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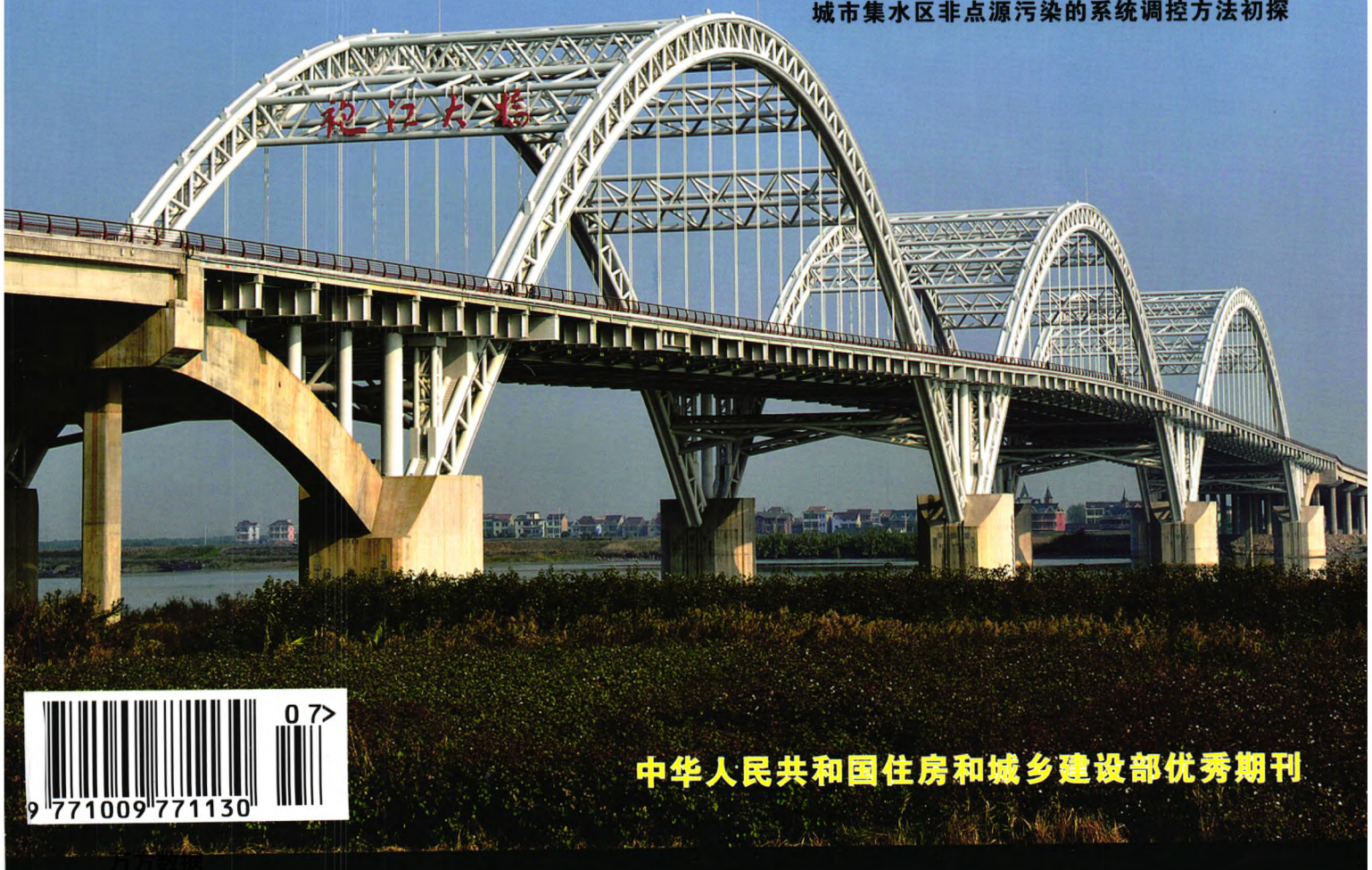
因为我们专心，所以我们专业！
——《城市道桥与防洪》

● 本期看点



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中华人民共和国住房和城乡建设部优秀期刊

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总 编 辑：骆燕妮
责任编辑：叶 露
编 辑：周盛伟 杨建华
英文校审：孙宁萍 常 红
摄 影：何业兴
地址：上海市中山北二路901号 邮编：200092
电话：(021)51298850 传真：(021)51298850
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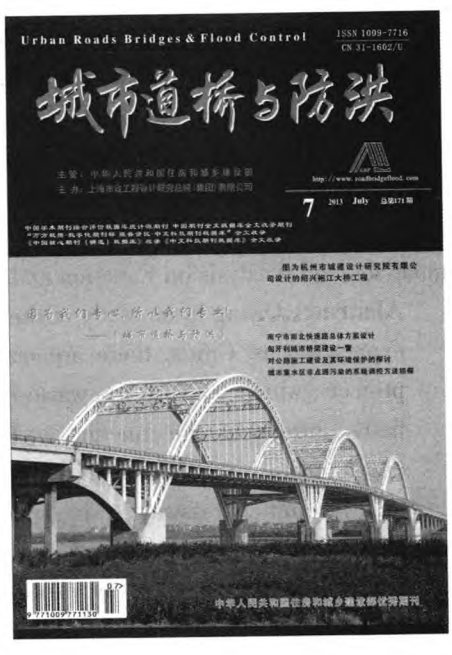

Urban Roads, Bridges & Flood Control

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CONTENTS

ROADS & COMMUNICATION

Abstract: The article introduces the design on the master scheme of the South-North Expressway in Nanning. The master scheme makes clear the functional position and the service object of the South-North Expressway in the planned road network of Nanning city. The article demonstrates the main technical standard and construction scale, puts forward the master layout scheme of the whole line, and focuses discussion on the paving form of expressway, setting up of interchange node and ramp, and spanning node scheme of Yongjiang River, which can be referred for the similar projects.

