

ORIGINAL RESEARCH ARTICLE

The Problems and Countermeasures in Construction Management

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ABSTRACT

Construction is a multi-type, multi-disciplinary and complex engineering system. In order to smoothly conduct construction process and to achieve the intended goal, it is necessary to carry out construction management in a scientific way. However, in the implementation of the system, there is often mismanagement which caused major safety accidents and the quality of construction has become a general concern. This paper analyzes some problems in the construction site, and proposed solutions to promote standardized law and safety measures for the construction management system.

KEYWORDS: site construction, problem, decision

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1. Current status of China's construction market

With the establishment of socialist market economic system, construction industry gradually adapt to the market, improve their competitiveness, expand domestic demand, promote national economic development, and improve people's material and cultural life, and hence, made a positive contribution. However, there are still many shortcomings in the current construction market in China.

(1) Advantages of construction industry is not obvious, and lacking of technology innovation

At present, many Chinese construction enterprises are competing in the same level. The gap of technology level between enterprises is not large, and technical characteristics and features are not obvious. For the construction industry, the improvement of competitiveness of through the reduction of material and labor costs is gradually decreasing. The strengthening of technological innovation is now the core of market competitiveness. In order to improve the level of competition, formation of a unique competitive advantage, improve the added value of construction, and high-tech convergence, technological innovation has become the inevitable choice of sustainable development of the construction industry.

(2) Incomplete assessment system of the entire construction market project

Project contract lacks scientific basis and the reward and punishment system is not strictly implemented. Project contract is mainly set to control the payment rate of head office, while the project is controlled personally, and the company is responsible to conduct inspection and supervision. Although later on other aspects such as project duration, quality, and safety objectives management have been included, but the cost reduction rate, technical process improvement benefits and other indicators are ignored or not implemented. For example, when a project is not completed within the stipulated time frame, the company will be punished; when the project is completed timely, on-site management does not conduct assessment. In this way, the company will only focus to complete the project within the stipulated timeframe, ignoring the details on on-site management, leading to material wastes, uncontrolled material use, and the project costs cannot be reduced.

(3) Overall quality of construction industry employees is not high

The social function of China's construction industry has long been difficult to completely be eliminated. Retirees increased year by year and the amount of external expenses enterprises co-ordination is increasing. The industry diverts staff, surplus staff is especially high, and an effective manpower management is not established. Staff size is too large

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and the overall quality is generally not high. There is no clear management concept nor correct market concept, and weak sense of crisis and competition.

(4) Weak market development of the construction industry. Comprehensive management shall be strengthened.

The ability of the market development depends on the quality of the products provided by the enterprises, customer satisfaction, strategies of the market, technological innovation and services provided. Although many construction companies are experienced in the above aspects, there is still room for the upgrade of market development. Statistical analysis of the industry shows that state-owned enterprises and state-owned holding enterprises have lost advantages in market competition, and this issue is accelerating. Therefore, important tasks that shall be conducted on the basis of current reformation as follow: deepened the current reformation, adjust property rights structure, establish scientific and effective corporate governance structure, change business model and mechanism, completely change traditional manpower management and policy, and improve the comprehensive level of management and control of the overall subcontracting mechanism.

(5) Marketing on construction enterprises is not given importance

Construction enterprises do not give importance to the role of public branding. Only small scale marketing such as slogans and logo are conducted. Brand strategy may be developed, but are mostly ineffective. According to the needs of industry development, construction enterprises should fully promote the marketing concept, improve corporate reputation, establish corporate brand, and expand market share. To ensure the quality of construction, comply with the contract commitments, enterprises shall change their passive approach, take the initiative to visit customers, and provide quality services to establish good reputation, pay attention to the creation of corporate image, actively carry out corporate image construction and management, and ultimately develop a healthy development to the entire construction market.

