The Burj Al-Arab: Re-Inventing the City of Dubai

Matt Sims

Introduction to Structural Engineering

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Overview of Presentation
Shaikh Mohammed Bin Rashid sought to use oil money to ensure a stable economy for the future.
Shaikh Mohammed awards the design contract to Atkins.
The “team” of designers and builders was led by chief architect Tom Wright.
The shaikh’s iconic hotel would resemble a yacht rising out of the water.
The man-made island was constructed using large rocks with an armor layer of hollow concrete blocks.
McNicholas had to ensure that pressure from the gulf would not blast away the basement of the hotel.
Reinforced concrete piles relied on skin friction to support the foundation.
The hotel structure is composed of concrete walls, a steel “exoskeleton,” and a concrete core.

“It’s okay for the architect to draw pretty pictures, but we have to build it.”
- Malcolm Murphy
The diagonal trusses down each side of the building were 85 meters long and weighed 165 tons.
The trusses were connected to the exoskeleton using giant washers with offset holes and steel pins.
Vortex shedding around the exoskeleton could shake the building apart.
Tuned mass damper systems were chosen as a solution to the vortex shedding problem.
The *Al Muntaha* restaurant was suspended 200 m above the sea using an arrangement of 10 steel cantilever beams.
The Burj Al-Arab is referred to as the world’s premier 7-star hotel.

- $650 Million
- 321 m
- 202 Palatial Suites
- World’s Largest Atrium (180 m)
- World’s Largest Fabric Wall
- 250,000 T
- 270 m off Coast
Shaikh Mohammed’s dream is becoming a reality.

The Burj Al-Arab was the first of several artificial islands and unique high-rise projects and is now the international symbol for Dubai.
Questions?

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