# Future Prospects for Civil Engineering

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**Abstract.** Mainly about the development of civil engineering, in the future field of civil engineering, there are about the differentiation of construction areas, there are environmental and climatic impacts, there are also unique innovations, the study is the future encountered in various regions and climates on civil engineering impact, the use of innovative ideas to try to solve the problem reasonably. The data will be collected and explored, and the end result will be to reduce the area used in civil engineering, the technology required for harsh climates to become higher, and the use of innovative methods to solve these problems.

**Keywords:** future, civil engineering, environment

## 1 Introduction

Civil engineering is a general term for the science and technology of building various types of land engineering facilities. It includes the applied materials, equipment, the objects of engineering construction and technical activities such as survey, design, construction and maintenance. In other words, the civil engineering refers to various engineering facilities built on the ground or underground, directly or indirectly for human life, industry, military, scientific research services and infrastructure.

The ancient period of the civil engineering spans from the Neolithic Age (about 5000 BC) to the middle of the 17th century, which can be roughly divided into three periods, namely the embryonic period, the formation period and the development period. The initial civil engineering makes use of natural materials, such as stone, wood and sand. Materials such as stones were also used to make hunting equipment, shelters, and utensils for eating. The purpose of the civil engineering at that time was to imitate natural shelters to build living places to avoid wind, rain and wild animals, also called the earliest civil engineering activities.

The early modern period of the civil engineering is from the middle of the 17th century to the middle of the 20th century, which lasted more than 300 years. When Galileo began to quantitatively analyze the structure, the civil construction engineering is believed to enter the modern era. Because of the appearance of material mechanics, elastic mechanics and material reinforcement theory, the civil construction engineering has a more systematic theoretical guidance, and therefore become an independent discipline. In terms of materials, the invention of cement and the application of reinforced concrete are the milestones in the history of civil engineering. The Civil engineering at that time


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was not only for survival, but also aimed at aesthetics, art and even religion. It had gradually become a more stable and well-established industry.

The modern civil engineering starts in the mid-20th century to the present. The boom of productive social forces, associated with the evolution of the modern science and technology have stimulated the development of the modern civil engineering. Advanced engineering materials, machinery equipment and techniques significantly benefit the modern civil engineering. However, nowadays the construction of most infrastructure such as houses, and bridges still use reinforced concrete and steel as the basic materials. These materials are not environmentally friendly since the production of steel could release lots of global warming gases. Apart from this, the construction process also needs human intervention, which sometimes is a dangerous and heavy work. therefore, it has been suggested that the future development of the civil engineering would make use of new materials to reduce the environmental pollution, and also artificial intelligence or advanced robots to do complex architectural designs or dangerous work, further avoiding safety issues for workers.

## 2 Analyze

Civil engineering is closely related to people's daily lives, including food, clothing, housing and transportation, because it involves industrial buildings, agricultural buildings and civil buildings. - thus, the innovation and reform of civil engineering is of much significance to people's lives. This paper reviews the directions of possible future development of the civil engineering and discusses their advantages and current dilemma. Civil engineering has already become a lot more mature, Many facilities have been automated and technologicialized, driven by social productivity and needs. And now when planning civil engineering, it is necessary to combine previous construction experience, propose a variety of engineering design schemes, and select the best engineering planning. With the gradual expansion of the scale of civil engineering construction, requires the relevant construction units to continuously optimize the engineering planning and ensure the rationalization of the engineering planning [1].

The development of civil engineering in the future will also be a big change. In the work, the author has had relevant internships and experiences in the current construction area, with the climate and lack of land resources will lead to the construction site being limited. Through further exploration and testing, the future of climate change warming and population fertility continues to increase, and our land desertification and housing shortage have become the main problem of civil engineering.

