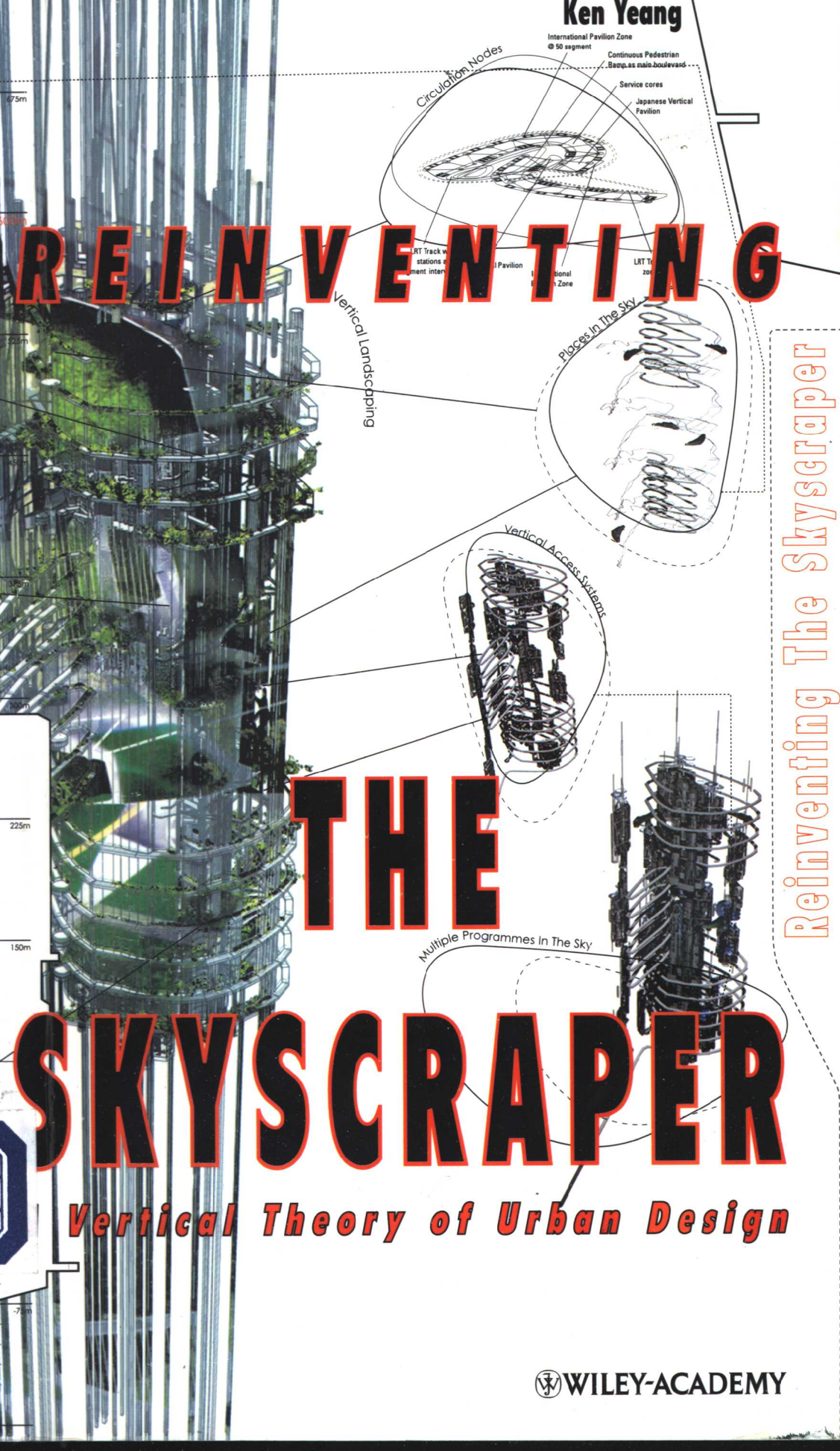


Ken Yeang



REINVENTING

THE

SKYSCRAPER

Vertical Theory of Urban Design

Reinventing The Skyscraper

Light Railway Transit Circulation

LRT Track with stations at 3 segment intervals

LRT Track zone B

Primary Circulation

Pavilions

Japanese Vertical Pavilion

Vertical Pavilion

Tertiary Circulation

Primary Circulation

Secondary Circulation

Circulation Systems

Vertical Access Systems

Continuous Ramps

Continuous Pedestrian Ramp as main boulevard

Boulevards in the Sky

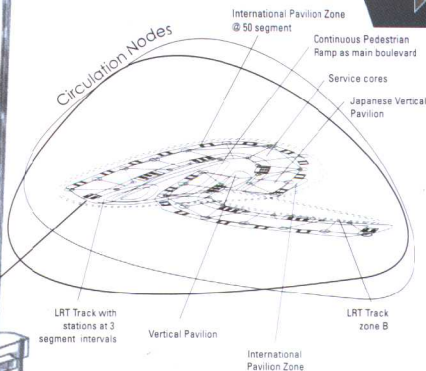
International Pavilion Zone @ 50 segment

International Pavilion Zone



REINVENTING THE SKYSCRAPER

A Vertical Theory of Urban Design
by Ken Yeang



Places In The Sky

Multiple Programmes In The Sky

Acknowledgements

I would like to record my gratitude and thanks to Maggie Toy, Abigail Grater, Mariangela Palazzi-Williams and Wiley-Academy in the realisation of the publication.

Published in Great Britain in 2002 by Wiley-Academy, a division of John Wiley & Sons Ltd

Copyright © 2002

John Wiley & Sons Ltd, The Atrium, Southern Gate,
Chichester, West Sussex PO 19 8SQ, England
Telephone [+44] 1243 779777

Ken Yeang,
8, Jalan 1, Taman Sri Ukay,
68 000 Ampang, Selangor, Malaysia
Telephone [+603] 4257 1966

Email (for orders and customer service enquiries): cs-books@wiley.co.uk
Visit our Home Page on www.wileyeurope.com or www.wiley.com

