



PROJECT PROFILE

Meydan One Mall

Design Peer Review of Long-Span Sloped Glazing System | Dubai, UAE



CLIENT

e.Construct

BACKGROUND

Meydan One Mall is a mixed-use residential and retail redevelopment project located in Dubai, United Arab Emirates. Architecturally, the project is notable for its intended use of a 55-metre-tall by 470-metre-long, multistory, fully conditioned indoor restaurant and retail space—the “Canyon”—that will be fully enclosed by glass. As illustrated in the conceptual design documents, the glass enclosure for the Canyon will be supported by a series of full-height, tubular structural steel frames; transverse catenary elements; and smaller rolled steel members. Glass and glazing details consist primarily of multilayer, laminated heat-strengthened and fully tempered glass panels and insulating glazing units.

WJE completed a design peer review of the proposed long-span sloped glazing system and full-height, operable glass curtain wall intended to enclose the conditioned space of the new Meydan One Mall in Dubai. As part of this review, WJE considered glass sourcing and fabrication; interface detailing to address environmental control layer continuity; and alternative systems available to improve durability, serviceability, and performance. WJE proposed ETFE as one alternative based on our own experience with that system in the U.S. and the precedent set for ETFE in a desert environment at Ferrari World in Abu Dhabi.



SOLUTION

WJE performed structural analysis to assess the anticipated installed performance of the proposed glass types and makeup of the glazing units under consideration for the Canyon project. The loads specified by the designer of record as the basis for design were used in the analysis for dead and live loads. Wind loads were based on a wind tunnel study of the Canyon roof that was prepared by a wind engineering consulting firm. Additionally, the load resistance of the glass was determined using the current provisions of ASTM E1300.



All three original glass design approaches were determined to be structurally adequate as designed and had excess capacity to resist design loads. In order to explore options available to reduce the initial cost of the system without sacrifice to the design intent of the architect, WJE completed a detailed analysis of both the glass make-up and underlying structural framing. Through this analysis, WJE determined that the original glass design was conservative and that a reduction in initial cost could be achieved through structural optimization. As an alternative, WJE also proposed a lighter-weight ETFE system to achieve the same goal, but one that would result in a change in the overall appearance of the canopy. Both options were presented to the owner for further consideration.

