

城市道桥与防洪

主管：中华人民共和国住房和城乡建设部
主办：上海市政工程设计研究总院(集团)有限公司



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- 中美印桥梁设计规范汽车荷载比较
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- 国内最大直径DN1200PE拖拉管工程施工应用



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封面工程

本期封面工程为重庆市石板坡长江大桥复线桥南桥头立交工程,由重庆市设计院设计。

该立交是由江南大道、南岸滨江路、江苑路等5条道路相交形成的组合式立交。其特点为:(1)南桥头立交中的南岸滨江路与石板坡长江大桥复线桥南引道高差达36m,立交匝道布置受到南侧长江河工模型线的限制,北侧受到科普中心和黄葛渡水厂用地的限制,西侧用地受到海事监管楼的限制,立交用地十分有限。(2)江南大道建设时开挖南坪隧道,对于切坡后的边坡采用较缓的坡率,以利于边坡绿化和环境景观设计。

采用迂回的匝道布置方式克服了36m高差,将立交工程建设对市科普中心、黄葛渡水厂、海事监管楼的影响降至最低。同时,利用组合式立交的特点,充分考虑了立交四周地块的交通出行需求。

该立交工程的设计时间为2003年,2006年6月通车。立交工程的交通功能完善,造型优美,具有山地城市建设特点,景观效果良好。

Urban Roads, Bridges & Flood Control

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ROADS & COMMUNICATION

Elementary Discussion on Construction of Roads in New Urban District Lou Zhongbo (1)

Abstract: Aiming at the characteristics of road construction with the good conditions and late-starting advantage in the new urban districts, this paper puts forward a series of new district road construction concept conforming to the systematical design of new district development planning, highlighting the regional feature, embodying the sustainability, using the four-new technology and building the excellent project in order to support the development of new urban district to be more healthy, more harmonious and sustainable.

Keywords: new urban district, road, characteristic, concept

Study on Design of Mountain Highway Based on Ecological Environmental Protection Concept Qiao Shi (5)

Abstract: The highway construction is bound to destroy the natural ecological environment in the region. It is very necessary to establish an environmental impact assessment index system and apply it to highway-environment interactive design. The aggregative indicator evaluation system of soil erosion, ecosystem and its service function, and ecological environment quality is built. Combined with the practical projects, this paper quantitatively evaluates the ecological environment impact of design indexes such as bridge-tunnel ratio, filling height, roadbed width and ecological compensation of highway in mountainous areas, which provides the useful reference for the design of the other highway projects in ecological protection area.

Keywords: mountain area, highway design, ecological environmental protection, impact assessment

Discussion on Experience of Road Construction in Xi'an International Port Area

..... Li Zhibo, Wang Xu, Zhang Wenchao (8)

Abstract: This paper summarizes the road construction in Xi'an International Port Area for many years and analyzes the main problems encountered in road design and the solutions. This paper mainly discusses the selection of cross-sections of roads in the whole area, the design concept of road structure, the treatment of borrow pits, the use of building waste and the treatment of collapsible loess in order to provide reference for

the construction of the similar development areas.

Keywords: international port area, road transect, typical subgrade, collapsible loess, Xi'an

Application of Overall Analysis Thinking of Planning Road Network Site in Urban Road Design ... Chen Yuhu (11)

Abstract: Taking the design of Xingfu Avenue in Xicheng District, Yongdeng County, Lanzhou City as an example, this paper sets forth the overall planning idea from "line to "face" road network site used in the design of urban roads, and integrates the overall analysis and optimization thinking of road network site into the process of road design so as to make the design results of urban road more in line with the actual regional site. Through sorting, reviewing and feedback, the planning results can be more in line with the engineering practice, have good landing ability, and avoid the engineering waste and conflicts in the development and construction of planning road network site.

Keywords: planning road network site, stepped terrace landform, landing ability, vertical control of site, site leveling

Overall Design of Ziqi Avenue Interchange Project in Siping City Qi Qingxiang (14)

Abstract: In order to speed up the infrastructure construction of Siping City in the northeast important industrial base of China, it is required to carry out the overall planning design for the intersection of Ziqi Avenue and Dongsheng Avenue. According to the analysis and demonstration of the project orientation, engineering situation and planning requirements of Ziqi Avenue Interchange Project, this paper puts forward three feasible hub interchange schemes. After the comparison and selection of schemes, the combined modeling is determined for the best scheme, and the overall design is carried out for the interchange project.

Keywords: hub interchange, overall design, forecast of traffic volume, Siping City

Design of Tianfu Avenue–Muhua Road Interchange Project in Chengdu Deng Xuefeng, Wang Li (18)

Abstract: This paper introduces the engineering situation of Chengdu Tianfu Avenue–Muhua Road Interchange, and analyzes its traffic status and type selection. Compared with the traditional full interchange of municipal roads, Tianfu Avenue–Muhua Road Interchange only uses two–layer cross system, which can not only ensure the landscape of the main road at the ground, but also reduce the interchange scale and save the investment in the same case of separating and converting the traffic of motor vehicles. This interchange has the larger promotion and using space at the combination of old and new areas with the pedestrians and less non–motor vehicle flow.

Keywords: interchange engineering, overall design, landscape effect, interchange type

Overall Design of Tengzhou Ping'an Road Tunnel Project Li Wanbai, Yang Yang, Liu Enguang (21)

Abstract: This paper introduces the comparison and selection of the overall design scheme of Ping'an Road Tunnel in Tengzhou including the planning overview, current situation, line position adjustment, cross-section comparison and key node design, etc., which can be referred for the design of the similar urban long shallow tunnels.

