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BURJ AL ARAB

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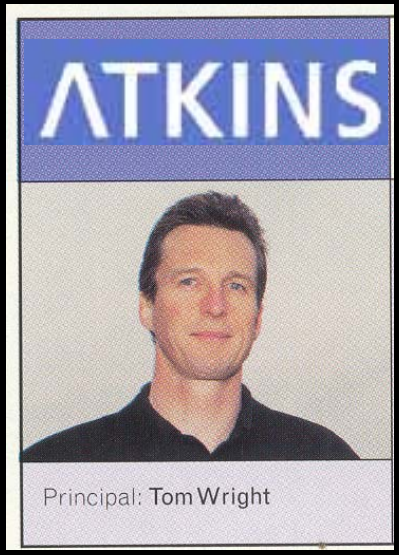
BURJ AL ARAB

The Design

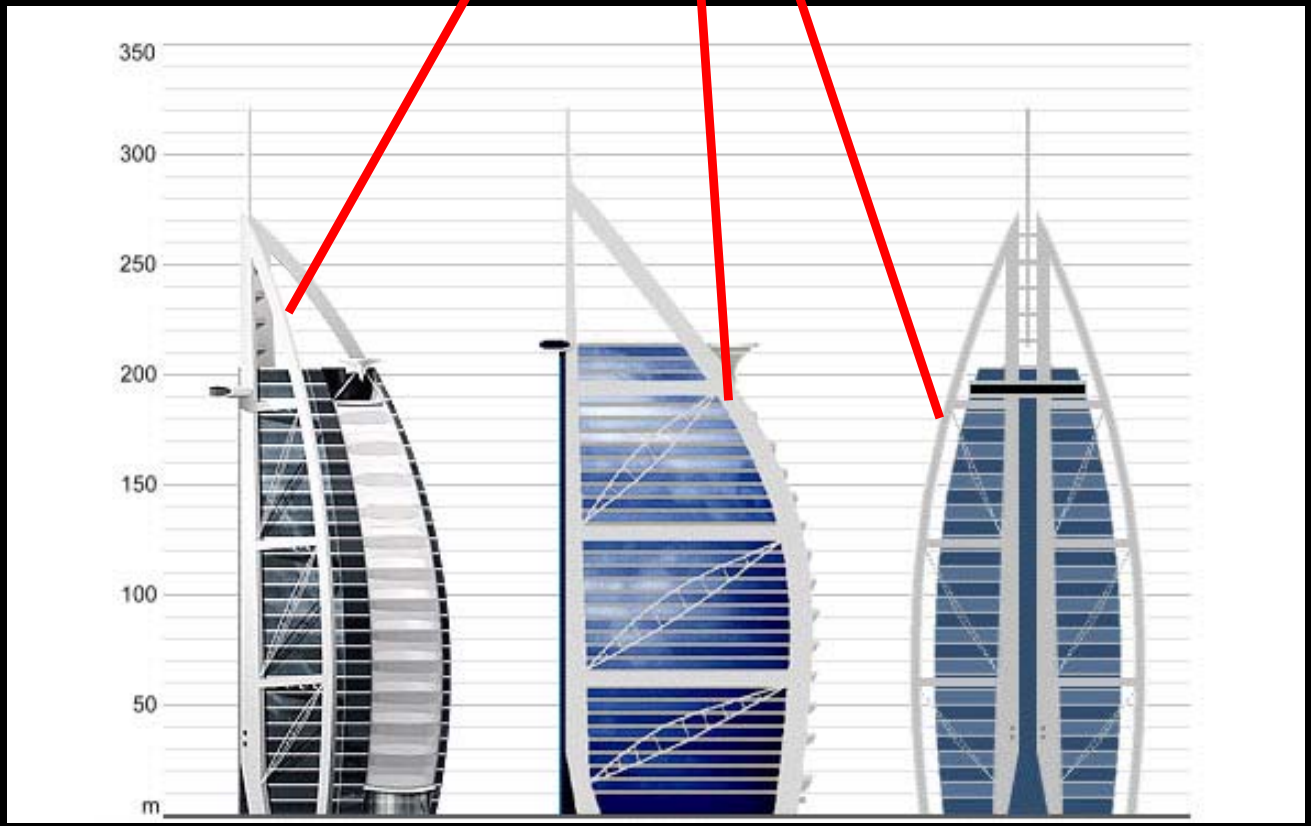
- Resembles a sail
- Shipping history
- Dubai monument
- Built on private island
- Tallest hotel in the world
- Underwater restaurant only accessible by submarine

- Architecture Firm: W.S. Atkins
- Based in Surrey, England
- Project Lead Architect Tom Wright
- Engineering Firm: Al Habtoor
- Construction began 1994 with planning and was completed in 1999

