



Future Cities 未来城市

Towards Sustainable Vertical Urbanism

迈向可持续的垂直城市主义

A collection of state-of-the-art, multi-disciplinary papers on tall buildings and sustainable cities

多学科背景下的高层建筑与可持续城市发展最新成果汇总

Editors (编者): Antony Wood, Shiling Zheng (郑时龄) & Timothy Johnson





ILLINOIS INSTITUTE
OF TECHNOLOGY

Bibliographic Reference:

Wood, A., Zheng, S. & Johnson, T. (eds.) (2014) *Future Cities: Towards Sustainable Vertical Urbanism: A collection of state-of-the-art, multi-disciplinary papers on tall buildings and sustainable cities*. Proceedings of the CTBUH 2014 Shanghai Conference, China, 16–19 September 2014. Council on Tall Buildings and Urban Habitat: Chicago.

Editors: Antony Wood, Shiling Zheng & Timothy Johnson
Layout, Coordination & Design: Steven Henry, Kristen Dobbins & Marty Carver

First published 2014 by the Council on Tall Buildings and Urban Habitat in conjunction with the College of Architecture and Urban Planning at Tongji University, Shanghai, and the College of Architecture at the Illinois Institute of Technology, Chicago.

© 2014 Council on Tall Buildings and Urban Habitat

Printed and bound in China by Shanghai Zero Ad. Co., Ltd.

All rights reserved. No part of this book may be reprinted or reproduced or utilized in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

Trademark notice: Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

ISBN13 978-0-939493-38-8

Note: There are three addendum publications to this main proceedings:

Wood, A., Tsang, W.M. & Safarik, D. (eds.) (2014) *Ping An Finance Center: In Detail*. ISBN: 978-0-939493-39-5

Wood, A., Jianping Gu & Safarik, D. (eds.) (2014) *The Shanghai Tower: In Detail*. ISBN: 978-0-939493-40-1

Wood, A., Chen, J. & Safarik, D. (eds.) (2014) *Suzhou Zhongnan Center: In Detail*. ISBN: 978-0-939493-41-8

参考文献:

Wood, A., 郑时龄 & Johnson, T. (eds.) (2014) 未来城市——迈向可持续的垂直城市主义：多学科背景下的高层建筑与可持续城市发展最新成果汇总。世界高层建筑与都市人居学会2014年上海国际会议论文集，中国，2014年9月16日至19日。世界高层建筑与都市人居学会(CTBUH)：芝加哥。

编者：Antony Wood, 郑时龄 & Timothy Johnson
版面协调与装帧设计：Steven Henry, Kristen Dobbins & Marty Carver

2014年由世界高层建筑与都市人居学会、同济大学建筑与城市规划学院和伊利诺伊理工大学建筑学院首次联合出版。

©2014世界高层建筑与都市人居学会(CTBUH)

由上海卓灞广告有限公司在中国印刷装订

保留所有权利。未经出版商书面许可，不得对本书的任何部分进行重印、复制或运用于任何形式，或由任何电子、机械或其它途径，目前已知或之后将有的，对本书进行复印、记录或任何信息储存或检索系统。

知识产权声明：产品或公司名称可能是商标或注册商标，且只用于无侵害目的的鉴别与说明。

ISBN13 978-0-939493-38-8

请注意：另有三本出版物将作为CTBUH 2014年上海国际会议论文集的补充

Wood, A., 曾伟明 & Safarik, D. (eds.) (2014) 《平安国际金融中心：深入解读》。ISBN: 978-0-939493-39-5

Wood, A., 顾建平 & Safarik, D. (eds.) (2014) 《上海中心：深入解读》。ISBN: 978-0-939493-40-1

Wood, A., 陈锦石 & Safarik, D. (eds.) (2014) 《苏州中南中心：深入解读》。ISBN: 978-0-939493-41-8

Council on Tall Buildings and Urban Habitat
世界高层建筑与都市人居学会(CTBUH)

S.R. Crown Hall
Illinois Institute of Technology
3360 South State Street
Chicago, IL 60616
Phone (电话): +1 (312) 567-3487
Fax (传真): +1 (312) 567-3820
Email (电子邮箱): info@ctbuh.org
http://www.ctbuh.org

The survival of humanity on this planet relies on a **radical repositioning** of our cities. In the face of unprecedented global population growth, urbanization, pollution increase and climate change, it is no longer enough to simply create buildings that minimize their environmental footprint. The reduction of operating and embodied energy consumption in every single building is, of course, vitally important – but even this is likely not enough to mitigate the huge issues at stake. We need to start considering how every building can start working with others in a **harmonious urban whole** – by maximizing urban/building infrastructure, sharing resources, generating and storing energy, and looking for completely new ways to improve the building's contribution to the city; physically, environmentally, culturally, and socially.

Cities thus need to be thought of, and buildings planned for, in **all three dimensions** – they cannot just be vehicles for isolated programs and expressed as products of two-dimensional zoning plans and height limits. Each **stratified horizon** of a tower has an opportunity to draw from the characteristics of the city and external environment, both of which **vary widely with height**. Wind, sun, rain, temperature, and urban grain are not the same through 360 degrees of plan or 360 meters of height, and our buildings need to both recognize, and draw opportunity from, that.

This is the primary subject of this publication, which draws together the papers presented at the CTBUH 2014 Shanghai Conference which took place at the Grand Hyatt Jin Mao Shanghai from 16–19 September, 2014. The subject matter is intended to drive thinking **beyond just buildings**, to considering cities as a whole. What best practices are some cities in the world already doing, and what else can be done to develop our cities **beyond a collection of disparate icons**, towards a vision of a connected, maximized, Sustainable Vertical Urbanism...

地球上人类的生存依赖于我们对城市的**革命性重塑**。面对着前所未有的增长、城市化、不断恶化的污染和气候变化，仅建造那些尽可能降低对环境影响的建筑是远远不够的。当然，减少每座单体建筑中的运营能耗和自含能耗是非常重要的——但即使这样也不足以缓解那些亟待解决的重大问题。我们需要考虑每一座建筑是如何在**和谐的城市整体**中与其它建筑相互作用的——最大化利用城市和建筑的基础设施、共享资源、生产并储存能源以及探索全新的方式来提升建筑在物质、环境、文化与社会方面为城市做出的贡献。

因此，我们需要从**三维立体**的角度来思考和规划城市与建筑——它们不能仅作为承载单一功能的媒介，或成为满足二维平面区域划分与限高要求的产品。摩天大楼的**每一层级的水平界面**都应当回应城市和外部环境的特征，而这些特征**随高度的不同而变化**。风、阳光、雨水、温度以及城市的肌理无论是在建筑的360度平面区域还是360米的高度范围都是不同的，我们的建筑需要对这些因素进行识别并作出回应。

这是本书的首要议题。CTBUH 2014年上海会议于9月16日至19日在上海金茂君悦酒店举行，本书收录了会议上的所有论文。该议题旨在推动人们**超越对建筑本身的思考**，将城市作为一个整体考虑。当今世界上的城市中已经完成的最佳实践有哪些，我们还可以做些什么使我们的城市**不再是毫无关联的标志性建筑的集合**，而实现相互联系的、最大化的、可持续的垂直城市主义的愿景.....

Please note that three specific project “In Detail” publications form an addendum to these proceedings, and are contained as PDF’s in the DVD on the inside rear cover of this book. The three project books are outlined below, and can be purchased separately at: <https://store.ctbuh.org>

请注意，学会还出版了三本剖析具体项目的“深入解读”系列出版物，以作为本论文集的补充。在本论文集封底内侧附带的DVD中收录了这三本书的PDF电子档。这三本剖析具体项目的出版物的概述如下，也可以在网单独购买：<https://store.ctbuh.org>

Ping An Finance Center: In Detail | 平安国际金融中心：深入解读

Wood, A., Tsang, W.M. & Safarik, D. (eds.) (2014) *Ping An Finance Center: In Detail*. A publication in the CTBUH “In Detail” Series. Council on Tall Buildings and Urban Habitat: Chicago. ISBN: 978-0-939493-39-5. 161 pages, Hardback.

Wood, A., 曾伟明 & Safarik, D. (eds.) (2014) 《平安国际金融中心：深入解读》。CTBUH“深入解读”系列出版物之一。世界高层建筑与都市人居学会(CTBUH)：芝加哥。ISBN: 978-0-939493-39-5。161页精装本。

The Shanghai Tower: In Detail | 上海中心：深入解读

Wood, A., Jianping Gu & Safarik, D. (eds.) (2014) *The Shanghai Tower: In Detail*. A publication in the CTBUH “In Detail” Series. Council on Tall Buildings and Urban Habitat: Chicago. ISBN: 978-0-939493-40-1. 146 pages, Hardback.

Wood, A., 顾建平 & Safarik, D. (eds.) (2014) 《上海中心：深入解读》。CTBUH“深入解读”系列出版物之一。世界高层建筑与都市人居学会(CTBUH)：芝加哥。ISBN: 978-0-939493-40-1。146页精装本。

Suzhou Zhongnan Center: In Detail | 苏州中南中心：深入解读

Wood, A., Chen, J. & Safarik, D. (eds.) (2014) *Suzhou Zhongnan Center: In Detail*. A publication in the CTBUH “In Detail” Series. Council on Tall Buildings and Urban Habitat: Chicago. ISBN: 978-0-939493-41-8. 142 pages, Hardback.

Wood, A., 陈锦石 & Safarik, D. (eds.) (2014) 《苏州中南中心：深入解读》。CTBUH“深入解读”系列出版物之一。世界高层建筑与都市人居学会(CTBUH)：芝加哥。ISBN: 978-0-939493-41-8。142页精装本。

Contents

目录

- 12 About the CTBUH | 世界高层建筑与都市人居学会(CTBUH)简介
- 13 About the Editors | 编者简介
- 14 Introduction | 引言

- 22 Innovative 50 Skyline | 50座创新性高层建筑

Chapter 1: Rethinking the Skyscraper | 第一章 重新思考摩天大楼

- 26 Rethinking the Skyscraper in the Ecological Age: Design Principles for a New High-Rise Vernacular
反思迈向生态的摩天大厦：实现新高层建筑地域性的设计原则
Antony Wood, CTBUH/IIT/Tongji University | 安东尼·伍德, 世界高层建筑与都市人居学会/伊利诺伊理工大学/同济大学
- 39 The Tropical Skyscraper: Social Sustainability in High Urban Density | 热带摩天楼：高密度都市中的社会可持续性
Mun Summ Wong, Richard Hassell & Alina Yeo, WOHA
- 47 Urban Density and the Porous High-Rise: The Integration of the Tall Building in the City – from China to New York
城市密度和多孔性高层建筑：高层建筑与城市网络和公共空间的整合——从中国到纽约
James von Klemperer, Kohn Pedersen Fox Associates PC
- 57 The Public Meaning of Skyscrapers: Shenzhen Stock Exchange and CCTV
摩天大楼的公共意义：深圳证券交易所及中央电视台新台址主楼
David Gianotten, Rem Koolhaas & Sylvia Chan (陈曼霞), OMA
- 63 Rethinking Skyscrapers in China and Elsewhere | 重新思考中国和海外的摩天楼
Hayano Yosuke & Cheng Ye, MAD Architects | 早野洋介 & 野城, MAD 建筑事务所
- 67 Space Formations | 空间形态
Ole Scheeren (奥雷·舍人), Büro Ole Scheeren
- 75 Towards 2050 – The Challenge for Tall Buildings | 展望2050——超高层建筑的挑战
Craig Gibbons, Kristina Moores & Josef Hargrave, Arup (奥雅纳); Gregory Kiss, Kiss + Cathcart
- 81 Beyond Icons: Developing Horizontally in the Vertical Realm | 超越建筑标志性的意义：垂直领域中的水平向开发
*James Robinson, Hongkong Land Limited (香港置地); Antony Wood (安东尼·伍德), CTBUH/IIT/Tongji University
(世界高层建筑与都市人居学会/伊利诺伊理工大学/同济大学)*
- 89 Sky Bridges – Pedestrian Circulation Through the Urban Fabric | 天桥——城市肌理中的人行流线
Bashar Kayali & Michelle Bacellar, Al Ghurair Construction
- 96 Shanghai International Financial Center: Future City Vision | 上海国际金融中心：未来城市愿景
Sergio Valentini & Francisco Gonzalez Pulido, JAHN
- 104 CTBUH Research Seed Funding Project 2013 – Green Living Façade for Tall Buildings: The Bosco Verticale
CTBUH种子基金研究项目——高层建筑绿色生态立面：空中森林
Elena Giacomello, Iuav University of Venice (威尼斯建筑大学)

- 112 Vertical Public Realms: Creating Urban Spaces in the Sky | 垂直公共空间：营造空中的城市空间
Yuri Hadi, De Montfort University (德蒙福特大学); Tim Heath & Philip Oldfield, University of Nottingham (诺丁汉大学)
- 120 Two-In-One Tower: An Expansion in Typology and Technology in Hanoi | 二合一塔楼：在河内项目上类型与技术的扩展
Matthias Olt, Callison; Hi Sun Choi, Thornton Tomasetti | 马希亚斯·奥特, 凯里森建筑事务所; 崔希瑄, 宋腾添玛沙帝
- 128 Air Filtration for Better IAQ and Energy Saving | 提升室内空气质量的低能耗空气净化系统
Ronald Wood, Innovative Plant Technology Pty Ltd

