

# 深圳港盐田港区东作业区集装箱码头工程专辑

## 目次

### ● 港口工程 ●

盐田港东作业区超大型集装箱码头布置*	施晓迪, 赵敏 (1)
开敞式海域复杂流态下新型码头结构设计	张蕊, 冯浩, 潘文博 (8)
自动化集装箱码头水平运输设备能源补充方式及应用*	姜桥 (15)
复杂地形条件下自动化集装箱码头总体布局*	周娜, 施晓迪, 唐照评 (22)
基于无人集卡的自动化集装箱港区总体布局模式	项青灵, 郭兆珈, 宋凡 (29)
自动化集装箱码头拆装锁钮工艺布置*	姜桥 (36)
复杂环境下盐田港大型自动化集装箱港区集疏运体系布置*	施晓迪, 周娜, 兰加智, 唐照评 (43)
基于盐田港货运运输体系分析的集装箱港区疏港交通提升优化*	李明, 张洋 (50)
港口门户形象一体化设计——以盐田港东作业区集装箱码头一期工程为例	刘格尔 (56)

### ● 地基与基础 ●

自平衡试桩法在高桩码头工程中的应用*	赵敏, 顾祥奎, 冯浩 (63)
深圳盐田港海相淤积土标贯响应及力学指标智能解译*	姜雄, 肖熠 (71)
$\phi 42\text{ mm}$ 和 $\phi 50\text{ mm}$ 两型钻杆标贯击数对比分析与修正*	陈凯, 杨秋芳 (80)
深圳滨海区域复杂人工填土勘察及工程地质特性分析*	易阳, 陈凯, 赵树光, 孙德科 (85)
复合地基桶式基础结构下沉力原位试验研究*	李武, 朱琳 (92)
盐田港区复杂地质条件下桩基础设计	杨留娟, 张滔滔 (96)
波浪对低透空率密排斜桩码头的影响*	王自文, 郭兆珈, 张蕊, 雷杨, 潘文博 (101)
盐田港东作业区地质风险分析*	赵树光, 李孝杰 (109)
复杂地层下轨道基础差异沉降分析和自动化监测*	赵文惠, 肖熠 (116)
高桩码头结构基桩常见问题分析及处理技术*	蒋腊梅, 王军 (121)
轨道基础弹性地基梁设计	陈方舟 (128)
后注浆技术在码头软土地基灌注桩补强工程中的应用*	李达宏, 张蕊, 顾祥奎 (133)
自动化集装箱堆场中复杂应力历史地基的工后沉降预测*	肖熠, 姜雄 (139)
盐田港东作业区软土特性及地基处理方案比选*	赵树光, 杨秋芳 (145)
大直径钢管桩承载力影响因素及现场试验分析	宋超, 李志豪, 孙益振, 白玉新 (152)
盐田东港区码头护岸工程软基处理技术*	张逾诚 (158)

● 结构与设施 ●

盐田东集装箱码头大容量码头岸电设施设计\* .....朱挺松, 姚宇 (164)

港区闸口建筑网架结构设计.....张滔滔, 杨留娟 (170)

盐田港超大型集装箱码头结构方案比选\* .....赵敏, 施晓迪, 顾祥奎, 冯浩 (175)

STEM波作用下直立式与斜坡式结构连接段护面块体设计\* .....王军, 蒋腊梅, 冯浩, 赵敏, 顾祥奎 (182)

高性能混凝土在水工结构中的应用.....吴梦恩, 李建军 (190)

● 数字化发展 ●

基于BIM的集装箱港区数字化交付平台建设与应用\* .....尹硕, 陆晶晶, 徐鑫 (196)

智慧管理系统在盐田港建设中的重要作用.....李志豪, 邹东明, 潘仑 (205)

自动化集装箱码头数字基础设施设计与实现.....陆志勇, 丁飞虎 (215)

基于Dynamo的高桩码头桩基BIM设计优化\* .....范文彰, 徐传超 (222)

盐田港东作业区集装箱码头闸口及港内交通仿真与评估\* .....李琳 (228)

考虑船公司满意度的泊位-岸桥计划干扰恢复 .....陆志勇, 刘玥骅 (237)