Keywords: urban long shallow tunnel, scheme comparison, key node

Overall Design of Yuanhua Road Expressway Project in Chengdu Hua Feng (25)

Abstract: This paper introduces the general situation of the Yuanhua Road Expressway Project in Chengdu, demonstrates the technical standards and construction scale of the project, and focuses on the overall design scheme mainly including the functional orientation, overall alignment and cross-section layout as well as the layout of entrances and exits.

Keywords: expressway, functional orientation, overall design, layout of entrance and exit

Study on Traffic Regulation Planning of Old County Town Zhang Yibin (28)

Abstract: First, this paper points out that the traffic regulation of old town should focus on the traffic demands of road network system, parking system, public transport system and slow traffic system, and the travel feature of town residents, and discusses the thought and method of traffic regulation planning of old town. Then combined with the example of Yuncheng County in Shandong Province, this paper puts forward the traffic strategy of simultaneously developing the motor vehicle and bus in the period of rapid urbanization. It should be to fully consider the protection of road rights for non-motored vehicle and bus, and the regulation of intersection, and to establish the continuous slow-traffic system in the planning of road network. At the same time, this paper points out that the comprehensive solution of supplementing the public parking, managing the parking demand and sharing the parking spots is suitably used in the parking planning of old county town. Finally this paper that the establishment of bus and external traffic hub of old town should be comprehensively considered with the demands of town and country.

Keywords: county, old town, traffic regulation, planning of road network, parking planning, bus planning

Study on Ramp Layout Scheme of Longdong Avenue Expressway in Section of Zhangjiang Science City
..... Guo Hengming (33)

Abstract: Longdong Avenue is located in the Pudong New District of Shanghai, is an east-west tangent line of the inner ring line of city, and is an urban trunk highway of city now. It is an urban expressway in the trunk road network planning of Shanghai, and is proposed to reconstruct into an expressway in the 13th Five-Year plan. The Pudong Canal Bridge is one of eight reconstructed bridges along Longdong Avenue, and is also an important node of the whole expressway reconstruction project. Based on the construction restrictions of

Pudong Canal Bridge, and combined with the reconstruction scheme, this paper determines the traffic organization of motor vehicles in the construction period, takes the corresponding diversion measures, and adopts the flow prediction to verify the feasibility of the scale of motor vehicle lanes in the construction period. Also this paper compares and selects the traffic schemes for the pedestrian and non-motored vehicle, and defines the recommended scheme, which can be referred for the traffic organization in the construction of the similar urban elevated expressway bridges.

Keywords: Longdong Avenue, expressway, Pudong Canal Bridge, traffic organization

Design of Xitai Road Expressway Reconstruction Scheme in Xi'an Guo Yixuan, Hu Miao (37)

Abstract: In order to speed up the construction of the expressway system in Xi'an City, the design criteria of the expressway reconstruction of Xitai Road is determined through the traffic volume analysis, and the overall scheme of the reconstruction and the node scheme of interchange are introduced, which provides a certain reference for the expressway reconstruction of urban roads.

Keywords: expressway, reconstruction, overall scheme, entrance and exit

Study on Reconstruction and Extension Scheme of Urban Expressway in Ningbo

..... Zhang Dakun, Gao Enquan, Chen Fangdong (41)

Abstract: Taking Hangzhou-Ningbo Expressway and Ningbo-Taizhou-Wenzhou Expressway within the expressway around Ningbo as examples, this paper studies the traffic characteristics of expressway and urban express way, the urban travel pattern, urban travel demand, proposes reasonable reconstruction plan of urban expressway by analyzing the traffic characteristics of highway and urban expressway, the urban travel pattern, the urban travel demand, and the advantages and disadvantages of retaining the expressway functions and municipal reconstruction, analyzes the functional orientation of urban expressway, and puts forward the reasonable reconstruction and extension schemes.

Keywords: urban expressway, urban express way, traffic characteristic, reconstruction and extension

Study on Operation Improvement of Intersection of S5 Highway and Yecheng Road

..... Zhao Yong, Yao Rui, Wang Ge (44)

Abstract: Since S5 Hujia Expressway adjusted to the urban expressway in 2012, the intersection of S5 and Yecheng Road has been severely congested in the peak hours. Through the investigation and analysis of the intersection of S5 and Yecheng Road, the main problems of intersections are summarized, the relevant measures with specificity and operability are proposed, and the effect of intersection improvement is estimated. The analysis process and specific measures can be referred for the similar intersection improvement projects.

Keywords: intersection congestion, vehicle interweaving, intersection improvement

Study on Key Technology for Design of Highway Reconstruction and Extension with Small-spacing Interchange ...

..... Tong Kaimin, Li Xiang (49)

Abstract: In order to solve the problems existing in the engineering design of the small-spacing interchange formed by adding the interchange in the present expressway, and based on the design principle to guarantee the traffic safety, to satisfy the traffic functions and to decrease the engineering cost, this paper puts forward the design elements for attention in the engineering design of adding the small-spacing interchange from the traffic analysis, overall design, widening design and etc. to make the design scheme of adding the small-spacing interchange group achieve the effects of safety, function and economy. The proposed design idea, design elements and solving scheme for the existing problems can be referred for the design of the similar projects.

Keywords: additional construction of interchange, small-spacing interchange, widening design, reconstruction and extension of highway

Calculation and Analysis of Instantaneous Longitudinal Slope at Starting Point of Interchange Ramp

..... Zhong Chengping, Li Jun, He Changming (53)

Abstract: The calculation method of longitudinal slope at the starting point of interchange ramp is not specified in the design code of China. Therefore, taking the A Ramp of Yihuang Highway Interchange as an example, and selecting the spacing 1 m and 5 m, the longitudinal slope at the starting point of the ramp is calculated by the instantaneous longitudinal slope method. Combined with the actual project, the calculation and analysis of the longitudinal slope at the starting point of ramp are carried out for two conditions of setting the road arch and not setting the road arch so as to provide the reference for the design of the longitudinal ramp of the interchange.