The construction and development process of underground space will destroy the original state of the formation and affect the ground environment, so the construction and development of underground space should adhere to the principle of sustainable development. It is necessary to increase the investigation and study of the groundwater system. Since the growth of surface plants is largely constrained by the groundwater environment, damage to the groundwater system should be avoided or minimized during the development process. Second, for the possible impact on the ecology of animals and plants, it is necessary to estimate and plan in advance, and take a variety of effective

means to balance the destroyed biological environment and morphology, and effectively protect the local ecological environment [2]. According to Mr. Ye Zihan's narrative, the construction and development of underground space may encounter various problems, such as the impact on ecology on the land and the impact on people's lives.

### 2.1 he Ecological Impact of Civil Engineering.

First of all, the impact on ecology, if the development of underground space, the need to occupy a large number of plant growth environment, in the case of increasing population, the amount of car use is also more, the production of carbon dioxide is very much, if the occupation of a large number of plants living space leads to the death of a large number of plants will reduce the absorption of carbon dioxide, followed by global warming. Secondly, if the underground space is developed, it is very easy to destroy the ecology of animals and plants, and it is easy to accelerate the extinction of some species.

Then even if it will pose a threat to the safety of people's livelihood, if the lack of plant protection on the land, the frequency of earthquakes will increase, causing the loss of residential houses on the ground and if you build a residence or any other form of building underground, if an earthquake occurs, the earthquake of the underground building is more intense, the loss will be greater relative to the land, if the underground space is too developed to use, the development is deeper, it is only possible to make the earthquake more intense, the amplitude and frequency of the seismic wave will be very large, and the loss is immeasurable.

### 2.2 Effects of civil engineering on groundwater.

The second is the treatment of groundwater. If humans build houses underground, it may affect the flow of groundwater and health. When people live underground, the excluded sewage may pollute clean groundwater resources, affecting the people's domestic water. Although reasonable discharge is also difficult to avoid some sewage malicious discharge, the same will also lead to land pollution, indirectly leading to plant death.

From the information, the author has investigated on the Internet, if you want to reasonably develop underground places for the use of civil engineering, the most important point is to protect the ecological environment and protect the safety of people's lives. After all, the development of places brought about by the development of underground sites is very large and will occupy a large number of living spaces for plants. The development of underground places should not curb the growth space of a large number of plants, and some places can be selected, such as places that have been desertified, which are not suitable for plant survival, and the environment there is also less prone to earthquakes and the existence of a large amount of groundwater.

### 2.3 What Should We Do in the Face of Difficulties?

With the continuous increase in the number of civil engineering construction, people's requirements for the construction of civil engineering are becoming higher and higher, and the construction scale of civil engineering is constantly expanding, which also makes the construction difficulty of civil engineering gradually increase, and the construction process required has become more complex, and the traditional construction technology has been unable to meet the construction needs of modern civil engineering, and even has a negative impact on the construction quality and efficiency of civil engineering. In this case, it is necessary to improve and innovate the previous construction technology, so as to improve the level of construction technology and promote the quality of civil engineering construction, which also plays an important role in improving the economic benefits and competitiveness of construction enterprises. In addition, at this stage, the competition between large and small construction enterprises is becoming more and more fierce. Only continuous innovation, can effectively cope with more challenges, enhance the core competitiveness of the relevant buildings themselves, and promote the further development of construction enterprises. In the current social era, the rapid development and wide application of science and technology have promoted the improvement of construction technology in civil engineering; The continuous updating of technical equipment has greatly improved the efficiency of civil engineering construction and construction, and at the same time improved the construction technology level of civil engineering. In the face of problems in civil engineering construction, it can be dealt with in a timely and effective manner, thus promoting the construction and development of civil engineering [3]. Therefore, if we want to build and develop underground accommodation in the future development, we need to have efficient and superb construction technology to help us, because this involves the safety of underground residents and the safety of residents on the ground, if it is improper or dangerous underground construction, it may lead to land collapse and indirectly lead to the collapse of buildings on the ground, such a loss is huge, and if it is to be rebuilt, it requires a lot of manpower, material resources and financial resources. Therefore, when the underground construction process should take into account whether the buildings on the ground can support them, the empty underground area for people to walk and a series of behaviors lack upward force to support the buildings on land, so people need to consider what kind of underground place to build in what kind of underground place, but also to consider the future of more and more human beings after the construction of accommodation underground, environmental conditions and other factors, for example, if in noisy places, places with many people, the ground is a high-speed rail, Train lanes and airport places, there may be more factors to consider, if the sound insulation is not good or the sound is not suitable for the construction of residential buildings, may only be suitable for the construction of subways or other means of transport. On the other hand, if it is the area below the vegetable field, it is relatively quiet to live in.

