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Plan to improve the retention of technical personnel of GF Construction Company

Juan Hu

Master in Applied Management

Supervisor:
Professor Luis Dias Martins, Researcher, BRU Business Research Unit ISCTE-IUL
Co-Supervisor:
Professor Sofia Lopes Portela,Assistant Professor, ISCTE-IUL

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BUSINESS
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Department of Marketing, Operations and General Management

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May my project findings provide valuable references and insights for researchers and practitioners in GF Construction Company and other related fields.

Abstract

GF Construction Company has been committed to various construction activities for 20 years since its establishment, and is a first-class construction enterprise with multiple professional business scopes. Due to the company's honest management, continuous technological innovation, and strong technical team, GF Construction Company has become a well-known construction enterprise in Jiangxi Province.

However, according to internal data from GF Company, the turnover rate of technical personnel has been increasing year by year in recent years. If the turnover of technical personnel continues to rise, it will to some extent affect the healthy and sustainable development of the company, increase costs for the enterprise, and cause significant losses. Faced with this situation, GF Construction Company needs to develop effective plans and take corresponding measures to improve the satisfaction and retention of technical personnel and employees.

In order to achieve this goal, after analyzing the external and internal environment, information of 160 technical personnel who have resigned from GF Construction Company between June 2023 and May 2024 was randomly selected for data analysis. A survey was conducted through telephone interviews to collect and analyze the reasons for the departure of technical personnel from GF Construction Company.

Keywords:

Loss of construction companies、technical personnel

JEL Classification:

J44

Resumo

GF Construction Company tem sido comprometida com várias atividades de construção por 20 anos desde a sua criação, e é uma empresa de construção de primeira classe com vários escopos de negócios profissionais. Devido à gestão honesta da empresa, inovação tecnológica contínua e equipe técnica forte, GF Construction Company tornou-se uma empresa de construção bem conhecida na província de Jiangxi.

No entanto, de acordo com dados internos da GF Company, a taxa de rotatividade de pessoal técnico tem aumentado ano a ano nos últimos anos. Se a rotatividade de pessoal técnico continuar a aumentar, isso afetará, em certa medida, o desenvolvimento saudável e sustentável da empresa, aumentará os custos para a empresa e causará perdas significativas. Diante desta situação, a GF Construction Company precisa desenvolver planos eficazes e tomar medidas correspondentes para melhorar a satisfação e retenção do pessoal técnico e funcionários.

Para atingir esse objetivo, após análise do ambiente externo e interno, foram selecionadas aleatoriamente para análise dos dados informações de 160 técnicos demitidos da GF Construction Company entre junho de 2023 e maio de 2024, sendo realizada uma pesquisa por meio de entrevistas telefônicas para coletar e analisar os motivos da saída do pessoal técnico da GF Construction Company.

Palavras-Chave:

empresa de construção civil、Perda de pessoal técnico

JEL Classification:

J44

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1. Introduction

GF Construction Company was established in 2003, with its registered address located in Nanchang City, Jiangxi Province. The company's business scope covers multiple fields, including various engineering construction activities, residential interior decoration, construction project quality inspection, etc. In addition, the company also has multiple external investment enterprises and 15 branch offices, demonstrating its extensive influence and resource advantages in the construction industry.

Due to various social factors, there is widespread turnover of technical personnel in various industries. Against this backdrop, this project will focus on the issue of technical personnel turnover faced by GF Construction Company. Through in-depth analysis of the reasons for turnover, influencing factors, and the effectiveness of current strategies, the main purpose of this project is to help GF Company comprehensively analyze the departing technical personnel team, analyze the root causes of technical personnel turnover, and propose targeted prevention measures for existing technical personnel, so that GF Company can better retain existing technical personnel resources, stimulate technical personnel vitality, and achieve efficient allocation of technical personnel resources. Through this study, it is expected to provide valuable management experience and strategic recommendations for GF Construction Company and similar enterprises to address the challenges that talent loss may pose to their development.

Based on internal and external analysis of GF Construction Company, opinions from departing technical personnel were collected using methods such as literature review and interviews.

This project is divided into seven chapters. The first chapter is an introduction, briefly describing the background, problems, objectives, and project methods of the topic. Chapter 2 is a literature review, providing a theoretical basis for the project. Chapter 3 is methodology, which introduces various methods used in this project, including interview method and cluster analysis method in quantitative analysis. Chapter 4 is an analysis of external circumstances. Through the data of departing technical personnel provided by the human resources and administrative department, and using PESTEL and Porter's Five Forces model, carefully analyze the channel information and summarize the reasons for employee turnover. Chapter 5 is an analysis of the internal situation. By summarizing the current basic situation of human resources and the turnover of technical personnel in GF Construction Company, cluster analysis is used to identify the characteristics and reasons for frequent turnover of technical personnel from the existing data of the enterprise. Chapter 6 proposes a solution for the turnover of technical personnel in GF Construction Company. This chapter is a solution to

the problem analysis in Chapter 5, targeting the factors that affect the intention of technical personnel to resign and the root causes of resignation, in order to alleviate the dilemma of GF Construction Company's turnover rate. Chapter 7 elaborates on the project conclusions and shortcomings obtained through the turnover of technical personnel at GF Construction Company, and proposes future prospects.

The project approach is shown in the following figure1.1

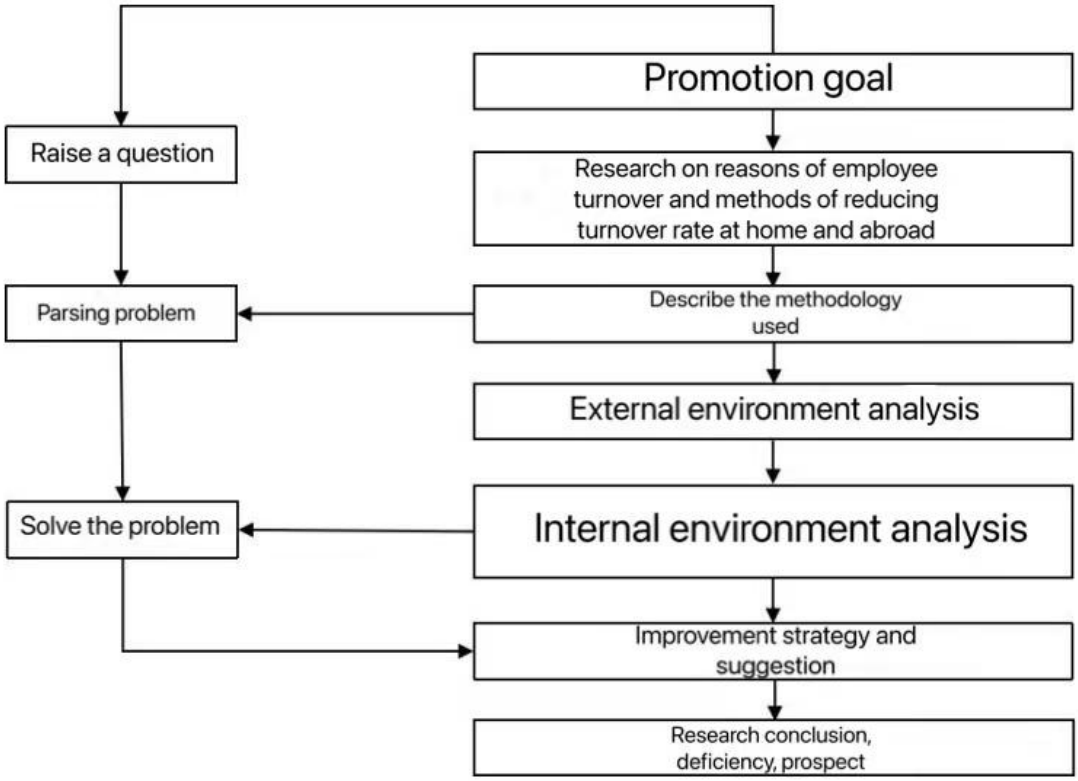

Figure 1.1 Thesis Technical Roadmap

Data source: Author (2024)

2. Literature Review

Employees are important resources for the development of enterprises, and enterprises are platforms for employees to realize their personal value. To achieve long-term development, enterprises must have a clear understanding of human resource management, do a good job in the basic business of human resource management, pay attention to employee turnover issues, and reasonably control employee turnover rates. This project conducts extensive literature project to summarize and evaluate the impact of employee turnover on enterprises, reasons for turnover, and methods for reducing employee turnover rates by domestic and foreign scholars.

2.1. Personal factors for employee turnover

Many scholars analyze and study from a personal perspective, and draw rich conclusions. They believe that the main personal factor for employee turnover is employee satisfaction.

Price (1977), as an expert in researching employee turnover, creatively proposed the Price model after years of research. The construction condition of the Price model is that there is a mutual influence between job transition opportunities and job satisfaction. Employees will only leave when job satisfaction decreases and there are more opportunities to switch jobs. Otherwise, if an employee is highly satisfied with their current job, even if there are opportunities to switch jobs, they will not resign. Haldorai et al. (2019) proposed that job intensity, employee relations, career development pathways, adaptability to the work environment, negative emotions, living environment, supervisor pressure, social status, and other factors can all have an impact on employee turnover. Ranjit (2019) believes that although there are various reasons for employee turnover, the factors can be roughly divided into three types: personal factors, internal factors within the company, and work-related factors. Oliveira et al. (2019) found that the work emotions of technical professionals can also affect their work situation and indirectly affect the turnover rate of technical professionals. Hackett (2019) believes that whether an employee's core values can be realized mainly depends on whether the employee's personal comprehensive development goal planning is consistent with the comprehensive development goals of the organization they work for. Individuals usually choose to approach the organization or move to a new organization that is closer to their personal goals. Park et al. (2020) conducted a meta-analysis to study the issue of professional and technical talent turnover. The research results showed that excessive work pressure can lead to turnover thoughts among professional and technical talents. Muhammad et al. (2020) believe that the better an employee adapts to their job, the more satisfied their job satisfaction is, and the stronger their willingness to stay, resulting in a lower tendency to resign. He and An (2020) believe that in terms of job characteristics,

construction company employees often leave home and cannot take care of their families. The lack of attention and support for project department employees and their families in this regard leads to an imbalance in the relationship between work and family, causing employees to feel uncomfortable and dissatisfied, and resulting in a tendency to resign. Krein et al. (2022) argue that employees' sense of appreciation and support is crucial for reducing personnel turnover. Wei (2022) divided the reasons for employee turnover into two categories: turnover due to dissatisfaction and turnover due to lack of satisfaction. Ghani et al. (2022) believe that the reasons for employee turnover depend on employee satisfaction. Wang et al. (2022) believe that employees have varying degrees of expectations for their work and often seek more suitable jobs through turnover.

2.2. Enterprise factors for employee turnover

Some scholars believe that the imperfections in various aspects of enterprises can lead to a large number of personnel turnover.

Some scholars believe that salary is the main factor leading to personnel turnover. Li (2019) found a positive correlation between salary, upward mobility, geographic location, and employee turnover intention through interviews, document surveys, and quantitative data analysis of departing employees. Kashif et al. (2020) believe that the primary factor affecting the loss of high skilled talent is salary. In addition, having more development opportunities and a better lifestyle are also key factors in preventing the loss of high skilled talents. Peng (2020) used a large state-owned construction enterprise as an example to analyze the reasons for the departure of frontline workers, mainly including high job mobility, working far away from family, lack of external competitiveness in salary and benefits, and lack of holidays. Wang (2020) believes that the key factors causing talent loss in enterprises are: neglecting employee vocational training; The salary and benefits of the enterprise do not match the job capabilities; Corporate culture does not align with employee values. Xie (2020) believes that compared to other types of talents, technical talents in enterprises have smaller competitive advantages in terms of salary, development space, and ability improvement. There are many reasons for this phenomenon, such as insufficient attractiveness of salary and benefits, lack of a systematic and complete management system, unclear training effects, and difficulty in combining theory with practice. Zhu (2022) believes that the unreasonable salary system, unclear career development channels, unreasonable training work, lack of management ability of senior management personnel, neglect of corporate culture construction, and long working hours are the reasons for employee turnover in enterprises. Wang (2022) believes that the main reasons for employee turnover in small and medium-sized enterprises are: unclear development prospects, family responsibility, lack of a sound

salary incentive system, lack of emphasis on employee training, lack of a reasonable promotion system, and lack of a good corporate culture. Deng (2022) believes that factors such as salary income, vacation system, and promotion channels are the main causes of personnel turnover.

Some scholars believe that insufficient corporate culture and social competitiveness are the main factors leading to personnel turnover. Li and Liu (2013) believe that the turnover of technical personnel is the result of multiple factors such as internal management environment, corporate culture, and institutional factors working together. Zhao et al. (2018) found that employees' turnover intention is largely influenced by external opportunities, job autonomy, and salary status. Liu (2020) conducted a study on the problem of turnover in construction enterprises. Taking state-owned construction enterprises as an example, with the dissipation of the demographic dividend, construction enterprises have gradually transformed from labor-intensive to labor-intensive, and the demand for technical talents has increased, leading to competition for talent resources. Qu (2021) believes that employee turnover is related to whether the economic development is good or not. In a situation where the social and economic development is good, the talent market will tilt towards a buyer's market, and the employee turnover rate will decrease, and vice versa.

2.3. Existing Solutions for Employee Turnover

Some scholars believe that organizations can reduce employee turnover through training programs. Han (2021) believes that measures to address high employee turnover rates include providing training opportunities and enhancing their professional skills. Akerstrom et al. (2021) suggest that companies can take corresponding intervention measures at the organizational level to influence employee turnover intention. He emphasized that enterprises need to take proactive measures in controlling employee turnover, and should have sufficient analysis and response measures for employee turnover. By improving the management level of various business systems, the comprehensive governance level of the enterprise should be promoted, and the personal comprehensive quality of employees should be enhanced to reduce the market-oriented exit of employees due to incompetence in their positions; At the same time, through the subtle influence of corporate culture, it helps employees enhance their sense of belonging and identification with the company, improve their cohesion and centripetal force, and build a workforce with reasonable age, education, position, and length of service levels. In this process, high requirements are placed on the enterprise to ensure that there is no excessive turnover of employees, as well as to ensure the reasonable flow and outflow of employees, in order to control the turnover rate within a reasonable range suitable for the development of the enterprise. Through in-depth research

and analysis, Gan (2021) can point out some strategies, such as establishing the concept of people-oriented management, improving and optimizing the salary and welfare system, building a dual career development path, optimizing talent training mechanisms, increasing humanistic care, and creating an inclusive corporate culture, which can effectively alleviate the problem of professional and technical talent loss in construction enterprises. Zhao and Wei (2023) proposed establishing a professional training and development system from the perspective of psychological contract to reduce employee turnover in small and medium-sized enterprises.

Some scholars believe that reducing employee turnover can be achieved through leadership management. Dutta and Khatri (2017) believe that leadership art ability and leadership behavior have a significant impact on employee turnover behavior. Believing that having more service-oriented leaders in enterprise management can reduce employee turnover rates. Stamolampros et al. (2019) argue that employee satisfaction is influenced by the leadership of leaders in the organization and the corporate culture within the organization, and whether the organization provides sufficient career development opportunities for employees is particularly important for employee turnover.