2. Existing problems in the construction process

(1) Safety management in the construction process is insufficient

1, Weak safety and legal awareness of the construction staff

Many safety risks in construction sites are due to human error. Not only workers, some management staff are also weak in safety awareness. The safety behavior of personnel in the construction site is not standardized, not according to statutory construction procedures, and avoidance to government regulation; some construction units do not even review construction drawings according to law, do not abide to the law on quality and safety supervision and construction permit procedures, and even contract the project illegally to construction enterprises or individuals who do not have appropriate qualifications. These phenomena cause dangerous accidents in a construction site. While the construction design may be linked to many personnel, it is difficult to guarantee the quality of the design, and violating the mandatory standards is common; on the other hand, unauthorized changes were made from the reviewed construction plan to accommodate the construction work, and requirements were also reduced.

2, Safety supervision is not in place, and management system is not implemented

At present, some concept and mentality of supervision law enforcement officers is not high, unable to correctly perform their duties, and some even neglect their duties. Some construction administrative departments and supervisory agencies do not actively enforce the law; do not observe the 'divide and complete coverage, and responsible to the people' approach to implement supervision responsibilities; do not strengthen the responsibility of the supervision personnel in conducting routine inspection duties, resulting in this regulatory avoidance behavior not being able to be detected and stopped in time, and safety supervision cannot be in place. Also, the responsibilities of safety production in the construction site are not clear, incomplete safety measures and ineffective implementation, resulting in a number of major accidents. In addition, punishment to the enterprises and personnel are insufficient.

3, Lacking in safety education and training

With China's development in economy and society and the acceleration of urbanization, a large number of additional rural labors migrate to the urban areas and into the market, entering the 'low threshold' construction industry. Currently, there are up to 50 million people in the construction industry where 80% are rural labor, accounting to one-third of migrated rural workers. Many of these workers does not receive training and education on the job. Although some of them may have some training, the training is often a mere formality, lacking of relevance and effectiveness, and difficult to meet the requirement of construction safety. In addition, the number of safety management personnel in construction industry is relatively small, overall quality is low, and fail to meet the needs of project management, causing weak safety management. Although some sites have complete safety management and have education and training guidelines, but the actual training of the personnel is vague.

(2) Comprehensive quality management is not in place

1, Quality management system is not safe, and supervision is not in place

Supervision quality which is low and lacking of professional ethics caused poor quality projects, instead of improving the project quality. Some supervision personnel is employed by the company to tackle the higher authorities, and do not perform any supervision duty. Also, with the instruction from higher authorities, many supervision units implement project supervision without competitive bidding procedures, resulting in perfunctory, poor supervision, and unsafe quality management system.

2, Low quality awareness of owners

The quality problems in construction projects are, to a large extent, closely related to the lack of awareness of the quality of service. For example: Lack of attention to the survey and design stage, unreasonable design program, lack of in-depth study, and even have missing items, errors, and other issues, which ultimately results in quality issues and accidents. In the bidding phase, relationship between the tender price and project quality is not established. Projects were tender to unreasonable contractors due to blindly asking for low prices. The authority towards supervision to the engineer is too little, causing an imbalance in supervision rights and duties; leading lost of function in supervision.

3, Poor quality management, and unqualified material and equipment

The material used has a very large impact on the quality of the construction works. If the poor main material enters the construction market and is easily passed during acceptance stage, this will cause great impact to the construction industry.

(1) Sand and mortar sand are very important materials in a construction, but they also have the most quality issues and cause complicated impacts. It is affected by the raw material quality, ratio, weighing, technology, curing conditions and many other factors. However, the most important issue still boils down to poor site supervision, not strict to follow laboratory provided construction mix, low technology levels, poor awareness, and deliberately cutting corners resulting in insufficient strength of concrete and mortar. The acceptance of test block are generally prepared by the construction enterprises and sent to the laboratory by their own. Hence, the test block may be fraud, included additives, or test blocks are being purchased, causing great difference between the test blocks and actual quality. Due to the good quality of test blocks, the acceptance of the actual material is naturally easy to pass.

