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因为我们专心，所以我们专业！
——《城市道桥与防洪》

学术联盟：上海市城市科学研究会

● 本期看点

武汉市无障碍环境建设研究
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总 编 辑：骆燕妮
责任编辑：叶 露 赵晓燕
美术编辑：杨建华
英文校审：孙宁萍
地址：上海市中山北二路901号 邮编：200092
电话：（021）55008850 传真：（021）55008850
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科技研究

相关专业

广告索引

封面工程

本期封面工程为第十一届中国(郑州)国际园林博览会B区暨双鹤湖中央公园项目。上海市市政工程建设发展有限公司作为该项目的工程咨询单位,全面代表业主单位负责工程建设的进度、质量、安全文明施工、造价控制,依靠自身丰富的市政工程管理经验和高超的技术水准提供专业服务。

该项目位于郑州航空港区南部双鹤湖片区核心区,是第十一届园博会重要组成部分。该项目占地165 hm^2,投资约40亿元,以“科技生态”为主题,致力于建设一座“先于城市又融于城市”的中央公园,实现现代科技与生态文明的有机融合。

根据总体方案设计,园区内规划布置有地下汽车联络道、城市综合管廊、地下商业广场和地下公共停车库等地下服务设施及水系、桥梁、绿化景观等。其中地下车库联络道(12.4 m×6.6 m)主线全长4.1 km,综合管廊(3.7 m×6.9 m)全长6.1 km,地下商业面积5.3万m^2,地下车库4.4万m^2(停车位1 319个),水体面积44.8万m^2,桥梁40座,水闸4座,溢流坝2座,绿地面积116.4万m^2。

该项目于2016年2月2日开工,2017年7月基本建成,9月29日与园博园同时开园。

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CONTENTS

ROADS & COMMUNICATION

Abstract: Taking Dalian Southern Binhai Avenue East End Bridge Tunnel Project as an example, the article mainly introduces the structural style and plane forking structure of large urban underground interchange, and the key overall design and construction technologies of tunnel. The super large section and large section of this tunnel are connected with excavated box culvert, and the special structures of excavated box culvert and double-arch tunnel are rare in tunnel construction of China, which provides a useful reference for the other projects in China.

Keywords: underground interchange, long-span split tunnel, excavated box culvert, double-arch tunnel, super large section

Abstract: The types and features of underground road are analyzed. The design principles and methods of urban underground road are summarized. Based on the most constructed underground tunnels, the overall design points are elementarily analyzed from three aspects of road alignment, cross section and safety facilities. The horizontal and vertical curves of driving sight distance are required to check and calculate especially in the route design. The straight line length, and the tunnel entrance and exit should be concerned in the design.

Keywords: underground road, overall design, route alignment, road cross section, road safety

Abstract: According to the land planning and the practical engineering construction condition of the project, the article analyzes the traffic capacity and service level of this road section, and introduces the overall design of urban expressway, and the design gist of the interchange scheme for two main nodes of the intersecting node of Hucheng Avenue West and Guangzhou - Qingyuan Expressway, and the intersecting node of Hucheng Avenue West and Jianshe Road III, which can be referred for the design of the similar engineering projects.

Keywords: urban expressway, forecast of traffic volume, interchange, scheme design, overall

Abstract: Bicycle traffic is an important part in the low-carbon transport. The bicycle planning emphasis in the Dongtan Eco-City of Chongming District in Shanghai is the bicycle rental system and bicycle lane system. The article puts forward the total demand of rental bicycle, the calculation method of fitted-out bicycle, and the hierarchy system and division standard of bicycle rental points, plans the overall layout of rental points in Dongtan Starting Area, and introduces the different rental points of plane layout scheme. The operation mode is the Public-Private Partnership (PPP) mode cooperated by the enterprise and government. The bicycle lane network of Dongtan Eco-City is composed of two systems of routine road and slow special land. The article defines the minimum bicycle lane widths of the different roads, and introduces the different roads of cross section design and road layout planning, and finally evaluates the reachability of bicycle rental point and the density of bicycle land in Dongtan.

Keywords: bicycle traffic, bicycle rental point, hierarchical division system, PPP mode, slow special land, cross section design

Abstract: In the present city of increasing sharply the traffic demand of motored vehicle and unbalancing seriously the traffic supply and the traffic demand, the reviving movement from road to street is rising now. Not only the planning designers, but also the managers have a better understanding of "street" and "road". The article analyzes the problems existing in the design layout of modern urban road, discusses the different road design keynotes, introduces the elicitation from the street movement and the traffic calming design, and summarizes the characteristics and application scope of calming design. Taking the Shanghai Daning Road Street Landscape Planning Project as an example, the article introduces the application of traffic calming in this project.