Most scholars believe that the problem of employee turnover still needs to be solved from aspects such as company compensation and corporate culture. Yang (2018) believes in her research that the main reason for employee turnover is in enterprises, and lists measures such as improving salary and benefits systems and valuing corporate culture that enterprises should take in the project. After studying the current situation and problems of employee turnover in small and medium-sized enterprises, Wen (2019) came up with three countermeasures: first, companies should improve their employee management mechanism system to help employees determine clear and reasonable career development plans based on their actual situation; second, clarify job responsibilities; third, attach great importance to cultural construction. Xing (2019) believes that enterprises can effectively improve the problem of employee turnover by establishing and improving salary incentive mechanisms, enhancing the management level and comprehensive quality of enterprise managers, establishing a people-oriented corporate culture atmosphere, establishing and improving multi-channel career trajectories, and building a talent loss warning mechanism. Wang (2019) believes that organizations should improve the salary performance and working environment of project personnel in terms of employee turnover. Zhang and Zhu (2019) pointed out that if employees lack loyalty and identification with the company, the company is prone to employee turnover. Therefore, private construction enterprises should continuously strengthen their corporate culture construction, establish corporate values to enhance cohesion, and take the corporate vision as a macro culture to motivate and promote

employees. They should combine the corporate vision with employees' personal development goals, achieve consistency between employees' own development and the company's strategic goals, thereby enhancing employees' sense of identity, reducing the lack of psychological security, retaining talents, and reducing personnel turnover rate. Zhang (2020) believes that strengthening corporate culture construction, enhancing team cohesion, and improving incentive systems can effectively motivate employees and reduce employee turnover. Yang (2022) proposed that from the perspective of game theory, in order to effectively reduce the talent turnover rate of small and medium-sized enterprises, a game equilibrium should be constructed from three aspects: welfare system, employee training, and regulatory mechanism. Xu (2022) believes that companies can improve employee retention rates and reduce employee turnover rates by improving salary and benefits systems, perfecting career development plans, strengthening employee stress management, and transforming enterprise management models. Zhu (2022) believes that enterprises should optimize their salary and welfare operation system, improve their human resource management level, strengthen knowledge and skills training, and innovate corporate culture construction to reduce employee turnover. Xing (2022) analyzed the current development status of human resources in the construction industry and proposed that enterprises should focus on performance evaluation and incentives in human resource management, and stimulate employees' creativity through a dual mechanism. Gao (2022) stated that human resource performance management in construction enterprises has a direct impact on employee turnover. By improving the performance management system, employee turnover can be effectively reduced. Zhang (2022) proposed that the accommodation environment of employees in small and medium-sized enterprises affects their intention to resign. Therefore, it is necessary to improve the accommodation environment, provide subsidies, and adopt personalized management methods to meet the different needs of employees.

Other scholars believe that employee turnover can be reduced at the individual level. Self T et al. (2022) argue that family supportive supervisory behavior (FSSB) can reduce employees' emotional expression and subsequent turnover intention, particularly among female employees. Donkor et al. (2022) concluded through their research that building confidence and trust among employees will reduce the willingness to leave public sector organizations [38]. Chaudhry et al. (2022) argue that sufficient suggestion from employee voices can reduce turnover intention.

2.4. Summary

By organizing relevant literature on employee turnover at home and abroad, it can be found that foreign countries have conducted detailed research on employee turnover from different perspectives, and have constructed relatively complete theoretical models. Research on the

special group of technical personnel is also increasing, but compared to general enterprises, construction enterprises have certain particularities; Compared to ordinary employees, technicians also have their own uniqueness. From domestic research, early studies on employee turnover and core employee turnover were mostly based on foreign research frameworks. However, in recent years, domestic scholars have gradually combined their research with China's national conditions and constructed a framework system for employee turnover based on domestic realities. However, the vast majority of research is based on the experience of solving problems in the development process of enterprises, so the scope of subjective judgment is too large, and the universality of the countermeasures obtained is also weak, especially for the research on the loss of technical talents in architectural design enterprises, which is relatively rare.

3. Methodology

In order to identify the reasons for the turnover of technical personnel in GF Construction Company and improve this situation in a targeted manner, the goal is to reduce the turnover rate of technical personnel in GF Construction Company by about 10%. The main methods used in this project are as follows:

(1) Literature review method: By reading relevant domestic and foreign literature in the field, we can understand the current situation and cutting-edge research results on the turnover of construction technicians. Based on these research results, we can provide theoretical support and analyze and solve the problems in this project.

(2) Model analysis method: By using external analysis methods such as PESTEL model and Porter's Five Forces model, the reasons for the turnover of technical personnel are analyzed in depth from multiple aspects, including politics, economy, society, technology, environment, law, as well as Rivalry among existing competitors, Threat of new entrants, Threat of substitutes, Bargaining power of suppliers, and Bargaining power of buyers.

(3) Quantitative analysis method: The company retains data on resigned technical personnel and has saved a large amount of data on resigned technical personnel during the 21 years of operation. In order to keep the analysis results up-to-date, information on 160 resigned technical personnel was randomly selected from June 2023 to May 2024 for comprehensive analysis based on gender, age, education, position, and tenure at GF Construction Company.

(4) Interview method: Design an interview outline and conduct telephone interviews with 160 technical personnel who have already resigned based on the outline. Collect and classify the interview results.The investigation of this project adopts the form of telephone interviews to collect the reasons for the departure of technical personnel. The specific steps are as follows:

The first step is interview design. Due to the fact that each departing employee retains their basic personal information during the resignation process, the interview content is limited to questions related to the reasons for resignation. The problem design is as follows:

① What is the most important reason for you to leave GF Construction Company?

② What aspects of GF Construction Company are you most satisfied with and least satisfied with?

③ What is your current job after leaving the company?

④ What do you think companies should improve the most in retaining talent?

⑤ Do you have any other suggestions for our company?

The second step is to select the interviewee and schedule the interview time. In order to keep up with the times, this project randomly selected 160 technical personnel who have already resigned between June 2023 and May 2024. These technical personnel are representative, covering various age groups, positions, work experience, and levels of technical personnel. The interview time is concentrated in June, and the interview time for each technician is controlled at around 10-20 minutes.

The third step is to analyze the interview results.

4. External situation analysis

4.1 Pestel analysis

4.1.1 Political factors

The instability of the political environment or frequent policy changes can affect a company's long-term strategic planning and employee stability. The "Measures for Classifying and Strengthening the Management of Government Investment Projects in Key Provinces (Trial)" issued by the General Office of the State Council of China on December 24, 2023 has led to a significant reduction in construction projects.

This policy requires 12 key provinces, including Tianjin, Inner Mongolia, and Liaoning, to strictly control the construction of new government investment projects, especially in transportation, municipal, and industrial parks. Unless granted special approval by the state, projects such as highways, subways, and light rail in Malaysia are not allowed to enter. In addition, the policy also involves the clearance of existing projects. Projects with a total investment completion rate below 50% will be deferred or suspended in principle, while those with significant problems above 50% cannot be continued. The issuance of this regulation has forced many technical personnel to be proactive and consider switching careers in order to avoid a series of negative impacts caused by passive layoffs in the company.

4.1.2 Economic factors

The instability of the macro economy may lead to fluctuations in overall demand in the construction industry, affecting the company's project acceptance and financial situation, thereby affecting the employment security and income level of technical personnel. This project will demonstrate the evolution from three aspects: GDP, inflation rate, and unemployment rate.

In 2023, China's gross domestic product (GDP) grew by 5.2% year-on-year, demonstrating stable economic growth. In the first half of 2024, China's GDP reached 61.7 trillion yuan, a year-on-year increase of 5.0% (data source: National Bureau of Statistics). Although this growth rate maintains a medium to high growth trend, it is slightly lower than that of 2023. The slowdown in GDP growth may directly affect investment and development in the construction industry, as construction activities are closely related to economic growth. Although a growth rate of 5% is still positive, if there is a decrease compared to the previous year, it may reduce the funding support for new project launches and ongoing projects. If the slowdown in GDP growth leads to a reduction in construction projects, employment

opportunities for technical personnel may be limited, increasing their likelihood of finding new jobs.

In terms of inflation rate, the Consumer Price Index (CPI) for residents in 2023 increased by 0.1% year-on-year, with a 0.3% increase in the second quarter (data source: Chinese government website), indicating a moderate rebound in price levels. This indicates that inflationary pressures will be relatively low during the first half of 2023 to 2024. The moderate increase in inflation rate is a positive signal for the construction industry as it may not significantly increase construction costs. However, if the inflation rate rises in the future, the prices of building materials may increase, adding cost pressure to the industry.

In terms of unemployment rate, the average national urban survey unemployment rate in 2023 is 5.2%, a decrease of 0.4 percentage points from the previous year. In the first half of 2024, the average urban surveyed unemployment rate was 5.1%, a decrease of 0.2 percentage points from the same period last year. The unemployment rate remained stable at 5.0% in the second quarter (data source: National Bureau of Statistics). This indicates that the job market has remained stable during this period. The decrease in unemployment rate usually means a tight labor market. If the tight labor market leads to wage increases, construction companies may face higher labor costs, which may also prompt technical personnel to seek higher paying positions. In addition, a lower unemployment rate may provide more employment options for technicians, thereby increasing the risk of turnover in the construction industry.

4.1.3 Social factors

The construction industry is mostly engaged in infrastructure construction, and the working environment for employees is relatively difficult. The construction period of railway and highway engineering is about 5-10 years, while the construction period of housing and municipal projects is about 2-5 years. Some renovation and expansion projects have slightly shorter construction periods, ranging from a few months to over a year. If the project type undertaken by the enterprise is railway or highway engineering, such projects are mostly distributed in remote mountainous areas, underdeveloped or sparsely populated areas. Bridge construction, road construction, and tunnel construction are often located in remote areas, and the living conditions and facilities for employees are very limited. The difference between daily life and urban life is significant. Moreover, there are many unstable factors in the nature of work, such as frequent changes in project location or schedule. In such situations, separation from family members and failure to fulfill the obligation to take care of

parents and children often occur. When technicians face the dilemma of choosing between family and career, most people will return to their families and seek employment nearby.

4.1.4 Technological factors

With the rapid development of technology in the construction industry, new technologies and materials continue to emerge. If the company cannot keep up with technological progress in a timely manner and provide continuous technical training and learning opportunities, technical personnel may feel that their skills are outdated and choose to resign to pursue a more advanced technological environment. For example, in the second half of 2023, 8 technical personnel who switched jobs at the same time resigned and joined Jiangxi MB Prefabricated Construction Company due to GF Construction Company's reluctance to enter this field too early, as the country is now strongly recommending prefabricated construction.

The strong technological advantages of industry competitors are also a potential major factor in the turnover of GF Construction Company's technical personnel. Technicians usually have a strong desire and ability for innovation, and some established construction companies have significant advantages in technology research and innovation. They not only have advanced technology, but also comprehensive qualifications, which can provide broad development space for technicians.

4.1.5 Environmental factor

Firstly, the working environment in the construction industry has certain characteristics, and construction projects often require employees to work long hours on the construction site, which may not be suitable for all technical personnel, especially those professionals seeking a more stable working environment.

Secondly, the changes in the social environment, the values and career expectations of the younger generation, through the advanced dissemination of self media, will also affect the ideological environment of technical personnel of all age groups. This is highly likely to prompt various technical personnel to seek jobs that are more in line with their personal development and lifestyle.

4.1.6 Legal factors

Firstly, the government's amendments to labor laws and regulations may change the rules of the labor market. If a company fails to adapt to these changes in a timely manner, it may lose its appeal to technical personnel.

Secondly, in terms of the legal framework of labor contracts, labor dispute resolution mechanisms, and labor protection and safety and health laws, if a company does not comply with legal rules in hiring and firing technical personnel, it will affect the loyalty of technical personnel.

Moreover, technicians typically possess the core technology and intellectual property of the company. If the company does not do enough to protect these assets, or mishandles the issue of intellectual property ownership when technical personnel leave, it may lead to legal disputes and affect the loyalty of technical personnel.

4.2 Analysis of Porter's Five Forces Model

4.2.1 Rivalry among existing competitors

Nowadays, there are numerous enterprises in the construction industry, and the competition for technical talents is particularly fierce. GF Construction Enterprises is facing competition from other companies in the same industry, especially those that offer higher salaries and better career development opportunities, such as Jiangxi First Construction Co., Ltd., Jiangxi Construction Engineering First Construction Co., Ltd., Jiangxi Construction Engineering Group Co., Ltd., etc. These companies have high visibility and influence in the construction market in Jiangxi Province and even at home and abroad. This competition may lead to the loss of technical personnel in GF construction companies.

4.2.2 Threat of new entrants

With the development of the market, although the construction industry in China is not as prosperous as it was a few years ago, there are still new construction companies constantly entering the market. China is a relationship oriented country, and some companies have accumulated certain resources and connections before entering the construction industry. These new companies have better channels and higher chances of winning bids than other construction companies. Some new enterprises establish companies after projects, and under such circumstances, they may attract experienced technical personnel from other

construction companies by providing more attractive conditions, which also increases the risk of GF technical personnel turnover.

4.2.3 Threat of substitutes

With the advancement of technology in the construction industry, the application of automation and robotics technology is gradually increasing. For example, the development of prefabricated building technology emphasizes the integration of design, production, and construction, which differs from traditional construction methods. Therefore, the on-site operational requirements for traditional positions such as carpentry, masonry, and concrete workers will be greatly reduced, which may lead to pressure for these technicians to undergo retraining or switch careers. In addition, prefabricated buildings require more specialized and high-end skills from technicians, who need to master new skills such as BIM technology, prefabricated component production, and on-site assembly. This means that technicians who fail to learn and adapt to new technologies in a timely manner may face the risk of being eliminated from the market. This has forced some technicians to have the idea of changing their job positions, thereby increasing the risk of technician turnover.

4.2.4 Bargaining power of buyers

In the construction industry, buyers usually refer to end-users or project commissioning parties such as real estate developers, governments, or private owners. If the buyer's bargaining power increases, they may demand lower prices or higher engineering quality and service levels, which will directly affect the cost structure and profit margin of the construction company.

For example, the "Yingtan Four Pavilions Project" located in Yingtan City, Jiangxi Province is a government investment project with a total investment of approximately 36022.23 yuan, and the buyer is Yingtan Urban Construction Investment and Development Co., Ltd. The buyer has strong bargaining power, and GF Construction Company has taken a series of measures to reduce costs in order to maintain competitiveness, including adopting new technologies and automation to improve production efficiency. This transformation has led to a decrease in demand for traditional construction technicians, especially those whose skills do not meet the requirements of new technologies. At that time, GF Construction Company was unable to provide necessary training and transformation opportunities for these technical personnel, and they faced a great risk of unemployment, which led to some technical personnel voluntarily resigning.

In addition, the enhanced bargaining power of buyers may also lead to intensified competition within the construction industry, forcing companies to continuously optimize their business models and cost structures. This internal competition may accelerate the pace of technological and managerial innovation, but at the same time, it may also have a negative impact on technical personnel who are unable to adapt to rapid changes, further driving talent loss.

4.2.5 Bargaining power of suppliers

In the construction industry, suppliers include but are not limited to enterprises that provide building materials, equipment, and professional services. The bargaining power of suppliers directly affects the cost structure and profit margin of construction companies.

When suppliers have strong bargaining power, they may increase the prices of materials and equipment, or demand more favorable payment terms, which will increase the operating costs of the construction company. In order to maintain profit margins, construction companies may need to seek alternative suppliers with lower costs or reduce other costs, including labor costs. This cost pressure may lead construction companies to reduce their investment in technical personnel, such as on-the-job training and introducing high-end technical talents, or lowering wages and benefits.

Technicians, especially those with professional skills and experience, may choose to leave due to dissatisfaction with changes in working conditions or a lack of career development opportunities. In addition, if competition within the construction industry intensifies, companies may be more inclined to hire contract or temporary workers to reduce long-term labor costs, which may also prompt full-time technical personnel to seek more stable jobs.

In summary, the enhancement of supplier bargaining power may indirectly affect the stability and turnover rate of technical personnel in the construction industry by increasing cost pressure, changing labor market dynamics, and promoting technological changes in the industry.

Through the analysis of Porter's Five Forces model, it can be seen that there are multiple reasons for the loss of technical personnel in GF construction enterprises.

5. Internal environment analysis

5.1. Company Overview and Business Scope

GF Construction Company was established in Nanchang, Jiangxi Province in 2003 and is a private enterprise. The business scope includes but is not limited to the following projects: first level general contracting for construction engineering, first level general contracting for municipal public works construction, first level professional contracting for steel structure engineering, first level supervision for building construction engineering, first level supervision for municipal public works, residential interior decoration and renovation, construction engineering quality inspection, etc.

