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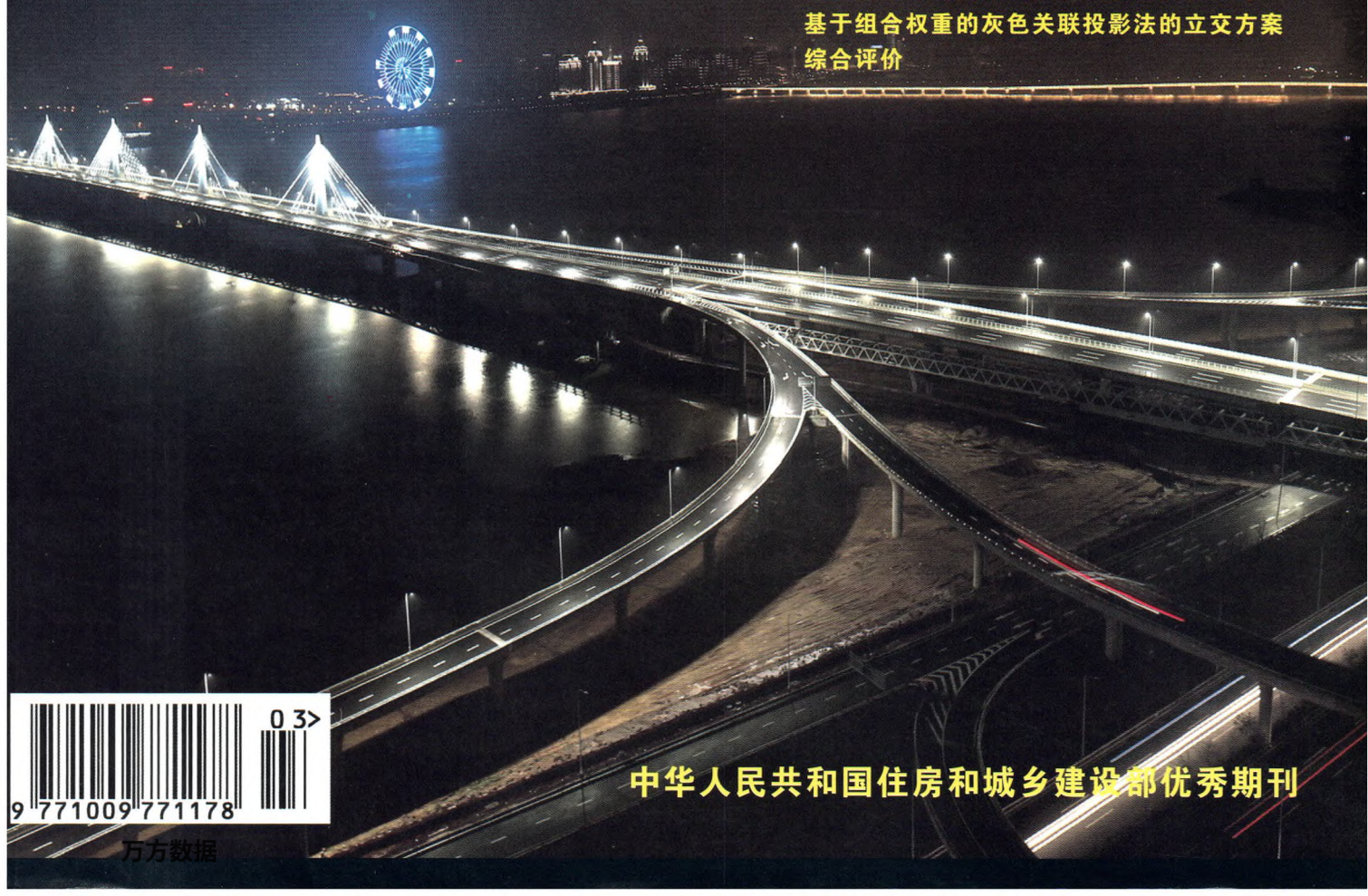
图为隧道股份上海城建市政工程（集团）有限公司施工的南昌朝阳大桥工程

因为我们专心，所以我们专业！
——《城市道桥与防洪》

学术联盟：上海市城市科学研究会

● 本期看点



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封面工程

本期封面工程为南昌朝阳大桥,由隧道股份上海城建市政工程(集团)有限公司施工建设。

南昌朝阳大桥工程是南昌城市快速路网格局中重要的跨江通道,是一座技术先进、造型美观、功能齐全的大型城市桥梁。该工程于2012年11月17日开工建设,是南昌当地首个设计、投资、施工一体化项目。

