The Research on Application of Housing Industrialization Management is Based on BIM Thinking

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Abstract—**With the large-scale construction of government affordable housing had been buiding, more attention has been paid to environmental protection, energy saving and emission reduction, as well as the increasing of quality and performance requirements of citizens for housing.Industrial housing is showing a distinct advantage slowing.Which rapid, modular and industrialized is the inevitable trend of changing the traditional construction mode to the industrialization of housing industry.In our country to achieve the industrialization of residential construction measures to landing, at this stage, the most effective and most direct, science is the development of prefabricated structure system, which is relatively more adaptable, PC residential popularizing.**

Index Terms—**BIM, thinking, House industrialization**

I. INTRODUCTION

Precast is the foundation of industrialization of residential construction assembly, the degree of industrialization of prefabricated components,which determines the residential industrialization project of prefabricated rate. Currently, our country's industrialization of residential prefabricated rate is still in a relatively low level. At the beginning of the construction stage, the design party needs to give a detailed drawings of prefabricated parts of the design stage to the prefabricated parts manufacturers, and carry out the industrialization of the components by the prefabricated manufacturers. The information transfer model of traditional two-dimensional drawings is difficult to fully reflect the design intention of designers, and there are some defects in this model. based on BIM thinking's the three-dimensional model interactive information model can alomst avoid the limitations of traditional models , and make the design with vendors to get real-time information transfer of prefabricated components in the design and modification of on-site production details changes, not only to avoid the information barrier, but also can shorten construction period and improve efficiency.

A. The application of BIM thinking in production and transportation of prefabricated components

At present, the market which can realize the information interaction platform between the design side and the manufacturer are mainly Autodesk company's BM 60 platform, Bentley company's ProjectWise platform. BM 60 platform, real-time docking design and prefabricated component model manufacturers information through cloud technology, through the extraction and change of prefabricated manufacturers BM 60 platform to get the model information, while designers design intent will directly offer component manufacturers, production process using the BIM model of the collaborative superiority of the prefabricated component. Complete information retained all the data, in favor of the industrialization of the production and processing of components.Component production is completed, will be faced with the problem is precast transportation to the construction site, we needs to consider three aspects in the transportation process : according to the actual size of prefabricated components and the degree of precision, reasonable arrangement of trucks; the development transportation plan, need to consider the construction site prefabricated position and rational planning of transport routes piled up; the production plan according to the construction sequence of precast transportation simulation, scientific control of prefabricated field assembly with dosage, to prevent the backlog of precast transportation stage, BIM and RFID (Radio Frequency Identification, RFID) are combined ,to prebrab specific implant containing a variety of information related to the RFID label, read the relevant design data from the BIM database through the component production management subsystem, at the same time every pre The manufacturing information, quality monitoring information and storage information of the component are returned to the BIM data. The principle of RFID tag coding is unique, thus ensuring the uniqueness of each component's code information, and ensuring the accuracy of the information of each component in the entire process of production, transportation and assembly [ys}. The information in the RFID tag is transferred to the BIM database for judging and processing, which can solve the problems in the

process of transportation to the assembly to a great extent.

B. The application of BIM thinking in industrial residential site assembly construction process

Enter the construction site, the most important is to solve the management problems and precast prefabricated hoisting site management problems in the construction of the traditional model, due to the lack of specific planning, the construction site of the prefabricated cluttered phenomenon often leads to lower efficiency, the assembly may lead to serious delays. The RFID technology is used to track the prefabricated parts in real time, and to control the actual process of lifting the prefabricated parts. The wireless network is used as the medium to deliver the information to the BIM data processing platform in a timely manner. At the same time, BIM combined with RFID, can make the information transfer prefabricated admission and lifting process more quickly and accurately, reduce the manual entry of information may have caused the error, such as component inspection, no need to have the construction personnel involved, set a fixed RFID reader directly,it can collect data as long as the vehicle speed can meet the conditions. On the basis of BIM thinking, combined with the advantages of RFID technology, realize the information management of prefabricated parts admission, acceptance and on-site hoisting construction, improve the work efficiency under the premise of saving manpower. The dynamic simulation of the project construction is also an indispensable part of the industrialization residential construction phase. In the construction process, how to obtain real-time comparison of the schedule and the actual schedule, to achieve the rational use of on-site resources allocation is very important, to provide scientific and theoretical basis and construction cost of 5D fusion simulation for the factors we can realize optimal allocation of manpower and material resources for the decision-makers of construction site construction time simulation 4D based on the dimension, reduce the cost to obtain greater economic benefits.

