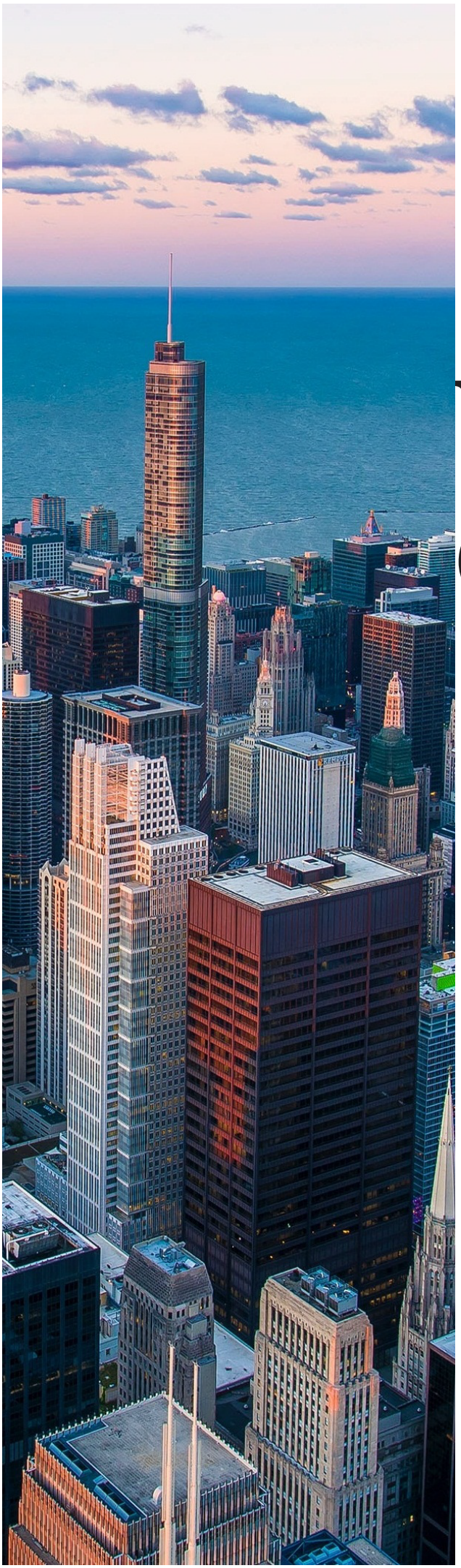

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RESEARCH ARTICLE

RESEARCH ARTICLE

Study of owner management on the common provincial trunk highway upgrading

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Abstract: This study reviewed a comprehensive discussion on the ownermanagement of the upgrading and reconstruction project of the common national trunk highway in Guizhou province. Established the Construction Project Management Measures and formulated the measures for the administration of construction projects. From the aspects of project owner management, credit evaluation, main procedures, daily delivery of information, property management fees, the implementation of construction projects, project completion audit , working methods and other aspects to research.
Keywords: trunk highway, upgrading project, management

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1 Introduction

With the development of the national economy, the ministry of transportation has given a strong support policy to help the highway in Guizhou province during the Twelfth Five-Year Plan. The highway of the general state has been upgraded, the National secondary road has reached 50%, and the Provincial secondary road has reached 8.7%. During this period, the reconstruction construction of secondary road in the whole province raised the climax. In the thirteenth Five-Year Plan, the state requires that the National secondary road of Guizhou province reach 90%, and the tertiary road and above reaches 50%. Based on the characteristics of guizhou mountainous area and inform, combined with the implementation of management of project owner, this article provides specific opinions and practice, for everyone in the road or promotions in the transformation of the construction of the project owner management study for discussion and get the application together.

2 Establishment of the management institution for project owners

The general requirements of the project management agency: total investment of 200 million yuan or within 30 kilometers of the project; the total number of managers is not less than seven; for each additional investment of 150 million yuan or 20 kilometers of additional miles, one engineering technical manager shall be added; engineering technicians are not less than 65% of the total number of managers and the professional technical titles of intermediate and above shall account for more than 50% of the total number of engineering technicians. Personnel qualification: have the corresponding engineering organization management ability; good command of relevant regulations and professional knowledge; experience in construction management of more than 1 highway project; professional skills and qualifications for corresponding positions.

Staff settings:One office director of owner management: previously worked as a unit leader or department head or senior professional technical position.

One deputy office director of owner management(technical director): have the technical position of middle and senior engineering.

One head of program: have the technical position of middle engineering.

One project director: have the technical position of middle engineering.

One safety director: must hold the highway engineering security personnel post card.

Finance director: must hold professional technical positions in accounting or economic series intermediate and above.

Other staffs (technical, comprehensive, pilot): must hold the corresponding position qualification certificate.

3 Established the Construction Project Management Measures

3.1 The basis of the Construction Project Management Measures

Tendering documents, special terms of contract, general terms of contract, technical standards of contract agreemen-

t, technical specifications of construction, design drawings, related management methods of units, etc.

3.2 Contents of the Construction Project Management Measures

3.2.1 First section: General rules, organization and job responsibilities

The main targets are the quality objectives, project target, security objectives and construction of a clean and honest administration, etc.

The institutions and job responsibilities are as follows: job responsibilities of the project owner, job responsibilities of the planning (measurement) department, job responsibilities of the engineering (quality) department, job responsibilities of the safety production department, job responsibilities of the finance department, job responsibilities of the integrated department, duty of the office director of owner management, duty of the deputy office director of owner management, job responsibilities of technical director, responsibility of project manager, responsibility of project manager, responsibility of chief security officer, responsibility of chief financial officer, responsibilities of chief executive officer of comprehensive office, responsibilities of other staff members, labor discipline and work Reception management methods.

3.2.2 Second section: Methods and management system

Main management system as follows: contract management of project schedule, project quality management, construction schedule management, measurement implementation rules, design change management, safe production (accident emergency rescue plan, construction safety and security) management, environmental protection management, standardized construction and civilized construction management, project financial management, central laboratory management, construction supervision and management, construction of a clean and honest administration management, engineering archive management.

3.2.3 Third section: Check the evaluation method and the corresponding form

The main assessment methods are engineering quality inspection evaluation methods, production safety inspection evaluation methods, construction schedule inspection evaluation methods, Construction safety and security checks evaluation methods, etc., and the form for the corresponding inspection and evaluation methods[1].

4 Safe production management

Project owners do have to conscientiously implement the requirements on work safety, and make sure safety product, there are leadership, measures, inspection, implementation. To form a security organization that unified leadership, hierarchical management. The project owner shall do a good job of daily safety precautions and safety supervision inspection, regular or irregular inspection. Combine regular checks with key spot checks, pay close attention to the accident hidden danger management and strictly implement the safety accident reporting system. Sign the safety responsibility of one by one, decompose the security responsibilities and implemented, define responsibility, rights and interests of production safety, the responsibility falls to the individual. When preparing the overall construction organization design and construction organization design of the sub-project, the project shall formulate targeted safety technical measures in accordance with the characteristics of the construction project and establish the safety production rules and regulations and operation regulations. Prepare a special construction plan for the more dangerous works, prepare emergency and safety drills in advance according to the regulations.

