

城市道桥与防洪

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——《城市道桥与防洪》

● 本期看点

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的编制研究

温州北部综合交通枢纽场站设施布局研究

独柱曲线梁桥的抗倾覆设计与研究

大跨度挡潮闸网架结构门型方案研究



万方数据

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英文校审: 孙宁萍 常红

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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Study on Motored Vehicle Origin and Destination Investigation (OD Investigation) Scheme of a National Highway Network Planning Project Tian Hongwen(1)

Abstract: The motored vehicle OD investigation is an important basic study content in the highway network planning study work, and is a work required to invest more manpower, time and fund into the planning investigation. Owing to the different project with the different characteristics, the policy decision of investigation work, the study and determination of work scheme, and the organization and implementation of investigation for the different projects have the important influence on the science, accuracy, work schedule and cost of the planning study work. The article focuses introduction on the policy decision, study and plan of motored vehicle OD investigation scheme of a country in Southeast Asia in the national highway planning work process.

Keywords: highway planning, OD investigation, scheme study

Discussion on Traffic Channelization Design of Urban Road Single-way Road Intersection Kong Ying(5)

Abstract: Through understanding of *Urban Road Intersection Design Specification*, the article analyzes the urban road traffic channelization design process (mainly for widening mode, stop line, crosswalk line and intersection greening belt) and the existing problem in Urumqi City, and puts forward the countermeasures and proposal.

Keywords: urban road, traffic channelization design, widening section, crosswalk line, stop line, greening belt

Research on the facilities distribution of the northern integrated traffic hub in Wenzhou ... Huang Yan, Feng Bao(8)

Abstract: This paper focuses on facility layout scheme optimization of the northern integrated traffic hub in Wenzhou. With the Huangtian integrated traffic hub promoted as comprehensive passenger transport center of Northern Wenzhou in the 12th Five-Year Comprehensive Transport Development Planning of Wenzhou, as well as the addition of Hangzhou-Wenzhou passenger dedicated line and Yongjia Bus Terminal, it was urgently to optimize the original land-use planning and the station facilities layout. On the basis of respect for the status quo and the idea of "Zero Transfer" and "Seamless Connection", facility layout of the station was optimized, as well as of traffic organization principles and methods were proposed.

Keywords: the northern integrated traffic hub of Wenzhou; station layout; planning optimization; traffic organization

- Analysis on Design of Airport Road (S) Interchange in Ring Road II Huang Ping (12)
Abstract: Taking Airport Road (S) Interchange in Ring Road II of urban expressway in Luzhou City as an analysis object, the article firstly forecasts and analyzes its traffic volume, then introduces the interchange scheme and compares the schemes, and finally introduces the interchange design, and analyzes and sets forth the design of its ramp, the connection mode of ramp and main line, and the design of ramp alignment.
Keywords: expressway, interchange, ramp, auxiliary road, forecast of traffic volume
- Design of Ecological Landscape Avenue to Coast of East China Sea Ma Xianmin, Xi Lingzhi (15)
Abstract: With the continuous development of urbanization, the functions of urban road become more abundant. Taking Baopu Avenue (Juyang Avenue ~ Shiyitang Dyke) and Jianan Avenue (Juyang Avenue ~ Shiyitang Dyke) in the eastern new area of the gathering are in Taizhou Gulf as the project background, the designs of road, island, bridge and landscape reflect the subject of "Taizhou Dream". The design integrates the all-river-run-into-sea culture personality of Taizhou, and is also compatible of aesthetic characteristics of Yue Lake to build the ecological landscape avenue to the coast of East China Sea.
Keywords: road, ecological landscape, design, gathering area of Taizhou
- Design of Caiyun Road Expressway Reconstruction Scheme Cao Jianxin, Ning Pinghua (19)
Abstract: The expressway reconstruction can improve the traffic efficiency, and is one of schemes to improve the urban traffic congestion. This paper introduces the design of Caiyun Road Expressway Reconstruction Scheme, discusses the concrete scheme from three aspects of road, node and supporting facilities, and introduces the technical standards and master scheme in the design of this project, which can be referred for the expressway reconstruction design of urban roads.
Keywords: expressway reconstruction, entrance, node reconstruction, supporting facilities
- Discussion on Design of Green Road Chen Shaohua (24)
Abstract: The article sets forth and analyzes the design of green road from six aspects of land saving, material source saving, energy conservation and energy utilization, water resource utilization, environment protection, greening and landscape.
Keywords: design of green road, resource saving, environment protection
- Discussion and Analysis on Design of CBD Entrance Area He Xin (27)
Abstract: The distribution traffic volume of urban large CBD often produces the great traffic pressure to the surrounding roads, and seriously affects the operation efficiency of road in the front of CBD entrance. The entrance area of CBD likes as the straight angle intersection of road, and is also the traffic bottleneck, but has the functions of temporary parking and etc. more than the intersections. Therefore, the entrance area becomes the heart of CBD traffic. The beautiful and reasonable form and the efficient traffic organization design of entrance area can make the traffic smooth. According to the setup experience of CBD entrance area of Tianjin City and taking the CBD in the comprehensive supporting area of the software and service outsourcing base in Tianjin High-tech New Zone as an example, the article proposes the idea of traffic organization design of large CBD and introduces the analysis result of entrance area setup form.
Keywords: traffic organization, CBD entrance area, three into one

Calculation and Analysis on Design of a Slope Treatment in Lanzhou City by Finite Element Method (FEM)

..... Tian Shutao (31)

Abstract: Combining with a slope geological hazard treatment project of Lanzhou city, the finite element inverse analysis calculation is carried out for two typical sections to achieve the shear strength indexes of this slope soil. The FEM model is established to analyze the stabilities of three conditions after the slope surface is treated. Based on the size of strain in the unreinforced slope plastic zone and the area through the deformation zone, the length passing through the plastic zone is determined. The calculation, analysis and validation of numerical numbers after reinforcement can judge its stability and reinforcing effect to satisfy the engineering requirements. The calculation and analysis results show that this method is easy to use and its result is reliable so as to provide the basis for the slope treatment.