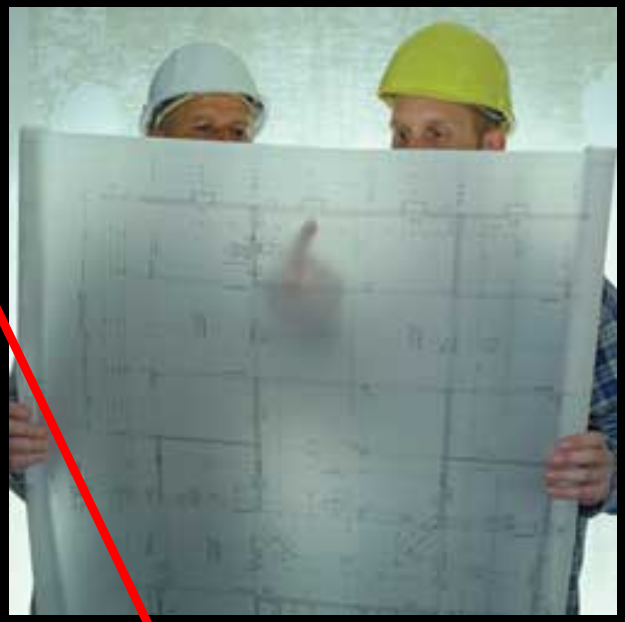


The Structure

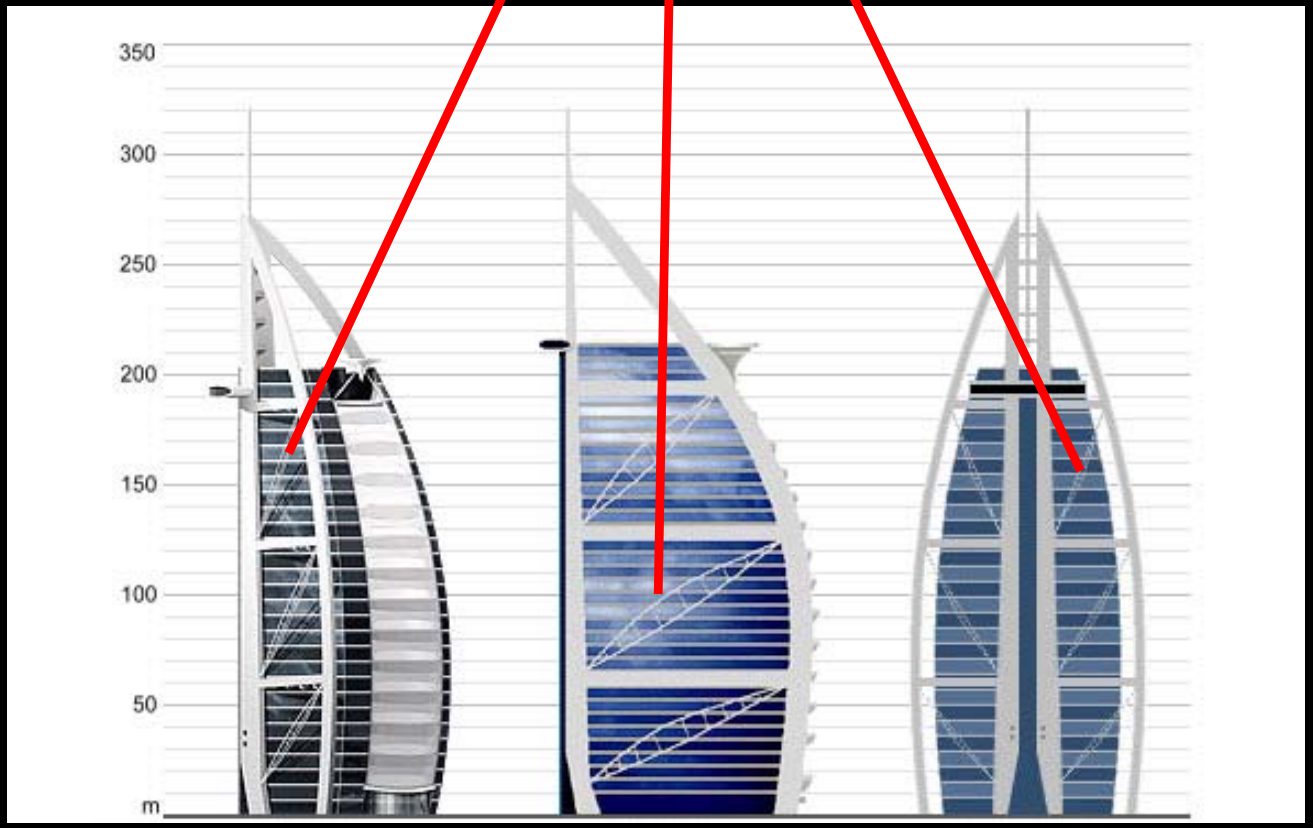
- Exoskeleton Frame



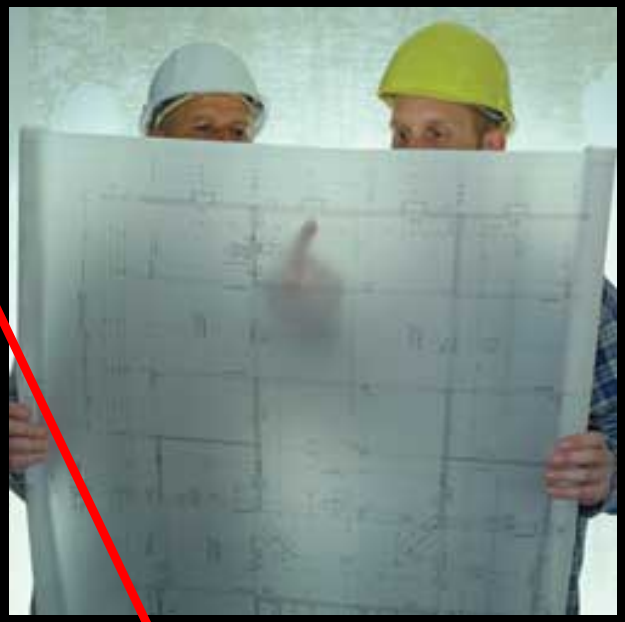
The Structure



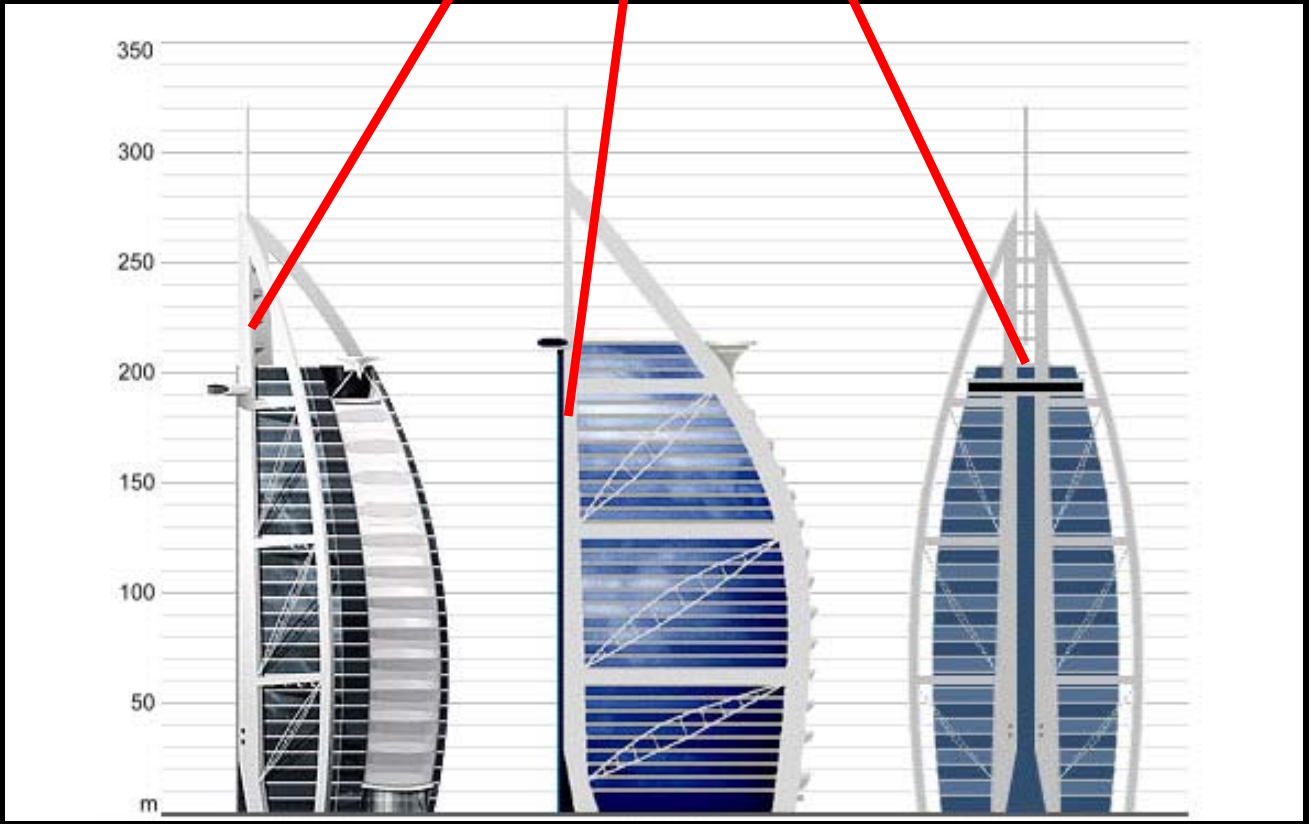
- Trusses



The Structure

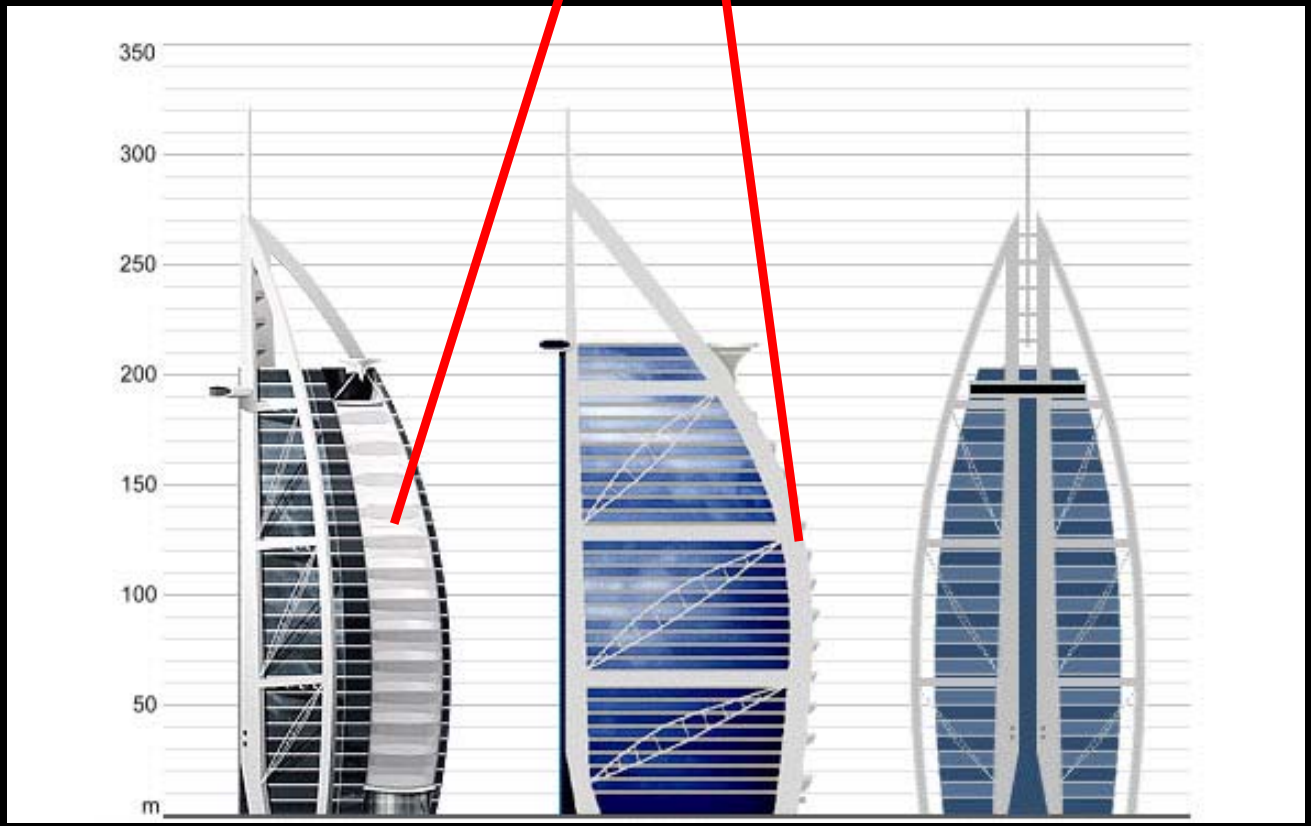


