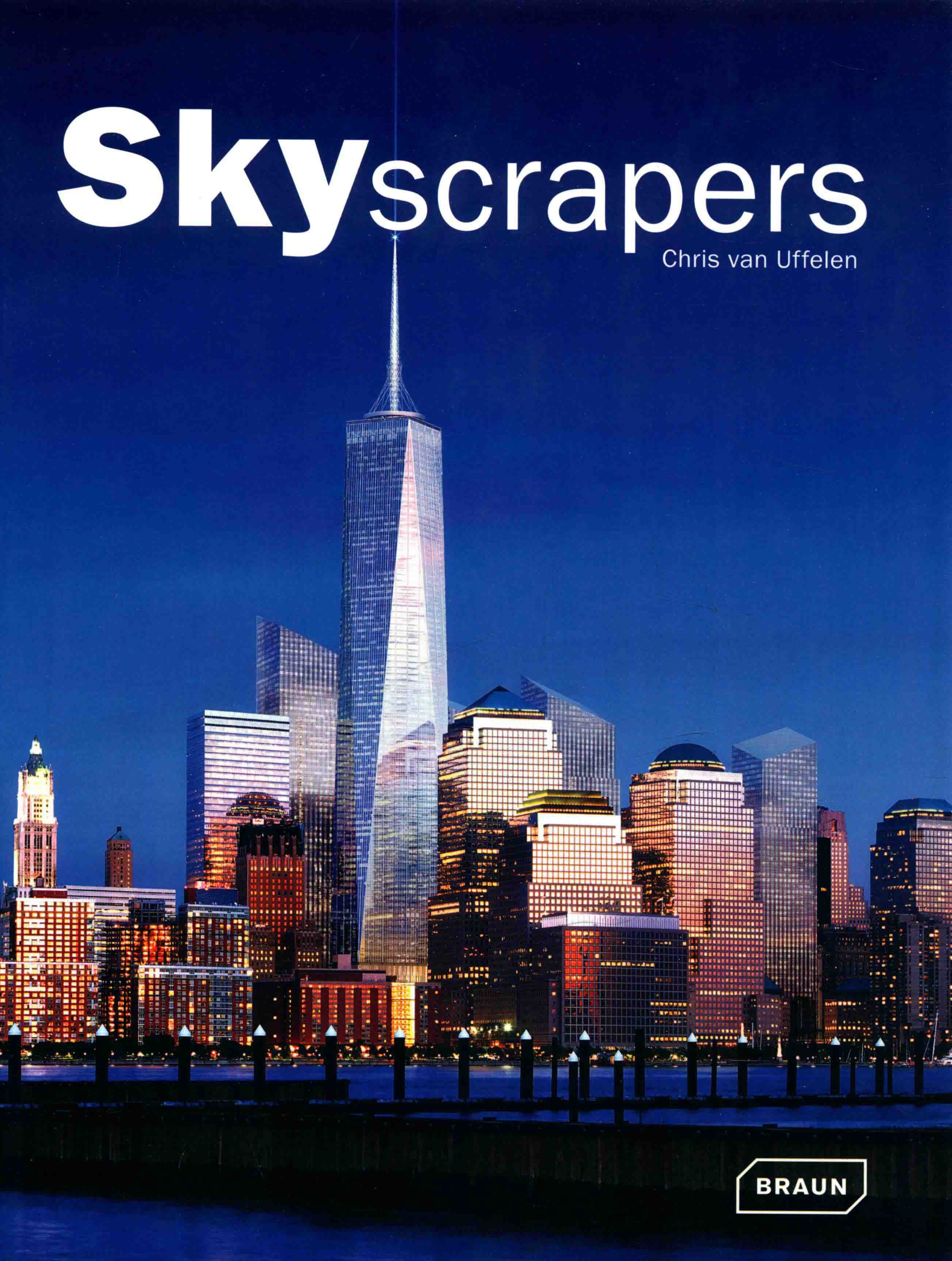


Skyscrapers

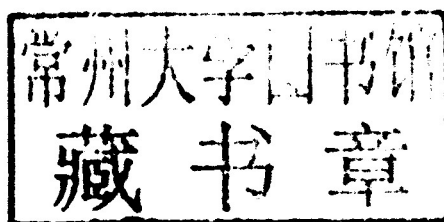
Chris van Uffelen



BRAUN

Skyscrapers

Chris van Uffelen



BRAUN

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographical data are available in the Internet at <http://dnb.d-nb.de>.