Keywords: slope treatment, inverse analysis method, finite element, plastic zone, anchor arm reinforcement

Study on Geological Features of Granite Road Project in Wenqiong Expressway of Hainan Province

..... Zhang Junfeng, Zhang Jiagen, Meng Qinglin, Liu Guoquan (34)

Abstract: Weathered granite rocks and granite residual soil are common particularity rocks in engineering geologic survey. According to the formation case disclosed in the engineering geological survey of Wenqiong Expressway, it is reasonable for the stratigraphic subdivision by the combined method of field core drilling identification and situ test. The paper discusses the significant change of granite residual soil in the presence of water and the unevenness of weathered granite rocks, and analyzes the causes of the formation. The paper also makes recommendations and treatment programs for the engineering geological problems in the design and construction of highway roadbed, slope, pile foundation and etc.

Keywords: granite residual soil, weathered granite rock, spheroidal weathering (boulders), unevenness, pile foundation

BRIDGES & STRUCTURES

Overturning Design and Study of Single Column Curved Girder Bridge ... Gao Chao, Zhu Lin, Wang Mingwei (38)

Abstract: The rapid development of city overpass makes the form of single column curved girder bridges have been widely applied. Owing to the problems of deficient design and vehicle overload, the bridge overturning events occur frequently in recent years. From the accident causes, and aiming at the bridge overturning accidents and failings caused in recent years in China, the article summarizes the regularity and characteristics, gives two kinds of the failure form and the key factors of causing the overturning failure, and points out two steps of overturning design ideas. The definition of overturning safety coefficient is proposed for the overturning design under the influence of live load. According to the statistical parameters of the impact on the existing single column supported girder bridges in Beijing City, a typical model is established for calculation and analysis to educe the safety coefficients under the different critical conditions. The article sets forth the overturning design under the influence of internal and external forces by the analysis method of engineering cases. A series of the spatial finite element calculation analysis, experiment, verification and calculation provides an important reference for the design of single column curved girder bridge.

Keywords: single column curved girder, overturning design, safety coefficient, spatial finite element

Analysis on Longitudinal Earthquake Response of Small Box Beam Structure Elevated Bridge in 8 Magnitude Zone

..... Wang Mingye (45)

Abstract: The old bridge utilization is the difficulty of urban road construction. Combined with the practical project of old bridge utilization of Xianzhuang Interchange, the article analyzes and studies the selection of old bridge utilization mode. The inspection and check understand the status of the existing old bridge of Xianzhuang Interchange. Based on the function demand and construction condition of Guangming Expressway and Xianzhuang Interchange, the old bridge utilization schemes are compared and selected. The spatial finite element model is established to simulate the mechanics action connecting the new bridge with the old bridge, and it is taken as the basis for the widening and reinforcing work of old bridges. The analysis on the old bridge utilization scheme of Xianzhuang Interchange will be referred for the utilization of the old bridges in the other projects.

Keywords: old bridge, bridge widening, numerical simulation, comparison and selection

Design of Newly Built Engineering Standard Continuous Beam of North Passageway of Pudong International Airport-Butterfly-shaped Beam Zhu Shifeng (48)

Abstract: The article introduces the design of the newly built engineering standard continuous beam of the north passageway of Pudong International Airport. The "butterfly"-shaped section of beam is selected to use as the bridge structure with the beautiful modeling. Its comprehensive index of pre-stressing is lower, the construction cost is lower, and the structure is feasible, economic, safe and reliable. The relative experience can be referred for the similar projects.

Keywords: butterfly-shaped beam, large cantilever pre-stressed continuous beam, selection of structure

Study on Construction Technology of Simple-supported Changed Continuous Beam Bridge and Computation Theory of Its Temperature Effect Wu Tao, Chen Qing, Tao Fanshen (52)

Abstract: The simply-supported continuous beam bridge has the characteristics the simple-supported beam bridge and the continuous beam bridge, and has been widely used in the highway and municipal bridge construction because of its convenient construction and good using performance. The article introduces the general construction technology of simple-supported changed continuous beam bridge, and derives the computation formula of temperature effect of simple-supported changed continuous beam bridge. The study contents can be referred for the design and construction of simple-supported changed continuous beam bridges.