Keywords: road interchange, ramp, longitudinal slope at starting point, calculation

Elementary Analysis on Fine Design of Retaining Wall for a Mountain Highway in Yesanguan ... Yang Yong (56)

Abstract: Based on the problem existing in the construction of retaining wall and combined with the design documents of construction drawings, this paper analyses the places and reasons of the problems in the design. Combined with the characteristics of mountain highway, this paper summarizes the countermeasures for the fine design of retaining wall for the mountain highways.

Keywords: mountain highway, retaining wall, fine design

Cause and Solving Measures for Cracks Produced by Dredger Fill In-situ Solidification Lei Xuli (59)

Abstract: After the scheme demonstration, the limestone soil is filled on the solidified soil in the further

implementation of engineering schedule. The longitudinal cracks are found locally in the range of roadbed and greenbelt in the filling process of limestone soil. The longest crack is 300 m and the width is about 5 m. According to the type of filed crack and the field construction organization, this paper analyzes the crack cause, and puts forward the solving scheme and preventive measures.

Keywords: in-situ solidification, design, crack, prevention

BRIDGES & STRUCTURES

Assessment on Seismic Performance of Y-pier Rigid-frame Bridge by Pushover Method Chen Fuli (61)

Abstract: In order to study the accuracy of Pushover method in the assessment of seismic performance of Y-pier rigid-frame bridge, taking a pre-stressed concrete Y-pier continuous rigid-frame bridge as an example, a three-dimensional spatial calculation model of Y-pier rigid frame bridge is established by using large-scale finite element analysis software, and the Pushover analysis is carried out. The results of Pushover are compared with the results of dynamic time-history analysis. The study shows that the Pushover method is more accurate for evaluating the seismic performance of the similar bridges.

Keywords: Pushover analysis, Y-pier, continuous rigid-frame bridge, seismic performance, time-history analysis

Study on Reasonable Completed Bridge State of Long-span Composite Beam Cable-stayed Bridge

..... Gong Zisong (65)

Abstract: The reasonable completed bridge state is the key points and difficulties in the design of cable-stayed bridge. Combined with the stress characteristics of composite beam cable-stayed bridge, this paper sums up, analyses and determines the basic principle of reasonable completed bridge state, and puts forward and determines the fractional step algorithm of the reasonable completed bridge state of composite beam cable-stayed cable. The basic idea is as follow: according to the relative engineering experience, the structure dimensions are drawn up, the "improved zero displacement method" is firstly used to decide the state of completed bridge, and then the "least square method" is used to adjust the cable force evenly. The live load effect is calculated. It is to comprehensively consider the bending moment uniform of the main beam, equal positive and negative bending moments, smaller bending moment of the main pylon, cable force uniform and avoiding the negative reaction of pier top in the operation state of completed bridge. The cable force is adjusted and the side-span concrete beam is set up with steel tendons. The operation state of completed bridge is checked and calculated. The engineering example of a long-span composite beam single-pylon cable-stayed bridge is calculated and analysed. The practice shows that this method is simple and useful with the clear thinking and high calculation accuracy, and can meet the design requirements.

Keywords: composite beam cable-stayed bridge, completed bridge state, fractional step algorithm, optimization of cable force

Discussion on Design of Urban Pedestrian Overpass and Treatment Measures of Structure in Complex Environment

Conditions Guan Qingjie, Zhang Zhongwei (70)

Abstract: This paper introduces the design of a pedestrian overpass in the complex environment conditions. The portal foundation of pile foundation plus joist is used for this overpass in order to avoid the underground pipelines, civil air defense and basements. The superstructure combined with the canopy design adopts the through truss. And the structure of double bearing and double vertical web member is constructed to solve the problems of adding the stairway entrance and exit in the middle of truss, and the entrance and exit closely adjacent to the cantilever span. As the first pedestrian overpass with the escalator in the northeast region of China, the simultaneous operation of the electric heating device and the driving system can guarantee the normal operation of the escalator of the pedestrian overpass in the severe cold regions.

Keywords: through truss, portal foundation, double bearing, electric heating device, buckling stability, natural vibration frequency

Design of Long-span Pre-stressed Concrete Variable Cross-section Skew Continuous-beam Bridge

..... Chen Hui (76)

Abstract: Based on the background of the main bridge (75 m+125 m+75 m pre-stressed concrete variable cross-section continuous beam) of Nanhe River Bridge in Meishan City, this paper summarizes the relative contents of overall layout, main girder construction, segment division, location of pre-stressed steel strands, and control principles of longitudinal and transverse stresses of main girder, and section stress of box girder. This paper discusses the treatment of skew end structure and the distribution of skew bearing reaction of the continuous box girder in order to provide the reference for the design of the similar bridges in the future.

Keywords: long span, cantilever pouring, continuous girder, skew

Comparison of Motor Vehicle Loading in Norms for Bridge Design in China, USA and India ... Bai Wulong (79)

Abstract: This paper compares and analyzes the stipulations of motor vehicle loading including the lane partition, lane loading, vehicle loading, impact coefficient, reduction coefficient and load arrangement in the bridge design norms of China, USA and India, and explains the differences of motor vehicle loadings in the norms of China, USA and India. The comparison shows that the norm of India is the maximum, the norm of China is centered, and the mid-span moment and displacement value of USA are the minimum under the motor vehicle loading according to the norm of USA.

Keywords: motor vehicle loading, lane loading, vehicle loading, impact coefficient

Overall Design of North Branch Bridge in Chongming – Qidong (Shanghai Section) Channel ... Yuan Huiyu (83)

Abstract: This paper introduces the overall design of bridge located at the river regime evolution area in the upper reaches of Changjiang River and in the reclamation range of North Branch. Based on the conclusions of two monographic studies, the reasonable spans and the relevant anti-scouring measures are taken to achieve the economic rationality of the design. At the same time, this paper also introduces the scheme comparison of bridge spanning the existing dike in order to obtain the more economic and reasonable scheme.