All Rights Reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except under the terms of the Copyright, Designs and Patents Act 1988 or under the terms of a licence issued by the Copyright Licensing Agency Ltd, 90 Tottenham Court Road, London W1Y 4LP, UK, without the permission in writing of the Publisher. Requests to the Publisher should be addressed to the Permissions Department, John Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex PO19 8SQ, England, or emailed to permreq@wiley.co.uk, or faxed to (+44) 1243 770571.

This publication is designed to provide accurate and authoritative information in regard to the subject matter covered. It is sold on the understanding that the Publisher is not engaged in rendering professional services. If professional advice or other expert assistance is required, the services of a competent professional should be sought.

Other Wiley Editorial Offices

John Wiley & Sons Inc., 111 River Street, Hoboken, NJ 07030, USA

Jossey-Bass, 989 Market Street, San Francisco, CA 94103-1741, USA

Wiley-VCH Verlag GmbH, Boschstr. 12, D-69469 Weinheim, Germany

John Wiley & Sons Australia Ltd, 33 Park Road, Milton, Queensland 4064, Australia

John Wiley & Sons (Asia) Ltd, 2 Clementi Loop #02-01, Jin Xing Distripark, Singapore 129809

John Wiley & Sons Canada Ltd, 22 Worcester Road, Etobicoke, Ontario, Canada M9W 1L1

ISBN 0-470-84355-1

Book Design by Yenniu Lim, Ridzwa Fathan, Shahrul Nizam and Renee Lee for ADF Management Sdn. Bhd.