(2) Poor steel quality. This is a cliché problem. The quality of individual reinforced base metal is very poor, which is reflected the most on the reinforced welds such as: during flash butt welding and electro slag welding of large diameter steel pipe, if there is poor control of the current and fusion process, it will affect the quality of the welding. If such products are used in construction, it will cause great danger to people's life and property. Poor quality steels have been able to be used so long due to the lack of responsibility of the supervision system. Obviously unqualified materials are let passed easily, which shows the loss of essence in the role of supervision resulting in many poor quality constructions.

4, Acceptance criteria of completion project is not being met, and quality of project is being reduced

Acceptance inspection on completion project is the last quality control of the entire project, and all the criteria shall be met. If the completion project does not meet the regulatory requirements, then the project quality is reduced. However, data shows that most of the projects have quality issues and the acceptance criteria are not being met. For example: During acceptance inspection, the personnel inspected hastily, did not inspect in-dept, or even inspecting only documents. This is a fraud and has resulted in low quality and so on.

(3) Cost control is not in place during construction

1, Cost control during bidding is not in place

Due to the influence of the external environment and the internal management level of the enterprise, the bidding process mainly has the following two problems: (1) the increasingly fierce competition in the construction market, the risk in tender offer has increased. To improve the winning rate, vicious competition occur during the offering stage, low prices were offered, causing unacceptable cost reduction rate, seriously restricting the level of project efficiency. (2) Difficult to control tender costs. As the management in construction market is not standardized, there is a lot of human - relations factor and finding alternative ways factor, causing high cost of business bidding, and this trend is increasing year by year.

2, Insufficient cost control in project evaluation

Through evaluation process, the main purpose is to evaluate the target cost, project profit margin, and then sign the contract, clearly stating the profit margin and other economic indicators. The existing problems in the evaluation are: the project evaluation is not unified; project evaluation ideas and methods are loose; in order to improve the project evaluation efficiency, cost is lowered deliberately, disguised by reducing labor insurance and other policy costs contrary to national policy, and against long term interest of the state and workers.

3, Cost control during construction is not in place

At present, some enterprises mainly encounter the following three issues: (1) Weak cost accounting foundation. Many enterprises do not establish a cost accounting system, cost accounting conducted was too simple, deliberately simplifying the accounting process, cost and distribution not tally, actual cost and budgeted cost not tally, and unable to meet cost analysis and assessment; (2) Institutional constrains on cost management is not in place. For example, unable to strictly follow organization design program, easily change the design specifications, unable to calculate the cost effectively. The analysis is too superficial causing issues could not be detected and resolved. Signing and implementation of contract is not standardized and rigorous where hidden issues are present. Some will begin construction first before resolving the cost issues, but the issues were later pushed to each other, and may even brought up to the court; (3) Poor cost awareness. The leader may not pay much attention to cost management and underestimated the importance in cost reduction, expense high cost to bid for renowned projects; due to poor cost management, staff reward and punishment is not made clear, no careful planning, loss and waste is common.

4, Assessment of the existence of cost-effective part of the incentive system is not in place

After the completion of the project, due to various reasons, the final accounts work is lagging behind, and some even drag to one year or so, causing difficulties to the performance appraisal. As the performance appraisal is not timely, the cost control after the completion of the project is often overlooked, exceed cost has occurred, causing great impact to the project. In addition, due to the imbalance of project rewards and punishment, when there is profit all are happy and bonus are given, but when loss occur, many excuses were given and punishment are reduced or omitted. This kind of reward and punishment is not equal, and is due to the lack of scientific and impartial incentive and restraint mechanism, not conducive to enhance enthusiasm of majority of employees, and will inevitably damage the long-term interests of enterprises.

(4) Serious environmental pollution caused by construction

1, Noise pollution

Noise is the main pollution during the construction period, mainly from the civil construction machinery such as piling machines, excavators, rollers, cranes, bulldozers, loaders, graders, mixers, chainsaws, welding machines, transport vehicles and other noise. Construction process often uses a variety of equipments at the same time and has exacerbated the impact of the noise. In addition, there are scaffolding and template loading and unloading, installation and removal, construction materials, cutting and other operation noise. In special circumstances, due to the day and night construction during the construction period, noise pollution has seriously affected the residents' daily work, life, and learning, leading to the highest complain rate in construction process.

