

### ZIFENG TOWER

**Official Name:** Zifeng Tower  
**Other Name:** Nanjing Greenland Financial Center  
**Developer:** Nanjing Guzzi Greenland Financial Center  
**Owner:** Nanjing State Owned Assets  
**Main Contractor:** Shanghai Construction  
**Location:** Nanjing / CHINA  
**Construction:** 2004-2010  
**Structural System:** Outriggered Frame  
**Structural Material:** Composite  
**Architectural Height:** 450 m  
**Height Occupied:** 316 m  
**Floors Above Ground:** 66  
**Elevator Count:** 54  
**Top Elevator Speed:** 7m/s  
**Use:** Mix-Use/ Hotel, Office, Retail Shops.



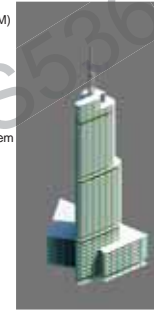
Drawing: Ramazan SARI  
Source: CTBUH (1)

### ARCHITECTURE



Image: Bustler (4)  
Sources: CTBUH (1), Taranath (6), Smith & Coull (7), Günel & Ilgın (8)

### STRUCTURE



Drawing: Ramazan SARI

**Design Architect:** Skidmore, Owings, Merrill (SOM)  
**Associate Architect:** ECADI  
**Structural Engineer:** SOM  
**MEP Engineer:** SOM  
**Structural System:** According to Taranath: Outrigger and Belt Truss System  
According to Smith: Outrigger Braced System  
According to Günel & Ilgın: Outriggered Frame System

### ARCHITECTURE

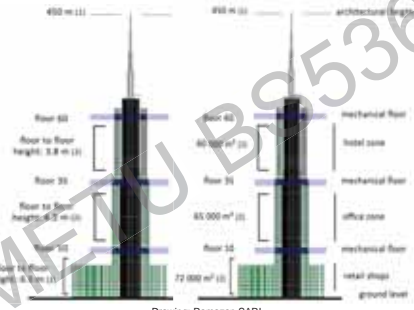


Image: SOM (3)  

- Clear sight of nearby mountains, lake and historic building
- An attractive form
- Public spaces placed at top of the tower
- Building Form related with the triangular site area.
- The Project was a competition and the winner is the Chicago Office of SOM
- Public spaces like restaurant and observatory areas placed top of the tower

Source: SOM (3)

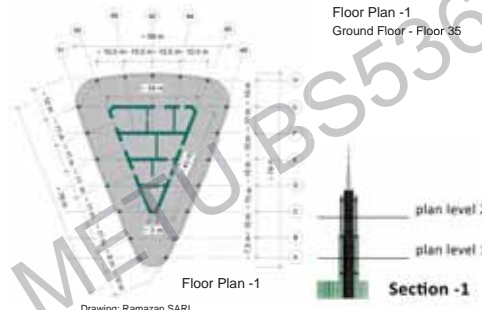
### ARCHITECTURE



Drawing: Ramazan SARI  
Source: CTBUH (1), CTBUH Technical Paper (2)

### ARCHITECTURE

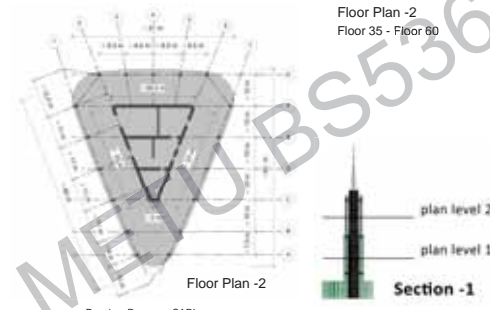
Floor Plan -1  
Ground Floor - Floor 35



Drawing: Ramazan SARI

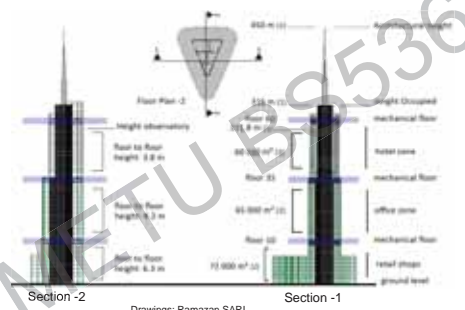
### ARCHITECTURE

Floor Plan -2  
Floor 35 - Floor 60



Drawing: Ramazan SARI

### ARCHITECTURE



Source: CTBUH (1), Technical Paper (2)

### ARCHITECTURE



Elevation -1 Elevation -2 Elevation -3  
Drawings: Ramazan SARI

### ARCHITECTURE



Real Elevation -1 Real Elevation -2 Real Elevation -3  
Image: China Builders (9), Image: All the Most (10), Image: SOM (3)

### STRUCTURE

Why Outriggered Frame System?

Building is defined as "Over-Limit and Complex Structure" for Chinese Code because of the 450m height of the structure.

Chinese Code Limit for the concrete core-steel structure is 190m.

