

铁道标准设计

RAILWAY STANDARD DESIGN

主办：中铁工程设计咨询集团有限公司

2021 年
第 65 卷 第 10 期

中国铁道学会桥隧委员会
铁路隧道年会论文专辑

科学规划 技术支持 保护生态 安全可靠

中铁十八局集团承建康定2号隧道出口

高标准 高质量 推进工程建设



万方数据



川藏铁路康定2号隧道

编委会名单

顾问	何华武	孙永福	卢春房	周镜
	邓文冲(美国)	江欢成	梁文灏	
	聂建国	杜彦良	陈政清	王复明
	冯夏庭	李术才	郑健	仲建华
	刘汉龙			

名誉主任:孔遁

主任委员:王洪宇

副主任委员:安国勇 巫伟军

委员:

于兴义	马庭林	王玉泽	王平	王东辉
王争鸣	王进	王星华	王修华	王俊峰
王清明	勾红叶	文望青	方勇	邓运清
石先明	田志军	白宝英	冯青松	冯威
朱丹	朱永全	朱颖	乔俊飞	乔健
伍军	刘学毅	刘家锋	闫斌	许三平
许玉德	负虎	孙立	孙树礼	苏国明
杜文山	李文江	李兆平	李红侠	李远富
李芾	李汶京	李邵军	李国良	肖广智
肖明清	吴奎奎	吴明友	汪吉健	汪胜
沈建明	张忠良	张学伏	陈良江	周江天
周诗广	赵勇	赵庶旭	胡所亭	姚令侃
姚楚峰	倪光斌	徐升桥	高宗余	高亮
郭锴	黄足平	曹永刚	龚彦峰	盛黎明
董勇	辜小安	魏春相	雷慧峰	蔡小培
颜华	薛吉岗	薛春晓	戴公连	魏宏伟

(以姓氏笔画排序)

主管:中国铁路工程总公司

主办:中铁工程设计咨询集团有限公司

主编:刘家锋

副主编:赵敬芬

编辑出版:《铁道标准设计》编辑部

地址:北京市丰台区广安路15号中铁设计大厦

邮编:100055

电话:(010)51830166 52696303(主编)

51830168 51830167 51831099

52696305(编辑)

在线投稿: <http://www.tdbs.cbpt.cnki.net>E-mail: tdbsb@263.net

国内总发行:中国邮政集团公司

北京市报刊发行局

订购处:全国各地邮局

中国标准连续出版物号: ISSN 1004-2954
CN 11-2987/U

邮发代号:82-765

国外总发行:中国国际图书贸易集团有限公司

国外发行代号:M1777

广告许可证:京丰工商广登字第0082号

印刷:天津中铁物资印业有限公司

出版日期:2021年10月20日

定价:国内50.00元 国外10.00美元

本期文章总篇数:34

目次

中国铁道学会桥隧委员会
2021年度铁路隧道年会专辑

前言一	关宝树	扉页1
前言二	赵勇	扉页2

隧道总体设计

沪渝蓉高速铁路崇太长江隧道关键技术探讨	马志富	1
印尼雅万高铁1号隧道总体方案及控制节点技术方案研究	韩华轩,孟庆余,朱战魁,赵福全	6
雅万高铁大直径盾构隧道关键设计问题探讨	席博阳	13
甬舟铁路金塘海底隧道总体设计与关键技术研究	唐雄俊,肖明清,焦齐柱,毛升	20
高原复杂环境TBM隧道设计及工程对策	陈花顺,李国良,陈绍华,朵生君,向亮,张威	26
京张高铁八达岭长城站设计思路及创新支撑	刘建友,吕刚,岳岭,刘方,孙行	32
汕头至汕尾铁路汕头湾海底隧道设计综述	吴强	38

隧道科学研究

隧道局部支护与系统支护判别标准及方法研究	肖明清,徐晨	44
川藏铁路隧道零弱边坡进洞理念与实践	肖广智,许卫武	49
对《高速铁路设计规范》等关于隧道部分标准优化建议	马志富,杨昌贤,马伟斌	55
川藏铁路大渡河特大桥锚洞对隧道安全影响评价	马云飞	60
隧道高性能支护喷射纤维混凝土配比试验研究	霍建勋,林传年,刘喆	65
双线铁路大直径盾构隧道管片结构空间内坐标解析研究	冯天炜,王朋乐,苏舒,朱战魁	74
寒区隧道洞口保温层设防长度确定方法探讨	吴剑,郑波,方林,匡亮,郭瑞	81
正断层错动对海底盾构隧道管片及环缝接头影响分析	孙文昊,陈立保,李沛松,王琦,张津	87
铁路隧道衬砌厚度及强度不足安全性影响分析	杜志田,朱双燕,赵福全,朱战魁	93
强震作用穿越不同位置粉土地层盾构隧道液化特性研究	朱双燕	98