Chapter 2: Developing Tall Buildings and Cities in China | 第二章 中国高层建筑与城市的发展

- 136 Shanghai Tower: Building a Green, Vertical City in the Heart of Shanghai | 上海中心大厦：建于上海心脏地带的绿色垂直城市
Jianping Gu, Shanghai Tower Construction & Development Co., Ltd. | 顾建平, 上海中心大厦建设发展有限公司
- 142 Ping An Finance Center: The Development and Construction of a Megatall | 平安金融中心：一栋超级高层的发展和建造
Wai Ming (Thomas) Tsang, Shenzhen Ping An Financial Center Construction & Development Co., Ltd.
曾伟明, 深圳平安金融中心建设发展有限公司
- 150 Suzhou Zhongnan Center: Rising Above Engineering Challenges | 苏州中南中心大厦：攻克工程难题
Dong Shen, Zhongnan Group | 沈东, 中南集团
- 158 Architectural Heritage Makes it Possible for People to "Linger": The Core Concept Behind the Bund Finance Center
建筑文化让“停留”成为可能——外滩金融中心·BFC项目之核心理念
Yang Wu & Lynn Lin, Bund Finance Center | 吴洋 & 林琨, 外滩金融中心
- 164 "C.I.T.I.E.S." of the Future: Sinar Mas Center as Exemplar | 未来"C.I.T.I.E.S."：金光中心案例
Toon Ming Chua (蔡敦明), Shanghai Jingang North Bund Realty Co. Ltd. (上海金港北外滩置业有限公司设计部);
Eric Schall, Skidmore, Owings & Merrill LLP
- 170 A New Skyline Vision: CTF Towers in Guangzhou and Tianjin | 天际线的愿景：广州与天津两地的周大福大厦
Wing Ip (David) Ho, Chung (Eddie) Yuk Fai, Hung (Annie) Lo & De Ming (Derry) Yu, New World Development Company Ltd.
何荣业, 钟毓辉, 卢虹 & 喻德明, 新世界发展有限公司
- 178 China Zun: Shaping the Future Skyline of Beijing | 中国尊：未来北京的城市新高度
Weiping Shao, Beijing Institute of Architectural Design | 邵韦平, 北京市建筑设计研究院
- 184 Greenland Group's Perspective on Commercial Space in High-Rise Buildings | 绿地集团关于高层建筑中商业空间的思考
Zhaohui Jia, Jing Hu & Min Tang, Greenland Group | 贾朝晖, 胡京 & 唐敏, 绿地集团
- 192 Emerging Urbanization and High-Rise Design Philosophy in China | 中国正在进行中的城市化以及高层建筑的设计哲学
Junjie Zhang, East China Architectural Design & Research Institute | 张俊杰, 华东建筑设计研究总院
- 200 Sustainable Vertical Urban Agglomeration | 可持续发展的垂直城市群
Enfang Liu, Jianing Pan, Dapeng Sun & Ying Liu, ISA Architecture | 刘恩芳, 潘嘉凝, 孙大鹏 & 刘莹, 上海建筑设计研究院有限公司
- 207 From Utopia To Reality: Group-Form Megastructure | 从乌托邦到现实：群体式巨构
Xu Yang & Yiru Huang, Tongji University | 阳旭 & 黄一如, 同济大学
- 215 A Hypothesis in Future Development of High-Rise Buildings in China | 中国高层建筑未来发展的一种假想
Wen Wu, ISA Architecture | 吴文, 上海建筑设计研究院有限公司
- 223 Urban Mega-Structure – Vertical Landscape of Hangzhou Civic Center | 都市巨构——杭州市民中心的垂直景观设计实践
Linxue Li & Jie Wu, Tongji University | 李麟学 & 吴杰, 同济大学

Chapter 3: Urban Issues & Infrastructure | 第三章 城市问题与基础设施

- 230 Urban Design and Nurturing Cities | 创建城市、培育城市
Kazunari Kano, Mori Building Co., Ltd. | 叶一成, 森大厦集团
- 235 Vertical Reality – How To Design Viable Vertical Urbanism | 垂直现实——如何设计真实可行的垂直都市
Paul Scott, Make Architects
- 243 Diversity and Change in Vertical Urbanism | 垂直城市的多样性和变化
Moshe Zur & Robert Oxman, Moshe Zur Architects Urbanists

- 251 Sustainable High Density Neighborhoods | 可持续高密度社区
Richard Witt, Quadrangle Architects, Ltd. (四角建筑事务所有限公司)
- 258 Human Scale in Vertical Urbanism | 竖向城市设计中的人性尺度
Sudhir Jambhekar & Edward Mayer, FXFOWLE Architects
- 266 Next Level – Public Transport and Density in Metropolitan Jakarta | 下一阶段——雅加达大都市的公共交通和城市密度
Prasetyo Adi, PDW Architects
- 272 A LEED Platinum Global Model for Vertical Urbanism | 垂直城市化的LEED铂金级全球模板
Jeffrey Heller, Heller Manus Architects
- 278 Examining King Abdullah Financial District (KAFFD) | 阿卜杜拉国王金融区之分析研究
Julian Chen, Jacob Kurek & Claude Bøjer Godefroy, Henning Larsen Architects
- 286 Shaping the Environment of the Urban Complex from an Urban Point of View | 城市视角下的综合体环境塑造
Peter Kok, Shum Yip Land Company Limited | 郝继霖, 深业置地有限公司
- 292 Learning from Hong Kong: Why High Density TODs Spell the Future for Asia's Most Populous Cities
以港为鉴：高密度的大众运输导向发展（TOD）为何代表亚洲的前景
Bryant Lu, Andy Leung & Anthony Cheung, Ronald Lu & Partners | 吕庆耀, 梁杰文 & 张文政, 吕元祥建筑师事务所
- 299 Integrating Vertical Cities and Transport Infrastructure | 整合垂直城市和交通运输基础设施
Shonn Mills, Abhijeet Kulkarni & James Clay, Ramboll
- 308 Research on a Vertical Space System of the Mixed-use Complex | 城市建筑综合体垂直空间体系研究
Zhendong Wang, Yinpu Wang & Qiang Hu, Tongji University | 王桢栋, 王寅璞 & 胡强, 同济大学
- 315 Interactions Between Residential and Office Towers in Melbourne | 墨尔本的高层住宅楼和办公楼的内在联系
Giorgio Marfella, University of Melbourne (墨尔本大学)
- 321 Urban Redevelopment – The Key to Sustainable Future Cities | 城市再开发——未来城市可持续的关键
Stephan Reinke, Stephan Reinke Architects
- 328 San Juan City, Sustainable Smart City on the Rise: A Case Study | 可持续发展的智能化城市圣胡安市：案例研究
Felino Palafox, Jr., Palafox Associates
- 336 Urban Renewal For A Global City | 全球化城市的城市更新
Gil Shenhav, Canaan Shenhav Architects, Ltd.

Chapter 4: Building Operation & Occupiers | 第四章 建筑运营与使用者

- 344 Vertical Community: Achieving a Harmonious Mix | 垂直社区：和谐的多用途建筑
Sam Cuccurullo, Tony Long, Andy To (杜日生) & Titus Kwong (邝信尧), CBRE (世邦魏理仕)
- 350 Sustainability with a View | 可持续性展望
Susanna See, WSP
- 357 The Logic of Luxury: New York's New Super-Slender Towers | 纽约的新超纤细高层：奢华的逻辑
Carol Willis, The Skyscraper Museum (摩天大楼博物馆)
- 365 Delivering and Managing Sustainable Tall Buildings | 实现及管理可持续高层建筑
Matthew Clifford, Peter Hilderson & Chris Wallbank, JLL (仲量联行)
- 372 Taipei 101: Tall Building Operation Towards Sustainability | 台北101大楼：向可持续化迈进的高层建筑管理
Cathy Yang, Taipei Financial Center Corporation | 杨文琪, 台北金融大楼股份有限公司
- 379 The Vertical Campus | 垂直园区
Jason Haase, LMN Architects
- 386 High-Rise Harmony – Legal Issues Unique to Tall Buildings | 高层建筑的和谐性——高层建筑独有的法律问题
Victor Madeira Filho, Madeira Valentim & Alem Advogados; Arthur Wellington, Thornton Tomasetti (宋腾添玛沙帝公司)
- 393 The 8x8 Tower: Sustainable Citizenship for the 21st Century | 8x8 高楼：21 世纪的可持续居民
Michael Bischoff, Pei Cobb Freed & Partners Architects

401 Psycho-Analysis of Tall Building Habitants in Mumbai | 孟买高层居民的心理分析
Vinda David, Sterling Engineering Consultancy Services Pvt. Ltd. (斯德林工程咨询服务有限公司)

Chapter 5: Sustainability & Environment | 第五章 可持续发展与环境

- 410 CTBUH Research Project: The Sustainability Implications of Urban + Suburban Locations – Initial Report
CTBUH对城市与郊区不同地点的可持续发展影响研究——初期报告
Peng Du (杜鹏), CTBUH/IIT (世界高层建筑与都市人居学会/伊利诺伊理工大学); Antony Wood (安东尼·伍德), CTBUH/IIT/Tongji University (世界高层建筑与都市人居学会/伊利诺伊理工大学/同济大学)
- 418 The Environmental Impact of Tall vs Small: A Comparative Study | 高层与低层建筑环境影响：对比研究
Christopher Drew, Katrina Fernandez Nova & Keara Fanning, Adrian Smith + Gordon Gill Architecture
- 426 21st Century Metropolis and the System Thinker | 21世纪的都市和系统思考者
Stephen Ray & Luke Leung, Skidmore, Owings & Merrill LLP
- 432 Design Challenges of the 3 Tallest Buildings in North/ East/ South China | 华北/华东/华南区三大超高层建筑设计中的挑战
Kam Chuen (Vincent) Tse, Lung Wai (Herbert) Lam, Sheung Lai (Eddie) Leung & Leung Wing (Daniel) Ho, Parsons Brinckerhoff
谢锦泉, 林龙伟, 梁尚礼 & 何亮荣, 柏诚(亚洲)有限公司
- 440 Supertall Buildings Infrastructure: Designing Vertical Cities | 超高层建筑基础系统设施：垂直城市设计
Mehdi Jalayerian, Environmental Systems Design, Inc. (美国环境系统设计公司)
- 446 Ultra-Low Energy Consumption in Upper Floors of Skyscrapers | 摩天大楼高区超低建筑能耗的实现
Man Xiaoxin, Yue Li, Zhuangzhuang Li & Junliang Cao, China Construction Engineering Design Group Corporation Limited
满孝新, 李悦, 李壮壮 & 曹钧亮, 中国中建设计集团有限公司
- 452 Building Services and Achieving Sustainable Vertical Urbanization | 建筑机电系统与实现可持续竖向城市化发展
Malcolm Laverick, AECOM
- 460 TOWERGEN 520m, 100MW of Clean Energy in a Supertall Design | TOWERGEN的高520米，产能100兆瓦清洁能源的超高层设计
Marshall Strabala & Andre Dean, 2Define Architecture
- 468 Architectural Comfort in Future Vertical Downtowns | 未来垂直城市的建筑舒适性
Iñigo Ortiz, Enrique León & Paloma Martín, Ortiz León Arquitectos SLP
- 474 A Case Study for Sustainable Vertical Urbanism | 一个垂直可持续城市主义的案例分析
Richard Mann, Ecosystem Architecture; Andrew Johnson, Arup (奥雅纳); Elke Haege, Elke Haege Landscape Architects
- 484 Sustainability Certification as a Tool for Design Optimization | 将可持续性认证用作设计优化工具
Roland Bechmann, Werner Sobek Group; Thomas Thuemmler & Christiane Ditzen, WSGreenTechnologies

Chapter 6: Material & Construction Advances | 第六章 材料与施工进展

- 492 Modular Tall Building Design at Atlantic Yards B2 | 大西洋广场B2地块的模块式高层建筑设计
David Farnsworth, Arup (奥雅纳)
- 500 A New Level of Integration of Design and Construction Solutions | 设计与施工解决方案一体化的新水平
Hongyu Li (李红雨博士) & Frankie Nip (聂浩然), AECOM
- 508 DfMA: Engineering the Future | 面向制造和装配的产品设计(DfMA):构建未来
Angus McFarlane & John Stehle, Laing O'Rourke
- 517 Life Cycle Analysis: Are We There Yet? | 生命周期分析：我们达到目标了吗？
Donald Davies & Ron Klemencic, Magnusson Klemencic Associates
- 526 CTBUH Research Project: A Whole LCA of the Sustainable Aspects of Structural Systems in Tall Buildings – Interim Report
CTBUH研究项目：高层建筑结构体系全寿命可持续性评估——中期报告
Dario Trabucco, CTBUH/Iuav University of Venice (世界高层建筑与都市人居学会/威尼斯建筑大学); Antony Wood (安东尼·伍德), CTBUH/IIT/Tongji University (世界高层建筑与都市人居学会/伊利诺伊理工大学/同济大学); Olivier Vassart, ArcelorMittal (阿塞洛米塔尔钢铁集团); Meysam Tabibzadeh, CTBUH (世界高层建筑与都市人居学会)
- 534 Embodied Carbon in Our Future Cities | 未来城市的碳自含量
Mark Sarkisian & David Shook, Skidmore, Owings & Merrill LLP

- 542 Ultra Light Weight Solutions for Sustainable Urban Densification | 城市集约化的超轻解决方案
Maurice Hermens, Michiel Visscher & John Kraus, Royal HaskoningDHV
- 550 Operational Stage BIM – Monitoring of Structural Safety | 运营阶段BIM——结构安全监控
Joost Kuckartz, Andrey Shakhramanyan & Andrey Yaremenko, SODIS LAB
- 556 From “O” to “L” Design Challenges, Gazprom Tower | 从“O”到“L”设计的挑战，俄罗斯天然气工业公司大楼
Peyman Askarinejad, Arabtec Construction LLC

Chapter 7: Structural & Seismic Advances | 第七章 结构与抗震进展

- 564 Study on Lateral-Load Resisting Efficiency of Mega-Frame Structures Above 450m | 450米以上巨型框架结构体系抗侧效率研究
Xin Zhao, Jiemin Ding & Honglei Wu, Tongji Architectural Design (Group) Co., Ltd.; Yue Zhang, Tongji University
赵昕, 丁洁民 & 吴宏磊, 同济大学建筑设计研究院(集团)有限公司; 张悦, 同济大学
- 571 Tapered Profile and Structural Design of Supertall Buildings | 超高层建筑锥形化体型与结构设计
Dasui Wang, Lianjin Bao, Jianxing Chen & Peng Qian, East China Architectural Design & Research Institute Co., Ltd
汪大绥, 包联进, 陈建兴 & 钱鹏, 华东建筑设计研究总院
- 579 New Type of Shear Wall and its Application in High-Rise Buildings | 新型剪力墙及其在超高层建筑中的应用
Zhong Fan, Kai Yang & Xiaohu Meng, China Architecture Design & Research Group | 范重, 杨开 & 孟小虎, 中国建筑设计研究院
- 587 MahaNakhon Tower and the Use of CTBUH Seismic Guidelines | Mahanakhon大厦与抗震设计指导
Kanokpat Chanvaivit, Bouygues-Thai Co. Ltd.
- 594 Seismic Action Reduction in Supertall Building Design | 超高层建筑结构减小地震作用的方法
Chunhe (Henry) Li & Yiyuan Zhang, Buro Happold | 李春和 & 张义元, 标赫工程设计顾问有限公司
- 602 Seismic Base Isolation of the Nunoa Capital Building | Nunoa首都大厦的隔震设计
Rene Lagos & Mario Lafontaine, Rene Lagos Engineers; Ruben Boroschek & Rodrigo Retamales, Ruben Boroschek & Associates
- 610 Advances in Seismic Design and Construction in Indonesia | 印度尼西亚抗震设计和施工的发展
Davy Sukamta, Davy Sukamta & Partners
- 617 Tall Building Seismic Design Case Study per China and U.S. Codes | 通过实例分析对比中美高层建筑抗震设计规范
Shaw (Xiaozhe) Zhang (张晓哲博士), Jorge Rivera, Aldrin Orue & Lin Han (韩琳女士), KPFF Consulting Engineers
- 625 Structure Engineering of W-Project in Busan Yonghoman | 釜山永湖湾W项目结构工程
Jong Soo Kim (金钟秀), Hyun Hee Ryu (柳炫希), Duck Won Cho (崔银圭) & Eun Gyu Choi (赵德远), C.S. Structural Engineering
- 632 Flexible and Safe Heavy-Duty Fixings in Tall Buildings | 高层建筑中安全的可调式重型固定装置
Lars Grote, HALFEN GmbH