- Central Spine



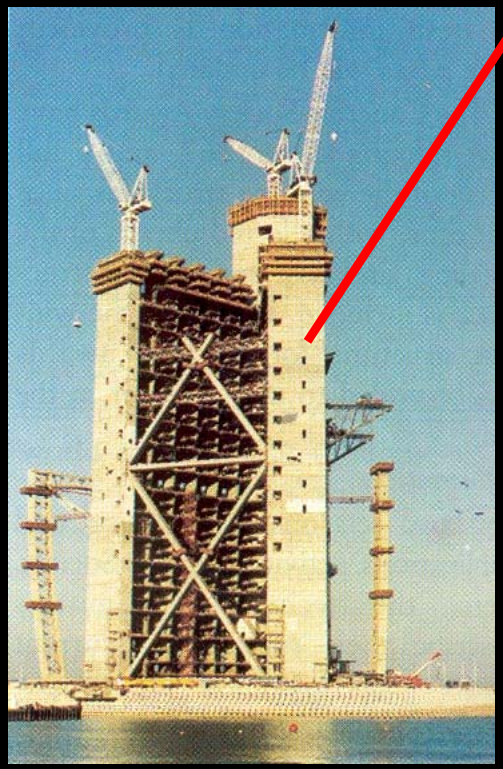
The Structure

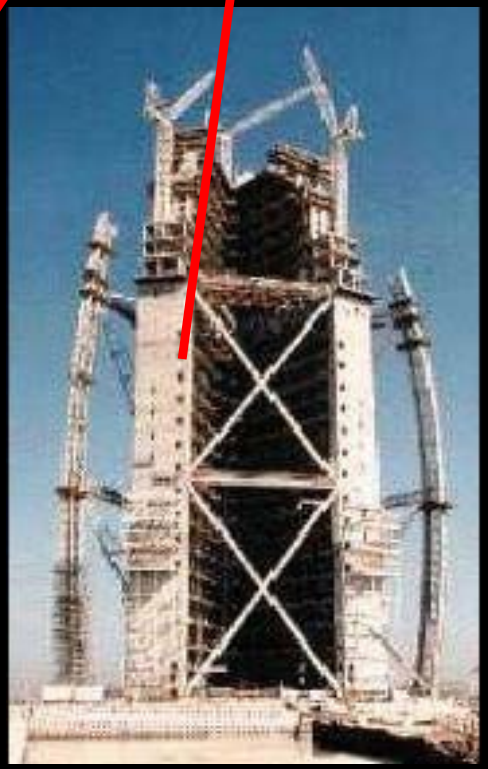
- Membrane



In Construction

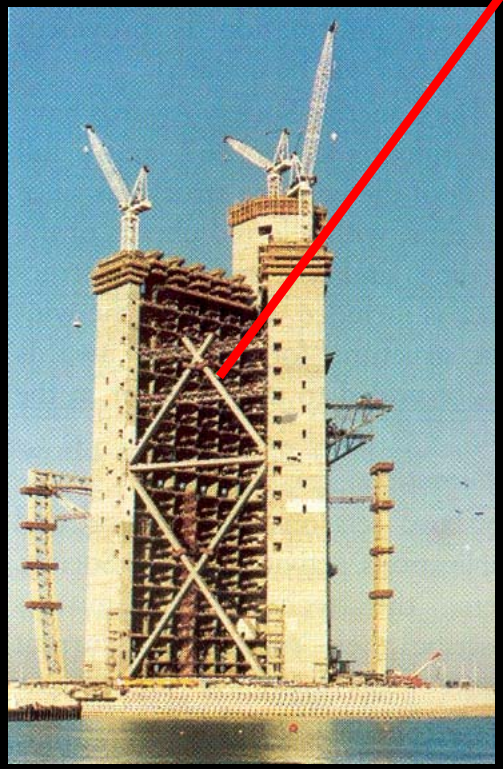
- Concrete Superstructure

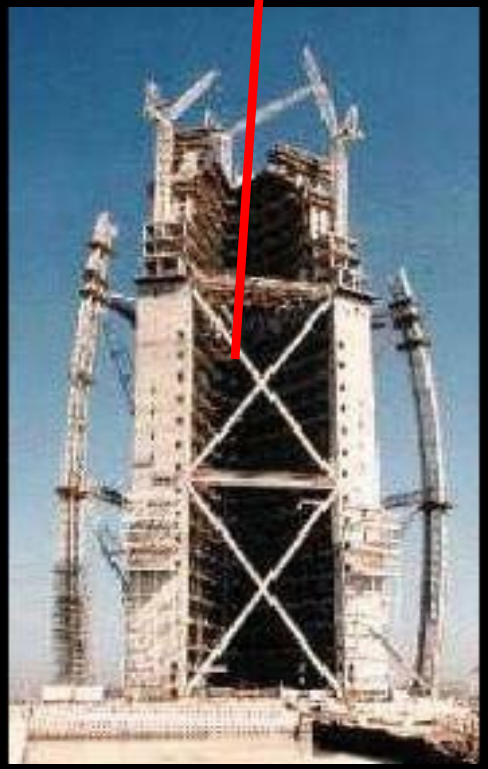