5 Safe production management

The project will implement the project quality responsibility life-long system within the design service life. The heads of all participating units shall take the lead responsibility for the project's quality management of the unit. The technical director (chief engineer) of each unit shall be responsible for the leadership of the project's engineering quality and technology. The project quality inspection leader of each unit shall be responsible for engineering and technical aspects. The project leaders of each unit shall be directly responsible for the quality of the project site. The project chief engineer of each unit is directly responsible for the quality technology of the project site. The responsible person of the engineering quality inspection of each unit project site shall take the responsibility of the engineering quality of the unit project site on the engineering technology. Site engineering and technical personnel are directly responsible persons.

6 Project scheduling management

Prior to the commencement of the project, the project proprietor shall conscientiously review whether the construction unit construction has operability overall construction organization design plan (meeting the requirements of the project duration); supervise the supervising engineer to carefully examine whether the project is reasonable, whether it meets the requirements, and whether the construction measures are proper, quality and safety assurance measures are perfect; supervise the supervision engineer to examine in detail whether it is reasonable, whether it meets the rules and regulations, whether the construction measures are proper, and whether the quality and safety guarantee measures are improved.

The owner convenes a project schedule meeting on schedule every month to make arrangements for the overal-

l progress of the project. The progress of the actual construction of the project should be compared with that of the planned schedule. If lagging behind, the project should be adjusted in time to strengthen the construction power and increase the input of resources so as to ensure the planned duration achieve[2].

7 Design change management

Design changes are divided into major design changes, larger design changes and general design changes. General design changes approved by the project legal person and be submitted to the provincial bureau for the record. Major design changes and larger design changes are approved by the provincial bureau. After major design changes approval, submitted to the Provincial Department for the record. Owners should strictly control larger or major design changes, strict implementation of the approval authority, dealing with general design changes. Strictly implement the design change site signing system, the general design change plan has been checked and signed by the owner, construction, supervision and design representatives. Major changes and larger changes shall be implemented in accordance with the design change management procedures of the Ministry of Transport and Provincial Department to ensure the rationality and accuracy of the design changes. Engineering change must be based on sufficient. When the supervision engineer signs the change design, it is required to verify the accuracy, the expression is clear, and no vague words should be used. The assessment of engineering changes and changes shall be in conformity with the provisions of the contract and related measures. In the process of engineering construction, the original design unit shall be responsible for the modification of the project design documents due to the design defects, and no other units or individuals may modify it without authorization. For larger and more changes, the approval of the relevant units should be submitted to the original examination and approval unit for approval.

8 Engineering measurement and payment

The quality of engineering measurement project must meet the technical specification and design drawing requirements. All kinds of inspection and acceptance procedures are complete. The measurement specification, content, method, measurement unit and the unit price engineering project of the engineering project must be in conformity with the terms of the contract, bill of quantities, the requirements of technical specification and related documents, and the project owner shall uniformly use the measurement payment format or the measurement payment software. After the first trial approved the owners do strict review, send to the project management department sign, and then send to branch project leader for examination and approval, by the project finance department to pay for the metering project.

9 Credit evaluation

Credit evaluation is the evaluation that construction unit evaluate the survey and design unit and the construction unit about the design, construction quality, later service quality in the implementation of the project. Support material collection and collation work should be done well. Set up the account in quarterly basis, give construction unit and survey and design unit a fair and impartial evaluation, recommend outstanding enterprises for the transportation industry. The credit evaluation of the supervision unit and the central laboratory is evaluated by the government supervision agency. The owner of the project should do a good job in the related assessment and evaluation for the central testing room and the supervising unit, and provide some basic materials for the evaluation of the supervision institution, provide some basic materials for monitoring evaluation.

10 The main formalities settlement related to the project

10.1 Highway construction project management agencies for the record

To collect the documents that established by the legal person, documents of the legal representative, the document of the project feasibility study report, enterprise legal person business license or institution legal person certificate, the construction of information about funding sources, profession title certificate of the head of institution, technical director, financial administrator, personnel in key position (security department head, planning department head, engineering department head), the head of the organization and the technical director of the previous project management work performance and related supporting documents, Construction Project Management Method of project owner. Go to the preliminary design document or construction drawing design document approval of the competent department for the record[3].

10.2 Highway engineering quality and safety supervision application and highway engineering quality registration

According to the project (self-managed, escrow) management mode, collect the following documents: relevant documents and basis of the engineering project; contract documents of design, construction and supervision; project supervision outline (or supervision plan); construction organization plan; qualification data of the supervision units, central laboratories, survey units, design units and construction units (business license, qualification certificate, safety production license, organization agency code and bank card, etc.); relevant personnel information(Id card, graduation certificate, professional title certificate, professional

technical certificates); bridges, tunnels, high slopes, high-fillings, main structures of large-scale support projects, etc.; submit to the supervision department for approval.

10.3 Highway engineering quality and safety supervision application and highway engineering quality registration

According to the project (self-managed, escrow) management mode, collect the following documents: relevant documents and basis of the engineering project; contract documents of design, construction and supervision; project supervision outline (or supervision plan); construction organization plan; qualification data of the supervision units, central laboratories, survey units, design units and construction units (business license, qualification certificate, safety production license, organization agency code and bank card, etc.); relevant personnel information(ID card, graduation certificate, professional title certificate, professional technical certificates); bridges, tunnels, high slopes, high-fillings, main structures of large-scale support projects, etc.; submit to the supervision department for approval[4].

10.4 Highway construction project started permit

Collect the following documents: approval documents of construction drawing design; the audit opinion of the transportation authority on the implementation of construction funds; the approval of land and resources departments concerning land expropriation or the approval of controlled land; list and contract price situation of construction units and supervision units; prepared prequalification report, bidding documents and bid evaluation report; handling material of quality supervision procedures; materials of ensure project quality and safety measures; submit to State (City) transportation department to approval.

10.5 Road property rights

Collecting land acquisition and demolition generated land housing measurement, payment, contractual basis for the agreement, to the county land and resources management department to handle the highway land property right certificate.

11 Daily submission of project owners

- Project progress report: reflect all aspects of the project.
- Weekly report: know about the land expropriation and demolition of local government for government supervision.
- Engineering quality report: quality supervision bureau should know about the quality of project construction.
- Geological hazards and safety production reports of construction: know about the safety aspects of the geological and construction production.
- Highway construction market order report: know about whether the highway construction market has violated the basic construction procedures, appoint the construction team and construction material and other behaviors.
- Propaganda and reporting: carry forward highway culture, report on the construction of the project, encourage all participating units complete the objectives ensuring the quality.
- Temporary information: to submit the information of the project according to the temporary arrangement of the superior timely. The focus should be on the project quality safety self-inspection project promotion work report.