Keywords: South-North Expressway in Nanning, master design, expressway form, design of grade separation, setting up of ramp

Abstract: The article briefly introduces the master design of Tianjin Binhai New Area Qingfang Avenue Project, and sums up the key technical issues of this project in detail. The relative experience can be referred for the similar projects.

Keywords: widening reconstruction project, master design, treatment of key technical issues, different settlement of new and old roadbeds, foam light soil, Tianjin Binhai New Area

Abstract: As the representative of BRT, the new mass transit system has a great role in solving the urban traffic problem, and is especially suitable for the national conditions of China. It is necessary and timely to construct the middle and mass, rapid and new transit system in Liuzhou under the condition of not yet being reached on time of metro system because of high construction cost. Aiming at the BRT system in Liuzhou under construction, the article discusses the construction BRT system in the medium sized cities according to the practical situation of Liuzhou, which can be referred for the similar cities.

Keywords: bus rapid transit, BRT, intelligent traffic, Liuzhou

Abstract: Owing to no study of the key technical standard for the function conversion of express highway to expressway in China, there are many difficulties in some express highway reconstruction into expressway projects, which leads to the waste of engineering resources. Aiming at dealing with the situation, the article firstly introduces the function evolution of express highway to expressway in the process of urban space development, and then analyzes and compares the differences of functions and standards of the express highway and expressway in six aspects of land use, traffic capacity, service level, cross section type, horizontal and longitudinal linear designs, and grade separation.

Keywords: express highway, expressway, urban space, function and standard, comparison

Abstract: The article introduces the significance of energy conservation analysis in the engineering feasibility

cessed mainly by the labor power for a long time. This mode has the disadvantages of scattering, confusion, large error and high manpower demand, and seriously restricts the industrializing development speed of project construction in China. According to the practical conditions of bridge culvert structure reinforced bar processing manufactory and mechanization of Zhaohua Expressway Contract I, the article introduces the application of expressway bridge culvert structure reinforced bar processing manufactory and mechanization. The contents can be referred for the similar projects.
Keywords: expressway, bridge culvert structure, reinforced bar, manufactory, mechanization, popularization and application

BRIDGES & STRUCTURES

Abstract: The article systematically introduces the investigation, enlightenment and proposal of urban bridge construction in Budapest, Sz é kesfeh é rv á r and etc. of Hungary, which can be refereed for the similar project in order to promote the health development of urban bridge construction in China.
Keywords: investigation, Hungary, urban bridge, bridge construction, enlightenment

Abstract: Dazhenggang Bridge in Shanghai-Hangzhou Expressway overpasses the new and old Shanghai-Kunming Railway, Hangzhou-Shanghai Line (Shanghai Section) Class III Channel and underpasses S32 Expressway from south to north. The article sets forth the technologies of this project jacking the long-coupling large-roadway bridge, hoisting and heightening the old bridge, widening the old bridge, and long-span continuous steel-concrete composite box beam bridge. In which, the longest jacking coupling of the old bridge is 188 m, the maximum jacking height is 4.461 m, the maximum height of old bridge heightening is about 7.4 m, the maximum height of the reconstructed upright column is 18.4 m, and the widening at the outer side of the old bridge is 2.5 ~ 6.5 m. It is hard to connect the new structure with the old structure. The 2 × 75m equal-height single-cell long-cantilever continuous steel-concrete composite box beam is used to overpass Dazhenggang Channel. The old expressway bridge is beneficially attempted in this project, which can be referred for the similar projects.
Keywords: Shanghai - Hangzhou Expressway, reconstruction of old bridge, master design, composite box beam, bridge jacking, bridge widening, bridge design

Abstract: The article introduces the design of Shenan Yellow River Bridge in Lanzhou. This bridge is an interchange project. Its main bridge is a through butterfly steel box arch composite beam bridge. It is firstly used in single-span arch bridge. This structure is the innovation in bridge design, and its experience can be referred for the designers of the bridges.
Keywords: Lanzhou, Shenan Yellow River Bridge, design, through, butterfly, steel box arch, composite beam, V-shaped pier

Abstract: The structural system of long-span half-through arch bridge comes down to five structural systems of the thrust single-arch system, the self balancing multi-arch system, the self-balancing rigid frame multi-arch system, the rigid frame and through arch composite system and the beam support system. The article analyzes the laws of stress and force transmission of these five structural systems, and sums up the master installing parameters and structure shapes of every system.
Keywords: long span, half-through arch bridge, structural system

Abstract: The mechanics characteristic of self-anchored suspension bridge is quite different from the traditional earth anchored suspension bridge. The article analyzes the stability calculation principle, and by the case of Xining City Haihu New Area Wenhui Road Bridge Crossing Huangshui River, introduces the stability calculation of the main pylon in the master model of the whole bridge, and considers the influence of the other members of the whole bridge on the rigidity of the main pylon. Separately aiming at the different boundary conditions, the stability critical force of the main pylon is calculated. The result shows that the longitudinal restraint of the main girder greatly influences the stability calculation of the main pylon of the self-anchored suspension bridge. When the longitudinal restraint is set up between the pylon and the girder, the stability critical force of the main pylon is improved more than the longitudinal sliding system. The rotation restraint between the pylon and the girder influences the stability of the main pylon a little.

Keywords: self-anchored suspension bridge, main pylon, stability calculation, bridge design

Abstract: The main beam of concrete self-anchored suspension bridge is commonly the pre-stressed concrete structure. Under the combined action of the strong cable force, pre-stressing and supporting counter force, the stress status of the main cable anchorage zone is very complicated. Aiming at the stress status of the main cable anchorage zone to be studied, it is significant to optimize the detail structure of anchorage zone and the layout of pre-stressed steel beam. Taking Zhangjiagang Zhenshan Bridge as an example, the article analyzes the space stress of the main cable anchorage zone by the finite element method, and sums up the stress characteristics of the main cable anchorage zone of this bridge.