Chapter 8: Wind, Building Movement & Damping | 第八章 风、建筑变形与阻尼

- 642 Using Supplemental Damping Systems on High-Rise Buildings | 附加阻尼系统于高层建筑中的应用
Xiangdong Du (杜向东), Chien-Shen Lee, Bujar Morava & Jon Galsworthy, RWDI
- 650 Research on Wind-Induced Vibration of the Steel Tower on High-Rise Buildings | 高层建筑楼顶突出物风致振动问题研究
Yaming Li, ISA Architecture | 李亚明, 上海建筑设计研究院有限公司
- 657 Innovative Designs for Natural Ventilation in High-Rise Buildings | 高层建筑自然通风的创新设计
Kevin Peddie & Tony Rofail, Windtech Consultants
- 664 Developments in CFD Responding to the Increased Demands of Taller Buildings
计算流体力学的发展与其在高层建筑中与日俱增的需求
Darren Davies & Jon Winchester, Wirth Research Limited (维尔特研究有限公司)
- 671 Optimizing the Form of Tall Buildings to Urban Environments | 优化适宜于都市环境的高层建筑形式
Ahsan Kareem, Seymour Spence, Sarah Bobby & Enrica Bernardini, University of Notre Dame (圣母大学)
- 677 Design of a Slender Building with High-Performing VE Dampers | 配备高性能VE阻尼器的纤长形态高层建筑设计
Michael Montgomery, Kinetica; Kevin MacLean & Tibor Kokai, Read Jones Christoffersen Ltd.; Constantin Christopoulos, University of Toronto (多伦多大学)

- 685 Sustainability and High-Rise Buildings – 56 Leonard Street | 可持续性高层建筑——Leonard 街56 号项目
Silvian Marcus, WSP
- 691 BRB and FVD Alternatives to Conventional Steel Brace Outriggers | 传统外伸臂支撑的替代方案：BRB和FVD
John Viise, Patrick Ragan & Jim Swanson, Halvorson and Partners
- 700 Optimizing the Structural Design of the 151 Story Incheon Tower | 151层仁川塔的结构设计优化
Ahmad Abdelrazaq, MoonSook Jeong, Soogon Lee & Sangki Jang, Samsung C&T (三星C&T公司)
- 709 Relationship Between Periods and Structural Heights | 结构自振周期与结构高度关系
Congzhen Xiao, Peifu Xu & Jianhui Li, China Academy of Building Research | 肖从真, 徐培福 & 李建辉, 中国建筑科学研究院
- 715 Integrated and Sustainable Damping Systems for Tall Buildings | 高层建筑中的综合可持续性阻尼系统
Kyoung Sun Moon, Yale University School of Architecture (耶鲁大学建筑学院)
- 722 The Impact of Comfort Assessment Criteria on Building Design | 舒适度评价标准对建筑设计的影响
Johann Andrade Ferrareto & Carlos Eduardo Nigro Mazzilli, University of São Paulo (圣保罗大学); Ricardo Leopoldo e Silva França, França & Associados Projetos Estruturais

Chapter 9: Façade Design | 第九章 外墙设计

- 732 All Things are Not Equal: Responsive Façades for Tall Buildings | 万事皆不同：超高层建筑响应式外立面
Jeffrey Holmes, Woods Bagot (伍兹贝格建筑事务所)
- 740 The Passive Design of High-Rise Envelope | 高层建筑围护结构的被动式设计
Jie Zhang & Jia Yin, Shanghai Elite Façade Consultants | 张杰 & 尹佳, 上海创羿建筑工程咨询有限公司
- 747 Curtainwall Lifecycles: Evaluating Durability and Embodied Energy | 幕墙生命周期：耐久性与固化能耗的评鉴
Mic Patterson & James Casper, Enclos; Ben Silverman, Island International Exterior Fabricators (海岛国际幕墙制造公司); Karen Kensek, University of Southern California (南加利福尼亚大学)
- 754 Blades of Steel: Understanding the Limits of Metal Façade Design | 钢之刃：了解金属外墙设计的局限
Patrick Loughran, Goettsch Partners
- 762 Stainless Steel Claddings for High-Rise Architecture | 高层建筑不锈钢幕墙
Jörn Teipel & Gert Weiss, Outokumpu EMEA GmbH (奥托昆普)
- 769 Performance of Shadow-boxes in Curtain Wall Assemblies | 幕墙安装中阴影框的性能
Mikkel Kragh, Stanley Yee, Lawrence Carbarry & Neil McClellan, Dow Corning (道康宁公司)

Chapter 10: Fire & Life Safety | 第十章 消防与生命安全

- 776 Solutions for Fire & Life Safety at Extreme Heights | 超高层建筑消防与生命安全解决方案
Simon Lay, AECOM
- 783 Tall and Supertall Atria for Sustainable Buildings | 绿色建筑中的超高中庭设计
Ervin Cui (崔鏖), Alberto Alvarez-Rodriguez, Kim Clawson & Dan O'Connor, AON Fire Protection Engineering
- 790 The Evolution of Building Evacuation Design in China | 建筑疏散设计在中国的发展
Fang Li (李方), James Antell & Martin Reiss, RJA Group
- 798 Balanced Fire Protection in Buildings | 建筑中的平衡式防火技术
Alfredo Ramirez, Underwriters Laboratories
- 803 Managing the Risk of Fire in Future Tall Building Environments | 未来高层建筑环境火灾风险控制
Russ Timpson, Horizonscan

Chapter 11: Vertical Transportation | 第十一章 垂直交通

- 811 Green Vertical Transportation: More Than Just a Concept | 绿色垂直交通：不仅仅是概念
Robert Boog, Schindler Elevators (迅达电梯有限公司)

- 816 Innovative Elevator Technologies To Future Proof Your Building | 面向未来建筑的创新电梯技术
Johannes de Jong, KONE Elevators (通力电梯)
- 823 Permanent Magnet Machines For Elevators In Super High-Rise Buildings | 超高层建筑电梯所采用的永磁曳引机
Zbigniew Jerry Piech, Otis Elevator Company (奥的斯电梯公司)
- 829 Energy-Efficient Elevator Solutions for High-Rise Buildings | 高层建筑电梯节能方案
Patrick Bass, ThyssenKrupp (蒂森克虏伯)
- 833 Modernization: Renewing the Lifecycle of Vertical Transportation | 旧梯更新改造：延长垂直交通工具的生命周期
Franz Arnold, Schindler Elevators (迅达电梯)
- 839 Elevator Use During Construction Time of Tall Buildings | 高层建筑施工期间使用电梯的好处
Marja-Liisa Siikonen, Janne Sorsa, Mikko Kontturi & Johannes de Jong, KONE Elevators (通力电梯公司)
- 845 Use of Elevators During Emergencies | 紧急情况下电梯的使用
Paul Stranieri & David McColl, Otis Elevator Co. (奥的斯电梯公司); Geeta Bora, UTC Fire & Security (联合科技公司建筑及工业系统); Art Hsu, United Technologies Research Center (联合科技研究中心)
- 852 How Vertical Transportation is Helping Transform the Modern City | 垂直交通如何改变了现代城市
Glen Pederick, Meinhardt Group (迈进集团)
- 860 Vertical Transportation and Logistics in Mixed-Use High-Rise Towers | 垂直运输与物流在多功能高层塔楼中的应用
Jeff Marsh, Eric Rupe & Robert Baker, Lerch Bates Inc. (利沛咨询公司)
- 865 Elevators: Continuity and Enrichment of Architectural Experience | 电梯：建筑游览经历的延续和丰富
Aleksey Gorilovsky, Stein Ltd. (斯泰因有限公司); Dmitry Gorilovsky & Peter Langley, LiftEye Ltd.
- 872 Door Technology for High-Rise Applications | 电梯门技术在高层建筑中的应用
Marcello Personeni, Sematic Elevator Products (思迈特电梯设备)

Appendices | 附录

- 881 CTBUH Height Criteria | CTBUH高度评判标准
- 885 100 Tallest Buildings in the World | 世界最高的100座建筑
- 890 Conference Sponsors | 大会赞助商
- 891 Conference Committees | 大会委员会
- 892 Index by Authors | 作者索引
- 894 CTBUH Organization & Membership | CTBUH组织结构和会员级别

Introduction: China

引言：中国

There is perhaps nowhere on the globe where the issues of “sustainable vertical urbanism” are more relevant than in China – the world’s most active tall building market by far. By the end of 2015, it is estimated that one in three buildings taller than 150 meters in the world will be located in China. With roughly 250 million people set to move into Chinese cities in the next decade or so, the pace of urban construction, including road, rail, and water infrastructure and cultural institutions, in addition to tall buildings, has outstripped any previous period in human history. Many of the iconic towers now rising in China have lent world recognition to cities that relatively few Chinese – let alone Westerners – were previously aware of. These mega-projects have provided a global stage for once-obscure Chinese cities and companies, and a veritable creative “playground” for Western architects faced with a much more conservative building climate at home. This has gone hand-in-hand with the rise of a middle class that never before had the kind of purchasing power it does now. The change wrought by urbanization has been nothing short of breathtaking.

Distribution of Tall Building Cities in China

The distribution of tall buildings across the cities of China is wide. Though Hong Kong, Shanghai, and Guangzhou are the three cities containing the greatest number of tall buildings currently, these are not the only epicenters of development. According to data collected at the end of 2013, by the end of 2015, at least 69 Chinese cities will contain one building over 150 meters in height. Twenty-three of those 69 cities will have at least 10 buildings taller than 150 meters (see map opposite).

The reasons for this shift are not abundantly clear, but the change does seem to correlate with two major trends currently underway in China.

- The first is that the government has a policy to move 250 million rural residents into cities by 2025, with the objective of shifting China from an agrarian economy to an industrial/consumer economy.
- The second is that Chinese manufacturing is shifting away from the major cities on the coasts and into the interior, in search of lower labor costs.

The confluence of these trends would seem to point toward increased urbanization and tall-building activity in regional cities. One such city is Shenyang, which is expected to have 81 buildings over 150 meters tall by 2015, ranking it fifth in the country with 6.4 percent of the total.

大概没有其它国家比中国更适合讨论“可持续的垂直城市主义”的问题了——中国是目前世界上最活跃的高层建筑市场。据估计，截至2015年底，将有相当于全球三分之一的高度150米以上的建筑位于中国。而在未来十年间，中国将有大概2.5亿人涌入城市居住，因此城市建设将会以前所未有的速度发展。其中，除了高层建筑的建设外，也将大量建设公路、铁路和水利基础设施和文化产业基地。中国目前建设的很多标志性的摩天大厦使其所在的城市受到了全世界的瞩目，而在此前却很少有中国人关注这些城市，更不用说西方人了。这些巨型项目为曾经低调的中国城市和企业提供了一个全球性的舞台，也为那些在自己国家因为更为保守的建筑氛围而无法充分发挥其创造性的西方建筑师提供了一个可实现真正创新的“游乐场”。与之相伴的，中国逐渐崛起的中产阶级也具有了前所未有购买力的。这种由城市化造就的转变是令人惊叹的。

高层建筑在中国的分布

高层建筑广泛分布于中国的很多城市。虽然香港、上海和广州是目前拥有高层建筑数量最多的三个城市，但并不是仅有这三座城市才是高层建筑发展的中心。截至2013年底的统计数据表明，到2015年底，预计中国至少会有69座城市拥有一座超过150米高的建筑。这69座城市中将有23座城市至少拥有10座150米以上的建筑（见下页地图）。

尽管这种转变的原因还不是非常清楚，但似乎与目前中国存在的两大趋势有关。

- 第一个是政府有相关政策，即在中国由农业经济转向工业/消费经济的目标下，2025年前要将2.5亿农民转移到城市中。
- 第二个是中国的制造业正在逐渐由沿海城市向内陆城市转移，以寻求更低的劳动力成本。

这两大趋势的聚集点似乎正是区域城市中的快速城市化进程和高层建筑发展。沈阳就是其中一个例子，预计到2015年沈阳将拥有81座超过150米的高层建筑，占全国总数的6.4%，排名第五。

香港的高层建筑占中国所有超过150米高层建筑总数的31.9%，上海则占12.7%，这两座城市仍占据主导地位。然而，这种主导地位已经在最近几年中被削弱了。预计到2015年底，其高层建筑占有率将分别萎缩至23.2%和10.1%，因为高层建筑在中国其它城市不断地发展起来。

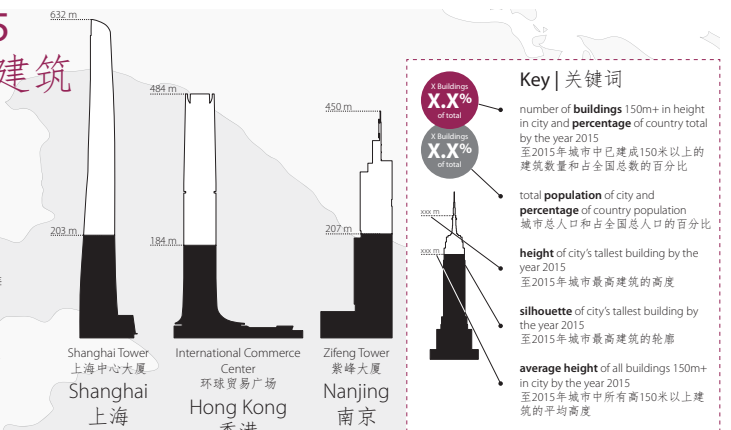
China Cities: 150m+ Buildings by 2015

中国城市：至2015年超过150米高的建筑

The cities shown in the diagram are the top 15 cities by number of buildings taller than 150 meters that are expected to be completed by the end of 2015. The remaining 54 cities with at least one such building are listed as a group.