Printed and bound in Malaysia by EHT Creative & Graphic Services

Foreword

006

01 *Premises for a Vertical Theory*

008

02 *The Tall Building Typology and Cities*

033

03 *Decomartmentalising the Skyscraper's Built Form*

056

04 *Urban Design Framework and Vertical Land-Use Mapping*

072

05 *Diversification of Vertical Land Uses*

088

06 *Public Realms and Place-Making in the Sky*

101

07 *Vertical Landscaping and Open Spaces*

126

08 *Creating Neighbourhoods in the Sky*

138

09 *Movement, Accessibility and Streets-in-the-Sky*

148

10 *Artificial Land in the Sky: Flexibility and Change*

173

11 *The Skyscraper as an Urban Ecosystem*

180

12 *The New Skyscraper*

193

Appendix

212

Bibliography

218

Index

220

Foreword

How can we make working, living and all aspects of our life in the high-rise building more palatable? Today this is the one of the most compelling questions confronting our politicians, city planners, urban designers, architects, investors, sociologists and all those concerned with the planning, design and development of, and investment in our cities.

While on the one hand many of them will vehemently decry the desirability of the tall building as a built form, citing a multitude of reasons why we should not build upwards, at the same time they have to ruefully conclude that the adoption of the tall building as the urban built form of choice is inevitable. Simply stated, unless an alternative equivalent built form presents itself that can economically and physically be a more viable solution to the intensification of our cities' land use (as a consequence of urban growth), then tall buildings will remain with us for a while.

Presented here is a new approach to the tall building, where its design and planning are perceived as a form of urban design which takes precedence over its architectural form-making. The outcome of this approach is a built milieu that is more physically and socially comprehensive; a high-rise built environment that is more humane and more habitable; a built environment that should be a replication of, and where possible significantly improve on the ideal and pleasurable life that we currently enjoy, and have always enjoyed, at the ground plane.

The ideas and propositions presented here will lead to a more livable intensive urban environment, if taken to their logical conclusion, they should eventually become the fundamental bases for the planning and building codes governing the design of future high-rise buildings and the development of our cities.