### 2.4 The Cost of Investment in Civil Engineering.

**The Scale of Investment in Fixed Assets Continues to Grow.** According to the statistics of the National Bureau of Statistics, the scale of China's fixed asset investment has increased year by year. In 2004, the scale of China's fixed asset investment was 5.9 trillion yuan, and in 2016 it increased to 59.65 trillion yuan, and the scale of investment has doubled several times in more than ten years, as follows (see Figure 1):

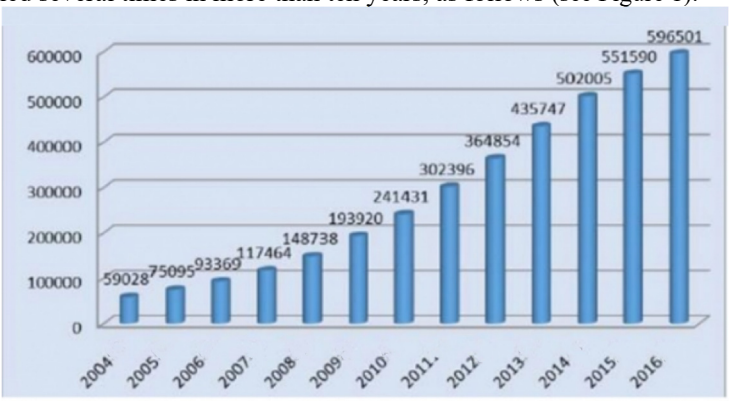


**Fig. 1.** Investment in fixed assets of the whole society from 2004 to 2006 (Unit: 100 million Yuan)

With the sustainable development of China's national economy, the scale of fixed asset investment in the whole society will continue to increase in the foreseeable future, laying a solid foundation for the development of the foundation and foundation engineering industry [4]. According to an analysis of the market size and investment scale of China's civil engineering construction industry in 2017

**The Construction Industry Is Developing Rapidly.** Construction industry as one of The basic industries of our country, is an important part of the national economy. China’s construction industry since the end of the 1970s began to recover development, with the deepening of reform and opening up and the sustained and rapid development of the national economy, the construction industry into a stage of rapid development. According to the statistics of the National Bureau of Statistics, the output value of China's construction industry increased from 2.9 trillion yuan in 2004 to 19.36 trillion yuan in 2016, an increase of 566.97%, and the changes in the total output value of China's construction industry from 2004 to 2016 are as follows (see Figure 2):


**Fig. 2.** 2004-2016 total production value of Chinese construction industry (Unit: 100 million Yuan)

From the figure 1 and 2, the total output value of China's construction industry has increased rapidly, and as a basic subdivision of the construction industry, the foundation and foundation engineering industry has also grown rapidly [5]. According to an analysis of the market size and investment scale of China's civil engineering construction industry in 2017.

As can be seen from these two figures, with the increase of the years, the monetary investment in civil engineering continues to increase in a large form, and its total output value is also getting higher and higher, indicating that the technological innovation required for civil engineering is also constantly improving and increasing, and the cost investment in technology is also increasing. In the future, the field of civil engineering can go to the sky or the underground, and the fields covered are particularly demanding on technology, and people need to solve both the direct conflicts and problems of ecology and civil engineering and the needs of people's lives

## 3 Conclusion

The future planning of civil engineering is very rich and very challenging, many visual feelings are inseparable from civil engineering, and when the number of human beings is increasing, the role of civil engineering is also increasing, and this factor to be considered is not only people's accommodation problems, travel mode problems, but also ecological problems, natural environmental disasters and other issues, so the civil engineering should have innovative means and master superb technical skills.

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