II. THE APPLICATION OF THINKING IN THE MANAGEMENT PHASE OF INDUSTRIAL RESIDENTIAL OPERATION AND MAINTENANCE

A. Data integration and sharing in operation and maintenance management

The industrialization of residential projects after the completion of design and construction, will enter the building in the whole life cycle of the longest cloud for the maintenance of stage management, the integration of information is a foundation to realize accurate and efficient, integrated management. At present, the traditional management system, such as computer maintenance management system CMMS, computer aided facilities management CAFM, EDMS electronic document management system, energy management system EMS and building automation systems such as BAS, although these facilities management system can work independently, but the system can not work collaboratively with business

sharing, and residential use after the independent data acquisition system needs to consume a large amount of material and financial resources.

BIM model integrates all the data from all items contained in specification, design, construction, operation and maintenance phase information, model information and component parameter information, BIM information database for CMMS, CAFM, EDMS, EMS, BAS and other commonly used operation management system to provide information and data, to eliminate the drawbacks of incompatible between the various systems. The system realizes the resource sharing and business collaboration.

B. Visual control in operation and maintenance management

When in debugging, fault prevention and maintenance, BIM visualization of 3D model combined with RFID technology, which uses the RFID reader function can help property management personnel easily fixed position of equipment, materials and decoration and other related components, and obtain the relevant information query for inspection. Visualization of BIM maintenance management model can avoid thinking of the property management staff to the traditional experience, intuition and subjective discrimination to determine the equipment pipe air conditioning system, electric power, gas and water etc. based on the location of. The pipes are relatively concealed, such as ceilings, walls, or floors that can't be seen. In the traditional mode, the positioning of equipment pipelines is time-consuming, inefficient and inefficient for the property management personnel. The use of BIM visual model completion can rapidly locate the position of electrical and mechanical, HVAC, equipment for pipe drainage construction in residential buildings, the location of components, equipment, pipeline operation and maintenance management stage as possible, while providing related information to the property management staff .

C. Emergency management decision and Simulation in operation and maintenance management

The data and information needed for emergency management are spatial and can be stored and searched based on the 3D BIM model. Through the real-time data information provided by the BIM model, the corresponding emergency response decision can be made even without knowing the specific situation in advance. BIM visualization model to assist the rescue personnel positioning and identification of a sudden accident, space information and 3D model contains can identify the danger zone, thus making the right evacuation route, to improve the accuracy and scientificity of emergency decision. Between BIM application in operation and maintenance management, BIM can provide detailed information for the rescue personnel before they arrive at the location. BIM can not only improve the emergency response ability of rescue personnel in the emergency situation, but also can be used as an analog tool to evaluate the losses caused by unexpected accidents, and simulate and deduce the emergency response plans.

CONCLUSION

The implementation that using BIM strategy thinking into the housing industry, its advantages can provide consistent information in the whole life cycle of PC residential buildings, as virtual real buildings, depending on the parameterization and visualization, the sustainability analysis and 4D 5D simulation; and can provide powerful support in residential design, standardization residential Bupin components, industrial production and residential sustainable design, so as to promote the housing industry informatization, to strengthen the residential project information exchange between the parties to participate in and communicate with each other to ensure seamless, but also to develop industry standardization of the housing industry to provide relevant experience.

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