ISBN 978-3-03768-114-5

© 2012 by Braun Publishing AG
www.braun-publishing.ch

The work is copyright protected. Any use outside of the close boundaries of the copyright law, which has not been granted permission by the publisher, is unauthorized and liable for prosecution. This especially applies to duplications, translations, microfilming, and any saving or processing in electronic systems.

1st edition 2012

Project coordination: Editorial Office van Uffelen
Editorial staff: Nicole Kurz, Lisa Rogers, Eva Zink
Graphic concept: ON Grafik | Tom Wibberenz
Layout: Julia Chromow, Nicole Kurz, Eva Zink

All of the information in this volume has been compiled to the best of the editor's knowledge. It is based on the information provided to the publisher by the architects' and designers' offices and excludes any liability. The publisher assumes no responsibility for its accuracy or completeness as well as copyright discrepancies and refers to the specified sources (architects' and designers' offices). All rights to the photographs are property of the photographer (please refer to the picture credits).

8 Preface

Office

16 One World Trade Center Competition Design
Studio Daniel Libeskind

18 One World Trade Center
Skidmore, Owings & Merrill (SOM)

22 3 World Trade Center
Rogers Stirk Harbour + Partners

24 Seven World Trade Center
Skidmore, Owings & Merrill (SOM)

28 200 Greenwich Street, World Trade Center
Foster+Partners

30 Landmark East
Arquitectonica

34 Hegau Tower
Murphy/Jahn Architects

38 WestendDuo
KSP Jürgen Engel Architekten

42 Poly Plaza
gmp · von Gerkan, Marg and Partners Architects

46 Torres de Hércules
Rafael de la Hoz Arquitectos

50 Duna Tower
skyline architekten

54 Bank Saint Petersburg
EGP Gerasimov und Partner, Sergei Tchoban,
nps tchoban voss

58 Astra Tower
KSP Jürgen Engel Architekten

62 Dalian Twin Towers
gmp · von Gerkan, Marg and Partners Architects

66 300 North LaSalle
Pickard Chilton

70 Hearst Tower
Foster+Partners

74 Süddeutscher Verlag Headquarters
GKK+Architekten, Prof. Swantje Kühn,
Oliver Kühn

78 O-14
Reiser + Umemoto

80 Volkswahl Bund
nps tchoban voss

84 155 North Wacker
Goettsch Partners

88 RWE Tower
Gerber Architekten

92 Manitoba Hydro Place
KPMB / Smith Carter / Transsolar Integrated
Design Consortium

96 Diagonal ZeroZero Telefonica Tower
EMBA_Estudi Massip-Bosch Arquitectes

100 1180 Peachtree
Pickard Chilton

104 Menara Karya
Arquitectonica

108 European Central Bank
Coop Himmelb(l)au Wolf D. Prix & Partner

110 De Maastoren
Dam & Partners Architecten

114 Königstadt Carree Alexanderplatz
STP Architekten

118 Iberdrola Tower Bilbao
Pelli Clarke Pelli Architects

122 GHD
Al Bidda Tower

126 Sign!
Murphy/Jahn Architects

130 Doha High-Rise Office Building
Ateliers Jean Nouvel

132 Westraven Office Complex
cepezed architects

136 300 East Randolph
Goettsch Partners

140 Business Tower 123
3LHD

144 T1 Tower
Valode & Pistre architectes

148 Al Hamra Firdous Tower
Skidmore, Owings & Merrill (SOM)

152 Boulevard Plaza
Aedas Limited

156 Atradius Office Building
OevertZaaijer architecture and urbanism

160 Torre Espacio
Pei Cobb Freed & Partners

164 Torre Caja Madrid
Foster+Partners

168 The New York Times Building
Renzo Piano Building Workshop,
FXFOWLE Architects

Living

174 Dorobanti Tower
Zaha Hadid Architects

176 Newton Suites