Keywords: simple-supported changed continuous beam bridge, construction technology, temperature effect, application

Design of Main Bridge of Huhai Gandeer Yellow River Bridge Wei Jun, Zhang Jianqiang (54)

Abstract: The main bridge of Huhai Gandeer Yellow River Bridge is a single-plane pre-stressed concrete partial stable-stayed bridge with the span layout of $(80+5 \times 120+80)$ m. The long cantilever single-box double-chamber section is used for the main girder. The bridge is 37 m wide. The cantilever plate of the main girder is constructed with a stiffened slab every 3.5 m. A diaphragm is constructed corresponding to the inner of box and chamber. The stayed cable is the epoxy steel strand cable system. The wire tube type cable saddle is used in the cable pylon anchorage zone. The main pylon is the diamond section. The pylon body is the longitudinal shape A. Combined with the plane and spatial static analysis, the bending resistance, shear resistance, anti-split performance and stress are checked up. The results satisfy the norm requirements. The project is located in the high intensity seismic belt. The longitudinal velocity lock + transverse energy dissipation shock absorbers are taken as the combined isolation scheme for the structure. The dynamic

analysis shows that its seismic performance can satisfy the norm requirements. The main pier is constructed by the turnover formwork method, and the main girder is constructed by the cast-in-place cantilever method.

Keywords: partial cable-stayed bridge, wide box girder, long cantilever, bridge design, structural analysis, seismic measures, construction method

Design and Construction of Long-span Rigid Frame Continuous Arch Bridge Liu Zhicai, Tang Ying (59)

Abstract: The article introduces the design and construction of a 7×66 m long-span rigid frame continuous arch bridge, and compares and selects the structural materials. The computation shows that the horizontal thrust at the arch foot of steel structural box section rigid frame arch bridge is a half less than the concrete arch, and can ensure the construction period. The group pile foundation is used for the substructure. The thrust block is installed every 2~3 spans. The flexibility of group pile foundation is considered in the computation and analysis. The all-welded steel box girder structure is used for the superstructure, and is constructed by the finite support method.

Keywords: rigid frame arch, continuous arch, steel box section, flexibility of group pile foundation, thrust block

Analysis on Old Bridge Utilization Scheme of Xianzhuang Interchange He Zegang, Cai Xiantang (61)

Abstract: The old bridge utilization is the difficulty of urban road construction. Combined with the practical project of old bridge utilization of Xianzhuang Interchange, the article analyzes and studies the selection of old bridge utilization mode. The inspection and check understand the status of the existing old bridge of Xianzhuang Interchange. Based on the function demand and construction condition of Guangming Expressway and Xianzhuang Interchange, the old bridge utilization schemes are compared and selected. The spatial finite element model is established to simulate the mechanics action connecting the new bridge with the old bridge, and it is taken as the basis for the widening and reinforcing work of old bridges. The analysis on the old bridge utilization scheme of Xianzhuang Interchange will be referred for the utilization of the old bridges in the other projects.

Keywords: old bridge, bridge widening, numerical simulation, comparison and selection

Study on Optimization of Cable Force of Jiehe River Bridge in Tianshui City Xing Qingru (65)

Abstract: The force of stayed cable is very important directly to the whole stress of structure. Taking Jiehe River Bridge of Tianshui City as an example, the article introduces the establishment of cable force optimization model to adjust the structure to the ideal status of finished bridge. This bridge is a $75 \text{ m} + 115 \text{ m}$ half floating system single-pylon double-span cable-stayed bridge with the optimization method of the minimum bending energy. In the bending energy of structure as the objective function for optimization of cable force, the more optimized status of finished bridge is achieved. The dimension of this bridge is obviously too large. The study result has a certain reference for the optimization of cable force of single-pylon double-span cable-stayed bridges.

Keywords: half floating system, single-pylon double-span cable-stayed bridge, optimization of cable force

Practical Computation Method of Main Cable Linearity of Suspension Bridge Wen Qingliang (67)

Abstract: Based on the principle of analysis iteration method and combined with the stress characteristics of suspension bridge under the constant load action, the article introduce the practical methods of the main

cable finished bridge linearity of suspension bridge, the revision computation of main cable length at saddle, the computation of no stress cable length, the computation of saddle pushing pre bias and the computation of no-cable clip installation position. Its application of Zhenshan Bridge shows that these computation methods are simple and efficient.

Keywords: bridge design, suspension bridge, main bridge linearity, construction control

Simplifying Computation of Load Transverse Distribution Coefficient Based on MIDAS/Civil

..... Qiu Neng, Lai Huanlin (70)

Abstract: Aiming at the stress characteristics of simple-supported beam bridge structure, combined with the basic principle of computing bridge structure inner force of load transverse distribution coefficient and based on MIDAS/Civil software, the finite element model of automatically computing the load transverse distribution coefficient is proposed. This new method has the specific calculation theory. The visualization processing before and after the model can make the computation process is greatly simplified, and the computation result is reliable and is easy to master for application by the engineers.

Keywords: simple-supported beam bridge, load transverse distribution coefficient, MIDAS/Civil, finite element software

Assessment of Bearing Damage Grading Standard and Study of Its Replacement

..... Wang Jianjun, Tao Jun, Wu Xiaoguang (75)

Abstract: Aiming at no study theory applicable to the assessment of bearing damage grading standard now, based on the bearing replacement project of Xinjiang and according to the characteristics of bearing damage grading, the article analyzes the deterioration mechanism of bearing damage, and studies the bearing damage grading standard assessment by this theory, which can guide the bearing replacement and provide the theoretical support for the replacement of the bearings in Xinjiang Region.