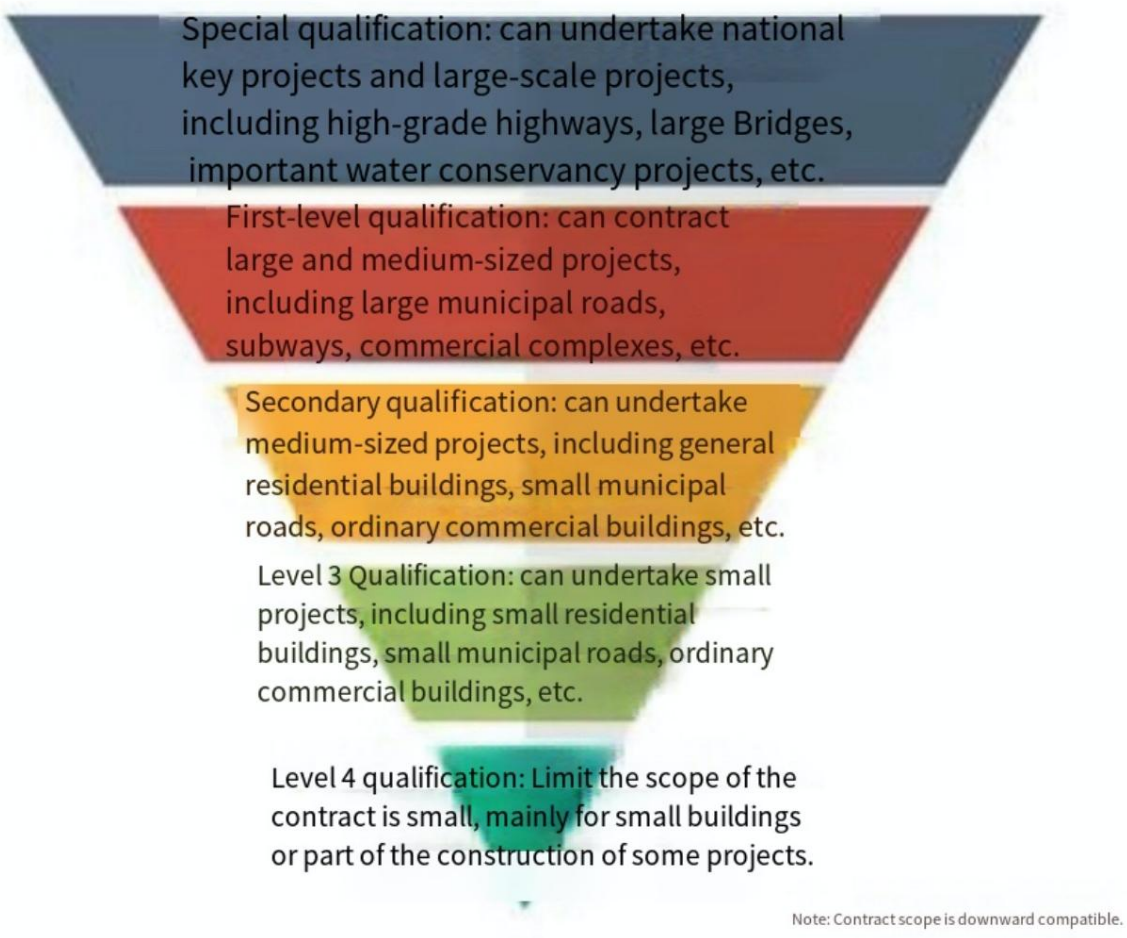

Figure 5.1.Classification of China's Construction Qualification Contracting Scope
Source: Internal company information.(2024)

GF Construction Company is one of the early enterprises to enter the construction industry market in Jiangxi Province. With the background of the booming development of the construction industry in Jiangxi Province, after more than ten years of development, it has achieved good performance. The company has successively undertaken the construction of

hundreds of large, medium, and small-scale projects such as high-rise residential buildings, commercial buildings, industrial plants, and municipal gardens. The first acceptance rate of project quality is 100%, and the safety protection of the constructed projects reaches 100%. Many of these projects have won awards for high-quality projects at the provincial and municipal levels, as well as awards for safe and civilized construction sites and standardized construction sites at the provincial and municipal levels.

GF Construction Company has invested in 6 companies since its establishment, with 30 patent information and 6 copyright information in terms of intellectual property. It has 15 branches nationwide.

Figure 5.2. Distribution of GF Construction Company Branches

Source: Internal company information.(2024)

5.2. Classification of technical personnel

GF Construction Company currently has 635 employees, including 115 management personnel and 520 technical personnel in various fields. The company's organizational structure and classification of technical personnel levels are shown in Figure 5.2.1:

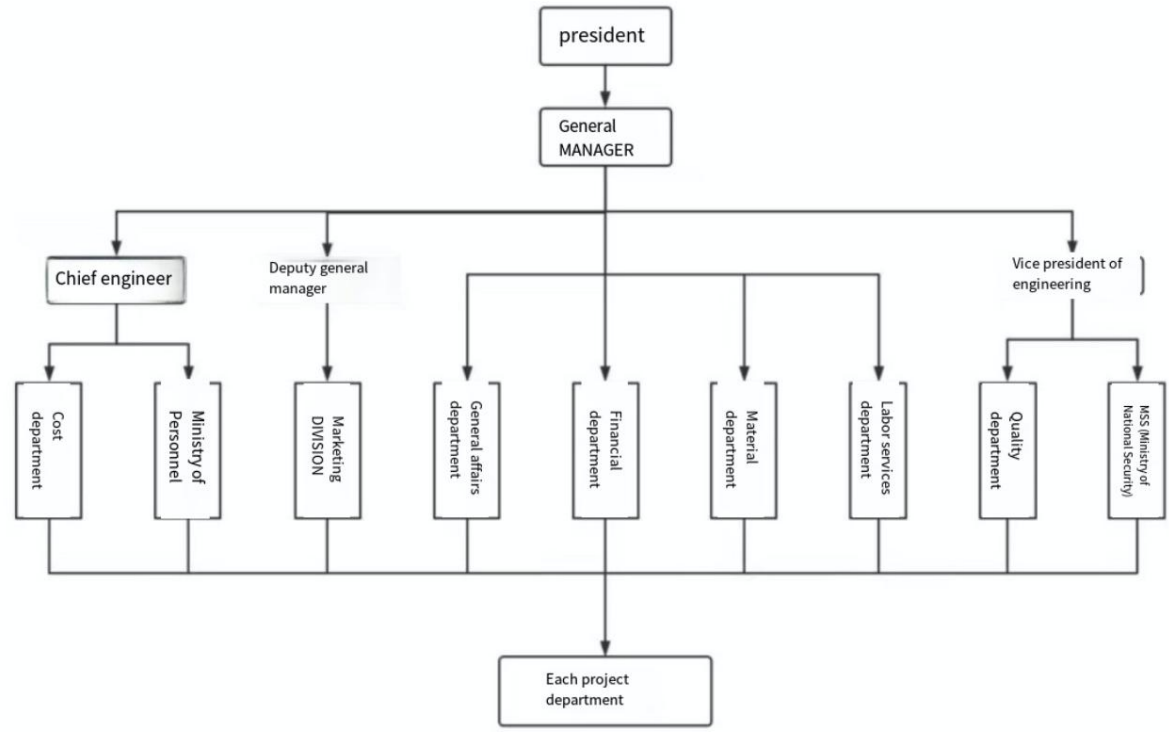

Figure 5.3. Company Organization Chart

Source: Internal company information.(2024)

Figure 5.3. shows the organizational structure of GF Construction Company, which currently consists of 9 departments: Engineering Department, Project Department, Finance Department, Operations Department, Pre control Department, Procurement Department, and Human Resources Department. The technical personnel discussed in this project are those engaged in key technical positions in civil construction, mainly under the project department of GF Company, as shown in Figure 5.4.:

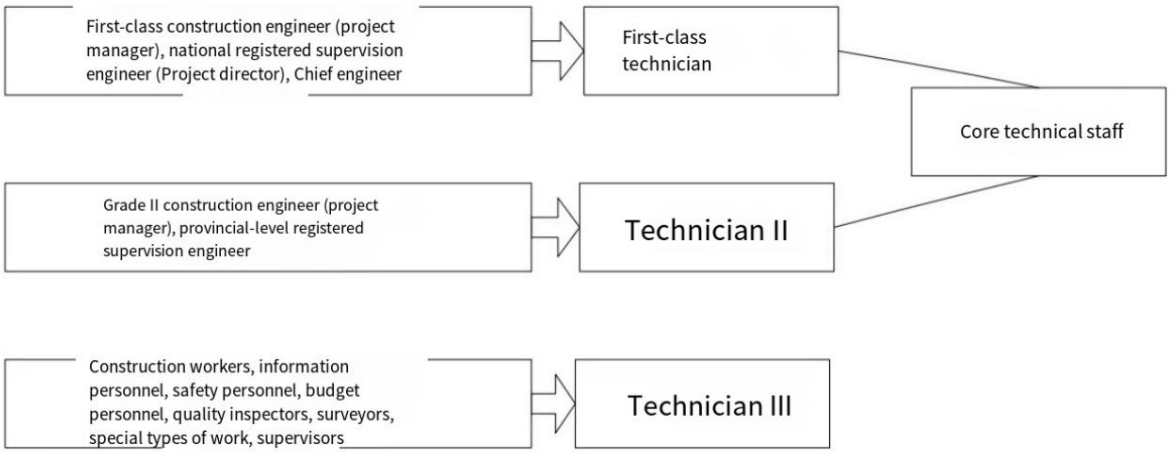

Figure 5.4. Classification of Technical Personnel Levels

Source: Internal company information.(2024)

The core technical personnel are the first and second level technical personnel in Figure 5.4.

First level technical personnel must meet any of the following conditions: (1) obtain a registered first level construction engineer, registered first level cost engineer, or national registered supervision engineer registration certificate and register with the company; (2) Having three types of personnel certificates; (3) Having intermediate or higher professional titles. This type of personnel can undertake mega and large-scale engineering projects.

Second level technical personnel must meet any of the following conditions: (1) obtain a second level or higher registered professional qualification certificate (construction engineer, cost engineer, safety engineer, provincial registered supervision engineer, etc.); (2) Having three types of personnel certificates; (3) Having intermediate or higher professional titles; (4) Having a job certificate; (5) More than 5 years of work experience in the same position; (6) Grassroots management personnel. This type of personnel can undertake large and medium-sized engineering projects.

Third level technical personnel must meet any of the following conditions: (1) possess certificates in the eight major employee positions; (2) Having a technician certificate; (3) More than 3 years of work experience in the same position. These personnel are all grassroots technical personnel.

5.3 Analysis of the current situation, characteristics, and reasons for the turnover of technical personnel

5.3.1 The current situation of technical personnel turnover

In order to more accurately and intuitively reflect the turnover of technical personnel in GF Construction Company in the past 4 years, the human resources management system of GF Construction Company's Human Resources and Administration Department queried the turnover data of technical personnel from 2020 to 2023. Through the sorting and analysis of the turnover data of technical personnel in the past 4 years, the current situation of technical personnel turnover was obtained. The specific data is shown in Table 5.3.1.1 below:

Table 5.1. Statistics of Technical Personnel Resignation Rate of GF Construction Company from 2020 to 2023

Time	Number of people at the beginning of the year (persons)	Number of people at the end of the year (persons)	Number of new hires (persons)	Number of resignations (persons)	Turnover rate (using the official formula)
2020	556	672	419	303	49%
2021	851	788	562	625	76%
2022	891	725	437	603	75%
2023	644	589	473	528	86%

Note: Employee turnover rate=number of resignations in the current period/(number of employees at the beginning of the current period+number of employees at the end of the current period) x 100%, data sourced from the Human Resources Department of GF Construction Company (2024)

Note: Employee turnover rate=number of resignations in the current period/(number of resignations at the end of the period+number of resignations in the current period), data sourced from the Human Resources Department of GF Construction Company

Construction projects have certain particularities: construction projects are usually one-time, and after the project is completed, the construction team may disband or transfer to other projects. The construction projects are distributed in different geographical locations, which requires frequent migration of technical personnel and affects the stability of family and social life. Construction sites often have harsh conditions, making daily life, shopping, and entertainment inconvenient. Moreover, the workload is high and there are safety risks involved. In order to deliver on time, construction projects often require overtime work, which increases the workload of technical personnel. Large scale construction projects involve coordination at multiple technical and management levels, placing high demands on the professional and management abilities of technical personnel.

Based on the particularity of the construction projects mentioned above, it is not difficult to find that the turnover of technical personnel is inevitable. However, from the above data analysis, it can be seen that the turnover rate of technical personnel in GF Construction

Company was 49% in 2020, 76% in 2021, 75% in 2022, and 85% in 2023, showing an increasing trend year by year over the past four years. This also greatly reflects the poor stability of GF Construction Company's current employees, which has had a negative impact on the company's daily production and operation. Therefore, how to quickly and effectively reduce the serious loss of technical personnel in GF Construction Company is an urgent problem that the enterprise needs to solve.

5.3.2 Profile of technicians who resigned

In order to objectively analyze the characteristics of the turnover of technical personnel, 160 samples were randomly selected from the company's departing technical personnel for a period of one year from June 2023 to May 2024, and systematically analyzed from dimensions such as age, gender, position, length of service, and educational level.

From the age structure of departing technical personnel, it can be seen that the most common age group is between 31 and 36 years old, followed by 36 to 40 years old. From this, it can be seen that young people (aged 31-40) account for a large proportion of the lost personnel. This may be related to the fact that young employees are more easily attracted to external employment opportunities and seek better career development and benefits. These employees have some work experience and are in the stage of starting or already starting a family. Once the existing environment of the company cannot meet their daily development changes, they have a high intention to resign.

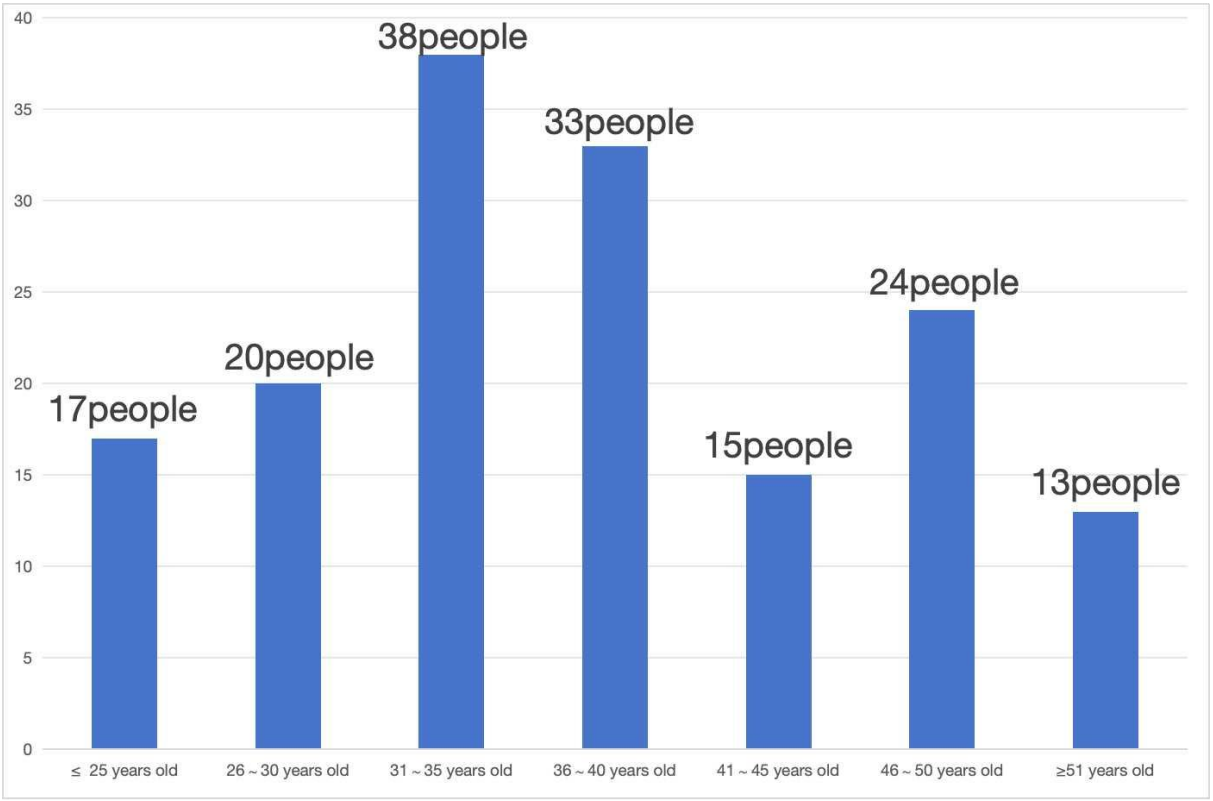

Figure 5.5. Age structure chart of 160 departing employees from GF Construction Company

Source: Internal company information (2024)

Among the 160 individuals, there were 130 male technical personnel, accounting for 81%; There are 30 female technicians, accounting for 19%. This is due to the special nature of construction engineering and the limitations of job content, many job positions are more suitable for men.

