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**The scope of the papers in this journal includes, but is not limited to:**

- Architectural design
- Municipal public facilities construction
- House and civil engineering building
- Green building
- Railway/road/tunnel/bridge engineering
- Construction and building materials
- Building operations
- Running water conveyance project
- Industrial and mining engineering building
- Municipal engineering
- Central heating and central gas supply for building
- Municipal road construction

# Frontiers Research of Architecture and Engineering

**Editor-in-Chief**  
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# Exploration of Smart City Construction

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## ABSTRACT

In recent years, all walks of life have begun to propose the construction of “smart cities”. It is hoped that the construction of “smart cities” can promote the transformation and upgrading of urban development and make our cities prosperous and sustainable. In the future, urban construction is very likely to develop in the direction of intelligence and intelligence, and a scientific and effective understanding and objective evaluation of the development status of China’s smart cities will be conducive to the planning and design of China’s smart cities in the new era, formulate scientific construction policies, and strengthen the supervision and guidance of construction. At present, as far as China is concerned, the urbanization process is accelerating, the urbanization rate is increasing year by year, and the level of urbanization has increased significantly, and people are beginning to think about how to better combine technology and services to serve the people. Smart cities, as one of the concerns, may be able to better solve this kind of problem.

## 1. Introduction

Accelerating the construction of smart cities is a major measure and comprehensive measure for China to promote a high degree of urban informatization and networking. In March 2014, the Central Committee of the Communist Party of China and the State Council issued the “National New Urbanization Plan (2014-2020)”, which clearly “promoted the construction of smart cities”, and included smart cities in the national strategic planning for the first time, representing that the construction of “smart cities” has officially become a national act. How to build a distinctive smart city is a question worth pondering in

front of us.

“Smart cities” need to pay attention not only to the development of information and communication technology, but also to the quality of knowledge education and social services; Attention should be paid not only to the rational allocation of natural resources, but also to the participation of management, so that all elements can work together and promote the sustainable development of the economy and the improvement of the living standards of the people. “Smart city” is a higher level of urban digitalization and urban intelligence. Specifically, through digitalization, cloud computing, comprehensive perception, and intelligent analysis, the city’s resources can be integrated with

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each other, and information from different departments or units can be circulated to each other to make better use of resources <sup>[1]</sup>.

## 2. The concept of smart city

At present, there are different opinions on the understanding of the concept of smart city, and there is no consensus in the academic community. Through the review of relevant literature, it is found that smart cities can be roughly summarized into three categories.

### 2.1 Emphasize the importance of technology

Jiao Minglian believes that smart city is a model that uses information and communication technology to collect and analyze information, integrate key information, and operate the core system of the city to meet the different needs of society. Huang Xinguang, Wei Zhenwu, Liu Lu, Zhang Yunyong, Wang Fang, etc. believe that smart cities are the embodiment of a new generation of information technology, and will effectively and reasonably solve the problems found in urban construction and management.

### 2.2 Emphasis on the process of urbanization

One point of view is that smart cities are gradually established in the process of continuous development from traditional cities to wireless cities and digital cities in the context of industrial informatization. Another point of view is that a smart city is the embodiment of a country's or region's digitalization of cities, the intelligence of cities, and the process of intelligent urbanization.

### 2.3 Emphasis on urban management

Chen Ruming believes that smart city is to use wisdom to manage and develop the city, public management and services should mobilize wider public participation, and the government should provide more, better and more convenient public service products, so as to better realize the city management function.

On the whole, the author believes that smart cities are based on the innovation and development of science and technology, relying on the new generation of information technologies such as the Internet of Things and cloud computing, adhering to the service tenet of "people-oriented, benefiting the people and facilitating the people", focusing on urban planning, construction, management, and services, promoting urban transformation and upgrading, promoting urban informatization and intelligent operation, and making cities prosperous and sustainable <sup>[2]</sup>.

## 3. Development trend analysis

### 3.1 The scale of smart city construction in China continues to rise

In recent years, the construction of smart cities in China has entered a stage of explosive growth. Up to now, according to public data, 94% and 71% of provincial capitals and cities with independent planning in the country have carried out the top-level design of new smart cities to promote the implementation of various smart city projects. Governments at all levels have actively attracted social capital to invest in smart cities, which has effectively stimulated the development of related industries. According to the statistics of the China Academy of Information and Communications Technology, the total investment in smart cities in China reached 1.7 trillion yuan in 2020, accounting for 3.1% of the national fixed asset investment.

