

Case Study: **KK100 Tower**
by
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Case Study: **KK100 Tower** by Ekrem Bahadır Çalışkan
Submitted to: Günel, Ay – Fall 2016



KK100

Official Name: KK100¹
Other Names: KK100 Development, Kingkey 100, Kingkey Finance Center Plaza, Kingkey Finance Center¹
Location: Shenzhen, China
Tower Area: 220,000 m²
Structural Material: Composite¹
Structural System: Outriggered Frame System
Height Architectural and to Top: 441.8 m¹
Height Occupied: 427.1 m¹
Total Development Area: 417,000 m²
Usage: Hotel | Office¹
Elevators: 69¹
Number of Stories: 100 above ground, 4 below ground¹
Aspect Ratio: 1:9.5¹
Inter Storey Drift: 1/450¹
Construction Date: 2007-2011¹
Rankings: 2nd tallest in Shenzhen, 10th tallest in China, 14th tallest in Asia, 18th tallest in World¹ (ranking by 2017)
Owners: Shenzhen Kingkey Real Estate Development Co Ltd.
Architectural Design: TFP Farrells¹
Architecture of Record: Huasen Architectural & Engineering Designing Consultants Ltd.¹
Structural Designer: ARUP, RBS Architectural Engineering Design Associates¹

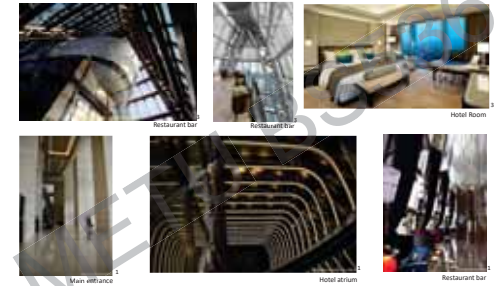
1- www.ctbuh.org, visited January 2017 (completed, architecturally and structurally topped out)
2- www.arup.com, visited January 2017

Photographs and Images-Exterior



1- www.ctbuh.org, visited January 2017
3- www.skyscrapercity.com, visited January 2017

Photographs and Images- Interior



1- www.ctbuh.org, visited January 2017
3- www.skyscrapercity.com, visited January 2017

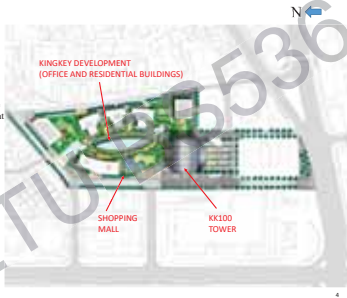
Site Plan

Total Development area is 417,000m² that includes 5 residential buildings and 2 commercial buildings.⁵

Transformation of 3.6 hectare (occupied by dense and low rise residential) by joint development system.⁶

Tower contains 210,000m² of 28 floors-accommodation (five star St. Regis hotel) and 72 floors-office.⁷

The building is topped off by a 5-storey "Sky Garden" - a stunning viewing gallery occupied by a variety of fine-dining restaurant.⁷



4- www.bs.asia.com visited January 2017
5- kingkey brochure, ctbuh
6- www.archdaily.com, visited January 2017

Awards and Additional Information

- 1-Best Tall Building Asia and Australasia 2012 Finalist (CTBUH Awards Finalist)¹
- 2-15th Excellent Project Prospecting Design Program Award, Shenzhen 1st Class Award 2012²
- 3-Architectural Society of China, Golden Prize 2013³
- 4-Guangdong Outstanding Engineering Exploration Design Award, 1st Class Award 2013
- 5-Emporis,USA, The Emporis Skyscraper Award Ranked 4th in the World's Top 10, 2013

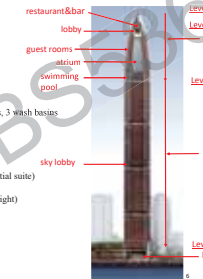


- Floor System is steel decking⁹
- TFP Farrells won the commission to design the Kingkey Finance Development in an international competition which included several leading architectural practices.⁴
- Kingkey Finance Tower is the tallest building ever completed by a British architect⁴
- Kingkey Finance Tower is the 9th tallest building in the World when it was completed at 2011¹
- Energy: Wind Load Cate¹⁰
- There is not any damper in tower¹⁰
- KK100 set a record of pumping high-strength C120 grade concrete to the height 417 meters¹¹

1- www.ctbuh.org, visited January 2017
2- www.baas.com.cn, visited January 2017
3- www.architect.co.uk, visited January 2017
4- Arup Structural Design Report
5- Interview with Steve Wong (TFP Farrells)
6- Trends and Innovations in High Rise Buildings Over The Past Decade, Wenjia Gu
7- www.emporis.com, visited January 2017
8- www.emporis.com, visited January 2017
9- Arup Structural Design Report
10- Interview with Steve Wong (TFP Farrells)
11- Trends and Innovations in High Rise Buildings Over The Past Decade, Wenjia Gu

