

**Bank of China Tower,  
Hong Kong**

Country/City: China/Hong Kong  
Building Function: Office  
Structural Material: Composite  
Construction: 1985-1990\*\*  
**Architects:**  
I.M. Pei & Partners, Sherman Kung & Associates  
**Structural Engineers:**  
Leslie E. Robertson Associates;  
Valentine, Laurie and Davis\*  
**Structural System**  
Mega Column System (Günel-Ilgın)  
Mega Frames with suber columns\*\*  
Space Structure (Smith)\*\*\*  
Space Truss System (Emporis)  
**Height:** Architectural: 367.4 meter\*  
**Floors Above Ground:** 72\*  
**Number of Elevators:** 49\*  
**Gross Floor Area Total:** 135,000 m2\*  
**Owner:** Bank of China, Hong Kong



Emporis, Emporis Corporation, A Global Building Information Company, www.emporis.com/building/bankofchinatower-hongkong-china.

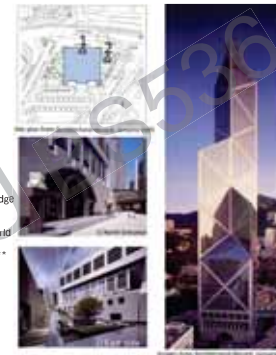
\*CTBUH, *Skyscrapers and Urban Habitat*, www.ctbuh.org  
\*\*Taranath, B., *Steel, Concrete & Composite Design of Tall Buildings*  
\*\*\*Smith, B.S. & Coull, A., *Tall Building Structures: Analysis and Design*

**Important Facts**

- The architect of Bank of China Tower, I.M. Pei, was the son of one of the previous managers of Bank of China\*
- At the time of its completion, was the "tallest building in Asia"
- tallest building outside the continent of America
- fifth tallest building in the world
- first composite megastructure tall building in the world.

**Challenges for design:**

- Site in a dense business district, but at the edge of it\*\*
- Site is surrounded by elevated highways
- Site had bad memories from the Second World War\*\*
- Norman Foster's HSBC building is near to it\*\*
- Site is in a typhoon and earthquake zone\*
- Restricted Budget (\$150 million)\*\*



\*Philip Jodidio and Janet Adams Strong, "Bank of China", I.M. Pei (Complete Works, New York, Rizzoli: Distributed to the U.S. trade by Random House, 2008, pp.194-201)  
\*\*Peter Blake, "Scaling New Heights", *Architectural Record*, January, 1991.

**Articulation of the geometry**



drawn by Serdar Erşen

**Architectural Design**

- Architectural expressionism
- Expression of structure at facade
- Integration of pure structure, function, form, and urban symbolism
- Bamboo symbolism for the architectural inspiration\*
- Bracing structure is expressed with aluminum architectural cover.\*\*\*



image from Wikisource.com

**Feng Shui effect**

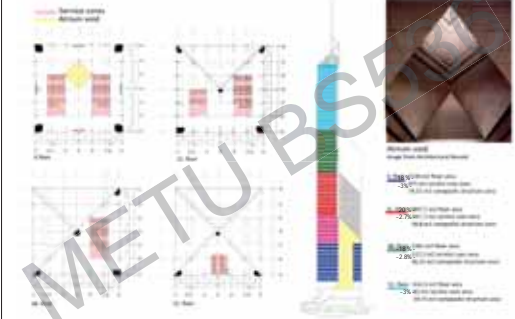
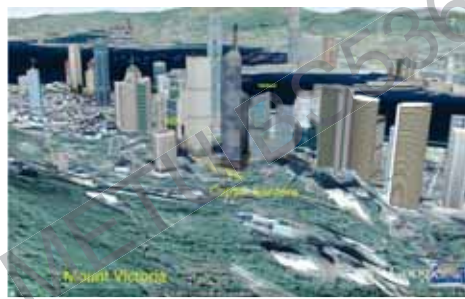
- X's at the facade with their negative meaning has changed into the "Diamond shape" by the articulation of "Quadrants"\*\*\*
- Surrounding site has been integrated with "triangulated gardens"\*\*\* with the Feng Shui understanding.



image from "Scaling New Heights", *Architectural Record* January 1991.