### 3.2 The volume of smart city infrastructure continues to expand

For example, the construction of infrastructure such as Xueliang project, smart transportation, smart pipe network, and smart water has promoted the application of various information and communication infrastructure such as smart street lights, communication base stations, and sensors, providing a foundation for accelerating the establishment of an Internet of Things perception system for urban components. At the same time, various localities are also stepping up efforts to build information infrastructure to facilitate data exchange, such as data centers, transmission networks, and information security facilities <sup>[3]</sup>.

### 3.3 The level of smart city construction and development has been continuously improved

With the continuous enhancement of the ability to collect IoT sensing data, the application scope of digital technologies such as big data, artificial intelligence, and blockchain has expanded, the data resources of city-level platforms have become more abundant, and the data sources of smart cities have gradually expanded from government information to smart terminals, the Internet, enterprises and other types, and an urban big data operation system has been built to provide information through multiple channels and share and reuse data from all parties. At the same time, according to the statistics of relevant institutions, more than 90% of China's prefecture-level cities have built municipal-level cloud platforms, and nearly one-third of them are promoting the construction of city-level big data platforms. Cities are actively exploring

ways to interconnect data between various infrastructures and departments based on their own conditions.

### **3.4 Smart cities continue to give rise to various application scenarios**

Smart city applications continue to expand and enrich the service scenarios of benefiting the people and enterprises, and have become a key area of smart city construction. While releasing and implementing the overall action plan for smart cities, all localities continue to promote the practice of specific fields such as “smart construction sites”, “smart transportation” and “smart cultural tourism”, combined with geographic information and artificial intelligence and other information technology applications, and provide real-time feedback on the operation of buildings, streets, pipe networks, environment, transportation, population, economy and other fields through data, and then a number of innovative service models for urban management, housing and construction, security, government affairs, education, medical care and culture have emerged, which can provide convenient, integrated and active public services. The construction of new smart cities provides new development opportunities for new infrastructure, Internet of Things, cloud computing, software services, network communications and other industries, and is gradually becoming a strong driving force for economic growth and high-quality development.

### **3.5 Smart cities are transforming from construction to long-term operation**

Through the guidance of national policies, the coordinated promotion of various departments and the continuous innovation of various localities, the construction of China’s new smart cities has achieved remarkable results, but it has also exposed the emphasis on construction and light operation. Emphasis on concept, light on connotation; Emphasis on government and light on society; Problems such as unclear construction and operation models and insufficient participation of social capital have become important factors affecting the effectiveness of new smart cities. It has become an inevitable choice for all localities to improve the effectiveness of smart city construction and achieve sustainable development by promoting the development of smart cities from construction-based to long-term operation, promoting a better combination of effective markets and promising governments, and building a value ecology of government guidance, government-enterprise cooperation, multi-party participation, and professional operation. From the perspective of operation, it is becoming the consensus of smart city operation

to take security as the premise, user-based, data as the key, and scenario as the starting point<sup>[4]</sup>.

## **4. Problems in the construction of smart cities**

### **4.1 Lack of awareness of the construction of smart cities**

The essence of everything can be discovered only after in-depth thinking and investigation, and the in-depth and accurate understanding of the construction of smart cities can more effectively promote the construction and development of smart cities. Since the concept of “smart city” was proposed, the vast majority of first-tier cities and more than 50% of second-tier cities have started smart city construction. However, from the perspective of strengthening ideological security, there are still cognitive differences in the connotation of smart cities, and they are facing the problem of further deepening their understanding. Since the concept of smart city was introduced into China, experts and scholars, city governments, and enterprises have defined the concept of smart city from different perspectives. Some elaborate on the description of smart cities from the technical level, and derive the technical characteristics of smart cities; Some describe the construction guarantee system from the perspective of the overall development of smart cities, emphasizing the mutual connection, mutual support and coordinated development of each subsystem. Experts and scholars will naturally draw different conclusions when they carry out research on the construction of smart cities from different perspectives. Therefore, the understanding of the nature and development law of smart city construction has not yet been safely put in place, and this insufficient understanding is very likely to hinder the rapid development of smart city construction.

### **4.2 Advanced core technology support is insufficient**

Although the construction of smart cities has emerged, the construction of China’s communication network is still in the basic stage, which restricts the rapid development of smart cities. On the one hand, China’s core technologies such as high-tech equipment, hardware facilities, and software maintenance are lacking, and most of the core technologies and services rely on foreign countries. Engineering and technical services, software equipment research and development, data transmission and other technologies are not perfect, and most of the information technology on data mining, processing, transmission and other aspects rely on traditional business operations for research and development, which cannot support the



Internet of Things, the Internet and intelligent smart city technology path. The lack of innovative research on core technologies hinders the development of information technology. On the other hand, there is a lack of supporting support for standards and specifications. Technical standards are the specification and unification of technology, and now the core technology is becoming more and more complex, and there is no unified standard constraint and specification, which will bring threats to social security. CAS, the world's leading security certification body, released data that argues that the increasing convenience of cloud computing and the Internet of Things has exacerbated the problem of data breaches. The national policy planning, laws and regulations have not yet been perfected, and there is a lack of unified industry standards and laws and regulations to restrict and guide the construction process. The interfaces are diverse and complex, and it is difficult to realize the interconnection of network systems, and it is difficult to coordinate information sharing, which is very likely to form and expand the problem of "information islands"<sup>[5]</sup>.