Keywords: overall design of bridge, pier scouring, silting-up, dike protection, plastic flow of soil body, durability

Overall Design of Toutun River Bridge in Wuchang Avenue Ren Hongye, Wei Zhipeng (87)

Abstract: The main bridge of Toutun River Bridge in Wuchang Avenue is a double-layer steel truss bridge. Its total length is 586.42 m. Wuchang Avenue is an east-west urban expressway from Urumqi to Changji. Toutun River Bridge is the main channel into Changji. Therefore, this bridge should not only focus on the traffic function, but also the landscape function. This paper introduces the overall design conception, overall layout and structure design of Toutun River Bridge in Wuchang Avenue in detail. The main bridge is the double-layer steel truss bridge. The landscape effect is realized by combining the regional features on the basis of traditional truss, has become a municipal landscape bridge with the very characteristics and provides a certain reference for the design of the similar bridges.

Keywords: Toutun River Bridge, overall design, truss bridge

Structure Design and Static Analysis of Jiangwan Bridge Cao Xuhua, Chen Haibin, Peng Zhimiao, Chen Wei (91)

Abstract: The main bridge of Jiangwana Bridge is a shaped arch pylon steel-concrete composite girder double-plain cable-stayed bridge with the main 183-m span. The main girder is a composite girder combined of the steel box girder and pre-stressed concrete box girder. The bridge is 44.5 m wide. It is the widest single-pylon steel-concrete composite cable-stayed bridge in China now. This paper summarizes the design concept and structural system of the main bridge of Jiangwan Bridge, which can be referred for the design of the similar super-wide high arch pylon steel-concrete composite girder cable-stayed bridges.

Keywords: arch pylon, composite girder, cable-stayed bridge, karst cave

Design of Wide Deck Composite Girder for Yibin Yanpingba Changjiang River Bridge Jiang Jianjun, Tian Bo, Wen Kai (95)

..... Jiang Jianjun, Tian Bo, Wen Kai (95)

Abstract: Yibin Yanpingba Changjiang River Bridge is a 480 m-span composite beam cable-stayed bridge. Its middle span is a steel-concrete composite girder. Its side span is a pre-stressed concrete beam. The steel-concrete combined section is set up at 10.5 m of the middle span side near the cable pylon. The deck of middle span is 40 m wide with double-way six lanes. The steel-concrete composite girder is composed of main steel longitudinal girder, steel cross girder, small longitudinal beam, prefabricated deck slab and cast-in-situ deck slab. According to the analysis and study, the steel-concrete composite girder adopts the section type of steel double-box girder + concrete deck slab. The height at the outside web is 3.5 m. The height at the bridge axis is 2.9 m. The segment length is 10.5 m and 11.1 m. The closure section is 7 m long. The spacing of steel cross girder is 3.5 m and 3.7 m. The thickness of concrete deck slab is 26 cm. The thickness near the cable pylon is to 28 cm and the local thickness near the web is to 40 cm. The anchorage of cable girder adopts the steel anchor box, which is set up in the steel box girder. The space calculation result shows that the stresses of main steel longitudinal girder, concrete deck slab and steel cross girder are all controlled in the reasonable range, the maximum value of vertical deflection of main girder is -340 mm and the rigidity meets the requirements.

Keywords: Yanpingba Changjiang River Bridge, long span, cable-stayed bridge, wide deck, composite girder, design

Safety Reconstruction of Bridge Cable Damage Cai Ming (100)

Abstract: The detection every two years and the replacement every ten years for the stayed cable of bridge have become into practice. But the problem is that would not stayed cables be broken suddenly after replaced? When is broken? Would the broken cables damage the bridges? This paper tries to discuss the solutions.

Keywords: stayed cable of bridge, damaged, reconstruction

Scheme Design of Bridge Landscape for Tengzhou Fenghuang Avenue Bridge Zhang Jianjun, Yang Yang, Xue Zhongyi, Su Xiaonan (104)

Abstract: This paper introduces the scheme design of the bridge landscape for Tengzhou Fenghuang Avenue Bridge in detail including the basic overview, technical indicators, regional historical and cultural background, bridge landscape design concepts and principles, and the three landscape schemes of Fenghuang Avenue Bridge, which can provide references for the landscape design of the similar bridges.

Keywords: bridge landscape, scheme design, layout of bridge type

FLOOD CONTROL & DRAINAGE

Elementary Discussion on Operation and Maintenance of Suzhou Creek Deep Drainage and Storage Pipeline System

Project Cai Xuan, Han Jingchao, Zhou Juanjuan (108)

Abstract: In order to effectively solve the problems of drainage system upgrading, waterlogging disaster prevention and initial rainwater pollution control, the construction of the Suzhou Creek Deep Drainage Storage Pipeline System Project has been put on the agenda. This paper discusses the engineering overview, functional positioning, operation mode and maintenance management of this project, and discusses the problems for attention in the operation and the key points of maintenance and management. Referring the foreign experience and combined with the operation situation of drainage system in Shanghai, the scientized, systematized and informationalized operation and maintenance scheme is established.

Keywords: deep drainage storage tunnel, Suzhou Creek Deep Tunnel Project, operation and maintenance

Engineering Design of Beihai Hongkan Wastewater Treatment Plant Upgrading Reconstruction Project

..... Lv Wenbo, Xu Jing (111)

Abstract: The treatment scale of Beihai Hongkan Wastewater Treatment Plant Upgrading Reconstruction Project is 200 000 m³/d. Through the analysis of the current secondary effluent quality index, the influent quality and main removal index of the advanced treatment process are determined. The BAF post-denitrification biofilter technology and LHPS high efficiency inclined-tube settling tank process are adopted for the advanced treatment. The engineering design of core technology and dosing part of the advanced treatment is introduced in detail, and the selection of external carbon source is analyzed. The relevant experience can be used as reference for the similar projects.