WOHA

180 Holzhafen High-rise Apartments
ASTOC Architects and Planners

184 The Scotts Tower SOHO
UNStudio

188 The Hansar
WOHA

192 A'Beckett Tower
Elenberg Fraser

196 Veer Towers
Murphy/Jahn Architects

200 Chicago Spire
Santiago Calatrava Architect & Engineer

202 Absolute Towers
MAD Architects

206 The Met
WOHA

210 The Ascent at Roebling's Bridge
Studio Daniel Libeskind

214 The Legacy at Millennium Park
Solomon Cordwell Buenz

218 The Hyde
WOHA

222 Bosco Verticale / Vertical Forest
Boeri Studio

224 W Barcelona
Ricardo Bofill - Taller de Arquitectura

228 Skypark
MKPL Architects

232 Hotel ME
Dominique Perrault Architecture

236 Orchard Suites
MKPL Architects

238 Villange
4a Architekten

242 Bella Sky
3XN Architects

246 600 Fairbanks Court
Murphy/Jahn Architects

Mixed-use

252 Burj Khalifa
Skidmore, Owings & Merrill (SOM)

256 Highlight Munich Business Towers
Murphy/Jahn Architects

260 Fiera Milano
Studio Daniel Libeskind

264 Sunrise Tower
Zaha Hadid Architects

268 Boutique Monaco
Mass Studies

272 Russia Tower
Foster+Partners

274 Grand Lisboa Hotel and Casino
Dennis Lau & Ng Chun Man Architects & Engineers (HK)

278 Federation Complex
ASP Schweger Assoziierte Gesamtplanung,
Sergei Tchoban, nps tchoban voss

282 Dubai Pearl
Schweger & Partner Architekten

286 London Bridge Tower
Renzo Piano Building Workshop

288 Linked Hybrid
Steven Holl Architects

292 Rødovre Skyvillage
MVRDV

296 Neues Zentrum Kagan
Kleihues + Kleihues

300 Cor
Oppenheim Architecture + Design

304 Shanghai IFC
Pelli Clarke Pelli Architects

308 Mixed Use Center
Coop Himmelb(l)au Wolf D. Prix & Partner

310 Ten Museum Park
Oppenheim Architecture + Design

314 Torres Porta Fira
Toyo Ito & Associates Architects,
b720 Fermín Vázquez arquitectos

318 Sliced Porosity Block
Steven Holl Architects

320 La Liberté
Dominique Perrault Architecture

324 New Taipei City Museum of Art
Kengo Kuma & Associates

328 PalaisQuartier
KSP Jürgen Engel Architekten

332 KK100
TFP Farrells

336 Villas in the Sky
Henning Larsen Architects

340 Shenzhen Logistic Center
JDS Architects

342 U-Bora Tower
Aedas Limited

346 The Beetham Hilton Tower
Ian Simpson Architects

350 Energy Tower Burj-A-Taga
Gerber Architekten

354 Nantes Vegetal Tower
Edouard François

358 Montevideo
Mecanoo architecten

362 R432
rojkind arquitectos

366 T30A Tower Hotel
Broad Group

368 Beijing Yintai Center
John Portman & Associates

372 **Wuhan Greenland Center**
Adrian Smith + Gordon Gill Architecture

376 **Yangqiao Park Business**
logon

380 **NLF Nilüfer**
GAD_Global Architectural Development,
Dara Kırmızıtoprak Mimarlık

384 **Marina + Beach Towers**
Oppenheim Architecture + Design

396 **Grand Hyatt at Chicony Plaza**
Goettsch Partners

390 **Raffles City**
UNStudio

392 **The Pano**
WOHA

396 **Doha Sports Tower**
AREP

398 **Fukoku Tower**
Dominique Perrault Architecture

402 **Tower at Suk Al Thalath Al Gadeem**
Kleihues + Kleihues

406 **Laminar Tower**
Soriano & Asociados

408 **GT Tower East**
ArchitectenConsort

412 **Crystal Towers**
Henning Larsen Architects

414 **Mode Gakuen Cocoon Tower**
Tange Associates

418 **DC Towers**
Dominique Perrault Architecture

422 **Nuritkum Square**
NBBJ

426 **Aeon**
Reiser + Umemoto

428 **Diamond Towers – Wuhan Xinhua
Bookstore**
GKK+Architekten, Prof. Swantje Kühn,
Oliver Kühn

