovation talents mainly concentrated in universities and government agencies, although is innovation main body, but that lacks a first-class technology innovation talents.

A huge gap between Chinese enterprises and foreign enterprises. Both overall and individual, no matter in technology, management, or in terms of assets, the Chinese enterprise competitiveness is very weak compared with foreign enterprises; the construction market internationalization trend is not very adapted. Chinese construction enterprises have not yet formed the scale economy, out of the situation of low profit margins [2]. Therefore, compared with foreign construction companies, Chinese companies in both the assets, business income, labor productivity, and is all there is a huge gap in profitability.

The characteristics of the Chinese building foundation construction

Complexity. China is a vast country; the engineering geological conditions are very complicated, such as silt soil, miscellaneous fill soil, collapsible loess, frozen soil, seasonal frozen soil, etc. In addition, the lava geological mainly in China's southwest, in other regions and distribution [3]. At the same time, China is a country more earthquakes, high magnitude, and the earthquake effect on foundation is very big. The complex geological conditions of foundation engineering survey and design process and increased the difficulty, construction of large and complex technical problems are put forward.

Multiple. Due to improper foundation design or construction scheme crack house, cause serious loss of instance, caused by the vicious huge engineering construction waste is really amazing.

Potential. Cohesion, complex process from the main structure itself is always covered in different extent after the procedure before the procedure, the concealment of the working procedure quality has obvious, this also is the main structure engineering must strengthen concealed engineering acceptance check, complete concealment acceptance of storage.

Severity. In degree, the construction project was completed once, foundation quality accident problems often is irreparable, the damage it brings, is far better than to input by the construction of foundation engineering cost much more [3]. Whether selecting a location, survey and design, or construction quality problem, once appear quality problem, foundation projects tend to cause the instability of foundation, construction of the whole structure of destruction, is deadly, destructive construction project major quality accident, not only cause huge economic losses, but also directly endanger people's lives and property. Because the foundation carry the full load of the upper construction entity, so once appear local damage, the extent of damage spread quickly, and accidents are often sudden, often not easy to be found by people, the more aggravated the harmfulness and seriousness.

Difficulty. Foundation engineering quality accident treatment is difficult it is to point to it and other parts for construction project, the accident treatment, by contrast, the reason is that is closely related to its status and role of: the first is the foundation engineering of underground engineering, accident treatment of construction operation difficulty is larger; Second is once foundation take the top load, handling of itself, is bound to affect the buildings upper structure performance, especially for engineering built consign is used, it bear the full load of all construction projects, coupled with the foundation engineering quality accident chain, so it is very difficult [3].

The development trend of Construction technology

High technology development trend. New technology revolution to the all-round, multi-level penetration in the field of construction, is the modern features, technical movement is the basic form of high technological development construction technology. This penetration driving construction technology system connotation and denotation of rapid expansion, the structure of motors, functional diversification, layout, intensive, driving power, mechanized operation, intelligent control, longevity and operation of high and new technology development trend [4]. Building materials technology is high technical indicators, artifacts, multi-functional building materials direction. In this kind of development trend, the technology industrial architecture has been towards high-tech development, the use of more advanced construction technology makes the whole construction process of rationalization, efficiency, is the core concept of industrial construction.

Ecological development trend. Ecological cause toward building materials and technology to develop high quality, low consumption, long life, high performance, production and minimal impact on the environment of the degradation of waste after the construction materials direction; Architectural design goal, design process and the future operation of the construction projects, all must consider the negative impact on the ecological environment, as far as possible choose low pollution, low energy-consuming equipment, building materials and technology to improve the service life of buildings, makes every effort to make the buildings with the surrounding ecological environment in harmony [4]. In this trend, the flexibility of building will become the industrial construction technical problems, the first consideration in the use of high-tech materials as well as to contribute to the harmonious development of the surrounding ecological, the other at the end of the building use value influence of the building itself on the surrounding environment in the construction of the consideration.

The development trend of green building. Let green design into the building, advocate the use of environmental protection and energy saving materials. Now people gradually realize the design of the role of environmental protection, "green design" has become the focus of architectural design. Environmental protection and health of green building materials emphasize decoration materials besides practical function. The appearance of beautiful, also have to human body. No poison environment [5]. The traditional design method of building materials, people-centered, from meet the needs of people as the starting point, ignoring the follow-up products used in the process of resource consumption and environmental impact. Standards of green building materials is to meet the strength requirement, and to maximize the use of waste, and energy saving, the purification function and benefit the human physical and mental health.

The trend of bionic architectural culture. Architectural bionics has become a new trend of The Times, and is a new subject of architectural culture. It mainly studies bionic city, bionic function, bionic structure, and bionic form and so on. From the perspective of the speed of the development of science and technology, the future urban construction will certainly too bionic and ecology as the main body. Plant growth mechanism and the law of natural ecology, combined with the characteristics of construction, the most has the vitality of artistic form, also is the guarantee of sustainable development [5]. Architects draw inspiration from the nature, get inspired, creating all kinds of buildings. Human survival and development needs, buildings need to protect the ecological environment, as a trend of the new era, architectural bionics also need to develop, because it will become a source of architectural innovation in the future and ensure the important means of environmental ecological balance.