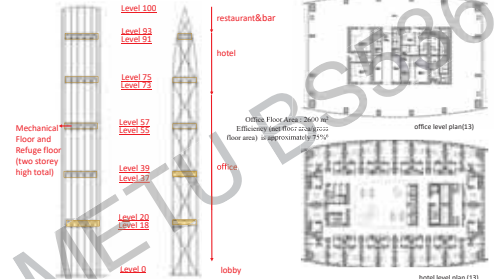
Architectural Layout

- Office Levels:
69 levels (L4-L172)
Floor height:
Typical Office: 4.2m floor to floor height (2.8m clear height, 130mm raised floor)
Trading Floor: 4.73m floor to floor height (3.33m clear height 300mm raised floor)
Population Density: 12sqm/person
Toilets: Female - 5 wcs, 3 wash basins; Male - 3 wcs, 4 urinals, 3 wash basins
1 sky lobby - L39 & L40¹
- Hotel Levels:
26 levels (L75-L100)
297 guest rooms and suites (176 typical rooms; 28 panoramic rooms, 44 suites; 1 presidential suite)
Floor height: 3.5m (common area - 2.4m clear height, private area - 2.8m clear height)
Hotel Sky lobby at L95 - 40m atrium height
63m cent atrium (16 guest room levels)
5 levels of restaurants (L96-L100)
Swimming Pool at L75 (7m (W) x 28m (L))¹



5- kingkey brochure, ctbuh
6- www.emporis.com, visited January 2017

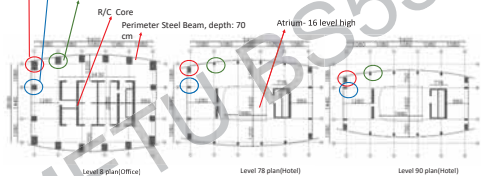
Architectural Layout



5- kingkey brochure, ctbuh
6- Arup Structural Design Report
13- www.openbuildings.com, visited January 2017

Structural Layout

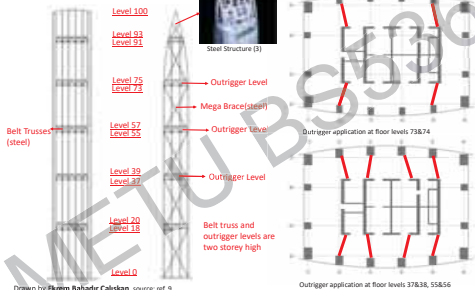
Corner Columns- Composite(steel embedded R/C), dimensions: 395x270cm-250x150cm from level 0 to level 94
Perimeter Columns- Composite (steel embedded R/C), dimensions: 235x235cm-150x80cm from level 0 to level 94
Perimeter Columns- Composite (steel embedded R/C), dimensions: 320x260cm-120x90cm from level 0 to level 94



Drawn by Ekrem Bahadır Çalışkan, source: ref.9

3- www.skyscrapercity.com, visited January 2017
9- Arup Structural Design Report

Structural Layout



Drawn by Ekrem Bahadır Çalışkan, source: ref.9

3- www.skyscrapercity.com, visited January 2017
9- Arup Structural Design Report

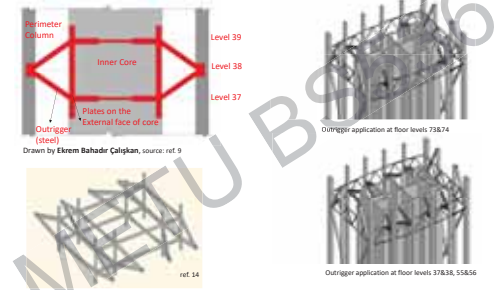
Structural Layout



Drawn by Ekrem Bahadır Çalışkan, source: ref.9

9- Arup Structural Design Report

Outriggered System



Drawn by Ekrem Bahadır Çalışkan, source: ref.9

9- Arup Structural Design Report
14- Arup Presentation

Photographs and Images- Construction



3- www.skyscrapercity.com, visited January 2017

References

- 1- <http://www.ctbuh.org>, CTBUH Tall Building Database
- 2- <http://www.arup.com>, Official web page of structural designer
- 3- <http://www.skyscrapercity.com>
- 4- <http://www.loft-asia.com>
- 5- kingkey brochure, ctbuh
- 6- <http://www.archdaily.com>
- 7- <http://www.luosen.com.cn>, Official web page of Architecture of Record Firm
- 8- <http://www.e-architect.co.uk>
- 9- Arup Structural Design Report
- 10- Interview with Steve Wong (TFP Farrells)
- 11- Trends and Innovations in High Rise Buildings Over The Past Decade, Wenjia Gu
- 12- <http://www.emporis.com>, visited January 2017
- 13- <http://www.openbuildings.com>
- 14- Arup Presentation, September 2007