### **4.3 Lack of support policies for the development of smart industries**

A sound industrial system is an important force to support the rapid development of smart cities. At present, China lacks new policies for the development of new technologies, new applications and new forms of business for the construction of smart cities, as well as the deepening, refinement and effective implementation of existing industrial support policies. For example, although the State Council has formulated a number of policies to further encourage the development of software and integrated circuits, the corresponding strategic plans are formulated in different places, and the development of smart industries such as integrated circuits and Internet value-added services in some places is not the same. The operability is not strong, and in the specific implementation process, there are problems of poor implementation and unsatisfactory results. For example, in the process of implementing industrial support policies in some cities, there are more prominent problems such as "it is difficult to determine the target of policy support" and "the recognition of the identified support object is not high", which makes it difficult to implement special support funds and tax exemptions.

### **4.4 Lack of talents in the smart industry**

The smart industry is just emerging, and there is a shortage of professionals in China's smart industry. On the one

hand, there is a lack of entrepreneurs in the smart industry. For a long time, the high-end market of the industrial chain in the fields of electronic information and communication technology has been mainly occupied by multinational companies such as IBM. The concepts, technologies, and standards of smart city construction, operation and management are also mainly controlled by some internationally renowned companies, and domestic enterprises are less involved. Even if it is involved, it cannot master the core technology and enter the key industrial links. As a result, there is a scarcity of large local companies and entrepreneurs with an international presence in this field. At the same time, the awareness of the emerging smart industry is limited, some domestic entrepreneurs dare not or are unwilling to enter the field of smart industry, and the pace of intelligent transformation of emerging smart industries or traditional industries is relatively slow. On the other hand, there is a lack of talents for smart industry applications. There is a lack of high-level interdisciplinary talents in fields such as economics and business management, as well as high-skilled talents such as software engineers, logistics engineers, and financial analysts<sup>[6]</sup>.

## **5. Countermeasures and suggestions for the construction of smart cities**

### **5.1 Deepen the understanding of smart cities**

It is necessary to deeply understand the social background of smart cities, and further study the impact of smart cities on China's urbanization, modernization and informatization. At present, it is necessary to conscientiously summarize the experience of digital city construction, summarize the progress made in digital city construction, and make great efforts to comprehensively promote the construction of digital city.

### **5.2 Do a good job in top-level design and make overall and reasonable planning**

Performance, scientific and reasonable planning, and steady and efficient process are the main issues that should be considered in the construction of smart cities. The scope and direction of the construction of smart cities should be comprehensively grasped and clarified, and the development of smart industries and the gradual optimization of industrial structure should be realized through the development of common technologies. Local government agencies should combine the actual situation, take the interests of the people as the center, select the key points in urban construction in a targeted manner, seek high-quality forms of government-enterprise cooperation, constantly change the mode of investment and financing, and actively mobilize the support of institutions and enterprises in



the construction of smart cities to create intensive smart cities.

### 5.3 Unified construction standards

At present, many cities across the country have launched the development strategy of building smart cities, but the mode and content of smart city construction are not the same, and a unified consensus and construction standards have not been reached. Therefore, it is urgent to realize the unified standards for the construction of smart cities at the theoretical and practical levels, formulate corresponding standards for information data collection and use, and realize the efficient expansion and versatility of the system. Establish a sound system evaluation mechanism and certification standards for smart cities.

### 5.4 Strengthen the integration and sharing of information resources on the basis of strengthening information security measures

In the process of application, the boundaries of information use should be clearly defined, and a sound information security system should be continuously established, especially for information that will threaten national and public security or interests, a strict confidentiality mechanism must be formulated, and at the same time, the establishment of relevant laws and regulations should be strengthened and improved, and the use of information should be standardized and legalized.

