

# Application of BIM Technology in the Construction of Building Fire Pipelines

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**Abstract.** This With the rapid development of science and technology, the construction industry should also invest in new technologies and new vitality. BIM technology came into being under this background, and has the advantages and characteristics that the traditional technology can't match in the past. New technologies such as BIM must be put into the construction of building fire pipelines. Using its characteristics and properties, it can reduce the pressure during pipeline construction and improve the quality of pipeline construction. It can also effectively improve the construction of building fire pipelines. BIM technology will be used in buildings. It plays a huge role in the construction and application of fire pipelines and brings great convenience. This article will introduce BIM technology through discussion, and analyze the application of BIM technology in the construction of building fire pipelines.

**Keywords:** BIM technology; Building fire pipeline; Pipeline construction; Technology application.

## 1. Introduction

To modernize buildings, new technologies must be adopted. BIM technology utilizes its features of visualization and coordination to control and supervise the progress of pipeline construction, overcome the difficulties in the pipeline construction process, strengthen the effective communication and communication between various departments in the construction of building fire pipelines, reduce the difficulty of work, and improve the The science of construction work. BIM technology can also use its three-dimensional model drawings to conduct construction experiments, increase the accuracy of building fire pipeline construction, and improve quality. Driven by the government and leading enterprises, BIM technology is developing rapidly. The advantages of BIM technology can properly solve problems in pipeline construction and promote the development of building fire pipeline construction.

## 2. BIM technology overview

### 2.1 Current Situation of BIM Technology in my country

BIM technology is a "building information model" technology, and this technology is also a "revolutionary" technology for the integration of my country's construction industry and information. The application of BIM technology in construction reflects the combination of construction engineering and technology, which brings huge economic and social benefits to my country's construction industry. However, from the current point of view, the development of BIM technology in my country still has limitations and has not been fully developed. BIM technology brings together all the requirements of different disciplines in construction. It can be said that one technology can solve many problems. Problems that will occur in the project [3]. BIM technology brings together all project information, such as design, construction, and operation, in one building model. At present, BIM technology has gone through three stages of germination, generation and development, and has reached a mature stage. However, in China, this technology has not been popularized. In my country's construction industry, only individual design institutes are using it. BIM technology has incomparable characteristics. As a new technology, BIM can greatly improve the shortcomings of the construction industry and improve the quality of building fire protection pipelines. Any new technology has imperfections. As a new technology, BIM will inevitably have some problems, which need to be

further solved and improved in the development process. Although my country's BIM technology has not been popularized, many companies have begun to prepare for the introduction of BIM technology, and this technology has also received strong support from the government. With the rapid development of my country's economy, BIM technology will definitely occupy the market. , have a bright future.

## **2.2 Advantages of BIM Technology**

BIM technology is the product of the continuous development of scientific society, and naturally has the characteristics and advantages of informatization. BIM technology enables engineers to free their hands and change from manual drawing to computer-aided drawing, which can increase the accuracy of model drawings. BIM technology will promote the third revolution in the field of engineering design, which is also an information revolution. BIM technology can transmit data in the whole process of building construction, which can effectively improve the quality and efficiency. BIM technology not only reflects the integration and innovation of the construction industry and new technologies, but also promotes the improvement of construction quality [1]. The application of BIM technology also makes up for the shortcomings and shortcomings of construction equipment pipeline construction, and is an important means to ensure construction quality and construction safety and construction progress in pipeline construction. In the construction of construction equipment, pipeline equipment can be said to be the most difficult part. It needs to be coordinated with various work and needs to have strong professionalism. Not only that, in pipeline construction, it is necessary to pay attention to the actual environmental factors and the Coordination in design to avoid conflicts.

### **2.2.1. Visualization**

BIM technology transforms the two-dimensional drawing model into three-dimensional, and the design and construction of buildings all become three-dimensional visualization. For example, the connection between buildings and the connection between each work in the building can be displayed through three-dimensional visualization. . The 3D map can not only reduce manual errors, but also better strengthen the communication between the heads of various departments

### **2.2.2. Coordination**

Under the visual 3D model, individual projects can be researched simultaneously or communicated directly. During the construction of construction equipment, the professionalism between the various projects is relatively large, especially in the pipeline construction, the professionalism of the various workshops is not connected, and the professionalism is strong, and conflicts are inevitable, so all the work in the pipeline construction must be done well Communication and coordination. The visual 3D model diagram can effectively solve this problem, effectively coordinate engineering projects, reduce problems caused by unreasonable solutions, and save time.

### **2.2.3. Simulation**

The 3D visualization model can not only integrate the simulation diagram of the whole project, but also conduct simulation exercises. This can not only reduce the occurrence of safety accidents, but also increase the scientific nature of building design and construction arrangements, and optimize buildings with high complexity.

### **2.2.4. Optimization**

BIM technology optimizes and integrates all the work in the construction process through digital information. This not only reduces the difficulty of manual work, but also greatly improves the quality and construction efficiency of the building, making the entire project more secure.

### **3. Application of BIM technology in pipeline construction**

#### **3.1 Difficulties in pipeline construction**

The construction of building fire pipelines is a very difficult project, involving various professional fields, and it is very professional, which requires coordination of various tasks, but the workload is large, the tasks are many, and the professionalism is strong. It leads to the difficulty of communication between various tasks, and conflicts are prone to occur. In the architectural design drawings, it is difficult to clearly mark the space and structure required by the pipeline, which makes the pipeline construction more difficult, it is easy to cause safety problems, and it will also cause conflicts in various work, and the phenomenon of rework will be more serious. During the pipeline construction, the factors that are greatly affected by the actual environment, coupled with the complexity and professionalism of the project, will cause problems in the pipeline construction. Therefore, if there is a problem in the pipeline construction, it will have a greater impact on the entire project. It will also cause pressure on the pipeline construction personnel. In pipeline construction, new technology must be injected to effectively reduce the difficulty in pipeline construction.

