

# Practical Application of Surveying and Mapping Engineering Technology in Real Estate Surveying

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**Abstract:** With the smooth development of China's economic construction work, significant progress has been made in various fields. Among them, in the field of land management, the measurement of real estate has also achieved higher efficiency on the original basis. Due to the continuous updating of science and technology in our country, surveying and mapping engineering technology has also been applied to various projects, and the level of measurement has also been fundamentally improved. The measured values are more accurate, and the difficulty of measurement work is gradually reduced. It can fully and comprehensively display the actual situation of real estate land. This article analyzes and summarizes the current application situation of surveying and mapping engineering technology, and proposes some practical and feasible technical implementation plans, aiming to help new surveying technologies play practical roles in the real estate field.

**Keywords:** Surveying and mapping technology; Real estate surveying; Practical application

## 1. Introduction

The main purpose of using surveying and mapping technology for real estate surveying is to obtain more accurate data information and consider the natural environment around the real estate. Sometimes surveying and mapping technology can also analyze all work content related to the rights subject in real estate.

<sup>[1]</sup>With the continuous infiltration and application of technological innovation technology in various fields of work, surveying and mapping personnel have also utilized new surveying and mapping technologies to complete various tasks in practical work, and are willing to study the operational steps and core concepts of new technologies, effectively improving the accuracy

of real estate surveying and mapping work, making the entire surveying and mapping process more scientific and standardized. Therefore, relevant surveying and mapping personnel must use their spare time to learn new surveying and mapping technologies, and effectively improve their comprehensive literacy.

## 2. The Main Types of Surveying and Mapping Work in the Real Estate Field in China

Firstly, in our country, real estate surveying and mapping work is usually carried out, which is also an important component of the real estate field. The au-



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thenticity and accuracy of real estate surveying data can directly affect the vital interests of the people. The main content of this surveying and mapping work is to calculate and organize the land area occupied by buildings, which will directly affect the interests of the real estate development field. Secondly, it is to conduct cadastral surveying and mapping, which is different from real estate surveying and mapping and has a certain correlation with government departments.<sup>[2]</sup> China has a vast land area and also requires a large number of professional talents to plan and utilize its territory reasonably. At this point, it is necessary to use cadastral surveying and mapping technology to obtain accurate land data, making land planning work more scientific and government departments will be more targeted when managing land.<sup>[3]</sup> Subsequently, surveying and mapping technology is widely applied in the field of forestry and grassland measurement. Compared to the first two types of surveying and mapping work, forestry surveying is more difficult. As the measurement object is data from the natural environment, the surveying and mapping data seems to not involve the actual interests of the people. However, in fact, accurate acquisition of natural environment data can help people better understand the actual situation of the ecological environment in the early stage, understand the types of resources that can be utilized, and be able to plan limited resources reasonably to effectively improve resource utilization. Therefore, surveying and mapping work in the field of forestry and grassland can indirectly affect the quality of human life and social development trends in the future.

### **3. Characteristics of Surveying and Mapping Work in the Real Estate Field**

Firstly, real estate surveying and mapping work is authoritative, and China has also issued relevant surveying and mapping standards and strict regulations for work in the real estate field. Therefore, surveying and mapping technical personnel should study the various surveying and mapping provisions announced by the

state before carrying out each task, strictly follow relevant regulations for surveying and mapping of real estate. After the surveying and mapping work is completed, the data results should be stored as raw materials in the archives, and the surveying and mapping results should be submitted to the approval department for review.<sup>[4]</sup> During this period, no one is allowed to tamper with any data information in the data without authorization, nor can they modify the relevant content of the workflow at will. When conducting project approval, the approval personnel need to strictly refer to various national regulations and carefully review the materials. Once the surveying and mapping results are implemented and approved, they will be used in various business transactions and serve as an important basis for real estate development projects, making them materials with strong legal effect. In summary, surveying and mapping data can safeguard the legitimate rights and interests of real estate property owners. Therefore, the surveying and mapping results have legal validity and authority, and must be treated rigorously. Secondly, surveying and mapping work in the real estate field often needs to be carried out in the field, and the complexity of the field environment invisibly increases the difficulty of surveying and mapping work. Therefore, when surveying and mapping personnel are preparing to present the results of on-site surveying and mapping on drawings, it is necessary to present all the things at the surveying and mapping location, determine the scale values, and accurately mark the boundaries of the territory, in order for such drawings to have practical value. Compared to ordinary surveying and mapping drawings, surveying and mapping drawings in the real estate field usually have a larger scale. At the same time, there may be differences in the surveying objects in the real estate field, and the characteristics of the surrounding environment of the real estate will also be reflected in the drawings. The main purpose of this is to enable viewers of the drawings to have a better understanding of the characteristics of the location of the house and a detailed understanding of

the surrounding terrain. Finally, personnel involved in real estate surveying and mapping work not only need to have a high professional level, but also should serve as witnesses to every fair transaction.<sup>[5]</sup> Therefore, when selecting surveying and mapping personnel, it is necessary to ensure that they have a high professional level. Secondly, surveying and mapping personnel need to have a thorough understanding of the operating methods of the real estate trading market, know the transaction process or buying and selling channels, etc. Only those who possess the above two abilities can be called qualified surveying and mapping personnel. Housing construction work is highly comprehensive, and there may be situations of demolishing excess buildings during this period, as well as work to expand the scope of land use. During these tasks, staff need to conduct timely supplementary surveys or re-survey certain tasks to ensure the authenticity of the data.