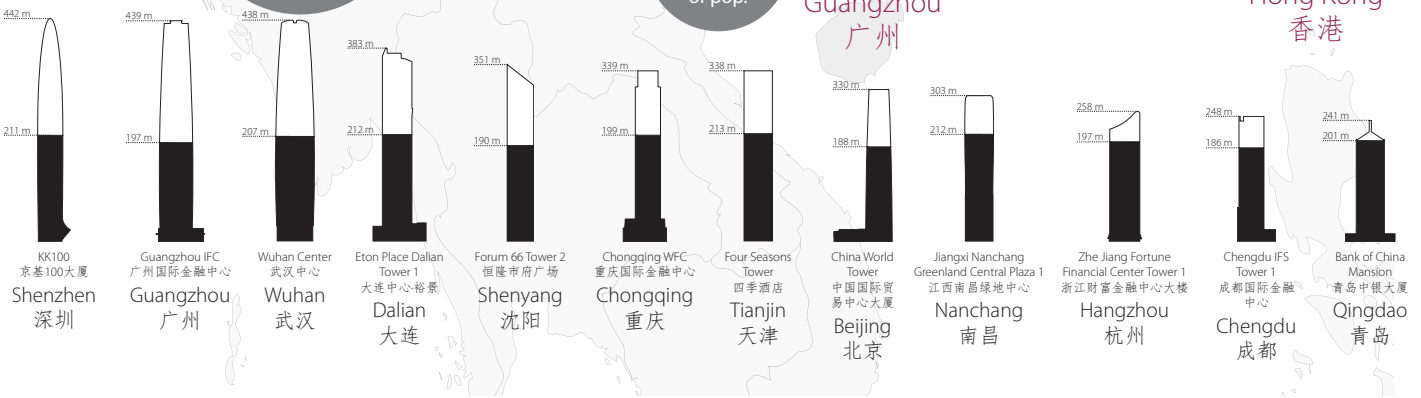
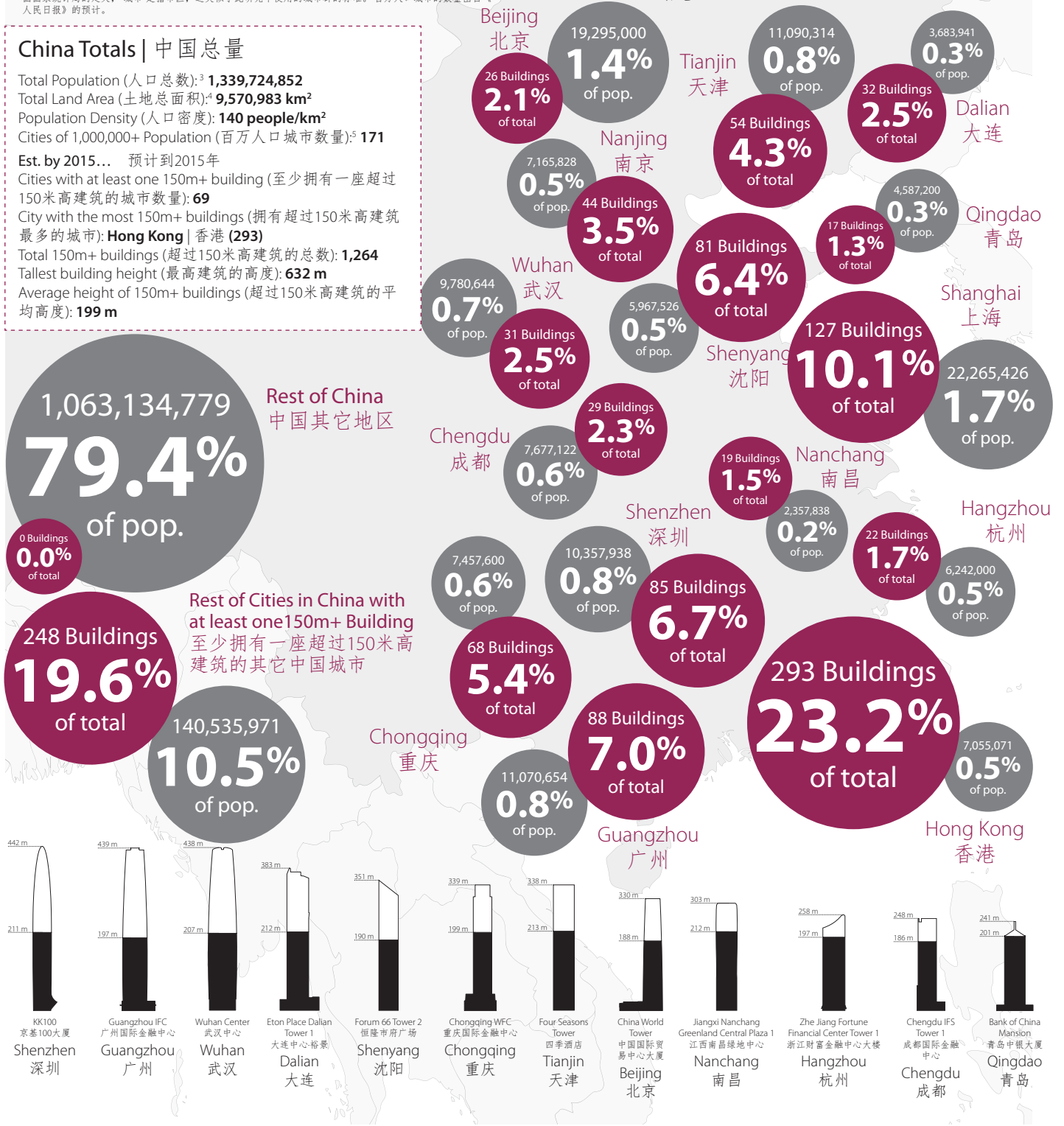
图表中的城市是拥有超过150米高建筑（预计至2015年年底竣工）数量最多的前15座城市。其他至少拥有一座超过150米高建筑的54座城市作为一个组被列出。

- The focus on buildings over 150 meters is driven by the need to ensure accuracy of data, rather than suggesting that this is the threshold for a tall building. | 聚焦超过150米高建筑是源自确保数据准确性的需要，而非暗示这是定义高层建筑的标准。
- All tall building data is taken from the CTBUH Skyscraper Center as of July 26th, 2013. | 所有高层建筑数据来源于CTBUH摩天大楼中心，数据更新至2013年7月26日。
- Unless otherwise noted, all population data is taken from the 2010 Chinese Census by the National Bureau of Statistics of China. | 除非另有说明，所有的人口数据来源于中国国家统计局2010年中国人口普查。
- Unless otherwise noted, all land area data is taken from the UN Demographic Yearbook 2009-2010. | 除非另有说明，所有的土地面积数据来源于2009-2010年联合国人口统计年鉴。
- "City" refers to the Urban Area as defined by the National Bureau of Statistics of China, which is akin to the Urban Agglomeration criteria used throughout this study. Number of 1,000,000+ cities is an estimate by People's Daily. | 根据中国国家统计局的定义，“城市”是指市区，这类似于此研究中所使用的城市群的标准。百万人口城市的数量出自《人民日报》的预计。



China Totals | 中国总量

Total Population (人口总数):³ **1,339,724,852**
 Total Land Area (土地总面积):⁴ **9,570,983 km²**
 Population Density (人口密度): **140 people/km²**
 Cities of 1,000,000+ Population (百万人口城市数量):⁵ **171**
Est. by 2015... 预计到2015年
 Cities with at least one 150m+ building (至少拥有一座超过150米高建筑的城市数量): **69**
 City with the most 150m+ buildings (拥有超过150米高建筑最多的城市): **Hong Kong | 香港 (293)**
 Total 150m+ buildings (超过150米高建筑的总数): **1,264**
 Tallest building height (最高建筑的高度): **632 m**
 Average height of 150m+ buildings (超过150米高建筑的平均高度): **199 m**



Rethinking the Skyscraper in the Ecological Age: Design Principles for a New High-Rise Vernacular

反思迈向生态的摩天大厦：实现新高层建筑地域性的设计原则



Dr. Antony Wood

Dr. Antony Wood

Council on Tall Buildings and Urban Habitat
S.R. Crown Hall, Illinois Institute of Technology
3360 South State Street
Chicago, Illinois, 60616

tel (电话): +1 312.567.3820
fax (传真): +1 312.567.9226
email (电子邮箱): awood@ctbuh.org
www.ctbuh.org

Dr. Antony Wood has been Executive Director of the CTBUH since 2006, responsible for the day-to-day running of the Council. Based at the Illinois Institute of Technology Chicago, Antony is also a Research Professor in the College of Architecture there and a visiting professor of tall buildings at Tongji University Shanghai. His field of speciality is the design, and in particular the sustainable design, of tall buildings. Prior to moving to Chicago, he worked as an architect in Hong Kong, Bangkok, Jakarta, Kuala Lumpur and London. His PhD explored the multi-disciplinary aspects of skybridge connections between tall buildings.

安东尼·伍德博士，自2006年起担任CTBUH执行理事，负责学会的日常运作。他同时也是芝加哥伊利诺理工大学建筑学院研究副教授和上海同济大学的客座教授，其专业领域是高层建筑设计，尤精于可持续设计。到芝加哥工作前，他曾任香港、曼谷、雅加达、吉隆坡及伦敦等地任建筑师，他的博士论文从多个学科的角度探讨了摩天大楼之间的空中桥廊连接问题。

Abstract

This paper investigates tall buildings from an aesthetic and social, as well as commercial and environmental, viewpoint; as contributing elements in the fabric of a city. Against a backdrop of the large-scale homogenization of cities architecturally around the world, the paper suggests ten design principles which, if adopted in skyscraper design, could result in tall buildings which are more appropriate to the place in which they are located – physically, environmentally, culturally, socially and economically. In doing this, it promotes the need for a new vernacular for the skyscraper in each region of the world, and suggests this would have significant ecological, as well as social, benefits.

Keywords: Tall Buildings; Ecological; Social; Aesthetic; Design Principles; Vernacular

摘要

本文从美学、社会学、商业和环境视角研究高层建筑这一城市肌理的构成要素。在世界各地城市建筑大规模同质化的背景下，本文提出十大设计原则。如果在摩天大厦的设计采用这些原则，可使其不论是在物质环境层面，还是在文化社会和经济层面更契合所在环境。由此推动世界各地的摩天大厦设计对一种新的地域性的追求，并继而带来显著的生态及社会效益。

关键词：高层建筑；生态；社会；美学；设计原则；本土性

Are we there yet?

Though we have seen major advances in the technologies, efficiencies and performance of tall buildings over the past couple of decades (Parker & Wood, 2013), arguably the urban expression of the typical skyscraper has not changed much from the predominant glass-and-steel aesthetic championed by Modernism in the 1950s. The architectural details have become much more refined since then, and certainly both materials and systems perform much better than a half century ago, but the rectilinear, air-conditioned, glass-skinned box is still the main template for the majority of tall buildings being developed around the world. Many of these boxes vary with how they meet both ground and sky, but they are part of a globalized expression.

There is, of course, a smaller group of ever-more adventurous sculptural forms that have come to the forefront alongside the more commercially-inclined boxes over the past decade or two (defined by the focus of the CTBUH 2006 Conference as “Tapered, Tilted, Twisted”, with a tongue-in-cheek “Tortured” added posthumously – see Wood, 2007). But, in both the “box” and the “sculptural” approach, the relationship between the

我们做到了吗？

虽然我们已经看到，在过去的几十年中高层建筑的技术、效率和性能取得了重大进展 (Parker & Wood, 2013)，但是代表城市面貌的典型高层建筑并没有在20世纪50年代现代主义所倡导的以玻璃和钢为主导的美学定义之后发生太大改变。自20世纪50年代之后，虽然建筑细部变得更加精致，材料和系统性能相比半个世纪前也获得了很大提升，但其直线型的，带空调的及玻璃立面的建筑仍成为全球大多数高层建筑建设的主要模板。虽然很多方盒子在底部以及顶部会有些变化，但仍然摆脱不了国际式的桎梏。

当然，在过去十年到二十年间，伴随着满足商业性需求的方盒子建筑的发展，还是出现了一少部分更加先锋的雕塑般形态的建筑¹（在主题为“锥形的，倾斜的，扭曲的”CTBUH 2006年会议后，这样的形式被戏剧化地定义为“受虐的”形态——详见伍德，2007）。但是，无论是在“方盒子”还是“雕塑式”的手法下，建筑物与场地的关系要么是实现单一的商业功能，要么是单一的视觉功能。因此，这些建筑大多与其所栖居的环境特征毫无关联——不论是在物质形态方面，文化方面，环境方面，抑或是社会方面。



Figure 1. Cities of the world are becoming culturally and aesthetically homogenized, with skylines that become synonymous with the place, but are not necessarily related to the culture or climate. Skylines from top: Warsaw, Miami, Melbourne. (images copyright Filip Bramorski, UpstateNYer, Cazz)

图1：随着天际线成为当地的代名词（与文化或气候不一定有关联），全球的城市在文化与审美上变得越来越同质化。自上而下的天际线图：华沙、迈阿密、墨尔本。（版权所有：Filip Bramorski, UpstateNYer, Cazz）

building and its location is predominantly either a commercial one or a visual one. Thus these buildings are largely divorced from the specifics of the place they inhabit – physically, culturally, environmentally and, often, socially too. For hundreds, and in some cases thousands, of years the vernacular architecture in many of today's tall building cities had to be intrinsically tied into its location – for its materials, its ventilation, its ability to function within a given climate and culture – but this was largely rejected in the Modernist belief in a “universal architecture”, which transcended mere “context” and worked on a higher philosophical plane.