Keywords: self-anchored suspension bridge, anchorage zone, partial stress, analysis and calculation

Abstract: Taking the (65+100+65) m steel - concrete composite continuous beam bridge spanning the Naning - Kunming Railway in Kunming South Connection Line Expressway Project as the background, the response spectrum and the dynamic time-history analysis method are used to carry out the earthquake response analysis of the bridge. Aiming at the non-linear character of lead rubber support, the structural response analysis is carried out separately by the response spectrum under the E1 earthquake action and the time-history analysis method under the E2 earthquake action. The calculation of the M-Phi curves of each pier stud section can decide the operative mode of each pier stud all being within the elastic operative range under the E2 earthquake action and can achieve the objective to set up the performance of seismic isolation device. The large bridge structural analysis software MIDAS is used for the finite element analysis.

Keywords: steel-concrete composite continuous beam, seismic analysis of substructure, seismic design of seismic isolation device, lead rubber support, seismic ductility, capacity protection

Abstract: The lead rubber support is used able to obviously prolong the natural vibration period of structure and decrease the earthquake force if the bridge pier is lower and the rigidity of bridge substructure is larger, which can guarantee the pier stud at the elastic state under the action of strong earthquake. The laminated rubber support can also satisfy the earthquake resistance requirements if the bridge pier is higher and the rigidity of bridge substructure is not larger. The reasonable selection of the lead rubber support or the laminated rubber support can be based on the practical engineering demands in the design work according to the earthquake prevention requirement of bridge.

Keywords: lead rubber support, laminated rubber support, earthquake resistance

Abstract: Zicai Bridge is a super-long bridge crossing Qinjiang River in the central area of Qingzhou. The main structure of Zicai Bridge is a pre-stressed concrete self-anchored suspension bridge with three spans of 65 m+158 m+65 m. The total width of its main beam is 35.5 m. The article firstly introduces the structural characteristics of this bridge. The key design parameters of its rise span ratio, main beam type, main pylon modeling, cable crane and anchorage system are compared and studied by the preliminary calculation and also referring the cases of the similar bridges at home and abroad in order to select the reasonable result for the realization of the design intents.
Keywords: self- anchored suspension bridge, prestressed concrete beam, design parameters

Abstract: The article briefly introduces the bridge type and the section characteristics of 2-span 33-m steel-concrete composite girder bridge. Aiming at no calculation software specially used for analyzing the steel-concrete composite curved girder bridge now, the article calculates and analyzes its structure according to the straight girder bridge by the software - the bridge Dr. Program version 3.1.0, and checks the spatial analysis by the 3D-BSA2006 curved slope skew bridge spatial analysis procedure, and contrasts the reaction forces of the inner and outer bearings.
Keywords: steel-concrete composite curved girder bridge, design, calculation

Abstract: This article introduces a cable-stayed footbridge with a main span of 72.3 m. It adoptsI-shapedcomposite beam.According to the structural design, the static calculation and stability analysis of this bridge, the rationality and security of this design scheme are validated. Also according to the study on the comfort of pedestrians, the article analyzes the dynamic characteristics of this bridge. The results can be referred for the design of the similar bridges.
Keywords: footbridge, structural design, vibration analysis

Abstract: The article introduces the section design of 30-m pre-stressed concrete simple-supported box girder for the viaduct in Shenzhen Metro Line 11, and focuses introduction on the longitudinal calculation and analysis of the main beam for box girder, which can be referred for the similar projects.
Keywords: metro viaduct, box girder, design, calculation

Abstract: Taking five bridges around Didang Lake of Shaoxing City as the background, the article introduces the landscape, aesthetic design and structural design of bridges around the lake in order to combine the humanistic spirit with the environment of Shaoxing City. The structural shapes of the bridges strive to be innovative and to be into environment.
Keywords: bridge modeling, landscape, master design

Abstract: In recent years, it is more and more required for the appearance of the urban landscape bridges with the rapid development of traffic construction in China. A bridge is no longer the structural entity isolated from the environment and culture. It will carry the mission embodying the regional culture, showing the city style and reflecting the city characteristics. Combined with the practical experience of the landscape design for Nantong Beicheng Bridge, the article discusses the design of the current urban landscape bridge.
Keywords: urban landscape bridge, landscape design, regional environment, architectural style

Abstract: The article focuses introduction on a design idea in the design characteristic and the technological treatment of Lhas Landscape Passenger Footbridge. The footbridge can be challenged and innovated to certain extent in the basis of the conventional design so as to achieve a certain aesthetic design. The article briefly introduces the project background, construction difficulty, difficulty treatment and practical effect, and sums up the design experience of this footbridge. The relative experience can be referred for the similar projects.
Keywords: footbridge, landscape, TMD shock absorption

Abstract: With the rapid development of urbanization construction in China, the design of urban bridge more and more seeks the beauty. Guizhou Province Libo County Guantang Bridge is an 85m + 85m double-arch single-pylon cable-stayed bridge. Its structure is novel and its model is graceful. At present, there is a little experience of this bridge able to be referred. The article sets forth the main aspects of structural design, structural calculation and construction scheme of this bridge. The relative technical parameters can be referred for the similar projects.
Keywords: urban bridge, Guantang Bridge, double-arch single-pylon cable-stayed bridge, novel structure, design, construction

Abstract: Depending on the construction of the trestle bridge in the deep water zone at the south bank of Quanzhou Bay Crossing-sea Bridge and taking the assembling construction as the construction concept, the article describes the design optimization of the structural type of the trestle bridge, the use of prefabricated steel reinforced concrete slab to replace the surface structure of trestle bridge, and introduces the construction technology. The result shows that the optimized structure of trestle bridge can decrease the construction processes, efficiently improve the construction efficiency and have the obvious economical benefit. This construction technology decreases the water high-altitude construction time of workers in maximum and makes the personal security of the workers be ensured, and at the same time the assembling construction can efficiently decrease the construction difficulties and make the construction simplified and standardized.
Keywords: assembling, trestle bridge, structure design, construction technology