Keywords: post-denitrification biofilter, high-efficiency inclined-tube settling tank, external carbon source

Study on Water System Planning of Rule Lake New Town Yu Lu, Ding Xuehui (115)

Abstract: The present water system of Rule Lake New Town is hard to meet the planning orientation and construction demand of Ganjiang New District, and is also more difficult to meet the sustainable development requirements of ecological environment. This paper sorts out the water system of Rule Lake New Town again and adjusts its planning from the viewpoints of water safety, water environment and water ecology, and puts forward the new treatment thought of the people oriented and the harmonious development of human and nature.

Keywords: Rule Lake New Town, water system planning, flood control and waterlogging drainage, water environment treatment, water ecological protection

Study on Wave Simulation of Chongming Ecological Island Seawall Upgrading Project

..... Xu Min, Wang Lulu (118)

Abstract: In order to provide the design wave elements and study the wave situation of Chongming Ecological Island Seawall Upgrading Project, and considering the practical conditions of underwater

terrain, and wave refraction, shoaling, reflection and breaking, the MIKE 21 model is used to simulate the distribution of wave height in the engineering area. The result shows that MIKE 21 model can better simulate the generating and communicating processes of wave. This model is suitable to use in Chongming District of Shanghai. This paper analyzes the change distribution of wave in the area of Chongming Island in order to provide the wave elements for the seawall upgrading project, and gives the proposals from the viewpoint of wave distribution.

Keywords: seawall, wave simulation, MIKE 21

Optimized Design of Sludge Feed Screw Pump Used for Low-temperature Vacuum Dewatering Drying Complete

Equipment Xu Yuliang (121)

Abstract: Taking the sludge treatment project of a wastewater treatment plant (WWTP) as an engineering example, this paper introduces the same pressure class of safety valve and return sludge pipe constructed at the outlet of sludge feed screw pump used for the low-temperature vacuum dewatering dry complete equipment in order to guarantee the safety of the pipeline between the screw pump and the low-temperature vacuum dewatering drying complete equipment, and the safety of the low-temperature vacuum dewatering drying complete equipment, which can be referred for the optimized design and installation of the similar engineering screw pumps.

Keywords: low-temperature vacuum dewatering drying complete equipment, screw pump, safety valve

Technological Application of Ecological Revetment Gu Xing, Huang Haohao (124)

Abstract: With the development of social economy, the demand of the people for the ecological environment is increasing day by day. How to integrate the construction of ecological environment and river management is a direction worth studying. The ecological revetment derives from the traditional revetment, but is different from the traditional revetment. The ecological revetment breaks the tradition of completely separating the water and soil to harden the revetment in order to meet the requirement of river function in the river management in the past. The ecological revetment is the current development tendency of river revetment. The common forms are mainly the ecological gabion revetment, timber pile revetment, greening concrete revetment, interlock block revetment and stabilized soil revetment.

Keywords: ecological revetment, stabilized soil revetment, ecological gabion revetment, greening concrete revetment, interlock block revetment, timber pile revetment

MANAGEMENT & CONSTRUCTION

Characteristic Analysis of Field Fast Detecting Technique for Dynamic Modulus of Roadbed Xu Fang (127)

Abstract: The dynamic modulus of roadbed can be obtained mainly by two methods of laboratory test and field detection. Aiming at the current situation of the field fast detecting technique for the dynamic modulus of roadbed, this paper completely analyzes the working principles, detecting ranges and technical characteristics of three field fast detecting methods of FWD detecting method, DCP detecting method and PFWD detecting method. The results show that the FWD detecting method is fast and widely applicable, and can better master the conditions of every pavement structure and material filling, but there are still some problems to be solved. The DCP detecting method is simple and reliable with low cost, and is still in its primary applications in China. The PFWD detecting method is portable and quick.

Keywords: roadbed engineering, dynamic modulus, FWD detecting method, DCP detecting method, PFWD detecting method

Cause Analysis and Prevention of Collapse of Karst Soil Cave in Construction of Subgrade ... Cai Quanhui (130)

Abstract: The collapse of karst soil cave is one of the main geological hazards during the subgrade construction of karst area. Taking the collapse of karst soil cave in the intercity expressway of Songtao - Yuping of Tongren City as an example, this paper introduces the forming conditions and collapse causes of karst soil cave, analyzes the influence of subgrade construction on the collapse of soil cave, and puts forward the prevention and treatment measures for the collapse of soil cave in the construction of subgrade, which can be referred for the construction of the other subgrade projects.

Keywords: subgrade construction, karst soil cave, collapse of soil cave, prevention measures

Reinforcement Treatment of Slope Landslip of Excavation at South Bank of Wenzhou Bridge ... Li Jianzhong (134)

Abstract: The slope landslip of excavation at the south bank of Wenzhou Bridge is located on the Grade 4-6 of this slope. The shallow stratum of this slope is the fully weathered or strongly weathered tuff. Its structure is loose and its intensity is low. The lower of this slope is the white weak weathered tuff. Its lithology is more complete. The thickness of the slope body in the central area of landslip is large. The water content of soil layer is high. The peripheral slip mass is thin and the water content is low. Aiming at the features of landslide mass, the overall support scheme of the miniature pile reinforcement of pre-stressed anchor cable for the central area of landslip cooperated with anchor cable frame for the slope surface, and the reinforcement of anchor rod for the surrounding area and anchor rod frame for the slope surface is selected. The limit equilibrium of given sliding surface is used to analyze and compare the different support effects. It is found that the stabilizing effect of anchor cable frame is obvious, and the overall support scheme can meet the stability requirements of the slope mass saturated with water under the condition of rainstorm.

