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12 2015 December 总第200期

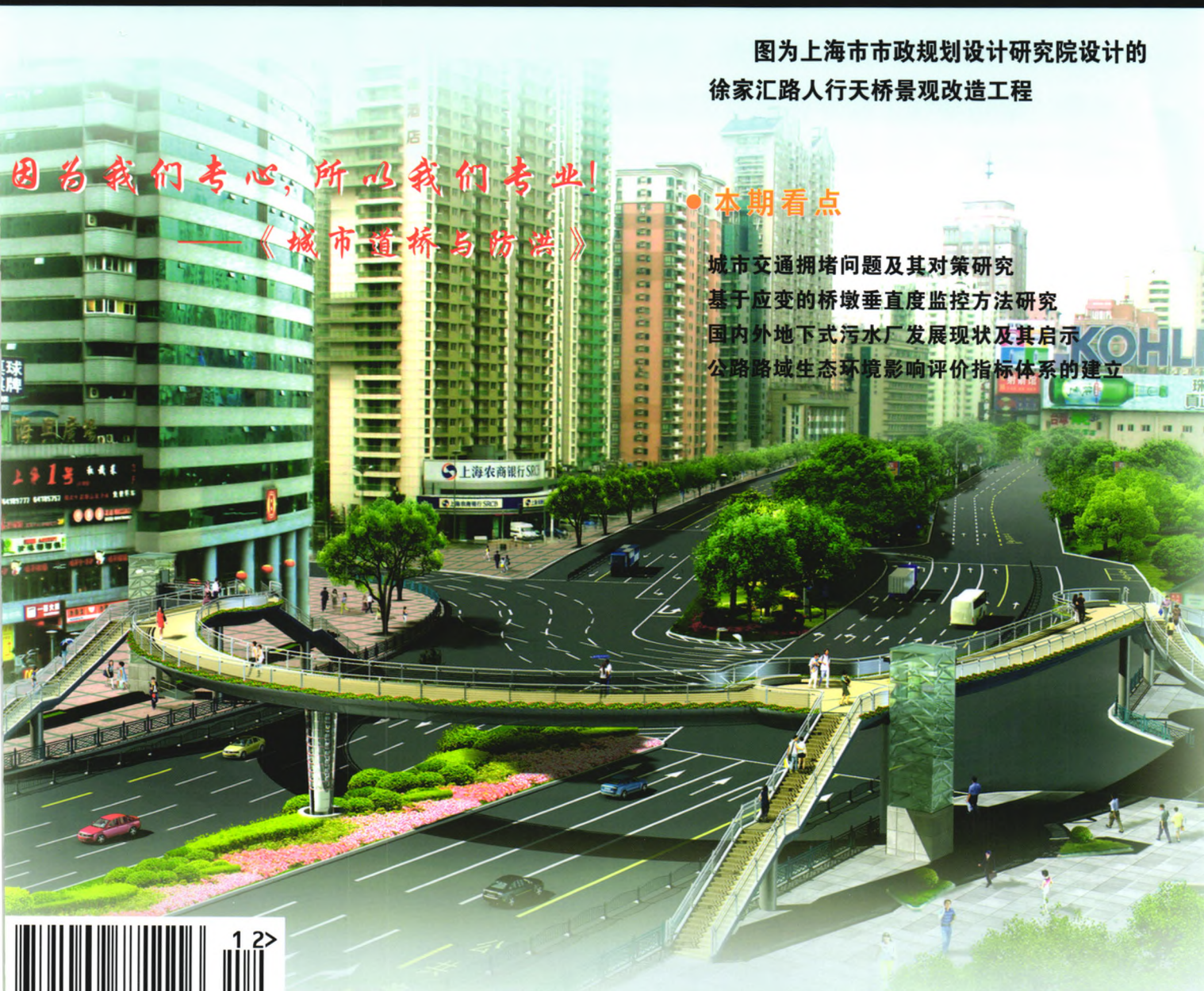
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● 本期看点

- 城市交通拥堵问题及其对策研究
- 基于应变的桥墩垂直度监控方法研究
- 国内外地下式污水厂发展现状及其启示
- 公路路域生态环境评价指标体系的建立



中华人民共和国住房和城乡建设部优秀期刊

城市道桥与防洪 (月刊)

CHENGSHI DAOQIAO YU FANGHONG

2015 年 第 12 期 (总第 200 期)

2015 年 12 月 15 日出版

1984 年创刊

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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出 版: 《城市道桥与防洪》编辑部

总 编 辑: 骆燕妮

责任编辑: 叶 露

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来稿邮箱: cdq@smedi.com

国外发行: 中国国际图书贸易总公司 代号: BM 1859

排版印刷: 上海竟成印务有限公司

地址: 上海市纪念路 500 号 邮编: 200434

中国标准连续出版物号: CN 31-1602/U

广告许可证号: 3101020130030

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Urban Roads, Bridges & Flood Control (Monthly)

Number 12, 2015(Total Number 200)

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Study of Congestion Problems and Countermeasures for Urban Traffic Jiang Yan, Liu Qiaoyun (1)

Abstract: The congestion of urban traffic is one of main factors restricting the development of urban traffic. According to the analysis of the present situation of urban traffic congestion in China, it is found that the limited traffic supply is hard to satisfy the increasing traffic demands, and it is the primary cause of urban traffic congestion. The solving of urban traffic congestion must proceed from two aspects of traffic supply and traffic demand on the one hand of greatly developing the bus priority system and reasonable urban traffic planning to increase the traffic supply, on the other hand of utilizing the administration means and the charging measures to control traffic demand. Finally, on this basis, the urban roads are intelligently administrated to play the function of urban road to the largest extent.

Keywords: congestion of urban traffic, traffic supply, traffic demand, bus priority

Study on Land Traffic Demand Forecast and Traffic System of Kunming Changshui International Airport

..... Xiong Kun (4)

Abstract: Kunming Changshui International Airport is positioned as the large hub airport facing the South Asia and Southeast Asia, and connecting the Eurasian, and is the core of the airport layout and the aviation network in Yunnan Province. Based on the annual passenger throughput of the long-term objective of Kunming Changshui International Airport, the article forecasts the peak hour of land traffic demand of airport so as to reasonably determine the construction scale of land road system. According to the scale and overall layout of the terminal area of Kunming Changshui International Airport, the article puts forward the analysis idea and principle of land traffic system, and introduces the design idea of “operation speed”, “step-by-step separation” and “three-main and three-auxiliary road”. The people-foremost traffic trip service can be provided for the airport passengers interchanging many traffic lines and multi-floor traffic by the engineering measures of classifying and grading to set up the special parking lots of taxi and bus, and landing floors and departure floors according to the different vehicle types and the different areas for parking.