Abstract: The assembled pre-stressed fish-belly beam inner strut system is a new supporting type of foundation pit and is used more frequently in recent years. The system is composed of steel assembled components of fish-belly beam, diagonal brace, angle brace, triangle connecting peaces and circuit purlin. Therefore, the steel structures can be completely reused after the braces disassembled. However, this advanced technique hasn't been known and mastered by the most engineers, who even more do not understand the points for attention in its application process. In result, this process is limited in its application range. Besides, some problems are ignored so as to cause the faults of the projects. This new technology is a few used because of a few study of it in China. By the engineering case of Nanjing South Station Ring Highway Subway, the article analyzes the whole engineering construction process and sums up the advantages and disadvantages of this strut system in order to carry out more discussion and study, which can be referred for the design of the similar projects.
Keywords: fish-belly beam, strut, foundation pit, rigidity

Abstract: Aiming at the problems of a bored power tunnel crossing the adjacent bridge pile foundation, a two-dimensional FEM model is built to analyze the influence rule of tunneling on the pile foundation of the adjacent bridge under the conditions of the different tunnel depths and the central distances of tunnel and pile foundation. The results show that the excavation will have the great effect on the pile foundation when the center distance of tunnel and pile is less than a certain range. The locations of the maximum horizontal deformation and the maximum bending moment of the pile will change with the depth variation of tunnel. While the depth of tunnel is at the upper part of pile, the maximum horizontal deformation and the maximum bending moment of pile will be relatively larger.
Keywords: bored tunnel, adjacent existing bridge pile, cross, depth of tunnel, center distance of tunnel and pile

Abstract: The main bridge of an expressway crossing-river bridge is the through continuous steel truss arch structure. Its spans are arranged by (132+276+132)m. The total length of the main bridge is 540 m. A 70-t spanning mobile gantry crane is installed separately at two side spans of the main bridge in order to assemble the steel beams of side span and to lift the steel beam members up to the bridge. On the basis of 2008 crane design standard, the structural stress calculation and the stability analysis are carried out for 70-t mobile gantry crane for lifting the steel truss beam of a high-speed railway by the limit state method. The article focuses introduction on the load value and load combination of gantry crane according to the standards, and the method of modeling calculation and optimization design by midas civil.
Keywords: gantry crane, design calculation, structural stress, stability analysis

FLOOD CONTROL & DRAINAGE

Abstract: On the basis of comprehensively analyzing the transport and control process of the pollutants in watershed, the present situation of non-point source (NPS) pollution control and its limitations, the control system and procedure of NPS pollution in the urban watered of China are proposed. In addition, the concept of the effective green area is proposed to allow the runoff from the other lands. The comprehensive department of the government is required to coordinate and solve the management of the effective green area to be added according to the foreign experience.
Keywords: urban watershed, non-point source (NPS) pollution, watershed management, effective green area

Abstract: The initial rainwater storage tank is used to store initial rainwater and can avoid the initial rainwater directly discharged into river to cause the water pollution. With the emphasis on the ecological environment, the initial rainwater storage tank has been started to construct in many cities. According to the design case of the initial rainwater storage tank of No.2 Rainwater Pumping Station in Zhengding New Area of Shijiazhuang City, the paper introduces the design gist of the initial rainwater storage tank in the urban drainage system, which can be referred for perfecting the design method of the initial rainwater storage tank.
Keywords: initial rainwater storage tank, pumping station, design

Abstract: The negative pressure collection system is a new technology for hard to collect the village domestic sewage by the gravity mode. According to a demonstrating project of Punan Village in Luzhi County of Wuzhong District in Suzhou, the article introduces the engineering design of negative pressure collection system in order to provide the reference for the design of the similar projects.
Keywords: village sewage collection, negative pressure collection system, demonstrating project, Suzhou City

Abstract: The article introduces the adjusting process of the Sludge Anaerobic Digestion Project of Shanghai Bailonggang Wastewater Treatment Plant, analyzes the adjustment process, and sums up the problems met in the adjustment and the solving measures of the egg-shaped digestion tank in order to provide the reference for the adjustment of the similar projects.

Keywords: wastewater treatment plant, sludge disposal, anaerobic digestion, operation and adjustment

Abstract: The article introduces the technical characteristics and the main design parameters of aeration grit chamber, analyzes the problems often existing in the operation of aeration grit chamber in the sewage treatment industry and the measures taken to solve this kind of problems, and provides the source materials for the design of aeration grit chamber in the future so as to guarantee the security and reliability of the engineering operation and achieve the expected treatment effect of the design.

Keywords: aeration grit chamber, operation management, surface scum, scum collection system, grit lifting system

Abstract: The chemical Oxygen Demand (COD) is an important index of monitoring the water quality, and can be taken as the index of balancing the relative content of the organic compounds in water. The rapid test method is more and more noted in recent years because of the potassium dichromate standard method with the disadvantages of long analysis time and low efficiency. The article studies the COD rapid digestion spectrophotometry, and introduces the establishment of laboratory inner quality control method to monitor the whole process of test, which can effectively improve the accuracy of the analysis process.

Keywords: COD, rapid test, quality control method, accuracy

Abstract: This paper discusses the laying scheme of the intake pipeline crossing the gravity dam according to the engineering cases, compares and selects the stress calculation formulas and theory of the jacking pipe, analyzes the influence of jacking pipe construction on the built dams, and puts forward the seepage treatment scheme of the dams after constructed. The contents can be referred for the similar projects.

Keywords: jacking pipe, crossing dam, analysis of pipe stress

Abstract: The article analyzes the flood control security in the operation period of underground space (self-waterproof, retaining and drainage capacities) from the angle of engineering measures and the flood control security in the operation period of underground engineering from the angle of non-engineering measures. The security measures can be referred for the similar projects.