432 **Turning Torso**
Santiago Calatrava Architect & Engineer

436 **S-Trenue**
Mass Studies

440 **CCTV Headquarters**
OMA

444 Architects' Index

455 Picture Credits

456 Imprint

Skyscrapers

Skyscrapers

Chris van Uffelen

BRAUN

8 Preface

Office

16 One World Trade Center Competition Design
Studio Daniel Libeskind

18 One World Trade Center
Skidmore, Owings & Merrill (SOM)

22 3 World Trade Center
Rogers Stirk Harbour + Partners

24 Seven World Trade Center
Skidmore, Owings & Merrill (SOM)

28 200 Greenwich Street, World Trade Center
Foster+Partners

30 Landmark East
Arquitectonica

34 Hegau Tower
Murphy/Jahn Architects

38 WestendDuo
KSP Jürgen Engel Architekten

42 Poly Plaza
gmp · von Gerkan, Marg and Partners Architects

46 Torres de Hércules
Rafael de la Hoz Arquitectos

50 Duna Tower
skyline architekten

54 Bank Saint Petersburg
EGP Gerasimov und Partner, Sergei Tchoban, nps tchoban voss

58 Astra Tower
KSP Jürgen Engel Architekten

62 Dalian Twin Towers
gmp · von Gerkan, Marg and Partners Architects

66 300 North LaSalle
Pickard Chilton

70 Hearst Tower
Foster+Partners

74 Süddeutscher Verlag Headquarters
GKK+Architekten, Prof. Swantje Kühn, Oliver Kühn

78 O-14
Reiser + Umemoto

80 Volkswohl Bund
nps tchoban voss

84 155 North Wacker
Goettsch Partners

88 RWE Tower
Gerber Architekten

92 Manitoba Hydro Place
KPMB / Smith Carter / Transsolar Integrated Design Consortium

96 Diagonal ZeroZero Telefonica Tower
EMBA_Estudi Massip-Bosch Arquitectes

100 1180 Peachtree
Pickard Chilton

104 Menara Karya
Arquitectonica

108 European Central Bank
Coop Himmelb(l)au Wolf D. Prix & Partner

110 De Maastoren
Dam & Partners Architecten

114 Königstadt Carree Alexanderplatz
STP Architekten

118 Iberdrola Tower Bilbao
Pelli Clarke Pelli Architects

122 GHD
Al Bidda Tower

126 Sign!
Murphy/Jahn Architects

130 Doha High-Rise Office Building
Ateliers Jean Nouvel

- 132 Westraven Office Complex**
cepezed architects
- 136 300 East Randolph**
Goettsch Partners
- 140 Business Tower 123**
3LHD
- 144 T1 Tower**
Valode & Pistre architectes
- 148 Al Hamra Firdous Tower**
Skidmore, Owings & Merrill (SOM)
- 152 Boulevard Plaza**
Aedas Limited
- 156 Atradius Office Building**
OevertZaaijer architecture and urbanism
- 160 Torre Espacio**
Pei Cobb Freed & Partners
- 164 Torre Caja Madrid**
Foster+Partners
- 168 The New York Times Building**
Renzo Piano Building Workshop,
FXFOWLE Architects

Living

- 174 Dorobanti Tower**
Zaha Hadid Architects
- 176 Newton Suites**
WOHA
- 180 Holzhafen High-rise Apartments**
ASTOC Architects and Planners
- 184 The Scotts Tower SOHO**
UNStudio
- 188 The Hansar**
WOHA
- 192 A'Beckett Tower**
Elenberg Fraser
- 196 Veer Towers**
Murphy/Jahn Architects
- 200 Chicago Spire**
Santiago Calatrava Architect & Engineer
- 202 Absolute Towers**
MAD Architects
- 206 The Met**
WOHA