自动化集装箱码头危险货物堆场巡检机器人应用技术\* .....丁飞虎, 陆志勇 (243)

● 施工技术 ●

锤击偏心对钢管桩高应变检测结果的影响分析.....李志豪, 何金海, 李建军, 孙益振, 白玉新 (248)

徕卡全站扫描仪MS60在全自动化港口道路堆场施工测量中的应用 .....程永, 聂廷余, 管祖辉, 李鹏兵 (253)

填海区回填土地基强夯处理技术.....胡杰 (258)

基于北斗的国产装备测量精度分析及工程应用\* .....孙洪瑞, 葛金龙, 张登奎 (264)

新技术在盐田港施工安全管理中的运用.....吴贵红, 黄竹亮 (271)

大型方块水下安装定位方法.....陈韶强, 陶华卿, 聂廷余 (277)

波束测深质量控制难点及其在盐田港工程中的应用\* .....孙洪瑞, 张登奎 (283)

● 特约彩版 ●

理事单位风采——中交第三航务工程勘察设计院有限公司

深圳港盐田港区东作业区集装箱码头工程..... (封面)

公司简介..... (封二)

公司资质..... (插一)

数智与自动化..... (插二)

地基处理与自动化堆场..... (插三)

高标准码头设施..... (插四)

公司专利..... (封三)

公司荣誉..... (封底)

# CONTENTS

## ● Port Engineering

Layout of super-large container terminal in east operating area of Yantian Port .....	SHI Xiaodi, ZHAO Min ( 1 )
Design of new wharf structure under complex flow conditions in open sea area .....	ZHANG Rui, FENG Hao, PAN Wenbo ( 8 )
Energy supplement methods and applications for horizontal transportation equipment in automated container terminals .....	JIANG Qiao ( 15 )
Overall layout of automated container terminal under complex terrain conditions .....	ZHOU Na, SHI Xiaodi, TANG Zhaoping ( 22 )
Overall layout mode of automated container port based on unmanned container trucks .....	XIANG Qingling, GUO Zhaojia, SONG Fan ( 29 )
Layout of twistlocks destuffing processes in automated container terminals .....	JIANG Qiao ( 36 )
Layout of collection and distribution system for large-scale automated container terminals in Yantian Port under complex environments .....	SHI Xiaodi, ZHOU Na, LAN Jiazhi, TANG Zhaoping ( 43 )
Improvement and optimization of port-evacuating traffic in container port area based on analysis of freight transportation system in Yantian Port .....	LI Ming, ZHANG Yang ( 50 )
Integrated design of port gateway image: case of phase I project of container terminal in east operation area of Yantian Port .....	LIU Geer ( 56 )

## ● Ground and Foundation

Application of self-balanced pile test method in high pile wharf engineering .....	ZHAO Min, GU Xiangkui, FENG Hao ( 63 )
Standard penetration response and intelligent interpretation of mechanical parameters for marine sedimentary soil in Yantian Port, Shenzhen .....	JIANG Xiong, XIAO Yi ( 71 )
Comparison and correction of standard penetration test count of $\phi 42$ mm and $\phi 50$ mm drill pipes .....	CHEN Kai, YANG Qiufang ( 80 )
Exploration of complicated artificial fill and analysis of engineering geological characteristics in Shenzhen coastal area .....	YI Yang, CHEN Kai, ZHAO Shuguang, SUN Deke ( 85 )
In-situ experimental study on sinking force of bucket-foundation structure on composite foundation .....	LI Wu, ZHU Lin ( 92 )
Pile foundation design under complex geological conditions in Yantian port area .....	YANG Liujuan, ZHANG Taotao ( 96 )
Influence of waves on low-permeability closely arranged inclined pile wharves .....	WANG Ziwen, GUO Zhaojia, ZHANG Rui, LEI Yang, PAN Wenbo ( 101 )
Geological risk of east operating area of Yantian Port .....	ZHAO Shuguang, LI Xiaojie ( 109 )
Analysis of differential settlement of track foundation and automatic monitoring in complex geological formations .....	ZHAO Wenhui, XIAO Yi ( 116 )
Analysis and treatment technologies for common problems in foundation piles of high-pile wharf .....	JIANG Lamei, WANG Jun ( 121 )
Design of elastic foundation beam for rail foundation .....	CHEN Fangzhou ( 128 )
Application of post-grouting technology in reinforcement project of cast-in-place piles in soft soil foundation of wharf .....	LI Dahong, ZHANG Rui, GU Xiangkui ( 133 )
Post-construction settlement prediction of ground with complex stress history in automated container yard .....	XIAO Yi, JIANG Xiong ( 139 )
Soft soil characteristics and comparison of foundation treatment schemes in east operation area of Yantian Port .....	ZHAO Shuguang, YANG Qiufang ( 145 )
Influencing factors and field test of bearing capacity of large diameter steel pipe piles .....	SONG Chao, LI Zhihao, SUN Yizhen, BAI Yuxin ( 152 )
Soft foundation treatment technology for revetment project in eastern Yantian Port .....	ZHANG Yucheng ( 158 )