12 Construction fund management

Project construction funds to implement account management, earmarking. The project owner urges the construction unit to set up a project capital account at a designated bank and strictly enforce the accounting standards for business enterprises. No transfer, diversion or occupation of the construction funds shall occur, nor any occurrence of false invoices, payment of white batches, discrepancies in cost and expense, etc. , to pay all taxes and fees in time. Project owners do to urge the construction unit shall sign tripartite funding management agreement with the landlord bank, abide by all provisions of the terms of the contract about money use, consciously accept the owner and the bank supervision management of project construction funds and check, accept the auditing department audit of project fund, and strictly carry out the audit opinion. Construction project owner management fee refers to the construction project project preparation, construction, construction, completion work, acceptance, summary and other work costs. The costs include staff salaries, wage subsidies, allowances, office expenses, conference fees, travel expenses, vehicle costs, project bidding costs, resident construction costs, business entertainment and other expenses. In particular, the business entertainment expenses shall not exceed 10% of construction project owners management fees, financial management shall be set up by category, in accordance with the provisions of the financial system, strict control.

13 Implementation of construction projects

13.1 Project implementation adhere to the principle

When implemented, the design shall be carried out in accordance with the construction drawing design. Local design changes can be made, but the following points should

be made: first, make the design drawing perfect principle: re-check and joint trial the design drawing and the actual topography and landform when entering the construction site, perfect the drawings. Second, make good use of the old road principle: make full use of the old road as an emergency parking zone or a climbing lane or a village fair or landscape resting place. Third, local adjustment principle: For the past villages of the line, subject to house demolition, cultural relics protection, drainage and other effects, may be appropriate to adjust the line plane, vertical[5].

13.2 To supervise the key parts of the project

- Bridgefoundation, hole pile, beam plate, arch ring.
- High slopecut slope $\geqslant$ 20 m.
- High fillfill $\geqslant$ 5 m. It is mainly stratified compaction.
- Large-scale support engineering structure: large retaining wall $\geqslant$ 1200 m ^{2} or the height of the retaining wall $\geqslant$ 8.0 m. Base bearing capacity, strength of concrete and mortar.
- Roadbed inspection: plane position, longitudinal surface elevation, ratio of slope, groove depth.
- Pavement: the pavement thickness, compaction degree and asphalt dosage of each structure layer.

Implement The First Project Acceptance System, implementation of Four New Technologies application.

14 Project completion audit

Basis of audit: bidding documents and contracts, Related documents and systems, key auditing design changes and exceed the total contract part of the project. In daily work, do the original records, pictures, video data collection and finishing, provide truthful and valid data and information, accept social supervision and government audit, to achieve the reasonable compliance expenses of project funds.

15 Theme of project owner management

15.1 Contract management

Project owner management should be based on consultant signed the project consulting contract, bidding documents signed survey and design contracts, construction contracts, construction supervision contracts (including the central laboratory) as a basis.

15.2 Safety production management

Based on the State Safety Production Law, the Technical Specifications for Road Construction Safety, the Road Safety Guide and the Original Road Safety Maintenance and Management, Supervision and management of safety funds, construction safety, construction insurance, safety drills, safety and security, and prevention of potential safety hazards.

15.3 Safety production management

The establishment of four systems of quality management that is Government Supervision, Corporate Management, Social Supervision, Self-inspection. Strengthen the contractor's raw materials, mining materials, construction mix, construction techniques and processes, construction self-assessment and data recording supervision and check the quality of the project and accept the quality supervision and inspection of provincial highway bureau.

15.4 Construction schedule management

According to the characteristics of highway reconstruction, combined with the project of the requisition, funds in place, to determine the optimum construction plan, the reasonable allocation of personnel, engineering machinery and equipment, progress plan, do demolition and construction, to supervise and urge the construction progress.

15.5 Investment control

The bid of the construction unit is the bid of the quantity list price, that is, the design quantity, the price quoted price as the quotation, is the unit price management is not the general price contract. In the management of construction drawings based design, strict control of the number of projects and the imbalance of quotations, to ensure that do not break the approved construction drawings budget.

15.6 Design change control

Design changes are divided into major design changes, larger design changes and general design changes, one of the following situations is a larger design change:

- Continuous length of more than 2.0 km route plan adjustment.
- The type, width and thickness of pavement structure change.
- The number or structure of large and medium-sized bridge changes.
- The number of tunnels change or programs change.
- Other individual project costs change more than 500 million.
- Exceed construction design approval budget.

In accordance with the above requirements, owner management shall strictly control major or larger design changes, master the approval authority of project owners, and deal with general design changes. Design changes to have supporting information, the number of projects to seek truth from facts, the unit price in accordance with the list, similar to the list of negotiated prices, construction plans under the float unit price management, in line with the design change procedures, stand the audit.

15.7 Raise awareness of environmental protection

Strengthen the awareness of environmental protection, with the concept of green engineering throughout the entire construction, prohibit indiscriminate chaos, destroying the ecological balance of behavior, make full use of the old road, build Guizhou Smooth and Beautiful Highway.

15.8 Information and archive management

Familiar with construction drawing design, budget, quantity of design of the list of sources clear, classification establishment of engineering measurement, design change, safety production, project quality, land property rights, financial special, credit rating, clean government and meeting documents and other accounts. The focus is design change, land property accounting. The Implementation Rules for Acceptance and Acceptance of Highway Engineering (Handover), Regulations on File Filing and File Filing of Major National Construction Projects, Measures for Traffic Archives Management, Measures for Registration of Archives of Traffic Construction Projects, Traffic Construction Project File Special Acceptance as the basis for guidance, improve file management.

15.9 Clean government construction management

Take Guizhou Province's Ten Prohibitions and Five No Provisions in the field of management of transport system as well as the requirement of cleanliness at this stage as the guideline, not less than one meeting and daily education should be conducted every month to strengthen the management of clean government.

16 The work of the project owner

- Coordinate the land acquisition and demolition work of local governments. Pay more respect, negotiate more, communicate first, then do, master the technique of work.
- The service of the designer: Provide flat, vertical, to the acres, wire control points, pile-by-pile coordinates of the electronic version, and sent design representative resident, guide the design in the construction of a reasonable application.
- The problem of construction: Provide the support basis for the problem, submit the supervision review, initial opinion, and finally the owner to approve.
- Correctly handle the relationship between owner, construction and supervisor. Strictly speaking, the relationship of the contract (entrusted) is equal. In the project construction is to help each other, to communicate with each other, support each other, mutual understanding and common development, work together to complete the project.

17 Conclusion

This is our actual practice in the management of project owners. We have obtained some experience and achievements. Certainly, there are still some shortcomings. We will continue to improve our work and hope that comrades will study and give criticism and rectification. For ordinary the provincial trunk highways and other upgrade project owners management provide a scientific and useful guidance.

Conflict of Interest Declaration

No conflict of interest was reported by the author.