Keywords: bearing, damage, grading assessment, deterioration mechanism

FLOOD CONTROL & DRAINAGE

Study on Grid Structural Gate Type Scheme of Long Span Tidal Barrage

..... Tang Jinzhong, Zhu Bohua (78)

Abstract: According to the analysis of the present gate type structure, an innovation scheme of grid structural gate type of tidal barrage is proposed. The arched grid structure is used as the stress system of gate in the span direction. The plastic front panel instead of steel is not rusted and frees from the repair and maintenance. The characteristics of grid structure with long span and light weight are fully applied. At the same time, the circular arc concave groove is innovated to use as the walking and supporting track to make the supporting and walking of gate combine two into one, which reasonably solves the supporting and walking mechanism of long-span gate leaf. The article fully proves of grid structural gate type design scheme and analyzes its structure, and sets forth its implementation method, which can be referred for the selection of long-span tidal barrage type.

Keywords: tidal barrage, long span, grid structure, gate type, study

Further Discussion of Computation on Large Drainage Area of Rainwater Pipe Network System

..... He Zhigang, Hu Jun (83)

Abstract: At present, the computer aided design of hydraulic model has been generally introduced in the developed countries with regard to the large drainage area of rainwater pipe network system, but the hydraulic computation model software is still hard to comprehensively promote its use in China because of various limitations now. A new computation idea and method is proposed for the large-sized drainage pipe network system combined with the reasoning formula method and time delay superposition method in order ... to provide the reference for the similar engineering projects according to its engineering characteristics. ... **Keywords:** large drainage area, rainwater pipe network system, time delay superposition, computation

Design of Rainwater Open Channel System in Dalian Xizhong Island Petrochemical Area Lu Fengfeng, Zhou Nailei (87)

Abstract: Rainwater system is the critical infrastructure to guarantee the normal operation of the city. The article introduces the application of modular open channel system in the rainwater engineering of Dalian Xizhong Island Petrochemical Area, analyzes the unique advantages of the modular open channels in this area, and summarizes the key points of the design and construction process, which can be referred for rainwater engineering of similar petrochemical areas.

Keywords: rainwater open channel, petrochemical area, modular open channel

Application of Methanol Dosing Room in Sewage Treatment Design of Industrial Garden Mu Ying (89)

Abstract: The sewage from the industrial garden is generally mixed wastewater combining the domestic sewage of the residents and the production wastewater of industrial enterprises. The sewage is of low biodegradability, the carbon source is not enough, and the removal rates of various pollutants are higher required. The ordinary biochemical treatment can not ensure the effluent up to standard. According to the practical engineering cases, the article compares various carbon source dosing modes commonly used in China, and discusses the design of methanol dosing room in detail.

Keywords: wastewater treatment plant in the new and high-tech zone, carbon source, methanol dosing room

MANAGEMENT & CONSTRUCTION

Solving Method to Bad Visibility of Control Point in Earlier Stage of Urban Road Construction Jin Junjie (92)

Abstract: In the earlier stage of urban road engineering construction, there is the situation of bad visibility of adjacent control point (traverse point) caused by the slower housing removal and green transport lag within the range of road engineering construction. It will bring the great influence on the road construction survey lofting work, and is even hard to carry out the normal survey lofting work according to the appointed plan. The article discusses how to ensure the continuity of survey lofting work of control point under the condition of bad visibility by the use program and function of total station, and 10-year field construction survey experience.

Keywords: early stage of road construction, bad visibility of control point, solving method

Discussion on Optimization of Construction Organization Design of Highway Engineering Project ... Wang Lili (94)

Abstract: The highway construction organization design is the written document formed by the scientific and reasonable arrangement according to the objective rule of construction and the local construction conditions, construction schedule, resource consumption and etc. This scientific and reasonable design is the objective to achieve by the optimization of construction organization design. The article analyzes and sets forth the optimization of construction scheme and the optimization of resource utilization. The relative experience can

be referred for the similar projects.

Keywords: engineering project, construction organization design, optimization

Analysis on Construction Stability of Long-span Continuous Rigid Frame Sun Yu, Yu Zhitaq, Dong Xuezhzhi (96)

Abstract: Combined with a continuous rigid frame within Sichuan Province, the article analyzes the stabilities in the construction of the highest pier and the largest cantilever, and in the operation stage of the finished bridge. The analysis shows that the safety reserve of the largest cantilever in construction stage is lower. The construction monitor and control should be strengthened in the control stage of construction.

Keywords: continuous rigid frame bridge, construction stage, buckling mode, stability

Discussion and Study on Construction Management of Bridge Engineering Prefabricated Beam Song Hui (100)

Abstract: The article analyzes and illustrates the construction management of bridge engineering prefabricated beam including the selection, layout and construction of prefabricated beam site. The foreign advanced idea and technology are referred for the analysis and illustration of the prefabricated beam construction management. According to the practical construction experience, the guarantee measures of construction quality and construction safety are reasonably proposed. The relative experienced can be referred for the similar projects.