Keywords: landslip, pre-stressed anchor cable, reinforcement treatment

Detection of External Drum Disease of Steel Tube and Reinforcement of Concrete-filled Steel Tube Arch

Bridge Yao Jun (136)

Abstract: The steel arch rib will have the expansion phenomenon of tube wall in the process of concrete pouring if the design of transverse restraint of steel tube arch rib is unreasonable or the construction technology is improper. Based on the test and stress analysis of a concrete-filled steel tube arch rib appearing the external drum of steel tube in the process of concrete grouting of arch ribs, this paper puts forward some suggestions for reinforcement treatment, which can provide reference for the disease treatment and reinforcement of the similar projects.

Keywords: steel tube arch rib, concrete pouring, tube wall expansion, reinforcement treatment

Statistical Analysis on Investigation and Survey of Foundation Pit Support Structures at Home and Abroad

..... Yang Xiaolong, Gao Junhan (140)

Abstract: On the basis of investigation and survey information of foundation pit support structures at home and abroad, and analyzing the relationship among the different pit areas, pit depths and supporting methods, this paper summarizes the design features of pit support structures at home and abroad now in order to provide the reference for the design and construction of pit support structures in the future in China.

Keywords: foundation pit engineering, pit support structure, underground diaphragm wall

Application of "Zonal Asynchronous" Construction Method in Granite Paving of Super-large Area Station Square

..... Wang Feng (143)

Abstract: The granite stone paving of urban square belongs to the later process of decoration engineering. In view of the characteristics that the outdoor granite paving engineering has the oversized, the shape is irregular, and many main construction units carry out the three-dimensional cross construction hard to implement the synchronous paving in the whole area of Lanzhou West Railway Station Comprehensive Transportation Hub Project Phase II, and in order to avoid the quality problems of large alignment deviation of vertical and horizontal seams, and flatness or height difference between the adjacent blocks not meeting the requirements caused by the local construction, and the risk of delayed schedule, the "zonal asynchronous" construction method is used to establish the two-stage surveying control network for the zonal fixed-point control, which can ensure the successful paving of oversized area granite station square and guarantee the realization of schedule goal and quality target.

Keywords: zonal asynchronous, construction, oversized area, square granite, paving

Study on Hoisting Construction Technology of Prefabricated Segment for Utility Tunnel Pan Wei (146)

Abstract: The prefabrication technology of utility tunnel is a rapid green construction technology of

prefabricating the blocks or segments of main structure for the utility tunnel in the factories under the conditions of open excavation, underground excavation or covered excavation, and then transporting to the fields for assembly. This paper analyzes the molds selection of prefabricated segment for utility tunnel by the engineering examples, studies the set position and structure form of the point hoist in the hoisting process, analyzes the advantages and disadvantages, and calculates the stress of the point hoist. The result shows that the requirements of norm are met, which can be referred for the similar projects.

Keywords: city, underground utility tunnel, prefabricated utility tunnel, point hoist, sling

Elementary Analysis on Effective Measures for Construction Safety and Management of Municipal Roads in Wenzhou
..... Zhang Wen Yuan (150)

Abstract: The municipal engineering construction is very important to promote the construction and development of the whole city. The whole municipal road construction can effectively promote the economic and social development of the urban areas, and improve the economic development level of the whole city. In the construction of municipal roads in Wenzhou, the municipal roads must be safely managed so as to guarantee the whole construction quality of the municipal roads. Therefore, it is very necessary to master the management concept and the quality of administrative staff, and to manage and control the construction technologies, which will be benefit to improve the whole construction quality and level of urban roads.

Keywords: municipal road, construction, safety management

Discussion and Study on Wall Forming Quality of Lining Laminated Wall in Steel Setting Mold Construction - - -
..... Fang Wei (152)

Abstract: As the concrete pouring support mold, the building construction formwork is continuously improved in the market demand. Compared with the limitation of the traditional timber formwork, the steel setting mold is more and more widely used in the large road and bridge projects with the relatively simple structures because of its high reuse rate, better flatness of wall surface, good setting effect of formwork, and higher safety. The two-wall-into-one underground structure style is used for many underground building structures, which can decrease the construction quantity of underground structures, increase the integrated rigidity of wall and save the resources.

Keywords: steel setting mold, temperature stress, deep horizontal displacement, stress and strain of enclosure body

Application of Maximum-diameter Water Supply Pipe in Engineering Construction in China
..... Wang Yongxing (156)

Abstract: This paper focuses on the application of the maximum-diameter trenchless horizontal directional

drilling DN1200HD water supply pipe in China in the construction of Shanghai Wuning Road Expressway Reconstruction Project, and summarizes the selection of construction technology, the control of every construction process and the influence on the environment.