Ken Yeang
2002

▷ 006 007

008

033

056

072

088

101

126

138

148

173

180

193

212

218

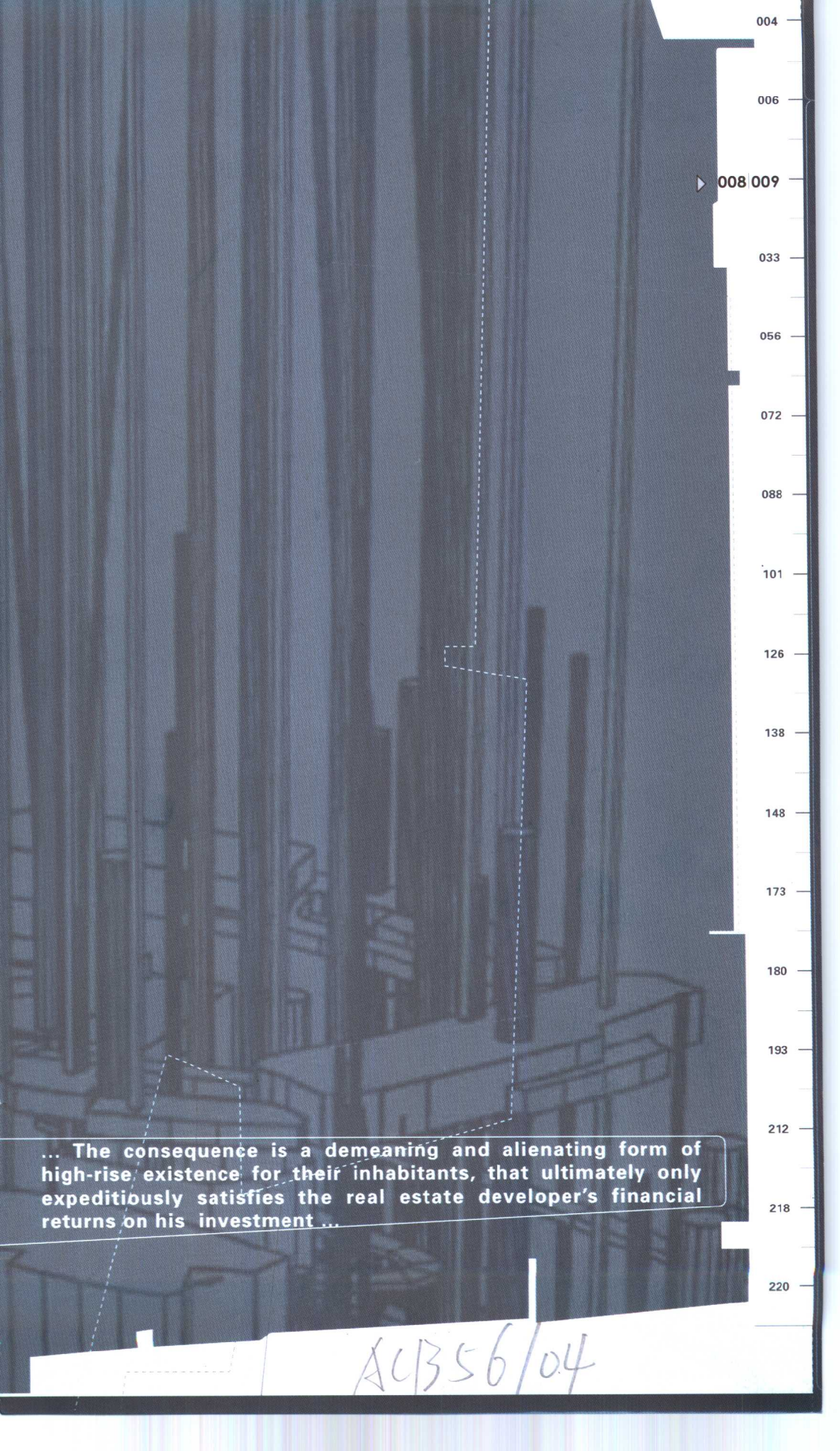
220

► *Premises for a Vertical Theory* chapter 01

Chapter 01

► Reinventing the Skyscraper

... Their basic planning remains the same. Whether in concrete or in steel, most are still nothing more than a series of stacked trays piled homogenously and vertically one on top of the other, while at the same time seeking to optimise net-to-gross area spatial efficiencies ...



... The consequence is a demeaning and alienating form of high-rise existence for their inhabitants, that ultimately only expeditiously satisfies the real estate developer's financial returns on his investment ...