朝阳大桥全长约3.1 km,由东岸接线、西岸接线和跨越赣江的主桥组成。主桥主跨采用六塔七孔单索面斜拉桥方案,跨越赣江范围全长约1 560 m。主桥采用塔梁固结、塔墩分离的支承型式。塔和墩为混凝土材质。施工采用波形钢腹板PC箱梁新技术,在施工过程中可以减少大量的模板、支架和混凝土浇注工程,免除在混凝土腹板内预埋管道的繁杂工艺,方便施工,缩短工期,降低了工程造价。

朝阳大桥功能实用性更强——设人非系统与机动车系统相互分流,减轻通行压力;造型更美观——6个"合"字形桥塔设计使得上塔的线形弧度各不相同。

该工程深水浅覆盖层基础难度大,双臂钢围堰施工风险高,波形钢腹板体系技术新,宽幅波形钢腹板PC组合梁斜拉桥工艺复杂。朝阳大桥项目团队精心组织,严格管理,统筹安排,确保了朝阳大桥在进度、质量、安全等方面均能有效控制。大桥于2015年5月18日顺利实现通车。

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CONTENTS

ROADS & COMMUNICATION

Abstract: The article introduces the engineering background and construction conditions of Jingmi Road (Jingcheng Expressway – Kaifang Ring Island). According to the collection of present situation and the interpretation of planning scheme, the article further analyzes the project function and design scheme, and summarizes the design scheme of this project, which can be referred for the similar projects.

Keywords: Jingmi Road, construction condition, road function, road design

Abstract: With the rapid development of city, it is required to consider the relationship between the road and the local economic development during the construction of new interchange. And the route alignment and the scheme selection should take account of the short-term development and long-term planning of city. As an important part of the expressway, the interchange is required to reduce the land occupation and acquisition as far as possible during the design. According to the comparison and selection of the functions, restricting factors and schemes of Shajingbei Interchange in Shenzhen Outer Ring Expressway, the article sets forth and analyze to determine how to select the reasonable interchange and flexibly to layout the ramps under the premise of satisfying the requirements of traffic capacity so as to make the interchange coordinated with the current terrain.

Keywords: expressway, interchange, comparison and selection of scheme

Abstract: As only one expressway radiation within the development area, Beijing –Shanghai Expressway has been hard to satisfy the linking-up demand of the development area and the city area of Beijing with the development construction of Yizhuang Development Area and with the increasing traffic volume. According to the reconstruction of Beijing Expressway and Ring Road V Interchange, a ramp is newly constructed in Beijing – Shanghai Expressway to link up with Yizhuang Development Area so as to strengthen the connection of the city area of Beijing and Yizhuang Development Area and to relieve the traffic congestion.

Abstract: The article puts forward the stability calculation of the protection and reloading of existing dam, and quantitatively studies and analyzes the stability and deformation of the dam protection along sea to achieve the relative experienced model for providing the basis of the stability and safety of the similar projects. The relative experience has the important guidance for the implementation of highway and urban road reconstruction projects along sea, river and lake in China.

Keywords: dam subgrade, displacement, settlement, stability

Abstract: With the fast development of cities in China, the construction development speed of municipal road is further improved. However, it is hard to completely avoid the natural terrain of present mountains and rivers in the road network planning of municipal road. Therefore, the safety and stability of slopes in the road construction cannot be ignored. The article further discusses the safety and stability of municipal road slope by the design case of the K3+640 ~ K3+980 cutting slope work of North Jiaojiang Road (Jiaojiang Road Extension) Road Section A Project in Zhangzhou Jiaomei Special Steel Advanced Processing Industrial Zone.

Keywords: municipal road, deep cutting slope, slope protection

BRIDGES & STRUCTURES

Abstract: The article systematically introduces the development history of the urban bridge construction in Shanghai – the largest economic center, financial center and cosmopolitan city of China, focuses introduction on the technical innovation of three crossing-sea bridges of Donghai Bridge, Shanghai Changjiang Bridge and Ningbo Daxie Bridge, and introduces the relative enlightenment.

Keywords: Shanghai, crossing-sea bridge, technical innovation

Abstract: The pier top boundary condition of high pier in the finished stage of bridge is between the hinge and consolidation. Its calculation length coefficient is often difficult to take. By constructing the shape function of high pier in finished stage of bridge, the energy method is used to solve the instability force critical force of high pier in the rigidity subgrade in the finished stage of bridge. Also the Euler's formula is used to achieve its calculation length coefficient. Combined with the example, the finite element method and energy method are used to calculate, compare and analyze the calculation results of the both. The results show that it is required to calculate the non-ideal boundary effect of pier top during the calculation of high pier calculation length. In addition, the calculation result of the recommended energy method formula is close to the finite element program with the higher precision, which can be referred for the designs.