隧道方案研究

广湛高铁湛江湾海底隧道方案比选与盾构机选型研究	唐国荣,齐春	103
渤海海峡跨海通道隧道建设方案研究	王乐明,孟庆余,万自强,冯天炜,贾辉,李佳琪	110
胶州湾第二海底隧道跨断裂带抗错方案研究	陈立保,孙文昊,孙州,武哲书	116
双线铁路大直径盾构隧道疏散滑梯可行性研究	刘雨竹,王明年,王松,郭晓晗,胡萧越,于丽	123
城市高速铁路明挖隧道装配式结构设计方案研究	孙一鸣	130
川藏铁路分修隧道内紧急救援站排烟口优化探讨	方钱宝,陈思宇,王峰,张路华	135
川藏铁路易贡特长隧道设计方案研究	陈敬军,李国良,陈绍华,许宇,朵生君	140

隧道结构设计

川藏铁路隧道穿越活动断裂带工程措施探讨	张景,李国良,杨木高,刘国庆,陈敬军,朵生君	148
川藏铁路泸定车站特大跨度隧道支护体系优化设计	华阳,陶伟明,吴林,曹彧,匡亮,吴咏双,王闯	155
高地应力软岩隧道塌方处置措施及处置效果评价	邹逸伦,廖雄,李正辉	161
高地震烈度区川藏铁路隧道护拱明洞结构受力分析	——以安良隧道为例	
	范雲鹤,汤印,余刚,徐邳威,辜英晗,陶伟明,曹彧,匡亮	167
水下盾构隧道管片接缝防水密封垫截面设计研究	王旭,孟庆余	172
矿山法铁路隧道拱部预制衬砌接头选型设计研究	杨宝,刘保林,曹林卫,旷文涛,杨昌宇	179

隧道新技术、新装备应用

矿山法铁路隧道衬砌拱部预制拼装现场试验研究	刘保林,旷文涛,齐如见,杨宝,杨昌宇	184
甬舟铁路金塘海底隧道结构健康监测方案研究	唐雄俊,毛优达,孙州	189
超大直径盾构机海底无损拆解及配套土建方案研究	吴强	195
基于三维激光扫描技术的超欠挖算法在隧道开挖中的应用	李瑶,嵇一,吴勇生,郑荣政,苏舒,文言,曾国良	200

CONTENTS

Overall Design of Tunnels

Discussion on Key Technologies of Chongtai Yangtze River Tunnel of Shanghai–Chongqing–Chengdu High-speed Railway	MA Zhifu	1
Study on Overall Scheme and Node Control Technology Scheme of No. 1 Tunnel for Jakarta–Bandung High Speed Railway in Indonesia	HAN Huaxuan, MENG Qingyu, ZHU Zhankui, ZHAO Fuquan	6
Discussion on Key Design Problems of Large-diameter Shield Tunnel of Jakarta–Bandung High-speed Railway Project	XI Boyang	13
Investigation of Overall Design and Key Technology of Jintang Subsea Tunnel of Ningbo–Zhoushan Railway	TANG Xiongjun, XIAO Mingqing, JIAO Qizhu, MAO Sheng	20
TBM Tunnel Design and Engineering Countermeasures for the Complex Environment of the Plateau	CHEN Huashun, LI Guoliang, CHEN Shaohua, DUO Shengjun, XIANG Liang, ZHANG Wei	26
Design Scheme and Innovative Achievements of Badaling Great Wall Underground Station of Beijing–Zhangjiakou High-speed Railway	LIU Jianyou, LÜ Gang, YUE Ling, LIU Fang, SUN Xing	32
Summary of Shantou Bay Cross–Harbour Tunnel Design for Shantou–Shanwei Railway	WU Qiang	38

Tunnel Science Research

Study on the Criterion and Method for Distinguishing Local Support and Systematic Support of Tunnel	XIAO Mingqing, XU Chen	44
Concept and Practice of Sichuan–Tibet Railway Tunnel Construction without Slope Cutting	XIAO Guangzhi, XU Weiwu	49
Optimization Suggestions on Tunnel Standards in Code for Design of High Speed Railway	MA Zhifu, YANG Changxian, MA Weibin	55
Impact Evaluation on Tunnel Safety of Dadu River Bridge on Sichuan–Tibet Railway	MA Yunfei	60
Experimental Study on High Performance Fiber Shotcrete Ratio for Tunnel Support	HUO Jianxun, LIN Chuannian, LIU Zhe	65
Research on the Spatial Coordinate Analysis of the Two-track Railway Large-diameter Shield Tunnel Segment	FENG Tianwei, WANG Pengle, SU Ge, ZHU Zhankui	74
Discussion on the Methods to Determine the Laying Length of the Insulation Layer at Tunnel Portals in Cold Region	WU Jian, ZHENG Bo, FANG Lin, KUANG Liang, GUO Rui	81
Analysis of the Effect of Positive Fault Misalignment on Subsea Shield Tunnel Segment and Annular Joint	SUN Wenhao, CHEN Libao, LI Peisong, WANG Qi, ZHANG Jin	87
Safety Influence Analysis of Insufficient Thickness and Strength of Railway Tunnel Lining	DU Zhitian, ZHU Shuangyan, ZHAO Fuquan, ZHU Zhankui	93
Research on Liquefaction Characteristics of Shield Tunnel Passing through Silt Layers in Different Positions under Strong Earthquakes ...	ZHU Shuangyan	98