#### **3.2 Application of BIM technology in pipeline construction**

BIM technology can establish architectural models through its own characteristics, integrate different design drawings of various jobs and specialties using digital information to integrate modeling, and carry out secondary design. This not only reduces the conflicts between the various jobs, but also enables the various jobs to communicate in a timely manner. BIM technology can not only coordinate various work during design, but also simulate the process of later installation, detect in advance whether there will be conflicts and collisions in the construction process, and make adjustments in time. BIM technology is widely used in the construction of building fire pipelines. It can not only simulate and budget for construction, but also test the construction through 3D model drawings. At the same time, it can also use its own characteristics to supervise the construction process, greatly improving efficiency. .

#### **3.3 Take full control of the model**

The pipeline construction project is complex and requires cooperation and communication between various departments. BIM technology can share models among various departments, and can fully control the models. Not only that, BIM technology can also comprehensively control the building model, and grasp the situation and respond in time when the building model needs to be changed. The cloud service technology in BIM technology can do a good job in the corresponding detection and control of the project, and can ensure whether the data information of each work is scientific, and can also effectively reduce errors and prevent problems caused by errors. Comprehensive control of the data model can ensure the accuracy of construction, as well as the construction progress and safety [4].

#### **3.4 All-round dynamic management of data**

After the engineering designer completes the design, BIM technology can carry out data management and quickly establish a 3D model to understand the project content. However, an engineering project is not static after design, and there will always be objective factors that lead to changes in the engineering plan. BIM technology can respond in time when engineering changes, and can solve subtle problems that occur at different stages in time. When the engineering project changes, BIM technology can reduce the inaccuracy of the changed data through the characteristics of informatization and visualization, and can also reduce the errors that will occur in the change. Build a dynamic database that can be updated in real time.

### **3.5 Pipe Collision Monitoring**

In the construction process of building fire pipelines, due to the huge amount of materials and the complicated construction process, the problem of pipeline collision will inevitably occur. Traditional manual drawings and CAD drawings will inevitably have subtle errors in the face of intricate pipelines, which will not only affect engineering efficiency, but also cause quality problems. At this time, BIM technology can use the three-dimensional map to simulate the construction process, introduce the problem of pipeline collision, use the three-dimensional map to find the collision point, and modify it in time. When BIM technology detects collision points, it can not only detect accurately, but also issue a detection report according to the detection situation, which more effectively guarantees the quality, safety and efficiency of pipeline construction.

### **3.6 Precise design of pipeline**

In pipeline design, due to its complexity and professionalism, coupled with the influence of objective environmental factors, errors and errors are prone to occur. If errors and errors cannot be found in time, it will have a great impact on the project, not only will Delays in the construction period may even involve safety issues. BIM technology can accurately locate pipelines during design, leaving ready positions for construction equipment to construct pipelines. BIM technology can not only reserve the position of the pipeline, but also conduct drills for the bending and winding of the pipeline during the pipeline construction, which brings great convenience to the technicians, and can find and solve problems in advance. Construction increases accuracy, reduces errors, and reduces unnecessary costs.

### **3.7 Simulated construction**

The construction of building fire pipelines can be said to be a "one-off" project. If one link goes wrong, it may cause the entire project to be restarted. The construction of fire-fighting pipes in buildings is complicated and prone to mistakes, and there is a possibility that the installation sequence may be wrong. If errors occur in the pipeline construction process, it will increase the project cost and delay the construction period. Therefore, new technologies that can be predicted are very important. BIM technology can simulate the construction scheme through the system and select the best scheme. Using BIM technology can visualize the construction process, find problems more easily, and effectively prevent problems, think of problems in advance, and make response plans in advance. Doing construction simulation well in advance can effectively prevent problems, reduce the probability of problems during the construction process, and ensure the smooth construction process.

### **3.8 Improve the quality of supervision in pipeline construction**

Since the construction of building fire pipelines is a difficult project, there will be problems during the construction process, and construction supervision will play a role, but it is difficult for supervisors to find subtle problems in complex and meticulous projects. BIM technology can just take advantage of its visualization and its ability to control engineering data, to supervise the construction process in real time, to find problems in time, and to understand the site situation in real time. When BIM technology comprehensively supervises the construction process, it can quickly find the problem, clearly point out the error in a certain link, reduce the time for error investigation, and can also issue a targeted solution.

## **4. Problems with BIM technology**

Because BIM technology is not widely used, there are still many problems, such as the lack of talents in the application of BIM technology, BIM practitioners must master the concepts and tools of BIM technology, and have corresponding engineering professional background and practical experience. This series of requirements makes BIM technical talents scarce. The application of BIM

technology is also relatively lacking, and market competition and technology have not reached the corresponding heights, which also limits the development of BIM technology.

## 5. Conclusion

At present, new technologies have been integrated in all walks of life, and the construction industry has also seized the opportunity to join new technologies, especially in the construction of difficult building fire pipelines. The use of new BIM technology can not only simplify the difficulties in pipeline construction It can also effectively improve the quality and efficiency of the construction process and save costs. BIM Through the above discussion, we can understand that although BIM technology has shortcomings in objective conditions, it is of great benefit to the construction of building fire pipelines. Therefore, the construction industry should vigorously support the development of BIM technology and actively use BIM new technology, not only provides development opportunities for this technology, but also allows its own projects to be improved. Key words: BIM technology; building fire pipeline; pipeline construction; technology application

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