Keywords: hub airport, land traffic, forecast of traffic demand, traffic system, Kunming

Study on Design Method of Throat Depth Length at Road Exit and Entrance of Port Zhu Xianzhi (9)

Abstract: The port is the cargo distribution center, mostly being the start point of highway or city road and having the different traffic characteristics. The problems of traffic safety and traffic delay are easily caused

at the road exit and entrance of port because of unsmooth connection. The article analyzes the traffic characteristics at the road exit and entrance of port, introduces the establishment of simulation model, analyzes the corresponding relationship between the throat depth length and controlling delay time, and determines the reasonable throat depth length for the design of port road in order to ensure the safety and smoothness of driving.

Keywords: port road, exit and entrance, throat depth, design

Optimization of Road Design Scheme from Angle of Road Traffic Noise Influence Shu Jinqiong (12)

Abstract: In order to solve the problem of traffic noise nuisance, the article introduces the optimization of road scheme from two aspects of adjusting the local road line and road section by a case of Binjiang Avenue Project, and at same time to optimize the scheme from the angle of noise influence. The article introduces the scientific modeling for the noise influence of road engineering on the environment and the assessment for it. The article further puts forward the optimization and improvement of design scheme for the surrounding sensitive objectives after the road construction.

Keywords: road, traffic noise, environmental influence assessment

Analysis on Layout and Construction Form of Expressway Network in Center of Ningbo City ... Quan Hongwei (15)

Abstract: As the main frame of city road network, the expressway has become the effective measures to ease the urban traffic pressure. Aiming at the present traffic supply and demand contradiction in the central area of Ningbo City, the article analyzes the necessity of expressway construction. Based on the analysis of urban space layout structure in Ningbo City Master Plan, the article puts forward that the ring-shaped radial layout can be used for the expressway network in the central area, in which the 田-shaped road network structure is suitable for the main city area, and focuses analysis on the construction scheme of the 田-shaped road network. The “strong ring + cross-shaped link” construction type is recommended.

Keywords: expressway network, urban space layout, road network layout, construction type of road network

Design of Master Alignment and Node Scheme of Nanshan Road (Jianghai Road - Wuyi Road) ... Jin Xuefeng (18)

Abstract: According to the analysis of several design control points at Nanshan Road Tunnel, K0+780 Tunnel and Nanshan Interchange in Jiangmen City, the article completely introduces the master design scheme and alignment optimization of Nanshan Road Project.

Keywords: main trunk road of city, master design, bored tunnel, interchange

Study on Design Scheme of Beigong Road Overpass Pan Hualei (21)

Abstract: Beigong Road Overpass crossing over Lianshi Road is an important junction located in the rural-urban fringe in the west of Beijing, which connects Changxindian Area of Fengtai District and the new district of Mentougou with the city centre. The article analyzes the present road network of the engineering area, forecasts the traffic flow of the newly built overpass, and introduces the design and comparison of overpass scheme. On the basis of fully comparing, studying and proving the schemes, and according to the adjustment of the measures to local condition, the land is saved. Combined with the comprehensive development planning of the area, the project is implemented by the combination of the short term and the

long term. The developing space is retained. The engineering investment is saved. This project embodies the design idea of “green ecology, natural harmony and sustainable development”.

Keywords: selection of overpass, design of overpass, comparison and selection of schemes, optimization

Decision Making for Engineering Scheme of Pedestrian Tunnel in Urban Business Center Chen Jianfeng (25)

Abstract: The congestion at the main traffic intersection of business center is the common traffic problem in every bid city, in which the larger traffic volume of pedestrian and not regulated traffic are more obviously affected on the normal traffic of motored vehicle. The article introduces a case of pedestrian tunnel project constructed at the main traffic intersection of business center, sets forth its traffic, analyzes the basis of decision making, the influence on the field pipelines, the surrounding buildings and geological conditions, and introduces the main factor affecting the comparison, selection and study of engineering schemes, which can be referenced for the similar projects.

Keywords: pedestrian tunnel, engineering scheme, excavation construction, construction of rectangle-type pipe jacking

Analysis and Revision on Calculation Deviation of Earthwork in Curved Section of Roadbed

..... Pan Dan, Huang Zhicai, Peng Xiaobin (30)

Abstract: The section method is usually used for the roadbed earthwork of highway project. But for the special constructing points of the irregular alignments, i.e. curve and interchange, the conventional section method will have the greater deviation to calculate the earthwork, and will bring the dispute or even loss to the projects. Combined with the cases in expressway projects, the article analyzes the deviation causes and revision arithmetic of roadbed earthwork calculation of curved section, which can be referenced for the similar projects.

Keywords: curved section, roadbed earthwork, arithmetic, deviation, revision

Elementary Discussion of Signal Control at Grade Intersection of Modern Tramcar in Germany ... Yu Xiaochen (33)

Abstract: The tramcar signal priority at intersection is one of measures to greatly promote the public traffic. So it becomes the hottest topic in the signal control of tramcar at intersection. The cities operating tramcars, the relevant design offices and the research institutes have much explored on it. However, a large number of intersections in China are under the fixed time control. Therefore, the technology of flexible sensing control and tramcar signal priority is not too well known. Additionally, there is misunderstanding for some details and notions. In comparison, since the last century 80's, Germany has continuously researched the tramcar signal priority at intersection. And with the development of intelligent traffic systems, the Know-how in this field will be further improved.

Keywords: tramcar, intersection at grade, signal control, signal priority, Germany

Elementary Discussion on Angularity Performance of Reflective Sheeting Used for Traffic Sign of Road

..... Yang Erong (40)

Abstract: By analyzing the research result of legibility on traffic sign in China, the article gives the most-distant legibility distance and disappear distance of traffic sign, calculates the angle of incidence of vehicle headlight for traffic sign and the observation angle changing range of the drivers for traffic sign of the

different types of vehicle between the most-distant legibility distance and disappear distance, and finally points out that the reflective sheeting of sign should be selected by the angularity performance of reflective sheeting according to the theoretical calculated values.

Keywords: traffic sign, legibility, reflective sheeting, angularity

Elementary Discussion of Problems Existing in Road Lighting Design Process ... Zhang Jiqiang, Tang Kailiang (43)

Abstract: Aiming at the road grade lighting index existing in the design process of road lighting, the article analyzes the light distribution types and layout modes of lamps, and the installation heights and separation distances of lamps, and puts forward the corresponding solving scheme.