The consequence of this was, and still is, the aesthetic homogenization (and, arguably, cultural homogenization) of cities around the world – a force that has gathered pace exponentially over the past two decades, with the easier flow of capital, labor, goods – and architectural models – that now ensues. Now a “progressive” city is largely defined by its set of skyscraper icons (see Figure 1), but the association is largely “synonymous” rather than “indigenous” – the same set of icons would

在数百年中（某些例子甚至有几千年的历史），在当代很多拥有高层建筑的城市中，地域性高层建筑与其所在的地方是在本质上契合的——其在材料、通风、功能性上都充分考虑了当地的气候和文化——而这些被现代主义所信奉的“国际式建筑”否定了。这样的地域性不仅仅是在考虑与“文脉”对应，而是上升到一个更高的哲学层面。

这带来的后果是世界各地城市审美的同质化（或者说文化的同质化），而且这种影响还在继续——这种趋势在过去二十年里由于资本、劳动力、商品流通的加速而呈指数化地增长，而现在轮到了建筑产品。现在，一个城市的“先进”与否在很大程度上取决于是否有一组标志性的高层建筑（见图1），但这却让城市变得“同质化”，而不具有“本土性”——这些建筑如果放在世界其它城市中效果也是相同的。这些模式被快速地传播和复制。

当然，谈论这类建筑类型的“本土性”是十分困难的，因为毕竟它只不过只有一百三十多年的历史，最早从北美发展，而如今几乎已经遍布全球。无论是本土性和地域性都暗示与当地文化的长久

1: The question of what has inspired this recent diversification of approaches to building form, and whether they can be justified in energy/carbon terms, is a valid one that needs to become a more essential part of the industry's dialogue. The sustainability discussion in recent years has been focused almost exclusively on operating energy which, while vitally important, has resulted in the neglect of a sufficient discussion of embodied energy in building construction. Even the very definition of “net-zero energy” seems to omit the materials and construction process entirely. Numerous exemplar tall buildings have recently made great strides in the reduction of operating energy. However, the energy expended to create building forms in the first place is by no means constant across buildings, with iconic-sculptural forms clearly requiring more material gymnastics (and hence more carbon) to deliver the same quantity of floor area as a more regular form. But there is another side also to this equation: that of a building's greater contribution to society beyond delivering maximum floor area with the minimum energy/carbon expenditure. What do iconic-sculptural forms bring to our cities in terms of beauty or impact on urbanity and the human senses? Do we want to live in a world full of ultra-energy-and cost-efficient but rather dull boxes? What about the impact on social sustainability and urban diversity and a whole range of other, less-quantifiable aspects of “sustainability”? Like with all things, there will be an optimal balance point in this equation, but the debate thus far, for obvious reasons, has been focused on quantifiable metrics rather than subjective questions.

1: 是什么激发了近来建筑形式的多样化？以及它们是否具有合理的能耗和碳排放？这些都是需要成为行业对话关注的合理议题，重要组成部分。近年来对可持续性的讨论几乎完全集中在其运行能耗方面，虽然这是非常重要的，但是对此的过度关注导致了对建筑建造物化能耗的忽视。即使是“零耗能”的定义其本身也似乎完全忽略了材料和施工工艺部分消耗的能量。近来，许多作为典范的高层建筑其运作能耗的减少方面取得了长足的进步。然而，消耗额外的能量消耗来创建建筑形式首先就绝不是可持续的建筑物，标志性的，具有雕塑形态的建筑形式显然需要使用更多材料（因此具有更大的碳排放量），相比于普通形式的建筑，为了提供的面积。然后，另外一个方面也会影响最终耗能计算：即建筑物以最小能量/碳排放提供最大面积而对社会的贡献。标志性雕塑形式的建筑带给我们城市美景带来了何种积极的影响，或如何影响对城市风格和人感知？我们是否希望生活在一个充满能量并极具成本效益的世界，而是无聊之味的放盒子里？对社会的可持续发展和城市的多样性和“可持续性”等方面有何影响，而在“可持续性”不可测量的方面又有什么作用？像世界上其他的事物一样，会存在解决这些问题的最佳平衡点，但争论至今仍然一直专注于可量化的指标而不是主观的问题，造成这种现象的原因是显而易见的。

The Tropical Skyscraper: Social Sustainability in High Urban Density

热带摩天楼：高密度都市中的社会可持续性



Mun Summ Wong



Richard Hassell



Alina Yeo

Abstract

Asia's rapidly growing metropolises demand an alternative strategy for city planning and architecture that addresses the need to live appropriately and sustainably with our tropical climate and urban densities. This paper discusses WOHA's design approach in creating progressive, sustainable and humane environments that propagate a high quality of dense urban living in the tropics. Using (built and un-built) examples of the firm's institutional and public housing projects, these strategies involve devising (1) "Club Sandwich" typologies that radically organize programs of diverse natures into distinct, self-sustaining strata each with their own unique quality and character, and then synergize these varied strata into innovative high-density, high-/buildings designed for the tropics; and (2) "Vertical Village" models that foster community spirit by strategically forming urban clusters and weaving informal spaces along daily routes to encourage social bonding and interaction, good neighborliness, mutual care and watchfulness, a sense of shared ownership, belonging and pride.

Keywords: Tropical, Community, Sustainability, Liveability, High Density, 3D Urban Planning

摘要

亚洲的高速都市化对城市规划和建筑提出了新的策略需求，凸显了在热带气候和都市密度的一种适宜且可持续的生活方式的必要性。这篇文章阐述了WOHA在创造渐进的，可持续的和人性化的高质量高密度热带环境中所运用的设计手法。通过列举事务所的公共建筑和公共住宅项目（包含建成和未建成）展现了以下的手法：（1）“俱乐部三明治”原型，激进地将各种不同性质的功能分类到相互独立的有着独有性质和特征的层次中，再将这些不同的层次协同到一个具有创新意义的高密度热带摩天楼中；（2）增强社区性的“垂直村落”模型，通过策略性地组织都市聚落和在日常路线上编织进更多的非正式空间，能够增进社会融合与交互，良好的邻里感，相互关爱和照料，共有的主人翁精神，归属感和自豪感。

关键词：热带的，社区，可持续性，宜居性，高密度，3D城市规划

Mun Summ Wong, Richard Hassell & Alina Yeo

WOHA
29 HongKong Street
Singapore
059668

tel (电话): +65 6423 4555
fax (传真): +65 6423 4666
email (电子邮箱): wongmunsumm@woha.net
www.woha.net

Wong Mun Summ is the joint Founding Director of WOHA, an internationally-acclaimed architectural practice in Singapore. WOHA received the 2007 Aga Khan Award for Architecture for their first tropical high-rise tower, 1 Moulmein Rise in Singapore and garnered 4 World Building titles in 2 consecutive World Architecture Festivals in 2009 and 2010.

Wong Mun Summ是世界知名的新加坡建筑公司WOHA的联合创始人。WOHA的第一个高层建筑设计1 Moulmein Rise为他们赢得了2007年的阿卡汗建筑奖，在2009年和2010年又在两个后续的世界建筑节中获得了4个世界建筑的称号。

Richard Hassell is the co-Founding Director of WOHA. He graduated from the University of Western Australia in 1989, and was awarded a Master of Architecture degree from RMIT University, Melbourne, in 2002. He has lectured at universities around the world, and served as a Professor at the University of Technology Sydney, and the University of Western Australia.

Richard Hassell是世界知名的新加坡建筑公司WOHA的联合创始人之一，他1989年毕业于西澳大利亚大学，在2002年被墨尔本RMIT大学授予建筑学硕士学位。他在世界各地的大学发表过演讲，并出任悉尼科技大学，西澳大学的教授。

Alina Yeo has been associated with WOHA for the past 12 years and completed her Master of Architecture in 2005 from the National University of Singapore. Alina's portfolio encompasses design and project management of a variety of projects including institutional and high-rise condominiums. She was instrumental in the design of the award-winning School of the Arts, a pre-tertiary institution located at the heart of Singapore's civic district.

Alina Yeo在过去的12年里作为公司合伙人一直在WOHA工作，她于2005年在新加坡国立大学获得建筑学硕士学位。Alina的作品跨越了从公共建筑到高层公寓不同项目的设计和项目管理。他曾经参与过一个位于新加坡城区核心区域的提供基础教育艺术学校的设计并获得了奖项。

Expanding at an unprecedented rate. Asia's rapidly growing metropolises urgently demand alternative strategies for city planning and architecture that address the need to live appropriately and sustainably with our tropical climate and population densities. Working in 21st Century Asia, WOHA has spent the past 20 years investigating holistic urban planning and architectural solutions undergirded with a strong socially and environmentally sustainable vision in order to create highly dense yet highly liveable vertical cities in the tropics. This paper discusses the design approaches adopted in WOHA's institutional and public housing projects that demonstrate a paradigm shift: from piecemeal initiatives to integrated infrastructures; from 2D mono-use land parcellation to 3D multi-use program stratification; from hermetically sealed structures to breathable, verdant towers; from the hardware of urbanity to the heartware of community.

亚洲的都市化正在以一种空前的速度进行着，这对城市规划和建筑设计提出了迫切的新战略需求，并期待着一种在热带气候和都市密度下的适宜且可持续的生活方式。立足21世纪的亚洲，WOHA在过去的二十年里致力于进行整体性的城市规划和建筑设计，加强社会层面和环境层面的可持续性从而创造出一种高密度的热带宜居垂直城市。论文讨论了WOHA在办公建筑和公共住宅项目中采取的设计手法上的模式转变：从微小的设想转变为一体化的基础设施；从二维单一功能的用地分区到三维多用途的功能层化；从密封内化的结构到可呼吸的绿色塔楼；从都市的硬件到社区情怀。

热带都市社区建筑组团

从热带的传统生活方式中获取灵感，WOHA在乡土村落中社会场所的模式和被动式通风策略里提取出设计的脉络。通常而言，矗立在道路交叉口的一棵大树与周边的一小块绿地会成为社交和仪式的中心。WOHA发现居民们会自发地聚集在大树树荫之下，不同规模的社交和互动就

Tropical Urban Community Building Blocks

Drawing inspiration from traditional ways of life in the tropics, WOHA took design cues from the vernacular village's socio-spatial patterns and passive ventilation strategies. Typically, a large tree located at crossroads served as the social center for ceremonies, in conjunction with an adjacent village green. WOHA observed that communities naturally gathered under the tree's day-long protective shade, and that social interaction at various scales occurred spontaneously along daily routes. Areas with good visual connectivity promoted a sense of informal community surveillance and shared ownership, which improved safety and responsibility for its upkeep, while vibrancy and dynamism were generated by the diversity activities for all ages in spaces that physically extended invitations to people to participate or to observe. These foundational principles for making places that foster friendship bonds, forge collective memories and promote social opportunities, together with a keen design sensitivity to human scale and thermal comfort, shape the "Tropical Urban Community Spaces" found across WOHA's works.

"Club Sandwich" Typology

Using the metaphor of a "Club Sandwich" with its multi-layered effect, the following four institutional projects demonstrate WOHA's radical approach of organizing programs of diverse natures into distinct, self-sustaining strata each with their own unique quality and character, and then synergizing these varied strata into innovative high-density, high-amenity building typologies designed for the tropics. This not only results in richness and diversity of cross-programming, but also minimizes the building's footprint, opens up the ground level for activity generators/landscaping and maximizes areas for facilities by considering the ground plane as an essential, duplicable layer of the city that can be replicated at strategic horizons within and between buildings in the sky.

School of the Arts, Singapore (SOTA)

In SOTA, WOHA's strategy was to horizontally organize the school its dual constituent parts – private academic spaces upon a pedestal of public performing art theatres – with dynamic visual links and secured physical connections across both strata. (Figure 1) Against this backdrop, the school communicates with the wider community. A high volume, naturally-ventilated public concourse designed around an urban short-cut allows the public to see the activities of the school, and students to observe the happenings of the city. WOHA's creation of a covered yet breezy civic amphitheater plaza at the corner junction of the site, under the shade of extended cantilevers and conserved trees, has also become a highly popular urban rendezvous.

The scarcity of prime land meant that a typical playing field at grade was not feasible. Instead, a Student Assembly datum and a recreational Rooftop Skypark incorporating a 400m running track were inserted as new elevated ground levels in the sky, with their large footprints spread out like giant "Urban Umbrellas" shading and sheltering the public concourse, urban plaza and academic spaces below. This canopy effect, combined with breezeways in-between blocks, was designed for optimum human comfort that is naturally conducive for congregation. The building effectively becomes a "Machine for Wind", channeling and intensifying Singapore's very light breezes through its social spaces to provide a delightful and safe environment for children to learn and play in the inner city. The academic floors are layered and staggered to encourage diagonal air movement and dynamic visual sightlines across the different levels, with pockets of sky gardens, link

会在人们日常的路径周边产生。视野比较通达的区域更容易增进社区照料感和共享感，使得这片区域更为安全和也更容易被管理。空间中不同年龄段的人们各式各样的行为带来了生机和活力，吸引着其他人们前来加入或者围观。这些在场所构筑中激发情感联结，增进集体记忆和促进社交活动的基本原则，和一种对于尺度和热舒适性热切的敏感性结合在一起，构建出贯穿WOHA作品中的“热带都市社区空间”。

"俱乐部三明治"原型

用“俱乐部三明治”来比喻一种多层叠合效应，下文介绍的四个公共建筑中展现出WOHA激进地设计手法，将各种不同的功能分配到相互独立的有着独有性质和特征的楼层中，再将这些不同的楼层整合到一个极具创意的高密度，高舒适性的热带建筑类型中。通过这样的功能混合不仅获得更大的丰富性和多样性，并且减小了建筑的占地面积，将地面层开放给公共活动和景观绿化，还将通过将地平面看作一个重要的可以复制的城市表层在建筑和天空之间战略性的延伸，从而达到可提供给设施的面积最大化。

新加坡艺术学校 (SOTA)

在新加坡艺术学校这个项目中，WOHA的策略是将建筑分置到两个水平叠加的体量中，较为私密的学术空间被放置在由公众艺术表演剧院形成的基座之上，各部分之间有动态的视觉联系和连廊联结起来。（见图1）在这样的背景下，学校与周边的社区之间产生了对话。一条穿越建筑的向城市开放的路径旁边有一个高敞而有自然通风的公共区域，使得公众得以一瞥学校内发生的活动，也给予学生感知城市活动的机会。WOHA在建筑一角的交叉口处设计了一个在深远出挑和保留树木之下形成了通风阴凉的露天剧场，从而形成了一个非常受欢迎的都市集会地。

紧张的建筑用地意味着要提供符合标准的运动场是不可行的。于是，一个包括学生集会地和一个400米跑道的屋顶花园被放到了抬升到空中的新场地层上，运动场的巨大底面的边缘延伸出去，如同一把巨型的“都市雨伞”，为下面的公共区域，城市广场和学术空间提供遮蔽和阴凉。这种遮蔽效应和建筑体块之间阵阵清风一起，优化了人体热舒适性，自然而然有利于更多的集会。建筑成为了一个有效的“风捕捉器”，为社交空间捕捉和加强新加坡非常小的环境风，为孩童提供了一个在城市中心区域玩耍嬉戏的愉悦而安全的环境。教育部分的楼层层叠错落，插入一个个空中花园，连廊和联系各个体块楼层间的大尺度交通楼梯，以便引入更多对角穿越的风，在不同的楼层之间产生更加动态的视觉联系，鼓励学生之间更多自发的交流与合作。（见图2）环境稳固，明亮并有习习微风，绿色植物织成的绿墙为其遮阳，为紧张的一天提供一个休憩沉思的好去处。



Figure 1. Two distinct strata of SOTA with conserved trees and cantilevers shading a tropical amphitheater plaza

图1. SOTA的两个不同的体量，一个在保留树木和建筑出挑遮蔽之下的露天剧场

Urban Density and the Porous High-Rise: The Integration of the Tall Building in the City – from China to New York

城市密度和多孔性高层建筑: 高层建筑与城市网络和公共空间的整合——从中国到纽约



James von Klemperer

James von Klemperer

Kohn Pedersen Fox Associates PC
11 West 42nd Street
New York City, NY
USA 10036

email (电子邮箱): jvonklemperer@kpf.com
www.kpf.com

James von Klemperer is Design Principal at Kohn Pedersen Fox Associates where he has worked since 1983. He is responsible for a wide range of program types and scales of projects. In his work, he follows projects through the full process of design, from conception to completion.

