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推进低影响技术研究 建设新时代美丽中国

2018城市道桥与防洪第十一届全国技术论坛在成都举办

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封面介绍

“2018城市道桥与防洪第十一届全国技术论坛”于2018年9月18日至20日在成都市举办。本届论坛由上海市政工程设计研究总院（集团）有限公司、中国市政工程西南设计研究总院有限公司、成都市市政工程设计研究院联合主办。论坛主题为：推进低影响技术研究，建设新时代美丽中国。

习近平总书记在党的十九大报告中提出“加快生态文明体制改革，建设美丽中国”。低影响开发技术正是践行社会主义生态文明观的技术手段。

在现代社会，所有的城乡建设活动，都存在低影响开发问题。不仅包括对城乡水资源的影响，还包括对自然生态环境的影响，对居民生产生活的影响，对城乡历史文化发展的影响。在城乡建设过程中，必须与当地的历史文化、产业特征相结合，对原有规划布局及传统特色尽可能降低冲击和保护，因地制宜，最大化继承和发展开发场地原有的景观特色，产业特色和民俗文化特色。

近年来，广大城市建设者就低影响开发技术，在城市道路、桥梁、防洪排水、建筑、隧道、综合管廊等领域进行了大量的探索和实践，并取得了可喜的研究成果，积累了丰富的实践经验，同时也遇到许多新问题，本届论坛对此进行总结和交流。

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CONTENTS

2018 Urban Roads, Bridges & Flood Control Special for The Eleventh National Technical Conference

Abstract: The article firstly reviews and rethinks the problems of large demolition and large construction, same imagines of the city and no regional features caused in the nearly 30 years of urban construction in China, and analyzes these problems from the levels of consciousness and technology. And then the article sets forth the development mode of city under the new development concept from the national level and based on the spirit of the conference on the city construction by the central government. Finally, the article puts forward the thinking on how to design the urban roads into the urban streets and how to build the urban roads into the humanized public space in order to promote a new type of people-centered urbanization.

Keywords: new development concept, urban road, planning, street, humanization, traffic

Abstract: In 2015, on the basis of the basic framework of urban expressway and rail transit, Wuhan put forward a new urban construction concept of "let the city quiet down", and push the construction of slow traffic. The article sets forth the characteristics of slow traffic in Wuhan, summarizes the experience and implementation effect in the construction of slow traffic system and the demonstrated project in Wuhan from three aspects of surface, line and point, and puts forward four aspects of thinking on sustaining and carrying forward the construction of slow traffic.

Keywords: slow traffic, greenway, walking street, experience

Abstract: This paper elaborates the macro background and evaluation indexes of bus metropolis, and introduces the basic strategies and effects in the construction of urban bus metropolis at home and abroad. According to the experience of building the demonstrated city of the national bus metropolis in Shanghai, this paper summarizes the relative implementation strategies and puts forward the proposals for further

Abstract: The article summarizes the design concept and scheme of the main bridge of Jiangwan Bridge. In the preliminary design period, three schemes of about 180-mm span are proposed for the main bridge of Jiangwan Bridge. Finally, the single-pylon arched-pylon double-plane steel-concrete composite girder cable-stayed bridge is determined to use. The steel box girder is used for the main span of the main bridge, and the pre-stressed concrete box girder is used for the side span. The total width of bridge is 44.5 m with double-way eight lanes + pedestrian and non-motored vehicle lanes. The article introduces the survey method and result of karst caves. The relative design thought and experience can be referred for the similar projects.

Keywords: cable-stayed bridge, overall scheme, arched pylon, karst cave, geophysical prospecting CT, advanced drill

Abstract: The article sets forth the characteristics, principles and methods to design the urban bridge modeling landscape. According to the analysis on the design case of bridge, the article discusses the design method of urban bridge modeling landscape.