Keywords: road grade, lighting design, light distribution types

BRIDGES & STRUCTURES

Design of Main Bridge for Jinguang Bridge in Suzhou City Zhao Qingbo, Gao Yuan (45)

Abstract: The article focuses introduction on the structure of 100-m steel truss arch bridge of the main bridge for Jinguang Bridge in Suzhou including the design of every member, steel structure corrosion resistance, design calculation and other contents.

Keywords: steel truss arch bridge, master design, corrosion resistance, structure design

Study on Monitor Method of Pier Verticality Based on Strain

..... Geng Bo, Duan Qionglin, Kong Xiaojun, Peng Zuo (48)

Abstract: The article studies the monitor method of high pier verticality of mountainous bridge based on strain by Xunquan Expressway in Jiangxi. Referring the relative norm of railway, the limit value of pile top displacement is achieved on the height of bridge pier, and then the limit value of strain differences at two sides of pier bottom is achieved by the numerical simulation method. The measured strain differences at two sides of pier bottom are used to monitor the pier verticality. The result can be used for this project.

Keywords: strain, high pier, verticality, construction monitor

Study on Application of Permanent Observation Points Laid for Simply-supported Box Beam Bridge

..... Wang Gang, Zou Jikun (51)

Abstract: The permanent observation points and periodic observation of the bridge are the effective measures and means to know well the deformation, the displacement, the changing velocity and trend of bridge, and safety warning in time. This paper introduces the meaning, layout scheme and implementation cases of the permanent observation points of the bridge. The actual elevation relationship of observation point and bridge deck alignment is established through data collection, and the settlement values of main pier and main girder are calculated by the comparison of its actual elevation and the measured elevation. Its achievement is firstly used in observation in order to provide guidance and promotion for the operation safety monitoring of bridge maintenance.

Keywords: bridge, permanent observation point, achievement, application

Analysis on Local Stress of Arch Foot V Support for Rule Lake Bridge Zeng Tianbao, Zhang Lin (54)

Abstract: The arch foot V support is the key point of stress for the beam and arch combined bridge. The article simulates and analyzes the whole process of its arch foot V support by the Rule Lake Bridge. The significant conclusion is achieved for the design and construction.

Keywords: arch foot V support, beam and arch combined bridge, structure analysis

Comparison of Horizontal Vehicle Load in Foreign Design Specification Li Ji, Wang Honglong, Liu Xukai (57)

Abstract: With the year-by-year increment of the foreign construction investment scale of China and the integrated trend of the international market, the design institutes of China find the unprecedented opportunity of developing the international design - construction general contracting market. Facing the opportunity and challenge in international building market, it is required to master the international popular design specifications, such as: the traditional norm of the United Kingdom - British standard, the traditional norm of French - Fascicule, and the European norm - Eurocode drafted and strongly recommended by the European Standardization Committee so as to satisfy various requirements of the international market owners. The article focuses introduction on the specifications of horizontal vehicle load in the above three norms, and summarizes, compares and analyzes these norms in order to provide the reference for the bridge engineers during the international engineering design.

Keywords: opportunity of international construction market, foreign design norm, horizontal vehicle load, comparison.

FLOOD CONTROL & DRAINAGE

Present Situation of Development of Underground Sewage Plant at Home and Abroad and Its Enlightenment

..... Zhu Feng (62)

Abstract: With the fast development of urban industrialization and urbanization of China, the land resources are increasingly scarcer and the demands of the people for the living quality are high. The underground sewage plants are started to construct in China one after another. The article introduces the present situation of the development of underground sewage plant at home and abroad, sums up the advantages and disadvantages of underground sewage plant, and discusses the development trend of underground sewage plant in China by the construction of foreign underground sewage plant.

Keywords: sewage plant, underground, development

Application Practice of Advanced Dewatering and Resource Utilization of Urban Sludge Shen Jie (66)

Abstract: Based on the 200-T sludge advanced dewatering technology (80% water content) in Shanghai Jinshan Wastewater Treatment Plant, the article reviews the advanced dewatering technological engineering design, operation parameters, system deodorization and economy analysis of sludge by the pre-concentration - FeCl₃ and CaO conditioning - plate frame filter press, and analyzes the treatment, disposal and resource utilization of sludge cakes. The results show that the conditioning of FeCl₃ and CaO can alter surface characters of sludge particles and increase the compressibility of sludge. The water content of sludge cake is less than 60% after advanced dewatering, and satisfies the landfill standard. In addition, this kind of sludge cake can be used for making bricks and soil matrix of landscaping as well as incinerating disposal.

Compared with the traditional sludge dewatering technology, this technology is more economical and environmental friendly. The experience of process flow, operation parameters and economic benefit of this project can be referenced for the similar projects.

Keywords: municipal sludge, advanced dewatering, plate frame filter press, resource

Discussion on Collection and Treatment Methods of Urban Prime Rainwater Shi Huiting (69)

Abstract: In recent years, the pollution problem of urban prime rainwater has received widespread attention at home and abroad. The relative study shows that the pollutant content caused from the rainwater runoff occupies about 80% of the rainfall within 10~20 min of the prime rainfall. The pollution concentration of urban prime rainwater is great. With the increment of rainfall, the sewage concentration gradually reduces. Aiming at the causing process and the characteristic of urban prime rainwater, the article analyzes the collection and treatment methods of urban prime rainwater, and studies the calculation method of storage tank. In order to control the pollution of urban rivers and received waters, and to improve the status of urban water environment, the design idea is proposed.

Keywords: urban prime rainwater, storage tank, collection and treatment

Discussion of Farmland Irrigation Engineering Planning Design Tian Zhiwei, Wang Chao, Li Jiehua (72)

Abstract: On the basis of analyzing the engineering importance of farmland irrigation, the article summarizes the farmland irrigation engineering planning design including the forecast of prospect scale, the reasonable calculation of drinking water amount, how to ensure the irrigation capacity and anti-drying weather date, the design of water intaking method, the design norm of irrigation channel, and the design of layout area. Finally, the article summarizes the safeguard measures of implement and operating the irrigation planning, which can be referenced for the farmland irrigation engineering planning design.

Keywords: farmland, irrigation, planning design

Paint Wastewater Treated by Combined Process of Iron Carbon Micro Electrolysis and Biological Contact Oxidation Yang Xin, Wu Fuping, Ma Guogang, Tan Zhouquan (74)

Abstract: The combined process of iron carbon micro electrolysis and biological contact oxidation is used to treat the paint wastewater. The best iron-carbon ratio and pH are defined by the experiment of micro electrolysis, and the changes of COD, ammonia nitrogen removal rate and pH in a running cycle (2h) are studied under the condition of defining the optimum parameters. The removal rates of COD and ammonia nitrogen are 43.71% and 33.5% respectively by the experiments of micro electrolysis. The removal rate of COD is 70.50% by the process of biological contact oxidation. The effluent pH and COD attain the primary standard of *Integrated Wastewater Discharge Standard*(GB8978-1996).