Keywords: underground engineering, operation period, flood control security, engineering measures, drainage engineering measures

Abstract: Rilong Mountain - Wenzi Channel Prevention Project of a river in Liaoning Province Dandong City is an important work for the flood control of Dandong City. The interlocking hydraulic brick and woven bag concrete revetment are used to solve the dual-task of flood control and landscape owing to the lower standard of flood control in this section and its location within the border of the Dandong Industrial Area. The

MANAGEMENT & CONSTRUCITON

Abstract: Good pavement construction quality is the premise of achieving the expected performance of asphalt mixture. Therefore, it is greatly significant to study the detection and control method of the construction homogeneity of asphalt pavement. The article focuses setting forth on the control of construction segregation, puts forward the use of laser texture tester to evaluate the condition of pavement surface segregation as the main method for controlling the quality of asphalt pavement, and hereby evaluates the construction homogeneity of each representative road section.

Keywords: asphalt, asphalt mixture, segregation, laser texture tester

Abstract: Compared with the ordinary asphalt concrete, the rubber asphalt concrete has the better advantages of high temperature stability, water stability, noise reduction and environmental protection. According to four municipal road maintenance engineering cases, the article focuses setting forth on the technical indexes of raw materials and the construction control of mixing, transport, paving and rolling of the rubber asphalt mixture in order to provide the technical support for its application in the reconstruction of municipal roads.

Keywords: rubber asphalt, rubber asphalt mixture, rubber asphalt concrete, municipal road

Abstract: The passenger railway line from Zhengzhou to Xian is the first ballastless track passenger railway line with 350 km time per hour built in the collapsible loess region in China and also in the world. The collapsible loss is the main and special engineering geological problem met in this line. How to treat the foundation base well is related to the construction quality of the whole project. Based on this, the article mainly discusses the application of the lime-soil compaction pile in the roadbed foundation of collapsible loess region by the practical cases.

Keywords: lime-soil compaction pile, collapsible loess, foundation treatment, reinforcing, bearing capacity

Abstract: The article sets forth the new working method of using the impact drill for breaking the barriers of sewage pipelines at the pile foundation of the main line of Contract Section VII of Ningbo North Ring Expressway Project. The new working method is obviously more excellent than the traditional common construction method in the safety, construction period and cost, and the quality of finished pile satisfies the design requirements and standards.

Keywords: cast-in-site pile, barriers, breaking, impact drill

Abstract: The article analyzes and studies the roadbed pavement construction technology of easily settled soft soil roadbed section of highway bridge, and a series of structural design and roadbed construction measures taken for guaranteeing the construction quality and greatly reducing the non-uniform settlement probability of roadbed pavement in the settled section of highway bridge so as to avoid the bridgehead bump at the settled section of highway bridge, to improve the using performance of highway and to ensure the life security and property safety of drivers and passengers.

Keywords: highway bridge, settlement, roadbed pavement, structural design, construction technology

Abstract: According to the hydraulic pushing shifting construction of steel box beam for the main line spanning Genqiu Interchange in Hangzhou Qiushi Expressway Phase III Project and aiming at the characteristics of this project, the article analyzes and studies the selection, special requirements and key technical measures of the pushing shifting scheme.

Keywords: sewage pipeline, engineering protection, elevated bridge, function construction

Abstract: Luozhou Bridge is the longest-span self-anchored suspension bridge in China now. The pushing method is used to construct the main beam of this bridge. By the engineering background of this bridge, the article introduces the pushing construction technology of the steel box beam of the self-anchored suspension bridge, which can be referred for the construction of the similar projects.

Keywords: self-anchored suspension bridge, steel box beam, pushing, guiding beam

Abstract: Ningbo North Ring Expressway is the first integrated elevated expressway in Zhejiang Province. The composite beam is the steel structure crossing the main intersections. Its construction is more highly required for the more conventional structures of traffic under the bridge, construction organization sequence, hoisting safety and etc. Aiming at the characteristics of the composite beam of this project, the article completely sets forth each key construction technology of the integrated elevated composite beam, which can be referred for the similar projects.

Keywords: integrated elevated bridge, composite beam, construction, key technology

Abstract: This paper discusses the control of installation precision of steel box arch rib and its guaranteeing measures. Based on the practical field conditions, the installation precision of steel structure and the structure security of its installation process are ensured by two modes of shore assembly and ship assembly under the premise of reasonably arranging the construction procedure.

Keywords: steel box arch rib, hoisting, precision, control

Abstract: Depending on the construction of the approach bridge in Quanzhou Bay Crossing-sea Bridge South Bank Deepwater Zone, the article introduces the application of assembled steel hanging box in the construction of high-pile base slab from two aspects of the design and construction of steel hanging box. The cofferdam construction of steel hanging box has been widely applied in the construction of long-span deepwater bridges because of its characteristics of the short construction period, small flow resistance, being convenient for shipping, not necessary to submerge to the riverbed, small construction difficulty and small concrete usage.

Keywords: crossing-sea bridge, assembled, steel hanging box, high-pile base slab, construction

Abstract: The closure of pre-stressed concrete continuous girder by the form traveler cantilever construction is a key working procedure in the construction. The different schemes will give the different results. Combined with the engineering cases, the article studies the key technology of closing the continuous girder by the form traveler cantilever construction, and analyzes the displacement variation of continuous girder by the different closure modes and the different pre-stressing tensioning Sequences. Thus, some beneficial conclusions can be referred for the engineering designs.

