

# RAIC | IRAC

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## BACKGROUND

Set in the foothills of the Andes, just beyond the metropolis of Santiago, Chile, the Bahá'í Temple of South America uses light for its spiritual and design inspiration.

Fourteen years in the making, the house of worship represents the last of the eight continental temples commissioned by the Bahá'í community.

The tenant of universality central to the Bahá'í faith mandated the aspiration of the architecture; a design welcoming to people of all faiths and cultures, or none at all, and recognizable as a house of worship without reference to specific iconography. The brief specified a nine-sided domed structure with nine entrances to symbolically welcome people from all directions of the earth.

Developed through hand sketches, physical models, and state-of-the-art digital technology, the design is composed of nine identical, gracefully torqued wings that frame an open, accessible, light-filled space for prayer and meditation.

The structure of the temple consists of three principal sections: a two-storey concrete base composed of the basement with a service tunnel, the ground floor, and a mezzanine level; a steel superstructure consisting of nine identical, 30-metre tall wings or veils; and seismic isolators which separate the building parts below grade from those above.

The super-structures of the wings are comprised of hundreds of unique, individually engineered slim-profile steel members and nodal connections. Each of the wings rests on concrete columns on seismic bearings, so that in the event of an earthquake, the concrete pads can slide to absorb the shock.

An investigation into the material qualities that capture and express light resulted in the development of two cladding materials: an interior layer of exceptionally translucent marble from Portugal, and an exterior layer of cast-glass panels developed for this project.

The research for the cast-glass exterior cladding took nearly four years, working in collaboration with artisans at Jeff Goodman Studio in Toronto. A remarkable 21,129 unique pieces of both flat and curved cast-glass pieces were produced and assembled to create each of the nine wings. On the interior, flat pieces of marble were water-jet cut while the curved pieces were extracted from blocks.

The complex curves of the conceptual design required the studio to look beyond the traditional three-dimensional visualization software used by the architectural industry, toward modeling platforms geared to fabrication and manufacturing.



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CATIA software, used at the time primarily by the automotive, aviation, and aerospace industries, was selected for its ability to manage the large amount of geometric and informational data required for such a complex and non-regular form and to transfer this information directly to fabrication machines.

The final fabrication of the steel superstructure was made possible through advanced techniques, from CNC plasma cutting to 5-axis CNC milling machines. The multitude of parts was assembled in Germany into manageable sections, to be shipped and assembled on site in Chile.

The site is exposed to diverse weather conditions and located in a highly seismic zone. Consequently, the structural design of the temple had to be able to withstand extreme earthquakes, wind, and weather.

Prefabricated pieces for the structure and cladding of the building—made with the aid of advanced three-dimensional surveying technology—were shipped from multiple countries, where these elements were produced, and then assembled on site in Santiago.

The sophisticated use of BIM to coordinate a host of consultants from the design phase through to construction ensured that a complex form was able to come together without interference between trades as everything was updated on a single 3D model at site meetings.