ACB56/04

004

006

008 009

033

056

072

088

101

126

138

148

173

180

193

212

218

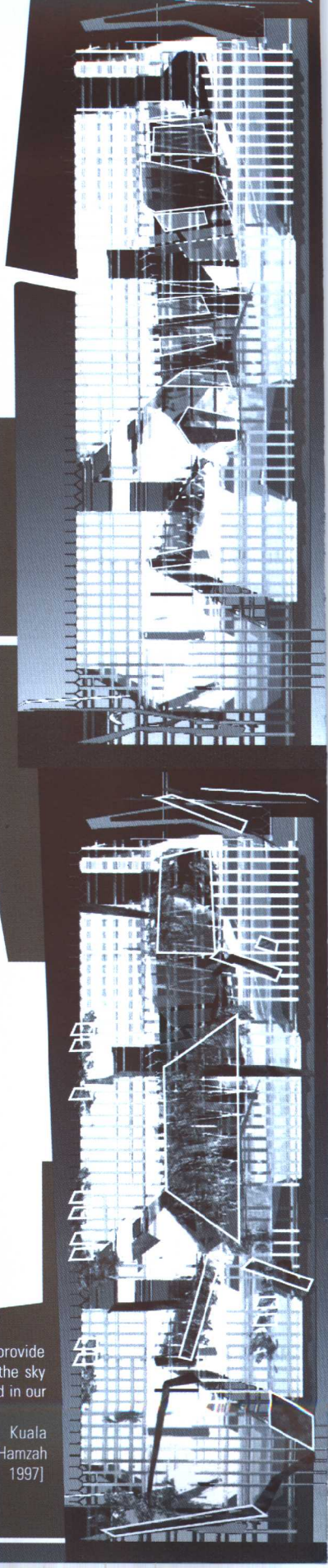
220

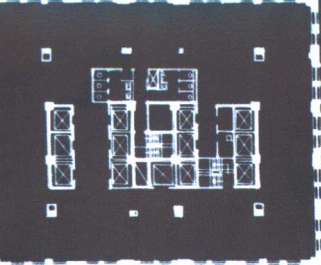
Premises for a Vertical Theory

What is crucially needed is a redefinition for more satisfyingly habitable working and living urban environments: more diverse; greater multiplicity; certainly less regimented; with networks of plazas, parks and enclosed spaces in the sky. Simply stated, an environment that recreates those fulfilling aspects of our life on the ground. What we need is a new skyline, for the prevalent one (found in most of our cities' Central Business Districts today) consists of skyscraper architecture that is ubiquitously repetitive in all its internal spatial dispositions; this is eminently visible through its very thin facades.

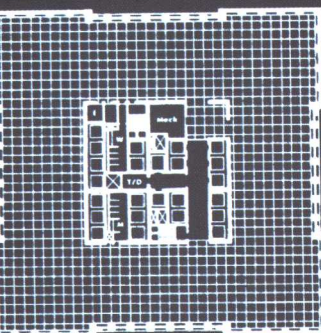
▷ We need to design pleasurable places in the sky like those found on the ground. [BATC Tower Kuala Lumpur, 1997]

▷ We need to provide large parks in the sky like those found in our major cities. [BATC Tower, Kuala Lumpur, © TR Hamzah & Yeang, 1997]

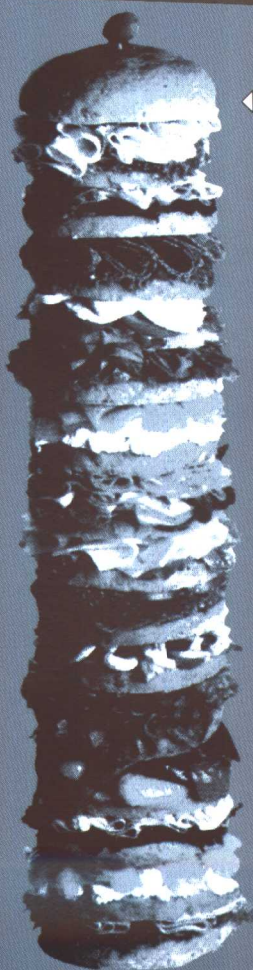




◀ Typical floor, plan of Chrysler Building, New York [completed 1930].



▲ Typical floor plan, of Mellon Bank Center, Philadelphia [completed 1991] showing that skyscraper design has changed little since its invention in the 1930s.



◀ Skyscrapers could be designed as a series of vertical events like a superburger, with a variety of spatial delicacies at each level.

Skyscraper architecture has remained essentially unchanged since its invention. Of course its technology and engineering have become far better and much more sophisticated, but most, if not all, of the skyscrapers constructed today remain fundamentally the same in built configuration. Their basic planning remains the same. Whether built of concrete or of steel, most are still nothing more than a series of stacked trays piled homogeneously and vertically one on top of the other, while at the same time seeking to optimise net-to-gross areal spatial efficiencies. The consequence is a demeaning and alienating form of high-rise existence for their inhabitants, that ultimately only expeditiously satisfies the real estate developer's financial returns on his investment.

004

006

▷ 010/011

033

056

072

088

101

126

138

148

173

180

193

212

218

220

Premises for a Vertical Theory

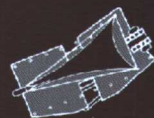
The proposition that skyscraper design should be urban involves an integration of socio-economic-political-environmental and physical concerns with the architectural concerns of building design. The multidisciplinary concerns include economics, ecology, sociology, environment, psychology, technology, urban geography, cultural theory and real estate, all of which will be seen to affect the design of the new skyscraper.