Keywords: summarization of background, layout analysis, management analysis, technical analysis

Estimation on Technical Status of Ziyaxin River Bridge in Shuohuang Heavy Load Railway - - - Zhao Dekuan (102)

Abstract: In order to estimate the technical status of heavy load railway bridge, Ziyaxin River Bridge in Shuohuang Heavy Load Railway is dynamically tested. The impact vibration test method is used to distinguish the transverse natural vibration frequency of bridge pier, and the transverse and vertical natural vibration frequencies of girder. In the dynamic test, the measured result is compared with the limit value stipulated in *Railway Bridge Inspection Specifications* by the test of the girder amplitude of girder control section and the response of acceleration under the operation action of train. The result shows that various dynamic parameter indexes of girder all satisfy the requirements of the specification, and illustrates the good operation function of girder structure. The partial piers of this bridge have been reinforced. In order to estimate the dynamic performance of pier structure before and after reinforced, the typical pier is selected to carry out the dynamic test analysis in the test. The change conditions of pier vibration parameters before and after reinforced are compared. The estimation conclusion can validate the pier reinforcement effect, which can provide the data support for whether or not to reinforce the rest piers.

Keywords: heavy load railway, dynamic response, natural frequency, impact vibration test method, technical status

Overall Synchronous Lowering Construction Technology of Travelling Form for Nanxiang Bridge in Ningbo City ...

..... Zhang Hongjun, Bian E (106)

Abstract: Ningbo Nanxiang Bridge is a pre-stressed concrete continuous bridge spanning Fenghua River. Its main span is 130 m. The travel form is used for construction. The combined winch traction device is composed of 1 winch frame, 2 movable pulley trolleys, 4 balanced pulleys, 1 synchronous controller and 2 steel wire ropes. 2 ropes are separately connected with two fixed hoisting points on the traverse beam in the front and back of travel form, and lowered by the synchronous controller of winch and pulley group. The combined winch traction device used for this project is easy to operate and fast installed with high safety

performance, which achieves the satisfied effect for the overall synchronous lowering of travel form.

Keywords: synchronous, winch, movable pulley, balanced pulley

Construction Management of Waterproof Bonding Layer of Urban Bridge Deck Wang Weixing, Li Jundai (109)

Abstract: In order to prolong the service life of urban bridge and improve the durability of concrete deck, the supervision unit takes part in selection of scheme, checkup of construction organizational, detection of raw materials and whole construction of process of materials in the construction of a bridge epoxy asphalt waterproof bonding layer, and organizes the parallel construction detection of a third-party. The results show that the bond strength and shear strength are much higher than the regulatory requirements, and various performance indexes are superior, which achieve and exceed the design requirements.

Keywords: concrete deck, durability, epoxy asphalt waterproof bonding layer, bond strength, shear strength, construction method

Study and Prevention on Common Quality Failing of Bridge Cast-in-situ Pile Zhu Changliang(113)

Abstract: The article analyzes the common failings in drilling, concrete pouring and finished pile inspection of several bridge cast-in-situ piles caused in the construction of elevated bridges in Shanghai A8 Highway, and puts forward the preventive measures and treatment methods, which can provide some experience referred for the treatment of the common quality failings in the construction of bridge cast-in-situ piles.

Keywords: bridge, cast-in-situ pile, common quality failing, study, prevention

Prevention Measures for "Floating-cage Phenomenon" of Cast-in-situ Pile Tang Guichuan (116)

Abstract: In the construction of pile foundation, the small-diameter "half reinforced cage" and the shorter reinforced cage often float because of various causes during the pouring construction of underwater concrete. The "floating-cage phenomenon" will change the structural stress state of pile foundation, and will cause the rework with the greater danger if seriously. The article discusses and sums up the prevention measures for the "floating-cage phenomenon". After the comparison and analysis, it is finally to select the method of steel fixer to prevent the reinforced cage from floating. The consumed materials of this method are a few, and its operation is simple and easy to learn. This method not only ensures the pouring quality of concrete, but also makes for the improvement of economic benefit, and can also efficiently prevent the cause of "floating-cage phenomenon".

Keywords: pile foundation, floating-cage phenomenon, prevention measures, economy

Elementary Discussion of Underwater Engineering Construction Measures for Reinforcement of Old Bridge

..... Wang Liangzong (119)

Abstract: Owing to some old bridges built in 1960s - 1970s with the not standardized design and low construction standard, these bridges gradually become the danger bridges because of traffic flow increment and load overweight. In order to upgrade the service ability of these old bridges, the reinforcement treatment must be carried out, and the construction of underwater engineering is often the key to the success or failure of the reinforcement treatment. Combined with the case of underwater construction in the reinforcement process of Baishan Bridge in Lujiang County of Anhui Province, the article introduces the method and steps of underwater construction, and the countermeasures for the special situations.

Keywords: reinforcement of old bridge, underwater construction, measures

Research of Highway bridge maintenance and preventive maintenance ZhaoYuxia(121)

Abstract: Introduced by the daily maintenance and management of highway bridge repair and preventive maintenance, methods, measures and problems, combined with maintenance and preventive maintenance project examples 20 highway bridges of Jiayuguan section from Lianhuo G30 line, Through the paper provide highway bridges maintenance and preventive conservation reference in the future .

Keywords: highway bridge; maintenance; preventive maintenance

Elementary Discussion on Asphalt Quality Control of Routine Tests Dong Xiaomei (125)

Abstract: With the wide application of asphalt pavement, the significance of asphalt test is increasingly obvious. The article sums up the influence factors and control measures of asphalt test quality, and the asphalt quality control gist of routine tests according to the experience of test work.