- 210 The Ascent at Roebling's Bridge**
Studio Daniel Libeskind
- 214 The Legacy at Millennium Park**
Solomon Cordwell Buenz
- 218 The Hyde**
WOHA
- 222 Bosco Verticale / Vertical Forest**
Boeri Studio
- 224 W Barcelona**
Ricardo Bofill - Taller de Arquitectura
- 228 Skypark**
MKPL Architects
- 232 Hotel ME**
Dominique Perrault Architecture
- 236 Orchard Suites**
MKPL Architects
- 238 Villange**
4a Architekten
- 242 Bella Sky**
3XN Architects
- 246 600 Fairbanks Court**
Murphy/Jahn Architects

Mixed-use

252 Burj Khalifa
Skidmore, Owings & Merrill (SOM)

256 Highlight Munich Business Towers
Murphy/Jahn Architects

260 Fiera Milano
Studio Daniel Libeskind

264 Sunrise Tower
Zaha Hadid Architects

268 Boutique Monaco
Mass Studies

272 Russia Tower
Foster+Partners

274 Grand Lisboa Hotel and Casino
Dennis Lau & Ng Chun Man Architects & Engineers (HK)

278 Federation Complex
ASP Schweger Assoziierte Gesamtplanung,
Sergei Tchoban, nps tchoban voss

282 Dubai Pearl
Schweger & Partner Architekten

286 London Bridge Tower
Renzo Piano Building Workshop

288 Linked Hybrid
Steven Holl Architects

292 Rødovre Skyvillage
MVRDV

296 Neues Zentrum Kagan
Kleihues + Kleihues

300 Cor
Oppenheim Architecture + Design

304 Shanghai IFC
Pelli Clarke Pelli Architects

308 Mixed Use Center
Coop Himmelb(l)au Wolf D. Prix & Partner

310 Ten Museum Park
Oppenheim Architecture + Design

314 Torres Porta Fira
Toyo Ito & Associates Architects,
b720 Fermín Vázquez arquitectos

318 Sliced Porosity Block
Steven Holl Architects

320 La Liberté
Dominique Perrault Architecture

324 New Taipei City Museum of Art
Kengo Kuma & Associates

328 PalaisQuartier
KSP Jürgen Engel Architekten

332 KK100
TFP Farrells

336 Villas in the Sky
Henning Larsen Architects

340 Shenzhen Logistic Center
JDS Architects

342 U-Bora Tower
Aedas Limited

346 The Beetham Hilton Tower
Ian Simpson Architects

350 Energy Tower Burj-A-Taga
Gerber Architekten

354 Nantes Vegetal Tower
Edouard François

358 Montevideo
Mecanoo architecten

362 R432
rojkind arquitectos

366 T30A Tower Hotel
Broad Group

368 Beijing Yintai Center
John Portman & Associates

372 **Wuhan Greenland Center**
Adrian Smith + Gordon Gill Architecture

376 **Yangqiao Park Business**
logon

380 **NLF Nilüfer**
GAD_Global Architectural Development,
Dara Kırmızıtoprak Mimarlık

384 **Marina + Beach Towers**
Oppenheim Architecture + Design

396 **Grand Hyatt at Chicony Plaza**
Goettsch Partners

390 **Raffles City**
UNStudio

392 **The Pano**
WOHA

396 **Doha Sports Tower**
AREP

398 **Fukoku Tower**
Dominique Perrault Architecture

402 **Tower at Suk Al Thalath Al Gadeem**
Kleihues + Kleihues

406 **Laminar Tower**
Soriano & Asociados

408 **GT Tower East**
ArchitectenConsort

412 **Crystal Towers**
Henning Larsen Architects

414 **Mode Gakuen Cocoon Tower**
Tange Associates

418 **DC Towers**
Dominique Perrault Architecture

422 **Nuritkum Square**
NBBJ

426 **Aeon**
Reiser + Umemoto

428 **Diamond Towers – Wuhan Xinhua
Bookstore**
GKK+Architekten, Prof. Swantje Kühn,
Oliver Kühn