2, Waste water pollution

Waste water in construction mainly comes from precipitation, mud, building materials, and cleaning water from concrete transport pipeline, concrete maintenance drainage, hydraulic test water, and wastewater from construction workers. Temporary water supply facilities on some sites have leakage but there is no corresponding management follow-up, leading to flooding at the construction site. Some of the mud and waste pump is directed into the sewer and caused precipitation, resulting in secondary water pollution.

3, Air pollution

During the construction period, the dust generated during the construction process affects the ambient air quality of the city. The main process contributing to dust generation are: site formation, earth excavation, transportation, storage and use of construction waste and cement-based building. Uncivilized practice such as littering still exists in some places. Woodworking saw machine operations, backfill of lime, gravel, and earth, dust exposed surface, and access roads of vehicles, and other places also caused a certain degree of dust pollution. In case of drought and rainy season, coupled with windy weather, dust on the construction site will be more serious. In addition, large canteen stove, coal burning, construction machinery, and construction vehicles also produce a certain amount of exhaust gas. In chemical melting process, chemical evaporation will produce some organic waste gas.

4, Solid waste pollution

The waste generated during the construction process mainly comes from the demolition of building, the construction of waste materials, dregs, waste packaging, house hold waste and so on. In the process of discarding soil from deep foundation pit building and artificial digging pile foundation, a certain amount of waste earth and mud is produced,

5, Other environmental issues

In the construction process of welding operations and construction site with strong light source, lighting has often become a complaint. Indirect environment issues may occasionally encountered in the excavation process due to unfamiliar underground pipeline conditions caused by digging water and pipe gas pipelines. In the process of film construction, environmental issues such as surface vegetation damage, surface exposed for long periods, formation

of ecological damage and soil erosion may also occur. Improper construction management can also cause landscape damage and other issues.

3. Strengthen the initiative of construction management

(1) To establish a sound and perfect security system

1, To strengthen safety education and awareness

'Safety first, prevention is crucial' is a safe working principle, an important slogan for safety education. At the same time, on-site safety management also includes worker protection equipments, occupational health prevention, whether behavioral habits are able to be promptly corrected, whether educational and safety signs are in place, emergency response facilities are in place, whether safety regulators are on duty, and so on. Strengthen the safety education and training of front-line operators and enhance their safety awareness and skills. Some managers are required to learn and master safety regulations, labor protection, fire extinguishing, scaffolding, tower crane, earthwork, on-site temporary electricity, high-altitude operations, vertical transport equipment, template work, lifting, civilized construction, on-site first aid and other safety knowledge. In order to improve the basic knowledge and requirements of construction workers, teaching resources such as migrant workers' schools and other teaching resources shall be put to full use, and encourage workers from low quality cultural background, poor safety awareness, and lack of self-protection awareness, to participate in the training. Encourage skilled workers to participate in training to improve vocational skills. Safety education shall be given importance.

2, Improve safety supervision and management system

Improvement of the construction safety supervision and management of operating mechanism at all levels shall be taken. A high quality security supervision and management of law enforcement team shall be established. Enterprises must develop safety education plans. For special types of work, safety management personnel must be required to accept testing and training. Preliminary job training for new workers shall be given by the corporate safety department. The department is responsible to organize training on 'Construction Regulations', 'Construction Engineering Safety Production Management Regulations' and other relevant standards and common knowledge. At the same time, the law enforcement supervision agencies has to break the traditional method of supervision on single construction unit, instead, according to the law, not only conduct supervision, but also survey, design, and implement supervision, regulate the behavior of the construction market, implement safety responsibilities, so that the safety production management can work together.