Keywords: asphalt test, influence factor, routine tests, quality control

Rethink about Work of "9.13" Rainstorm and "Feite" Typhoon Zhang Wensheng (127)

Abstract: The rainstorm caused by "Feite" Typhoon on September 13 and October 7~8, 2013 has brought the severe test to the safe operation of Shanghai, and also tests the rapid response and handling abilities in time of every party organized by the flood control department. Aiming at the problems existing in the response process, the article objectively analyzes the causes and puts forward the countermeasures proposals.

Keywords: "9.13" rainstorm, "Feite" Typhoon, response to flood control, Shanghai

STUDY ON SCIENCE & TECHNOLOGY

Study on Compilation of *Urban Underground Road Engineering Design Norm* in Industrial Standards of the Ministry of Housing and Urban-Rural Development Yu Mingjian, You Kesi (130)

Abstract: In order to standardize the urban underground road engineering design and unify the design standards of China, and according to the summarization of the relative underground road norms, study results and the well-known design experience at home and abroad, the *Urban Underground Road Engineering Design Norm* is studied and compiled to stipulate the differences in the design principle, geometrical linearity, passageway, traffic facilities, auxiliary facilities and disaster prevention between underground road and ground road. The article sets forth the study frame of this norm from three aspects of the master technical line, norm frame system, norm characteristic and originality. The compilation of this norm will fill the gaps in the present urban underground road engineering field of China, and has the important significance to improve the engineering design quality and to ensure the operation safety of urban underground road in the future.

Keywords: urban underground road, design norm, norm compilation

Expressway Network Bi-level Planning Model Based on Tourism Resources and Case Study

..... Wang Wenhui, Zhu Xiaoying (133)

Abstract: It is the current trend and direction of the expressway network planning to integrate the expressway resources to the tourism transportation network. From the perspective to integrate the tourism resources, the paper establishes an expressway network bi-level planning model based on tourism resources.

Then the paper studies the solution of the model – genetic algorithms, and uses Matlab to write the solving algorithm procedures. Finally, the paper introduces the case study of expressway network planning in Heilongjiang Province and demonstrates the feasibility and rationality of the model.

Keywords: tourism resources, bi-level planning, genetic algorithm, Heilongjiang

Research on Speed Limit of Freeway Tunnel Group Based on Artificial Neural Network

..... Yan Huili, Jin Lan, Huang Danqing, Ding Qi, Huang Xiaoyong (138)

Abstract: Based on the traffic operation status of the typical freeway tunnel group, the import variable is selected from the time factor, traffic dynamic factor, road condition and tunnel environment factor. The speed forecast model of freeway tunnel group is established based on artificial neural network by taking operation speed as the output variable. The article studies the influence level of each import variable on the output variable by the sensitivity analysis method, and compares and analyzes the sensitivity analysis result of each import variable. The study result shows that this method can fully use the information closely relevant to the speed to simulate the practical traffic flow of tunnel group, overcome the fault of traditional arithmetic hard to establish the model, and is suitable for the on-line model establishment of traffic flow speed limit control. This method is feasible and its accuracy is higher, which can provide the theoretical basis for drafting the speed limit of freeway tunnel group.

Keywords: artificial neural network, freeway tunnel group, speed limit

Determination Method and Application Study of Steel Strand Withdrawal Value

..... Liang Xiaodong (142)

Abstract: The correct determination of steel strand withdrawal value is always the difficulty of pre-stressing construction. The article introduces three methods to measure the withdrawal value of steel strand, in which the measuring method based on the pre-stressing intelligent tension system has the high reliability conveniently used for the engineering practice and is good for the popularization and application.

Keywords: rebounding value, intelligent tension, efficient pre-stressing

Forecast of Vault Settlement in Excavation of Super Large Sectional Tunnel by BP Nervous Network

..... Liu Xudong (145)

Abstract: The excavation of super large sectional tunnel will relieve the surface stress of surrounding rock in wide range. The tunnel vault will cause the obvious settlement under the joint action of the self-weight stress and additional stress of the upper rock. The settlement volume exceeding 100 mm has been observed in some soft rock tunnels. The tunnel will possibly collapse and be damaged if the vault settlement volume continuously increases. It is often unable to construct the support because of the limited conditions in the process of tunnel excavation. It is required to analyze and forecast the stability of tunnel. Taking the monitoring result at the exit section of the south line of Niuzhai Mountain Tunnel Excavation Project as an example, the time course changes of its settlement volume are forecast by BP nervous network method. It is supposed that the vault settlements have no influence before the breakthrough in the process of tunnel opposite excavation, and there is no influence between two tunnels. In the analysis process, the layer parameters are inputted to select the rock level, depth, distance from the tunnel face and two-line length. The hidden layer is set up by one layer. The node number is 9. The transfer function of hidden layer is inputted to select transig. The transfer function of output layer is inputted to select purelin. Before the forecast analysis by using this model, it is firstly to take the data of the excavated monitoring point as the training sample, and the value of excavation point is taken as the example after used to validate the reliability of the

model. The final analysis result shows that the use of the described method can more reliably forecast the vault settlement. Its result can be referred as the basis to forecast the tunnel safety.

