

The Application of Computer Graphics CAD Technology in Civil Engineering

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Abstract. The CAD technology of computer drawing software has powerful drawing ability. When it is applied to civil engineering, it will meet the drawing ability of different complexity in the design process, to achieve a variety of graphics format effective conversion. CAD technology platform compatibility is strong, can be in a variety of software systems for drawing, cross-media, cross-platform to achieve effective application. Therefore, in the process of improving the efficiency of civil engineering design in an all-round way, we should take the advantage of computer drawing CAD technology as the foundation and continuously improve the design method by innovating the design idea, really promote the innovation of civil engineering design.

Keywords: Computer, CAD technology of drawing, Civil engineering, Application

CAD is currently the most widely used software in construction engineering. The software is developed by Adobe, the most famous software company in the world. CAD software has perfect two-dimensional design tools and suites, at the same time can carry out three-dimensional design drawing and other functions, designers can carry out engineering drawing through this software, and can carry on the storage management to the drawing as well as the output of many kinds of formats, provides the effective power for the current comprehensive promotion civil engineering design and the construction efficiency.

1 THE APPLICATION BACKGROUND OF COMPUTER GRAPHICS CAD TECHNOLOGY IN CIVIL ENGINEERING

Before the introduction of CAD in civil engineering design drawing, it needs a lot of manpower and material resources to do the drawing work. Not only the work efficiency is low, but also the drawing quality can not be guaranteed effectively. After the introduction of CAD technology, only the related software needs to be modified and made by computer, and the complete civil engineering drawing requirements can be realized, at the same time, CD software can easily modify engineering drawings, and through its various functions and supporting software, the architectural design process can not take into account technical factors, simply by their own ideas of the design and expression, mapping function is getting simpler and better quality assurance.

Using CAD technology in computer drawing can improve the time-division and section-division of traditional drawing. In the process of civil engineering, it is necessary to comprehensively consider the specialized work of every structural part of the building, such as slab, beam, column, wall, etc. , beams collide, and in real engineering, they can be broken into different polyhedra such as cylinders, spheres, cones, and so on, then, with the help of computer drawing CAD technology, it is possible to simulate the design process of real color, light and motion track in the computer, and provide more realistic drawings for the following construction, to make sure the construction goes smoothly.

The three-dimensional design model is usually the information expression of modeling, which shows not only the geological characteristics, such as stratum color, thick and deep bottom, foundation structure, but also the spatial topological structure of engineering structure. In addition, from the point of view of Engineering Spatial Data Research, search and information decision-making. Therefore, the three-dimensional design model should have the characteristics of definiteness and visibility: definiteness. In the past two-dimensional situation, the geological section map only has some sections, and each section is scattered, in the actual processing section structure needs the operator to infer by

experience, this lacks certain certainty. The current three-dimensional geological model has been significantly improved, as long as the model is established, the data structure can be retained in the computer equipment. The three-dimensional design model is usually based on the data set stored on the network. It can be expressed on the computer equipment by using certain visualization technology, providing various ways for people to observe and understand.

Computer graphics CAD technology has a relatively high scientific and technological content, and the application of technical means is more complex, which requires high input of human, financial and material resources. It will not only lead to waste of resources, it will also raise the cost of inputs for businesses. With the application of computer drawing CAD technology in civil engineering, the working efficiency and drawing quality of civil engineering design drawing can be obviously improved, computer Graphics CAD technology will become an important technical support for designers to carry out civil engineering design work, so civil engineering designers should have a more comprehensive and detailed understanding of computer graphics CAD technology, to grasp the application scope of this technology in civil engineering clearly, in order to realize the maximum value of computer drawing CAD technology in civil engineering.

In the process of engineering design, the hierarchical structure can be displayed more clearly with the help of computer CAD technology, and the engineering design drawing can effectively reflect the structure of the design object under different views, at the same time, the graphics of each design object can effectively combine the basic components of several lower levels together to meet the basic requirements of engineering design. The traditional engineering design drawing generally does not include the principle of hierarchical model, so it can not accurately reflect the relationship between the lower part and the higher part, in this way can effectively highlight the computer CAD technology in the engineering design advantages. If a complete engineering design drawing wants to transfer its engineering content more perfectly, it should not only contain the external form of the engineering design object, and also need to reflect and shape-related graphic markings, size and text description and other information. At the same time, different layers may cross each other. Therefore, when the cross part appears in the running of computer CAD technology, the same space coordinate range can be copied immediately, so that the related operations in the space to complete, after the completion of the operation to return to the ontology coordinates, so not only can avoid the impact on the cross-section, but also can effectively improve the efficiency and quality of the operation.

2 THE APPLICATION ADVANTAGE OF COMPUTER DRAWING CAD TECHNOLOGY IN CIVIL ENGINEERING

2.1 In CAD technology, the input of human, material and financial resources has increased significantly

Although the use of CAD technology is convenient and quick, it needs not only professional technicians, but also corresponding maintenance personnel. And the purchase of legitimate software is also a considerable cost, in the design of the early, the need for staff professional training, increased the input of human and material costs.

2.2 The tacit understanding of job types will affect the work efficiency

Civil engineering design is a whole strong systems engineering, including many steps, more complicated, which requires designers in their work not only to consider the rationality of their own design, also consider the compatibility and compatibility with other jobs. In the civil engineering design process, each link's accuracy is guaranteed by the massive data, no matter which link carries on the data adjustment, will cause the plan change. Therefore, before the design, we should carry on the geology, the production facility and so on the spot inspection, then proposes the more optimized

design plan plan. So whether it is the collection and exchange of data, or field trip planning, all need time, any link with the problem will lead to the overall delay, directly affect the efficiency of the work.

