Research on Implementation Strategy of Housing Industrialization under BIM Thinking

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Abstract—**our country in the field of residential construction, from the first prefabricated construction system was put forward to the concept of the housing industry, from residential to a variety of slab structure prefabricated shear wall, prefabricated frame structure housing, after decades of development and exploration experience, has been how to approach ahead of the preliminary draw in the housing industry on the road, but in the process there are some problems have not been resolved. In the new era, under the new situation, the construction industry should not be content with staying where one is rut, but need to forge ahead, pioneering and innovative. BIM thinking and the housing industry has a good point, based on the framework of BIM thinking, it can be implemented and how to further promote the development of residential industrialization, and promote transformation and upgrading of construction industry, to our national economy a new increasing point.**

Index Terms —**BIM, Housing Industry, Strategy**

I. INTRODUCTION

The arrangement and distribution characteristics of the residential building space determine that the space must be highly repetitive. And compared to the complex public building space, residential building space is simple and clear, many, Huxing simple, especially it can be modular design basis. Under the BIM thinking, we can promote the establishment of the general residential design system from three aspects, namely, the subject standardization design, the spatial adaptability design and the part product modular design.

II. BUILDING A UNIVERSAL RESIDENTIAL DESIGN SYSTEM

Subject standardization design. Including the support of large space, as far as possible to reduce indoor walls, reducing the workload and difficulty in construction of cast-in-place at the same time, improve the diversity of choice to create the interior apartment layout, layout changes in residential life cycle; residential building type regularization, reasonable control of building shape coefficient, reduce

unnecessary bump size and to improve the utilization of residential space, and achieve the material saving and energy saving; residential intensive, modular transportation, nuclear pipeline wells makes the structure simple, clear layout, convenient management and maintenance.

Spatial adaptive design. Contains a series of apartment layout and diversification, according to the use of space size is divided into large, medium, mistress type series of apartment layout according to the number of family structure, and population, in an apartment layout can be realized within a variety of changes to meet the changing needs of habitat dynamics; spatial variability and flexibility, large space structure system with apartment layout should be flexible variable, indoor space should adopt the partition system, meet the needs of different tenants for space personalized demand; space intensive and open space, enhance relevance function, reduce the walls and other obstacles, such as the use of the open kitchen, kitchen, dining room, living room and other enhanced space relationship to each other,to make it one.

III. IMPROVE THE RELEVANT STANDARDS OF THE BIM AND HOUSING INDUSTRY IMPLEMENTATION

The emergence of BIM makes it possible to achieve efficient and lossless delivery of information at all stages of a project's life cycle, thus providing the potential for collaborative work among all participants in the project. No rules, no Cheng Fangyuan, BIM as a product of advanced science, we must have standards to regulate, in order to ensure the depth and breadth of BIM development. The BIM standard, namely building information model standard, it contains not only a data model for transfer format standards and nomenclature of various components in the model, should also include different project participants between the level of detail, transmission of information data and the depth of data content and format of the relevant provisions, formulate a unified form the rules of information transfer must rely on the BIM standard.

The BIM standard is mainly composed of industrial base, information delivery manual and international dictionary three supporting system composed of many national BIM standards are the technical framework

based on BIM, such as the United States standard 11 (National Building NBM application Information ModelStandard) in 2010, China's NBIMS proposed Chinese building information model standard China BuildingInformation Model Standards framework (referred to as CBM, the CBM standard framework from the resources, behavior, delivery of the three standards for the design, construction and operation of the project in three phases for interactive information transmission specification. BIM in the high-speed development of our country, so many universities, architectural design enterprises, construction companies and investment companies have invested in the BIM study, the national government departments have begun to attach importance to the development of BIM, the establishment of the BIM standard and promulgated for government departments should be the primary task. But so far, the application engineering information model building a unified standard in 2012 by the Ministry of housing approved "(NBM-CHN) and the" information model of construction engineering classification and encoding standard "has not promulgated, as can be imagined, making the market in line with national BIM Standard Guide is not easy, need to consider many factors of software the development, building codes and data format etc...At the same time, our countru's housing industry refer to construction related industries and implementation measures have not formed a complete standard system. The prefabricated construction system as an example, the lack of match and assembling building and independent standard system in the industry, although the national and local governments have promulgated a number of related standard specification for prefabricated construction, but are based on the concept of equivalent cast-in-place, not entirely assembled building tailored, resulting in the advantages of assembly type structure in the residential areas have not been brought into full play. In order to make prefabricated housing can really play its own advantages and benefits, should take corresponding measures to improve the relevant standards system, as follows: to adapt to the establishment and development of the prefabricated construction technology standard system, break the limit standard industry, professional division system based on; the establishment and perfection of prefabricated building design production, construction, testing, inspection and a series of standards; improve the prefabricated building components, standard, speed up the establishment of the standards of sandwich panels and unified embedded parts, connectors for key components of products and accessories.

IV.   CREATE AND IMPROVE COMPONENT AND PART QUALITY DATABASE

Under the Revit software project, add all primitives (building model from for components, walls, roofs, windows and doors for detail index, recording the model configuration, marking and detail components)

are created by family. All the information of prefabricated housing in prefabricated wallboard, precast slab, precast columns, and a variety of precast beams inside parts can be embodied in the "virtual corresponding family, openness and flexibility based on a family, in the design can be designed according to demand freedom to customize various prefabricated components and parts. Through the establishment of prefabricated residential Bupin components library, library, increasing the number of BIM virtual component types and specifications, and gradually realize the standardization of prefabricated family library, to enhance the diversity of prefabricated housing at the same time, to meet the customization needs of different owners.

V.   CREATION AND SHARING OF INFORMATION BASE

Library is a collection of information contained in the process of different stages of the project life cycle information, it is a complete huge system. The system is made up of a plurality of database subsystem, a variety of elements and the composition of the system, with the unity of opposites between complex between subsystems and elements and subsystems and elements, i.e. different but interaction. Library information not only covers the design stage of the BIM model, and the data base information, including construction stage, logistics cost, resource allocation and construction process information, an important part of equipment management, operation and maintenance phase of the emergency management information also belongs to the information base.

VI.   CONCLUSION

Establishment of information base and information sharing is the basic of communicating with each participant of the project in the process of housing industrialization .Taking prefabricated parts as an example, the commodity information of each product manufacturer in the residential industrial chain is integrated into the information database of the BIM model, which provides data support for the calculation of the quantity of the built-in parts. The decoration needs customized products, in the phase of scheme docking with the manufacturers, furniture factory mass production, at the same time for good construction interface, information database based support, according to the principle of modular integration to ensure its modular coordination, coordination and overall coordination of electromechanical support system.

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