Keywords: urban bridge, modeling landscape, aesthetics, design method

Abstract: The conventional reconstruction projects of small and middle-span bridges greatly influence the existing traffic. The full prefabricated bridge technology and rapid construction method are firstly applied in the Dianqi River Bridge Reconstruction Project of the existing expressway reconstruction projects in Beijing. The construction period normally required for 2~3 months will be shortened to 25 d, which will minimize the impact of construction on the present traffic. The article introduces the design scheme, construction steps and period control of rapid implementation of the full prefabricated bridge, and sets forth the key technologies of the integral prefabrication, manufacture and installation of pier column and bent cap, the socket-type connection of prefabricated pier column and foundation, and the large self-propelled crane integrally to hoist the steel girder in detail.

Keywords: bridge reconstruction, small and middle spans, rapid construction, full prefabrication

Abstract: The full prefabrication technology of bridge is a high-efficient, low-carbon and environmental-protection bridge construction technology. This paper introduces the practice of this technology in detail. Firstly combined with the development situations at home and abroad, the article briefly introduces the prefabrication technology of the superstructure, then introduces the prefabrication technology of the

Keywords: full assembly, prefabrication, excavation method, road tunnel, soft soil region

Abstract: Based on the background of garden city construction in Chengdu, the article studies the construction mode of garden city oriented by the water strategy, discusses the significance of water pattern, water treatment, water safety and water development for the development of garden city, and puts forward the construction strategy to upgrade the water planning, to ensure the water safety, to improve the water environment, to build the water landscape, to highlight the water culture and to integrate the water business forms in order to realize the maximization of ecological and economic values of garden city.

Keywords: water strategy, garden city, city planning, construction mode

Abstract: According to the national guidelines, the standard atlas and the related guidelines, and based on some problems in practical application, this paper discusses the way of achieving the upper planning index and the key technology of individual facilities in the practice of low impact development design of urban roads in order to provide certain reference for the similar projects of the other cities.

Keywords: urban road, low impact development, design, sponge city

Abstract: With the development of Beijing City, a large number of underground spaces of sunk interchange, underground road and tunnel are being developed, planned, designed and constructed. The roads under the sunk interchanges often become the severely afflicted area of waterlogging during the flood and waterlogging. The article introduces the technical lines in the flood and waterlogging control design of sunk bridge area (tunnel), and sets forth the investigation of the historical flood and waterlogging disasters of the project area in the flood and waterlogging control design stage, the determination of design water level of flood and waterlogging control, the division method of rainwater catchment area, the necessary non-engineering measures, the flood and waterlogging control design principle, and the other engineering flood and waterlogging control designs.

Keywords: sunk bridge area, flood and waterlogging control, design, essentials

Abstract: One of the sponge city construction core indexes mentioned in *Sponge City Construction Technical Guide – Construction of Low-impact Development Rainwater System (Trial)* is the annual runoff volume control rate. Based on the 1983~2012 rainfall data of China in *Guide*, the basic annual runoff volume control rates corresponding to the design rainfall of 31 important cities in China are deduced. But in the practical

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construction process. The reasonable finite element settlement results can improve the structure construction and hoisting position so as to guide the whole construction process and to reduce the construction risk. Taking a long-span continuous steel box girder as a study object, the mechanical performances of steel box girder and connecting bracket are simulated in the whole hoisting process through the finite element calculation. The simulating computation results show that the lateral position of hoisting point in the junction of solid-web diaphragm plate and mid-web plate is the best location, by this time all plate stresses of box girder are obviously improved. The calculation of the mechanical properties of steel box girder and connecting bracket in the hoisting process of the whole construction period can meet the construction needs, and has a large safety reserve.

Keywords: steel box girder, hoisting, bracket, finite element

Abstract: The article sets forth the present situations and causes of cracks and diseases of the variable cross-section continuous girder bridge, and its calculation and analysis, points out the deficiencies of single-girder model, plane beam grillage model and solid model used for the calculation in the design so as to educe the practical fine analysis method – spatial grid model, and introduces the principle of the spatial grid model in detail. Taking the disease bridges as the background, the article describes the detection results and preliminarily analyzes the crack causes. On this basis, the article analyzes the influence factors of overload and web temperature difference. The article contrasts the cracking positions of web and the transfinite range of stress from the views of the normal stress and surface tension stress. The result shows that the temperature difference is not a sensitivity factor to cause the web cracking, and the overload is the main factor to cause the web cracking. The conclusion is that the spatial grid analysis method can provide the significant guidance for the analysis of such box girder structure.