432 **Turning Torso**
Santiago Calatrava Architect & Engineer

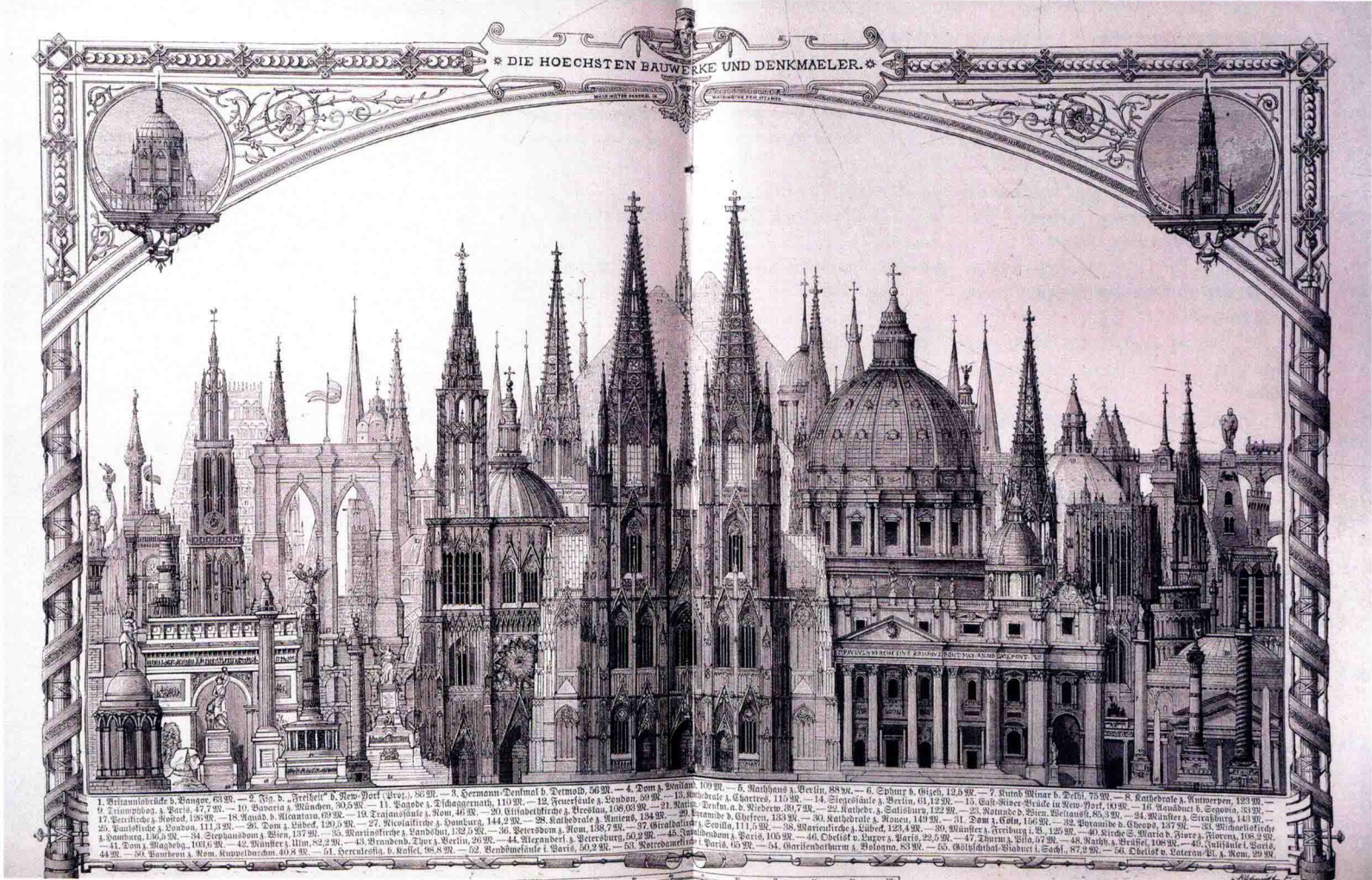
436 **S-Trenue**
Mass Studies

440 **CCTV Headquarters**
OMA

444 Architects' Index

455 Picture Credits

456 Imprint



A skyscraper is almost easy

by Chris van Uffelen

"A chair is a very difficult object. A skyscraper is almost easier. That is why Chippendale is famous." This comes from none other than Ludwig Mies van der Rohe (1886–1969), the man who was second to none when it comes to the development of the skyscraper after the Second World War. Essentially he was right, with a chair the burden of the person sitting on it is dispersed by four small points in contact with the ground (stereotype) whereas the prototypical form of a skyscraper derives from endless repetition of this same idea. In theory the typical floor plan is repeated and the only variation is the ground floor with its entrance.