References

[1] Zhang X J, 2011, Low grade highway along the river line promotion transformation design. *Urban Roads Bridges & Flood Control*, vol (5): 35-40,238.
http://doi.org/10.16799/j.cnki.csdqyfh.2011.05.011

[2] Su Y Q, Dong Y and Zhang H J, 2012, Network promotion renovation project design speed of. *Traffic standardization*,vol (17): 20-23.
http://doi.org/10.16503/j.cnki.2095-9931.2012.17.015

[3] Rodrigues A and Bowers J, 1996, The role of system dynamics in project management. *International Journal of Project Management*, vol.14(4): 213-220.
http://doi.org/10.1016/0263-7863(95)00075-5

[4] Ismail D, Majid T A, Roosli R, et al. 2014, Project management success for post-disaster reconstruction projects: international NGOs perspectives. *Procedia Economics and Finance*, vol.18: 120-127.
http://doi.org/10.1016/S2212-5671(14)00921-6

[5] Battikha M G, 2003, Quality management practice in highway construction. *International Journal of Quality & Reliability Management*, 5.vol.20(5): 532-550.
http://doi.org/10.1108/02656710310476516

RESEARCH ARTICLE

Construction technology and application of landscape architecture engineering construction

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Abstract: With the rapid development of Chinas modern economy, the quality of people's life has gradually imprvoed. Therefore, China has put forward higher standard reguierments for the construction technology of landscape engineering architecture. In order to conform to the development needs of the times, the construction of landscape architecture must create a number of science and art projects. The application and quality of construction technology in the construction of landscape engineering construction are the basic conditions to ensure the early completion of the project. In order to strengthen the quality of landscape architecture construction, we must master the technical focus of landscape architecture construction and make rational use of it.
Keywords: landscape, construction, technical application

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1 Introduction

The pace of urbanization in China is keeps accelerating and people pay more and more attention to the environmental protection. Planning and design of landscape architecture is very important in the whole urban development process. As the landscape architecture project is a very complex project, and the comprehensive construction technology. In this regard, it is necessary to strengthen the technical level, optimize management strategies, improve the quality of landscape construction and promote the rapid development of urban landscape.

2 Current situation of landscape construction technology in landscape architecture

With the rapid development of modern economy in China, the pace of urbanization is accelerating, the landscape is an important guarantee to promote the development of urbanization and a precondition to reflect the spirit of a city. People pay more and more attention to the environmental protection. Planning and design of landscape architecture throughout the entire urban development is very important. Landscape through the arrangement of flowers and trees planted to form a regular and creative flora, close to people's work and life, landscape construction technology to play the role of the extreme. Landscape construction technology is an important guarantee for improving the living standards of urban life. Landscape can beautify the city's spiritual outlook, beautify the environment, make people pleasing, purify the air quality to a certain extent, it is the city's freshener. At present, landscape engineering in China has been gradually marketized and made big progress. However, there are still some problems in the construction of landscape architecture, for example, the problems between landscape design and the development of urban scale, construction management problems, etc.

3 Construction technology analysis of landscape architecture project

3.1 Topsoil backfill technology

In the process of construction of landscape architecture, it is necessary to pay attention to the changes of the soil at all times, so as to maintain the soil's own nutrients and helps to promote the growth of plants. If necessary, the soil quality problem should be improved, and the soil depth generally controlled between 80 to 100 cm. In the control process need to pay attention to the following issues[1]. First of all, the rainy day can not be carried out, in the dry state to use forklifts to dig soil. Secondly, to protect the granule structure, and the soil with quality problems in the lower layer is constructed to avoid the existence of aquifer. Finally, it is important to note that the depth of the topsoil and the slope of the drainage should not be too obvious, the height should be moderate, and the height of the road should be controlled between 3 and 5 cm along the soil.

3.2 Plant planting technology

Dug dig planting is done after the completion of the point line, the size of the acupuncture points should be uniform with the size of seedlings soil ball, the depth of 10 to 30 cm deeper than the depth of the soil ball, the size of 20 to 50 cm more than the soil ball[2]. The acupoints are generally round or U-shaped, and the stone in the points particles removed. Before planting, according to the type of plant pruning to remove the messy branches. In the planting process, the plant should be planted according to the type of plant, strengthen planting techniques, control the degree of moisture of the soil, and combined with the type of plant for different maintenance. Finally, it is necessary to combine the planting drawings to correct planting and maintain the beauty of plants. Planting of plants should be done by professional planting growers to ensure that landscape architecture can be completed on schedule.

3.3 Fixed-point pay-off technology

A high-quality landscape architecture, its fixed-point pay-off technology is very important. The early design plays a decisive role in the visual effects of the later period. The building class are used as the fixed points by the fixed objects to determine the precise coordinate and execute strictly in accordance with the drawings. Drawings reference points, square grids and the like can also be used to determine the fixed-sposition of the plants. If the location is not accurate, it is necessary to ask the designer personally go to the scene to supervise designated line work, identify problems and solve them in time. In addition, pay attention to the species, the specifications, the appearance and uniformity of the line plant can not be too rigid. Once the plant release lines and drawings design need to be changed, it must be approved by the superior leader to make changes, and it is strictly prohibited to make any changes to the construction drawings at will.

3.4 Maintenance technology

In general, planting easy to maintain difficult. In order to improve the survival rate of plants, it is necessary to strengthen the late conservation of plants. In the maintenance process, reasonable and scientific methods of conservation are very important. For example, watering and fertilizing on time, pruning and cleaning plants, these steps are the key factors affecting the quality of the project. When planting plants, watering first or fertilization, how to properly pruning branches and leaves, to what extent is reasonable, these need a professional and strong construction staff to complete. If the plants die because of the amount of water they should always pay attention to the soil condition of the plants and regularly trim the branches and leaves of the plants and pay attention to the problems of pests and diseases so as to ensure that the plants can be well protected after planting and improve the survival of the plants rate.

3.5 Skeleton structure construction technology

Skeleton structure in the construction process, to prevent the erosion of water. Once the skeleton structure of the waterproof work is not resolved, the landscape architecture will extend the construction period[3]. In order to be prepared, whether it is brick or steel or hybrid skeleton, should pay special attention to the construction process to avoid water erosion.

4 Technical difficulties in construction technology of landscape architecture

First of all, during the construction of landscape architecture, a high-quality engineering construction includes the professional level , quality accomplishment, executive ability and communication skills of staff. Details determine the success or failure. The technical and ideological consciousness not implemented, the design is not reasonable, management and technical team execution are weak, which are the key factors affecting the progress of construction of the project. In every detail, it makes the construction quality is not up to standard once not in accordance with the norms to implement. Secondly, the overall steps of plantation planting, digging, pruning, planting and conservation should have more rigorous standards at each step. Once deviations from the standard will affect the quality of the soil, the plant will appear various problems in the growth process ,bring huge losses to project.

5 Landscape architecture construction application

5.1 Promote the pace of garden construction

To make the landscape always maintain different ornamental values throughout the year, it is necessary to have scientific and rational allocation of garden plants. Each plant has its own characteristics in the growth process. Each plant has its own characteristics in its growth process. Different plants have different demands and habits on sunlight, water and soil. This requires diversity in the planting process to ensure the healthy growth of plants[4]. Only reasonable allocation of plants can improve the landscape effect. In this regard, the garden staff should have a professional technical functions, grasps the operation flow of new technologies and promote the pace of gardens construction.