Keywords: pre-stressed concrete continuous girder, closure, system conversion

Abstract: The article introduces the construction control technology of a project. According to the construction characteristics of V-shaped pier and No.0 pier for Lema River Bridge, the construction control method is studied and determined. This method is combined with the deformation monitoring of support outside of V-shaped pier and the stress monitoring of key control section for V-shaped pier and No.0 sectional structure. The engineering practice shows that the measured result and the theoretical calculation result are better identical not only for the structural linear status, but also the control section stress with the good construction control effects, which can be referred for the construction control of the similar projects.
Keywords: V-shaped pier rigid frame bridge, construction control, No.0 section, stress monitor

Abstract: In the development of bridge construction, the cantilever construction method is often selected, especially more used in the construction of the long-span bridge (generally in more than hundred-meter span). The cantilever construction is used in more than 70% of the practical projects. It can not only simplify the complicated mechanical equipment and construction processes, but also give the obvious help to control the construction cost. The pre-stressing technology is successfully transplanted from the building of houses to the construction of bridges, which efficiently satisfies the development requirement of bridge consolidation. The article sets forth the effective combination of the pre-stressing technology in the cantilever construction in detail, which can be referred for the similar projects.
Keywords: cantilever construction process, cantilever pouring process, pre-stressed concrete continuous beam, pre-stressed concrete bridge

Abstract: This paper discusses the layout of cast-in-situ box beam support crossing urban road under the complicated traffic condition. According to the practical investigation of the local traffic conditions, the optimized layout type of support is reasonably arranged to solve the problems of construction and traffic organization of the upper structure crossing the urban roads.
Keywords: crossing, urban road, cast-in-situ box beam, construction scheme

Abstract: Taking a cable-stayed bridge as the background and based on fatigue monitor result of steel box girder, the article studies the fatigue performance of steel box girder for the overlong-span cable-stayed bridge. The result shows that the top slab and U-rib web are easy appearing with the fatigue cracks under the accumulative effect of vehicle, the stress range of every slab component of steel anchor box in cable girder anchorage zone is smaller, and the web outside of box girder is possibly appearing with the fatigue crack under the long-term traffic load. The bedplate, bedplate U rib and cable pylon steel anchor box can not be appearing with the fatigue loss because of smaller stress range value.
Keywords: cable-stayed bridge, steel box girder, fatigue, monitor

Abstract: The article introduces the maintenance method and technology of comb-plate expansion joints of bridge, and combined with the more common maintenance methods and materials now, comprehensively compares various advantages and disadvantages, and puts forward the more reasonable and efficient maintenance proposals from the aspects of construction technology, cost and material so as to instruct the maintenance of bridges.
Keywords: comb-plate expansion joint, self-locking nut, rapid concrete, efficacy wrench

Abstract: The form traveler construction technology is one of the most bridge construction methods nowa-

Abstract: At present, the steel reinforced concrete T-beam has been widely used in the highway construction. There are many advantages of this bridge, but the serious quality problems of hard to install T-beam, web to be dislocated and hard to install expansion joints are often caused in the construction if not strengthened to control, especially for skewed bridge, sloped bridge and curved bridge, which will change the whole stress system of bridge and directly affect the service life of vehicles and bridges. Aiming at the above quality problems and according to the detail conditions of the former construction processes, the article briefly discusses the T-beam prefabricating technology, the main control process and the matters for attention in the construction, which can be referred for the similar projects

Keywords: skewed bridge, curved bridge, post-tensioning process, T-beam prefabrication, technology and control

Abstract: This paper introduces the test content of bridge monolithic beam, including the determination of loading test efficiency, and the measurement and analysis of strain and deflection. The paper focuses discussion on the elimination of the temperature influence during the collection of strain data. The neutral axis height and the other issues must be accurately calculated in the strain theoretical analysis.

Keywords: strain, deflection, temperature, neutral axis

Abstract: The article discusses the deck pavement fault cause of hollow plate simple-supported girder, its reinforcement principle, its construction method and its engineering application. The aim validates the reinforcing effect of deck pavement of hollow plate simple-supported girder by the theoretical calculation and the measured data comparison.

Keywords:deck pavement, hollow plate girder, reinforcement, maintenance, to plant steel bar, steel fiber

Abstract: The article points out that the difference of subgrade treatment mode of embankment and bridge culvert foundation is the main reason to cause the bridgehead bump, and it is the key to control the human factors of survey, design, construction and etc. in order to decrease these differences.

Keywords: highway, bridgehead bump, problem, preventive countermeasure, discussion

Abstract: As the urban infrastructure construction, the municipal road water and wastewater pipeline project is an importantly composed part, which plays the significant role for the urban environmental protection, drainage and waste discharge. The construction environment of water and wastewater pipelines for the municipal roads is more complex. It is required to comprehensively consider the influence possibly caused by the ground traffic in the construction of water and wastewater pipelines, and also to consider the safety of the buried cables, pipelines and the other facilities because of the problems, i.e. pipeline leakage, deviation and backfill subsidence commonly existing in the construction. On the basis of problem analysis and summing up the practical experience, the article puts forward a series of technical gist in the construction of municipal road water and wastewater pipelines, which can be referred for the similar projects.

Keywords: municipal road, water and wastewater pipelines, pipeline engineering, engineering construction, technical gist

Abstract: According to Guangzhou Xunfenggang Parking Lot Tunnel Project, the article introduces the wa-

Abstract: According to the comparison and analysis on the traffic security accident data of the ordinary freight in Shanghai from 2006 to 2001, the article sums up the traffic security status, operation management problems and the existing security danger of the ordinary freight, introduces the relative international experience for treating and solving the relative problems of the developed countries, Europe and America, Japan and etc., and puts forward the improvement measures for the traffic security of ordinary freight in the aspect of security operation management.

Keywords: ordinary freight of Shanghai, traffic security, operation management, improvement measures

STUDY ON SCIENCE & TECHNOLOGY

Abstract: Through investigation and analysis, the causes of rutting in the super-long upslope section of Fenshuiguan in Ningbo-Taizhou-Wenzhou Expressway have been found. Many treatment measures are taken to evaluate the treatment effects of rutting. Also combined with the construction gist and the cost analysis of this structural layer, the treatment technology for the rutting in the super-long upslope section is given.

Keywords: long upslope, rutting, treatment measures, Superpave-20

Abstract: On the basis of analyzing and studying the transverse force coefficient at home and abroad and according to various radius curves and super-elevations collected from the typical highways, the article comprehensively studies the comfort of passengers and the security of driving, preliminarily determines the valuing standard of the transverse force coefficient of highway, and then briefly calculates, analyzes and studies the transverse force coefficients corresponding to the limit minimum radius and the general minimum radius as well as no-super-elevation minimum curve radius in the standard.