## ● Structure and Facilities

Design of large capacity shore power facilities for Yantian east container terminal .....	ZHU Tingsong, YAO Yu ( 164 )
Design of grid structure for buildings at gate of port area .....	ZHANG Taotao, YANG Liujuan ( 170 )
Comparison and selection of structural schemes for super-large container terminal in Yantian Port .....	ZHAO Min, SHI Xiaodi, GU Xiangkui, FENG Hao ( 175 )
Design of armour blocks at transition of vertical and slope structure under STEM wave action .....	WANG Jun, JIANG Lamei, FENG Hao, ZHAO Min, GU Xiangkui ( 182 )
Application of high-performance concrete in hydraulic structures .....	WU Meng'en, LI Jianjun ( 190 )

## ● Digital Development

Construction and application of digital delivery platform for container port areas based on BIM .....	YIN Shuo, LU Jingjing, XU Xin ( 196 )
Importance role of intelligent management system in construction of Yantian Port .....	LI Zhihao, ZOU Dongming, PAN Lun ( 205 )
Design and implementation of digital infrastructure for automated container terminals .....	LU Zhiyong, DING Feihu ( 215 )
BIM design optimization of pile foundation of high-piled wharf based on Dynamo .....	FAN Wenzhang, XU Chuanchao ( 222 )
Simulation and evaluation for container terminal gate and port traffic in east operation area of Yantian Port .....	LI Lin ( 228 )
Interference recovery of berth and quay crane plan considering satisfaction of shipping company .....	LU Zhiyong, LIU Yuehua ( 237 )
Application technology of inspection robot for dangerous goods storage yard in automated container terminal .....	DING Feihu, LU Zhiyong ( 243 )

## ● Construction Technique

Analysis of effect of hammering eccentricity on high-strain test results of steel pipe pile .....	LI Zhihao, HE Jinhai, LI Jianjun, SUN Yizhen, BAI Yuxin ( 248 )
Application of Leica total station scanner MS60 in construction surveying of road and yard in fully automated port .....	CHENG Yong, NIE Tingyu, GUAN Zuhui, LI Pengbing ( 253 )
Dynamic compaction treatment technology for backfill foundation in reclamation area .....	HU Jie ( 258 )
Measurement accuracy analysis and engineering application of domestic equipment based on BDS-3 .....	SUN Hongrui, GE Jinlong, ZHANG Dengkui ( 264 )
Application of new technologies in construction safety management of Yantian Port .....	WU Guihong, HUANG Zhuliang ( 271 )
Underwater installation and positioning method for large blocks .....	CHEN Shaoqiang, TAO Huaqing, NIE Tingyu ( 277 )
Difficulties in multi-beam bathymetry quality control and its application in Yantian Port project .....	SUN Hongrui, ZHANG Dengkui ( 283 )

Port & Waterway Engineering (Monthly)

2025 No. 3 (Serial No. 632) Published in Mar. 2025

Competent Authority: China Communications Construction Co., Ltd.

Sponsor: CCCC Water Transportation Consultants Co., Ltd.

Editor in Chief: WU Peng Department Director: CHEN Yunjin

Deputy Editor in Chief: SUN Xiaoqing

Edited and Distributed by: Editorial Department, Port & Waterway Engineering

Add: 28 Guozijian Street, Dongcheng District Beijing, P.R. China Post Code: 100007

Tel: 86-10-64066347