5.2 Scientific management of plants

In the process of landscape architecture construction, the scientific management of plants can improve the visual effects of landscape. Garden construction to a certain extent, plants will have an impact on the growth and soil environment, so in the planting process, paying special attention to whether plants can adapt to the soil humidity, choose good

quality seedlings. In addition, choose the suitable plant specifications, lush roots, no pests and diseases, in line with the planning standards of the landscape, leafy and healthy[5]. In the application of high slope protection technology, the stability of the slope can be maintained by planting grass.

5.3 Pay attention to garden maintenance work

In order to improve the construction quality of landscape engineering, it is necessary to pay attention to the gardens conservation and ensure the professional management of garden. First, regularly organize garden staff to conduct relevant professional training, improve their technical functions and cultural knowledge, and lay a solid foundation for the conservation of landscape plants to the standard. Secondly, by means of public bidding, we choose the reputable and experienced conservation units to reduce the investment in conservation work and improve the quality of planting. Thirdly, the relevant garden management department should carry out reasonable supervision and management of every detail of the construction of the garden project, to a certain extent, guarantee the quality of the garden conservation work.

6 Conclusion

In summary, with the rapid development of China's modern economy and the accelerating pace of urbanization, China has put forward higher standards for the construction technology of landscape architecture. As landscape engineering is a very complex project, and the construction technology is more comprehensive, there are already some landscape architecture construction technology has been unable to meet the current construction standards, lack of innovation. In this case, it is necessary to raise the level of construction, strengthen management, innovate technologies and promote the rapid development of landscape architecture projects. In the construction process, in order to better show the landscape effect, it is necessary to fully consider the consistency and integrity of the landscape of the landscape, beautify the appearance of the city and purify the urban air.

Conflict of Interest Declaration

No conflict of interest was reported by the authors.

References

[1] JI Dandan, 2016, Brief introduction of landscape construction technology and its application. *Engineering Technology*, vol.(12):185-186.

[2] Tong Z L, 2015, Exploration of Construction Technology of Landscape Architecture. *Henan Building Materials*, vol.(6): 69-70.
http://doi.org/10.16053/j.cnki.hnjc.2015.06.036

[3] Xu J C, 2015, Discussion on construction technology and application of landscape architecture construction. *Engineering Technology*, vol.(11):303-304.

[4] IKempenaar A and van den Brink A, 2017, Regional designing: A strategic design approach in landscape architecture. *Design Studies*, vol.18: 120-127.
https://doi.org/10.1016/j.destud.2017.10.006

[5] Lenzholzer S, Duchhart I and Koh J, 2013, Research through designing in landscape architecture. *Landscape and Urban Planning*, vol.(113): 120-127.
https://doi.org/10.1016/j.landurbplan.2013.02.003

RESEARCH ARTICLE

The problem and the solution in municipal building construction management

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Abstract: In recent years, with the progress of the society and sustainable development of national economy, to some extent for the stable progress of urbanization construction, as well as the municipal construction engineering scale and quantification of construction and development have created favorable conditions. As an important part of the municipal architectural project, its level and quality of the construction management not only concern the smooth implementation of municipal projects, but also reflects the construction quality and construction level of infrastructure in the whole city. Based on this, this article mainly from the perspective of management discuss the present condition of the construction management of municipal construction projects in China at present stage, probes into a series of suggestions to improve one by one, through the summary of the experience, and the quality of municipal engineering in our country overall construction management.

Keywords: municipal projects, construction management, current status, improvement

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1 Necessity of construction management in municipal construction projects

Different from ordinary construction projects, due to the particularity of its construction characteristics, municipal construction projects should be based on engineering properties, meet the features of publicity, service and others in municipal projects, and contribute to promote economic and social development. As the market construction industry closely related to urban development level, it represents the whole urban modern civilization construction achievements and construction quality, to some extent, it is also a "microcosm" of improvement of people's living standard. But municipal construction project is a comprehensive and systemic strong engineering type, involves a wide range, complex building types and great technical difficulties, therefore, it is necessary to strengthen the control and research on construction management of municipal construction projects. The quality of construction management to a large extent determines the quality of a municipal construction project is good or bad, as a result, municipal engineering construction management to establish a complete set of safety management mechanism from the several aspects, to improve the professionalism and efficiency in the municipal engineering construction, so as to improve the construction unit construction quality and construction schedule. In addition, in the construction process of municipal construction projects, the influence of natural conditions and objective factors is great, and the overall implementation of construction management can effectively avoid interference from external factors, for example, climate factors, etc. Therefore, in order to guarantee normal and orderly construction, relevant construction management work should be comprehensively deepened to make municipal construction projects reach stipulated quality.

2 Problems existed in municipal construction management

2.1 Poor construction site management

Usually, municipal engineering construction projects are mostly large-scale projects, and the site construction covers a large area, covering various fields in construction, which often leads to disputes and management loopholes[1]. First of all, in the aspect of site construction, due to poor implementation of engineering construction supervision the management work is not practical, management often superficial form, letting the site operating personnel not make implementation strictly according to relevant operation standards, which virtually increases the impacts of various safety risk factors on construction personnel in the process of construc-

tion, leading to occurrence of all kinds of safety accidents. Secondly, in terms of electricity of construction, comprehensive electricity standard is lacked at the construction site, persons near the construction site or provisional electricians are employed to supervise electricity safety at the site, due to limitation of professional qualities of the electricity personnel, electricity accidents frequently occur to disturb sequence of engineering construction. In addition, in the aspect of materials procurement, systematically perfect management method makes procurement personnel lack strict and cautious procurement plan, surplus procurement phenomenon often occurs leading to the long time stacking and a serious waste of materials.

2.2 The construction personnel lack comprehensive professional qualities

Generally speaking, the professional qualities of the construction personnel determine the overall quality and construction progress of the whole municipal project[2]. The key to the success of municipal engineering construction lies in the qualities of personnel. But from the current situation of municipal engineering staffing at the present stage in China, due to increase of project quantities, the construction unit eases the personnel employment standard, permits many non-professional personnel enter the construction site, and most of the construction personnel are from the remote and backward rural areas, who has not received a system of exercise and training, although they make personal contribution to the engineering construction, they lack the sense of construction safety and construction quality, do not make operation strictly according to relevant construction standard, which brings great hidden safety troubles, increases occurrence rate of safety risks. Meanwhile, due to the feature of slack personnel organization, there is big staff mobility, which is adverse to accumulation of experience, construction only relying on personal construction habit is easy to cause quality issues of municipal projects occurred during the process of actual construction, and safety and stability of the construction site are hard to get effective guarantee.

2.3 Poor sense of quality in construction unit

In China, municipal project belongs to one part of national infrastructure construction, in the process of construction, the governmental institutions play the dominant role, capital investment for the projects is mainly borne by the governments, which provide powerful capital support, during the process of facing investigation by the superior departments, perfunctory negative attitude is often adopted, the project construction period is over pursued, and then the project quality issues are put aside. At the same time, most construction unit are restricted by construction technique level, lack analysis on structure safety of the projects, for instance, drainage project, road project, etc., which result that there are constant new issues and new conflicts occurred during the process of using in the later phase, it is not only adverse to effectiveness and stability of urban operation, but also generates serious resources and cost waste.