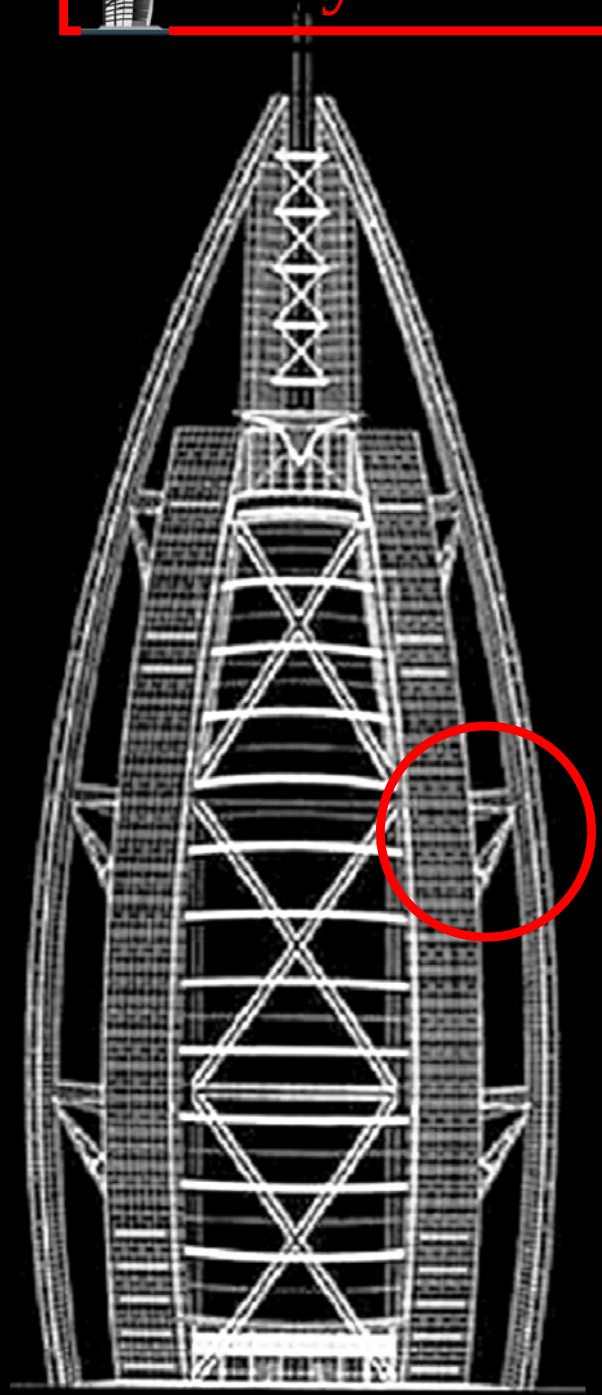
In Construction

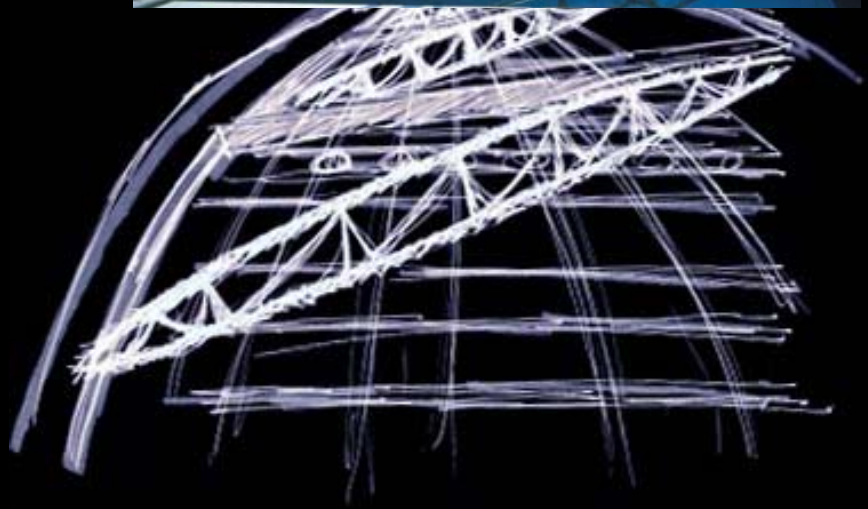
- Bracing





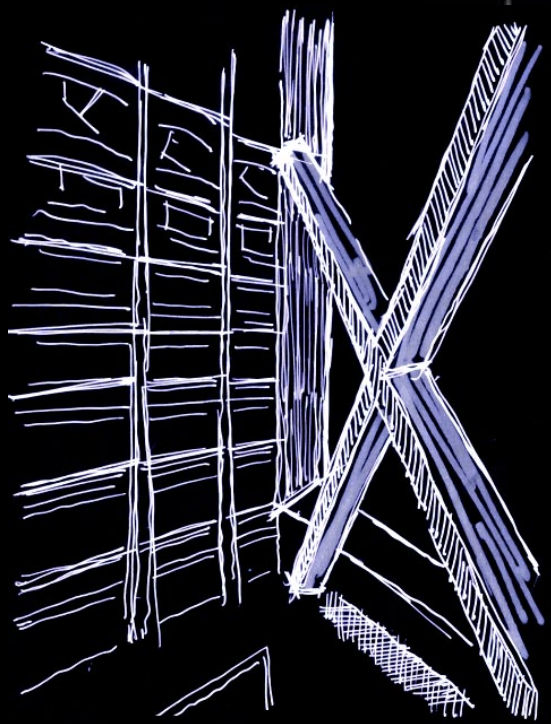
Analysis-Trusses

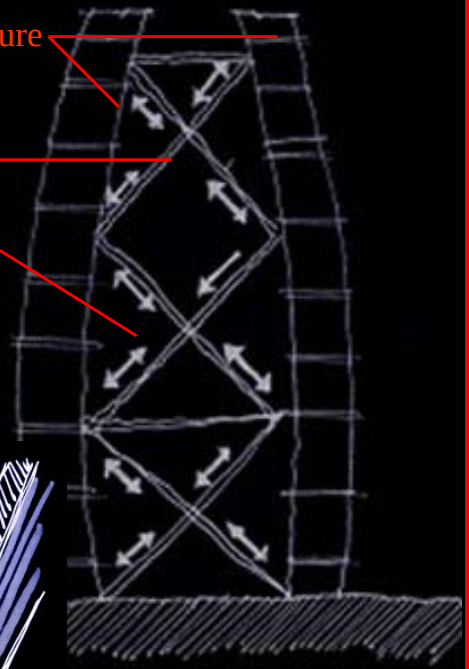




- Braces steel frame diagonally
- Resists Lateral Loads
- Reduce Moment and Deflection

