The Basilica of Our Lady of Lebanon

Pierre El Khoury's 1960s design is a breathtaking tribute to Mount Harissa

Situated on the high Harissa Mountain at an altitude of 550m, in close proximity to Jounieh Bay, the Basilica of Our Lady of Lebanon is built with its form converging towards the iconic statue of Virgin Mary. Designed in the late 1960s by renowned Lebanese architect Pierre El Khoury, the imposing basilica is an innovative work of architecture, paralleling both local and international movements in its structural and organic manipulations of concrete. The basilica's construction was an enduring process, with geometrical and cultural challenges that extended well into the 1990s.

Pierre El Khoury's design for the basilica was strongly a product of its time. During the 1960s, international architectural movements included approaches such as brutalism, which manifested in masterful concrete structures, and neo-expressionism, which encouraged formal and geometrical articulations, relying heavily on concrete's plasticity and aesthetic. El Khoury's design for the basilica is reminiscent of the work of Jørn Utzon for the Sydney Opera House, and also parallels Eero Saarinen's formal manipulations and Pier Luigi Nervi's structural ingenuity. Advances in structural tensioning of concrete were prominent as well in the late 1950s and early 1960s in both the USA and Europe, particularly prestressed concrete. El Khoury's immediate access to the technology through his family's business provided the setting and background for his design.

The basilica was envisioned as a ribbed shell structure with the raw materiality of concrete, hovering over a stepping interior and operating as a huge amphitheatre visually focused on the Virgin's statue through a central glazed opening. The shell was designed with multiple formal allusions, starting with the idea of a veil developing from the Virgin's dress, while geometrically cascading down to resemble the form of a sailboat. El Khoury situates his design in a masterful manner, connecting it in section to the sharp slope of the mountain, while depicting it in plan as converging lines that meet at the centre point of the statue.
In both its formal and structural approach, the design is suggestive of organic architecture — or nature inspired design, where form, aesthetics and structure are all part of a single coherent whole, as in most organisms. These approaches to design were well ahead of their time in El Khoury’s region. Although designed in the late 1960s, the basilica was officially inaugurated in the late 1980s. Yet its much earlier conception shows the architect’s forward thinking and his highly educated links to developments in architecture during that period.

The shell structure is composed of five overlapping veil sections on each side of the central nave of the basilica, the tallest reaching a height of 54m from the ground. Each of these sections is composed of 12 structural ribs constructed in reinforced concrete, emerging from a stone foundation wall. The ribs each have their unique complex curvature, changing orientation and angle as they ascend. In elevation, the curving line of the descending veils moves down counteracting the slope, while the ground line steps up forming and shaping the internal space along the natural slope. The structural design used reinforced concrete with post-tensioning in the shell's base, developed by engineer Noel Absa Hamad. The main challenge, according to El Khoury, was how to resist the lateral tendency of the rib geometry to unfold. The solution was to use tension cables tied from the base of the structure down to the foundations. The construction of the basilica started around 1970 and was done in several phases over a period of 20 years. In 1977, engineer and contractor Monir Aoun took charge of the execution from that date until its finalisation in 1997. The geometric complexity and scale of the basilica, in its concrete shell and towering curtain wall, were the biggest challenges, and necessitated ingenious solutions. Each side of the geometry had its own specific double curvature, and thus proved extremely difficult to draw and construct with the techniques available then.

The construction of the shell faced three main challenges: the scaffolding structure, the tower crane's flexibility and the implementation of the geometry's formwork on site,' says Aoun. He collaborated with French company Entrepomme in 1970, during the building of the structure, and after that, the construction was continued with the help of local companies.
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who were brought in to fabricate and install the intricate steel scaffolding. The tower crane was constructed on wheels and rails, allowing flexibility of movement as every section of the structure is poured. For the geometry, Asn says, he developed detailed blueprints following El Khouy’s design, where each rib’s exact shape, curvature and height were articulated. To execute the complex structure, every rib section was drawn over plywood panels on the ground, and then cut and constructed vertically to shape the complex formwork. Each set of opposing ribs were simultaneously poured vertically at intermittent sections of three metres, connecting at the top with a lateral beam.

Another difficult part was the main curtain wall façade that formed the front of the basilica between the two highest ribs. “With El Khouy’s consent, we developed concrete columns that revolve and taper as they ascend to hold the curtain wall system, which starts as two panels at the base and merges into a single line at the top,” says Asn. The glazing connected to these columns and their adjoining beams, forming the front opening.

To this day, the basilica’s design remains current and spatially compelling, proving to be timeless in its approach and concept. In a video interview with Joseph Brakha, Pierre El Khouy describes his approach to architecture: “Architecture for me is not only the act of building – it is to place a bit of harmony in our chaotic environment.” He asserts that architecture needs to stay current – to follow its time, materials and technology. The design of Harissa’s busy basilica stands witness to the architect’s vision and that period’s innovation and challenges. The intricacy of its structure, its internal complexity and its geometrical magnificence remain today a strong architectural symbol, assimilating people and elevating their experience.