Keywords: maximum-diameter water supply pipe in China, trenchless construction, horizontal directional drilling, example

Management and Control Measures for Construction Quality of Shanghai Changning Xinjing Port River Ecological Management Project Zhou Min, Li Na, Ye Jianfeng (160)

Abstract: Taking Shanghai Changning Xinjing Port River Ecological Management Project as an example, and combined with the field characteristics of the project, this paper analyses the engineering difficulties faced in the implementation process of the project. And based on the engineering difficulties, this paper puts forward the correspondent measures for the effective solution of the engineering progress, engineering coordination, safe civilized construction and other problems, which can be referred for the similar projects.t

Keywords: urban rivers, ecological management, management and control of quality

STUDY ON SCIENCE & TECHNOLOGY

Experimental Study on Water Content of Roadbed Based on Electromagnetic Wave Yun Zihui (163)

Abstract: Based on the influence of soil water content on the dielectric constant, the electromagnetic wave method is used to quickly measure the water content of roadbed. According to the analysis and summary of the achievements of soil water content measured by the electromagnetic wave method, an electromagnetic wave experimental method for the water content of roadbed is designed. And this method is used to carry out the laboratory experiment. The corresponding relation between the soil water content and the dielectric constant is obtained. At the same time, through the measurement of the different water contents of soil body by electromagnetic wave, this paper analyses the change rules of electromagnetic amplitude value and dielectric constant. The experiment result provides the basis for realizing the rapid non-destructive testing of roadbed water content by the electromagnetic wave

Keywords: electromagnetic wave, water content of roadbed, dielectric constant, non-destructive testing

Study on Construction Temperature Determination Method of Modified Asphalt Mixture ... Zhao Shaozong (166)

Abstract: As a non-Newtonian fluid, the modified asphalt cannot be used as matrix asphalt to determine its construction temperature by the viscosity-temperature curve. At present, the experience value commonly used at home and abroad will often cause the poor construction workability, the performance degradation and the energy waste. The mixing torque value of asphalt workability tester is used to establish the relation between

the matrix asphalt mixture and the modified asphalt mixture in order to select two matrix asphalts and two modified asphalts. According to the experimental verification and comparison of the mixture workability, the result shows that the viscosity-temperature curve is not suitable to determine the construction temperature of modified asphalt mixture. The use of torque method can better and exactly determine the construction temperature of modified asphalt mixture.

Keywords: modified asphalt, viscosity, construction temperature, workability, torque

Study on Influence of Fine Aggregate on Anti-slide Asphalt Wearing Layer Miao Penghui, Cong Lin (173)

Abstract: According to the laboratory simulation test of SMA asphalt mixture formed by the different fine aggregates through the small-sized speeding-up loading equipment MMLS3, the friction coefficient (BPN) and mean structural depth (MTD) of test specimen are measured at regular intervals, then all BPN and MTD data are analyzed for decay. And the BPN and MTD are changed to the international friction indexes (IFI) for the evaluation of anti-slide performance decay. The analysis shows that the angularity of fine aggregate has the larger influence on the anti-slide performance of asphalt mixture, and the greater the angularity of fine aggregate is, the greater the anti-slide index of mixture is.

Keywords: decay analysis, angularity of fine aggregate, anti-slide performance

Calculation Method and Influence of Normal Section Bearing Capacity of Pasted Reinforced Flexural Member under Secondary Stress Zhang Yongkang (178)

Abstract: Based on the stress-strain relation and the plane cross-section assumption of every material in the pasted reinforced flexural members of bridge, this paper summarizes the calculation method of the normal section bearing capacity of pasted reinforced flexural member influenced by the secondary stress, analyzes the influence of secondary stress on the normal section bearing capacity of pasted reinforced flexural member, and gives the calculating examples.

Keywords: pasted reinforced, secondary stress, calculation method, reinforcement effect influence

APPLICATION OF ACHIEVEMENTS

Technological Application of Stress Absorbing Layer in Fuxing Road Overhaul Project Yuan Haiyan (182)

Abstract: Aiming at the reflection cracks on the concrete reinforced layer in Fuxing Road Overhaul Project, this paper studies and analyzes the diseases. This paper analyzes the technological schemes for this key technology to treat the reflection cracks. The material indexes and acceptance indexes of the stress absorbing layer can be referred for the design and construction of the similar projects.

Keywords: reflection crack, stress absorbing layer, high-viscosity high-elastic modified asphalt

THE RELATIVE SPECIALITIES

Comparison and Selection of Interchange Scheme in Jing'an Temple Station Gong Ning (186)

Abstract: Aiming at the conditions of complex surrounding status and more control factors of the three-line interchange in Jing'an Temple Station of Shanghai Metro, this paper analyzes the control factors of its roads, buildings and pipelines, and the design difficulties of interchange scheme. This paper introduces the thoughts of two design schemes, compares the advantages and disadvantages of two schemes, and gives the optimization scheme. And also this paper introduces the other long-term reserved schemes of interchange. The focus on this scheme is how to find the best three-line interchange route in the surrounding dense buildings and the limited underground space not only to ensure the long effective operation of the future three metro lines, but also having to decrease the influence on the surrounding built areas.

Keywords: rail traffic, Jing'an Temple Station, three-line interchange, comparison and selection of schemes, design difficulties, control factor, pipe jacking

Connection Design of Precast Concrete Box-culvert Fabricated Pedestrian Underground Passage with Transverse

Joints Guo Shaoyu, Lu Yuting, Wei Xin (191)

Abstract: In order to guarantee the safety and durability of precast fabricated structure, it is very important to design its joints. Especially in the underground projects, the joints are the special weak position of precast fabricated structure under the combined action of water and soil pressure. Taking an underground passage project of Harbin City as the background, this paper introduces the design scheme of the joints for the underground passage, discusses the structural performance of joints for precast concrete box-culvert fabricated structure, and introduces the design of joints. After the comparison of the built underground projects, the result shows that the cost of the main structure of the precast concrete box-culvert fabricated underground passage compared with the cast-in-situ subway structure is increased, but the labor efficiency is improved, the construction period is shortened, the technical measures cost is reduced, the time is saved and the economic benefit is obvious.

Keywords: joints, precast, concrete box culvert, underground passage

Elementary Analysis on Current Application of Technical Standard System for Utility Tunnel

..... Qiang Jian (195)

Abstract: After the decades of study and practice, the technical standard system for the utility tunnel engineering has been established in China. Based on a mass of planning, design and practice, this paper sets forth the current application of technical standard system for utility tunnel separately from the viewpoints of

planning, design, construction and acceptance check, and analyzes the problems in the practical application of the technical standard system for utility tunnel.