Study on Tunnel Scheme

Study on Scheme Comparison and Shield Machine Selection of Zhanjiang Bay Undersea Tunnel of Guangzhou–Zhanjiang High-speed Railway	TANG Guorong, QI Chun	103
Study on the Construction Scheme of Bohai Strait Cross-sea Tunnel ...	WANG Leming, MENG Qingyu, WAN Ziqiang, FENG Tianwei, JIA Hui, LI Jiaqi	110
Research on the Anti-error Scheme for the Second Submarine Tunnel of Jiaozhou Bay	CHEN Libao, SUN Wenhao, SUN Zhou, WU Zhesu	116
Study on Evacuation Slide Design of Large-diameter Shield Tunnel of Double-track Railway	LIU Yuzhu, WANG Mingnian, WANG Song, GUO Xiaohan, HU Xiaoyue, YU Li	123
Study on the Structural Design Scheme of Prefabricated High-speed Railway Urban Tunnel	SUN Yiming	130
Discussion on the Optimization of Smoke Outlet of Emergency Rescue Station in the Reconstruction Tunnel of Sichuan–Tibet Railway	FANG Qianbao, CHEN Siyu, WANG Feng, ZHANG Luhua	135
Study on Design Scheme of Yigong Extra-long Tunnel of Sichuan–Tibet Railway	CHEN Jingjun, LI Guoliang, CHEN Shaohua, XU Yu, DUO Shengjun	140

Design of Tunnel Structure

Discussion on Engineering Measures for Sichuan–Tibet Railway Tunnels Crossing Active Fault Zones	ZHANG Jing, LI Guoliang, YANG Mugao, LIU Guoqing, CHEN Jingjun, DUO Shengjun	148
Optimized Analysis of Support System of Extra-large Span Tunnel Engineering in Luding Station of Sichuan–Tibet Railway	HUA Yang, TAO Weiming, WU Lin, CAO Yu, KUANG Liang, WU Yongshuang, WANG Chuang	155
Treatment Measures and Result Evaluation of Collapse in Soft Rock Tunnel with High Ground Stress	ZOU Yilun, LIAO Xiong, LI Zhenghui	161
Stress Analysis of Open Tunnel Structure of Sichuan–Tibet Railway Tunnel in High Earthquake-Intensity Area-A Case Study of Anliang Tunnel	FAN Yunhe, TANG Yin, YU Gang, XU Zhiwei, GU Yinghan, TAO Weiming, CAO Yu, KUANG Liang	167
Section Design of Shield Waterproof Gasket in Underwater Shield Tunnel	WANG Xu, MENG Qingyu	172
Research on Joint Selection and Design of Prefabricated Lining at Crown of Railway Tunnel Constructed by Mining Method	YANG Bao, LIU Baolin, CAO Linwei, KUANG Wentao, YANG Changyu	179

Applications of New Technologies and Equipment of Tunnels

Field Test Research on Lining Arch Prefabrication and Assembling of Mining Method Railway Tunnel	LIU Baolin, KUANG Wentao, QI Rujian, YANG Bao, YANG Changyu	184
Research on Structural Health Monitoring Scheme of Jintang Subsea Tunnel on Yongzhou Railway	TANG Xiongjun, MAO Youda, SUN Zhou	189
Study on Non-destructive Dismantling and Supporting Civil Engineering for Super-large Diameter Shield Machine in Sea Area	WU Qiang	195
Application of Over–Under–Cut Algorithm in Tunnel Excavation Based on 3D Laser Scanning Technology	LI Yao, ZHUO Yi, WU Yongsheng, ZHENG Rongzheng, SU Ge, WEN Yan, ZENG Guoliang	200

RAILWAY STANDARD DESIGN (Monthly)

Vol. 65, No. 10, 2021 (Serial No. 719) (Since 1957)

Competent Authority:

China Railway Engineering Corporation

Sponsor:

China Railway Engineering Design and Consulting Group Co., Ltd

Chief Editor: Liu Jiafeng

Edited & Published by:

The Editorial Office of Railway Standard Design
Address: No. 15, Guang'an Road, Fengtai District
Beijing China
Post Code: 100055
Tel: (86 – 10) 51830168 51830166 51831099
Http://www.tdbs.cbpt.cnki.net
E-mail: tdbsb@263.net

Subscribing Place:

The Editorial Office of Railway Standard Design

Publishing Code:

ISSN 1004 – 2954
CN 11 – 2987/U
Domestic Distributing Code: 82 – 765

General Distributor for Foreign Subscribers:

China International Book Trading Group Co., Ltd.
Foreign Service Distribution Code: M1777

Advertising License Number:

Jing-Feng-Gong-Shang 0082

Publishing Date: October 20, 2021

Price: ¥50.00 Domestic

\$ 10.00 Abroad