3, Implement proper safety measures in construction site

Construction site should be safe and civilized to ensure the health and safety of construction workers. Construction site layout should be carefully planned. Walls, doors, offices, etc. should be in a proper manner, materials are neatly stacked, civilized worker behavior, clear material and equipment logo, eye-catching safety signs, according to the requirements of standard requirements of security and management. Safety system shall be strictly implemented in the construction site. Operating environments and weather conditions may be safety factors. Therefore, more specific and targeted safety requirements shall be proposed to ensure the safety of construction personnel.

(2) Strict quality control and good acceptance work

1, Engineering drawings

Whether the construction drawings design is good or bad, it gives a direct impact on the overall quality of the project. Therefore, a certain qualification of the design party shall be selected, and there is a need to grasp the design fund. In the intense market competition, company shall not reduce design funds to prevent design related issues.

2, Construction team

The quality of the construction team can directly affect the quality of the project. After project approval, the project must go through tender, or according to the tender to select the construction team. Specific methods are: (1) To hear from the construction team on their technical strength, equipment status, funding situation and to take the specific measures to the project. (2) Focus on construction quality and site management. (3) examine the construction equipment, technical strength, and enterprise grade and qualification certificate. (4) To go through and evaluate the engineering plan provided by the party to determine its credibility.

3, Construction contract

After the construction team has been selected, the construction unit should sign a construction contract with the construction team, and the contract and the relationship between the two sides has legal provisions. The contents of the contract must be strict, detailed, clearly states responsibility, reward and punishment, reasonable requirements, complete procedures, and inspection. Before the construction contract is signed, it should report to the competent business unit

at the next level. After signing the contract, it should be taken to the local notary office for notarization in order to be subjected to legal supervision.

4, Quality of the project supervision

Improve quality supervision system to improve transparency and enforcement. At the same time, a predictive and service quality supervision model should also be established, combining the service and law enforcement. Behavior supervision and physical supervision can be achieved from a single physical supervision to the various quality aspects in the construction.

5, Conduct acceptance inspection on the completion project

Acceptance inspection must be strictly implemented according to the state issued project acceptance criteria. Acceptance of the quality of the project can be measured with specific method. (1) Focus on whether information and record is complete, whether they meet the acceptance criteria; mortar and concrete test pieces and components, etc. whether the strength of the design specifications meet the requirements; see whether the interior and exterior decoration meet standards, check no leakage in toilet, kitchen, balcony, water pipes, sanitary facilities, floor, roof cracking and so on. (2) Check the actual measures against basic engineering, main project engineering, structure of the affected parts and technical requirements.

(3) Increase cost management to achieve multi-aspects approach

1, Bidding part of cost management should be done in 'three establishment'

Establishing Engineering Information Screening and Tracking Mechanism. Careful analysis on construction market bidding information shall be done to identify the project and determine the authenticity of the examination and approval documents, to determine whether the tracking value is true. Based on the historical data of the enterprise or the bidding data of the same industry, the maximum reduction in the cost is set according to the factors such as the project category, investment subject and regional difference. The maximum reduction in the cost should not erode the direct costs and should tightly calculate the management fee, otherwise the risk of bidding should be considered. Establish an effective bidding performance appraisal system. Combined the enterprise historical data and the annual budget of the tender fee, the implementation of its controllable management and special accounts to implement detailed accounting, easy to compare analysis, assessment savings or overrun; the cost of the project and the total amount of project to be put into the tender work assessment objectives; the bidder's reward and punishment, tender results and the bid level of the profits in accordance with the project evaluation results.

2, Scientific and rational principles of project evaluation work

Enterprises should be base on the national budget quota, combined with the enterprise management level, prepare scientific and rational principles as a cost management guild line and as a basis for project evaluation. According to the assessment results and other factors to sign the project contract, stating clear profit margins, assessment of items, rewards and punishments standards, according to sub-project cost budget, and calculate the project profit level.