Keywords: utility tunnel, standard, planning, design, construction, acceptance check

Analysis on Design of Plant Landscape in Highway Engineering Cheng Hua (199)

Abstract: In the rapid development of modern social environment, the people are increasingly demanding for the smoothness, safety and aesthetics of highway engineering. Among the demands, the plant landscape of highway occupies an important position. Based on the discussion of the characteristics, main design contents and strategies of highway plant landscapes, this paper analyzes the detailed design of plant landscape in the highway engineering by the example of the expressway (G245-G213 connecting line) around Tianfu New District of Meishan City in Sichuan Province. The plants abound along the landscape, and also provide the people with a beautiful, comfortable and harmonious driving environment.

Keywords: highway engineering, plant landscape, greening, ecological design, seeds of trees, regional characteristics

Study on Design and Calculation Schemes for Excavation of High and Low Pits of Tunnel ... Jiang Zhujin (203)

Abstract: Combined with the engineering example of the high and low pits formed by the parallel of mainline tunnel and the lower ramp in Shanghai Zhuguang Road Tunnel Project, the article compares, selects and studies the different calculation schemes of pit support. A suitable calculation scheme of high and low pits is used. On the premise of meeting the requirements of stability indexes of the foundation pit, the article compares and selects the length of retaining piles required for the foundation pit under the constructing condition of high and low pits, which can be referred for the similar projects.

Keywords: high and low pits, foundation pit supports, retaining piles, parallel ramp, Zhuguang Road Tunnel

Design and Analysis of Foundation Pit for Intermediate Ventilation Shaft of Metro in Complicated Environment of Soft Soil Area Jiang Zhiwei (206)

Abstract: Based on the engineering background of the intermediate ventilation shaft between Hunan Highway Station and Yuqiao Station of Shanghai Metro Line 18, this paper studies the design scheme of intermediate ventilation shaft in the soft soil area. According to the surrounding environment of ventilation shaft, this paper analyzes the key and difficult points in the design of foundation pit, and puts forward the relevant treatment measures. In addition, this paper simulates and analyzes the influence of excavation process of foundation pit on the surrounding municipal pipelines by the finite element software. The result shows that this design scheme can guarantee the influence of construction process of foundation pit on the surrounding pipelines is controllable, and can provide the reference for the design of the similar projects.

Keywords: intermediate ventilation shaft, soft soil, excavation of foundation pit, finite element simulation

Energy Conservation of Metro Ventilation and Air Conditioning System in Hot–summer and Cold–winter Regions

..... Xiao Binjie, Huang Liangliang (210)

Abstract: In order to carry out the national laws, regulations and policies of energy saving and environment protection, the energy utilization efficiency of air condition is improved, and the design is optimized to improve the hot environmental cooling system of the metro stations in the hot–summer and cold–winter regions. Taking Huijin Road Station of Shanghai as an example, this paper analyses the function requirements and energy saving demand of the ventilation and air conditioning systems in the metro stations in the hot–summer and cold–winter regions. The cooperative control of ventilation system and water system is used to realize the energy saving design. This energy saving control scheme can effectively provide the energy saving of the cooling system in this station. The realization of energy saving at the same time to guarantee the environmental quality of metro can effectively reduce its energy consumption. The relative technological scheme can be referred for the similar projects.

Keywords: hot–summer and cold–winter region, metro ventilation and air conditioning system, energy saving control

Application of Precast Concrete Box–culvert Fabricated Structure in Pedestrian Underground Passage in Frozen Soil

Region Sun Li, Guo Shaoyu, Lu Yuting (214)

Abstract: Based on the precast concrete box–culvert fabricated structure technique, this paper further discusses the splicing, waterproof and assembly technologies of the precast concrete box–culvert fabricated structure in the pedestrian underground passage in frozen soil region, which have the more important reference value for improving the design level of precast concrete box–culvert fabrication.

Keywords: frozen soil region, precast concrete box culvert, fabricated structure

Analysis on Application of Engineering Budget Quota in Cost Management Dong Yanyan (216)

Abstract: In the engineering construction, the budget quota of engineering cost as an important component link is a key point required for attention now. As a modern cost management tool, it is more widely applied in the project construction. The quota management is to develop a more scientific and perfect management system through the application of economics, management and other disciplines. With the application of engineering budget quota, the work efficiency can be improved stably. This will have the more significant and positive impact on the improvement of engineering budget accuracy rate. This paper studies the problems in the application of engineering budget quota in the cost management, and hopes this work will play a guiding role in the follow–up development.

Keywords: cost management, engineering budget, quota

Elementary Discussion on Preliminary Budget Compilation Method of Financial Audit Projects
..... Xia Huliang (218)

Abstract: With the development of national economy, the engineering construction projects are increasing day by day, and the project investment is also growing. At the same time, the state investment control of engineering projects has been increasingly stringent, and more and more precision is required. Combined with a tunnel project in the area of Guangdong, this paper analyzes the risk points by various methods and measures, sorts out the controversial contents possibly existing in the whole project by the strict compiling and auditing system, and purposefully puts forward the solving scheme. By communicated with the owner and the financial assessment center, the requirements of the owner for the reduction rate of financial audit of preliminary budget documents are met, which provides a useful reference for the preliminary budget compilation of the other financial audit projects.

Keywords: engineering preliminary budget, financial audit project, compilation method

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集团简介
有凯泉的地方就有水

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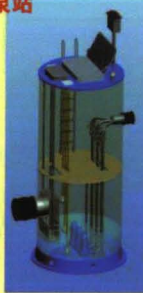
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配3台 Q=950m³/h H=17m
P=75kw 潜水排污泵