Keywords: road, street reconstruction, traffic calming

Abstract: Lingang Avenue as the main communication channel between Lingang New Town and Shanghai City is an important component of the radial road of Lingang New Town. Dadong Interchange is an important node in the Nanhui Section of G1501 Expressway, and is as the traffic transform node of G1501 Expressway and Daye – Dongda Highway. According to the planning of Lingang Area, the east side of Dadong Interchange is required to connect into the road and Dongda Highway is adjusted as Lingang Avenue. At the same time, Lemahe River Bridge is demolished. These will cause a certain influence on the travelling of motored vehicle and non-motored vehicle in this area. Aiming at this problem, the article introduces the scheme design from the aspects of adding the linking taxiway of intersection, perfecting the bus system, and organizing the slow traffic system and guiding the traffic of surrounding road network, which reduces the influence of project implementation on the travelling of pedestrian and vehicle in this area, and can be referred for the traffic organization scheme of the similar urban interchange nodes.

Abstract: The existing problems of urban road design are summarized and discussed. The principles and methods to design the modernized urban road are then put forward. Finally, several improvement proposals including the road route planning from the whole situation, improving the greening and landscape of road design, and integrating the municipal facilities of water supply, drainage and electrical pipelines into road design are put forward so as to improve the design quality of urban road under the background of urbanization development in China.

Keywords: urban road, design, people oriented, landscape, existing problem, improvement proposal

Abstract: Based on Hainan Province Danzhou City Haihua Island Municipal Road Project, the article proposes a set of economical and effective subgrade treatment scheme for the dredger fill subgrade of Haihua Island. According to the different requirements and the difference of dredger fill quality of the general roads within the island and the road section behind the bridge, the whole subgrade treatment scheme of Haihua Island combines three methods of cement mixing pile composite foundation, dynamic consolidation method and equal load preloading + cement mixing pile. The treatment effects of subgrade show that the treated subgrade achieves the specification requirements, and also saves the construction cost. This subgrade treatment scheme can be referred for the similar dredger fill island projects.

Keywords: soft subgrade, subgrade treatment, cement mixing pile, dynamic compaction method

Abstract: With the continuous expansion of city construction range, the road construction will be faced with a great deal of subgrade treatment work. The restricting factors of construction are more because of Lanzhou City built closely to the river. The time consumption of subgrade treatment work is long and its investment is large. The seeking of more economic and safe subgrade treatment method and measures increasingly becomes the gist of engineering construction. Combined with the engineering cases, and on the basis of comparing the subgrade treatment schemes, the combined method of riprap and displacement method with the dynamic compaction is used. Under the premise of ensuring the engineering safety, this scheme will greatly save the engineering investment. The largest characteristic of this scheme is the construction technology simple and fast, which can accumulate the experience for the treatment of flood lands in Lanzhou City.

Keywords: riprap and displacement, dynamic compaction, subgrade treatment

Abstract: The article analyzes the white and black reflection cracks of cement concrete pavement. Based on the cause and mechanism of crack, the targeted prevention measures are proposed. The article puts forward the solving method and the engineering construction gist of the reflective crack by the engineering case of

BRIDGES & STRUCTURES

Abstract: Combined with the practical engineering characteristics and aiming at the different diseases, the relevant reinforcement measures are selected. With the help of the software platform of Midas/Civil, the finite element analysis model is established on the engineering cases to carry out the theoretical reinforcement calculation of rigid frame arch bridge. The article compares and analyzes the parameters of deflection, strain and bearing capacity before and after reinforcement through the dynamic and static load tests. The result shows that the reinforcement scheme is reasonable and feasible, and the reinforcement effect is good.

Keywords: rigid frame arch bridge, reinforcement measures, finite element analysis, effect evaluation

Abstract: The arched cable pylon cable-stayed bridge has some superiority in the higher landscape requirement of bridge bid because of its appealing design, downy line and simple graceful advantages. At present, there is a little study on this kind of cable-stayed pylon in China. Its space plane system and curved pylon structure make the stress of the whole cable pylon anchorage zone more complex. Taking a single-pylon arched pylon cable-stayed bridge an engineering case, the article analyze the stress condition of cable pylon anchorage zone of arched cable-stayed pylon in detail, which can be referred for the design of the similar cable-stayed bridges.

Keywords: arched cable-stayed pylon, cable pylon anchorage zone, pre-stressing anchorage

Abstract: The orthotropic deck slab is widely used in the modern bridge engineering. Due its crisscross vertical and horizontal ribs, and the insufficient stiffness of steel roof, it is easy to cause the stress concentration and the fatigue cracking problem is serious under the partial wheel load stress. According to the idea of composite beam, a coating of RPC with various excellent mechanical properties is paved on the top of orthotropic deck roof. The roof stiffness is enhanced through the combined action of RPC and steel roof so as to decrease the fatigue cracking phenomenon caused by partial stress concentration. Taking the orthotropic bridge deck slab of Sutong Bridge as the study object, the article compares and studies the stress amplitudes at three common fatigue wearing positions. The study results show that the whole stiffness of orthotropic bridge deck RPC and roof is increased significantly after the use of the new RPC composite pavement, and the partial stress concentration is reduced. The new RPC composite pavement layer can obviously reduce the fatigue stress amplitude of the detailed parts.

