

Research on the Application of BIM Technology in Building Electrical Design

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Abstract: *In recent years, BIM technology has been widely used in the field of construction engineering at home and abroad. As a new type of building science and technology, it can better help related personnel to deal with the construction of the complex form of building construction work, and has a positive effect on the further development of the construction industry. According to the actual situation, the application of BIM technology is still in the initial stage. The application of BIM technology during the process of building electrical design is analyzed and discussed accordingly, and the application process and problems of BIM technology in the process of building electrical design are summarized.*

Keywords: BIM technology; Building electrical design; Applied research.

1. INTRODUCTION

On the basis of the continuous development of information technology, BIM technology arises at the historic moment. As a new virtual information technology, BIM technology is incorporated into the link of building electrical design, which can rationalize the application of data in all aspects of engineering construction planning, design and so on, and build an intuitive and comprehensive model. It is precisely based on the simulation, coordination and visualization characteristics of BIM technology, which can provide designers with more intuitive and three-dimensional basis, and promote the building electrical design more three-dimensional and accurate.

2. ANALYSIS OF THE APPLICATION PROCESS OF BIM TECHNOLOGY IN BUILDING ELECTRICAL DESIGN

In addition to this specialty, it is also necessary to know the direction of water pipes and air pipes of HVAC and water supply and drainage in real time. Analyze the application process of BIM technology, summarize the application content of BIM technology, provide reference basis for the application and development of BIM technology, and promote the development of building electrical design.

2.1 Model working mode

For small construction projects, the model is usually established by each unit separately, based on the connection and replication between units, so as to achieve the purpose of collaborative design

2.2 Collision Check

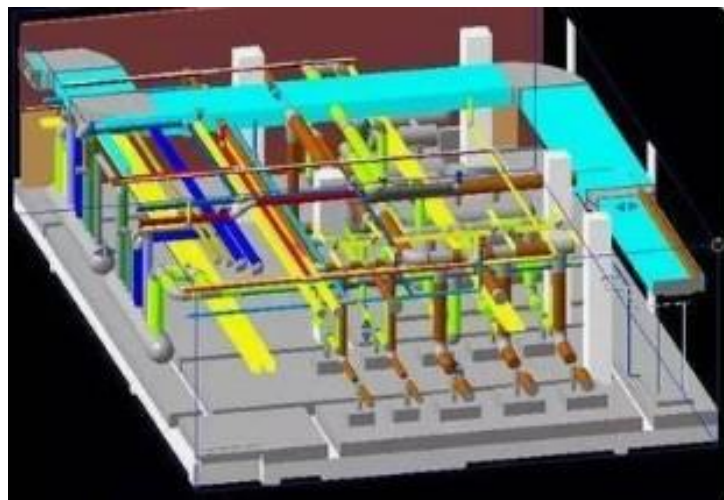


Figure 1: BIM model diagram

Under the condition of using this model, the mainstream computer configuration and network can basically meet the requirements of building electrical design. The specific content of the process is as follows: first, the professional unit of architecture and structure will complete the design of the central document of the building and upload it to the public server to

complete the establishment of the professional model; second, a copy of the central document will be established to optimize the parameters of the professional electrical equipment in the copy; meanwhile, the copy of the document content will be connected to the central document. Because BIM technology itself has the characteristic of real-time update of collaborative work, it can provide support for the progress update of the design of all units and the profession, realize the rapid decomposition of a large project by many people, and simultaneously design by many people, which can save the design cycle to a large extent.

2.3 Model Building

During the process of model drawing, based on the application of BIM technology, designers can realize two-dimensional and three-dimensional preview of any plane or section of the model. The results of architectural electrical design are more intuitive, and the optimization of various parameters is more convenient and fast. During the process of building electrical design, it is necessary to mark the distribution points of electrical equipment and pipeline connections in the two-dimensional plane. During the model building process, you need to add the electrical device parameters, including the device model, physical parameters, and electrical parameters. When the BIM software profile function is applied, the pipeline and bridge situation can be presented in three dimensions. In order to meet the comprehensive performance requirements of building electrical design, except

In the application of BIM technology during the construction process, it has a practical function, namely collision inspection. In the case of the application of this function, it can solve the design conflicts within and between the design majors existing in the architectural model. For example, during the design of building electrical pipelines, in the case of collision inspection, the corresponding collision inspection can be carried out on electrical and plumbing equipment. BIM software can display the conflict position and adjust accordingly, effectively eliminating the collision problem. With the development of science and technology, collision check can be applied in the same model revit software carries out inspection. For collision inspection of different models, BIM model comprehensive collision inspection software can be used to carry out inspection.