Keywords: super large sectional tunnel, vault settlement, BP nervous network, time course curve

Study on Composing Optimization and Deviation Rectifying Control of Common Shield Segment

..... Du Guanqun (151)

Abstract: In order to guarantee the construction quality of tunnel by shield method, the relationship among three parts of tunnel design axis, segment forming axis and shield machine advancing axis in the shield tunnel construction is deduced, the composing optimization and deviation rectifying control computation method is established, and the relative software is developed, which are used in the shield construction of Rail Traffic Line 1 and 2 of Ningbo City. The result shows that the computation method and software satisfy the engineering requirements, and provide the guarantee for the high efficient safe construction.

Keywords: shield tunnel, common segment, composing optimization, deviation rectifying control

Two Test Methods of Determining Consolidation Coefficient Li Xiongfei (156)

Abstract: With the development of social economy, the settlement requirements of various new buildings and more building types are high and high. How to provide the settlement calculation parameters from many aspects becomes the new subject in the study of geotechnical test. At present, the consolidation apparatus method is widely used in the indoor test to calculate the consolidation coefficient. Through the drawing calculation result, how to seek the calculation method of consolidation coefficient from the other test ways is the study direction of the people. The consolidation coefficient is calculated by the pore water pressure dissipation test method. According to the comparison with consolidation apparatus method, the article analyzes the differences of the results by two test methods, and evaluates the difference of two methods.

Keywords: consolidation coefficient, pore water pressure, time factor, dissipation

Study on Technical Performance of Emulsified Asphalt Cold Recycling Mixture Liu Yang, Bian Xiuqi (159)

Abstract: Cold regeneration technology is a kind of common environmental protection road maintenance technology. In order to research the mechanics performance of emulsified asphalt cold recycling mixture, unconfined compressive strength, cleavage strength and modulus of resilience test are selected to analyze change rule of mechanics performance. This paper has analysed emulsified asphalt cold recycling mixture through rutting and marshall tests and found that cement content and compaction times has certain influence on high temperature stability and moisture stability. At last, cold recycling engineering diversion and control are elaborated. It is proved that the application of cold recycling mixture technology have outstanding meaning to economic and social.

Keywords: cold recycling; mechanics performance; road use performance; benefits

THE RELATIVE SPECIALITIES

Discussion on Method of Space Utilization under Urban Bridge Zhu Haipeng, Zhao Dianwu (163)

Abstract: With the fast development of urbanization, the automobile quantity increases rapidly and the problem of "difficult parking" of city increasingly pricks up, which put forward the higher requirements for efficient utilization of space under urban bridge. The article introduces the field investigation and study in Beijing and Tianjin, and scientifically analyzes the space under bridge according to the reality of space under bridge now.

The result shows that it should be reasonable to reconstruct and utilize the space under bridge.

Keywords: space under bridge, parking lots, vehicle parking

Elementary Analysis of Public Space and City Design in Urban Residential Area Kong Yang (165)

Abstract: Owing to no systematical city design guideline, there are various unreasonable appearances in the present construction of public space in urban residential area so as to lead the lower service level of urban public space. According to the detail analysis of the continuous commercial development real estate projects on the partial areas of Wenyan Town in Xiaoshan District, and combined with the relative collected materials and the field investigation, the article briefly analyzes the problems in the planning of public space in the urban residential area, and points out many unreasonable problem sources in the planning process of modern residential area in order to help the design of public space in the present urban residential area. At same time, combined with the practical experience, the article sets forth the design idea and view of public space in the present residential area. The article points out that the "harmonious" residential area with the significance of the times can be built only by enhancing the transformation idea and establishing the correct value, and improving the design and management method and mode of the administration departments and designers, and with the help of the joint support and effort of the whole residents in the residential area.

Keywords: residential area, public space, city design, people oriented

Stress Analysis and Optimization Proposal of Foundation Connection Form of Road Noise Barrier

..... Tao Xiaoguang (171)

Abstract: With the rapid development of economy, the traffic noise more seriously influences the residents at both sides of city road, and more and more noise barriers are established on city elevated bridges and expressways with various connection modes of foundation. According to the finite element simulation and calculation of various foundation connections, the article analyzes the safeties of various structures. Based on it, the relative optimization proposal is put forward.

Keywords: noise barrier, striding stake, anti-collision wall, finite element analysis, structure optimization

Discussion on Design of Electric Power Cable Tunnel Line of Central City Area Shi Hong, Fang Qi (175)

Abstract: With the continuous development of city construction and the continuous improvement of urbanization level to result in the rapid increment of electricity load, the large section of cable electric power transmission mode is gradually widely used. At the same time with the high standard requirement of environment and landscape by the people, it has been impossible to elevate the cable in the central city area, but the electric cable tunnel used to lay the cable is popularized. Aiming at the complex underground environment of more underground buildings and limited underground space in the central city area, the article preliminarily discusses how to reasonably select the alignment and line of electric cable tunnel, feasibly implement the large section of electric tunnel, ensure the rapid increment of electricity load in the central city area, and minimum the influence of electric cable tunnel construction and operation periods on the city environment and landscape.

Keywords: electric cable tunnel, line design, longitudinal design, working shaft

Discussion on Landscape Design of High-speed Railway Transportation Hub Jiang Tao (178)

Abstract: The article illustrates and discusses the design of landscape in the front square of the comprehensive transportation hub station of high-speed railway in Urumqi and its surrounding roads. Based

on this case, the article tries to summarize the style, content, technique and process in the landscape design of large-sized comprehensive transportation hub. The relative experience can be referred for the similar projects.