Keywords: paint wastewater, iron carbon micro electrolysis, biological contact oxidation

Selection and Deformation Control of Foundation Pit Retaining Structure in Yueluo Highway Sewage Pipeline Double-line Project Wu Songling, Bei Han (77)

Abstract: Combined with Yueluo Highway Sewage Pipe Jacking Project, the article sets forth the selection of pipe construction mode located in the main trunk road of city and compares the advantages and disadvantages of the different pit retaining structures, and also according to the practical engineering conditions, simulates

and calculates the influence of foundation pit on the ambient environment and the deformation condition of soil during construction.

Keywords: pipe jacking, retaining of foundation pit, deformation calculation

MANAGEMENT & CONSTRUCTION

Analysis on Benefits of a New GSOG-20 Asphalt Mixture Used to Suppress Reflection Cracks Guo Yabing (80)

Abstract: The GSOG technology of suppressing the reflection cracks used in the old cement pavement asphalt overlays has been widely applied in the area of Shanghai. A new GSOG asphalt mixture modified by rubber powder and high viscosity modifier has been developed in 2015. This new asphalt mixture has the excellent performance suppressing the reflection cracks after proved in the test section. The innovation points of this test are firstly to use the limestone as coarse aggregate in high viscosity discontinuous gradation asphalt mixture, and to introduce the waste rubber powder in this test. The article analyzes and discusses the application value and market prospect of this new asphalt mixture from economic benefit and social benefit.

Keywords: GSOG, waste rubber powder, limestone, compound modification

Analysis on Measures of Improving Evenness in Construction of Asphalt Pavement Yan Linjun (82)

Abstract: The evenness is one of important indexes to evaluate the comprehensive using performance of municipal road, directly determines the important characters of driving comfort and safety, and also has the important effect on the using value, service life, utilization rate and economic benefit of municipal road. The article analyzes the method and measures of improving the asphalt pavement evenness in the construction of municipal road. The relative experience can be referenced for the relative technical members.

Keywords: municipal, road, asphalt road, evenness

Application of ATPB Open Graded Asphalt Stabilized Macadam Flexible Base in Reconstruction of Municipal Road Fu Jinggang (84)

Abstract: Reflective crack is one of the main diseases of asphalt pavement. Aiming at this problem, the article puts forward the large grain asphalt mixture, as the flexible base is used for the municipal road. According to its good drainage characteristic and its higher durability, the large grain asphalt mixture of ATPB asphalt macadam as the base is used in the secondary molding of Oujiang Road. And the good result is achieved.

Keywords: municipal road, large grain asphalt mixture, reconstruction, base, ATPB

Study on Workflow of Traffic Engineering Quality Supervision Management Gao Jiedun, Ding Zhengxiang, Ge Songbin (87)

Abstract: Combined with a science and technology project of Zhejiang Transportation Bureau – No. 2014T04 *Building of Traffic Quality Supervision and Management Workflow and Analysis of Business Data*, the article studies the workflow of traffic quality supervision industry management organization in Zhejiang, builds the existing workflow chart, and presents the better design methods of rebuilding workflow. The study achievement can guide the establishment of three-level province-municipality-county quality supervision business system, and lay the foundation for realizing the information integration between the new and old

systems.

Keywords: traffic engineering, quality supervision, workflow

Elementary Discussion on Measures to Improve Engineering Quality of Municipal Road Zou Jiandong (91)

Abstract: The article briefly introduces the common problems existing in the engineering quality of municipal road, deeply analyzes the influence factors, discusses the measures to improve the engineering quality of municipal road, and puts forward some actual management and control methods. The application of these methods in the practical engineering proves the availability of these methods.

Keywords: road engineering, quality, influence factor, measures

Study on Construction Technology of Urban Cable-stayed Truss Bridge Zheng Hu (94)

Abstract: The cable-stayed truss bridge is one more advanced bridge structure now, and can better solve the corrosion resistance of flexible cable stayed bridge and the problem of stayed cable fatigue. This bridge has the advantages of good rigidity, small investment cost, beautiful modeling and reasonable stress. Based on this, the article discusses the construction technology of urban cable-stayed truss bridge.

Keywords: urban cable-stayed truss bridge, bridge construction technology, discussion

Optimized Design of Form Traveler for Long-span Wide Continuous Rigid Frame Bridge Long Bing (97)

Abstract: Taking a long-span wide continuous rigid frame bridge as a practical example, the article analyzes the engineering construction of long-span wide continuous rigid frame bridge, and sets forth the optimized design of form traveler used in the engineering cantilever construction of long-span wide continuous rigid frame bridge.

Keywords: long-span wide continuous rigid frame bridge, form traveler cantilever construction, optimized design

Low-temperature Construction Technology of Combined Beam Cable-stayed Bridge Jiang Xiaokui (101)

Abstract: There has been a set of well-known construction technology used for the construction of combined beam cable-stayed bridge under the normal temperature environment now. But at present, there is no precedent to construct this kind of bridge in winter in the cold regions. The difficulties are mainly the control of steel beam alignment, the control of steel beam closure, and the control of concrete quality in the pouring of wet joint concrete in winter. Taking a combined beam cable-stayed bridge as an example, the article discusses the low-temperature construction technology and the construction process control in winter of combined beam cable-stayed bridge. The relative experience can be referenced for the similar projects.

Keywords: combined beam cable-stayed bridge, low-temperature construction, construction gist

Integrated Large Bent Cap of Liziping Bridge No.1 Ouyang Longshun (104)

Abstract: In the integrated large bent cap project of Liziping Bridge No.1, the curve of long-span pre-stressed concrete continuous rigid frame beam and its high pier are very complicated. The linearity and the inner force of large bent cap are closely linked with the construction technology. The article analyzes the engineering conditions, planning arrangement and construction preparation, discusses and sums up the relative theoretical calculation and the relative practical technology, and drafts the scientific construction

scheme so as to ensure the successful construction of large bent cap.

Keywords: Liziping Bridge, integrated large bent cap, construction technology

Elementary Discussion on Hoisting Technology for Steel Box Beam of Suspension Bridge Xu Shengbiao (107)

Abstract: The hoisting of steel box beam is a very important procedure in the construction of ground anchored suspension bridge and is an important link directly to affect the system safety of suspension bridge. The article introduces the hoisting technology of non-standard segment of steel box beam of suspension bridge by Stamford Bridge in Danang City of Vietnam. The relative experience can be referenced for the similar bridges.