Keywords: finished stage of bridge, high pier, calculation length coefficient, energy method

Abstract: In order to study the stress distribution and force transfer mechanism of anchorage zone of sail-shaped steel pylon, by the engineering background of the Ningbo Binhai Road V Bridge (single-plane single-pylon cable-stayed bridge) crossing Luzhongwan River, and based on the finite element software MIDAS FEA 3.6.0, the complete solid finite element model for GT8# segment of steel pylon is set up by the equivalent plate thickness method to analyze the stress distribution and force transfer mechanism of the main stressed plates. The results show that the Von Mises stress of the different plates of the steel anchor box is all less than 200 MPa and can meet the relevant requirements in the codes. The stress concentration occur at the connection among the shear plates of the steel anchor box and the inside-outside webs of the steel pylon, but this area is limited and the stress diffuses more fast. By comparing three different cross-section forms of the horizontal steel tension member, the Feng-shape form is determined not only to meet the needs of bearing loads, but also to simplify the node construction and to reduce the processing and manufacturing difficulties of steel structure. In the meantime, by analyzing the influences of the different lengths of the flange inserting the pylon on the stress distribution of anchorage zone, the twice height of steel tension member is proposed for the optimal design scheme.

Keywords: cable-pylon anchorage zone, force transfer mechanism, stress analysis, steel tension member, node design

Abstract: The steel strand anchorage zone as the critical stress node of prestressed component is always the dead zone of quantization calculation of prestressed concrete bridge for a long time. There is no the known design theory. In order to seek a more accurate and general design method, the article analyzes the stress characters of many anchorage zones, clears up the calculation process of strut-and-tie theory by horizontally comparing many relative literatures, summarizes the design methods and design gist of strut-and-tie model, discusses and amends some critical parameters, and forms a practical and feasible strut-and-tie design idea so as to provide the basis for the following design of D-zone concrete.

Keywords: D zone, steel strand anchorage zone, triangular tooth piece, strut-and-tie model, stress analysis

Abstract: Most of old rigid frame arch bridges in service have been seriously damaged. Aiming at the fault characteristics and combined with the practical projects, the rigid-frame arch bridge is improved and designed. The spatial finite element software is established to analyze its static and dynamic performances. The bean and plate combination model is used to reflect the structural stiffness more accurately during analysis. The analysis result shows that the bean and plate combination model can be used for the engineering design of the similar structures and improve the design efficiency. The controlling conditions of the main section stress of

FLOOD CONTROL & DRAINAGE

MANAGEMENT & CONSTRUCITON

Abstract: According to the practical situation of MK Project in Uganda, the article introduces the innovation of cooperation mode, positive integration with local culture and adjustment of personnel structure in the implementation process of project. The exploration to strengthen the localization construction and to carry out the construction technology standardization provides some practical experience for greatly promoting the internationalization of project management.

Keywords: complement each other's advantages, cultural integration, localization construction, standardization technology, enterprise propaganda

STUDY ON SCIENCE & TECHNOLOGY

Abstract: Aiming at the Multi-target characteristics of comprehensive evaluation of interchange scheme, the comprehensive evaluation index system is established and the combination weight of grey relational projection method is proposed. According to the combination of analytic hierarchy process and entropy weight method, the evaluation index weight is determined and the grey relational projection method is used to evaluate the interchange scheme. Combined with its validation by the engineering cases, the conclusion shows that the index weight is more scientific and reasonable with the strong authority, and is more practical.

Keywords: interchange scheme, combination weight, grey relational projection, comprehensive evaluation

Abstract: At present, the expressway network has been more perfected in China. Many expressways have also come into the maintenance period. More and more attention is also paid to the maintenance technology of asphalt pavement. The micro surface technology is widely popularized since introduced into China because of its advantages of energy conservation, environmental protection, convenient construction, low construction cost, fast traffic opening and long service life. There are many factors influencing the mixture of micro surface. A factor of additive cement is experimented in laboratory. The article analyzes and summarizes the influence law of cement on the pavement performance of emulsified asphalt mixture of micro surface from the aspects of mixable time, cohesion index, wet wheel wear value and low-temperature crack resistance, and provides the guidance basis for the construction technology of micro surface.

Keywords: micro surface, emulsified asphalt, cement, pavement performance

Abstract: The heating cable melting ice-snow technology is a method of cable heating actively to prevent and to clean up the ice and snow on road, and has been successfully applied in the road structure. However, the

APPLICATION OF ACHIEVEMENTS

THE RELATIVE SPECIALITIES

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