3 Solutions for issues existed in municipal construction management

3.1 Enhance sense of construction safety management of municipal projects

For a long time, “safe construction” is one of the everlasting important topics of municipal projects, safe and stable construction environment does not only need construction techniques as support, but also needs to enhance the sense of personal safety and sense of the quality of construction personnel[3]. First of all, as the main practitioners and policy makers in the process of construction, the construction unit should adopt the mode of personnel training on a regular basis to intensify basic construction techniques and theoretical knowledge so as to ensure that the construction personnel master the latest construction techniques and construction process. At the same time, in the process of personnel training, in view of the different natures of work positions, training contents and training efforts are also different, locating and making up the deficiencies should be paid much attention to, construction techniques and knowledge level of the construction personnel should be comprehensively improved to enhance relevant emergency handling capacity of the construction personnel, they should grasp the safety hidden danger repeatedly occurred in the key part combining the actual construction site, and relevant personnel should be supervised to adopt relevant solutions. In addition, the relevant department can organize to hold technique training work, or organize relevant techniques discussion activities to promote personnel to enhance communication with others, exchange construction experience in the activities to make up their deficiencies, truly improve their personal professional quality and lay a solid basis for the production quality of municipal projects.

3.2 Strengthen management, adopt responsibility system and reward system

As many people are very passive in the management, which will greatly impact development of management work. Adoption of responsibility system means specific division of functions and responsibilities to every person, which can confirm the reward and punishment based on work engagement of every person. This type of competitive management means can greatly boost enthusiasm of management staff and development of management work[4].

3.3 Intensify supervision function of municipal project supervision units

In order to further improve municipal construction engineering construction quality, besides strengthening management,

enhancing sense of management, supervision intensity and supervision scope of supervision units should also be expanded to further enhance supervision management work, gradually establish and perfect safe production rules and regulations based on safe production, and lay solid basis for effective safety supervision work of municipal construction projects[4]. Meanwhile, as important part of supervision work, the supervision personnel should constantly improve their professional quality, specify their position duties, fully use the rights granted by the supervision work, and guarantee no occurrence of quality issues in every step of the construction process of municipal architectural project with meticulous work attitude. In addition, in the construction process of municipal architectural projects, the supervision department should take progress situation and quality of the projects into consideration, fully apply relevant laws and regulations, conduct powerful adjustment and control of the project progress, cost, quality and contract management. Every relevant unit should enhance daily communication, conduct trans-positional consideration, highlight problem orientations, and positively coordinate solving of issues in the engineering projects and promotion of the projects. At last, in order to normalize operation action of project supervision, strengthen construction of supervision team, training activities of supervision business should be organized in the municipal construction projects, it is not only beneficial to improve personal business quality of the supervision personnel, but also promote overall improvement of supervision service level.

4 Conclusions

As starting point and foothold of all the work of municipal construction projects, construction management stil-l has many deficiencies in the aspect of management level at present, and needs constantly improvement. Furthermore, due to influence of its own construction features of municipal construction projects, the management work is hard to conduct in the process of actual construction. Regarding to this situation, relevant management department needs to further enhance construction safety management sense of municipal projects, enhance construction safety management sense of municipal construction projects, and complete and perfect emergency management system to improve construction management level and management quality of municipal construction projects.

Conflict of Interest Declaration

No conflict of interest was reported by the authors.

References

[1] Yu Y X and Ding D Y, 2010, Issues existed in municipal project construction management and countermeasures. *China High-Tech Enterprises*, vol.18(02):169-170. http://doi.org/10.13535/j.cnki.11-4406/n.2010.18.082

[2] Wu B and Chen H Y, 2013, Brief discussion on issues existed in municipal project construction quality management and countermeasures. *China New Technologies and Product-s*, vol.13(08):88. http://doi.org/10.13612/j.cnki.cntp.2013.08.163

[3] Sui Y L, Lui M and Liu C X. 2015, Analysis on issues about architectural project construction management and countermeasures. *Management & Technology of SME*, vol.4:28.

[4] Chen W, 2016, The key points of municipal engineering construction management and the improvement of management system. *Low Carbon World*, vol.31:187-188. http://doi.org/10.16844/j.cnki.cn10-1007/tk.2016.31.116

[5] Huang Y Y, 2017, Current situation of municipal engineering construction management and improvement measures. *Jiangxi Building Materials*, vol.5:246-247.

RESEARCH ARTICLE

The relationship between urban planning and architectural design

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Abstract: With the continuous expansion of the urban area in China, people pay more and more attention to the relationship between urban planning and construction design. Architectural design is aimed at indoor and outdoor space, its principle is to ensure the safety of the space and aesthetics, while urban planning for urban space design and layout. It can be said that architectural design is the micro-design of urban planning, and urban planning is a wide range of planning and design. This article outlines the relationship between urban planning and architectural design and puts forward some measures to reasonably adjust the relationship between of them.
Keywords: urban planning, architectural design, relationship

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1 Introduction

Urban planning and architectural design are closely related. And in real life, the concept of organic integration of architectural design in urban planning can promote the healthy and steady development of urban construction. In addition, if the concept of urban planning is incorporated into the architectural design, the cultural thinking and cultural heritage in urban planning can be fully demonstrated, the characteristics of urban development can be reflected, promoting the rapid urban development.

2 The relationship between urban planning and architectural design

2.1 The difference between urban planning and architectural design

In general, there are many differences between the two, mainly in the following aspects[1]. First of all, from the design goal point of view, urban planning does not have a clear goal and its controllability is relatively strong, but architectural design has a clear goal and it is not only to meet the requirements of urban development, but also gives full play to its own function as a building. Therefore, architectural design requires rich architectural knowledge. Secondly, from the design process perspective, urban planning has a strategic goal. The main objective of urban planning is to optimize urban construction and promote sustainable development in cities based on the actual conditions in cities. Architectural design should be sufficient consider its own factors when designing, we must continue to improve their own factors in order to achieve design. Finally, from the design task perspective, urban planning is achieved through constant planning and design over a long period of time. Architectural design is mainly presented to people in the form of design task book.

2.2 The link between urban planning and architectural design

2.2.1 Architectural design is an important part of urban planning

The purpose of urban planning is to reasonably adjust and allocate resources such as infrastructure and environmental functions in cities, which will directly affect the city's landscape, industrial distribution and economic investment. Scientific and reasonable urban planning can promote the rapid urban development[2]. Architectural design is a process to improve the construction technology, style, quality, etc. Building design should ensure that the use of construction projects, functions, etc. to meet the needs of social development, to ensure that the design style is consistent with the surrounding environment, at the same time, and to highlight their own design style. From the above, we can see that although the urban planning and architectural design in the design of the surface is independent, but the architectural design is an important part of urban planning, architectural design for urban planning services, the architectural design process should consider the style of urban planning.