## 6. Conclusion

Since the concept of smart city was proposed, the development of smart cities in China has generally gone through four stages: exploration and practice, normative adjustment, strategic tackling and comprehensive development. The construction and operation of smart cities involves many fields, and the requirements for capital investment, talent team, and professional quality are extremely high. Focusing on the construction and operation of smart cities, an industrial chain and an ecosystem of smart city construction and operation have been formed

in China composed of equipment manufacturing, software development, technology application, industrial finance, consulting and planning, solutions, system integration, operation services and other enterprises, and a five-in-one comprehensive promotion of “government, industry, research and research” has been initially formed. At present, more and more localities have begun to focus on promoting the transformation of smart city development from government-led construction to social diversified participation, joint construction and long-term operation, so as to provide fertile soil for the high-quality development of the digital economy. It has become an inevitable choice for all localities to improve the effectiveness of smart city construction and achieve sustainable development by promoting the development of smart cities from construction-based to long-term operation, promoting a better combination of effective markets and promising governments, and building a value ecology of government guidance, government-enterprise cooperation, multi-party participation, and professional operation.

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# Construction Engineering, Equipment Installation, Construction Engineering

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## ABSTRACT

At present, with the development of society, China's civil construction equipment installation engineering has many majors, complete categories and high functional requirements. In particular, the installation of the equipment is a large amount of work, with a large number of types of work, with a strong degree of specialization, and also technically complex. In the construction of construction projects in China, the installation of engineering equipment is a key control point of construction safety, and equipment installation has always been a key point that construction enterprises attach great importance to. The installation of engineering equipment will not only affect the overall progress of engineering construction, but also affect the quality of the project, therefore, the installation of construction equipment has played a vital role and has attracted increasing attention. Combined with the actual situation of construction enterprises, this paper briefly introduces some problems and solutions existing in the construction of construction enterprises.

## 1. Introduction

The installation of construction equipment is an important part of construction engineering. Whether it is in the design of the building, or in the installation, we must try to improve the quality of life of people, therefore, the construction company should try to improve the installation management of the equipment, and develop a set of scientific and efficient measures to ensure the installation quality of the equipment, to create a safe and comfortable

living and working environment for the future residents, in recent years, the relevant construction technology of domestic construction equipment has made great progress, not only to broaden the company's business scope, but also to ensure the quality of the company's projects, Promote the sustainable development of the company. Therefore, how to make better use of construction equipment in China's construction is an urgent problem to be solved<sup>[1]</sup>.

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## 2. The significance of construction equipment installation management

The installation and management of construction equipment will affect the development of the entire construction industry and can strengthen the advantages of construction quality. First, when installing construction equipment, ensure that the equipment is at a good operating level and give full play to the performance and role of the equipment. When the equipment does not work well, it will affect the quality of the construction project. Therefore, the installation of construction equipment in accordance with the requirements of the standard specifications can maintain the operational effect. Second, scientifically manage the installation and operation of construction equipment to ensure that the indicators and parameters meet the requirements of the specification, so as to realize the stable development of construction equipment installation, so as to improve the overall level of the building<sup>[2]</sup>.

## 3. Installation of construction engineering equipment

With the rapid development of the national construction industry and the national economy, the demand for equipment in the construction industry is getting higher and higher, and the demand for equipment in the construction industry is also increasing. Mainly include: building electrical, building water supply and drainage, air conditioning, smoke prevention system, building video intercom, access control system, monitoring system, elevator engineering and so on. At present, the installation of construction equipment in China is still facing many problems. While the form of bidding is generally accepted, only a few capable companies can win the bid, and many large contractors do not live up to the green county project. Generally speaking, when the project is fully completed, they will subcontract some of the small project days and then send a small number of technical experts to the site for guidance. As for the technicians who were temporarily borrowed, they would occasionally come back to check it out. In addition, most small and medium-sized industries have low technology content, and there are certain safety risks in the construction process. Therefore, in order to ensure the quality of the project, supervision should be strengthened in the construction of the project<sup>[3]</sup>. In addition, due to the weak technical strength of small companies and the small number of personnel, safety problems often arise to construction equipment during construction. Therefore, in the process of engineering construction, it is necessary to strengthen the quality control in the construction process. In the construction of the project, it is neces-

sary to strengthen the review of engineering data, monitor and manage the construction of the project, and improve the quality of the construction of the project.

## 4. Management of construction equipment installation process

Since the installation of contractor equipment involves the installation of different equipment, we start with different aspects of the construction process, rather than the installation and management of a single piece of equipment.

### 4.1 Construction equipment installation, construction materials management

The quality of the purchased building materials must be carefully inspected, the materials must be inspected on site, and the materials meet the requirements of the design drawings. Controls the amount of material entering the object. Through layers of checks, the quality of drainage equipment is ensured. In addition, it is necessary to strengthen the auxiliary materials for the installation of engineering equipment. Material managers must always be aware of the warranty period, service life, etc. Due to the dual monitoring of the main and auxiliary materials, the requirements of building materials are met, which provides a basis for the installation quality of construction equipment<sup>[4]</sup>.