\*Peter Blake, "Scaling New Heights", *Architectural Record*, January, 1991  
\*\*Architectural Record, January 1991  
\*\*\*Jodidio and Strong, "Bank of China", 2008, pp.195-200  
\*\*\*\*Architectural Record, September 1985

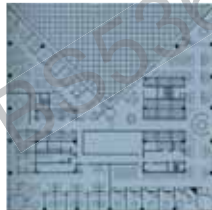
Google Earth image of the near environment of the tower



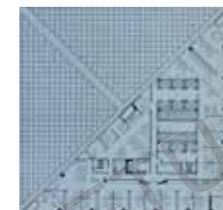
**Architectural Plans**



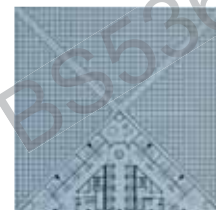
Floors 4 - 16\*



Floors 26 - 31\*



Floors 38 - 44\*

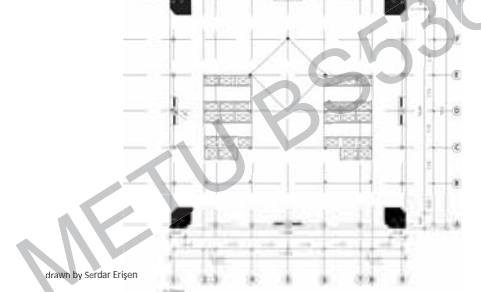


Floors 51 - 66\*

\*Drawings from "Scaling New Heights", *Architectural Record* 1991 January

\*Drawings from "Scaling New Heights", *Architectural Record* 1991 January

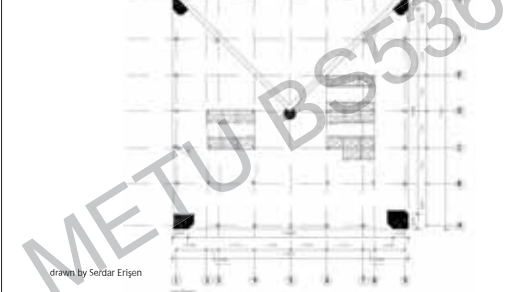
**Structural plans\***



drawn by Serdar Erşen

\*Architectural Record September 1985

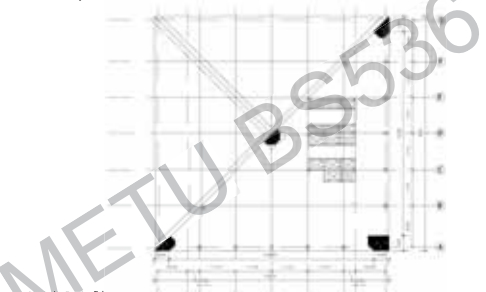
**Structural plans\***



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\*Architectural Record September 1985

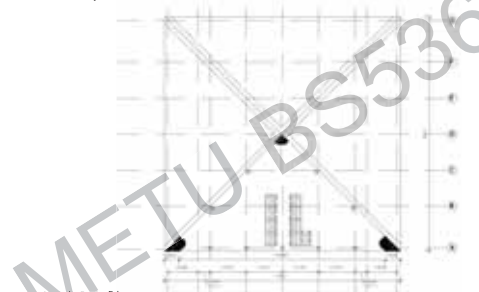
**Structural plans\***



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\*Architectural Record September 1985

**Structural plans\***



drawn by Serdar Erşen

\*Architectural Record September 1985

**Structural design**

Restricted budget and regional factors such as typhoon and earthquake lead to be made building light and efficient structure\*

Mega column system / Space truss system

Composite structure  
Mega composite columns with steel bracing system\*\*

At every thirteen floor gigantic horizontal bracing frames\*\*

Stiffening trusses on the perimeter with 12-story major bracing configuration\*\*

40 % less steel usage by the composite structure system when compared to the conventional solutions as a more light and efficient solution\*\*

\*Jodidio and Strong, 2008, "Bank of China"  
\*\*Architectural Record 1985 September  
image from ENR 1988 October