▷ Floor plans for the BATC Signature Tower.
[© T. R. Hamzah & Yeang, 1997]

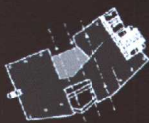
N
Scale 1:1500



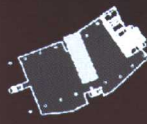
Level 29



Level 65



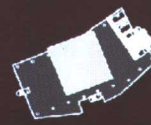
Level 60



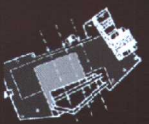
Level 24



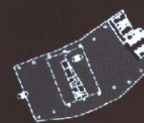
Level 55



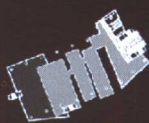
Level 19



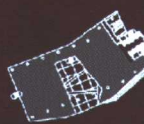
Level 50



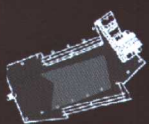
Level 14



Level 45



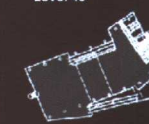
Level 9



Level 40



Level 4



Level 35

Tenant Space
Special Functions
Sky-courts/Public Spaces

Structure + Core: walls, columns, plant rooms, stairs and lifts, WCs, lobbies
Primary circulation: main corridors, horizontal routes required for escape in case of fire
Fit factor: space that is unusable because of building peculiarities
Support space for all the building: cafeteria, library, reprographics, conference suite
Ancillary space: for departments or groups: group files, local copier, project area
Work space: desks, offices and the local circulation to reach them

▷ Multiplicity of land uses can be planned like layers within the skyscraper.
[Source: Alexi Marmot Associates]

As cities and their business and residential

precincts become considerably denser, we need to

approach skyscraper

design in such intensive ▸ 012/013

urban localities as more

of an urban design

proposition and not just

as an architectural

design for a building type.

The rationale is that, as

an urban design

proposition, we would be

required to regard the skyscraper

as a vertical extension of the

city and to carry out its design

in considerably more complex

and inclusive terms. This is

new territory that deserves

critical exploration. For

instance, we would need to

design the skyscraper's

external, internal and

transitional spaces to be

similar to those successful

urban spaces found in many of

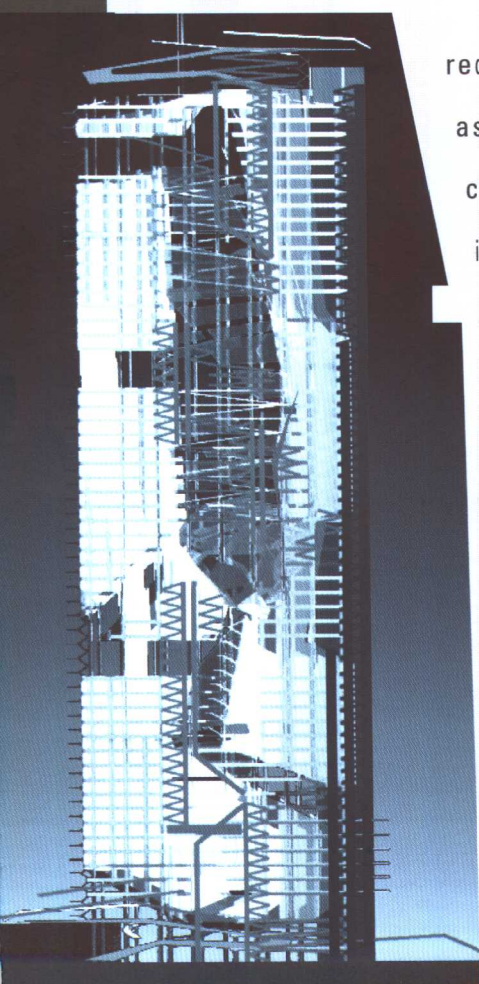
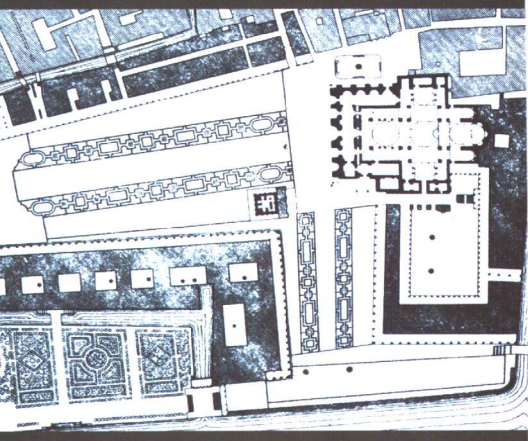
our cities, but at the same

time take into studied

consideration the needs of its

current and future users.

