Burj Khalifa

**Facts**
- **Official Name**: Burj Khalifa
- **Other Names**: Burj Dubai
- **Structure Type**: Building
- **Status**: Completed
- **Country**: United Arab Emirates
- **City**: Dubai
- **Street Address & Map**: 1 Emaar Boulevard
- **Building Function**: office / residential / hotel
- **Structural Material**: steel/concrete
- **Proposed**: 2003
- **Construction Start**: 2004
- **Completion**: 2010
- **Official Website**: Burj Khalifa

**Rankings**
- **Global Ranking**: #1 Tallest in the World
- **Regional Ranking**: #1 Tallest in Middle East
- **National Ranking**: #1 Tallest in United Arab Emirates
- **City Ranking**: #1 Tallest in Dubai

**Height**
- **Occupied**: 585.4 m / 1,921 ft
- **Architectural**: 828 m / 2,717 ft
- **To Tip**: 829.8 m / 2,723 ft
- **Observatory**: 555.7 m / 1,823 ft
- **Floors Above Ground**: 163
- **Floors Below Ground**: 1
- **Top Elevator Speed**: 10 m/s
- **Tower GFA**: 309,473 m² / 3,331,140 ft²
- **# of Elevators**: 58
- **# of Apartments**: 900
- **# of Hotel Rooms**: 304
- **# of Parking Spaces**: 2,957

**Companies Involved**
- **Owner/Developer**: Emaar Properties
- **Architect**: Skidmore, Owings & Merrill LLP
- **Engineer of Record**: Hyder Consulting
- **Structural Engineer**: Skidmore, Owings & Merrill LLP
- **Design**: Skidmore, Owings & Merrill LLP
- **Engineer of Record**: Hyder Consulting
- **MEP Engineer**: Skidmore, Owings & Merrill LLP
- **Design**: Skidmore, Owings & Merrill LLP
- **Project Manager**: Turner International LLC
- **Main Contractor**: Samsung C&T Corporation; Arabtec; Besix
- **Other Consultant**: Kinematics Inc.
- **Building Monitoring**: Hyder Consulting
- **Civil**: Hyder Consulting
- **Façade**: Far East Aluminum Works Co., Ltd.; ALT Limited
- **Façade Maintenance**: Lerch Bates
- **Fire**: Rolf Jensen & Associates
- **Geotechnical**: Hyder Consulting
- **Interiors**: Hirsch Bedner Associates
- **Landscape**: SWA Group
- **Lighting**: Fisher Marantz Stone
- **Parking**: Walker Parking Consultants
- **Vertical Transportation**: Lerch Bates
- **Wind**: RWDI
- **Material Supplier**: JORDAH; HALFEN; Al Ghurair
- **Cladding**: Otis Elevator Company
- **Elevator**: CoxGomyl
- **Façade Maintenance Equipment**: Hilti AG
- **Fire**: Jotun
- **Proofing**: Dow Corning Corporation
About Burj Khalifa