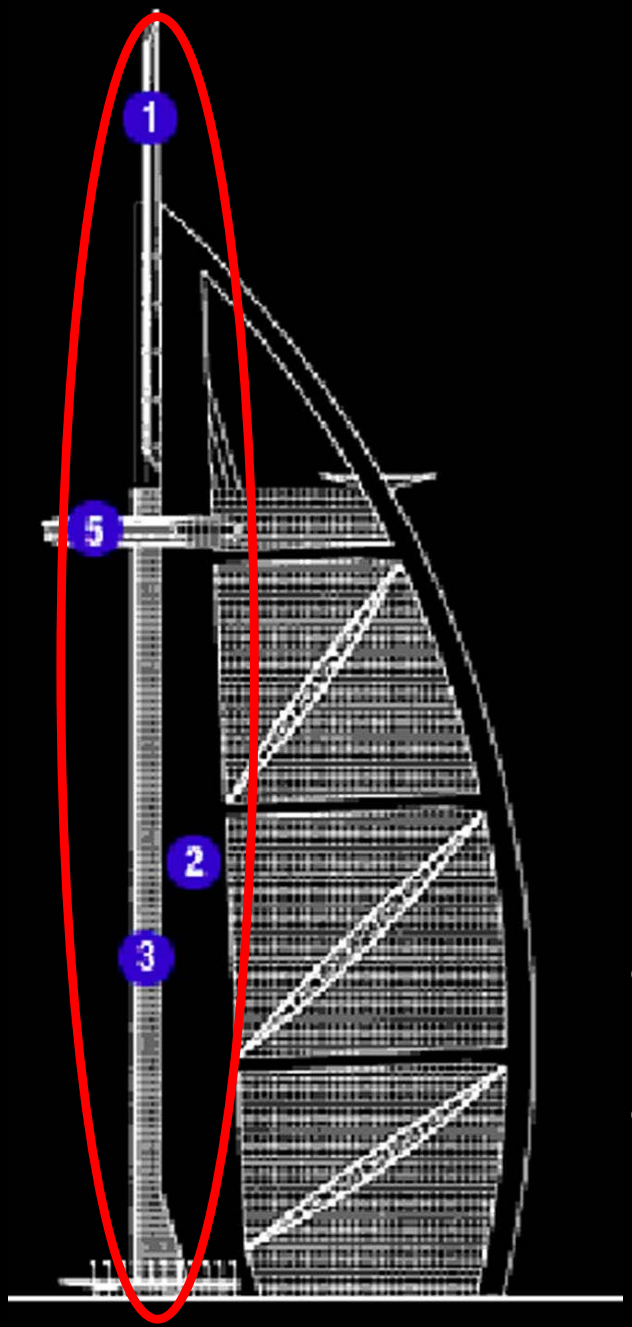
Analysis-Bracing

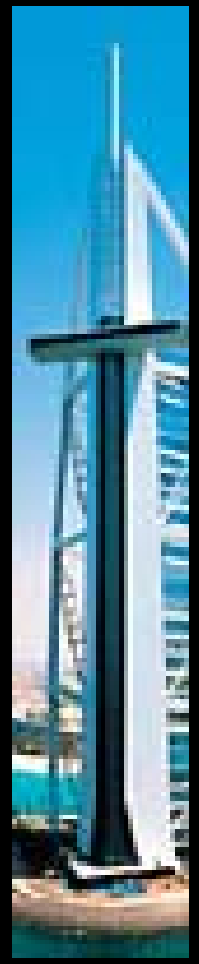




- Braces the exterior steel frame
- Resists Lateral Loads
- Resists Overturning

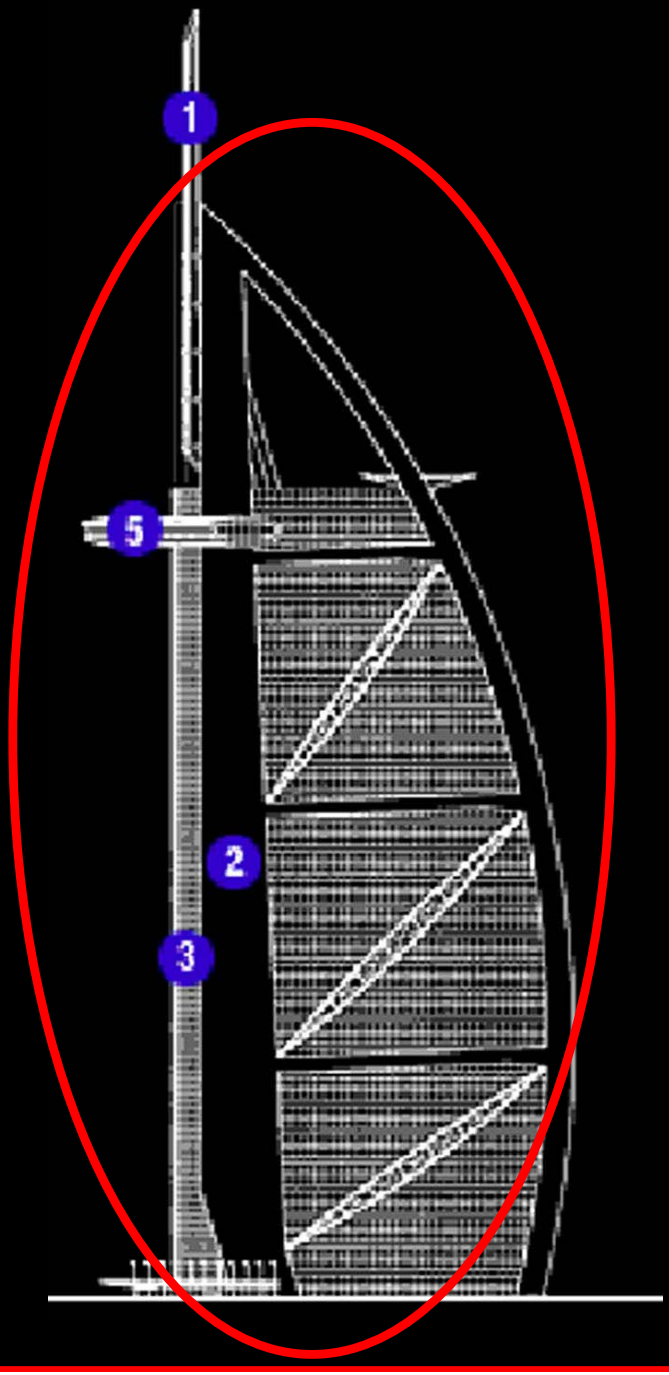
Analysis-Spine

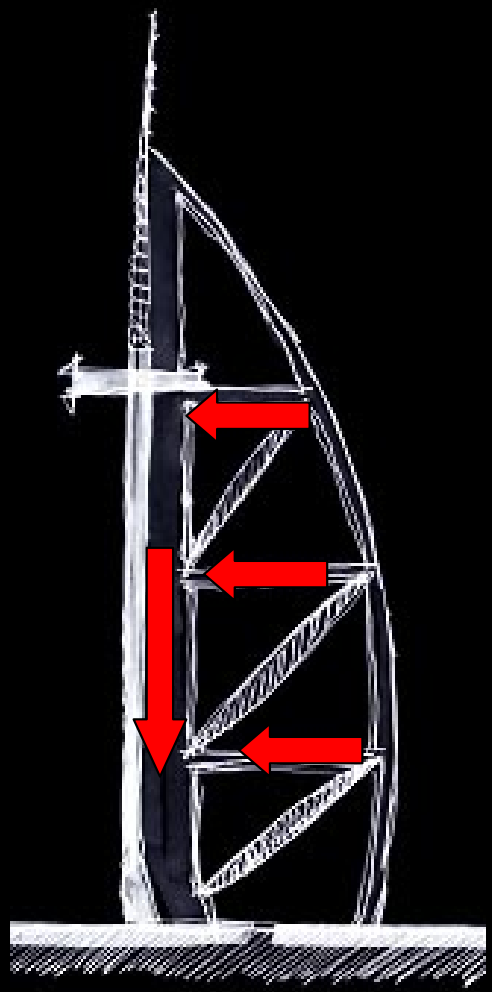