Keywords: suspension bridge, steel box beam, hoisting

Analysis and Management on Drill Falling of Cast-in-situ Piles for a Bridge Ye Yuanfen, Gao Yunfeng (110)

Abstract: There are many factors to cause the drill falling in the construction of cast-in-situ piles, such as the complex geological conditions, construction operation and mechanical causes. This paper analyzes the cause of drill falling in the construction of cast-in-situ piles for a bridge, and introduces the management scheme of drill falling including the in-situ salvage, expansion of pile diameter and increment of pile number. Finally, the optimal scheme is elected after comparison. The increment method of pile is selected for this project, but it is required to recalculate the reaction force of every pile in order to ensure the safety.

Keywords: cast-in-situ pile, drill falling, expansion of pile diameter, increment of pile number

Study on Design and Construction Technology of Bridge Foundation Zhang Liqun (112)

Abstract: In the engineering design and construction of bridge foundation, it will be affected by various extraneous factors owing to the complexity of the environment. In order to guarantee the construction of bridge foundation, it is required to carry out the reasonable design and use the reasonable construction technology. Based on this, the article studies and discusses the design and construction technologies of bridge foundation.

Keywords: bridge foundation, design, construction, cast-in-situ pile

Traversing Erection Construction Technology of T-shaped Beam Prefabricated by Steel-tube Pile Bailey Bracket Fan Yuanlin, Huo Zhao cai (115)

Abstract: Huangyi Changjiang River Bridge is located within Huangyi Town of Luzhou City in Sichuan Province. The total length of this bridge is 1 223 m. The construction of the prefabricated T-shaped beam for the approach bridge is limited by the field. The T-shaped beam is prefabricated by erecting the steel-tube pile Bailey bracket near the piers, and is directly installed on the bent cap in traversing after tensioning. Under no condition of constructing the prefabrication site, the article introduces the construction technologies of using the steel-tube pile Bailey bracket to erect T-shaped beam prefabrication pedestal and the traversing installation.

Keywords: steel-tube pile Bailey bracket, prefabricated T-shaped beam near pier, traversing installation

Elementary Discussion on Optimization of 0# Provisional Anchorage and Bracket System Constructed by Traveling Form Guo Xiaobing (118)

Abstract: Taking Dongshan Bridge in Bid A of Dongshan Liaison Line in Haixi Expressway as the

background, the article introduces the scheme optimization and comparison of the main bridge 0# cast-in-situ bracket and provisional anchorage system of Dongshan Bridge. The optimized scheme uses the simple concrete column instead of the conventional concrete filled steel tube support system, which improves the construction safety, speeds up the construction schedule and also reduces the construction cost.

Keywords: traveling form, cantilever pouring, provisional anchorage, 0# block, optimization

Discussion on Design and Operation Management of Large-scale Wastewater Treatment Plant

..... Jiang Lingyan, Wang Rongsheng (120)

Abstract: The characteristics of large-scale wastewater treatment plants in China are summarized and analyzed. The optimal design proposal for adapting to the practical production of large-scale wastewater treatment plant is proposed. The operation management suggestion is put forward to improve the standard of large-scale wastewater treatment plant.

Keywords: large-scale wastewater treatment plant, operation, design

Analysis on Influencing Factor of Deep Foundation Construction on Ambient Environment and Its Preventive Measures

..... Ye Sheng (122)

Abstract: There are many influence factors of deep foundation construction on the ambient environment, including the natural factors of geological conditions of the soil in the foundation pit site, the procedure and conditions of construction, and the human factor of construction quality. In order to guarantee the safety of ambient environment during construction, it is required to deeply analyze these influence factors, and to find out the internal connecting link of the influence of deep foundation pit construction on the ambient environment. In the construction process, some preventive measures are taken to ensure the safety of the ambient environment during the construction of deep foundation pit and to minimize the influence of construction on the ambient environment.

Keywords: construction of deep foundation pit, influence factor, preventive measures

Plane Fitting Calculation of Deep Horizontal Displacement at Side Wall of Foundation Pit

..... Jiang Feng, Li Zheng (126)

Abstract: In the excavation of foundation pit, the deep horizontal displacement will be caused under many influencing factors, thereby to bring some unfavorable effects on the stability and construction of foundation pit. In order to control the displacement range of deep horizontal displacement in the excavation of foundation pit, to ensure the stability of foundation pit and to promote the smooth excavation of foundation pit, it is usually to design a set of deep horizontal displacement monitoring scheme of foundation pit in the excavation of foundation pit. This scheme uses the relative instruments to observe and survey the deep horizontal displacement of foundation pit. But this scheme can only reflect the local position changes at the side wall and inclined hole of foundation pit, and is hard to master the whole of deep horizontal displacement change at the side of foundation pit. Aiming at this situation, a common mathematics software Maple is used to carry out the fitting calculation of deep horizontal displacement at the side wall of foundation pit excavated in a project in order to strengthen the master and control of deep horizontal displacement at side wall of foundation pit. The article discusses the range of most close to the actual value of deep horizontal displacement, which can provide the reliable data support for the following excavation of foundation pit and promote the smooth excavation of foundation pit.

Keywords: side wall of foundation pit, deep horizontal displacement, plane fitting calculation

Study on Application of Shield Cutter Head Gear in Repair Technology in Tunnel Rao Bo (128)

Abstract: The article describes the repair of damaged cutter head gear in the tunnel of Duniyang Avenue Station ~ Sport Center Station (S) in Bid II of Wuhan Rail Traffic Line 3, and introduces the technical measures of gear repair in tunnel, and the parameter setting and technical measures of shield tunneling after gear repair, which ensures the shield tunneling in and evades the risks of excavating shaft, hoisting cutter head out and returning to factory repair because of hard to repair in tunnel. This repair technology can be referenced for the similar projects.

Keywords: areal tunnel, fatigue crack, bead weld, detection of defects, parameter setting

Study on Main Factors of Influencing Tender Valuation of Contractor in Construction Engineering Bid Document Li Dong, Han Xiaoling (133)

Abstract: The engineering bid document reflects the bidder expectations and the requirements of tenderers for the project, and is the programmatic document to guide the tenderer for the preparation of tender documents. Some main contents in the bid document are very important for the tenderer to accurately carry out the tender valuation and define the tendering strategy. The accuracy of tender offer will be also directly related to the probability of winning contract and the profit of contractor. Therefore, the tenderers need to carefully study the bid documents and analyze the main factors more greatly affecting the tender valuation so as to make the tender offer more accurate and reasonable in order to achieve the desired effect of the tender.