Burj Khalifa has redefined what is possible in the design and engineering of supertall buildings. By combining cutting-edge technologies and cultural influences, the building serves as a global icon that is both a model for future urban centers and speaks to the global movement towards compact, livable urban areas. The Tower and its surrounding neighborhood are more centralized than any other new development in Dubai. At the center of a new downtown neighborhood, Burj Khalifa’s mixed-use program focuses the area’s development density and provides direct connections to mass transit systems. Burj Khalifa’s architecture has embodied references to Islamic architecture and yet reflects the modern global community it is designed to serve. The building’s Y-shaped plan provides the maximum amount of perimeter for windows in living spaces without developing internal unusable area. As the tapering tower rises, setbacks occur at the ends of each of the 196 cymbals in an upward spiraling pattern that decreases the mass of the tower as the height increases. These setbacks were modeled in the wind tunnel to minimize wind forces. The design of the Tower was significantly influenced by its performance with respect to the wind, in both its shaping and orientation. The building went through many wind tunnel tests and design iterations to develop optimum performance. The exterior cladding, comprised of aluminum and textured stainless steel spandrel panels, was designed to withstand Dubai’s extreme temperatures during the summer months by using a low-E glass to provide enhanced thermal insulation. Vertical polished stainless steel fins were added to accentuate Burj Khalifa’s height and slenderness. The unprecedented height of the Burj Khalifa required it to be an innovative building in many ways. Design techniques, building systems, and construction practices all required rethinking, and in many cases new applications, to create a practical and efficient building. The structural system, termed a “battened core,” is designed to efficiently support a supertall building utilizing a strong central core, buttressed by its three wings. The vertical structure is tied together at the mechanical floors through outrigger walls in order to maximize the building’s stiffness. The result is an efficient system where all of the building’s vertical structure is used to support both gravity and lateral loads. The Tower incorporates numerous enhancements to the fire and life safety systems, including an elevator system for elevators which allows for them to be used for controlled evacuation under certain situations, decreasing total evacuation time by 45% over stairs alone. Due to its height, the building is able to utilize ventilation where cooler air temperatures, reduced air density, and reduced relative humidity at the top of the building allow for a fresh air. When air is drawn in at the top of the building, it requires less energy for air conditioning, ventilation, and dehumidification. The building’s height also generates a substantial stack effect due to the thermal differences between the building’s interior and exterior, but Burj Khalifa was designed to passively control these forces, reducing the need for mechanical means of pressurization. Burj Khalifa has one of the largest condensate recovery systems in the world. Collecting water from air conditioning condensate discharge prevents it from entering the wastewater stream and reduces the need for municipal potable water. The tower’s management systems utilize smart lighting and mechanical controls which lower operational costs, allow for a more efficient use of building resources and services and better control of internal comfort conditions. Individual electric energy monitoring systems enable energy optimization of the tower’s systems over its lifetime. With over 185,800 sq m (2,000,000 sq ft) of interior space designed for Burj Khalifa, planning of the building’s interior space began at the earliest stages of its design focusing on three main goals: to recognize and acknowledge the building’s height, to integrate its structural and architectural rationale, and to appreciate the locale’s heritage, history and culture. The interiors of the uppermost floors were designed to reflect celestial influences. This is in contrast to the lower floors, which are inspired by natural elements. An art program for elevators which allows for them to be used for controlled evacuation under certain situations,

CTBUH Initiatives

The Middle East: 30+ Years of Building Tall
28 Nov 2018 – CTBUH Research
Buur Khalifa to Host 2018 Conference Opening VIP Reception
4 Apr 2018 – CTBUH News
Vertical Transportation: Ascent & Acceleration
12 Sep 2017 – CTBUH Research

Research Papers

Highest Special-Purpose Spaces
29 Jul 2019 – CTBUH Journal Issue III
The Global Tall Building Picture: Impact of 2018
Jan 2019 – CTBUH Journal 2019 Issue I
The Middle East: 30+ Years of Building Tall
Oct 2018 – CTBUH Journal, 2018 Issue IV

CTBUH Awards

Global Icon Award 2010 Winner
CTBUH Awards 2010
Innovation Award 2015 Award of Excellence
CTBUH Awards 2015
Best Tall Building Middle East & Africa 2010 Winner
CTBUH Awards 2010

Videos

The Future of Tall Building Technology
22 Oct 2018 – William Baker, SOM
Building Tall Skyscraper Lecture Series: How High Can We Go?
16 Mar 2017 – Antony Wood, CTBUH; Richard Tomasetti, Thornton Tomasetti; Ian Smith, thyssenkrupp, Gordon Gill, Adrian Smill + Gordon Gill Architecture
CTBUH 2016 China Conference - Panel, "Tall Buildings and Context: How High Can We Go and Why Should We?"
18 Oct 2016 – Ron Klemencic, Magnusson Klemencic Associates; Karl Almstead, Turner Construction Company; Andrew Nicholson, CBRE; Jon Pickard, Pickard Chilton; Ian Smith, thyssenkrupp

Other Building Facts

The tallest building in the world. Preceded by Taipei 101.

First building to hold the title of World’s Tallest Freestanding Structure since the Empire State Building lost the title to the Ostankino Tower in 1967.
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