- Lateral loads are transferred from steel frame to central spine
- Spine unifies the steel and concrete structures

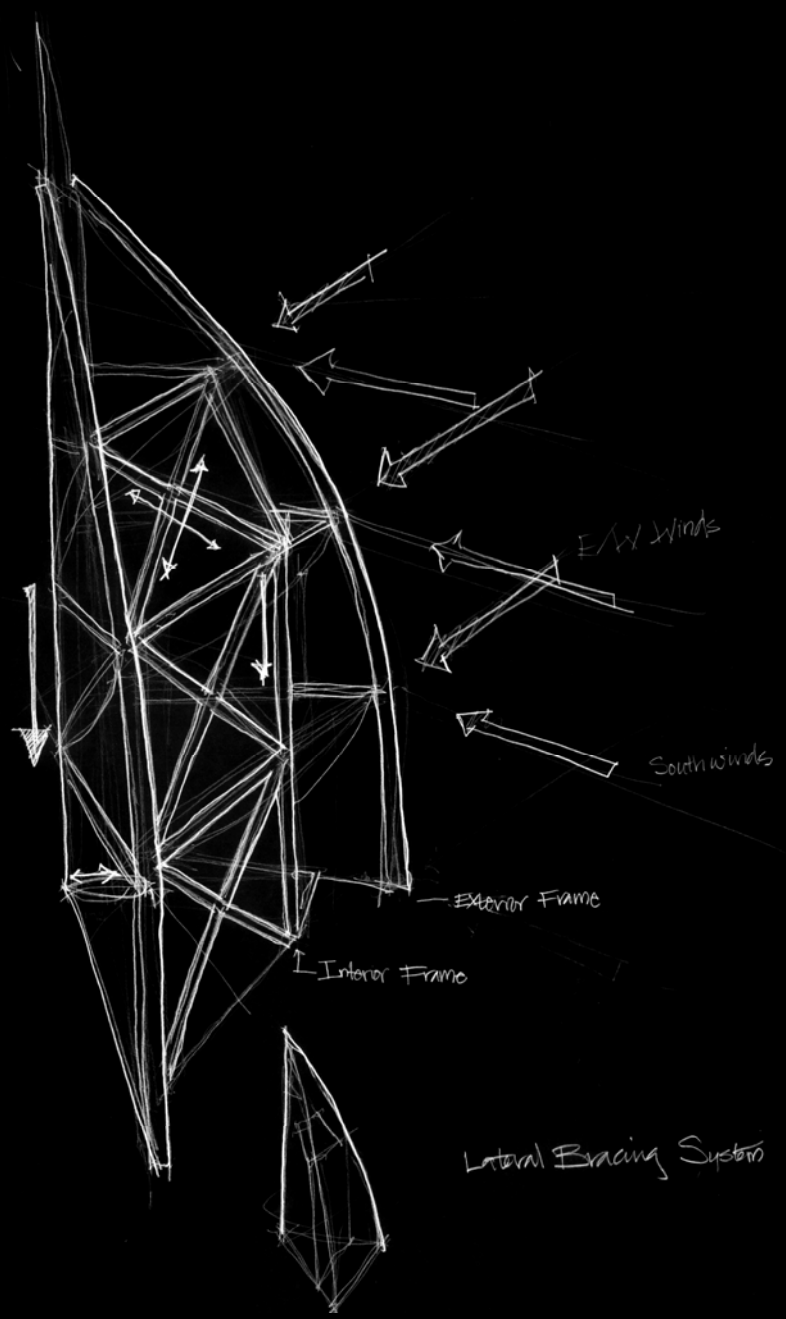
Analysis-Frame





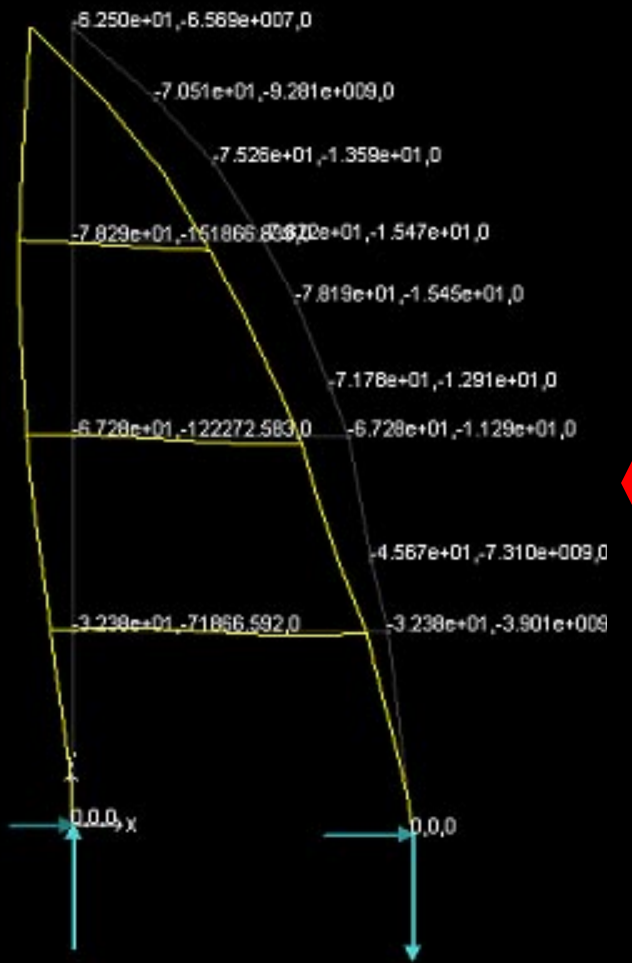
Whole loads are first passed from reinforced concrete in multistory frame to main steel exoskeleton, and then to the foundation.