Jamie is currently leading the design of One Vanderbilt Place in the USA. His other US work includes, the Foley Square Courthouse in New York, and the Park Fifth residential development in Los Angeles.

In China, Jamie has completed major mixed use projects, such as Hang Lung Plaza 66 (Shanghai), and Hua Mao China Central Place (Beijing). Other Chinese projects include Jingan Kerry Center and the Tianjin Riverside 66 retail market.

Jamie was also the chief designer of Dongbu Financial Tower, winner of the Korean National Architecture Award. Other Projects in Korea include the master plan for New Songdo City, a 1500-acre town and the Lotte World Tower still under construction.

詹姆斯·冯·克伦佩勒自1983年进入科恩·佩德森·福克斯联营公司工作，现担任公司的设计负责人。他一直负责各种类型和规模的项目，项目跨度范围从房子的大小到一个城市的尺度。他在工作中参与项目设计从构思到完成阶段的全过程。

在美国，詹姆斯目前领导了范德比尔特广场设计团队，这个高楼项目毗邻纽约中央车站。他设计的华盛顿彼得森国际经济研究所和康涅狄格州的金神大赌场项目都获得了美国建筑师学会奖章。他在美国其他工作包括：纽约弗利广场法院、洛杉矶第五园住宅开发项目，于2007年获得了NYAIA奖。

在中国，杰米已经完成了几个重要的混合功能项目，如恒隆广场66（中国上海），以及华贸中心（中国北京）。他参与开发的中国项目包括静安嘉里中心和天津海河66零售中心，成为2009年NYAIA奖的赢家。

在韩国，杰米是东部金融大厦的首席设计师，此项目是NYAIA奖和韩国国家建筑奖得主。他领导了新松岛市总体规划，一个1500英亩的镇，并在2007年获得第一个由ULI颁发的绿色城市奖，在这一项目中，他参与了几个重要建筑的主创设计，包括第一世界住宅综合体、国际学校和100英亩的中央公园。他设计的乐天世界大厦正在建设中，设计高度555m，将于2015年完成。

Abstract

As the skyscraper matures as a building type, its role in actively connecting to, and reinforcing, major threads of urban fabric becomes increasingly more important. The creation of public spaces inside of and adjacent to tall buildings allows for significant additions to the public realm, facilitating better connections between varied uses, providing needed access to critical transportation functions.

In this more integrated version of the tall building type, the density afforded by a vertical structure is complemented by strategically devised porosity of plan and section. This paper examines three major tower projects which exemplify a progressive approach to permeable design: the recently completed Jingan Kerry Centre in Shanghai, the Lotte Supertower in Seoul, now half completed, and the One Vanderbilt tower being proposed next to Grand Central Terminal in New York City. These projects suggest possibilities for innovative approaches to private development strategies, public planning processes, and architectural design.

Keywords: Permeable Design, Public Space, Spatial Continuity, Sectional Variety, Organic Grids, Urban Fabric

摘要

随着摩天大楼作为一种日渐成熟的建筑类型，它对联系并增强城市结构的积极连接作用变得越来越重要。高层建筑内部和相邻公共空间的创造允许大量增加公共领域、促进各种用途之间更好的连接、以及提供对重要交通功能可达性。

在这种集成度更高的高层建筑类型中，由垂直结构所带来的密度辅以平面和剖面的多孔战略构想。本文探讨了三个大型高层项目，用渐进方式渗透的设计：最近完成的上海静安嘉里中心、完成一半的首尔乐天世界大厦、纽约市大中央车站旁拟建的范德比尔特塔。这些项目对私人开发项目、公共规划流程以及建筑设计的战略创新方法进行了可能性尝试。

关键词：透水设计，公共空间，空间连续性，截面多样性，有机网格，城市结构

Introduction

Urban density, as measured by the concentration of built area, rate of occupancy, and intensity of user activity, is one of the most important factors affecting our ability to deal with critical opportunities and challenges of today's cities. The potential for high efficiencies of land use, energy consumption, and personal time all point to the advantages of condensed utilization in downtown districts. For more than a century, tall buildings have allowed for high ratios of usable floor area to land area, thus serving as essential components of center city planning and design. However, if not strategically conceived, building density can create major difficulties of an overcrowding of the ground plane, a lack of diversity of use, a scarcity of public space, and a less than optimal access to light and air.

引言

城市密度——由建成区面积的集中度、占地率和用户活动强度等几个因素确定，是影响我们应对当今城市关键机遇和挑战的能力的最重要因素之一。土地使用、能源消耗、个人时间的高效利用潜力都指向城市中心区的紧凑使用优点。一个多世纪以来，高楼大厦都采用高容积率，从而成为服务于中心城市的规划和设计的重要组成部分。然而，如果缺乏合理的战略构想，较高的建筑密度可导致一系列不良的效果，如地平面拥挤、功能多样性的缺乏、公共空间匮乏以及采光和空气质量的不理想。

作为对建筑密度的改变，精心策划而建造大规模建筑缓解了前文提到的由于密度过高所带来的挑战。新的公共开放空间的嵌入、公众使用功能的增加、公共流线与高层建筑的连接可以让城市生活通过其他的方式在密集环境中高效地流动。在某些情

As the converse of density, carefully planned porosity of constructed mass allows for essential relief from some of the challenges arising from extreme compaction mentioned above. The insertion of new public open spaces, the addition of varieties of public use, and the connection to public circulation routes into tall structures can allow city life to flow effectively through otherwise dense environments. In some cases, sectional manipulation makes it possible to replicate the ground plane at multiple levels, adding to capacity of the public realm.

The ultimate efficiency of such tall building projects comes with the connection to transport networks and even adjacency to major transport hubs. This remains one of the most important uses of vertical construction, to place large quanta of working and living quarters where users can access their space conveniently without needing to rely on the automobile. Ultimately, this can be seen as a strategy for the management of carbon footprint and other energy use metrics.

In such large mixed use environments, a degree of porosity can also naturally lend a measure of human scale, mitigating the some of the psychological challenges of occupying mega scale buildings. The aesthetic effect of unmitigated mega-masses can otherwise become a deterrent to the happy acceptance of dense living. Porosity becomes the natural enabler of efficient density.

This paper will examine three contemporary tall building projects whose primary design, commercial, and civic goals, include the active integration of a vertical structure with urban networks.

These projects can be listed and characterized as follows:

- Jingan Kerry Center (organic grid collage)
- Lotte Supertower (vertical city)
- One Vanderbilt Ave (a tree with roots)

The three tower projects occur in widely diverse locales (Shanghai, Seoul, and New York), rise to varying heights (270m, 555m, and 400m), and feature broadly differentiated mixes of internal use. The first has been recently completed, the second is half constructed, and the third is currently being permitted. What they all have in common is that they seek to achieve the strategic balance of density and porosity described above.

Jingan Kerry Center Shanghai

The Jingan Kerry Center, a major mixed use project recently completed in Shanghai, tests several hypotheses about the role of the tall building in promoting the goals of progressive urban design. The investigations launched by these questions are both practical and theoretical in nature, and were pursued consistently by architect and client from the first sketch to the day the complex opened. They are as follows:

- First that a Superblock consisting of an assemblage of large scale buildings can be used to extend and reinforce the permeable grain of the historical city.
- Second, that an integrated cluster of variously scaled building elements can make an effective connection between ground plane and skyline, through a gradual sequence of formal and programmatic connections.
- Third, that the rectangular grid, which provides us with an organized basis for planning and construction, can be used to create a heterogeneous, and even organic design, responding deftly to a multitude of uses, visual agendas and contextual idiosyncrasies.

况下，通过对截面的精心设计可以在不同的高度上创造多个地平面，从而增加了公共空间的承载能力。

高层建筑项目的最终效率来自于与交通网络的连接，或者得益于临近主要交通枢纽的区位优势。垂直建设模式的最重要的是把工作和生活区设置在用户可以方便到达而无需依赖于汽车的地方。最终，这可以被看作是对建筑碳足迹和其他能源利用指标的管理策略。

在这样大规模混合功能环境中，一定程度的空隙可成为缓解庞大建筑物带来的心理挑战的人性化措施。否则，庞大建筑物的视觉效果可能成为对高密度生活积极接受度的威胁。多孔性成为高密度的自然推动力。

本文将探讨3个当代高层建筑项目，其主要设计、商业和城市目标均包括垂直结构与城市网络的有效整合。

这些项目及其特点如下：

- 静安嘉里中心（项目概念：有机网格拼贴画）
- 乐天超级大厦（项目概念：垂直城市）
- 范德比尔特大道（项目概念：带根树）

这三个高层建筑项目位于不同的环境中（上海，首尔和纽约），并且具有不同的高度（270m, 555 m, 400 m），而内部功能混合情况差异较大。第一个项目已于近期完成，第二个已完成一半，第三个项目刚刚获批。三个项目的共同点是，都寻求实现合理的密度和空隙率的战略平衡。

上海静安嘉里中心

静安嘉里中心是一个于日前在上海完成的大型混合用途项目，项目尝试了几种用高层建筑推动渐进式城市设计目标作用的设想。围绕这些问题开展的调查工作具有实践和理论性特点，并从项目伊始便成为建筑师和客户关注的问题。详情如下：



Figure 1. Jingan Kerry Center Shanghai

图1. 上海静安嘉里中心

The Public Meaning of Skyscrapers: Shenzhen Stock Exchange and CCTV

摩天大楼的公共意义: 深圳证券交易所及中央电视台新台址主楼



David Gianotten



Rem Koolhaas



Sylvia Chan

David Gianotten, Rem Koolhaas & Sylvia Chan

OMA

14/F On Hing Building, 1 On Hing Terrace, Central Hong Kong

tel (电话): +852 36918941, +852 36918941, +852 36918941

fax (传真): +852 3691 8948

email (电子邮箱): schan@oma.com

http://oma.eu/home

David Gianotten joined OMA in 2008, launched OMA's Hong Kong office in 2009, and became partner in 2010. He leads OMA's Asia Pacific operations and is one of the three managing directors of the worldwide OMA Holding.

大卫·希艾莱特于2008年加入OMA, 在2009年成立OMA香港办公室, 并于2010年成为合伙人。他领导OMA在亚太区的众多项目, 是OMA环球控股三位董事成员之一。

Rem Koolhaas founded OMA in 1975 together with Elia and Zoe Zenghelis and Madelon Vriesendorp. He graduated from the Architectural Association in London and in 1978 published *Delirious New York: A Retroactive Manifesto for Manhattan*.

雷姆·库哈斯是OMA的创始人, 于1975年与Elia和Zoe Zenghelis及Madelon Vriesendorp共同创立OMA。他毕业于伦敦建筑联盟, 并于1978年出版了《疯狂的纽约——一部曼哈顿的回溯性宣言》一书。

Sylvia Chan is the Communications Officer of OMA Asia Pacific. With training in architecture and journalism, she engages in research on architectural writing. She is currently a PhD student at the University of Hong Kong.

陈曼霞是OMA亚太区的公关主任。她曾受建筑和新闻的专业培训, 从事有关建筑写作的研究。目前, 她是香港大学的博士生。

Abstract

Through the designs of Shenzhen Stock Exchange and the CCTV Headquarters in Beijing, the paper illustrates the potential of skyscrapers in creating public meaning. This paper argues that the skyscraper typology can be constantly reinvented to generate new meaning. The reinvention of the skyscraper typology can create public meaning at two levels: at the physical level, a skyscraper can generate a new public space in the urban context; at the metaphorical level, a skyscraper with an unconventional gesture can coincide with the ambition of a city to move forward. This paper further argues that skyscrapers should be designed as necessary components within the urban context. The meaning / lack of meaning of each skyscraper is dynamic – as the city evolves, a skyscraper acquires new meaning. This interaction is possible if skyscrapers compete in terms of new ideas that respond to the context and push the skyscraper typology beyond conventions.

Keywords: Skyscraper, Shenzhen Stock Exchange, CCTV, Public Space, Urban Context, OMA

摘要

通过深圳证券交易所和北京中央电视台新台址主楼的设计, 本论文显示摩天大楼对创造公共意义的潜在可能。本论文主张摩天大楼类建筑可时常颠覆重塑, 造就新意义。摩天大楼类建筑可通过两个层面创造公共意义: 就实质层面而言, 摩天大楼可在城市文脉中创造新的公共空间; 而就象征层面而言, 非传统外型的摩天大楼与城市迈进新纪元的追求一致。本论文进一步主张摩天大楼应设计成城市文脉中不可或缺的构件。每座摩天大楼承载的公共意义或缺失的公共意义都是动态的——随城市演化, 摩天大楼会得到新意义。若摩天大楼能就呼应城市文脉的新意念来互相竞争, 并使摩天大楼的建筑类型突破常规, 便可达到这种互动。

关键词: 摩天大楼, 深圳证券交易所, 中央电视台, 公共空间, 城市文脉, OMA

Framed by the term “skyscraper,” the skyscraper typology has been forced into the ceaseless race to reach for the “sky.” Ultimate height has become almost the only achievement the skyscraper aspires. The one-dimensional competition skyscrapers engage in has exhausted its typology, making it a typology of mediocrity. Skyscrapers are in need of liberation: liberation from mediocrity, liberation from the “sky.” Reinvention of the skyscraper typology asks for a shift of focus from single verticality to interaction with the context in which they root. The recently completed Shenzhen Stock Exchange (SZSE) (see Figure 1) and the CCTV Headquarters in Beijing (see Figure 2) by OMA are skyscrapers that reinvent the typology by focusing not on height but the creation of public meaning. This paper argues that skyscrapers are not isolated tall objects that paradoxically create isolation and a defensive environment within density, but that they are necessary components within a specific urban context. The skyscraper is not a typology that has only one dimension but instead can be constantly reinvented to generate new meaning.