3, Construction cost should be done in 'five importance'

It is necessary to divide the cost and the cost is reasonably divided according to the principle of controllability according to the characteristics and management needs of the project construction organization. The cost of the project must be according to the principle of controlling the decomposition of the cost center, cost center assessment, reward and punishment standards. Regular analyze and assess the cost center to resolve issues in timely manner. It is necessary to improve the internal control system of the project, including the establishment of employee responsibility system, the expenditure authorization system, the asset safety management system, the construction site management system, the contract management system, the performance appraisal and reward and punishment system, and strict implementation of work. For the project specification, requires an orderly and efficient construction and evaluation on completion of project to guarantee the system. It is necessary to strengthen the inspection, guidance and supervision of project cost management in the higher level business, focusing on the implementation of the target responsibility cost budget and the degree to which the management activities of the project follow the principle of cost-effectiveness. When found irregular management in the cost behavior, timely corrective measures shall be taken to avoid greater losses.

4, Rewards and punishments after the completion of the cost assessment

(1) Conduct audit after project completion. It is necessary to verify, compare, analyze and accurately calculate the assessment indexes on the basis of the indicators determined in the contract, and make objective evaluation of the audit, and provide the basis for the project performance appraisal. (2) Based on the audit results to honor the reward and punishment, and resolve issues left after the project. The remaining property and material are sold or transferred, exit equipment performance should be restored to the required standards, designated person shall be responsible for the clean-up, claims, and liabilities. As soon as possible, deal with the left over work to avoid dragging resulting in unnecessary losses. Conduct project completion, clean up, assessment, reward, and punishment.

(4) Promote green construction, and create a healthy home

1, Prevention and control of noise pollution in construction site

(1) To complete wall before start construction. Install noise reduction safety curtain in advance as a protection to adjacent areas. (2) To strengthen the control of artificial noise, avoid beating, loud noise, and enhance the understanding of all construction personnel to prevent noise disturbance. To control noise from template removal, loading and unloading, and so on. (3) According to the characteristics of the construction stage, the construction site should be reasonably arranged. Equipment with high noise shall be arranged away from protection area (such as residents, hospitals, schools, etc.). (4) To strengthen the construction site noise monitoring, and adjust the noise control measures according to the monitoring situation to ensure the effectiveness of measures to achieve the purpose of construction without disturbing people.

2, Prevention and control of wastewater pollution

(1) Production wastewater should be introduced into pre-set sedimentation tank. Precipitation is strictly prohibited to directly enter the city sewer and river. (2) Domestic sewage should be discharged into the municipal sewage pipe network together with the construction waste water. It shall be disposed of by the sewage treatment plant and shall not be discharged directly into the surrounding rainwater pipe network or discharged directly into the river. (3) Management on all kinds of vehicles, equipment, fuel, oil and lubricants should be strengthened. All waste oil should go through centralized treatment, not free to be dumped anywhere, into municipal rainwater network and other nearby rivers.

3, Prevention and control measures of air pollution

(1) Hardening the transport route and arranging personnel and equipment to carry out sprinkling and dusting on a regular basis, and to cover or stack the dust on the site. (2) During usage of cement cans, the mixing station shall be set up with bag filter, spray dust collector and other dust removal facilities. (3) The management of transport vehicles. Transport vehicles shall not be overloaded. Transport of bulk materials and other vehicle materials shall not overtake other vehicles and take effective shelter measures. Before leaving, rinse wheels and other parts. Prevent the vehicle from sprinkle and leakage. (4) For High-rise building construction, a special floor shall be set up as a waste transport channel. Strictly prohibit high-altitude throwing.

4, Prevention and control measures of solid waste pollution

(1) The construction site shall be promptly cleaned up and construction waste to be timely cleared, to prevent long-term accumulation and dust; (2) To prohibit the use of toxic and hazardous waste for earth backfill, toxic waste shall be handled by qualified party. (3) During the construction period, domestic waste should be collected and sent to the nearby garbage dump for sanitary landfill disposal. It is strictly forbidden to dispose of the garbage, so as not to damage the landscape and pollute the environment.

4. Conclusion

Construction enterprises should pay attention to the construction process management, construction of high-quality engineering projects, to promote the healthy development of construction market.

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