2.2.2 Relationship between architectural design and urban planning in designing content

With economic development, people pay more and more attention to environmental issues, and people-oriented design concept is the pursuit of urban planning and architectural design. Therefore, the two have some similarities in design content, which are mainly reflected in the following aspects[3]. First, design content. Both should be considered the details of design space, structure, etc., in the selection of architectural design content should be based on urban planning, in strict accordance with the relevant provisions of urban planning for architectural design work. Second, the design direction of development. With the development of economy, urban planning has been developed in a three-dimensional and systematic direction and architectural design has also been oriented toward environmental protection and landmarks. Urban planning has been paying more attention to the advantages of architectural design in terms of its design content and urban planning has also begun to emphasize urban planning in terms of design content, The relationship between the two in urban development has become more and more close. Finally, the design function has been emphasized. Architectural design should be based on urban planning, architectural design can promote the healthy and stable development of urban planning and enrich the content of urban planning. Therefore, the both should carefully consider each others design content when designing, so that the premise of harmonious development of urban planning and architectural design is to highlight their respective characteristics.

3 Measures to properly adjust of the relationship between the two

3.1 Architectural design should consider the requirements of urban planning

With the development of economic, the process of urbanization in China is accelerating constantly and the population in the cities is constantly increasing. Although a lot of labor force is added to the cities and the development of the urban economy is promoted, it also brings pressure on the urban planning work. In the process of urban planning, these laborers need to be provided with the same social resources and living environment as urban residents, so this requires a reasonable adjustment of various resources in the cities. While increasing the pressure on urban planning it has promoted the development of the cities. The architectural design should be coordinated with the urban planning, the design content should be consistent too. Individual architectural design embodies the overall effect of urban planning, which has a huge effect on urban planning. Urban planning can provide the basis for construction, which has a close contact with urban planning. Urban planning can provide some reference for architectural design. During the process of architectural design, the design work should be carried out according to the urban planning plan. It is necessary to study the environment around the building and urban planning environment in detail, from protecting the ecological environment, developing the urban economy and promoting the cultural development and other aspects, to plan the most suitable architectural design.

3.2 Improve the scientific nature of urban planning

The main content of urban planning is to study urban development and layout, and to set a direction for the development of urban, which is of great significance to urban management[4]. Urban development is closely related to urban planning. If the urban planning is more scientific, it can promote the healthy and stable development of the city. On the contrary, if urban planning is unreasonable, it will adversely affect the urban development. In order to ensure that urban planning is reasonable, the planning work should be based on the three principles of socialization, security and economy during urban planning. In the process of urban planning, the local economic level should be taken into account, to maximize the interests of all parties. In the process of urban planning, the local characteristics should be taken into account, in accordance with the above-mentioned three principles for urban planning, so as to promote the healthy development of the city.

3.3 Strengthen the architectural design

The main content of the urban planning is to scientific integration of urban land resources and space to promote the healthy and stable development of the city, and reasonable set of various construction projects. The focus of urban planning is to maintain social balance, and pay attention to the coordination and harmony of the city. Most city constructions are made up of many projects that are not related to each other. For example, in general, architectural design can be done in a very simple condition, requiring only one principal, one client, one a copy of the design and construction funds. From the performance point of view, architectural design is to show the requirements of the owners, ignoring the relationship between the respective emphasis and pay attention to the individual of architectural design.

3.4 Urban planning and architectural design should be coordinated

Although there is a certain difference between urban planning and architectural design, the mutual unification of the two will lay the foundation for urban development and promote the healthy and rapid development of cities[5]. The process of architectural design work should be strictly follow the relevant requirements of urban planning, fully understanding the release of urban planning and related policies, at the same time, ensuring that the design concept and objectives of architectural design and urban planning are

consistent. For example, a city in the urban planning work, decided to build commercial areas around the train station, on the basis of these design of the buildings to highlight the stylish, casual design style of buildings, to ensure that this design and urban planning coordination. Under normal circumstances, the planning process should refer to the original buildings in the region, according to the various regions of the city planning and design, thus contributing to the healthy development of the city. Therefore, architectural design should be based on the contents of urban planning, not only to ensure the harmony between the architectural design and the urban landscape, but also ensure that characteristics be highlight.

4 Conclusions

To sum up, there is not only a difference between urban planning and architectural design, but also a certain connection, interaction and influences to promote the healthy and rapid development of the city. Urban planning will directly affect the economic development of the city, and architectural design has a direct impact on people's lives. Only scientifically dealing with the relationship between the two, can rationally adjust the urban resources, lay the foundation for the development of the city, improve the quality of people's life, and achieve the goal of sustainable urban development.

Conflict of Interest Declaration

No conflict of interest was reported by the authors.

References

[1] Cheng X H and Hou J, 2015, Discussion on relationship between urban planning design and architectural design. *Abstract version: Natural Science*, vol.(10):vol.(6): 95.

[2] Wu P P, 2015, Relations among urban planning, urban design and architectural design. *Quotation version: Engineering Technology*, vol.(10): 296-297.

[3] Pan Dong, Yu L and Li J K, 2015, Discussion on urban planning and architectural design issues. *Abstract version: Engineering Technology*, vol.(5): 10.

[4] Gebbeken N and Döge T, 2010, Explosion protectionarchitectural design, urban planning and landscape planning. *International Journal of Protective Structures*, vol.1(1): 1-21. http://doi.org/10.1260/2041-4196.1.1.1

[5] Gunder M, 2011, Commentary: Is urban design still urban planning? An exploration and response. *Journal of Planning Education and Research*, vol.31(2): 184-195. http://doi.org/10.1177/0739456X10393358

RESEARCH ARTICLE

Technical analysis on deep foundation pit supporting in architectural engineering construction

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Abstract: In recent years, the construction industry shows a rapid development in China. The amount of high-rise buildings continually increases, and in the meanwhile, the technical requirements of construction gradually increase, especially in deep foundation pit support construction technology. At present, there exist a large number of high-rise buildings in China. The working face of foundation engineering is becoming smaller and smaller, while the foundation pit is getting deeper and deeper. In order to ensure the quality of construction projects, the deep foundation pit support construction technology should be continuously improved. This paper analyzes the current status of deep foundation pit support construction, and the past studies and researches about the supporting technology of deep foundation pit. The conclusion of this paper is expected to provide some help for the construction enterprises.
Keywords: architectural engineering, construction, deep foundation pit, support techniques

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1 Introduction

With the economic development of China, the process of urbanization is accelerating and the number of high-rise buildings is increasing. Underground engineering and underground space of buildings are also exploited. At this moment, the supporting technology of deep foundation pit is getting wider and wider. Deep foundation pit support construction should be strictly in accordance with the relevant provisions and the actual project, to improve the quality of deep foundation pit support construction, and promote the healthy and stable development of construction enterprises.