受“摩天大楼”一词所框限, 摩天大楼类的建筑被迫参与无止境的“高空”竞赛, 终极的高度已几乎成为摩天大楼所追求的唯一成就。摩天大楼所参与的这种单向度竞赛, 已榨干了此类建筑类型的创造力, 使其成为一种平庸的建筑类型。摩天大楼需要得到解放: 从平庸中解放、从“高空”中解放。摩天大楼类建筑的颠覆重塑, 探求的是从单一的竖向追求, 走向与城市文脉的互动, 与建筑所植根之地更为紧扣。OMA最近落成的深圳证券交易所(深交所)(见图一)和中央电视台新台址主楼(央视大楼)(见图二), 通过聚焦于公共意义的创造而非建筑高度, 颠覆重塑了摩天大楼类建筑。本论文主张摩天大楼并非脱离环境的高耸之物, 没有在密度之中矛盾地造成脱离和具戒心的环境, 反而是特定城市文脉中不可或缺的构件。摩天大楼类建筑并非单向度, 反而能时常颠覆重塑, 造就新意义。

摩天大楼的公共意义

摩天大楼的颠覆重塑, 并非发生于自身的竖向建筑领域, 而是在能从中得到其公共



Figure 1. Shenzhen Stock Exchange, completed 2013. Source: (c) OMA Photography by Philippe Ruault.

图一：深圳证券交易所；于2013年竣工。来源：(c) OMA Photography by Philippe Ruault



Figure 2. CCTV Headquarters, completed 2012. Source: (c) OMA Photography by Philippe Ruault.

图二：中央电视台新台址主楼；于2012年竣工。来源：(c) OMA Photography by Philippe Ruault

Public Meaning of Skyscrapers

The reinvention of skyscrapers does not happen in an autonomous realm of vertical architecture but within an urban context from which skyscrapers derive their public meaning. The public meaning (or lack of public meaning) of each skyscraper is dynamic and changes depending on the city it is shaped in – as the city evolves, a skyscraper acquires new significance. The skyscraper typology can create public meaning at two levels: at the physical level, a skyscraper can generate a new public space in the urban context, as illustrated by the SZSE project; and at the metaphorical level, a skyscraper with unconventional gestures can coincide with the ambition of a city to move into a new era, as illustrated by the CCTV Headquarters project.

Shenzhen Stock Exchange – A New Public Space

The Shenzhen Stock Exchange, located in Southern China city Shenzhen – the fastest growing city in China, is an example of a skyscraper with public meaning at the physical level. Conceived in an architectural competition in 2006 and completed in late 2013, the 46-story (254.8 m), 265,000 m² SZSE headquarters is one of the many skyscrapers in Shenzhen's Central Business District, which began its development only in the 1980s. The compressed history of Shenzhen's development, which skipped many stages of architectural movements since the movement of modernism, has deprived the context of

意义的城市文脉中。每座摩天大楼承载的公共意义（或缺失的公共意义）都是动态的，而其转变取决于它所身处的城市——随城市演化，摩天大楼会得到新意义。摩天大楼类建筑可通过两个层面创造公共意义：就实质层面而言，摩天大楼可在城市文脉中创造新的公共空间，如深交所项目；而就象征层面而言，非传统外型的摩天大楼与城市迈进新纪元的追求一致，如央视大楼项目。

深圳证券交易所：崭新的公共空间

深圳证券交易所（简称深交所）于南中国城市深圳（中国发展最快速的城市），是在实质层面上具有公共意义的摩天大楼实例。楼高46层（254.8米）的深交所面积达265,000平方米，2006年通过竞赛确定建筑方案，于2013年年底竣工，是深圳中央商务区众多摩天大楼中的其中一座。深圳中央商务区仅从80年代开始发展；而深圳浓缩的发展历史，跳过了许多自现代主义运动以来的建筑运动阶段，剥夺了城市文脉的多样性，使深圳成为一个由现代的平凡摩天大楼支配的城市。面对“塔楼+基座”这其中最典型的设计要求，OMA简单却大胆地把基座部分抬升至离地36米，从而在大楼下创造出包围整个建筑的偌大公共广场，让深交所成为福田区的心脏地带——一个来自深圳、中国和更远地区的市民都可接近的真正金融中心。（见图三）

设计概览

深交所大楼内设深交所办公室、正式上市大厅、国际金融会议中心、中国画廊、技术支援中心、深交所数据中心、深交所食堂和会所。大楼还包含出租办公室、一间注册与结算公司、一间证券信息公司和零售区。三层高的基座经悬臂抬升至离地36米的空中，大楼中的所有证券交易功能都位于此处，包括上市大厅和所有证券交易部门。三层高的抬升基座每层面积达15,000平方米，是最大型的办公楼面之一，使各部门之间能够在同一楼层分工合作；这种合作性在竖向每层2,000平方米的原深交所大楼是无法达到的。抬升的基座同时设有国际金融会议中心和展览空间。深交所的行政办公室紧接抬升基座之上，使大楼的最高楼层可用于出租办公室和餐饮会所。另外，抬升基座亦增加深交所的展示面，可“转播”深圳金融市场的虚拟活动，深交所大楼因而可解读为证券交易市场的象征：投机买卖的热烈气氛在驱动市场的同时，仿佛也把大楼的基座抬升至离地36米的空中。（见图四）

与城市互动

深交所既容纳所有证券交易功能，亦代表中国证券交易市场；不过，大楼并非只为深交所而设计，更是为深圳这个城市。深交所通过以下方面接通深圳市：抬升基座而产生的园林绿化屋顶花园和底座公共广场、基座中如同边框把深圳各种功能的景观镶起的悬臂，以及反映天气状况的质感玻璃外立面。以上种种结合起来，让深交所成为一座为深圳而设的塔楼。

公共广场与屋顶花园

典型的“塔楼+基座”设计以基座把塔楼锚固在地面，此举可能使深交所脱离大众；设于地面的基座会遮蔽大楼的核心筒，限制大众进出深交所。为了促进大众进出深交所，OMA重新演绎了此典型“塔楼+基座”的设计要求，构想出颠覆“巩固的建筑必须坐落在巩固的基座之上”的建筑常规。通过把基座抬升，创造出亲切迎人、直通大楼核心筒的深交所入口，同时在深圳中央商务区的中心位置打造出公共广场。如此一来，原本极度私有化的建筑便通过新公共广场的创造得到公共意义，不只供大楼租户使用，更能让大众普遍使用。在公共广场，人们更可看到大楼的悬臂如何如边框般把深圳的景观镶起。南北两个方向的悬臂悬挑18米，东西向的则悬挑36米，提供独特视点观看市景，把深圳市过去30年发展的各种类型和功能区域镶嵌起来。（见图五、六）抬升的基座之上设有屋顶花园，其景观的样式受欧洲中世纪式地毯和中国传统剪纸所启发，象征在深圳经济特区中尤其明显的中西社会融合。屋顶

The Logic of Luxury: New York's New Super-Slender Towers

纽约的新超纤细高层: 奢华的逻辑



Carol Willis

Carol Willis

The Skyscraper Museum
39 Battery Pl
New York, New York
10280 USA

tel (电话): +1 212.945.6324
fax (传真): +1 212.732.3039
email (电子邮箱): caw3@columbia.edu

Carol Willis is the founder and director of The Skyscraper Museum in NYC and the curator for more than 20 exhibitions. An architectural and urban historian, she is the author of *Form Follows Finance: Skyscrapers and Skylines in New York and Chicago* (1995) and has edited and contributed essays to numerous monographs and collections. She appears frequently in television documentaries and radio broadcasts.

Ms. Willis is an Adjunct Associate Professor of Urban Studies at Columbia University where since 1989 she has taught in the Graduate School of Architecture, Planning, and Preservation.

卡罗尔·威利斯是纽约摩天大楼博物馆的创始人兼董事，她还同时承担20多个展览会的组织工作。她是建筑和城市方面的历史学家，是《金融决定形式：纽约与芝加哥的摩天大楼和都市天际线》（1995）一书的作者，她还撰写和编辑了许多行业内的专著和文章。她也经常出现在电视纪录片和电台节目中。

威利斯女士是哥伦比亚大学城市研究专业的兼职副教授。她从1989年开始执教于建筑、规划和建筑保护专业的研究生院。

Abstract

The recent exhibition "SKY HIGH & the Logic of Luxury" at The Skyscraper Museum examined a dozen super-slim, ultra-luxury residential towers on the rise in Manhattan. These pencil-thin buildings—all 50 to 90+ stories—constitute a new typology of skyscraper, even in a city where tall, slender structures have a long history. Predicated on sock views, these trophy properties exploit the city's system of transferable air rights and employ a development strategy of slenderness to stretch up to 300-400+ meters and have slenderness ratios ranging from 1:12 to 1:23. Sophisticated engineering and advances in material strengths have made these spindles possible, but Manhattan's extraordinary apartment prices and the international market for investment real estate explain their proliferation. Exclusivity is key: small floor plates with 1 to 2 units require only 2-4 passenger elevators. The conditions that created this rarified new form will remain indigenous to Manhattan, however, the paper posits.

Keywords: Slenderness, Super-Slender, Tower, Luxury

摘要

最近在摩天大楼博物馆举行的主题为“与天试比高·奢华的逻辑”的展览中，展示了曼哈顿正在建设的十二座超纤细、超豪华的住宅塔楼。即使在这座已拥有超高、超细建筑相当长历史的城市，这些如铅笔一样细、50-90多层的建筑，还是构成了摩天大楼的一种新类型。在获得震撼性景观视野的同时，这些居高临下的物业通过拔高到300-400多米和拥有1:20到1:23高宽比的纤细策略，开发了城市系统中的空中使用权。高超的工程技术和高端的建筑材料使得这些纤细建筑成为可能，但是曼哈顿极其昂贵的房价和国际市场投资房地产的热潮才是此类建筑兴起的有力解释。专属性是此类建筑的关键：楼板面积很小，每层只需布置1-2个单元，因此只需配置容纳2-4个乘客的电梯。曼哈顿固有的特性形成了这类罕见的新建筑类型，至少，本文是这么认为的。

关键词：纤细、超纤细、塔楼、奢华

All buildings are a product of time and place. This paper describes a group of super-slender, ultra-luxury residential towers currently on the rise in Manhattan—all 50 to 90+ stories—that represent an entirely a new type of skyscraper, even in a city where improbably slender structures have a long history. More than a dozen such remarkable buildings are underway in New York City, and there will be more (see Figure 1).

These celebrity spires are headline grabbers, in part for their "starchitect" designers, but even more for their stratospheric condo prices. The only tower that is currently topped out and fully enclosed—which is named One57 and designed by Pritzker-winner Christian de Portzamparc—has sold two penthouses for \$90 million. Other reported sales range from \$30-\$60 million. While some owners will enjoy their aeries as a primary residence, many apartments are being purchased as investments by wealthy individuals, LLPs, and by international buyers: they are, in effect, "strong-boxes in the sky," in the phrase of one noted real estate appraiser.

所有的建筑都是时间与空间的产物。本文描述了一组超纤细和超豪华的曼哈顿住宅塔楼，这些建筑一般在50-90多层高，尽管超级纤细的结构在这座城市里已经有相当长的历史，但是它们还是代表着一个全新类型摩天大楼的崛起。目前，在纽约有十二幢这样的建筑正在开发中，并将会有更多此类建筑崛起（参见图1）。

这些高层“名流”是新闻报道的头条，一部分原因在于其“明星”设计师，但是更主要的原因在于它们不菲的价格。目前唯一一座已经建成的塔楼名为“57街1号”（One57），由普利茨克奖得主克里斯蒂安·德·波特赞姆巴克（Christian de Portzamparc）设计，顶楼的两个单元已经以9千万美元的高价售出，其它单元据报道售价3千万到6千万美元不等。尽管有部分业主将这些高空中的房屋作为他们的首要住所，但更多单元是作为投资品被富有的个人、公司和国际买家购买。它们是“结实的空中盒子”，一位著名的地产评估师如此评价。

2013年10月，摩天大楼博物馆举办了“与天试比高·奢华的逻辑”的展览，探讨了此类建筑的设计，并分析了它们形成的条件。



Figure 1. From left to right – One57, 111 W. 57th Street, 432 Park Avenue, 56 Leonard, 30 Park Place, Tower D in Hudson Yards (Source: Atelier Christian De Portzamparc; SHoP Architects; CIM Group & Macklowe Properties; Alexico Group; dBox, Courtesy of SPI; Diller Scofidio & Renfro).

图1. 从左至右依次为：57西街111号，公园大道432号，莱昂纳多街56号，公园广场30号，哈德逊广场塔楼D座（来源：Christian De Portzamparc工作室；SHoP建筑事务所；CIM集团&Macklowe 房产公司；Alexico集团；dBox, Courtesy of SPI; Diller Scofidio + Renfro建筑事务所）

In October 2013, The Skyscraper Museum mounted the exhibition “SKY HIGH & the Logic of Luxury” which surveyed this group of designs and analyzed the conditions that created them. This paper summarizes that longer effort, which is archived in full on the Museum’s website, and it also endeavors to explain this phenomenon in the context of real estate market as it has continued to evolve in 2014¹.

Here are eight examples of the type (see Figure 2). As you see, the design approach is not stylistic; the façade treatment can be a complete glass membrane or a masonry curtain wall with punch windows. The structural system can be internal shear walls and mega-columns or an exterior bearing wall. Some of the towers are exceptionally tall: indeed, the loftiest one—by the same developer as One57—will rise to 1,423 ft, making it the tallest rooftop in the city.

But it’s not height that characterizes the type, it’s slenderness. Slenderness is the key design and development strategy of these towers, which range in height from 600 ft. to 1400+ ft. Slenderness keeps floor plates small—as tiny as 2,500 sq. ft.—in order to create the exclusivity of only one or two apartments per floor. It also reduces the number of elevators required (indeed, some of these towers of 50-80 stories have only three elevators: two passenger cars and one for service!) which further narrows the core. Slenderness lifts the project’s maximum legal FAR (floor area) as high in the sky as possible to achieve commanding views. These and other points described below constitute the “logic of luxury” of my subtitle.