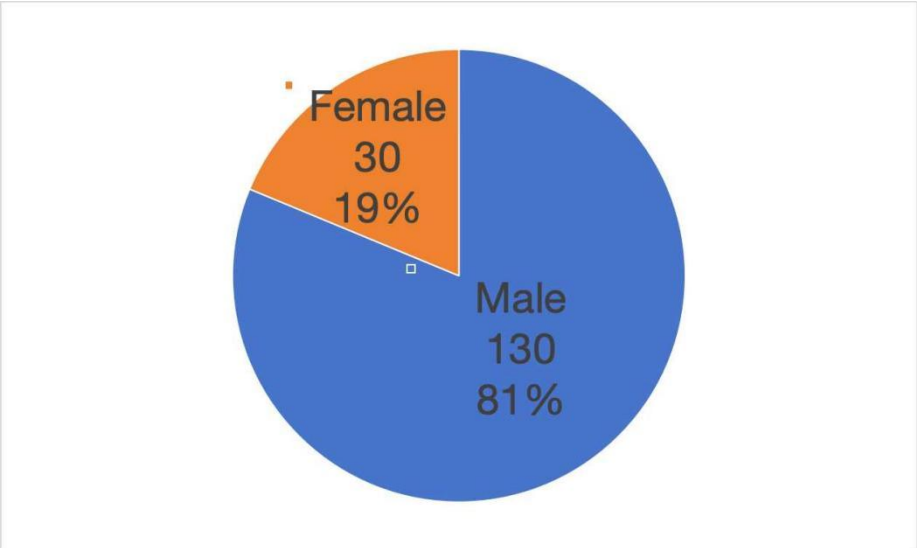

Figure 5.6. Gender structure chart of 160 departing employees from GF Construction Company

Source: Internal company information(2024)

From Figure 5.7., it can be seen that there is a significant difference in the number of resignations for different technical positions. Among them, the number of resignations for the position of construction worker is relatively high. As shown in Figure 5.8., third level technical personnel account for 77% of the total resigning technical personnel. This job structure reflects a possible trend: in GF Construction Company, different technical positions may have different challenges or pressures, which can affect the stability of their personnel. The company's management and human resources department may need to intervene and improve specifically for these high turnover positions to reduce the loss of technical personnel and maintain the company's technological strength and competitiveness.

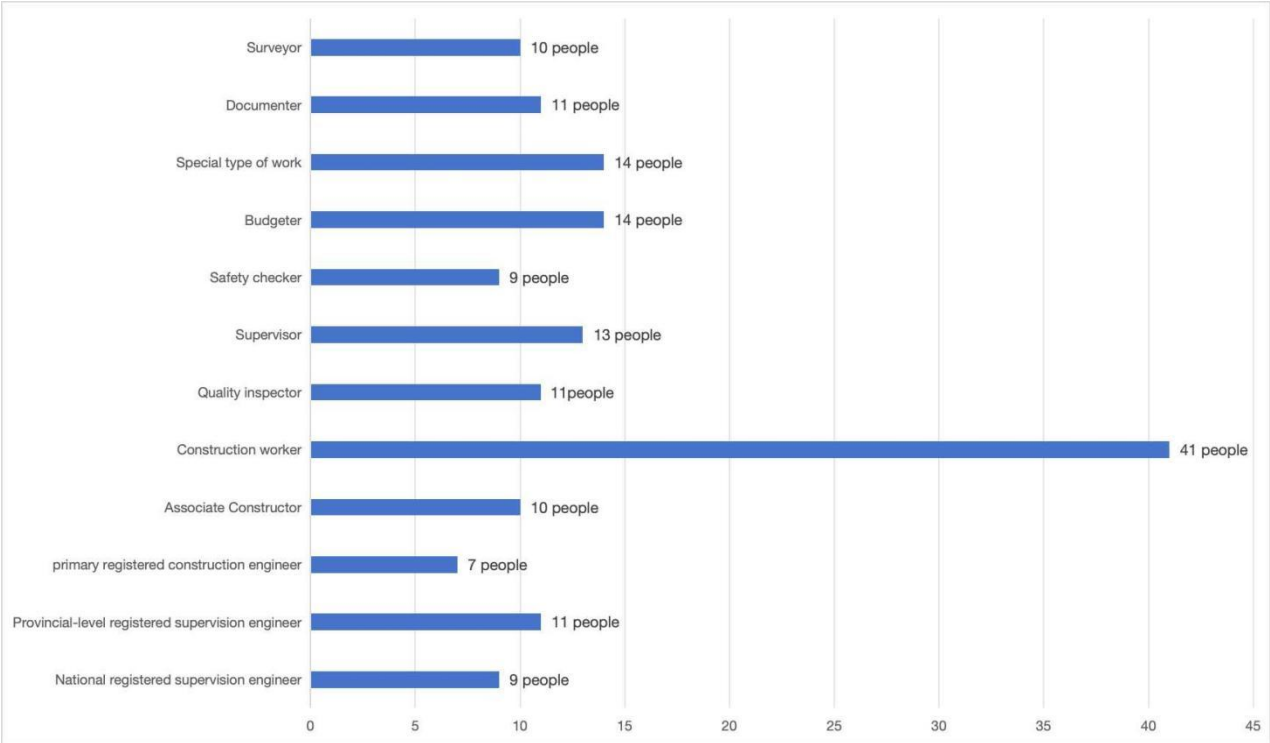

Figure 5.7. Position Structure Chart of 160 Resignated Employees from GF Construction Company

Source: Internal company information (2024)

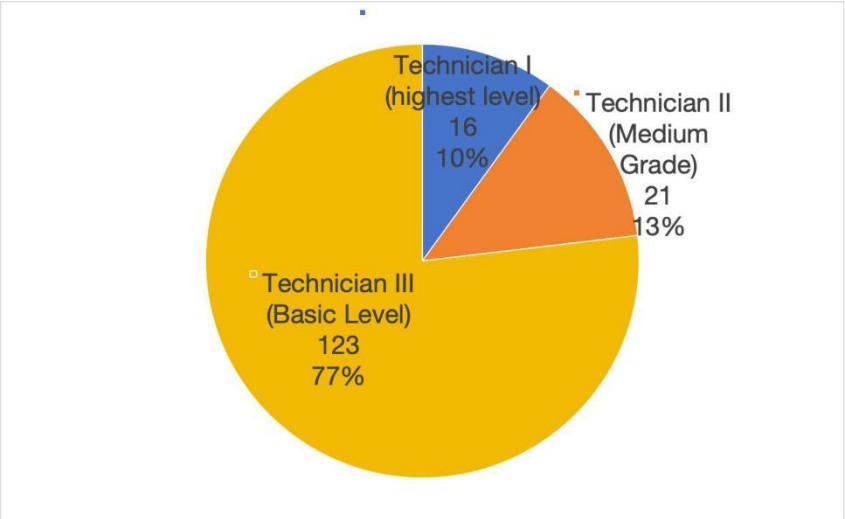

Figure 5.8. Position Structure Chart of 160 Resignated Employees from GF Construction Company

Source: Internal company information（2024）

According to the distribution of years of service in the company, only 21% of the technical personnel who resigned from GF Construction Company had worked in the company for more than 5 years, but nearly half of them had only worked in the company for about 1-2 years, accounting for 48%. This may be related to the time required for new employees to understand and adapt to the work environment and career development in the initial stage. In the initial stages, employees may face work pressure, role adaptation issues, and a gap between personal expectations and actual situations, making it easier for them to seek other opportunities or adjust their career paths. This is also related to the characteristics of engineering projects. Most construction projects have a duration of 1-2 years, and after the project is completed, the new project will change its work address. Due to various reasons such as transportation and family, many technical personnel resign with the completion of the project.

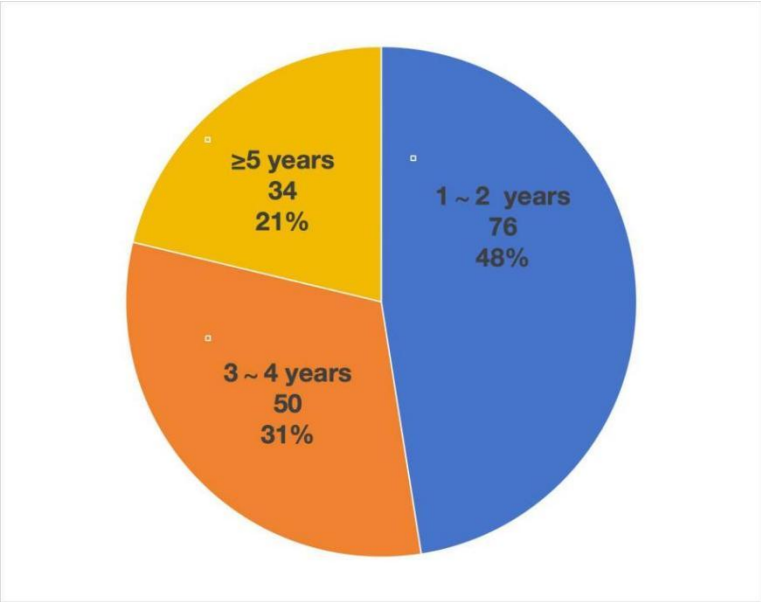

Figure 5.9. 160 resigned employees from GF Construction Company have been selected, and their length of service in the company is shown in the structure chart

Source: Internal company information（2024）

According to the distribution of educational level structure, the proportion of technical employees who have left GF Construction Company with a college degree is the highest, reaching 53%. Next are undergraduate education and high school or vocational education. In China, high school and vocational education belong to the same level of education, with undergraduate education accounting for 23% and the sum of high school and vocational education accounting for 23%. This is closely related to the type of enterprise of GF Construction Company, as in construction, specialized technical personnel related to architecture are needed. Therefore, in construction engineering, graduates from matching universities, vocational schools, and undergraduate institutions are often recruited, resulting in a higher proportion of employees with university, vocational school, and undergraduate degrees; Moreover, most of the work on the construction site has low technical content and does not require high educational qualifications. Personnel with high school education are fully capable of handling it. So the proportion of high school educated personnel can reach 17%, and most of them come from local and surrounding labor force.

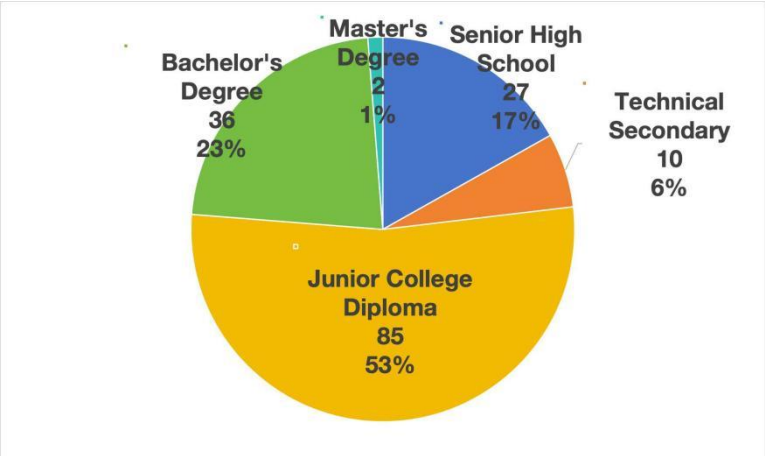

Figure 5.10. Educational level structure chart of 160 resigned employees from GF Construction Company

Source: Internal company information（2024）

5.3.3 Investigation and analysis of the reasons for the turnover of technical personnel

Among the 160 technical personnel who have already resigned, 106 have been interviewed by phone. The basic information and interview time of these 106 resigned technical personnel are shown in Appendix Table C. Based on the results of telephone interviews with these technical personnel, the specific reasons for resignation are classified and summarized in Table 5.2.:

Table 5.2. Statistics of Reasons for Resignation of 106 Technical Personnel

Serial number	Reason for resignation	Sample size (person)	Proportion of total sample size
1	The new project is too far away from home	22	21%
2	Low salary	15	14%
3	The company is unable to provide conditions and environment that align with its own career plan	13	12%
4	No salary increase	12	11%
5	Couples living apart in two places	10	9%
6	Low salary increase or long salary cycle	9	8%
7	Too much work pressure	7	7%
8	Lack of recognition and respect from subordinates, companies, and partners	7	7%

9	The living environment of the construction project is not ideal	6	6%
10	Suffering from unfair treatment and nepotism in company appointments	5	5%
Amount to		106	100%

Source: Author（2024）

The interview results showed that 21% of the respondents chose to resign due to the new project being too far away from home, inconvenient transportation, insufficient transportation subsidies, or the new project not being located in the city where the technical personnel live, and the company being unable to match them with new projects in the same city.

14% of the respondents expressed that the salary was too low, and most of these technical personnel are newly hired employees who are still dissatisfied with their salary even after becoming regular employees.

12% of the respondents stated that the company is unable to provide conditions and environment that align with their career plans. Most of these technical personnel are first and second level technical personnel who already have some kind of registration certificate. The company will add appropriate subsidies to their monthly salary due to this registration certificate during work. After these technical personnel continue to add other registration certificates, as GF Construction Company does not have relevant construction qualifications, they do not need such personnel registration certificates, and there will be no monthly subsidy for the registration certificates that are added. Therefore, these technical personnel will choose to work for construction companies with more comprehensive qualifications.

11% of the respondents stated that they still do not receive a salary increase after changing to a new project. This group of technical personnel are transferred to a new project after the completion of a project. As usual, most construction companies will adjust the salary of technical personnel based on their own qualifications. This group of technical personnel has caused dissatisfaction due to the lack of salary adjustment.

9% of the respondents had to face the situation of being separated from their spouse due to changes in their spouse's work or life. However, due to strong marital relationships and dependence, they chose to resign in order to avoid separation.

8% of the respondents pointed out that the salary increase was too slow or not significant. These personnel have a long tenure in GF Construction Company and are not satisfied with the daily salary growth cycle and amount.

7% of the respondents reported excessive work pressure. Some technical personnel are document clerks, who are unable to handle the complex technical and tedious

documentation of projects due to new hires or assignments to larger scale construction projects. Some technical personnel resigned due to difficulty adapting to the high-pressure management methods of local leaders.

7% of the respondents stated that in their daily work, their subordinates do not respect them, and the company does not attach importance to them. Even their subcontractors do not respect them enough, and their value and sense of self achievement are greatly reduced. Therefore, they want to seek a better work platform.

6% of the respondents believed that the living environment of the project was not ideal. Some project departments have not implemented fully enclosed management, and the personal and property safety of technical personnel cannot be guaranteed. Some projects have dirty, messy, and poor living environments, which technical personnel cannot tolerate.

5% of the respondents believe that the company has a phenomenon of nepotism, which has led to unfair treatment, and therefore they have resigned.

6. Proposals to improve the retention of technical personnel of GF Construction Company

Regarding the reasons for the turnover of technical personnel in GF Construction Company, corresponding handling suggestions are proposed, as shown in Table 6.1.:

Table 6.1. Improvement suggestions for each reason for resignation

Serial Number	Reason for leave	Improvement suggestions
1	The new project is too far away from home	Establish a long-term and diversified incentive and subsidy system
2	Low salary	Improve the salary system
3	The company is unable to provide conditions and environment that align with its own career plan	Expand the scope of company qualification contracting
4	No salary increase	Establish a sound promotion and assessment system
5	Couples living apart in two places	Establish a good corporate culture and provide humanistic care for the spouses of technical personnel
6	Low salary increase or long salary cycle	Establish a sound promotion and assessment system
7	Too much work pressure	Establish a sound training system
8	Lack of recognition and respect from subordinates, companies, and partners	Establish a good corporate culture.
9	The living environment of the construction project is not ideal	Establish cleaning positions in residential areas of construction projects and regularly clean them. The living area is fully enclosed and equipped with entrance registration devices and security booths to prevent strangers from entering the living area. The dormitories where technical personnel reside are made of high-quality activity board houses.