#### **4. Surveying and Mapping Techniques for the Application of Mechanisms in the Real Estate Field**

##### **(1). Application of RTK technology**

The so-called RTK positioning technology will organically combine the properties of mobile stations with reference stations, and on this basis, use GPS positioning systems to achieve dynamic positioning. Due to the distance between the reference station and the mobile station, the accuracy of the positioning system's statistical data will become increasingly low. Therefore, RTK positioning technology cannot allow the working distance of the two stations to exceed 10-15 km when applied. In today's society with the continuous development of satellite positioning, this positioning technology has been widely applied in practical work, which can effectively improve the efficiency of surveying and mapping workers.<sup>[6]</sup> Compared to other types of surveying techniques, this surveying method can save more work time. Moreover, RTK technology can help surveying personnel obtain more accurate measurement data. This technology generally applies

the dynamic time difference generated by carrier phase as the working basis, and has a good future development prospect. Compared with other surveying and mapping technologies, the application of this technology can achieve the purpose of real-time data monitoring, and it will also be faster and more convenient in executing various work tasks, fundamentally saving work time. It can achieve the integration of data measurement and is favored by many surveying and mapping workers. Meanwhile, the application of automated control systems in RTK technology can fundamentally reduce the probability of data errors. The working environment of real estate may have certain complexity at certain times, but environmental factors do not affect the implementation of RTK technology, ensuring the authenticity of the values

##### **(2). 3D laser scanning**

The use of three-dimensional lasers can give surveying and mapping work distinct digital features, and can complete surveying and mapping work in a very short time, and the collected data information is also more accurate. This method is often used in real estate surveying and mapping work in special terrain environments, and can achieve its expected results.<sup>[7]</sup> Especially in some areas with unfavorable geological conditions, surveying and mapping personnel are unable to conduct on-site measurements. At this time, the application of 3D scanners can successfully complete the work. This technology utilizes advanced working methods to change the previous surveying and mapping work, which is easy to operate and can adapt to various surveying environments, effectively compensating for many shortcomings in the original surveying and mapping work. Especially when measuring mines or surveying construction projects, it has strong advantages. Before applying 3D laser scanning technology, the first step is to thoroughly investigate the ground environment, and then use it as a benchmark for 3D scanning. The GPS positioning system is used to complete the ground control network, which can further accurately measure the numerical value of the data. Subsequently,

the surveying and mapping personnel need to build a model of the ground environment, and at the same time, they need to conduct step by step measurements to obtain DEM data information, which can accurately record complex terrain environments. Finally, when drawing digital line drawings, more accurate rendering can be achieved, and the implementation of 3D laser scanning technology can display various spatial positions in detail, which is conducive to establishing models.

### (3). Digital photogrammetry

This method is usually applied in the aerospace field, where photographic equipment with high sensitivity and resolution is placed in equipment in the aerospace field.<sup>[8]</sup> This way, measurement work can be carried out according to the actual needs of surveying and mapping work, and obtaining data will have a more clear and targeted approach. When using this surveying method, staff can set the specific process of surveying work according to their actual needs. At the same time, according to different work needs, a more scientific form of real estate surveying and mapping work can be developed, which can provide accurate data for workers in other fields at the same time. By utilizing the remote control function of satellite systems, surveying and mapping personnel can dynamically monitor the actual data changes in a certain area for a long time, which can provide a more detailed understanding of the changes in a certain real estate. The changes in China's land resources can be accurately recorded.

### (4). Application of 3S technology

3S technology is the latest surveying and mapping technology developed in China under the current situation, and has been widely applied in practical applications. When using this technology for real estate measurement, it can have a broader field of work. When staff use 3S technology to calculate the relevant values of the land area of a certain real estate, they can use GIS system software to draw the shape of the building, making area calculation more convenient. In addition, using GPS technology with 3S technology can achieve

higher work efficiency, and the operation is also very simple, resulting in a significant improvement in work efficiency.

## 5. Conclusion

In summary, the surveying and mapping engineering technology major focuses on the scientific collection and processing of Earth's surface and spatial information as its main business, cultivating highly skilled talents who are adaptable to modern production, construction, management, and service frontline, and have a comprehensive development of morality, intelligence, physical fitness, aesthetics, and labor. In the field of real estate measurement, advanced surveying and mapping technology can provide more accurate values. Relevant personnel need to keep up with the development trends of the times, actively utilize advanced scientific and technological advancements, better meet the actual needs of various industries, help them have bright development prospects, and promote the steady development of various sectors of society in China.

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