Keywords: bid document, tender valuation, bill of engineering quantity, affecting factor

Analysis and Study on Application of Modern Surveying and Mapping Technology in Water Conservancy Engineering Management Fan Siyi (136)

Abstract: With the age of continuous evolution, the engineering construction of water conservancy has a completely new look. The surveying and mapping technology runs through the whole process and plays the important part in the water conservancy engineering management. Its measurement accuracy has a close relationship with the water conservancy engineering quality. With the increasing development of science and technology, all kinds of modern surveying and mapping technology emerge as the times require, and are gradually used in the water conservancy engineering management. Therefore, the article discusses the application of modern surveying and mapping technology in the water conservancy engineering management.

Keywords: water conservancy engineering management, modern surveying and mapping technology, application, discuss

Study and Preparation of Repair and Maintenance Procedure of Farmland Waterlogging Drainage Facilities in Shanghai Li Nianbin, Huang Meng (139)

Abstract: After the construction for more than 10 years, the engineering system of farmland waterlogging drainage facilities is relatively perfected in Shanghai. But the problem of paying attention to construction and neglecting management is more prominent. The service life of some farmland waterlogging drainage facilities is too short, and the engineering benefit is reduced. In order to completely reverse this situation, the professional departments organized by Shanghai Water Affairs Bureau study and prepare the repair and

maintenance procedure of farmland waterlogging drainage facilities on the basis of investigating and studying the engineering status and management situation of farmland waterlogging drainage facilities in the whole city, which provides the scientific basis for the management of farmland water drainage facilities.

Keywords: farmland, waterlogging drainage facilities, repair and maintenance, procedure, Shanghai

Study on Safety Technology in Construction of Deep Foundation Pit Closing to High Voltage Transmission Line ...

..... Cai Hongmin, He Yijian, Zhu Guangjun (143)

Abstract: The article analyzes the technical characteristics and difficulties in the construction of deep foundation pit closing to a high voltage transmission line by a construction case of deep foundation pit in a project. The article introduces the reasonable planning of earthwork transport line for this project, the protection of high voltage line and the surrounding pipelines, the determination of supporting and removal scheme in the dense residential area, and the monitoring analysis of the whole construction process. The better economic benefit and social benefit are achieved in this project.

Keywords: support of foundation pit, optimization of trestle bridge, protection of high voltage line, support and removal, monitor of pipeline

Discussion on Monitoring Period of Peripheral Environment in Construction of Foundation Pit - - - Liu Dawei (147)

Abstract: The article introduces the main factors affecting the peripheral environment in the construction of foundation pit, synthesizes the engineering practical experience, and puts forward that it should be to extend the monitoring period for it on the basis of current local standards and requirements so as to protect the safety of peripheral environment of foundation pit and to avoid the unnecessary disputes.

Keywords: foundation pit, construction, monitoring period, peripheral environment

Application of Engineering Test Inspection Management in Improvement of Highway Engineering Quality

..... Shi Zhigang, Ye Dong (149)

Abstract: With the development of highway industry in China, the requirements of highway quality and class are higher and higher. The article analyzes the significance of test inspection management in highway engineering, sets forth the application of test inspection management in the highway engineering, and puts forward the measures and ways of guaranteeing and improving the engineering quality in highway engineering.

Keywords: highway engineering, test inspection, engineering quality

Analysis on Application of Hot Recycling Plant Mixing Technology of Asphalt Concrete

..... Cao Huafeng (151)

Abstract: The plant asphalt hot recycling technology, as a more advanced hot recycling technology now, is very widely in the utilization of asphalt pavement recycling technologies. This technology can not only realize the recycling of asphalt mixture, but also reduce the environmental pollution and save the materials of sandstone and asphalt. The utilization of hot recycling technology can effectively reduce the construction cost and protect the ecological environment. Based on it, the article discusses the application of hot recycling plant mixing technology of asphalt concrete.

Keywords: asphalt concrete, plant hot recycling technology, application analysis

STUDY ON SCIENCE & TECHNOLOGY

- Analysis and Study on Longitudinal Gradient of Urban Expressway in Snow Frozen Area Qu Chao, Qin Yufeng, Li Jian (153)
- Abstract:** The design speed is an important index to meet the expectations of road construction. In order to achieve a balanced design, all design parameters should be accommodated with it. The longitudinal gradient is one of the key parameters for profile design of road. This paper introduces the establishment of the maximum gradeability model of vehicle to calculate the maximum climbing ability of the representative vehicles of car and bus under the different gears on the basis of vehicle driving theory and combined with the traffic of the main vehicles and the road conditions of urban expressway in Dalian under snow frozen conditions, which can be referenced for the longitudinal design of municipal roads in the similar areas.
- Keywords:** snow frozen, urban expressway, design speed, vehicle driving theory, longitudinal gradient
- Study on Optimization Method for Alignment Design of Urban Expressway in Snow Region Liu Runyou, Lian Xiangping, Li Mingjian (156)
- Abstract:** In the northern snow areas of China, the winter snowfall seriously affects the traffic flow of the expressway, which will result in the increment of traffic congestion and traffic accident rates. Aiming at this problem, the paper considers the different road conditions maybe occurring in the northern snow areas, and the safety of motored vehicle. Referring to the alignment design methods in design of urban road, the paper puts forward the optimization method of expressway design in the northern snow areas, and analyzes the limitation of the maximum design grade and the maximum grade length, which provide a theoretical basis for the design of expressways in the northern snow areas.
- Keywords:** expressway design, snow areas, maximum grade, maximum grade length
- Analysis on Stress Intensity Factor of Cement Concrete Overlay on Existing Rubblized Cement Pavement Wang Zheng (160)
- Abstract:** The cement concrete overlay after rubblized is a reconstruction method for the existing cement concrete pavement. The reflective crack is one of its defect types. In order to estimate the reflective crack of cement concrete overlay, the article analyzes whether or not the effect of rubblization technology to reduce the reflective crack of cement concrete overlay, and analyzes the stress intensity factor of cement concrete overlay on the existing cement pavement by ABAQUS finite element software. The article studies the fracture mechanism of cement concrete overlay on existing cement concrete pavement after rubblized. The result shows that the rebblization for the existing cement concrete pavement can reduce the development speed of reflective crack or delay the causing time of reflective crack so as to lengthen the service life of pavement.
- Keywords:** road engineering, overlay, rubblization, stress intensity factor, reflective crack
- Research on Economic Benefit Evaluation Method of Existing Bridge Strengthening Hao Wei (164)
- Abstract:** In order to exactly evaluate the economy effect of bridge strengthening, by using the basic principles of engineering economics, and according to the analysis of the types of bridge traffic volume and the change of vehicle transport cost, the article introduces the calculation model of the direct and indirect

economic benefits created by bridges strengthening, puts forward the economic benefit evaluation method of bridge strengthening, and finally illustrates the evaluating process of scheme by an example. The calculation result indicates that this method can exactly evaluate the economic effect of bridge strengthening and can give some references to reasonably select the reconstruction scheme for the current bridges.

