

Museum of the Future – Dubai, UAE

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Adjacent to the Emirates towers, and the rest of the class defining Dubai skyline, The Museum of the Future brings about a slight contrast with the style of futurist architecture but reinforces a beauty, elegance, and a message all the same. ²Announced as one of the most complex and difficult construction projects ever attempted, the Museum of the Future emphasizes classical, abstract design through the most modern of methods.

The structural system of the building was designed through BIM, but even more importantly, Parametric Design. The shape of it, similarly to a distorted donut, is known as a torus. The complex architecture of it was what made ¹Parametric design a necessity in bringing it to life. The building features the same amount of corners as it does columns: none. The structural system relied entirely on a diagrid, which is the series of triangular frames, supported by a reinforced concrete ring beam and tower. The diagrid features a single diameter for the 2400 steel members⁵, which was only capable through the unity and congruent nature of parametric design. Instead of a concrete shell, the façade is lightweight, and is composed of fiberglass panels. There are a total of three sets of fire stairs, two of which form a double helix, and reside in the larger stem of the torus, sharing space with the main exhibition area. The last fire stair is delicately fitted into the other, thinner stem of the torus. Throughout construction, the structure was laser scanned periodically in order to assess how well it matched the planned model. The panels must withstand 92 lb/ft² wind load, whereas 71 lb/ft² is for hurricane risk areas⁴.

As stated the façade is composed of fiberglass panels, ²1024 of them to be exact, which intentionally matches the number of bytes in a kilobyte, furthering the Museum's message of the future. Each of the panels was created through digital fabrication. The fiberglass façade is decorated of Arabic calligraphy, which are poetic quotes from Sheikh Mohammed bin Rashid Al Maktoum, vice president and prime minister of the UAE, that describe his vision for Dubai's future. Moreover, this calligraphy serves as windows for the museum. ³This façade is designed with the most mindful materials, namely fire retardant glass and carbon fiber reinforced epoxy prepreg.

The building, focusing on the most innovative sciences of the present, and the outcomes they could lead to in the future, is designed with an articulate MEP system⁵, with strong sustainability in mind, that earned it the LEED Platinum Rating¹. Energy comes mainly from passive solar architecture, other environment friendly features include using greywater recycling systems, regenerative drive lifts, and limited parking to encourage public transportation. Parametric modeling of movement is used to determine best how to reduce queue times, corridor flow, elevator count.

The Museum of the Future also stresses the beauty, art, and poetry of architecture. The podium, a grass platform, represents the earth. The green hill is the earth, the building is mankind, and the void represents innovation. The void is meant to represent what we do not yet know, and the innovation we would use to obtain it. The Museum of the Future represents a perfect combination of art, symbolism, and the most efficient efforts of modern engineering.

Sources

¹ <https://www.killadesign.com/portfolio/museum-of-the-future/>

² <https://www.compositesworld.com/articles/building-the-museum-of-the-future>

³ https://www.archdaily.com/606670/dubai-s-museum-of-the-future-to-be-partially-3-d-printed?ad_source=search&ad_medium=projects_tab&ad_source=search&ad_medium=search_result_all

⁴ <https://www.dezeen.com/2015/03/06/dubai-museum-of-the-future-innovation-design-oval-shaped/>

⁵ <https://thesustainabilist.ae/the-museum-of-the-future/#:~:text=The%20Museum's%20design%20is%20a,lighting%20and%20external%20thermal%20insulation.>