Keywords: transverse force coefficient, comfort, minimum radius

Abstract: The slow transit is an important component of the urban transit system, and is one of the important strategies of low-carbon transport. The users of slow transit put forward the requirements of security, comfort and accessibility of the slow transit system. This paper presents the evaluation method and model of the infrastructure of slow transit system based on the above three evaluation indexes. The method of the user giving marks and the expert evaluation is recommended to achieve the weights of evaluation indexes. The hierarchical weighted method is used to achieve the satisfaction of slow transit system users. The paper put forward several proposals for the design of road infrastructure.

Keywords: slow transit system, infrastructure, security, comfort, accessibility, satisfaction

Abstract: Based on the operation characteristics of double toll station and vehicle, the article analyzes the operation cost of double toll station and the queue cost of drivers. On this basis, the starting quantity optimization model of toll booths with the minimum total cost of the both is set up. Then the average stop time and the average waiting number of vehicles are solved by the model simulation of Matlab. The application process of the model is realized by the practical cases.

Keywords: double toll channel, operation cost, queue cost, starting quantity of toll booths

Abstract: By the background of a cable-stayed bridge, and introducing the S-N curve based on the hot spot stress, the article studies the fatigue damage of the structure under the action of heavy traffic. According to the investigation of traffic volume, 35 sample data of traffic volume are achieved. The typical fatigue vehicle type and the vehicle load spectrum are given by the equivalent damage principle. The typical damage level of structural details is calculated by Monte-Carlo method and Miner linear damage norm. In order to study the influence of heavy traffic, the article considers two situations of a certain proportion of overloads of various fatigue vehicle types and the overload of only one vehicle type, and discusses the influence of heavy traffic on the structural damage. The study result shows that the fatigue life of bridge satisfies the design requirement according to the present forecast of traffic status. With the proportion increment of the overload vehicle quantity in the total traffic volume, the fatigue damage level of the components will rapidly increase. Compared with the other vehicle types, the damage level of more than 5-axis vehicle under the overload will be obviously increased.
Keywords: heavy traffic, fatigue load spectrum, Miner norm

Abstract: This paper comprehensively researches the mechanical properties of the partial curved-girder cable-stayed bridge by the special finite element model, and analyzes the influence of every loaded item on the space structural behavior in the construction phase and the use phase. According to the mechanical characteristics, this paper proposes the key points in the design process of the partial curved-girder cable-stayed bridge, which can be referred for the design and analysis of the similar bridges.
Keywords: curved girder, partial cable-stayed bridge, space performance, analysis and research, design gist

Abstract: Taking a practical butterfly steel arch bridge as an example, the article analyzes the stress and deformation of the whole bridge by setting up the three-dimensional finite element model and applying the elastic-plastic and geometric nonlinearity calculation method. According to the analysis on the maximum deformed section at the arch top of small arch rib, the article the stability characteristic of the special-shaped arch rib. The result shows that the partial unstability of arch rib will not play the control role for the limit carrying capacity of the whole structure. By the comparison of the stresses of the large arch rib and the suspender, and the character of deformation with the variation of loading coefficient, the data show that the rigidity of suspender will more greatly influence the carrying capacity of structure.
Keywords: butterfly arch, calculation method, arch rib, suspender, stability, limit carrying capacity

Abstract: The article sums up the characteristic and classification of the stabilization in the design of steel structure, and introduces the calculation method and specifications of the overall stability of stressed component and the bended component of the axis. The relative experience can be referred for the similar projects.
Keywords: steel structure, stressed component of axis, bended component, overall stability, particle stability

Abstract: The grain analysis test is one of the important contents in the engineering survey soil test. The accuracy and reliability of its test result are influenced by many factors. Aiming at the grain analysis test by the common densitometer method (A) (including test sieving method), the article compares and analyzes the influences of densitometer, analysis sieve, graduate, sampling quality, dissolving salt, soaking time, temperature, dispersant and etc. on the test result from two aspects of the test equipment and test process.
Keywords: grain analysis test, densitometer method, test sieving method, influence factor

Abstract: Aiming at the strong weathered rock usually existing below the bearing stratum of bedrock, there is no definite stipulation for the minimum thickness of bedrock bearing stratum below the end of socketed pile in the current standard. According to the practical cases, the article checks and calculates the minimum thickness of the different end resistance bearing ratios by the theoretical calculation and numerical simulation modes, and analyzes the minimum thickness of bearing stratum under the different rock strengths and the influence of underlying stratum below the strong weathered rock on its thickness.
Keywords: socketed pile, minimum thickness of bedrock bearing stratum, underlying stratum below strong weathered rock

Abstract: The article analyzes and discusses the influence of three factors, i.e. sectional area, tensile test force and numerical rounding on the measurement uncertainty of tensile strength test result of steel products.
Keywords: tensile strength, inclusion factor, weight, uncertainty

Abstract: This Paper studies the nitrogen removal potential of the anaerobic - oxidation ditch technology to treat the low-carbon sewage from the towns. According to the test and analysis of the denitrification potential to the influent and the anaerobic mixed liquid, the article sets forth that the particulate degradable component is mainly from the nitrogen removal carbon source, and opens out the significance of endogenous denitrification in the nitrogen removal process of low-carbon sewage.
Keywords: denitrification potential, oxidation ditch, endogenous denitrification, nitrogen removal and phosphorus removal

APPLICATION OF ACHIEVEMENTS

Abstract: Combined with the characteristics of the engineering survey, the article sums up the deficiency in the practical application of urban CORS system, proposes to build up RTK system of single base station based on GPRS and introduces the solution method to realize the real-time field use acquisition results, and the verification and promotion of the application cases.
Keywords: GPRS, single-base-station RTK, engineering survey, coordinate elevation transforming parameters