Keywords: high-speed railway hub, supporting landscape, scheme design, design of construction drawing

Elementary Discussion on How to Reasonable Determine Municipal Engineering Construction Cost and Function

..... Zhao Tianfeng (183)

Abstract: The reasonable preparation of municipal engineering estimation and budget can greatly utilize the limited financial fund. The article introduces the determination process and function of municipal engineering construction cost. The relative experience can be referred for the similar projects.

Keywords: estimation, budget, construction cost, financial fund, efficient use

Analysis of Metro Engineering Investment Control Qu Fang (186)

Abstract: With the rapid development of economical construction and the fast expansion of urban scale, the urbanization process is gradually quickening, a great deal of population come into city, the people travel and the materials exchange frequently, the traffic contradiction between supply and demand is prominent day by day, and the urban traffic congestion becomes the difficulty faced by every country in the world. Under the condition of serious traffic congestion of urban roads now, the metro can efficiently decrease the ground motored vehicle flow. The metro plays the positive role in the solving of urban traffic congestion and the improvement of city layout. However, the high primary investment of metro engineering is always one of the main problems persecuting the metro industry development. Therefore, it is very important how to control the investment.

Keywords: metro, investment control, engineering project

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上海先为土木工程有限公司是国内知名的具备特种专业工程承包资质的专业公司，主要从事桥梁顶升、桥梁顶推、桥梁加固维修及支座更换、建筑物平移纠偏、结构补强等特种领域的设计、咨询和施工。公司拥有20余项桥梁顶升及建筑物移动方面的专利技术，是国家二级工法“大型桥梁整体顶升施工工法”的主要编制单位，获得过上海市科技进步奖一项，上海公路协会科技进步奖一项。公司主要成员有3人次获得过上海市科技进步一等奖，4人获得过上海市科技进步二等奖。由公司独立完成的建筑物平移典型工程包括：大同展览馆平移旋转工程、上海梅林正广和大楼平移工程、上海市启秀实验中学东洋房平移修缮工程等。其中平移规模和难度最大的是大同市展览馆平移旋转工程。该建筑总面积达18 200 m²，平移总重量58 000 t，整体平移距离206 m，顺时针旋转90°。

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顶升工程、成都二环西路羊西立交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。

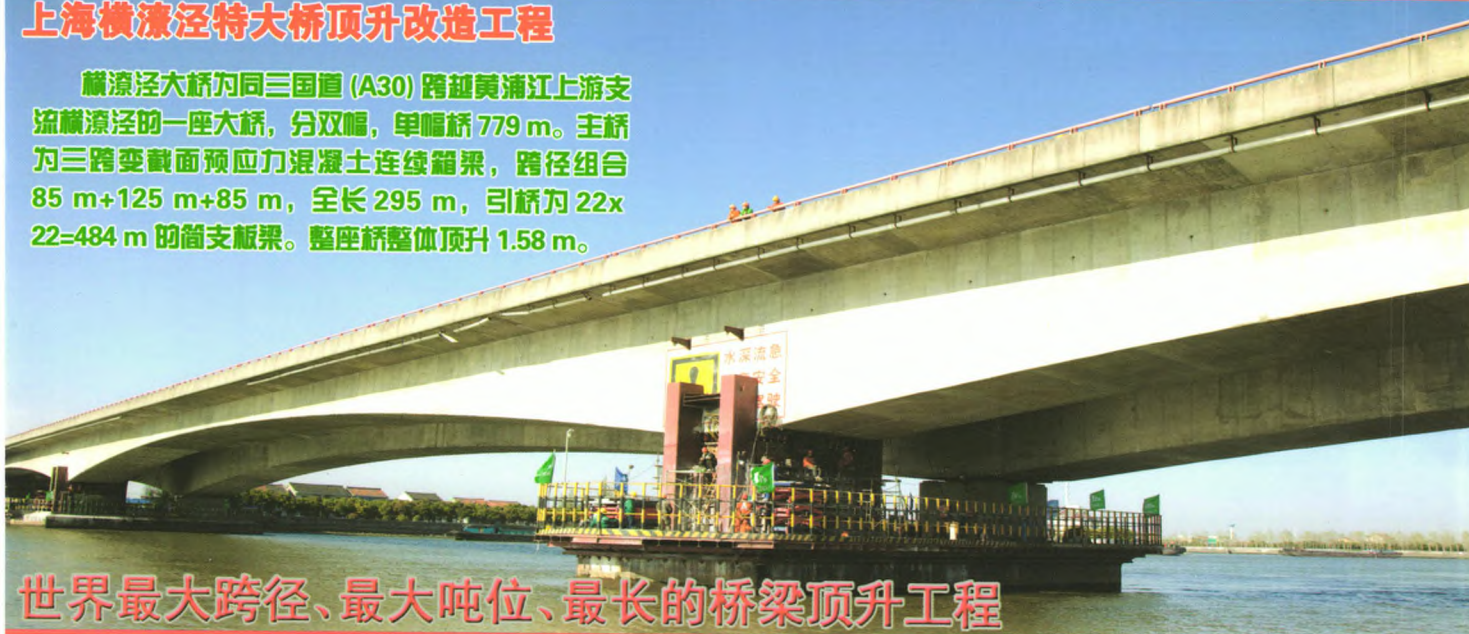
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