### 4.2 Safety management during installation

How to improve the quality of the project, shorten the construction period, improve the construction safety, and improve the safety of the construction personnel is another important topic in front of the installation enterprises at this stage. During the construction process, the conventional strength test of the safety rope is used to avoid accidents due to poor control and improper strength testing. Due to the particularity of the supervision personnel, the development of supervision work also directly affects the safety of the construction site. strengthening the professional capacity of regulators; Enables supervisors to enforce construction site safety requirements while focusing on project quality.

### 4.3 Installation and construction progress management

We understand the organizational level of the entire construction team, the ability to respond quickly, the use of the contractor's equipment and many other aspects, which can be reflected through the construction progress management of the equipment installation project. The construction progress management of building mechanical

and electrical installation projects must formulate detailed objectives and action plans, and according to the construction plan, decompose the small objectives of the construction plan into various control points, and strictly implement the daily engineering objectives. Plan detailed daily, weekly, ten-day, monthly and daily work summaries, and deal with and coordinate problems in a timely manner. The project manager must not only check the construction progress on a regular basis, but also supervise the construction personnel to carry out the corresponding work according to the plan <sup>[5]</sup>.

#### 4.4 Installation and construction cost management

In the management of equipment installation, we attach importance to the management of construction costs and reduce construction costs through diversified measures. Managers should be clear about their responsibilities and control the cost of equipment installation and construction in an all-round way. In the early stage of design, a detailed construction budget should be prepared to guide the installation and operation of the equipment. During the construction process, the relationship between construction quality and cost should be reasonably controlled and coordinated. In the completion process, it is necessary to accurately calculate the cost of the project and ensure the rationality of the funds. Summarize practical experience and continuously improve the effect of cost management. The construction quality and construction cost have a mutual influence relationship, and the construction cost can be scientifically controlled, which can achieve economic goals and strengthen the construction quality. Installing equipment in accordance with specifications can improve construction efficiency. When the enterprise does not organize and control the construction cost, when the cost exceeds the limit, the cost will be excessively compressed, which will seriously affect the construction quality. Therefore, the management personnel pay attention to the coordination of the relationship between construction quality and cost to ensure the smoothness of equipment installation and management.

#### 4.5 Management of equipment installers

When installing equipment, personnel will directly affect the quality of installation, so it is necessary to manage the installers scientifically. Equipment installation often involves a lot of content, follow different needs, reasonably divide construction personnel, refine the responsibilities of each position and process personnel, and accurately install equipment <sup>[6]</sup>.

First, when selecting installation personnel, select and

appoint installation personnel according to their professional foundation and professional ability.

Second, regularly organize installers to participate in education and training activities, improve the structure of professional knowledge, and strengthen practical operation capabilities.

Third, while improving the work ability of installers, it is necessary to do a good job in ideological education and safety education, and strengthen the quality responsibility awareness of installers.

### 5. Problems that should be paid attention to in the installation of construction equipment

#### 5.1 Improve the level of equipment

Mastering the process points of each construction step is an important guarantee to ensure the quality of construction. Attention should be paid to the strict control of the position, tightness and strength of the equipment, and the pressurization test of the equipment can effectively ensure the quality of the equipment, carry out the construction of the equipment in accordance with the design specifications and technical standards, and strictly control each technical key point in the construction process to prevent accidents in the construction process, and then improve the construction quality. In addition, the friction of the equipment can cause the bearings to heat up. The reasons for this are: low grease content, quality deviation of grease, improper clearance adjustment of bearings, etc. To this end, it is necessary to adjust the bearing clearance to ensure the lubrication quality and prevent the machine from overheating, so as to ensure the normal operation of the machine.

#### 5.2 Improve the level of site management

The construction unit should ensure the personal safety of workers, strengthen the inspection of the construction site, strengthen the inspection of construction equipment and construction personnel, and ensure the normal and long-term operation of the equipment. Perform routine maintenance on the equipment to ensure that the equipment is in good working order. In order to avoid high-quality accidents caused by non-standard equipment in the project, it is necessary to deal with and improve it.

#### 5.3 Improve safety work

On this basis, the safety guarantee system of construction projects is proposed, the work responsibilities of construction projects are clarified, and the standardization and institutionalization of construction projects are pro-



moted. At the construction site, safety measures should be strengthened on the construction site, hidden dangers should be eliminated, accidents should be prevented, and the smooth progress of construction should be ensured. It is necessary to establish an emergency management system to deal with emergencies that occur in emergencies to minimize economic losses caused by security incidents. In the process of construction and installation, it is necessary to strengthen the safety management in the process of construction and installation. The safety inspection work of construction personnel, first, should strengthen the safety training of construction personnel and cultivate their professional skills and professional skills; Establish a sound safety and security system, equipped with sufficient fire-fighting equipment, and regularly repair and replace fire-fighting equipment. Thirdly, security issues must be addressed. All potential hazards and safety systems are set up in accordance with the relevant standards so that hazards can be detected and eliminated in a timely manner.