It is difficult to define a "skyscraper". The term was taken from seafaring at the end of the 19th century (where skyscraper referred to the highest mast of a sailing ship) and at that time ten stories was enough for a building to be classed as such. In languages where an independent word developed for skyscraper, for example in German the word "Hochhaus" (literally "high house") the word "skyscraper" is then used to designate only the highest "Hochhaus". In terms of construction, a "Hochhaus" is defined as a building with a room where the floor stands at a height of 22 meters. This definition is used because firefighters' ladders only reach to 23 meters. In other countries only buildings over 100 meters

count as skyscrapers. Essentially, it all comes down to the fact that a skyscraper, whether in a group or alone, must rise above its surrounding context. This definition of course has changed over time in conjunction with general advancements in upwards expansion. Thought about in these terms, the timber framed houses of some medieval market squares could also be considered as the skyscrapers of their time. This definition then also includes medieval residential towers and the clay towers in Yemeni Shibam in the 16th century. The true skyscrapers of the Middle Ages, however, were the church towers, which rose above the two and three story buildings of the "cities" and were visible from afar. The 161-meter-high Ulm Minster was the tallest building in the world for 500 years (1377–1890). In contrast to the skyscrapers, the function of the church towers was primarily as symbol and emblem or as elevated belfries and vantage points. Nowadays, neither these nor lookout towers count as skyscrapers. In contrast to a tower, a skyscraper offers closed general-use rooms that serve everyday functions, such as living or working. Ancient Egyptian pyramids and zikkurats are also not included in the definition because of their function as tombs and due to their huge width.

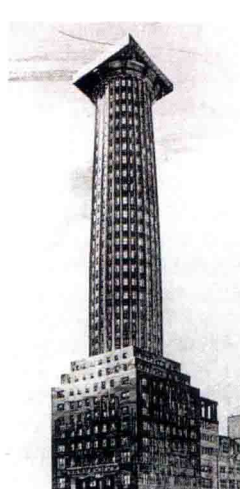
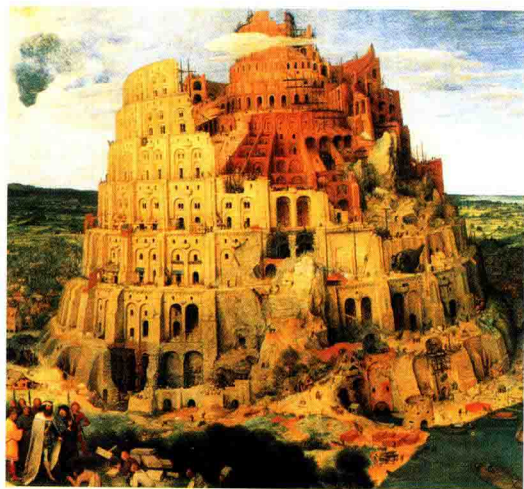
In most countries today, buildings more than 40 meters high or with more than twelve stories count as skyscrapers. The first building to earn the title of skyscraper was the Home Insurance Building in

Chicago. This was built by the structural engineer William Le Baron Jenney in 1885 and with a height of 42 meters would still fit the modern definition of skyscraper (1890 extended to 12 stories, 55 meters, torn down in 1931). After the Great Chicago Fire in 1880, a massive building boom took place in the city and the number of residents doubled within a year. Consequently, the price of land shot up six fold, making it essential to start building upwards rather than outwards. In 1889, the Home Insurance Building was topped by the Auditorium Building, also located in Chicago. This housed both an opera and offices and reached a height of 82 meters – the competition to see who can construct the highest building had begun.

The construction of skyscrapers at the end of the 19th century was only made possible by technical inventions. For the Monadnock Building in Chicago (1889–1891), Daniel Hudson Burnham and John Wellborn Root had to render the ground floor weight-bearing masonry almost two meters thick to enable it to carry the weight of the 16 floors. They also incorporated a steel lattice formwork, a design strategy already used for bridges and buildings (Jules Saulnier's Menier factory in Noisiel 1871). This kind of construction was thin and resilient and became affordable as steel prices dropped from \$166/ton in 1867 to \$32/ton in 1895 (Steel Rails). After Elisha Otis invented the elevator safety catch device in 1852, the first "Elevator Building" was built in New York in the 1870s.