Lateral Loads

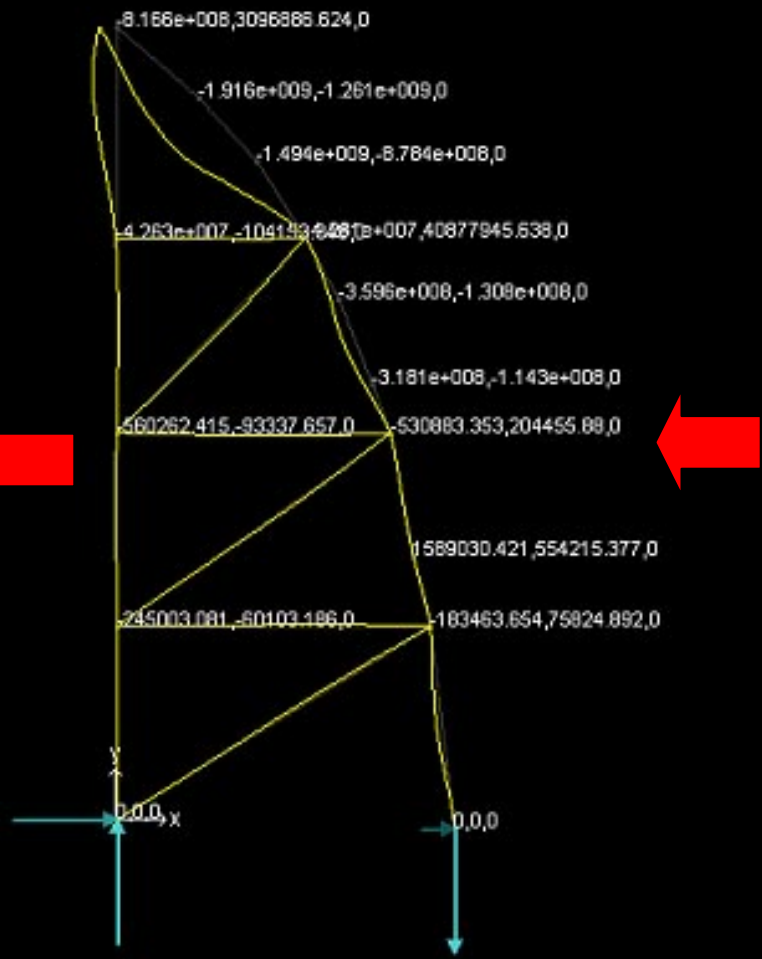


Lateral Loads

Without Bracing

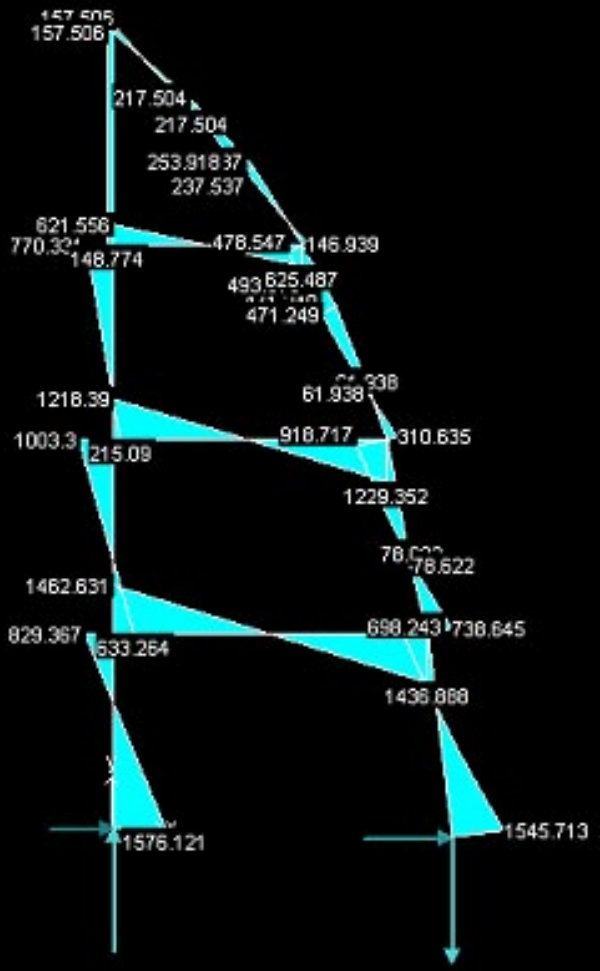


With Bracing

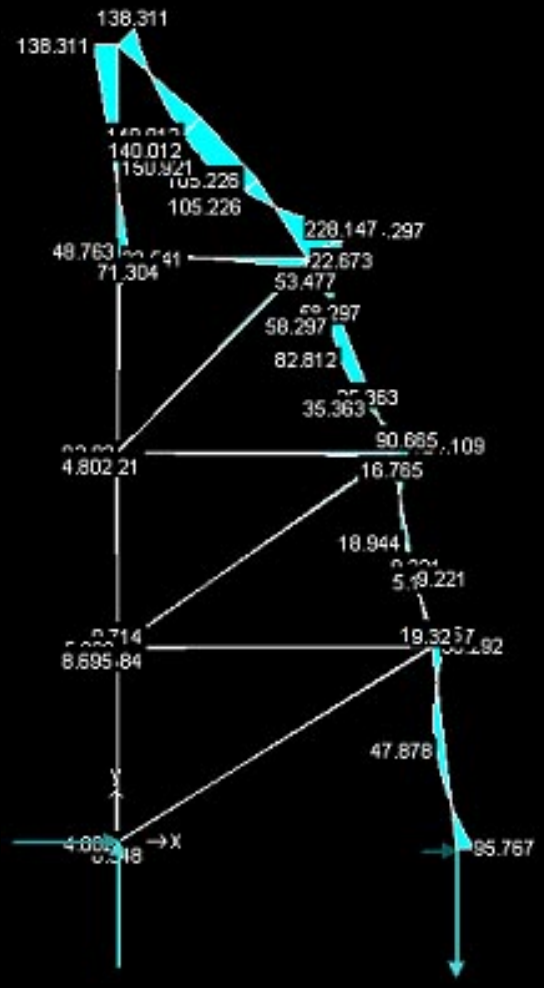


Moment Diagram

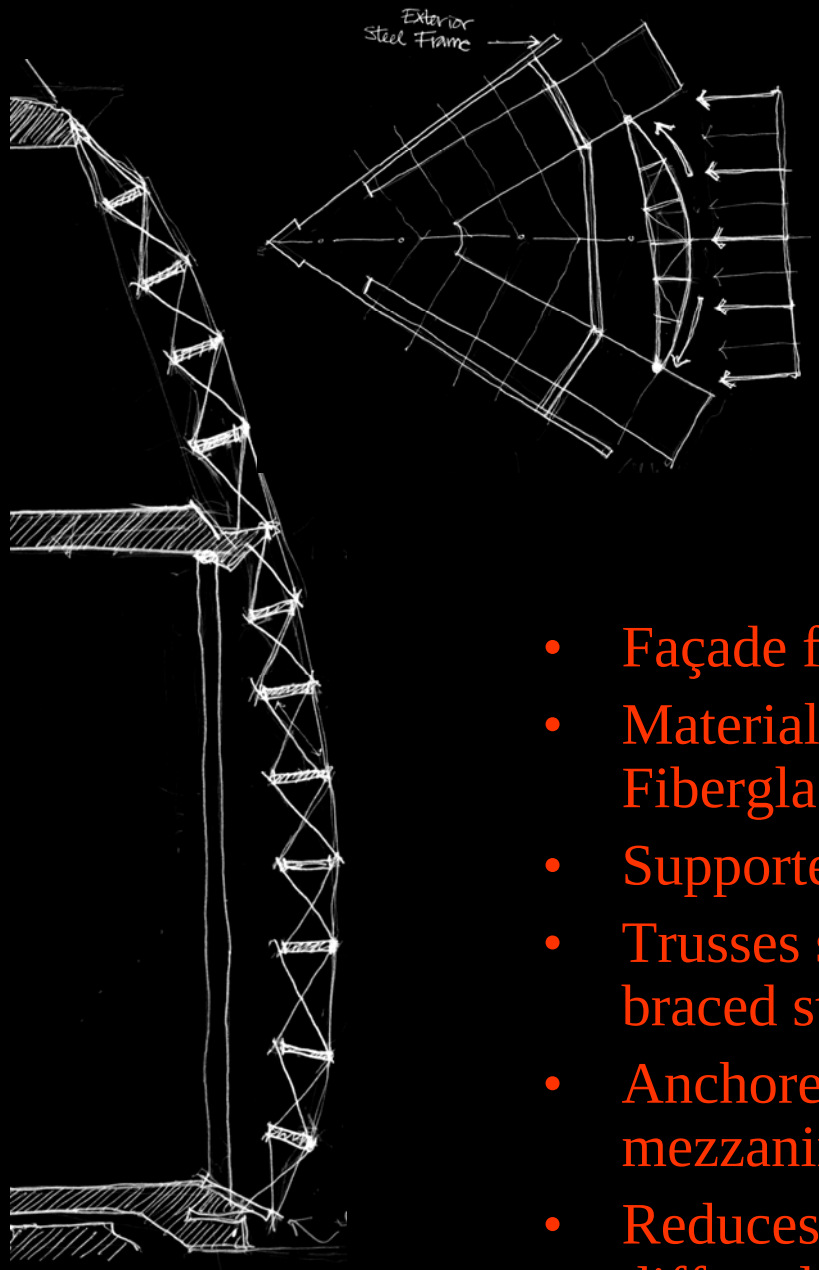
Without Bracing



With Bracing

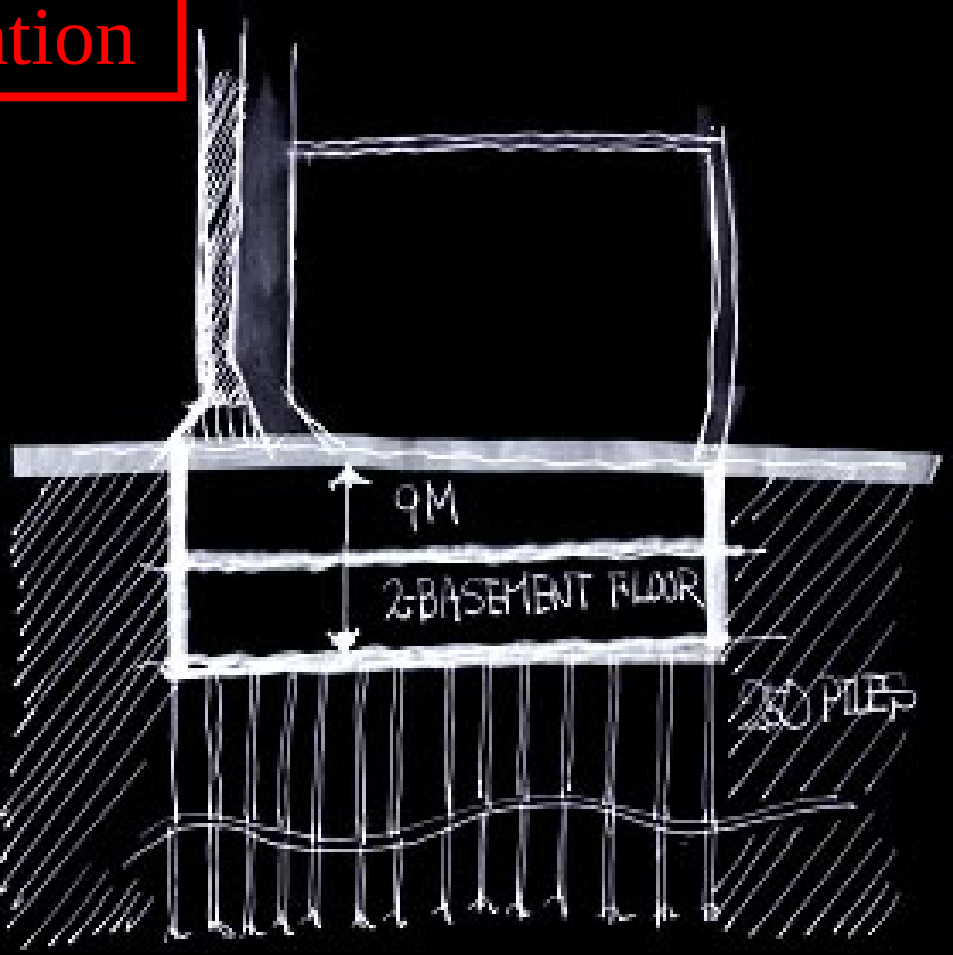


Atrium Membrane



- Façade for worlds tallest atrium
- Material – Teflon coated Fiberglass
- Supported on arched trusses
- Trusses supported by cross braced steel rods
- Anchored at the bottom, mezzanine at the top
- Reduces glare and allows diffused lighting into atrium

The Foundation



- Foundation is a piled raft
- 250 bored piles using friction
- Each is 1.5m and 35m long
- Bored through sand
- Resists earthquakes

The References

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Thank You