[RE]FOLDING MUQARNAS:
A CASE STUDY

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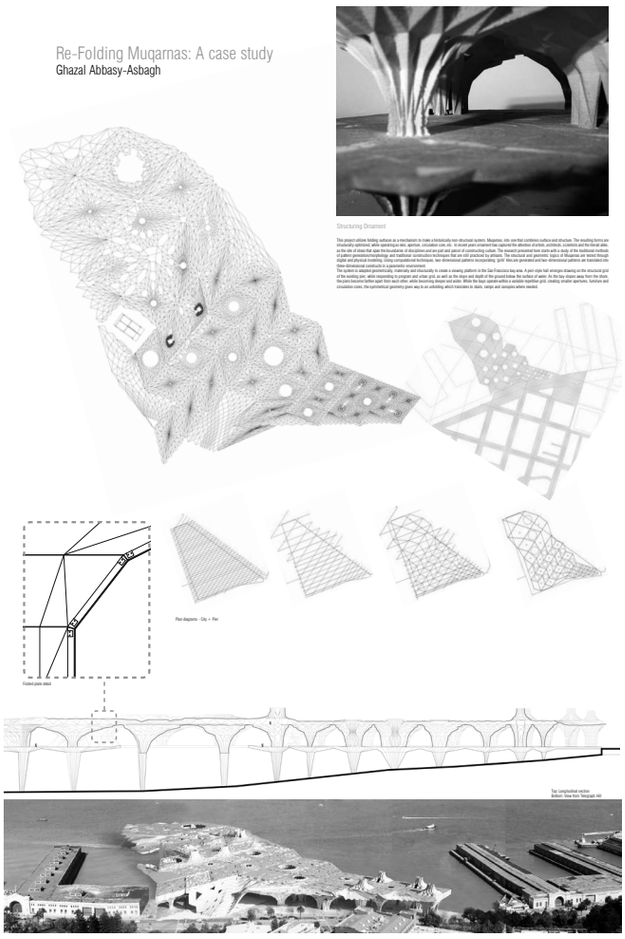
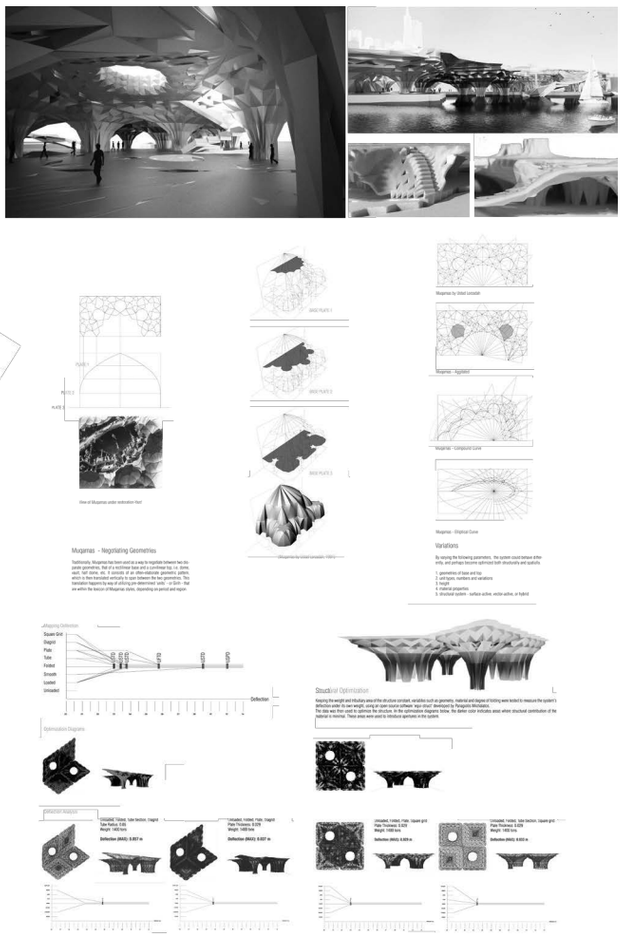
1 Muqarnas under reconstruction in Yazd, Iran (Aga Khan Archive, Harvard Fine Arts Library)

This project uses folded surface as a mechanism to make a historically non-structural system, Muqarnas, into one that combines surface and structure. The resulting forms are structurally optimized while operating as skin, aperture, circulation core, etc. In recent years, ornament has captured the attention of artists, architects, scientists and literati alike, as the site of ideas that span disciplinary boundaries and are operative in constructing culture. This research begins with a study of traditional methods of pattern generation and construction techniques still practiced by artisans. Traditionally, Muqarnas has been used as a way to negotiate between two disparate geometries, that of a rectilinear base and a curvilinear top, i.e. dome, vault, half dome, et cetera (Lur'zadah, 1979). It consists of an often-elaborate geometric pattern, which is then translated vertically to span between the two geometries. This translation happens by way of utilizing pre-determined "units"—or Girih—that are within the lexicon of Muqarnas styles, depending on period and region (Lur'zadah, 1979). The structural and geometric logics of Muqarnas are tested through digital and physical modeling. Using computational techniques, two-dimensional patterns incorporating "girih" tiles are generated, and translated into three-dimensional constructs.





The system is adapted geometrically, materially and structurally to create a viewing platform in the San Francisco Bay Area. A peri-style hall emerges, drawing on the structural grid of the existing pier while responding to program and urban grid as well as the slope and depth of the ground below the surface of water. As the bay slopes away from the shore, the piers become farther apart from one another while becoming deeper and wider. While the bays operate within a variable repetitive grid, creating smaller apertures, furniture and circulation cores, the symmetrical geometry gives way to an unfolding that translates to stairs, ramps and canopies where needed.

WORKS CITED

Lur'zadah, Husayn. 1979. Ihya-'i hunarha-yi az yad raftah-i mi'mari-i Iran / ta'lif va tasnif-i Husayn bin Muhammad bin Isma'il Lur'zadah. Tehran: Muhammad Khvajavi.

GHAZAL ABBASY-ASBAGH is a lecturer at the University of Virginia School of Architecture. A practicing architect since 2001, she has collaborated with award winning practices such as Office dA Architecture and Urban Design and Rafael Vinoly Architects. At Office dA her key projects were the Macallen Building and the Al-Sharq Master Plan, among other notable large urban projects. She was the project architect for building enclosure systems for the Howard Hughes Medical Institute at Rafael Vinoly Architects. Her work has been exhibited widely and recently received an AIA unbuilt award in Washington, DC. In 2013, she received a Fulbright Grant to travel to Panama City. Abbasy-Asbagh received her M.Arch from the Harvard Graduate School of Design and degrees in architecture and civil engineering from Catholic University.