Keywords: RPC, orthotropic bridge deck slab, pavement, epoxy asphalt concrete

Abstract: The article briefly introduces several common seismic isolation supports now, and sets forth the

FLOOD CONTROL & DRAINAGE

Abstract: The objective of sludge treatment and disposal is the Reduction, stabilization, harmlessness and resource in China. The article comprehensively compares and analyzes the sludge single-drying incineration technology and the sludge power-plant mixed burning technology from the total disposal of sludge, the coal transport of power plant boiler, the safe operation of power plant boiler, the discharge standard of exhaust gas and the utilization of fly ash, which can be referred for the design and operation of the similar sludge disposal projects.

Keywords: sludge, drying incineration, power plant, mixed burning

MANAGEMENT & CONSTRUCITON

Abstract: The spalling concrete, and the exposed and rusted steel bar of bridge pile foundation in water caused by the day-by-day scour of river water and sea water will lead to the hole shrinkage of pile foundation, which greatly threatens the safety of bridge structure. It is required to maintain and reinforce the pile foundation. According to *Study on Construction Technology of Steel Cofferdam for Bridge Pile Foundation in Spring Tide Range* (S20130013) and the case of Wenzhou City Dongou Bridge Pile Foundation Reinforcement Project, the article introduces the application of single-wall steel cofferdam in the treatment of quality problems of damaged and exposed-bar pile foundation in water, and sets forth several key technologies for attention in the implementation and construction of steel cofferdam reinforcing pile foundation construction scheme.

Keywords: bridge, reinforcement of pile foundation, single-wall steel cofferdam, spring tide range

Abstract: The hoisting of cross-shaped spiral sculpture over the concrete continuous box girder bridge is required to use 220-t truck crane to lift the deck. The construction load is larger. It is required to calculate and check the bridge structure. According to the simulation travel and hoisting status to achieve the relative operation parameters, and after the calculation of internal force and the recheck of reinforcement under the multi-working conditions, the result shows that the scheme is safe and feasible. The use of the cross-shaped mode to distribute the beam distributes the load of single landing leg to four subgrade boxes. The sand is paved under the subgrade box, which can solve the problem of overlarge partial load. The relative experience can be referred for the similar projects.

Keywords: truck crane, bridge structure, structure recheck

Abstract: According to the strict control in the detailed design and construction of the front-pivot form traveler for the cantilever section of main girder for cable-stayed bridge, the article introduces the application of front-pivot form traveler in the construction of space plane cable-stayed bridge, the solving method of key technical problems and the other technical details in the construction of front-pivot form traveler in detail. The relative experience can be referred for the similar projects.

Keywords: cable-stayed bridge, ultra-wide box girder, space plane, front-pivot form traveler

Abstract: The cast-in-situ full framing construction method is the most common construction method in the bridge engineering construction process. At the same time, the full framing construction is also the foundation link in the cast-in-situ box beam process. The framing strength, rigidity, stability and base bearing capacity will directly influence the engineering construction quality. Taking a practical project as an example, the article analyzes the construction method of cast-in-situ full framing. The framing pre-compaction test is carried out after the construction in order to ensure the construction quality of full framing.

Keywords: cast-in-situ full framing, vertical rod gasket laying, ballasting test

Abstract: Aiming at the characteristics of large lifting tonnage, big lifting height and high accuracy requirement of steel anchor box of a waterway bridge in North Street, the article studies and summarizes the elevated hoisting technology of large-tonnage steel anchor box including the hoisting frame design and construction of steel anchor box, the installation accuracy control of steel anchor box, and the connection control of steel anchor box and cable pylon concrete. This installation technology ensures the installation accuracy of steel anchor box, and can produce the good economic benefit and social benefit.

Keywords: steel anchor box, elevated installation, anchorage system

Abstract: The support collapse accident is a common accident in the construction process of large volume cast-in-situ continuous box girder support. The article firstly analyzes the cause of collapse accident of formwork support, and then analyzes the safety management measures for the scaffold support system so as to guarantee the construction safety of cast-in-situ continuous box girder support system.