¹ The exhibition “SKY HIGH & the Logic of Luxury” at The Skyscraper Museum (10/13-5/11.14) examined a dozen super-slim, ultra-luxury residential towers on the rise in Manhattan. A virtual version of the entire exhibition can be viewed here:

摩天大楼博物馆举办的“与天试比高·奢华的逻辑”的展览（13年10月至14年5月11日）仔细探讨了曼哈顿在建的12幢超纤细、超奢华的住宅塔楼。展览的电子版可参阅以下网址：

http://www.skyscraper.org/EXHIBITIONS/SKY_HIGH/video_intro.php

本文总结了这项耗时很长的研究（研究内容存档于博物馆的网站上），同时随着这一现象在2014年的“愈演愈烈”，本文也试图在房地产市场的背景中解释这一现象。⁽¹⁾

图2展示了此类建筑的8个案例。正如你所看到的，方案设计并不是风格化的；建筑外墙处理可以是完整的玻璃幕墙，或者是带有窗户孔的砖石砌墙体。结构系统可以是内部的剪力墙和巨柱，也可以是外承重墙结构。一些塔楼是非常高的：事实上，最高的一座塔楼——由“57街1号（One57）”项目的开发商开发——高达1423英尺，是城市中最高的一座建筑。

但是高度并不是此类建筑的特征，纤细才是此建筑类型所突出的特点。纤细度是设计和开发这些塔楼的关键，它们的高度范围在600英尺到1400多英尺不等。纤细度使得建筑每层楼面面积较小，一般在2500平方英尺左右，从而形成每层一到两户的专属公寓。同时，这也会减少所需电梯数量（事实上，有些50-80层的塔楼仅设有三部电梯，两部客梯，一部服务电梯），进一步缩小核心筒的空间。纤细使项目获得最大的合法容积率，从而获得优越的景观。以上及以下所描述的观点构成了本文要表达的副标题“奢华的逻辑”。

有多么纤细？

工程师们所定义的纤细度指的是底和高的比，这个比例通常是1:10或1:12。这类塔楼需要昂贵的措施来减少放大的风压效果，包括额外的材料和结构用以增强建筑的强度，以及用阻尼系统抵抗摇摆力（见图3）。1:12的纤细度比较形象的比喻就是：一把一英寸宽的尺子竖起来。图中所比较的是原来的世界贸易中心大厦1号楼和正在建设的公园大道432号的一座超纤细的住宅楼，后者的纤细度为1:15。尽管1971年建成时，世界贸易中心是当时世界最高的建筑，它高1368英尺，楼面各边长209英尺，它的底与高度之比小于1:7，它虽然高，但并不纤细。



Figure 2. Top from left to right - One57, 111 W. 57th Street, 432 Park Avenue, MoMA Tower, Bottom from left to right - 56 Leonard, 30 Park Place, 50 West Street, Tower D in Hudson Yards (Source: Atelier Christian De Portzamparc; SHoP Architects; CIM Group & Macklowe Properties; NYC Department of City Planning; Alexico Group; dBox, Courtesy of SPI; Time Equities Inc.)

图2. 上部从左向右依次为：57街1号，57西街111号，公园大道432号，大都会博物馆大楼；下部从左向右依次为：莱昂纳多街56号，公园广场30号，西街50号，哈德逊广场塔楼D座（来源：Christian De Portzamparc工作室；SHoP建筑事务所；CIM集团&Macklowe 地产公司；纽约市规划局；Alexico集团；dBox, Courtesy of SPI; Time Equities 公司）

Index by Authors

作者索引

- A**
- Abdelrazaq, Ahmad; 700
Adi, Prasetyo; 266
Alvarez-Rodriguez, Alberto; 783
Antell, James; 790
Arnold, Franz; 833
Askarinejad, Peyman; 556
- B**
- Bacellar, Michelle; 89
Baker, Robert; 860
Bao, Lianjin; 571
Bass, Patrick; 829
Bechmann, Roland; 484
Bernardini, Enrica; 671
Bischoff, Michael; 393
Bobby, Sarah; 671
Boog, Robert; 811
Bora, Geeta; 845
Boroschek, Ruben; 602
- C**
- Cao, Junliang; 446
Carbary, Lawrence; 769
Casper, James; 747
Chan, Sylvia; 57
Chanvaivit, Kanokpat; 587
Chen, Jianxing; 571
Chen, Julian; 278
Cheung, Anthony; 292
Cho, Duck Won; 625
Choi, Eun Gyu; 625
Choi, Hi Sun; 120
Christopoulos, Constantin; 677
Chua, Toon Ming; 164
Clawson, Kim; 783
Clay, James; 299
Clifford, Matthew; 365
Cuccurullo, Sam; 344
Cui, Ervin; 783
- D**
- Davies, Darren; 664
Davies, Donald; 517
Dean, Andre; 460
de Jong, Johannes; 816, 839
Ding, Jiemin; 564
Ditzen, Christiane; 484
Dravid, Vinda; 401
Drew, Christopher; 418
Du, Peng; 410
Du, Xiangdong; 642
- E**
- Eduardo Nigro Mazzilli, Carlos; 722
- F**
- Fanning, Keara; 418
Fan, Zhong; 579
Farnsworth, David; 492
Fernandez Nova, Katrina; 418
Ferrareto, Johann Andrade; 722
- G**
- Galsworthy, Jon; 642
Giacomello, Elena; 104
Gianotten, David; 57
Gibbons, Craig; 75
Godefroy, Claude Bøjer; 278
Gonzalez-Pulido, Francisco; 96
Gorilovsky, Aleksey; 865
Gorilovsky, Dmitry; 865
Grote, Lars; 632
Gu, Jianping; 136
- H**
- Haase, Jason; 379
Hadi, Yuri; 112
Haege, Elke; 474
Han, Lin; 617
Hargrave, Josef; 75
Hassell, Richard; 39
Heath, Tim; 112
Heller, Jeffrey; 272
Hermens, Maurice; 542
Hilderson, Peter; 365
Ho, Leung Wing (Daniel); 432
Ho, Wing Ip (David); 170
Holmes, Jeffrey; 732
Hsu, Art; 845
Huang, Yiru; 207
Hu, Jing; 184
Hu, Qiang; 308
- J**
- Jalayerian, Mehdi; 440
Jambhekar, Sudhir; 258
Jang, Sangki; 700
Jeong, MoonSook; 700
Jia, Zhaohui; 184
Johnson, Andrew; 474
- K**
- Kano, Kazunari; 230
Kareem, Ahsan; 671
Kayali, Bashar; 89
Kensek, Karen; 747
Kim, Jong Soo; 625
Kiss, Gregory; 75
Klemencic, Ron; 517
Kokai, Tibor; 677
Kok, Peter; 286
Kontturi, Mikko; 839
Koolhaas, Rem; 57
Kragh, Mikkel; 769
Kraus, John; 542
Kuckartz, Joost; 550
Kulkarni, Abhijeet; 299
Kurek, Jacob; 278
Kwong, Titus; 344
- L**
- Lafontaine, Mario; 602
Lagos, Rene; 602
Lam, Lung Wai (Herbert); 432
Langley, Peter; 865
Laverick, Malcolm; 452
Lay, Simon; 776
Lee, Chien-Shen; 642
Lee, Soogon; 700
León, Enrique; 468
Leopoldo e Silva França, Ricardo; 722
Leung, Andy; 292
Leung, Luke; 426
Leung, Sheung Lai (Eddie); 432
Li, Chunhe (Henry); 594
Li, Fang; 790
Li, Hongyu; 500
Li, Jianhui; 709
Li, Linxue; 223

Li, Yaming; 650
Li, Yue; 446
Li, Zhuangzhuang; 446
Lin, Lynn; 158
Liu, Enfang; 200
Liu, Ying; 200
Lo, Hung (Annie); 170
Long, Tony; 344
Loughran, Patrick; 754
Lu, Bryant; 292

M

MacLean, Kevin; 677
Madeira Filho, Victor; 386
Mann, Richard; 474
Marcus, Silvan; 685
Marfella, Giorgio; 315
Marsh, Jeff; 860
Martín, Paloma; 468
Mayer, Edward; 258
McClellan, Neil; 769
McColl, David; 845
McFarlane, Angus; 508
Meng, Xiaohu; 579
Mills, Shonn; 299
Montgomery, Michael; 677
Moon, Kyoung Sun; 715
Moore, Kristina; 75
Morava, Bujar; 642

N

Nip, Frankie; 500

O

O'Connor, Dan; 783
Oldfield, Philip; 112
Olt, Matthias; 120
Ortiz, Iñigo; 468
Orue, Aldrin; 617
Oxman, Robert; 243

P

Palafox, Jr., Felino; 328
Pan, Jianing; 200
Patterson, Mic; 747
Peddie, Kevin; 657
Pederick, Glen; 852
Personeni, Marcello; 872
Piech, Zbigniew Jerry; 823

Q

Qian, Peng; 571

R

Ragan, Patrick; 691
Ramirez, Alfredo; 798
Ray, Stephen; 426
Reinke, Stephan; 321
Reiss, Martin; 790
Retamales, Rodrigo; 602
Rivera, Jorge; 617
Robinson, James; 81
Rofail, Tony; 657
Rupe, Eric; 860
Ryu, Hyun Hee; 625

S

Sarkisian, Mark; 534
Schall, Eric; 164
Scheeren, Ole; 67
Scott, Paul; 235
See, Susanna; 350
Shakhramanyan, Andrey; 550
Shao, Weiping; 178
Shen, Dong; 150

Shenhav, Gil; 336
Shook, David; 534
Siikonen, Marja-Liisa; 839
Silverman, Ben; 747
Sorsa, Janne; 839
Spence, Seymour; 671
Stehle, John; 508
Strabala, Marshall; 460
Stranieri, Paul; 845
Sukamta, Davy; 610
Sun, Dapeng; 200
Swanson, Jim; 691

T

Tabibzadeh, Meysam; 526
Tang, Min; 184
Teipel, Jörn; 762
Thuemmler, Thomas; 484
Timpson, Russ; 803
To, Andy; 344
Trabucco, Dario; 526
Tsang, Wai Ming (Thomas); 142
Tse, Kam Chuen (Vincent); 432
Tzur, Moshe; 243

V

Valentini, Sergio; 96
Vassart, Olivier; 526
Viise, John; 691
Visscher, Michiel; 542
von Klemperer, James; 47

W

Wallbank, Chris; 365
Wang, Dasui; 571
Wang, Yinpu; 308
Wang, Zhendong; 308
Weiss, Gert; 762
Wellington, Arthur; 386
Willis, Carol; 357
Winchester, Jon; 664
Witt, Richard; 251
Wong, Mun Summ; 39
Wood, Antony; 26, 81, 410, 526
Wood, Ronald; 128
Wu, Honglei; 564
Wu, Jie; 223
Wu, Wen; 215
Wu, Yang; 158

X

Xiao, Congzhen; 709
Xiaoxin, Man; 446
Xu, Peifu; 709
Xu, Yang; 207

Y

Yang, Cathy; 372
Yang, Kai; 579
Yaremenko, Andrey; 550
Ye, Cheng; 63
Yee, Stanley; 769
Yeo, Alina; 39
Yin, Jia; 740
Yosuke, Hayano; 63
Yu, De Ming (Derry); 170
Yuk Fai, Chung (Eddie); 170

Z

Zhang, Jie; 740
Zhang, Junjie; 192
Zhang, Shaw (Xiaozhe); 617
Zhang, Yiyuan; 594
Zhang, Yue; 564
Zhao, Xin; 564

The survival of humanity on this planet relies on a **radical repositioning** of our cities. In the face of unprecedented global population growth, urbanization, pollution increase and climate change, it is no longer enough to simply create buildings that minimize their environmental footprint. The reduction of operating and embodied energy consumption in every single building is, of course, vitally important – but even this is likely not enough to mitigate the huge issues at stake. We need to start considering how every building can start working with others in a **harmonious urban whole** – by maximizing urban/building infrastructure, sharing resources, generating and storing energy, and looking for completely new ways to improve the building's contribution to the city; physically, environmentally, culturally, and socially.

Cities thus need to be thought of, and buildings planned for, in **all three dimensions** – they cannot just be vehicles for isolated programs and expressed as products of two-dimensional zoning plans and height limits. Each stratified horizon of a tower has an opportunity to draw from the characteristics of the city and external environment, both of which **vary widely with height**. Wind, sun, rain, temperature, and urban grain are not the same through 360 degrees of plan or 360 meters of height, and our buildings need to both recognize, and draw opportunity from, that.

This is the primary subject of this publication, which draws together the papers presented at the CTBUH 2014 Shanghai Conference which took place at the Grand Hyatt Jin Mao Shanghai from 16–19 September, 2014. The subject matter is intended to drive thinking **beyond just buildings**, to considering cities as a whole. What best practices are some cities in the world already doing, and what else can be done to develop our cities **beyond a collection of disparate icons**, towards a vision of a connected, maximized, Sustainable Vertical Urbanism...

地球上人类的生存依赖于我们对城市的**革命性重塑**。面对着前所未有的人口增长、城市化、不断恶化的污染和气候变化，仅建造那些尽可能降低对环境影响的建筑是远远不够的。当然，减少每座单体建筑中的运营能耗和自含能耗是非常重要的——但即使这样也不足以缓解那些亟待解决的重大问题。我们需要考虑每一座建筑是如何在**和谐的城市整体**中与其它建筑相互作用的——最大化利用城市和建筑的基础设施、共享资源、生产并储存能源以及探索全新的方式来提升建筑在物质、环境、文化与社会方面为城市做出的贡献。

因此，我们需要从**三维立体**的角度来思考和规划城市与建筑——它们不能仅作为承载单一功能的媒介，或成为满足二维平面区域划分与限高要求的产品。摩天大楼的**每一层级的水平界面**都应当回应城市和外部环境的特征，而这些特征**随高度的不同而变化**。风、阳光、雨水、温度以及城市的肌理无论是在建筑的360度平面区域还是360米的高度范围都是不同的，我们的建筑需要对这些因素进行识别并作出回应。

这是本书的首要议题。CTBUH 2014年上海会议于9月16日至19日在上海金茂君悦酒店举行，本书收录了会议上的所有论文。该议题旨在推动人们**超越对建筑本身的思考**，将城市作为一个整体考虑。当今世界上的城市中已经完成的最佳实践有哪些，我们还可以做些什么使我们的城市**不再是毫无关联的标志性建筑的集合**，而实现相互联系的、最大化的、可持续发展的垂直城市主义的愿景……

ISBN 978-093949338-8



9 780939 493388 >