Therefore, **Outriggered Frame System** is selected to support the structure



Axonometric View  
Drawing: Ramazan SARI  
Source: Technical Paper (2)

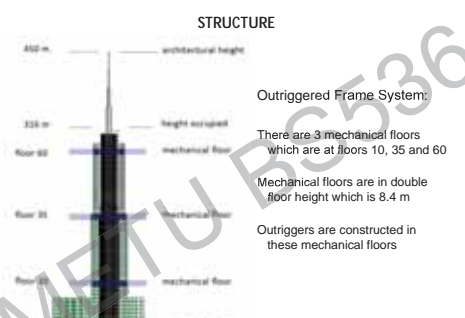
### STRUCTURE

Outriggered Frame System:

There are 3 mechanical floors which are at floors 10, 35 and 60

Mechanical floors are in double floor height which is 8.4 m

Outriggers are constructed in these mechanical floors



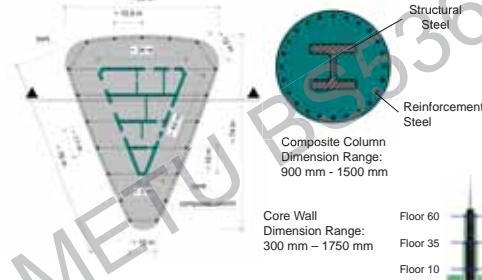
Section -1  
Drawing: Ramazan SARI  
Source: Technical Paper (2)

### STRUCTURE



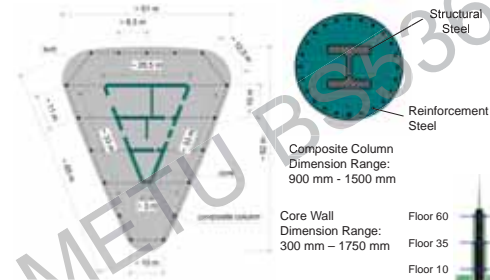
Outriggers and belt in Mechanical Floor  
Drawing: Ramazan SARI

### STRUCTURE



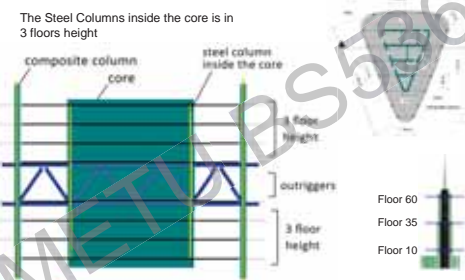
Source: Technical Paper (2)

### STRUCTURE



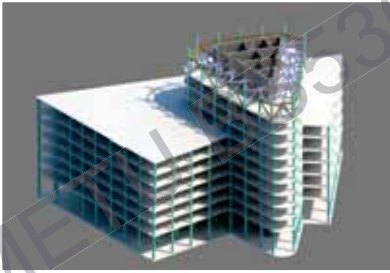
Source: Technical Paper (2)

### STRUCTURE



Source: Technical Paper (2)

STRUCTURE

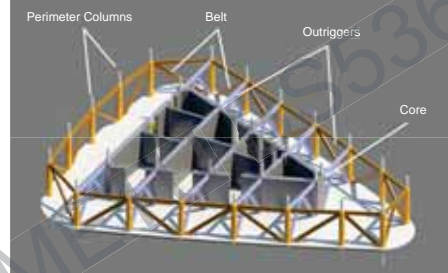


Axonometric View of the Floor 10

Drawing: Ramazan SARI

Source: Technical Paper (2)

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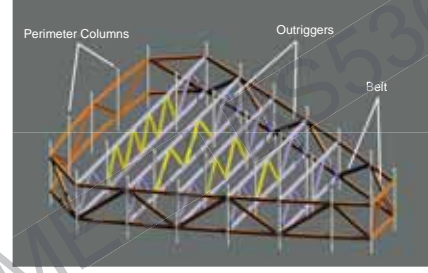


Axonometric View of the Mechanical Floor

Drawing: Ramazan SARI

Source: Technical Paper (2)

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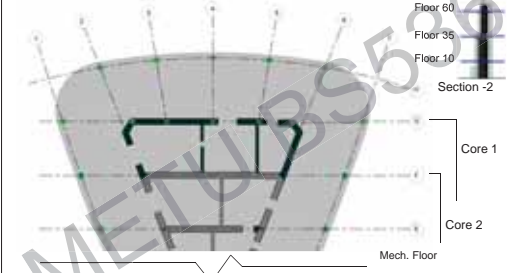


Axonometric View of the Steel Structure in the Mechanical Floor

Drawing: Ramazan SARI

Source: Technical Paper (2)

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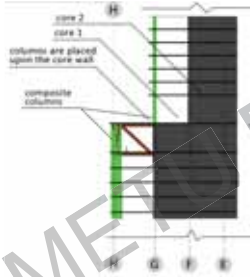


Partial Plan of the Floor 35

Drawings: Ramazan SARI

Source: Technical Paper (2)

STRUCTURE

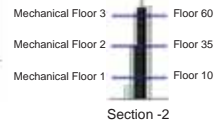


Partial Section of the Floor 35

Drawings: Ramazan SARI

Source: Technical Paper (2)

The Perimeter Columns of the narrow side of the building in floor 35 or mechanical floor 2 placed upon the core wall because of the getting smaller of the building volume after this floor



REFERENCES

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- 6- Taranath, B., Steel, Concrete and Composite Design of Tall Buildings, New York, McGraw-Hill Book Company, 1998
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