10	Suffering from unfair treatment and nepotism in company appointments	Establish an open and transparent management system

Data source: Author（2024）

Establish a long-term and diversified incentive and subsidy system. Due to the unique nature of work at GF Construction Company, some technical personnel need to travel far from their hometowns to work on projects in remote areas. Additionally, due to the heavy workload of construction companies, they often have to work overtime. Therefore, in order to ensure the enthusiasm of technical personnel and maintain their fighting spirit at all times, the company needs to establish a long-term incentive system for its technical personnel. For example, a one-time large reward can be given to employees who have worked for ten years, twenty years, and thirty years in each calculation stage. At the same time, the long-term work reward system should be well promoted among the company's technical personnel. Secondly, flexible application of disguised incentives and subsidies can be used. For example, in some logistics positions of branch offices and project departments, priority can be given to the families of technical personnel. This can reduce the situation of married technical personnel living apart from each other, increase the stability of technical personnel's job performance, increase the stickiness between enterprises and technical personnel, and encourage enterprise technical personnel to serve the enterprise for a long time.

Improve the salary system. Develop a scientific salary system based on the actual situation of the enterprise. The Human Resources department of the company can conduct surveys on salary and benefits of enterprises of the same scale and excellent enterprises, identify gaps, and provide favorable basis for optimizing the salary system. Regularly or irregularly organize themed meetings to understand the true thoughts of technical personnel on current salary and benefits. Technical personnel can point out the shortcomings in the company's salary and benefits settings. Technical personnel with different work abilities, departments, and positions contribute differently to the company. A good compensation system can comprehensively consider the contributions of technical personnel, and pay reasonable compensation based on their contributions to the company, work skills, and job salaries. Pay attention to the setting of performance-based pay. Performance pay is a part of compensation, and GF Construction Company's performance work only refers to the amount that technical personnel can receive by completing their workload normally. The company can break down performance pay into part-time fees, subsidies, and bonuses based on its characteristics. The part-time fee refers to the compensation received by employees for accepting additional work or assisting leaders and colleagues in completing their assigned

workload. This model not only provides more opportunities for technical personnel to showcase their talents, but also improves work efficiency and reduces human resource costs. Subsidies can include overtime pay, holiday pay, transportation allowance, etc. The bonus can be set based on the employee's contribution to the company. The greater the contribution, the greater the bonus coefficient and the greater the return received. For non economic compensation, GF Construction Company should provide convenience for technical personnel from multiple perspectives such as promotion mechanism, technical personnel training system, and corporate culture. This system can stimulate the enthusiasm and potential of technical personnel, create more value for the company, increase their satisfaction with the company, and effectively reduce employee turnover. Develop different subsidy measures for employees in different regions, combine their salaries with the location of the enterprise's employee projects, and provide high subsidies to employees in difficult areas, so that employees in remote areas can receive better salary and benefits. This is conducive to the normal development of the company's projects in remote areas and reduces the phenomenon of no employees willing to go to remote projects.

Expand the scope of qualification contracting. GF Construction Company has comprehensively strengthened its qualification management and carried out multi-faceted and multi qualification upgrades, which can ensure that the certificate registration personnel can be used by the company after successfully adding items, making the enterprise qualifications fully in line with the career planning of technical personnel and increasing the loyalty of technical personnel to the enterprise.

Establish and improve promotion and assessment systems. GF Construction Company can develop performance evaluation methods that are in line with the company's development based on the psychological needs of technical personnel and the company's own situation. Technical personnel's business ability, work performance, dedication, professional ethics, etc. can be included as assessment criteria. Assessing technical personnel through a combination of quantitative and qualitative methods from multiple perspectives. The process must demonstrate the principles of fairness and impartiality. The content of each performance evaluation indicator is partially set as shown in Table 6.2.:

Table 6.2. Performance evaluation content (partial)

Assessment content	Assessment indicators
Performance evaluation	Core work, daily work, unplanned work, target work, work completion quality, work completion progress, safety, work errors and other indicators
Ability assessment	Indicators such as professional knowledge, communication ability, business ability, management ability, comprehension, innovation ability, planning

	ability, execution ability, learning ability, decision-making ability, etc
Attitude assessment	Indicators such as discipline, principles, sense of responsibility, initiative, positivity, and teamwork awareness

Data source: Author（2024）

The types of performance evaluations are conducted on technical personnel through a combination of regular and irregular assessments. Regular assessments are divided into ten month, monthly, six-month, and annual assessments. The irregular assessment includes daily assessment and promotion assessment. Implementing scientific and fair promotion for technical personnel through effective assessment not only increases their personal salary, but also affirms them.

Establish a good corporate culture and provide humanistic care for the spouses of technical personnel. The human resources department of the company maintains active communication with technical personnel, comprehensively understands their difficulties in work and life, and provides certain assistance to the difficulties they encounter, so that technical personnel can receive the company's care. For example, the company can provide education for technical personnel's children, spouse work, and housing.

Establish a sound training system. The excessive work pressure of technical personnel is mainly due to their insufficient abilities. The training of technical personnel by enterprises is mainly to meet the needs of technical personnel, while improving the productivity of enterprise technical personnel through training. GF Construction Company should organize various forms of educational and training activities, arrange technical personnel to actively participate in learning, and encourage technical personnel to engage in self-directed learning. The company should fully utilize modern online distance education methods, establish two platforms for on-site education and online education, and form a networked, convenient, and self-directed education and training model, striving to establish a learning organization. The training work is led by the human resources management department of the organization, focusing on the training of technical personnel in various branches and project departments on vocational skills and qualities. Technical personnel education and training are divided into two categories: internal training of the company and self-learning of technical personnel. Firstly, onboarding training. The main training targets are newly hired technical personnel. Training is aimed at enabling new technical personnel to quickly understand the overall company profile and corporate culture, and quickly enter their job roles. Secondly, process training. The main purpose is to train and enhance the work ability, professional level, and basic qualities of technical personnel, ultimately enabling them to better perform their duties. Each department should summarize its training work for the current year at the end of each year, propose new training needs, develop a training plan for its technical personnel for the

current year, and submit the department's training plan, needs, training work summary, and related materials to the company's human resources management department, providing a basis for the department to develop the next year's training plan. Through training and learning, technical personnel have the opportunity and platform to learn, improve their business abilities, increase their competitiveness for promotion, promote mutual communication and learning among technical personnel, and thus meet their needs.

Establish a good corporate culture. Creating corporate culture stories, building an internal online community for technical personnel, organizing cultural practice activities or conducting corporate culture training, etc., to enable technical personnel to understand the significance of corporate culture construction, master the standards of value judgment, strengthen internal communication and exchange among technical personnel, and enhance the cohesion of the company. Intensify the internal infrastructure construction efforts of the company to provide a good working environment and living guarantee for the technical personnel of the enterprise. Work on details, such as refreshing instant coffee and full afternoon Dim sum. Only by having a good working and living environment can we stimulate the enthusiasm of technical personnel, improve their work enthusiasm and innovation ability, and quickly promote the growth of talents.

Establish cleaning positions in residential areas for construction projects, regularly clean and maintain the cleanliness and tidiness of the living quarters. In order to protect the life and property safety of technical personnel, the living area is fully enclosed and entrance registration devices and security booths are added to prevent strangers from entering the living area. The use of high-quality activity board houses in the dormitories where technical personnel live can not only effectively prevent safety hazards caused by extreme weather, but also reduce discomfort caused by extreme heat and cold winter. Due to the fact that most technicians reside in temporary living areas established for construction projects, this measure can provide strong logistical support for technicians and reduce the lack of sense of belonging caused by working away from home.

Establish an open and transparent management system. Establish a transparent decision-making mechanism to ensure that the process of making important decisions (such as project allocation, budget adjustments, promotion mechanisms, etc.) is transparent, allowing technical personnel to understand the background and basis of the decisions and enhance trust. Regularly hold a general meeting or departmental meeting to share information on company strategy, project progress, future plans, etc., encourage technical personnel to ask questions and provide feedback, and enhance two-way communication of information. Clearly define the responsibilities, goals, and evaluation criteria for each position, ensuring that technical personnel understand their job expectations and evaluation criteria,

and reducing dissatisfaction and resignations due to unclear responsibilities. Establish a fair and transparent performance evaluation process to ensure that evaluation criteria are open and consistent, so that technical personnel can clearly see how their performance is evaluated and how to improve to achieve higher standards. Encourage employees to provide feedback on management and work environment, establish anonymous feedback channels, ensure that employee suggestions and appeals are promptly handled, and safeguard employee rights. Publicize career development paths and training plans to enable technical personnel to understand how to achieve career goals through training and self-improvement, and enhance work motivation and loyalty. Regularly report the company's operational status, market trends, and other information to technical personnel through internal websites, email communications, employee manuals, etc., to promote information transparency and sharing, and enhance team cohesion.

Through the above improvement measures, the turnover rate of GF technical personnel can be effectively reduced, the existing technical construction force of GF Construction Company can be stabilized, the company's strength can be steadily increased, and a virtuous development cycle can be promoted.

7. Implementation

7.1 Schedule

The following plan will be implemented in stages to ensure that GF Construction Company can comprehensively optimize internal management and corporate culture, enhance employee satisfaction and competitiveness between November 2024 and June 2025. The specific implementation plan is shown in the table 7.1.:

Table 7.1. Implementation plan

Serial number	Proposal List		Implementation time
1	Establishing cleaning positions and upgrading safety in residential areas of construction projects	Recruiting cleaning personnel and upgrading the entry-level registration system	From November 1st, 2024 to November 15th, 2024
		Complete the closure of the living area	From November 16th, 2024 to November 30th, 2024
		Upgrade of activity board rooms in technical personnel dormitories	From December 1st, 2024 to December 15th, 2024
2	Corporate culture construction	Design and Promotion of Corporate Culture Framework	From November 1st, 2024 to November 30th, 2024
		Employee culture training	From December 1st, 2024 to December 31st, 2024
		Corporate Culture Month activity to enhance team cohesion	From January 1st, 2025 to January 31st, 2025
3	Perfect salary system	Salary System Research and Design	From November 1st, 2024 to November 10th, 2024
		Internal review and announcement of salary system	From November 11th, 2024 to November 30th, 2024
4	Establishment of	Develop a promotion and	From December 1st,

	Promotion and Assessment System	assessment framework	2024 to December 15th, 2024
		Internal discussion and adjustment	From December 61, 2024 to December 31, 2024
		Formal implementation and employee training	From January 1st, 2025 to January 15th, 2025
5	Establishment of training system	Training Needs Research and Course Design	From January 16th, 2025 to February 15th, 2025
		Training implementation and effectiveness evaluation	From February 16th, 2025 to March 31st, 2025
6	Humanistic care system	System Design and Preparation for Employee Spouse Care Activities	From February 1st, 2025 to February 28th, 2025
		Implementation of caring activities	From March 1st, 2025 to March 31st, 2025
7	Incentive and subsidy system	Design incentive and subsidy plans	From March 1st, 2025 to March 15th, 2025
		Implementation and adjustment of the system	From March 16th, 2025 to April 15th, 2025
8	Qualification and Business Expansion	Apply for the first level qualification of general contracting for highway engineering construction	From January 1st, 2025 to January 15th, 2025
		Apply for the first level qualification of general contracting for mechanical and electrical engineering construction	From January 1st, 2025 to January 15th, 2025
		Apply for the first level qualification for general contracting of water conservancy and hydropower engineering construction	From January 1st, 2025 to January 15th, 2025
9	Management	Revision of Management System	From April 1st, 2025 to

	system is open and transparent	and Design of Disclosure Mechanism	April 30th, 2024
		Implementation of open and transparent system and employee training	From May 1st, 2025 to May 31st, 2025

Data source: Author（2024）

7.2 Budget

The cost estimation for the proposal list for implementing the plan (covering 15 branch offices and 62 ongoing project departments) is shown in the table 7.2.:

Table 7.2. Budgets for various implementation plans

Serial number	Proposal List		Implementation cost	Cost of each project department	Total cost
1	Establishing cleaning positions and upgrading safety in residential areas of construction projects	Recruitment and Salary of Cleaning Personnel (1 person per project department, monthly salary of 3000 yuan, 12 months)	CNY：36,000 EUR：4,580	CNY：130,000 EUR：16,541	CNY：8,060,000 EUR：1,025,585
		Upgrade of entry-level registration system (for each project department)	CNY：6,000 EUR：763		
		Closed renovation of living areas (for each project department)	CNY：8,000 EUR：1,017		
		Upgrade of activity board rooms in technical personnel dormitories (10 rooms per project department)	CNY：80,000 EUR：10,179		
2	Corporate culture construction	Design of corporate culture framework and production of promotional materials (to be carried out uniformly by the headquarters and allocated to each project department)	CNY：1,960 EUR：249	CNY：25,484 EUR：3,242	CNY：1,580,008 EUR：201,046
		Employee culture training	CNY：		

		(for each project department, external trainers)	11,000 EUR：1,399		
		Monthly activity expenses for corporate culture (per project department)	CNY： 12,524 EUR：1,593		
3	Perfect salary system	Salary System Research and Design (Unified by Headquarters)	CNY： 150,000 EUR： 19,086	/	CNY： 300,000 EUR： 38,173
		Internal review and announcement of system meeting costs (to be conducted uniformly by the headquarters)	CNY： 150,000 EUR： 19,086		
4	Establishment of Promotion and Assessment System	System design and discussion (cost allocation for each project department, including headquarters guidance)	CNY：9,678 EUR：1,231	CNY： 19,355 EUR： 2,462	CNY： 1,200,010 EUR： 152,693
		Employee training (for each project department, external trainers)	CNY：9,677 EUR：1,231		
5	Establishment of training system	Training needs research and course design (for each project department)	CNY： 15,484 EUR：1,970	CNY： 25,806 EUR： 3,283	CNY： 1,599,972 EUR： 203,586
		Training implementation and effectiveness evaluation (for each project department, including external trainers)	CNY： 10,322 EUR：1,313		
6	Humanistic care system	Institutional design and activity preparation (for each project department)	CNY：7,258 EUR：923	CNY： 14，516 EUR： 1,847	CNY： 899,992 EUR： 114,518
		Implementation of caring activities (for each project department)	CNY：7,258 EUR：923		
7	Incentive and subsidy system	Design incentive and subsidy plan (conducted uniformly by the headquarters and	CNY：8,474 EUR：1078	CNY： 16,935	CNY： 1,049,970

		distributed to each project department)		EUR：2,154	EUR：133,602
		Cost of system implementation and adjustment meetings (cost allocation for each project department, including headquarters guidance)	CNY：8,461 EUR：107		
8	Qualification and Business Expansion	Apply for the first level qualification of general contracting for highway engineering construction (unified by the headquarters)	CNY：900,000 EUR：114,519	/	CNY：2,700,000 EUR：343,558
		Apply for the first level qualification for general contracting of mechanical and electrical engineering construction (unified by the headquarters)	CNY：900,000 EUR：114,519		
		Apply for the first level qualification for general contracting of water conservancy and hydropower engineering construction (unified by the headquarters)	CNY：900,000 EUR：114,519		
9	Management system is open and transparent	Revision of Management System and Design of Disclosure Mechanism (Unified by Headquarters)	CNY：240,000 EUR：30,538	/	CNY：480,000 EUR：61,077
		System implementation and employee training (conducted uniformly by the headquarters, with external lecturers hired)	CNY：240,000 EUR：30,538		
Amount to					CNY：17,869,952 EUR：2,273,840

Data source: Author（2024）

The above cost estimate is a preliminary budget, and actual expenses may vary depending on market conditions, specific implementation details, and the actual situation of each project.