2.4 Drawing and publishing

After the completion of architectural electrical design work, in order to meet the needs of design drawings, it is often necessary to provide a variety of release methods, including but not limited to drawing printing and export JPG, DWG format file, at the same time, also need to automatically generate drawing catalog, and equipment list, objective and clear display of the electric bridge and electrical equipment, the specific relationship between the pipeline.

3. PROBLEMS IN THE APPLICATION OF BIM TECHNOLOGY IN THE PROCESS OF BUILDING ELECTRICAL DESIGN

Because BIM technology itself has the characteristics of visualization and three-dimensional. It is helpful to improve the efficiency and quality of architectural electrical design. However, under the influence of many factors, the application of BIM technology is easy to occur in the process of building electrical design. The main contents are as follows:

3.1 Lack of Standards

The existence and development of BIM technology is closely related to the development of modern social economy. Compared with foreign environment, our country BIM technology has started late and has relatively little application scope, and has not yet formed a scientific and perfect BIM technology standard. Without BIM technical standard, building electrical design The application of BIM technology is prone to difficulties.

3.2 BIM design is not perfect

So far there is no unified standard electrical family file library. All the equipment components in building electrical design are based on the family, in the case of fewer electrical professional family documents, designers often need to spend a lot of time and energy in building electrical design at the beginning of the family documents, increasing the corresponding cost of human resources. At the same time, due to the lack of unified standard family file library, the drawing work of lightning protection and grounding plane cannot be completed during the process of building electrical design. This is because the software does not involve the families required to draw this part of content, and the equipment components of lightning protection and grounding are relatively complex, so the corresponding production work cannot be completed. However, in the case of setting up a unified standard family file library, the normalization and standardization degree of BI M design can be improved, and the possibility of expanding the application range of BI M technology in building electrical design also increases.

3.3 High equipment requirements are proposed

Based on the establishment of BIM working mode, when multiple units carry out operation activities at the same time and the collaborative work scope is large, it often puts forward higher requirements for equipment.

4. APPLICATION OF BIM TECHNOLOGY DURING CONSTRUCTION

The application of BIM technology in the engineering construction process includes two parts: project construction stage and project operation stage. The specific contents are as follows:

4.1 Application of BIM technology in the project construction phase

The application of BIM technology in the project construction stage can improve the efficiency and quality of project construction management. BIM technology should be applied to implement on-site 4D management of the project. Firstly, appropriate schedule should be prepared to avoid the omission of the project schedule and better control the construction schedule of the whole project. Secondly, the construction schedule should be established. Based on the standard basis, the model is established, the project cost is reasonably and accurately assessed, the construction cost of the whole project is strongly controlled, the accurate procurement of materials and equipment construction resources is done well, and the economic losses are reduced as far as possible. In addition, the construction site simulation work is organized to analyze the running space of large machinery, so as to ensure and improve the safety of the construction site to the maximum extent. While doing the above work well, it provides a model close to the real condition of the project completion for the owners and the property management, so as to provide reliable information model support for the owners' next step of construction operation and management after the project is completed and the building is put into use. When the above series of work is completed, the architectural model can be applied and developed in the whole life cycle of the building, and the overall value of the architectural model will be better improved.

4.2 Application of BIM technology in project operation stage

With the continuous development of modern science and technology and the increasingly popular intelligent operation and management mode of buildings, the information source of building components accumulated by BIM technology in the electrical design stage of buildings gradually has greater application value and utility, especially in the operation and management period. According to the actual situation, when it is applied in the project operation stage, the owner unit can establish the corresponding information integration platform by combining the middleware technology, complete the input work of the main asset information in the BIM model, and provide important support for the real-time sharing of various information data. Secondly, accurate scheduling of information data of construction equipment, including various parameters, provides important data support for construction operation management. Based on equipment parameters, energy saving optimization operation of building electrical system and energy saving control of equipment use can be realized. The operation status of the building safety model is optimized, the accident process is simulated, and emergency escape drills are carried out to better meet the safety control needs of the building system.

5. CONCLUSION

In summary, through the discussion and analysis of this paper, it can be seen that BIM technology itself has the characteristics of simulation, coordination and visualization, it can provide designers with more intuitive and three-dimensional basis, promote the building electrical design more three-dimensional and accurate, pay attention to the application status and development trend of BIM technology in building electrical design. Summarize the application process and problems of BIM technology, and give full play to it. The application value of BIM technology promotes the further development of building electrical design, which is of great practical value.

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