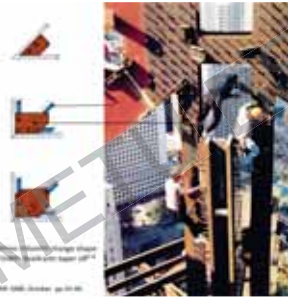


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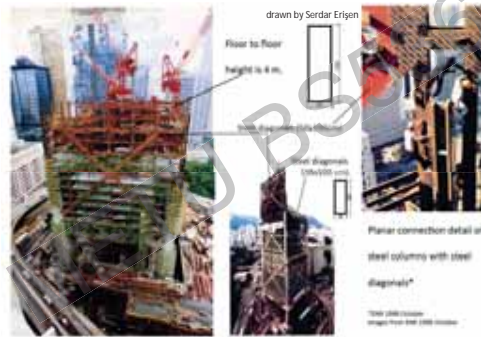


image from ENR 1988 October

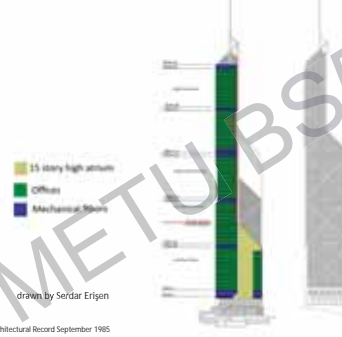
The load of the fifth column is transferred to the corner columns by diagonal steel structures\*



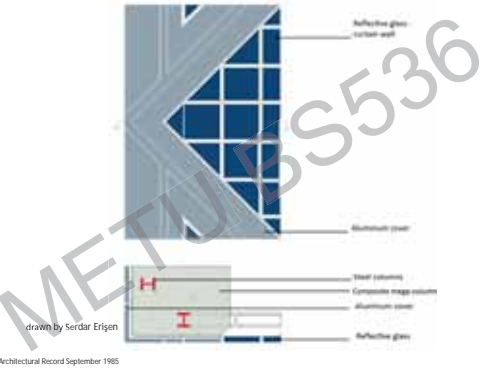
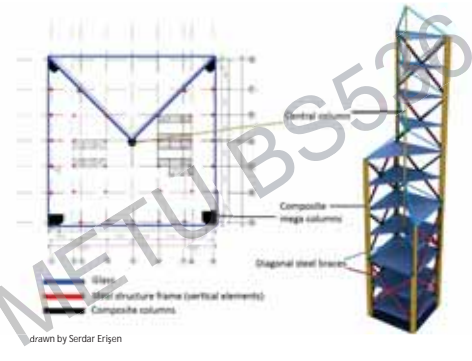
Steel box diagonals filled with concrete



Section, Elevation\*



\*Architectural Record September 1985



\*Architectural Record September 1985

Axometric drawings



References

Blake, P., "Scaling New Heights", *Architectural Record*, January, 1991.

CTBUH Council on Tall Buildings and Urban Habitat, Illinois Institute of Technology, S.R. Crown Hall, 3360 South State Street, Chicago, Illinois, USA, <[http://buildingdb.ctbuh.org/building.php?building\\_id=287](http://buildingdb.ctbuh.org/building.php?building_id=287)>

Dupré, Judith, "Bank of China", *Skyscrapers*, New York: Black Dog & Leventhal; Poole: Chris Lloyd [distributor], 2008, pp. 108-109.

Emporis, Emporis Corporation, A Global Building Information Company, Theodor-Heuss-Allee 2, 60486 Frankfurt, Germany, <<http://www.emporis.com/building/bankofchinatower-hongkong-china>>

Gordon, Douglas E., "Curtains' Up in Hong Kong", *Architecture*, No. 79, February 1990: 95-96.

Günel, M., Halls & İlgin, H., Erme, Yüksek Binalar: Yapıya Sistem ve Aerodinamik Form, Ankara: ODTÜ Mimarlık Fakültesi Basım İşliği, 2010.

Jodidio, Philip & Strong, Janet Adams, "Bank of China", *J.M.Pel: Complete Works*, New York: Rizzoli; Distributed to the U.S. trade by Random House, 2008, pp.194-201.

Rasterfer, Dart, "Logic of Eccentricity", *Architectural Record*, September, 1985.

"Stretching the art of composite structures", *ENR*, October 1988: 35-46.