▽ We need to recreate public realms like Venice's
Piazza San Marco in the sky.
[Source: *Design of Cities*, Edmund M. Bacon, 1967]



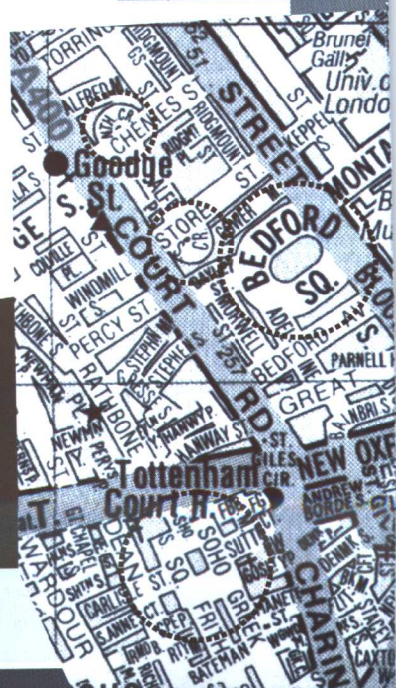
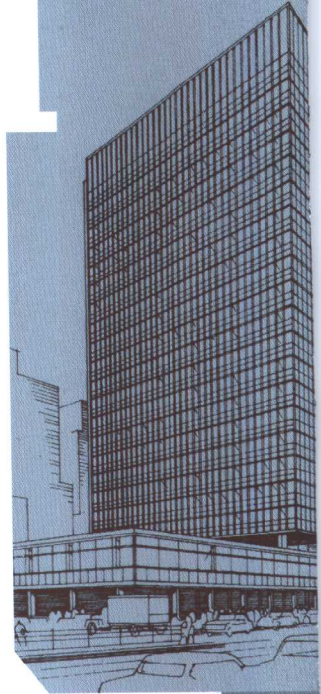
△ We need to provide within skyscrapers a
multiplicity of land uses and a greater
complexity in their movements systems.
▽ [BATC Tower, Kuala Lumpur, © TR Hamzah &
Yeang, 1997]

Premises for a Vertical Theory

Urban design also determines the very shape of the streets and public spaces that make up our urban areas. It influences how easy and pleasant it can be to move from one area to another, how much daylight, landscape and beauty we can enjoy. All these aspects should be part of the influence on the design of the new high-rise. What is crucially needed is a theory for skyscraper design that is equivalent to a vertical theory of urban design, which would radically revise our existing spatially and socially demeaning approaches to the creation of the skyscraper's built form.

The compelling imperative for the theory is, of course, driven by the skyscraper's own reason for its existence: its sheer spatial and population intensity.

▽ The bland skyscraper that signifies a monotonous and impersonal pattern of life and dreary use of spaces.



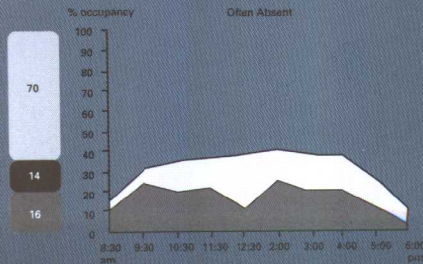
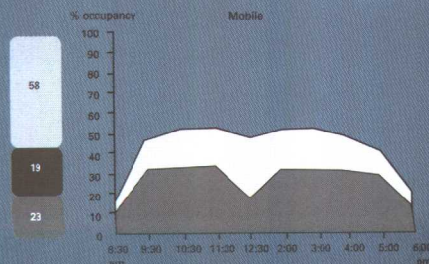
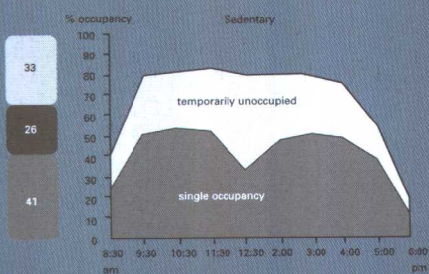
▷ The skyscraper should have within it a series of small squares as public refuge zones within a dense urban realm. Example: Public squares as found in European cities such as London.