7.3 Control and assessment

In order to ensure the smooth implementation and effectiveness evaluation of the execution plan, the following aspects are being carried out: planning for corporate culture stories and internal online community construction, signing contracts to clarify service content and delivery time, establishing project management teams, and regularly checking progress for control. Quantitative evaluation will be conducted through employee engagement surveys and website activity statistics. To improve the salary assessment system, we will establish a special team, set milestones, and regularly review the draft system to control it. Analyze the implementation effect of the system through employee satisfaction surveys and changes in turnover rates. Regarding the allocation of cleaning staff in the living area and the upgrade of residential board houses, we will control it by establishing standardized service processes, regularly inspecting the quality of cleaning and facility maintenance, and conducting inspections by the company's quality inspection department on the upgraded board houses. Evaluate employee satisfaction and complaint records through technical staff surveys. Regarding the support for technical personnel living in different locations, control is achieved by setting check-in procedures and standards, and regularly checking the arrangement of prefabricated houses. Evaluate through a satisfaction survey of the technical staff who have checked in. Control the Friday dining event through budget management and supplier screening. Evaluate through employee participation and satisfaction surveys. For online group meetings, set agendas to control from fixed meeting times. Evaluate through meeting minutes and follow-up action tracking, including but not limited to anonymous feedback from technical personnel after the meeting. For team building activities and annual meetings, control should be ensured by clarifying goals and budgets, and arranging activities accordingly. Evaluate through employee engagement and satisfaction surveys. For children's enrollment assistance, a dedicated person will be set up to be responsible and a service process will be established to control it. Evaluate based on the number of successful enrollment cases and employee satisfaction. For the hosting activity area, regular inspections are conducted to control it through quality acceptance after construction and safety and hygiene standards during daily use. Evaluate through parent satisfaction surveys and child engagement. Set training objectives and assessment standards to control the training and

retraining of outstanding new employees. Evaluate through post training assessment and career development tracking. For internal online training, control is exercised through course content review and update cycle management. Evaluate through learning completion rate and feedback survey. For the processing of first level qualifications in highway, electromechanical, water conservancy and hydropower, a time node will be set through commissioning professional institutions. Successfully obtained qualifications for evaluation through tracking the status of qualification application.

It is also necessary to establish an overall evaluation framework. Firstly, a special team should be established to supervise the implementation of each plan. Conduct regular reports and submit monthly progress and issue reports on implementation. Secondly, collect opinions through surveys, gather feedback from employees and stakeholders, and continuously improve. At the same time, it is necessary to use KPIs and quantitative data to evaluate effectiveness. We also need to ensure transparency in the use of funds and avoid overspending. Finally, a risk assessment is required to identify potential risks and prepare strategies to address them.

8. Conclusions

In the context of globalization and informatization, the mobility of technical personnel has become an important issue in enterprise management. Especially in the construction industry, the stability of technical personnel is directly related to the development ability of enterprises and the quality of construction projects. The problem of technical personnel turnover faced by GF Construction Company not only affects the company's continuous production capacity, but may also lead to the loss of knowledge and skills, thereby affecting the company's market competitiveness. This study aims to comprehensively analyze the reasons for the turnover of technical personnel in GF Construction Company and propose effective measures to reduce turnover rate, improve employee satisfaction and retention rate.

The project adopted various methods such as literature review, quantitative analysis (cluster analysis), and qualitative analysis (interview method), and analyzed GF Construction Company from both internal and external perspectives using multiple model analysis methods to ensure the depth and breadth of the research.

Project has found that the loss of professional and technical talents in GF Construction Company has been increasing year by year in the past four years. Combining age, position, education, and length of service, in-depth research has found that technical personnel aged between 31 and 40, with a college degree, 1-2 years of work experience, and at the third level of the company have the highest proportion of turnover. These professional and technical talents are the backbone of the company. By randomly selecting the data of departing technical personnel from the company and conducting telephone interviews to investigate this group of technical personnel, the research data will be organized and statistically analyzed. Based on the comprehensive analysis of the results of two surveys, it is concluded that the reasons for the loss of professional and technical talents in GF Construction Company include unreasonable salary and benefits, limited career development, poor working environment, and unfair management systems. Therefore, a comprehensive solution has been proposed, including salary reform, career development planning, improving the working environment, and establishing a fair and transparent management system. The budget covers the costs of human resources training, facility upgrades, cultural construction, and other aspects. Key performance indicators (KPIs) include the turnover rate of technical personnel, employee satisfaction survey results, and project success rate.

The research of this project may be affected by sample selection bias, time constraints in data collection, and measurement errors of individual variables, therefore the summary of reasons for resignation is not comprehensive enough. The consideration of items related to promotion and performance evaluation, salary and benefits, and establishment of corporate

culture is not comprehensive enough, the pertinence is not prominent enough, and some viewpoints are subjective, so the conclusions obtained may have certain deviations.

In future research, the sample size can be expanded to collect as much interview content as possible from former employees, and compared with the results of questionnaires or interview surveys conducted by in-service technical personnel, in order to obtain more objective and authentic research results. We can explore the relationship between the turnover of technical personnel and corporate culture, leadership style, as well as the impact of digital transformation on the retention of technical personnel. In addition, research can adopt more diversified data collection methods, such as social media analysis and big data technologies, to obtain more comprehensive insights. The research conclusions of the projecet still need to be tested through practice and continuously improved. Please criticize and correct the experts, judges and teachers, and provide valuable opinions and suggestions to provide feasible solutions for GF Construction Company to reduce the loss of technical personnel in future production and operation.

Bibliographical References

Akerstrom, M., Severin, J., Imberg, H., Jonsdottir, I. H., Björk, L., & Corin, L. (2021). Methodological approach for measuring the effects of organisational-level interventions on employee withdrawal behaviour. International Archives of Occupational and Environmental Health, 94, 1671-1686.https://doi.org/10.1007/s00420-021-01686-y

Bin Deng. (2022). Survey on reducing employee turnover rate. (16).10.3969/j.issn.1674-2877.2012.16.049

Beiting He & Ran An.(2020).Why persist under high pressure？ The work of Chinese expatriates——Research on the Mechanism of Family Balance. Nankai Management Review(03),141-154.10.3969/j.issn.1008-3448.2020.03.014

Chaudhry, N. I., Roomi, M. A., Eugien, M., & Chaudhry, J. I. (2022). Treating top management team conflicts through employee voice for reducing intentions to quit: moderating role of union instrumentality. International Journal of Conflict Management, 33(2), 203-222.https://doi.org/10.1108/ijcma-03-2021-0035

Cuiping Gan.(2021).Research on the Reasons and Countermeasures for the Loss of Professional and Technical Talents in ZY Construction Company(Master's thesis, Chongqing Technology and Business University).Master doi:10.27713/d.cnki.gcqgs.2021.000368.

Chang Wei.(2022).Analysis of Reasons and Countermeasures for Grassroots Employee Turnover in Small and Medium sized Private Enterprises Based on the Two Factor Theory.Management and Technology of Small and Medium sized Enterprises(17),64-66.

Donkor, F., Appienti, W. A., & Achiaah, E. (2022). The impact of transformational leadership style on employee turnover intention in state-owned enterprises in Ghana. The mediating role of organisational commitment. Public Organization Review, 22(1), 1-17.https://doi.org/10.1007/s11115-021-00509-5

Dutta, S., & Khatri, P. (2017). Servant leadership and positive organizational behaviour: The road ahead to reduce employees’ turnover intentions. On the horizon, 25(1), 60-82.https://doi.org/10.1108/oth-06-2016-0029

Ghani, B., Zada, M., Memon, K. R., Ullah, R., Khattak, A., Han, H., ... & Araya-Castillo, L. (2022). Challenges and strategies for employee retention in the hospitality industry: A review. Sustainability, 14(5), 2885.https://doi.org/10.3390/su14052885

Guanpeng Wang,Shuangyan Qin & Hengjian Cui.(2022).Analysis and Prediction of Factors Influencing Employee Turnover.System Science and Mathematics(06),1616-1632.10.12341/jssms21320

Haldorai, K., Kim, W. G., Pillai, S. G., Park, T. E., & Balasubramanian, K. (2019). Factors affecting hotel employees ' attrition and turnover: Application of pull-push-mooring framework. International journal of hospitality management, 83, 46-55.https://doi.org/10.1016/j.ijhm.2019.04.003

Hackett, K. (2019). Staff training needed to help sepsis survivors' outcomes. Emergency Nurse, 27(4).https://doi.org/10.7748/en.27.4.6.s2

Huanxia Wang.(2019).Research on the problem and countermeasures of personnel turnover in small and medium-sized construction enterprises' projects.Inner mongolia science technology and economy(19),31+33.CNKI:SUN:NMKJ.0.2019-19-011

Han Zhang.(2022).Research on Employee Turnover Issues and Countermeasures in Small and Medium sized Enterprises.Economic Research Guide(13),4-6.10.3969/j.issn.1673-291X.2022.13.002

Iqbal, K., Peng, H., Hafeez, M., Wang, Y., & Li, C. (2020). The current wave and determinants of brain-drain migration from China. Human Systems Management, 39(3), 455-468.https://doi.org/10.3233/hsm-190622

Jolly, P. M., Gordon, S. E., & Self, T. T. (2022). Family-supportive supervisor behaviors and employee turnover intention in the foodservice industry: does gender matter?. International Journal of Contemporary Hospitality Management, 34(3), 1084-1105.https://doi.org/10.1108/ijchm-02-2021-0280

Jianfu Li & Guanjun Liu.(2013).Construction of prevention mechanism for employee turnover in enterprises.China Labor(05),44-46.CNKI:SUN:LDKX.0.2013-05-020

Jixin Zhao,Mengqian Wang & Dali Zhao.(2018).A Study on the Influencing Factors of Employee Turnover in Internet Companies Based on Price-Mueller Model.Journal Of Hebei University Of Economics and Trade(05),93-101.doi:10.14178/j.cnki.issn1007-2101.2018.05.012.

Jiayin Yang.(2018). Reasons for the loss of professional and technical personnel in the C company and management strategies (Master's thesis, Beijing Jiaotong University).Master CNKI:CDMD:2.1018.104388

Jin wang.(2020).An analysis of the dilemma of talent loss in enterprises.Chinese and Foreign Entrepreneurs(15),130.

Jimei Zhang.(2020).Analysis and Countermeasures of Talent Loss in Enterprises.Chinese and Foreign Entrepreneurs(02),120.

Jingyue Zhu.(2022).Scientific response to grassroots employee turnover.human resources

(10),90-92.10.3969/j.issn.1672-1632.2022.10.043

Jiandong Xing. (2022). A Brief Analysis of the Development Status of Human Resource Management in Construction Enterprises. industry building(7), 265-265.

Kumar, B. R. (2019). A study to understand which job context factors are responsible for high employee turnover rate in call centers with special reference to Pune City. International Journal of Management, IT and Engineering, 9(9), 34-42.

Krein, S. L., Turnwald, M., Anderson, B., & Maust, D. T. (2022). "Sometimes it's not about the money... it's the way you treat people...": A Qualitative Study of Nursing Home Staff Turnover. Journal of the American Medical Directors Association, 23(7), 1178-1184.https://doi.org/10.1016/j.jamda.2021.11.036

Lulu Han.(2021).Research on the Influencing Factors and Countermeasures of Technology R&D Staff Turnover in HT Internet Company(Master's thesis, Northeast Agricultural University).Master doi:10.27010/d.cnki.gdbnu.2021.000741.

Lingyan Gao.(2022).Problems and Countermeasures in Human Resource Performance Management of Construction Enterprises.CHINA COLLECTIVE ECONOMY(09),134-135.

Price, J. L. (1977). The study of turnover. The Lowa State University, 7. https://doi.org/10.1177/073088847800500406

Park, J., & Min, H. K. (2020). Turnover intention in the hospitality industry: A meta-analysis. International Journal of Hospitality Management, 90, 102599.https://doi.org/10.1016/j.ijhm.2020.102599

Pengtao Wang.(2022).Analysis of Reasons and Countermeasures for Employee Turnover in Small and Medium sized Enterprises.International public relations(19),25-27.doi:10.16645/j.cnki.cn11-5281/c.2022.19.017.

Qiang Li.(2019).Research on Talent Loss in a Subsidiary of China Construction Third Engineering Bureau(Master's thesis, Beijing Jianzhu University).Master

Rasheed, M. I., Okumus, F., Weng, Q., Hameed, Z., & Nawaz, M. S. (2020). Career adaptability and employee turnover intentions: The role of perceived career opportunities and orientation to happiness in the hospitality industry. Journal of hospitality and tourism management, 44, 98-107.https://doi.org/10.1016/j.jhtm.2020.05.006

Stamolampros, P., Korfiatis, N., Chalvatzis, K., & Buhalis, D. (2019). Job satisfaction and employee turnover determinants in high contact services: Insights from Employees' Online reviews. Tourism Management, 75, 130-147.https://doi.org/10.1016/j.tourman.2019.04.030

Shuaishuai Yang & Min Wang.(2022).Research on Talent Loss in Small and Medium sized Private Enterprises Based on Game Theory.Theoretic Observation(01),95-97.10.3969/j.issn.1009-2234.2022.01.023

Tongtong Xu.(2022).Research on Employee Turnover Issues and Countermeasures in Company Y (Master's Thesis, East China Normal University).Master doi:10.27149/d.cnki.ghdsu.2022.003922.

Xue Wen.(2019).Exploration of Employee Turnover in Small and Medium sized Enterprises.Chinese and Foreign Entrepreneurs(36),81-82.CNKI:SUN:ZWQY.0.2019-36-067

Xingen Liu.(2020).Thoughts on How Construction Enterprises Can Retain Talents——Taking a state-owned construction enterprise as an example.value engineering(15),41-43.doi:10.14018/j.cnki.cn13-1085/n.2020.15.019.

Xianxuan Zhu.(2022).Research on the problem and countermeasures of grassroots employee turnover in Y Printing and Packaging Company(Master's thesis, Guangxi Normal University).Master doi:10.27036/d.cnki.ggxsu.2022.000702.

Yingjun Xing.(2019).Research on the Causes and Countermeasures of the Brain Drain of Small and Medium sized Internet Enterprises(Master's thesis, Qingdao University).Master 10.27262/d.cnki.gqdau.2019.002347

Yi Peng.(2020).The Loss and Control of Frontline Engineering and Technical Talents in State owned Construction Enterprises — — Taking the T game as an example.human resources(06),20-23.10.3969/j.issn.1672-1632.2020.06.013

Yifei Xie.(2020).Research on the problem and countermeasures of technical talent loss in YH Company(Master's thesis, Guilin University of Electronic Science and Technology).Master doi:10.27049/d.cnki.ggldc.2020.000744.

Yang Zhao & Yong Wei.(2023).Reasons and Countermeasures for Employee Turnover in Small and Medium sized Enterprises.Cooperative Economy and Technology(05),105-107.doi:10.13665/j.cnki.hzjjykj.2023.05.062.