2.3 Lack of uniform smart architecture software

At present, professional software can only stay at the two-dimensional level, can only be regarded as drawing software, lack of a certain degree of intelligence. Intelligentization not only transforms into three-dimensional image, but also carries on the self-adaptation corresponding standard. The required numerical value is reasonable and convenient for construction. The widely popular engineering design software in China needs to be debugged by engineers, and all kinds of problems need to be improved. It also shows that there is a lack of uniform intelligent structural software in China.

2.4 Solidify the designer's creative inspiration

Architecture actually contains many disciplines, art, philosophy, culture, science and technology in every detail reflected incisively and vividly. Any design work is inseparable from the designer's creative inspiration, this inspiration is more subjective, but CAD drawing is more mechanical, can not play at will, its inspiration to kill. In the actual situation, the design unit takes the winning bid as a single purpose, the tender documents are beautifully made, and they have made great efforts in the General Plan Effect Drawing, the work center of gravity is shifted, not only ignoring the architectural effect of the general plan arrangement drawing, it also ignores the artistic creation of designers.

2.5 Binding design ideas

Due to the limitation of the computer screen, the attention of the designer can only be partial, which may result in insufficient grasp of the whole situation and affect the proportion of the whole building. CAD technology requires a large amount of data as a basis, which leads to the designer's architectural inspiration can not be very good performance, on the other hand, the limitation of CAD technical operation and the skilled degree of designer's operation also can not express the designer's design inspiration accurately.

3 THE APPLICATION OF CAD TECHNOLOGY IN CIVIL ENGINEERING

With the continuous development of computer, the application of computer technology in civil engineering is more and more extensive, and the application of computer will certainly drive the modernization of civil engineering construction, rapid development of science and technology. Therefore, from a long-term perspective, it is necessary to promote the application of computer technology in civil engineering, not only to improve construction efficiency and reduce production costs, but also to comply with the requirements of the exhibition. We should vigorously promote the application of computer technology in civil engineering.

3.1 Application in the planning process

Pre-planning is very important to civil engineering, which directly influences the construction period and even determines the construction quality. In civil engineering investigation, it is necessary to carry out investigation of geotechnical engineering, not only to prepare investigation report, but also to draw up all kinds of attached drawings and schedules, not only need to invest a lot of manpower and time, but also low efficiency and high error rate. But the introduction of computer technology, such as CAD survey software, can effectively improve the efficiency of survey, save a lot of time and energy, but also can improve the accuracy of survey, reduce the error of survey results. Therefore, designers must consider various factors, such as environmental factors, social factors, natural factors and so on. At the

same time, each planning work is closely related to the follow-up construction operation. If the quality of work in the planning process is not up to standard, then more time and money will be used to make adjustments in the later stages. Generally, the application of CAD technology in the planning process mainly covers the following aspects: the planning of storage information system, such as Urban Policy Information System, geographic information system, etc. . It can directly correspond to the appropriate database, making the operation more efficient. Assist with its strong relevance to the production system, such as urban landscape performance system. Information-based analysis system, the most common is the urban planning information analysis system, its unified storage of information, direct input system platform for analysis and processing, and then ensure that the implementation of urban planning higher level, more scientific.

3.2 Application in design process

Civil engineering design covers many aspects, such as the selection of structural form, structural checking analysis, shape and size assumption, modeling analysis, etc. . Although each design work has its unique request, but all can apply the computer drawing CAD technology to carry on the processing, guarantees the design plan level. In particular, the structural design of civil engineering design system has a great impact on the quality of engineering construction. Designers must combine CAD system software to model the entity of the target structure, ensure the section and stress condition of each structure component, calculate the section and stress range accurately according to the actual situation, ensure the follow-up construction to get more scientific and accurate guidance.

3.3 Application in construction process

The civil engineering construction link also has the strong system, the complexity, the construction personnel needs to carry on the scientific coordination to each work, including the construction investigation, the tender quoted price, the personnel deployment, the construction design and so on. The application of computer graphics CAD technology can coordinate these work more scientifically, especially in engineering contract system, bidding system, network planning system and so on. With the upgrading and optimization of Technology, the comprehensive technical management level of construction enterprises has been continuously improved.

3.4 Application in maintenance management

With the increase of construction time, the external complex environment will lead to obvious aging and function decline of the building. In order to prolong the service life of the building, it is necessary to carry out the management and maintenance of the building, which covers inspection, reinforcement and maintenance. For engineering construction, gas and water pipelines design is the first application of computer graphics CAD technology, especially in the pipeline location and condition analysis. With the continuous optimization of the technology, the implementation level of these tasks is getting higher and higher. In particular, the periodic detection of information data preservation function, so that the project maintenance management can be more efficient implementation.

4 CONCLUSION

Computer CAD technology is a revolutionary innovation, in order to better play its role, the relevant personnel need to carry out professional training and education, so that they have a comprehensive understanding and grasp of computer CAD technology, and achieve the effective promotion and application of computer CAD technology. At the same time,

the application of computer CAD technology in civil engineering process, but also need to continue to excavate and innovate, in order to better play its role.

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