Keywords: traffic volume, vehicle transport cost, direct economic benefit, indirect economic benefit, evaluation method

Analysis and Study on Mechanisms of Hydration Heat Temperature Field and Stress Field of Large-section Anti-slide Pile Hou Xiaoqiang, Yao Zhengxue, Wang Jian, Wang Zheng, Hou Yanping (169)

Abstract: The article truly simulates the change statuses of temperature field and stress field caused by the concrete hydration heat of two solid and box anti-slide piles, and considers various initial conditions and boundary conditions of convection with air and heat transmission with anchoring foundation soil. According to the analysis on the effects of the temperature differences, temperature peak values, tension stresses and allowable stresses of two structural anti-slide piles, the article considers that the box anti-slide pile has the performances of larger heat radiation surface and smaller temperature difference. And its temperature change and stress change are all smaller than the solid structural anti-slide pile. It has the better durability and safety.

Keywords: anti-slide pile, hydration heat, temperature field, stress field

Present Study and Expectation on Eight-lane Large-section Twin Tunnel Li Hongtao (174)

Abstract: The eight-lane large-section twin tunnel is the trend of highway traffic development in the recent years. Based on the study results of this field at home and abroad, the paper focuses analysis on the spacing optimization, surrounding rock pressure, support design and construction methods of eight-lane twin tunnel. Through the summary of previous study results, the paper points out the problems existing in the study of eight-lane twin tunnel now, and puts forward the development direction of future study.

Keywords: eight-lane twin tunnel, spacing optimization, stability of surrounding rock, secondary lining, double-side drift method

Experimental Study on Properties of Inner Anti-corrosion Material for Steel Pipe Jacking of Water Conveying Engineering Zhang Shuo (180)

Abstract: Aiming at the inner corrosion resistance of steel pipe jacking in the alkaline raw water conveyance project, the cement mortar coating and liquid epoxy coating are sampled to carry out the soaking weight loss and performance test, and to conduct the cement mortar crack soaking experiment. The result shows that the cement mortar is always at the weight gain state after soaked to adsorb grain in water while the weight of epoxy liquid basically remains constant. The alkali resistance of cement mortar is better and its chemical performance is more stable. However the alkali resistance of liquid epoxy coating is commonly and may be a little off and surface changes, and the chemical stability is commonly. The crack of cement mortar is not clear away and its dimension is also not decreased after soaked. For 6~8 mm cracks, the water can permeate to the outer of pipe, and it is required to carry out the grouting repair. For 2~3mm cracks, it is not necessary to repair because of no water leakage basically.

Keywords: inner corrosion resistance, steel pipe jacking, cement mortar coating, crack, medium and strong corrosiveness

Study on Water Stability of Cold Patch Asphalt Mixture Zhao Yaqin (183)

Abstract: Water stability is one of the important influence factors on the combination property of cold patch asphalt mixture. In order to study the influence factors on the water stability of cold patch asphalt mixture, the immersion Marshall Tests are carried out to discover the influence rule of voidage, gradation composition, mineral powder dosage and asphalt content on mixture. Based on that, some rule and conclusion are summarized.

Keywords: cold patch asphalt mixture, water stability, influence factor

APPLICATION OF ACHIEVEMENTS

Study on Application of Traction Technology in High-voltage Power Pipeline over Important Water Project

..... Wang Xiaoqing, Nie Ronghai, Zhang Xiuhua, Dai Shucai (187)

Abstract: The low-voltage power pipeline traction over river has become increasingly common in the power pipeline construction. Especially for the river bridge without the reconstruction conditions, the traction technology is the more quick and convenient construction method. Taking the project of 110KV high-voltage power pipeline over Beijing-Hangzhou Canal as an example, the article sets forth the construction process and the matters needing attention of high-voltage power traction technology in the engineering application under the condition of long and deep embedment. Its effect can be referenced for the similar projects in the future.

Keywords: high-voltage power, traction, water body, metro

THE RELATIVE SPECIALITIES

Establishment of Highway Area Ecological Environmental Impact Assessment Index System ... Song Gongjian (191)

Abstract: The large scale construction of highway results in ecological negative effect, and causes the huge damage on ecological environment. According to the comprehensive analysis on the natural ecological environment, environmental pollution prevention and landscape greening, the ecological environmental impact assessment index of highway area is determined and the ecological environmental impact assessment index system is established. The ecological environmental aspects of highway area are divided into three parts of ecological resource, environmental quality and greening landscape, in which the part of ecological resource includes the land, water and biology, the part of environmental quality includes the sewage treatment, atmospheric pollution, noise and solid waste disposal, and the part of greening landscape includes the greening and landscape.

Keywords: highway, road area, ecological environment, assessment index

Study of Pollutant Emission Control Standard for Urban Underground Road Fan Yiqun, Ni Dan (194)

Abstract: The pollution gases emitted from vehicles in urban underground roads, either by the high wind tower to discharge, or by the road tunnel vent to ventilate out, will all have a negative impact on the air quality of surrounding environment. With the introduction of the domestic relevant regulations and the national attention to the atmospheric environment, it has become an inevitable trend to purify the air

pollutants in urban underground road. This paper focuses discussion on the significance, the method and the index of the pollutant emission standard for road tunnel discharge outlet and the guiding role of the air purification technology for underground road.

Keywords: underground expressway, air purification technology, pollutant emission standard for tunnel

Discussion of Surface Settlement in Construction of Urban Metro Tunnel under Complicated Condition

..... Li Xuewen (199)

Abstract: With the continuously speeding up of modern urbanization process, the proportion of underground traffic rail network is continuously increased in the construction of city traffic. The construction of urban metro tunnel will certainly break the original balanced state of underground rock mass so as to build the new balance. The surface settlement will be the problem inevitably faced in the construction of underground rail traffic network. The article discusses the surface settlement problem in the construction of urban metro tunnel under the complicated condition, and puts forward the more effective solving method.