#### **5.4 Strengthen the inspection of instruments and the control of materials**

Testing is an important method to verify the quality of the project. It is mainly through the testing of various materials and projects, and based on the test data to evaluate the quality of materials and projects, so as to judge whether the quality of materials and projects meet the relevant standards. Through the testing of all equipment, comprehensive management of its overall performance, analysis of its problems, and timely measures to solve them, to ensure the normal operation of the equipment, improve its work efficiency, in the purchase of all kinds of construction equipment required materials, should first do a good job in the research of materials, to ensure the quality of materials, for the future work to lay a solid foundation.

#### **5.5 Implement construction quality management measures**

First, scientific management of construction technology: construction organization design, technical disclosure, and program management will affect the installation quality of construction equipment. Due to the lack of a standard system for the above-mentioned content, there are a variety of undesirable problems, based on the actual situation, formulate a detailed construction plan, and scientifically guide the installation and construction of equipment. When formulating the construction plan, it is necessary to pay attention to the design instructions, process standards and other materials to ensure that they meet the construction requirements and continuously improve the effect of

the plan. When the subcontractor prepares the construction plan, it shall consult with all the participating parties, do a good job of technical disclosure, and reduce the gap in quality management standards. In the construction plan, due to the lack of schedule, technical protection, quality acceptance standards and the review work is too formal, it has not been implemented into the actual construction operation. The main cause of this phenomenon is the lack of a quality management system. When the construction personnel install the equipment, they should be based on the specific situation, improve the content of the construction management plan, and apply it to the specific construction. Personnel should receive education and training, and constantly update their professional knowledge and skills. Introduce excellent technical personnel and management personnel to maintain the level of construction management. According to the development of the industry and the market, construction enterprises should optimize the installation process and standards of equipment, and promote the application of new materials, new technologies and new processes. In addition, the implementation of the responsibility management system, involving personal responsibility, determine the responsibility of departments and individuals, when there is an adverse event, the relevant responsibility can be investigated in a timely manner.

Second, scientific management of construction materials: in the installation of construction equipment, pay attention to the performance and quality of construction materials, and focus on the two-person review method to ensure that the materials meet the design requirements. For example, when installing water supply and drainage equipment, check the type of pipe according to the indicated pipe diameter. Follow the design standards and construction requirements, and check the pipe material. Pay attention to the verification of the quantity of incoming materials. At the same time, pay attention to the performance and quality of control materials, and pay attention to the improvement of equipment installation quality. Construction enterprises should inspect auxiliary materials, such as when installing central air conditioning, they should check the specifications, quality, and shelf life of sealants, and check the main materials and auxiliary materials in accordance with the standard requirements, so as to eliminate the potential safety hazards of construction equipment installation and construction.

## **6. Conclusion**

According to the above analysis, we can understand that there are still many deficiencies in the whole process of construction equipment installation and management, and construction enterprises need to find and formulate

countermeasures to solve and improve. In the increasingly competitive market, construction enterprises want to survive, their own competitiveness is a very decisive factor, but also must be responsible for the construction equipment installation management related work, to ensure the quality of installation management, improve the quality of the entire construction project, so that construction enterprises in such market competition to obtain better development and occupy a place. In addition, it is also necessary to pay attention to the daily maintenance and maintenance of equipment engineering, so that it can improve the construction efficiency of the construction project and ensure the quality and efficiency of the project construction under good performance and working conditions.

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# Architectural Design and Urban Planning in the New Situation

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## ABSTRACT

Under the influence of the world economy, China's economic development is very rapid, the people's living standards have been greatly improved, and the urbanization process has been accelerated. As a part of urban planning, architecture plays an important role in urban planning and construction, so urban planning must be combined with the future development goals of the city, develop in an all-round way, strengthen architectural design, ensure the consistency of urban planning and architectural design, and create a good environment for urban development. Therefore, this paper analyzes the relationship between architectural design and urban planning under the new situation, clarifies the relationship between architectural design and urban planning, and strengthens urban construction.

## 1. Introduction

Urban planning and architectural design are very closely linked, in the process of modern urban construction must deeply grasp the connection between the two, the use of comprehensive and systematic planning methods to organically combine the two, so as to jointly realize the needs of urban construction modernization and intelligence, so that the city's architecture has more local characteristics and unique style, so as to improve the overall level of urban planning and construction. Scientific, perfect and standardized building design can highlight the unique charm of the city, and can also design some representative landmark

buildings, which can bring people a sense of pleasing to the eye, and maximize people's aesthetic needs in terms of building appearance and interior.