Zhaojun Qu.(2021).Reasons and countermeasures for employee turnover in current enterprises.human resources(12),78-79.10.3969/j.issn.1672-1632.2021.12.041

Appendices

Appendix A – Employee Resignation Record Form

Serial Number	Name	Gender	Age	Marital Status	Education Background	Office Branch	Position	Date On Board	Resignation Date	Length Of Service （years）
1	Changgen Yang	Male	52	Married	Junior College Diploma	Jian	Provincial-level registered supervision engineer	7/3/2019	5/6/2023	4
2	Yiran Ouyang	Male	43	Married	Bachelor's Degree	Huhehaote	National registered supervision engineer	10/5/2018	7/6/2023	5
3	Baogen Li	Male	53	Divorced	Junior College Diploma	Nanchang(HQ)	Construction worker	2/4/2021	8/6/2023	2
4	Xuzu Tu	Male	50	Married	Senior High School	Nanchang(HQ)	Quality inspector	15/6/2018	12/6/2023	5
5	Kun Zhang	Male	24	Married	Bachelor's Degree	Chengdu	Supervisor	9/5/2021	15/6/2023	2
6	Laiqiang Zhang	Male	28	Married	Technical Secondary	Chengdu	Special type of work	1/4/2019	15/6/2023	4
7	Hiu Zhang	Male	33	Married	Bachelor's Degree	Chengdu	Associate Constructor	3/7/2018	16/6/2023	5
8	Guoping Gong	Male	42	Married	Junior College Diploma	Changsha	Safety checker	15/1/2020	20/6/2023	3
9	Guomei Wan	Female	46	Married	Junior College Diploma	Changsha	Safety checker	2/3/2021	21/6/2023	2
10	Hui Tong	Male	32	Married	Technical Secondary	Wuhan	Special type of work	13/5/2022	30/6/2023	1
11	Hongsheng Leng	Male	41	Married	Junior College Diploma	Guangzhou	Budgeter	24/3/2020	12/7/2023	3
12	Bingnan Huang	Male	40	Married	Junior College Diploma	Cahngchun	Budgeter	25/1/2018	13/7/2023	5
13	Xiaoxun Yu	Male	46	Married	Junior College Diploma	Jiujiang	Provincial-level registered supervision engineer	30/1/2021	14/7/2023	2
14	Jianyun Xiong	Male	48	Married	Junior College Diploma	Jiujiang	Supervisor	27/6/2021	17/7/2023	2
15	Yue Leng	Female	22	Married	Bachelor's Degree	Ganzhou	Documenter	4/5/2022	17/7/2023	1

16	Pan Liu	Female	23	Married	Bachelor's Degree	Wuhan	Documenter	12/6/2022	20/7/2023	1
17	Nianxian Gong	Female	44	Married	Senior High School	Guiyang	Quality inspector	15/7/2017	20/7/2023	6
18	Xiao Rao	Male	36	Divorced	Bachelor's Degree	Nanchang(HQ)	primary registered construction engineer	12/3/2017	21/7/2023	6
19	Yi Zhang	Male	25	Married	Junior College Diploma	Fuzhou	Construction worker	15/5/2021	24/7/2023	2
20	Xin Zhang	Male	27	Married	Senior High School	Yichun	Construction worker	23/4/2020	25/7/2023	3
21	Xinlei Wei	Male	22	Married	Senior High School	Yichun	Construction worker	28/6/2022	25/7/2023	1
22	Xiang Guo	Male	23	Married	Senior High School	Yichun	Construction worker	25/7/2022	27/7/2023	1
23	Jun Ma	Female	33	Married	Junior College Diploma	Wuhan	Surveyor	25/7/2021	28/7/2023	2
24	Maomao Zhao	Male	46	Married	Technical Secondary	Changchun	Surveyor	25/5/2016	1/8/2023	7
25	Biyun Yang	Male	39	Married	Junior College Diploma	Jiujiang	Associate Constructor	12/1/2019	1/8/2023	4
26	Quangen Hu	Male	45	Married	Bachelor's Degree	Jiujiang	National registered supervision engineer	5/3/2018	10/8/2023	5
27	Zhijian Rao	Male	37	Married	Bachelor's Degree	Jiujiang	primary registered construction engineer	10/7/2020	11/8/2023	3
28	Xiuyun Bian	Male	47	Married	Bachelor's Degree	Huhehaote	National registered supervision engineer	18/4/2016	15/8/2023	7
29	Xingfu Leng	Male	54	Married	Junior College Diploma	Wuhan	Special type of work	21/3/2022	16/8/2023	1
30	Shangchang Hu	Male	55	Married	Senior High School	Changsha	Construction worker	1/5/2017	16/8/2023	6
31	Dawen Hu	Male	55	Married	Senior High School	Changsha	Construction worker	6/3/2018	16/8/2023	5
32	Xiaomin Zhang	Female	38	Married	Bachelor's Degree	Guangzhou	Associate Constructor	30/8/2021	21/8/2023	2
33	Heran Gong	Male	32	Spinsterhood	Junior College Diploma	Guangzhou	Supervisor	28/3/2021	22/8/2023	2
34	Changhua Zhao	Male	41	Married	Junior College	Guangzhou	Documenter	30/7/2020	24/8/2023	3

					Diploma					
35	Yaohui Zeng	Male	35	Married	Bachelor's Degree	Guangzhou	Provincial-level registered supervision engineer	1/6/2020	24/8/2023	3
36	Bo Liu	Male	36	Married	Junior College Diploma	Pingxiang	Budgeter	14/6/2021	28/8/2023	2
37	Ran Xu	Male	36	Divorced	Junior College Diploma	Shangrao	Supervisor	15/5/2020	29/8/2023	3
38	Dingbao Sun	Male	51	Married	Senior High School	Fuzhou	Construction worker	18/2/2022	31/8/2023	1
39	Yijing Xu	Male	21	Spinsterhood	Junior College Diploma	Shangrao	Documenter	15/8/2022	5/9/2023	1
40	Zhiwen Sun	Male	26	Spinsterhood	Junior College Diploma	Yingtan	Quality inspector	4/7/2020	5/9/2023	3
41	Qiujun Li	Female	35	Married	Junior College Diploma	Yingtan	Documenter	30/5/2021	8/9/2023	2
42	Changhua Wang	Female	46	Married	Senior High School	Jingdezhen	Construction worker	20/6/2019	8/9/2023	4
43	Guilai Wan	Female	40	Married	Junior College Diploma	Jingdezhen	Quality inspector	17/5/2020	15/9/2023	3
44	Jing Ouyang	Male	36	Married	Junior College Diploma	Fuzhou	Provincial-level registered supervision engineer	25/6/2021	15/9/2023	2
45	Hu Wang	Male	33	Married	Senior High School	Huhehaote	Construction worker	29/6/2021	15/9/2023	2
46	Sisi Wang	Male	31	Married	Technical Secondary	Huhehaote	Construction worker	24/1/2021	15/9/2023	2
47	Yuyan Zhou	Female	30	Spinsterhood	Junior College Diploma	Nanchang(HQ)	Budgeter	23/4/2018	19/9/2023	5
48	Wenhui Mai	Male	39	Married	Junior College Diploma	Nanchang(HQ)	Provincial-level registered supervision engineer	11/3/2017	20/9/2023	6
49	Guoqiang Zhong	Male	30	Spinsterhood	Bachelor's Degree	Fuzhou	Associate Constructor	27/5/2021	20/9/2023	2
50	Dajun Qu	Male	46	Married	Senior High School	Jian	Construction worker	24/8/2022	21/9/2023	1
51	Tian Zhao	Male	32	Spinsterhood	Bachelor's Degree	Jian	Budgeter	12/8/2019	22/9/2023	4
52	Zheng	Male	36	Married	Junior	Wuhan	Documenter	28/5/202	25/9/202	2

	Zuo				College Diploma			1	3	
53	Zhimin Zhang	Male	43	Married	Junior College Diploma	Wuhan	Quality inspector	2/7/2020	9/10/2023	3
54	Yu Gu	Male	26	Spinsterhood	Senior High School	Chengdu	Construction worker	19/6/2022	9/10/2023	1
55	Zhiping Song	Male	30	Married	Junior College Diploma	Guiyang	Safety checker	1/10/2021	11/10/2023	2
56	Pan Yang	Male	37	Married	Junior College Diploma	Shangrao	Special type of work	3/4/2021	12/10/2023	2
57	Boyang Li	Male	37	Married	Bachelor's Degree	Nanchang(HQ)	Associate Constructor	8/3/2020	16/10/2023	3
58	Wenjun Ju	Male	28	Spinsterhood	Junior College Diploma	Yichun	Surveyor	25/4/2021	16/10/2023	2
59	Sihao Cheng	Male	25	Spinsterhood	Junior College Diploma	Yingtan	Supervisor	7/6/2021	18/10/2023	2
60	Weiguo Liu	Male	51	Married	Bachelor's Degree	Nanchang(HQ)	Associate Constructor	24/8/2016	18/10/2023	7
61	Zhenzhong Xu	Male	49	Married	Junior College Diploma	Guiyang	Surveyor	26/5/2020	19/10/2023	3
62	Jianhui Liang	Male	48	Married	Bachelor's Degree	Guangzhou	Budgeter	11/3/2018	23/10/2023	5
63	Guoqing Zhang	Male	33	Married	Junior College Diploma	Wuhan	Supervisor	19/9/2019	24/10/2023	4
64	Jinghua Xu	Male	46	Married	Senior High School	Jiujiang	Construction worker	12/10/2020	25/10/2023	3
65	Fengjin Yang	Male	42	Divorced	Junior College Diploma	Jian	Budgeter	20/9/2019	25/10/2023	4
66	Dan Fu	Female	38	Married	Junior College Diploma	Jian	Special type of work	3/4/2018	27/10/2023	5
67	Yibing Deng	Male	34	Married	Bachelor's Degree	Nanchang(HQ)	Associate Constructor	6/2/2018	30/10/2023	5
68	Donghua Mao	Male	35	Married	Junior College Diploma	Huhehaote	Budgeter	16/7/2022	31/10/2023	1
69	Tengfei Ye	Male	32	Spinsterhood	Technical Secondary	Guiyang	Quality inspector	27/8/2022	1/11/2023	1
70	Deguo Deng	Male	56	Married	Junior College Diploma	Changchun	Construction worker	17/5/2020	1/11/2023	3

71	Yuping Liu	Male	33	Married	Bachelor's Degree	Changchun	Supervisor	21/8/2019	6/11/2023	4
72	Xiangyan Liu	Female	44	Married	Master's Degree	Chengdu	primary registered construction engineer	20/11/2017	7/11/2023	6
73	Fangquan Xiong	Male	45	Married	Junior College Diploma	Guiyang	Provincial-level registered supervision engineer	24/8/2020	7/11/2023	3
74	Jiayu Cheng	Female	32	Spinsterhood	Junior College Diploma	Guiyang	Budgeter	20/4/2021	13/11/2023	2
75	Bibo Li	Male	49	Married	Junior College Diploma	Chengdu	Special type of work	6/5/2021	13/11/2023	2
76	Lihe Zhang	Male	48	Married	Junior College Diploma	Chengdu	Special type of work	6/5/2020	2023/11/15	3
77	Wenhao Luo	Male	20	Spinsterhood	Senior High School	Wuhan	Construction worker	30/4/2022	16/11/2023	1
78	Tao Lu	Male	22	Spinsterhood	Senior High School	Wuhan	Construction worker	1/7/2022	16/11/2023	1
79	Junjie Wang	Male	32	Married	Junior College Diploma	Wuhan	Surveyor	30/6/2020	20/11/2023	3
80	Zheng Ma	Male	33	Married	Junior College Diploma	Wuhan	Construction worker	18/5/2021	21/11/2023	2
81	Qiao Liu	Male	41	Married	Master's Degree	Nanchang(HQ)	National registered supervision engineer	11/10/2019	21/11/2023	4
82	Yongling Huang	Female	35	Married	Junior College Diploma	Chengdu	Supervisor	18/8/2021	23/11/2023	2
83	Yan Zhang	Male	36	Married	Junior College Diploma	Chengdu	Documenter	3/11/2022	24/11/2023	1
84	Bin Zhao	Male	42	Married	Bachelor's Degree	Changchun	Provincial-level registered supervision engineer	1/12/2019	24/11/2023	4
85	Wenlin Yu	Male	46	Married	Senior High School	Jiujiang	Construction worker	9/8/2018	27/11/2023	5
86	Xiaowen Duan	Female	40	Married	Bachelor's Degree	Yichun	Special type of work	17/7/2020	29/11/2023	3
87	Jian Luo	Male	37	Married	Junior College Diploma	Pingxang	Safety checker	25/4/2021	29/11/2023	2

88	Ruiqi Zhao	Male	32	Married	Junior College Diploma	Ganzhou	Construction worker	28/7/2022	30/11/2023	1
89	Jixiang Ren	Male	34	Married	Bachelor's Degree	Ganzhou	Budgeter	14/11/2020	1/12/2023	3
90	Ke Wu	Male	32	Spinsterhood	Bachelor's Degree	Changsha	Construction worker	19/10/2021	4/12/2023	2
91	Zhiyao Wen	Male	35	Married	Junior College Diploma	Changsha	Surveyor	12/11/2022	5/12/2023	1
92	Yuanyuan Mei	Female	36	Married	Junior College Diploma	Changsha	Documenter	23/9/2021	5/12/2023	2
93	Hang Su	Male	24	Spinsterhood	Junior College Diploma	Changsha	Construction worker	24/7/2022	8/12/2023	1
94	Xueqin Liu	Male	21	Spinsterhood	Junior College Diploma	Guangzhou	Construction worker	8/11/2022	11/12/2023	1
95	Guoping Zeng	Male	25	Spinsterhood	Junior College Diploma	Jingdezhen	Construction worker	5/5/2021	12/12/2023	2
96	Yiquan Wang	Male	46	Married	Junior College Diploma	Changchun	Provincial-level registered supervision engineer	24/8/2019	15/12/2023	4
97	Changfu Chen	Male	38	Married	Bachelor's Degree	Ganzhou	National registered supervision engineer	1/3/2017	15/12/2023	6
98	Dongmei Hu	Female	47	Married	Senior High School	Nanchang(HQ)	Construction worker	17/3/2020	18/12/2023	3
99	Xun Jiang	Male	36	Married	Bachelor's Degree	Jingdezhen	National registered supervision engineer	14/5/2018	18/12/2023	5
100	Xingtong Yao	Male	26	Married	Bachelor's Degree	Nanchang(HQ)	Documenter	26/10/2021	21/12/2023	2
101	Zhifeng Zhu	Male	47	Married	Senior High School	Shangrao	Construction worker	21/11/2018	21/12/2023	5
102	Ruifu Du	Male	32	Spinsterhood	Junior College Diploma	Huhehaote	Construction worker	8/4/2021	27/12/2023	2
103	Xiong kang	Male	38	Married	Junior College Diploma	Yichun	Quality inspector	20/8/2021	29/12/2023	2
104	Anqi Huang	Male	34	Married	Junior College Diploma	Yingtan	Quality inspector	28/12/2019	3/1/2024	4

105	Can Huang	Male	33	Married	Junior College Diploma	Shangrao	Safety checker	27/11/2021	4/1/2024	2
106	Liyao Wang	Male	24	Spinsterhood	Junior College Diploma	Jiujiang	Construction worker	1/1/2023	8/1/2024	1
107	Long Zhang	Male	26	Spinsterhood	Senior High School	Jingdezhen	Surveyor	22/10/2022	8/1/2024	1
108	Liang Zhao	Female	28	Married	Junior College Diploma	Jingdezhen	Special type of work	2/1/2022	26/1/2024	2
109	Zhengjie Song	Male	23	Spinsterhood	Junior College Diploma	Jian	Safety checker	1/12/2022	26/1/2024	1
110	Zeming Lei	Male	29	Spinsterhood	Junior College Diploma	Nanchang(HQ)	Budgeter	2021/1/15	26/1/2024	3
111	Xiaoxu Su	Female	30	Married	Junior College Diploma	Yingtan	Budgeter	1/2/2022	29/1/2024	2
112	Wenyu Wang	Male	31	Spinsterhood	Bachelor's Degree	Yingtan	Associate Constructor	14/1/2020	29/1/2024	4
113	Fengying Chen	Female	52	Married	Senior High School	Wuhan	Special type of work	14/11/2020	31/1/2024	3
114	Da yang	Male	43	Married	Junior College Diploma	Jiujiang	Budgeter	28/2/2021	21/2/2024	3
115	Limin Yan	Male	28	Married	Junior College Diploma	Jian	Surveyor	31/1/2022	21/2/2024	2
116	Feng Luo	Male	29	Spinsterhood	Junior College Diploma	Ganzhou	Construction worker	7/1/2023	21/2/2024	1
117	Haoyue Yan	Female	30	Married	Bachelor's Degree	Jiujiang	Provincial-level registered supervision engineer	8/12/2021	21/2/2024	2
118	Yi Yang	Female	37	Married	Junior College Diploma	Jian	National registered supervision engineer	18/11/2020	21/2/2024	3
119	Jiangchong Chen	Female	39	Married	Senior High School	Yichun	Construction worker	8/10/2019	21/2/2024	4
120	Wenxi Xiong	Male	26	Spinsterhood	Junior College Diploma	Yichun	Construction worker	5/9/2021	29/2/2024	2
121	Qingfeng Jiang	Male	28	Spinsterhood	Junior College Diploma	Huhehaote	Special type of work	1/11/2020	1/3/2024	3