↖ | Irving Underhill, *Southern Manhattan seen from the Woolworth Building*, New York City, 1913

↖ | *Die Gartenlaube (The Garden Arbor)*, by publisher Ernst Keil's Nachfolger, Leipzig, 1882



Elevators had long since been used in the mining industry but it was only with this new technical innovation that it became acceptable to use them for everyday passenger transportation. Finally, air conditioning – in the Auditorium Building – solved the problem of ventilating rooms at a great height. The Reliance Building in Chicago (Burnham, Root and Charles B. Atwood, 1895) with its large-area glazing introduced the predecessor to the curtain wall. Typical for the first Chicago School style were so-called “Chicago Windows”, groups made up of a large fixed center panel flanked by two smaller double-hung sash windows, that often projected from the wall to form an “Oriel Window”, designed to allow as much light to enter as possible (Chicago Building by Holabird & Roche, 1905.)

Early constructions attempted – some times more and sometimes less successfully – to incorporate historical vocabulary into the new style. This practice continued for a long time in New York (Cass Gilbert: Woolworth Building, 1913, 260 meters) and later served as the starting point for the Stalinist “wedding cake style” (the Seven Sisters in Moscow). Chicago’s Louis Sullivan, was the first who attempted to plumb the depths of the aesthetic possibilities offered by the new style and so developed a new architectural language for the sky-

scraper. He no longer decorated his buildings with columns, but tried to divide the structure into three sections, base shaft and pediment; also emphasizing the height instead of proportionally reducing it with a vocabulary that was no longer suitable or appropriate. He was much freer in terms of detail decoration, using ornamental design for its own sake rather than ornamentation that pretended to serve a function – as the earlier columns had done. His statement “form (ever) follows function” (“The Tall Office Building Artistically Considered” in “Lippincott's Magazine”, 1896) did not mean that decoration should be relinquished, but rather that the form should (naturally) complement the function. Adolf Loos went either further than Sullivan, repudiating the florid ornamentation of the Vienna Secession with his essay “Ornament and Crime”. Loos put forward a design for the Chicago Tribune Tower in 1922, a stylized column almost Postmodern in form. Other entries in this competition demonstrate all the styles that the early 20th century had to offer. Numerous pioneers of the Classical Modern style took part but it was Raymond Hood and John Mead that won with their Neo-Gothic design. It wasn’t until 1932 that a skyscraper in the more modern form was built; the 150-meter Philadelphia Saving Fund tower by William Lescaze and George Howe. At the same time a 40-meter high

skyscraper by Jan Frederik Staal was built in a prominent position on H.P. Berlage’s south extension to Amsterdam. This is one of the purest residential skyscrapers and is very purposefully formed, allowing it to break the majestic dignity of the Amsterdam School style, which ruled the rest of the city extension. In contrast to the American office skyscraper, the residential skyscraper remained a largely European phenomenon. At this time in New York the zoning law led to a new form of skyscraper. This regulated light flow into the streets by staggering the building components: A ten story limit on perimeter block development, and progressively staggered back from their street façade as they rose higher.

Once the staggered building occupied one quarter of the area of the site, a central tower of any height could begin. The height competition began and found its expression

☞☞☞ | Pieter Bruegel the Elder, *Tower of Babel*, 1563, fantasy of a zikkurat

☞☞ | William Le Baron Jenney, *Home Insurance Building*, Chicago, 1884, 42 m

↑ | Holabird & Roche, *Chicago Building*, Chicago, 1905, 45 m, Chicago windows

↗ | Alfred Loos, *Chicago Tribune Tower*, Chicago, competition 1922

↗↗ | William van Alen, *Chrysler Building*, New York City, 1930, 319 m

→ | Adler & Sullivan, *Wainwright Building*, St. Louis, 1891, 45 m

→→ | Cass Gilbert, *Woolworth Building*, New York City, 1913, 260 m