More and more diversified. With the intensified contradiction between human and land, land resources are scarce; the needs of social production and life of large construction; Combined with the construction of science and technology progress, people build the blocks of massive, complex structure, functional diversity, well-equipped building [4]. These buildings are often in which can hold tens of thousands to tens of people live, work and entertainment. Therefore, in this sense, it can be said that architecture is a small city that is a big building. This is an important trend in the development of architecture. The cubic construction of large-scale trend at the same time, architectural form, style, artistic tendency is increasingly diversified. This is since the reform and

opening, with public ownership as the main body, a variety of ownership economy common development on the architectural culture reflected; And foreign architectural theory, style, genre is widely spread in China; As well as architects to emancipate the mind, flowers, the result of innovation. Now China's large and medium-sized cities appeared many architectural forms, different style, artistic tendency of different public buildings, the change of Chinese cities, the same thousand city bad image has a major role [5]. With the development of economy, science and technology, building art style diversification trend is bound to be stronger. In the field of architectural design, the architects try to looking for prototype and inspiration from the biological form, thus creating many excellent form of building structures, such as thin shell structure, is the study of animal housing and imitation. After ten million years of evolution of various organisms, is an important source of architects to create.

Industrialization and automation. The general technology of the current state of the construction industry in China, is in the process of industrialization. At the same time, the former industrial society of manual operation, extensive management and a high and new technology application of the information society at the same time. According to the status quo of China's construction industry, its development will need to have completed the following tasks [6]. First of all, is machine production instead of manual work, gradually raise the level of mechanization. Second, adopt new technology, new material, Standardized, modular specification. Building industrial production can greatly improve the construction speed, shorten the construction period. Third, is the introduction of information technology into the construction process, realize the construction organization, scientific work flow, technical management standardization. Fourth, is widely used in automation technology in the construction, to speed up the pace of construction robotics research use, let robot to complete the construction of the dirty work, hard work, dangerous living.

High strength and varieties. Material is the foundation of the construction. The new material varieties increase at an annual rate of 5%. The end of last century the development of Chinese building materials quickly, but is still very backward compared with the advanced world level. Many places are still in the use of solid clay brick, this destruction of farmland, not only influence the ecological environment, but also increase the construction weight [6]. Due to meet the needs of the next strategic target and build China will, on a large scale building materials also will therefore continue to develop. The trend of development will be high strength structure materials, functional materials, the varieties of the new material widely used.

Intelligent. Because of computer technology, communication technology, microelectronics technology, multimedia technology, interactive network technology, automation technology, new material technology to the rapid infiltration and diffusion in the construction field. As early as in 1984 the United States Connecticut is the world's first intelligent office building, then, the United States, Japan, Europe and other countries have raised a hot wave of construction of intelligent buildings. At the same time, intelligent building group of intelligent, smart blocks, city planning and construction of also appear in succession [6]. China's intelligent building construction began in 1990, has built the so-called "intelligent building" more than hundreds of building. One of the more successful intelligent buildings is the Shanghai museum, not only the domestic leading, and reached the international advanced level. We believe that the rapid rise in intelligent building, building signs into a new era; intelligent building on time is a gradually developing process [4]. On the space should be divided into different levels, should not just be a pattern. Intelligent building must also is a high quality of the sustainable development of ecological architecture and green architecture. Intelligent building is an irreversible trend. Our architects and engineers should strive to put more of the high and new technology applied to the construction, for the country and more intelligent building design and construction to the people.

Summary

Large capacity, correlation degree is high the construction industry employment is an important production department of the national economy. Construction industry is the pillar industry of national economy, in the construction of a well-off society in an all-round way is shouldering the

important historical mission. On the one hand, the optimization of industrial structure, make China's fixed asset investment scale will remain in a reasonably high level, brings broad market space for the development of construction industry. The WTO transition period ended on the other hand, the domestic and international market integration, China's construction industry will face more intense competition, both opportunities and challenges. Must further deepen the reform, enhance vitality, and realize the new development. On the other hand according to the requirement of the administrative permit law and construction market development, reform and improve the system of construction market access and cleared, improve and standardize the bidding rules. Establish a nationwide network of engineering construction of credit system, the implementation of the credit supervision and disciplinary system, establishing and perfecting the self-discipline of enterprises, government regulation, expert consultation and social insurance safeguard mechanism combination of survey and design quality and safety. Strengthen the supervision of government investment project the whole process of quality and safety. In accordance with law, implement the responsibility system for production safety. Give full play to the industry association, institute of management in the industry, industry self-discipline, industry development, and reflect the member, the role of the membership interests, etc.

References

- [1] Ch.G. Zhang, Development trend of Chinese construction new century, *Journal of Chongqing University (social science edition)*, 2011, vol.3, pp.23-36.
- [2] H.F. Guo, China's construction market situation analysis and development trend of study, *The building economy* 2007, 2007, vol.5, pp.43-46.
- [3] G.L.Ping, Construction market development trend and challenges, *The construction enterprise management*, 2012, vol.5, pp.56-59.
- [4] H.L. Gao, The Chinese construction market present situation and development, *Trend of real estate*, 2007, vol.8, pp.16-19.
- [5] R.J. Sun, Introduction to the development of Chinese construction companies, *Intelligence development of science and technology and economy*, 2005, vol.10, pp.43-46.
- [6] M.Ch. Yang, Building theory of times and the development trend of Chinese construction, *Journal of Jiangnan University*, 2014, vol.8, pp.54-56.