Keywords: cast-in-situ continuous box girder, support design, scaffold management

Abstract: With the rapid development of city construction, the deep foundation pit engineering is more and more

Abstract: The highway development of China is the important guarantee to improve the economic level of the residents. At present, the highway pavement of China is mainly composed of asphalt. With the development of economy and the improvement of the people's living level in China, the sustained increment of private car ownership greatly increases the pressure to the asphalt pavement, and then causes the certain damage to the pavement. In order to improve the bearing capacity of asphalt pavement, it is necessary to carry out the technical study of the construction quality control of asphalt pavement. Combined with the working experience for many years, the article discusses the type and application of asphalt pavement construction quality dynamic control technology. The effective construction quality control of highway asphalt pavement should be taken action practicably. The new technology should be further used to create the farther development space of highway construction.

Keywords: asphalt pavement, construction quality, dynamic control technology

Abstract: The expressway asphalt pavement often undergoes the different degrees of disease because of exposing to the weather after put into service, which will cause the influence on the traffic state of expressway. The article analyzes and studies the common disease cause, type, treatment technology and preventive proposal of expressway asphalt pavement, and puts forward the preventive measures to help the reduction of the early damage of asphalt pavement, better to improve the asphalt pavement quality and to guarantee the smooth road traffic.

Keywords: expressway, asphalt pavement, influence factor, treatment technology

Abstract: The cement concrete pavement has the advantages of high strength, good stability, good durability, a few maintenance cost and high economic benefit. But it is very necessary to discuss the repair construction technology of cement concrete pavement crack because of more common crack problems of cement concrete pavement. The article analyzes and discusses the damage causes, types, repairing status and crack repair construction technology of cement concrete pavement, which can be referred for the similar projects.

Keywords: concrete pavement, damage cause, crack repair technology

Abstract: The highway is the constituent part of the transportation infrastructure, and plays a decisive role in the national economic construction and the people's life. At the same time, the rapid development of highway transportation has put forward the high requirement for the highway maintenance. The article analyzes and discusses the existing problems, influence factors, principle and contents of highway maintenance machinery allocation. It stands from present and looks forward to the future. The professional maintenance and mechanical maintenance are the development direction of highway maintenance.

Keywords: highway mechanization, maintenance, machinery allocation, technical application

Abstract: The center cross-diaphragm (CRD) method is a common construction method in the weak stratum construction of tunnel. The utilization of CRD method to construct can effectively prevent the sinking and deformation of supporting structure, prevent the horizontal displacement of soil body and reduce the ground settlement. Taking Majiapo Tunnel as an example, the article analyzes the engineering geological situation of tunnel. According to the study, it is designed to use the CRD method for the excavation construction of tunnel. The article discusses the construction technology of CRD method, which can be referred for the construction of the similar tunnel projects.

Keywords: CRD method, crossing silty-fine sandstone, tunnel, advanced small catheter

Abstract: The use of standardizing construction management can ensure to achieve the great effects in the quality, safety and schedule of expressway construction management. Combined with the standardizing construction management practice of T-beam precast yard in Contract Section 18 of civil engineering of Liuwei Expressway, the article sets forth the relative contents of expressway standardizing construction management.

Keywords: expressway, T-beam precast, standardizing, yard construction, safety

STUDY ON SCIENCE & TECHNOLOGY

Abstract: Aiming at three characteristics of more positions, wide places and a few number of steel urban bridge, the article puts forward the general paving technology scheme of steel urban bridge, introduces the durable waterproof bonding system including the epoxy mica anticorrosive coating, the large dose no solvent of epoxy resin waterproof layer and the hot melt particle bonding material. The paving construction using the fine-granule dense high-viscosity asphalt mixture can guarantee the watertight feature, flexibility, high-temperature stability and anti-skid performance, and is beneficial to the following maintenance and repair. A series of property test is carried out including the material pull-out test, stretching test, attendant test, and paving system shear, pull-out and fatigue tests. The test results show that this paving system has the better pavement performance and durability.

Keywords: urban bridge, steel deck paving, hot melt particle, general scheme, chemical bonding

Abstract: The rapid treatment of soft soil subgrade is the effective measures for shortening the road construction period and ensuring the construction quality. Combined with the flood land soft soil of Changjiang River in Hexi Region of Nanjing, the article introduces the development of a high-efficient economic soft soil curing agent. The main curing material is the cement, and the auxiliary curing materials are

THE RELATIVE SPECIALITIES

Keywords: investor, municipal, BT project, settlement, construction cost, examination

Abstract: Based on the statistical analysis of section type, flat rate and supporting parameter of the flat large-section tunnels at home and abroad, the article preliminarily evaluates the design parameters of Maluanshan Tunnel in Shenzhen - Pingshan - Yantian Expressway Project relying on Shenzhen - Pingshan - Yantian Expressway Project. The conclusion is that the design section type, flat rate and supporting parameters of Maluanshan Tunnel basically conform to the tendency of large-section design at home and abroad, are more reasonable as a whole, and but have the certain optimization space.

Keywords: large-section tunnel, flat rate, section type, supporting parameter

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