122	Binglan Tu	Female	36	Married	Senior High School	Wuhan	Safety checker	9/3/2021	1/3/2024	3
123	Lifeng Gui	Male	31	Married	Junior College Diploma	Guangzhou	Supervisor	12/1/2023	5/3/2024	1
124	Tingchai Huang	Male	34	Married	Bachelor's Degree	Jiujiang	Supervisor	31/12/2021	6/3/2024	2
125	Baosen Liao	Male	32	Married	Technical Secondary	Huhehaote	Safety checker	7/12/2021	11/3/2024	2
126	Jinze Yu	Male	36	Married	Junior College Diploma	Guiyang	Construction worker	30/11/2018	14/3/2024	5
127	Hongxiang Zhou	Male	52	Married	Senior High School	Guiyang	Construction worker	3/1/2016	14/3/2024	8
128	Siyu Li	Female	35	Married	Junior College Diploma	Changsha	Quality inspector	16/12/2020	15/3/2024	3
129	Jinbao Huang	Male	34	Married	Junior College Diploma	Changsha	Special type of work	28/10/2021	19/3/2024	2
130	Bingchuan Yang	Male	46	Married	Senior High School	Wuhan	Construction worker	1/4/2020	20/3/2024	4
131	Fei Li	Male	37	Married	Technical Secondary	Fuzhou	Construction worker	16/2/2023	22/3/2024	1
132	Zhongwen Zhao	Male	54	Married	Senior High School	Fuzhou	Construction worker	15/1/2018	25/3/2024	6
133	Kuisen Cai	Male	34	Married	Junior College Diploma	Pingxang	Quality inspector	29/12/2021	27/3/2024	2
134	Jun Ye	Male	50	Married	Technical Secondary	Pingxang	Construction worker	24/2/2022	27/3/2024	2
135	Shifeng Wan	Male	37	Married	Junior College Diploma	Ganzhou	Construction worker	9/12/2019	29/3/2024	4
136	Wenxiang Wu	Male	36	Married	Bachelor's Degree	Nanchang(HQ)	primary registered construction engineer	6/11/2018	29/3/2024	5
137	Yuhao Du	Male	24	Married	Senior High School	Ganzhou	Construction worker	28/2/2022	1/4/2024	2
138	Kun Duan	Male	30	Married	Junior College Diploma	Fuzhou	Documenter	12/4/2022	2/4/2024	2
139	Long Xu	Male	38	Married	Junior College Diploma	Shangrao	Quality inspector	7/12/2020	2/4/2024	3
140	Tnighui Zhao	Male	32	Married	Senior High School	Yichun	Special type of work	24/2/2022	10/4/2024	2
141	Bofeng guo	Male	34	Married	Bachelor's Degree	Yichun	Supervisor	8/2/2023	12/4/2024	1

142	Peihua Luo	Female	50	Married	Junior College Diploma	Jian	primary registered construction engineer	20/4/2019	15/4/2024	5
143	Heyan liu	Male	32	Spinsterhood	Bachelor's Degree	Guangzhou	Safety checker	17/1/2021	18/4/2024	3
144	Yanting Zhang	Male	35	Married	Junior College Diploma	Changchun	Surveyor	2/3/2022	18/4/2024	3
145	Bingyu Yin	Female	30	Spinsterhood	Junior College Diploma	Changchun	Documenter	11/3/2022	23/4/2024	2
146	Shiqiang Xiang	Male	46	Married	Bachelor's Degree	Guangzhou	Associate Constructor	1/5/2019	24/4/2024	5
147	Hongxialeng	Female	48	Married	Junior College Diploma	Changchun	Associate Constructor	24/3/2018	25/4/2024	6
148	Jie Lin	Male	41	Divorced	Junior College Diploma	Chengdu	Construction worker	7/2/2023	6/5/2024	1
149	Yunfa Li	Male	48	Married	Bachelor's Degree	Jiujiang	National registered supervision engineer	16/4/2016	7/5/2024	8
150	Zhanjun Yu	Male	54	Married	Junior College Diploma	Guiyang	National registered supervision engineer	1/4/2017	7/5/2024	7
151	Zhouquan Shi	Male	51	Married	Technical Secondary	Guiyang	Construction worker	1/1/2015	8/5/2024	9
152	Zeqiang Chen	Male	43	Married	Junior College Diploma	Ganzhou	Provincial-level registered supervision engineer	12/6/2021	15/5/2024	3
153	Hongzhen Cheng	Female	53	Married	Technical Secondary	Pingxang	Special type of work	25/3/2016	16/5/2024	8
154	Guojin Wang	Male	49	Married	Bachelor's Degree	Fuzhou	primary registered construction engineer	10/5/2018	20/5/2024	6
155	Hanxin Hong	Male	36	Married	Junior College Diploma	Jingdezhen	Supervisor	30/12/2020	20/5/2024	3
156	Jinruan Zheng	Male	33	Married	Junior College Diploma	Jingdezhen	Supervisor	28/4/2022	23/5/2024	2
157	Ye Zhang	Male	29	Spinsterhood	Junior College Diploma	Jiujiang	Surveyor	26/2/2023	24/5/2024	1
158	Qing Ye	Female	32	Married	Bachelor's Degree	Guangzhou	Budgeter	16/2/2022	27/5/2024	2

159	Xikang Liu	Male	37	Married	Junior College Diploma	Shangrao	Provincial-level registered supervision engineer	27/3/2020	29/5/2024	4
160	Mingtao Chen	Male	39	Married	Bachelor's Degree	Nanchang(HQ)	primary registered construction engineer	8/4/2020	30/5/2024	4

Data source: Human Resources Department of GF Construction Company（2024）

Appendix B – Interview outline for departing technical personnel

1、Interview purpose

Understand the main reasons for the turnover of technical personnel in GF Construction Company.

2、Interviewee

Part of the technical personnel lost by GF Construction Company between June 2023 and May 2024.

3、Interview content：

① What is the most important reason for you to leave GF Construction Company?

② What aspects of GF Construction Company are you most satisfied with and least satisfied with?

③ What is your current job after leaving the company?

④ What do you think companies should improve the most in retaining talent?

⑤ Do you have any other suggestions for our company?

Appendix C – Information on personnel who underwent telephone interviews among the 160 resigned technical personnel selected

Serial Number	Name	Gender	Age	Position	Interview Date	Interview duration
1	Yuanyuan Mei	Female	36	Documenter	June 3, 2024	10 minutes
2	Guoqiang Zhong	Male	30	Associate Constructor	June 3, 2024	12 minutes
3	Qing Ye	Female	32	Budgeter	June 3, 2024	18 minutes
4	Wenhui Mai	Male	39	Provincial-level registered supervision engineer	June 3, 2024	13 minutes
5	Wenhao Luo	Male	20	Construction worker	June 3, 2024	15 minutes
6	Wenjun Ju	Male	28	Surveyor	June 3, 2024	20 minutes
7	Dingbao Sun	Male	51	Construction worker	June 3, 2024	13 minutes
8	Zhongwen Zhao	Male	54	Construction worker	June 3, 2024	11 minutes
9	Xuzu Tu	Male	50	Quality inspector	June 3, 2024	19 minutes
10	Xingfu Leng	Male	54	Special type of work	June 3, 2024	21 minutes
11	Xiang Guo	Male	23	Construction worker	June 3, 2024	16 minutes
12	Quangen Hu	Male	45	National registered supervision engineer	June 4, 2024	16 minutes
13	Junjie Wang	Male	32	Surveyor	June 4, 2024	15 minutes
14	Sisi Wang	Male	31	Construction worker	June 4, 2024	17 minutes
15	Siyu Li	Female	35	Quality inspector	June 4, 2024	12 minutes
16	Fengying Chen	Female	52	Special type of work	June 4, 2024	20 minutes
17	Nianxian Gong	Female	44	Quality inspector	June 4, 2024	22 minutes
18	Jiayu Cheng	Female	32	Budgeter	June 4, 2024	18 minutes

19	Jinbao Huang	Male	34	Special type of work	June 5, 2024	19 minutes
20	Bingchuan Yang	Male	46	Construction worker	June 5, 2024	14 minutes
21	Biyun Yang	Male	39	Associate Constructor	June 5, 2024	16 minutes
22	Zhengjie Song	Male	23	Safety checker	June 6, 2024	18 minutes
23	Pan Liu	Female	23	Documenter	June 6, 2024	13 minutes
24	Zhanjun Yu	Male	54	National registered supervision engineer	June 6, 2024	17 minutes
25	Hiu Zhang	Male	33	Associate Constructor	June 6, 2024	15 minutes
26	Changfu Chen	Male	38	National registered supervision engineer	June 6, 2024	15 minutes
27	Zeqiang Chen	Male	43	Provincial-level registered supervision engineer	June 6, 2024	15 minutes
28	Baogen Li	Male	53	Construction worker	June 6, 2024	16 minutes
29	Binglan Tu	Female	36	Safety checker	June 6, 2024	18 minutes
30	Bofeng guo	Male	34	Supervisor	June 8, 2024	19 minutes
31	Guomei Wan	Female	46	Safety checker	June 8, 2024	20 minutes
32	Zhifeng Zhu	Male	47	Construction worker	June 8, 2024	23 minutes
33	Zhijian Rao	Male	37	primary registered construction engineer	June 8, 2024	21 minutes
34	Tian Zhao	Male	32	Budgeter	June 8, 2024	10 minutes
35	Guojin Wang	Male	49	primary registered construction engineer	June 8, 2024	10 minutes
36	Xiaoxu Su	Female	30	Budgeter	June 8, 2024	9 minutes
37	Liang Zhao	Female	28	Special type of work	June 8, 2024	26 minutes
38	Xinlei Wei	Male	22	Construction worker	June 9, 2024	14 minutes
39	Feng Luo	Male	29	Construction worker	June 9, 2024	18 minutes
40	Jianyun	Male	48	Supervisor	June 9, 2024	14 minutes

	Xiong					
41	Dajun Qu	Male	46	Construction worker	June 9, 2024	15 minutes
42	Weiguo Liu	Male	51	Associate Constructor	June 9, 2024	17 minutes
43	Yiquan Wang	Male	46	Provincial-level registered supervision engineer	June 9, 2024	19 minutes
44	Anqi Huang	Male	34	Quality inspector	June 10, 2024	21 minutes
45	Xiao Rao	Male	36	primary registered construction engineer	June 10, 2024	15 minutes
46	Mingtao Chen	Male	39	primary registered construction engineer	June 10, 2024	15 minutes
47	Shangcha ng Hu	Male	55	Construction worker	June 10, 2024	17 minutes
48	Yi Zhang	Male	25	Construction worker	June 10, 2024	19 minutes
49	Zheng Zuo	Male	36	Documenter	June 10, 2024	13 minutes
50	Hui Tong	Male	32	Special type of work	June 10, 2024	16 minutes
51	Jianghong Chen	Female	39	Construction worker	June 10, 2024	18 minutes
52	Bibo Li	Male	49	Special type of work	June 11, 2024	15 minutes
53	Wenxi Xiong	Male	26	Construction worker	June 11, 2024	13 minutes
54	Lifeng Gui	Male	31	Supervisor	June 11, 2024	12 minutes
55	Peihua Luo	Female	50	primary registered construction engineer	June 11, 2024	11 minutes
56	Xiuyun Bian	Male	47	National registered supervision engineer	June 11, 2024	10 minutes
57	Jian Luo	Male	37	Safety checker	June 11, 2024	14 minutes
58	Xin Zhang	Male	27	Construction worker	June 11, 2024	15 minutes
59	Kun Zhang	Male	24	Supervisor	June 11, 2024	13 minutes
60	Shiqiang Xiang	Male	46	Associate Constructor	June 12, 2024	16 minutes
61	Fei Li	Male	37	Construction worker	June 12, 2024	13 minutes
62	Guoqing	Male	33	Supervisor	June 12, 2024	17 minutes

	Zhang					
63	Wenxiang Wu	Male	36	primary registered construction engineer	June 12, 2024	12 minutes
64	Hanxin Hong	Male	36	Supervisor	June 12, 2024	14 minutes
65	Maomao Zhao	Male	46	Surveyor	June 12, 2024	16 minutes
66	Dawen Hu	Male	55	Construction worker	June 12, 2024	14 minutes
67	Hongxia leng	Female	48	Associate Constructor	June 12, 2024	17 minutes
68	Guoping Zeng	Male	25	Construction worker	June 14, 2024	14 minutes
69	Shifeng Wan	Male	37	Construction worker	June 14, 2024	10 minutes
70	Guoping Gong	Male	42	Safety checker	June 14, 2024	32 minutes
71	Long Xu	Male	38	Quality inspector	June 14, 2024	25 minutes
72	Changhua Zhao	Male	41	Documenter	June 14, 2024	9 minutes
73	Da yang	Male	43	Budgeter	June 14, 2024	10 minutes
74	Sihao Cheng	Male	25	Supervisor	June 14, 2024	10 minutes
75	Zhiwen Sun	Male	26	Quality inspector	June 14, 2024	15 minutes
76	Ye Zhang	Male	29	Surveyor	June 14, 2024	17 minutes
77	Xiaowen Duan	Female	40	Special type of work	June 15, 2024	14 minutes
78	Xingtong Yao	Male	26	Documenter	June 15, 2024	17 minutes
79	Hongsheng Leng	Male	41	Budgeter	June 15, 2024	14 minutes
80	Jun Ma	Female	33	Surveyor	June 15, 2024	14 minutes
81	Can Huang	Male	33	Safety checker	June 15, 2024	15 minutes
82	Long	Male	26	Surveyor	June 15, 2024	17 minutes

	Zhang					
83	Tingchai Huang	Male	34	Supervisor	June 15, 2024	18 minutes
84	Zeming Lei	Male	29	Budgeter	June 15, 2024	13 minutes
85	Xiaoxun Yu	Male	46	Provincial-level registered supervision engineer	June 16, 2024	12 minutes
86	Pan Yang	Male	37	Special type of work	June 16, 2024	16 minutes
87	Ruifu Du	Male	32	Construction worker	June 17, 2024	14 minutes
88	Haoyue Yan	Female	30	Provincial-level registered supervision engineer	June 17, 2024	16 minutes
89	Yijing Xu	Male	21	Documenter	June 17, 2024	14 minutes
90	Lihe Zhang	Male	48	Special type of work	June 17, 2024	15 minutes
91	Baosen Liao	Male	32	Safety checker	June 18, 2024	12 minutes
92	Fengjin Yang	Male	42	Budgeter	June 18, 2024	11 minutes
93	Heyan liu	Male	32	Safety checker	June 18, 2024	13 minutes
94	Jie Lin	Male	41	Construction worker	June 20, 2024	16 minutes
95	Hu Wang	Male	33	Construction worker	June 20, 2024	18 minutes
96	Zhimin Zhang	Male	43	Quality inspector	June 20, 2024	19 minutes
97	Ke Wu	Male	32	Construction worker	June 23, 2024	13 minutes
98	Bin Zhao	Male	42	Provincial-level registered supervision engineer	June 23, 2024	14 minutes
99	Yan Zhang	Male	36	Documenter	June 23, 2024	27 minutes
100	Fangquan Xiong	Male	45	Provincial-level registered supervision engineer	June 23, 2024	14 minutes
101	Liyao Wang	Male	24	Construction worker	June 23, 2024	17 minutes
102	Ruiqi Zhao	Male	32	Construction worker	June 24, 2024	18 minutes
103	Hang Su	Male	24	Construction worker	June 24, 2024	28 minutes
104	Jinruan	Male	33	Supervisor	June 25, 2024	13 minutes

	Zheng					
105	Jixiang Ren	Male	34	Budgeter	June 27, 2024	19 minutes
106	Zheng Ma	Male	33	Construction worker	June 27, 2024	11 minutes

Data source: Author（2024）