## 2. The importance of architectural design in urban planning

### 2.1 Further promote urban development

From a macro perspective, urban planning plays a crucial role in the construction and future development of cities. Further strengthening the architectural design work can play a certain role in promoting the development of

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the city; From a micro perspective, the development of architectural design can effectively improve the quality of life and quality of life of citizens. In order to play a good role in promoting the sustainable and modern development of the city, architects must make a detailed analysis of the specific environment of the city, and at the same time, continue to explore more scientific construction planning and urban architecture, so as to achieve the continuous improvement of urban architecture <sup>[1]</sup>.

## **2.2 The architectural design fully reflects the urban planning**

During the period of architectural design and urban planning, some designers did not pay much attention to the harmony between the building and the environment, resulting in too much attention to the functionality and practicality of the building. During the design of a building, it is important to strictly follow the urban design and planning guidelines, and at the same time, to have a thorough understanding of the goals of the plan to ensure that the design of the building not only meets the functional requirements, but can also be effectively integrated <sup>[2]</sup>.

## **3. The main problems existing in architectural design and urban planning under the new situation**

### **3.1 The protection of architectural monuments and historic districts is limited**

Architectural monuments are the direct embodiment and expression of the city's regional cultural characteristics, which clarify the long-term development trajectory of the area. However, due to the current situation of rapid economic development, the government has paid more and more attention to urban planning. However, some architectural monuments have been damaged to varying degrees due to problems such as disrepair, and after renovation, the architectural monuments have gradually lost their original cultural charm due to the modern elements added to them. Secondly, due to the lack of professional and technical personnel, it is difficult for the protection of architectural monuments to play a substantive role and effect <sup>[3]</sup>.

### **3.2 The protection of cultural relics and monuments is insufficient**

At present, with the deepening of reform and opening up, people have invested a lot of resources in economic development and increased the importance of urban economic development, but in some cities and regions, the

ancient buildings that have cultural value only through the pursuit of economic interests have suffered certain damage to the history and culture. The absence and damage of history and culture highlights the incongruity between architectural design and urban planning. The main reason is that the relevant government departments and units lack a certain degree of rigor and comprehensiveness in urban planning, and there are obvious problems in the protection of historical and cultural buildings, which seriously hinders the implementation of the sustainable development of urban culture <sup>[4]</sup>.

### **3.3 There is a serious lack of standardized control measures**

Combined with the relevant standards and requirements, it can be seen that the urban planning scheme should be reviewed and approved by the relevant competent units before the follow-up measures can be implemented and implemented in an orderly manner, and when there are defects and unreasonable points in the plan, it must be comprehensively regulated and optimized to ensure that it meets the specified standards and requirements before it can be fully implemented. Operations that are not strictly approved should be planned to be illegal and will not be accepted by the people.

### **3.4 The enthusiasm of the public to participate in urban planning and management is low**

At the heart of the urban planning process is the creation of a healthy, harmonious and functional living environment for the local population. Urban residents have the right to exercise certain supervision and management over urban planning. However, some people's personal quality level and cognitive ability are limited, and they lack correct cognition and understanding of participating in urban planning and management, and simply believe that urban planning belongs to the work of the government and has no direct relationship with themselves, resulting in low enthusiasm of urban residents in participating in urban planning. In addition, there is a lag in the concept of urban planning of government authorities, which makes it difficult to effectively improve the efficiency of relevant management work, and it is difficult to meet the actual development needs of cities, which hinders the smooth implementation of urban planning and the implementation of sustainable development goals <sup>[5]</sup>.

## **4. Architectural design and urban planning strategies under the new situation**

In recent years, with the implementation of the prin-



ciple of “planning first, then construction” in the construction of new urbanization, the guiding and binding functions of urban planning on architectural design have become more and more obvious. Therefore, in addition to paying attention to the building itself, designers also need to accurately understand the relationship between architecture and the city, so as to deal with the relationship between architectural design and urban planning. Specifically, under the clear urban planning requirements, designers should adopt the following strategies in the actual architectural design process<sup>[6]</sup>.