2 Technical meaning of deep foundation pit supporting

The construction technology of deep foundation pit mainly includes the excavation technology and support technology of deep foundation pit. The support technology refers to the protection measures for large-scale construction projects or for the safety of underground projects. The depth of more than 5 meters of basement project[1]. According to different support methods, the deep foundation pit support technology can be divided into column perfusion pile, underground continuous wall, soil nailing wall and other support methods. Different support technologies are adopted under different conditions and environments. Deep foundation pit not only to scientifically handle the foundation, but also to improve the basic carrying capacity, increase the stability of the foundation, to extend the service life of the building. Therefore, in the process of deep foundation pit construction, the construction process of each stage of environmental protection and supporting devices shall be fully considered, which will affect the construction quality and construction cost of the construction project. If there is a problem in the construction process, the construction of deep foundation pit surrounding buildings and ecological environment have adverse effects, construction enterprises should be based on the actual situation of the construction project, select the appropriate deep foundation pit support technology, strengthen construction technology management, improve construction quality.

3 Current status of deep foundation pit support construction

With economic development, urbanization progress is speeding, the requirement of living environment of people is also increasing, which leads to a decrease in land resources. of China and quantities of high-rise buildings gradually increase[2]. The basis is the vital part of the whole architectural construction, which directly influence construction quality of the architectural project. Therefore, building enterprises should emphasize on deep foundation pit support techniques and improve the quality to guarantee basic construction quality. Construction techniques required to be used in every construction step and should be studied in details. Protective measures are required to make sure smooth completion of construction.

Foundation pit support does not only make sure normal

work of construction personnel, but also guarantee life safety of construction personnel. In recent years, many safety accidents occurred in China due to deep foundation pit issues, which lead to economic losses and casualties. There are still unstable earthwork issues of foundation pit high wall in the process of deep foundation pit excavation after excavation. The main reasons are that drainage facilities not in place and high wall support cannot meet construction requirements, etc.

4 Deep foundation pit support construction techniques

4.1 Preparation before construction

Preparation should be made before construction, responsibilities should be fulfilled by every department, every construction group should according to actual situation of architectural project, every department should enhance cooperation to improve construction speed[3]. For example: construction personnel and technical personnel in charge of specifying work contents, have certain rights, and face to emergent problems during the process of construction. In addition, every department should enhance communication, realize sharing of construction information, learn about construction situation in real time, adjust work contents in time based on current status of construction, and guarantee smooth construction. Besides, every enterprise should also be organized to study construction drawings, master key points of construction, and learn about every step of construction. In order to make sure reasonable design of drawings, chief engineer should check the construction drawings, technical personnel should also inspect paving status of ground wires and pipelines of the construction site, and make research report. Based on the research report, effective measures should be adopted to protect pipelines to avoid damage of pipelines during construction.

4.2 Earthwork excavation

Construction enterprises should strictly conduct earthwork excavation according to construction plan to make sure scientific process of construction. In order to guarantee smooth earthwork excavation construction, preparatory work should be made before construct, mainly including install at the drainage facilities, electrical equipment and others. During the process of excavation, it should be ensured that the construction is stable, manual excavation and mechanical excavation should be reasonably combined to effectively improve speed of earthwork excavation construction. The dug earth should be transported to other places in time, and it should be guaranteed the certain distance between the foundation pit and transportation vehicles, lest the transportation vehicles impact stability of the foundation pit[4]. For earthwork, the foundation pit needs to be backfilled, it should be placed around the foundation pit after excavation, and there should be also certain distance between the foundation pit and the earthwork. In addition, after completion of deep foundation pit excavation, the construction site should be cleared up, meanwhile, drainage ditch and water collection well should also be build on both sides of the foundation trench to avoid the foundation pit ponding.

4.3 Foundation treatment

There are some special situations during the construction process of deep foundation pit project, for instance: there are some rocks, old walls and other substances in the foundation, and those should be cleared away during the process of deep foundation pit excavation construction, to avoid impact on stability of the foundation. Regarding to this condition, the geological and topographical features should be analyzed in detail, and targeted treatment measures should be adopted based on relevant materials before construct of deep foundation pit excavation. After clearing these barriers, some sand mixture should be backfilled, if the basic part is in the place of hard pan layer. Building blocks can be made on the soft layer, and rebars should be pre-embded on the basis. If construct begins without foundation treatment, it will make subsidence of superstructures, in very severe cases, collapse may occur. Therefore, construction enterprises should emphasize on foundation treatment work.

4.4 Deep foundation pit support

4.4.1 Steel sheet piles support

This support technique is simple and the construction cost is low, it is widely used to deep foundation pit support construction[5]. This kind of support technique is continuous, therefore, during the process of construct, it should be ensured that every construction step be closely combined. In addition, during foundation pit support construction, piling can be operated after confirm of positioning, it should be guaranteed that positioning of the pile of defence is scientific to improve construction quality.

4.4.2 Arrayed cast-in-place piles support

Structure of the support technique is mainly reinforced concrete piles and hole digging of reinforced concrete. Apply for the technique to support construction can not only ensure construction efficiency, but also effectively reduce construction costs. However, the gap among every support pile is large, hence coupling beams should be used to connect with these support piles, meanwhile, reinforce treatment.

4.4.3 Deep mixing soil-cement

Generally, the cement and aggregates are mixed, then firming agent is used to form the support structure. Construction techniques should be constantly improved to guarantee smooth support construction.

4.5 Dewatering and drainage construction

In the process of deep foundation pit excavation construction, if the lowest location of the foundation pit is below the underground waterline, the waterproof layer is broken leading the underground water enter into the foundation pit, dewatering and drainage construction of deep foundation pit should be conducted. Before deep foundation pit excavates, targeted technical measures should be adopted according to geological conditions to lower underground waterline, ensure that the underground water will not impact and the stabilization of the foundation. Currently, there are many dewatering and drainage methods used in deep foundation pit, for instance, construction of drainage pitch. In order to improve speed of dewatering and drainage construction, water distribution equipment can be installed if conditions permit. For some foundation pits with entering of small quantity of water, manual drainage can be used.

5 Conclusions

To sum up, with development of architectural industry in China, application of deep foundation pit support techniques is wider and wider, and it will directly impacts length of service and safety of the architectural projects. Therefore, building enterprises and construction enterprises should pay much attention to deep foundation pit support techniques, and conduct construction strictly according to practical situation and relevant stipulations of architectural projects, enhance construction management, constantly improve deep foundation pit support construction techniques, and facilitate healthy and stable development of architectural enterprises in China.

Conflict of Interest Declaration

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References

[1] Tan Y H, 2015, Analysis on technical key points of deep foundation pit support construction of architectural project. *Sichuan Cement*, vol.(10):274.

[2] Liu Hui, 2015, Technical analysis on deep foundation pit support construction of architectural project. *Industry* , vol.(43):15-16.

[3] Wang Y Nan, 2016, Technical analysis on deep foundation pit support construction of architectural project. *Engineering Technology*, vol.(7).

[4] Zhou N Q, Pieter A V, Vermeer, et al. 2010, Numerical simulation of deep foundation pit dewatering and optimization of controlling land subsidence. *Engineering Geology*, vol.114(3-4):251-260. http://doi.org/10.1016/j.enggeo.2010.05.002

[5] Luo Z J, Zhang Y Y and Wu Y X, 2008, Finite element numerical simulation of Three-Dimensional Seepage control for deep foundation pit dewatering. *Journal of Hydrodynamics*, vol.20(4):596-602. http://doi.org/10.1016/S1001-6058(08)60100-6