Keywords: asymmetric, web crack, variable cross-section continuous girder, spatial grid model, disease analysis

Abstract: The composite steel-concrete girder is a new type of structures using the characteristics of good steel tension property and good concrete compression performance to integrate the steel and the concrete by connectors and to bear the force together. This kind of girder has not only the advantage of the steel structure and the reinforced concrete structure, but also the remarkable economic and social benefits of technology. In order to study the influence of structural geometric parameters and material strength on the ultimate bearing capacity of composite girder in the high-strength steel-concrete composite girder, the finite element numerical calculation model of 12 high-strength composite girders is established under the deuce symmetrical loads in the span to analyze its ultimate bearing capacity. The analysis result indicates that the

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Abstract: In Shenzhen, the base slab of a bridge project overpasses the tunnels of the existing Metro Line 5 and Metro Line 11 of Shenzhen at short range. The minimum clear distance of the base slab and tunnel is 4.6 m. Owing to the characteristics of complex soil property and closing to the tunnel, the excavation of foundation pit for base slab will cause the adverse impact on the tunnel. The 3D finite element numerical model is established to simulate and analyze the influence of the bridge base slab during the excavation and construction on the existing structure of metro tunnel through the structural deformation of the existing tunnel, the curvature radius of tunnel longitudinal deformation curve and the additional stress of tunnel structure, and demonstrate the operation safety of the existing metro tunnel. The study result can be referred for the design and construction of the similar projects.

Keywords: small spacing, base slab of bridge, metro tunnel, numerical simulation

Abstract: With the development of urbanization process in China, the construction scope of road engineering projects is getting larger and larger. The construction technology of bridge engineering as the constructional engineering emphasis is continuously perfected and developed. The relative construction quality is also upgraded to a certain extent. The article analyzes the quality control of the pre-stressed pipe grouting technology in the bridge engineering construction. The relative experience can be referred for the similar projects.

Keywords: bridge, engineering, construction, pre-stressing, pipe, grouting technology, quality control

Abstract: In order to satisfy the demand of large-diameter buried plastic drainage pipeline in the municipal engineering, the large-sized sand box test system is used to test and research the DN1200 and above large-diameter buried plastic drainage pipelines. The conformance test and the backfill contrast test prove the conformity of the theoretical calculation formula, which provides the test data reference for the design, construction and operation management.

Keywords: large diameter, plastic drainage pipeline, test analysis

Abstract: The foundation treatment has the distinctly important practical significance in the construction process of civil engineering. Combined with the geological condition of a wastewater treatment plant upgrading reconstruction project, the article analyzes the foundation characteristics of the main buildings and structures, and puts forward the foundation treatment scheme combining the anchor rod, reinforced

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definition and function evaluation based on the value engineering theory, and the method how to distinguish the necessary and unnecessary functions, and to eliminate the latter. The final quotations several schemes are compared and selected by taking the tender offer as the element and taking the marking standard of tender offer as the function. The optimal quotation is achieved by the strictly systematic calculation and analysis. The evaluation system is built to analyze all influence factors in the evaluation marking tables stipulated in the bidding documents, and the first and second factors are evaluated by the single-factor fuzzy evaluation of the expert marking. Based on the maximum membership degree, the function evaluation score of each scheme is achieved. The scheme evaluation result is obtained by the basic formula of the normalization data using value engineering. The final bid decision is formed by comprehensively absorbing the advantages of each scheme. Combined with the bid and tender process of Beijing – Urumqi Expressway Gansu Section Baigeda – Mingshui Highway Project, the article introduces the decision analysis on the tender price of the project, which can be referred for the similar projects.

Keywords: value engineering theory, fuzzy comprehensive evaluation, tender offer

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