#### 4.1 Organize architectural designers to learn the plans and requirements of local urban planning

In order to ensure that the architect can design the results in line with the local urban planning and design, the architect can be organized to consult the local urban planning management to understand the local government’s development plan and requirements for the area before starting the design. Designers must be aware of the need to ensure that they can design buildings that are in line with local urban planning, and to be able to conduct self-assessment after the design plan is completed to ensure that the designed building plan is completely in line with the requirements of urban planning. Therefore, it is necessary to organize architects to learn the plans and requirements of local urban planning, because different cities need to optimize and build different aspects in the process of development, some cities need to optimize the transportation system, while some cities need to build more buildings for office, study and residence. Therefore, architects must grasp the local urban planning plans and requirements, and accurately locate the city’s current main development direction and future development goals before carrying out architectural design activities<sup>[7]</sup>.

#### 4.2 Update the architectural design concept

First, it is necessary to establish the concept of harmony and unity between aesthetics and practical functions. Realizing the unity of aesthetic function and practical function is the key concept to be followed in the urban planning practice of new urbanization construction in recent years. For example, the “14th Five-Year Plan for New Urbanization” clearly points out that in urban planning and design, it is necessary to optimize the spatial layout of residential, industrial, commercial, transportation, ecological and other functions, and appropriately increase the proportion of residential land; It is also proposed to promote the development of urban design, strengthen the shaping and control of urban style, and promote the

coordination of new and old building volumes, styles and colors. Therefore, when designing buildings, it is necessary to focus on combining the concept of harmony and unity of aesthetics and practical functions in urban planning, and integrate practicality and aesthetics into architectural design practice. Second, we must establish a green and low-carbon design concept. The concept of green and low-carbon is the key concept of urban planning in the construction of new urbanization, which is in line with the actual development of modern cities. For example, the “14th Five-Year Plan” New Urbanization Implementation Plan mentions that green life creation actions will be carried out, green travel and the construction of green families and green communities will be promoted, energy-saving products and new residential buildings will be fully decorated, and a green consumption incentive mechanism will be established. In the design of urban buildings, designers should continue to deepen their understanding of the concept of green and low-carbon, and gradually establish the concept of green and low-carbon design in design practice, so that the design of buildings meets the clear green and low-carbon design requirements in urban planning. Third, it is necessary to establish a design concept that integrates architecture with nature and humanity. Realizing the harmonious coexistence of man and nature is the development concept advocated in urban planning, and designers should combine their own experience and experience to correctly understand and deal with the relationship between architecture and man and nature from the concept. In order to ensure that the designed building meets the actual situation and needs of people’s activities; In the relationship between architecture and nature, it is necessary to establish the concept of integration and mutual complementation between buildings and the natural ecological environment, that is, to ensure that the construction and use of buildings will not damage the surrounding natural ecological environment, and to use the surrounding natural ecological environment to set off the ecological value of buildings<sup>[8]</sup>.

#### 4.3 Incorporate innovative elements

With the continuous acceleration of urbanization, China’s urban planning and architectural design level is also constantly improving, in order to achieve the coordinated development of the two, the relevant departments should be combined with the actual development of the city, in the planning process into the integration of innovative elements, to further promote the long-term development of the city. In the process of urban planning and architectural design, we can appropriately absorb the advanced experience of foreign countries, comprehensively consider the

national conditions, the living habits of the masses, social development mode and other factors, and continue to innovate, so that urban planning and architectural design can be highly suitable for the local geographical characteristics, and ensure the rationality of urban planning under the guidance of scientific design concepts. Nowadays, with the rapid development of ecological civilization, it is also an inevitable trend of the times to integrate innovative elements into urban planning and architectural design, not only to let local residents feel the development of the city, but also to let foreign tourists intuitively feel the rapid changes of the city and establish a beautiful city image.

#### 4.4 Improve the supervision system

When carrying out urban planning and architectural design, the relevant government and departments must establish a sound supervision mechanism to ensure the strict implementation of the system, which is of great significance for building a modern intensive city. At present, in order to maximize economic benefits, many enterprises ignore the construction quality of buildings, which makes tofu slag projects and unfinished projects appear frequently, which not only causes a great waste of resources, but also is not conducive to building a harmonious society. In order to build a civilized city and create a harmonious investment environment, the implementation of urban planning and architectural design must not be separated from the regulatory system, and the relevant departments must speed up the improvement of the legal system of urban planning, ensure the rationality and scientificity of urban planning, and select a professional construction team by means of bidding to ensure that urban planning can be carried out smoothly.

#### 5. Conclusion

In short, urban architecture is the main component of urban construction, urban architecture is the specific im-

plementation of urban planning, and architectural design and construction are very important for the display of urban image. Therefore, in the process of urban construction, it is necessary to combine the actual needs of urban development planning and take into account the long-term development of the city. In the face of today's rapidly changing and developing cities, it is necessary to adopt a more scientific and reasonable, rigorous way to plan, build a better living environment, better realize the people's expectations for a better life, and continuously enhance people's sense of happiness and gain.

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