Keywords: complicated condition, urban metro tunnel, construction, surface settlement

Summarization and Discussion on Lightning Detection of Cable-stayed Bridge

..... Zheng Jianxiong, Lin Xiaojian, Lu Zhipeng, Huang Yuan (201)

Abstract: In recent years, the cable-stayed bridge is applied in the traffic construction project. Zhongshan City belongs to the area with more lightning activities because of 84.5 thunder storm days averagely in a year and frequent lightning activities. As the key node of traffic, the bridge located at the water and land boundary is extremely vulnerable to the invasion of lightning. Therefore, the higher technical requirements are put forward for the lightning protection of cable-stayed bridge. Aiming at the characteristics of design and construction of cable-stayed bridge, the idea of large-space integrated lightning protection is applied to analyze and find out the easy lightning area of bridge, to define the special lightning measures, and to summarize some experience for lightning detection of cable-stayed bridge.

Keywords: cable-stayed bridge, lightning detection, integrated lightning protection

Application of Engineering Construction Cost in Comparison and Selection of Urban Viaduct Schemes

..... Zhang Yan (204)

Abstract: The urban viaduct is one of important projects in municipal engineering construction. Its construction scale is large and its construction cost is high. The article introduces the application of engineering construction cost in the comparison and selection of urban viaduct schemes. The relative experience can be referenced for the similar projects.

Keywords: urban viaduct, construction cost, traffic

Design Validation of Wind-PV Hybrid Streetlight System

..... Yuan Liang, Yin Xuping (206)

Abstract: With the evolvement of international energy pattern and economic development mode, as the biggest energy producer and consumer in the world, the energy-saving, emission reduction and clean energy industry will present a new trend of green environmental protection in China. With the large-scale promotion of high efficiency LED streetlight, the use of two ideal clean energies of wind and solar power as the power supply for the street lighting becomes a trend of energy-saving and emission reduction. How to high effectively and

scientifically carry out the engineering design and application of wind-PV hybrid streetlight system, and to realize the energy-saving and emission reduction of street lighting is one of the continuous exploration directions in the field of engineering technology of road lighting under the premise of guaranteeing the quality of street lighting.

Keywords: wind-PV hybrid streetlight, street lighting, design validation

Excellent Journal of the Ministry of Housing and Urban-Rural Development of PRC

Urban Roads, Bridges & Flood Control

Monthly

Number 12, 2015 (Total Number 200)

Publication on December 15th, 2015

<http://www.roadbridgeflood.com>

Start publication in 1984 Scope of issue: Issue at home and abroad

Department responsible for the work: the Construction Ministry in PRC

Sponsor: Shanghai Municipal Engineering Design & Research Institute

Editor & issue: Editorial department of "Urban Roads, Bridges & Flood Control"

Editor-in-chief: Luo Yanni

Address: No.901 Zhongshan Bei Er Road, Shanghai

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Fax: (021)55008850

E-mail: cdq@smedi.com

ISSN 1009-7716

CN 31-1602/U

Domestic price: 18 yuan RMB

**Journal of Municipal Engineering Branch of China Society of Civil Engineering
and Municipal Design Branch of China Society of Prospecting Design**



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由公司独立完成的典型桥梁顶升工程包括：同三国道（A30）跨上海横潦泾特大桥梁顶升工程、成都二环西路羊西立交与清水河立交整体调坡顶升工程、杭申线沪杭高速公路桥梁顶升工程等。桥梁顶升规模和难度最大的是A30跨横潦泾特大桥梁顶升工程。该桥全长779 m，主桥为85 m+125 m+85 m=295 m的三跨连续梁，整体顶升高度1.58 m，全桥顶升重量达48 000 t，是国内迄今为止规模及难度最大的顶升项目，并创造了吨位最大和跨径最大桥梁整体顶升工程两项世界纪录。

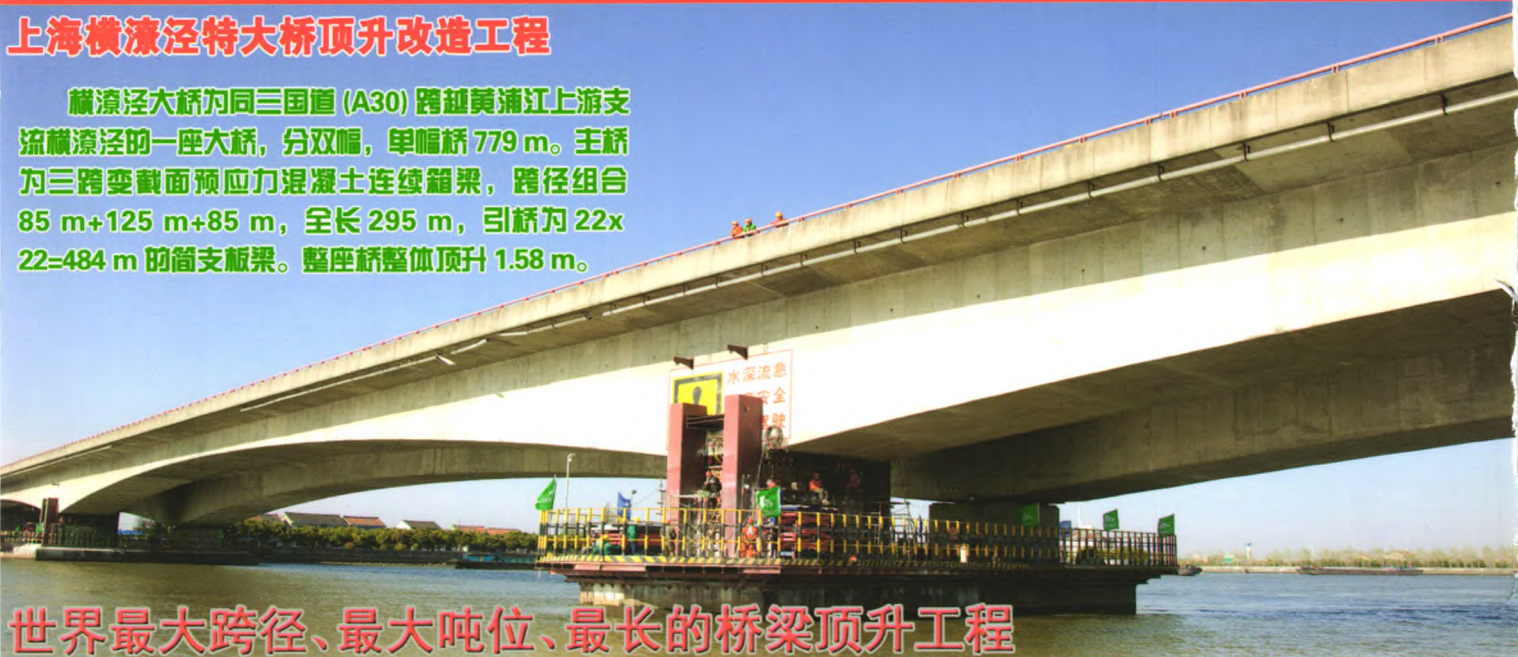
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