Abstract: The non-nuclear density gauge is used to test the temperature segregation for the compaction quality of asphalt surface layer. The non-nuclear density gauge is used fast and nondestructively to quantify and test the density variation of asphalt concrete pavement to carry out the dynamic control and evaluation of construction quality. The article analyzes the transverse and longitudinal heterogeneities of asphalt concrete pavement and its causes, and also studies the influence of temperature on the uniformity of asphalt concrete pavement. The result shows that the temperature does not obviously influence the heterogeneity if only above the compaction temperature.
Keywords: road engineering, temperature segregation, non-nuclear density gauge, degree of compaction

Abstract: This paper introduces the application of low-noise porous asphalt pavement in the municipal roads of hot and humid area from the aspects of the raw material selection, mixture mixing ratio design, construction control, the points for attention and maintenance management in a constructed low-noise porous asphalt

THE RELATIVE SPECIALITIES

Abstract: The continuous and scattering wavelet transformation is used to analyze, identify and simulate the stochastic process, and make it be characterized. The wavelet transformation is used to transform the stochastic process into a localized orthogonal basis function, which can provide a convenient method to simulate, analyze and emulate an unstable state process. The time domain and frequency domain of wavelet transformation are analyzed to make the character of instant signal given by time-frequency chart become possible, but the traditional method can not do it. The wavelet analysis is found able to apply in many domains in the short history of its development. The article briefly discusses the application of the continuous and scattering wavelet transformation to analyze the development status of mathematical signal, and also introduces some methods to identify and characterize the instant stochastic process of earthquake engineering.
Keywords: wavelet, earthquake, engineering

Abstract: The article introduces the calculation method of capacitance compensation capacity of high-voltage single-stage centrifugal blower. According to the characteristic analysis of single-stage centrifugal blower, the article gives the practical capacitance compensation capacity of high-voltage single-stage centrifugal blower and determines several strong-points to be grasped in the projects so as to ensure the practical energy conservation effect archived by the capacitance compensation for blower.
Keywords: single-stage centrifugal blower, high-voltage capacitance compensation, energy conservation

Abstract: Jingguang Road (N) Tunnel in Zhengzhou City is an important component of Jingguang Expressway System. The article mainly introduces the supporting of foundation pit, and the design of the main structures and the operation system, and sums up the characteristics of engineering design of this project, which can be referred for the design of the similar projects.
Keywords: tunnel, supporting, structure, design, system

Abstract: According to the practices of tunnel engineering monitor measurement of Guangdong-Guangxi Expressway Lianhuan Section and Jiyuan-Jincheng Expressway, the article puts forward the method of using the displacement change rate and combining the geological and supporting information to judge the stability of wall rock and instruct the construction, and introduces its application in three aspects of modifying the grade of wall rock, changing the construction method and forecasting the collapse danger.
Keywords: tunnel, stability of wall rock, judging standard, application, forecast of collapse

Abstract: The lining concrete crack has the greater impact on the construction quality in the tunnel engineering construction. Therefore, the article puts forward the preventive measures for the cause of concrete cracks by the practical cases in order to improve the tunnel engineering construction quality, which can be referred for the similar project.
Keywords: tunnel engineering, lining concrete, concrete crack, preventive measures

Abstract: According to a existing repair of a shield machine and the repair problem of this rotary joint of its center, the article studies the characteristics of this component, analyzes the damage status, discusses the repair economy and puts forward the improvement scheme. It is significantly to implement this repair work for ensuring the shield machine to be smoothly tunneled in the next tunnel.
Keywords: earth pressure balanced shield, rotary joint of cutter center, shield repair

Abstract: It is required to reserve the enough implementation condition for the rail traffic shield obliquely tunneling the lower of the area in later period during the implementation of a section for Shanghai East-West Passage Project. The article systematically sets forth and studies the designs of the new dissymmetrical building envelope and inner structure used for the deep foundation pit of the underground structure in this section, which can be referred for the similar projects.
Keywords: shield tunneling, dissymmetrical building envelope, deep foundation pit, design

Abstract: The RC column-steel beam structure is a RC column as a vertical component and the lightweight steel beam is used as the structure type of roof. It differs from the portal framed structure and also from the RC framed structure. Combined with analysis gist of the structure, the paper discusses the key structures and compares its economies, and studies the application of RC column steel beam structure in the sludge treatment plant.
Keywords: RC column steel beam, portal frame, plant structure

Abstract: According to the summarization, development application and superiority of the engineering tunnel, the article sets forth the development tendency of the engineering tunnel for the construction modernization of municipal infrastructures, and for the intensification and intelligence of municipal pipelines, and its important promoting role in the construction of the urban infrastructures. According to the design and construction cases of the engineering tunnels in Huaxia Road, Guangming New Area, Shenzhen City and in the ceramic culture creative area of Jingdezhen City, the article sums up the design gist and difficulties of the engineering tunnels, analyzes the restraint factors and the main problems existing in the engineering tunnel, and puts forward the proposals for its development.
Keywords: underground development space, engineering tunnel, pipeline intensification, intelligence, Shenzhen City

Abstract: The earthwork engineering is a problem having to be met in the course of city construction and development. How to implement the earthwork engineering better is the problem to be concerned by the people. The article discusses the matters for attention in the earthwork engineering from the different factors to influence the earthwork engineering, which can be referred for the similar projects.
Keywords: earthwork engineering, earthwork calculation, site leveling, loosing coefficient, earthwork balance

Abstract: Taking the structural design of a heating thermal container anaerobic fermentation tank in a garbage disposal plant as an example, the article briefly discusses the structural design method and design gist of the container-type anaerobic fermentation tank, and puts forward several proposals of structural design according to the characteristics of fermentation tank.
Keywords: container-type anaerobic fermentation tank, structural design, heating, thermal insulation, corrosion resistance, impermeability

WORK & DISCOVERY

Abstract: The carrying out of the education and training of employees is necessarily required to improve the overall quality of employee team and to adapt the sustaining development of enterprise. According to the human resource management characteristics of construction engineering project management company, the article preliminarily discusses how to carry out the education and training of employees, and introduces some detail methods and practical cases to carry out the education and training, which can be referred for the similar companies.

Keywords: human recourse management, education and training, exploration and practice

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