Generally stated, the objectives of urban design, now applied to skyscraper design are to:

▷ 014/015

- design and create a place with its own character and identity;
- ensure an urban continuity and enclosure in providing a place where public and private spaces are clearly distinguished;
- provide quality public realms as places with attractive, successful and accessible outdoor areas;
- provide ease of movement by creating places that are easy to get to and move through;
- design for legibility so that places are easy to understand and have a clear image;

- design for adaptability as places can change easily;
- provide diversity by creating places with variety and choice.

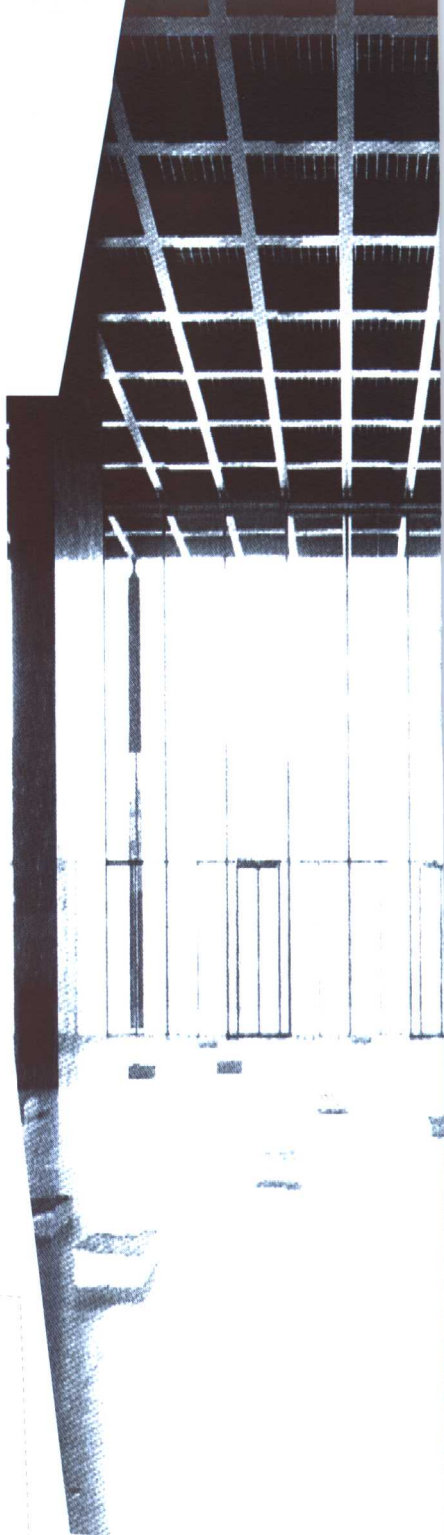


△ People do not remain in one place in the skyscraper. They move about within their spaces over the working day and require a diversity of internal environments:

[Source: Alexi Marmot Associates, space-occupancy studies for various organisations]

Premises for a Vertical Theory

The skyscraper's huge built-up content of internal spaces and the subsequently high density of user population are unlike those of other building types. This intensity is entirely concentrated over a small ground-footprint area. Surely such focused conditions must demand considerably more design endeavour than just the facile configuring of a series of repetitive floor plates spread over the building's entire height? As an urban design proposition we would need to design skyscraper spaces similar to the urban spaces found at the ground plane but with different types and scales. We need to provide urban precincts and realms within its high-rise built form, as well as greater accessibility and better shaping so that its internal spaces become vital settings for a public life-in-the-sky. This endeavour should also include the provision of breathing open spaces within the skyscraper's built



△ Most existing office floor plates in today's skyscrapers are bland and devoid of any visual interest.