Prefabrication in an Expanded Field

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When discussing the topic of prefabrication, the projects that come immediately to mind are the modular box homes or unitized curtain wall systems now pervasive in the building industry. Yet prefabrication is everywhere, and in radically different forms. From Office dA and Johnston Marklee's Helios House gas station to Foster + Partner's modular structure for the Queen Alia International Airport, offsite fabrication reduces costs, construction time and can increase construction standards.

Prefabrication is by no means a radical idea at the installation scale; nevertheless it made huge sense when anticipating the install process in a well-traveled site in Cal Poly San Luis Obispo's campus library. Reflection is located above a grand staircase so the installation time needed to be short and easy. An offsite fabrication process was anticipated from the start of design through the choice of a lightweight aluminum material that enabled the modulated form to be preassembled in larger groupings. The assembly is comprised of powder-coated .040" aluminum--only .570 pounds per square foot-- that was folded and dry welded using rivets. The folded form created rigidity and integrity in each module. Since each component was extremely lightweight, the 72 parts were connected in just 13 prefabricated assemblies. As a result, the contractors were able to install the modules in four hours, which was faster than anticipated—most of the onsite construction time was spent setting up the scaffolding.

Reflection is a semi-permanent installation created for the Robert E. Kennedy Library. The modulated sculptural form echoes its surrounding staircase context by climbing the wall and bouncing light from the nearby windows. It also literally reflects activity in the stairwell with subtle mirrored faces that animate the field with the movement of passersby. At night, the adjacent window wall reflects both the piece and its embedded lighting, projecting it into the courtyard outside. Students helped to assemble the modules and computer engineering major, Eric Buckthal, engineered the lighting program for the embedded LEDs that emit a different sequence of colors during daylight and nighttime hours.

LIGHTNESS AND PREFABRICATION IN AN EXPANDED FIELD

Above: Early studies and paper model investigating form and texture.

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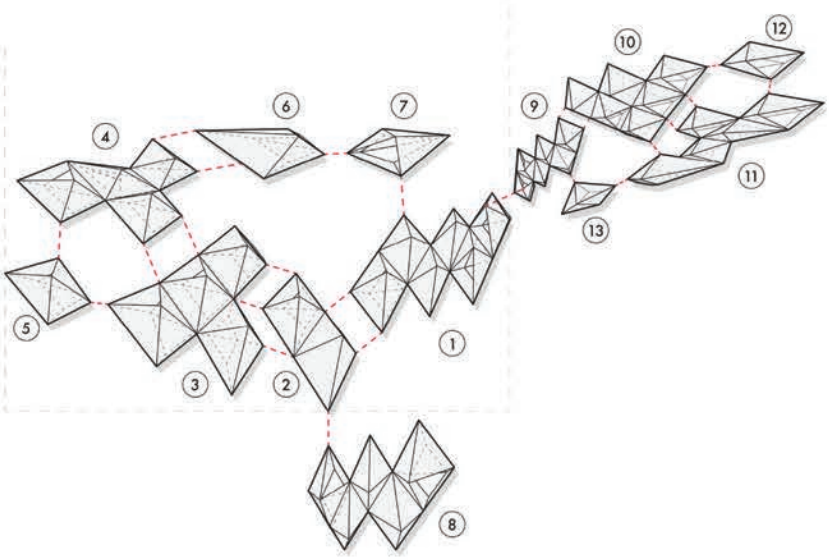
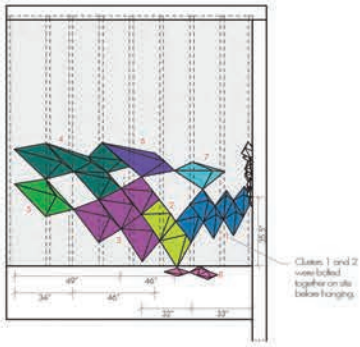
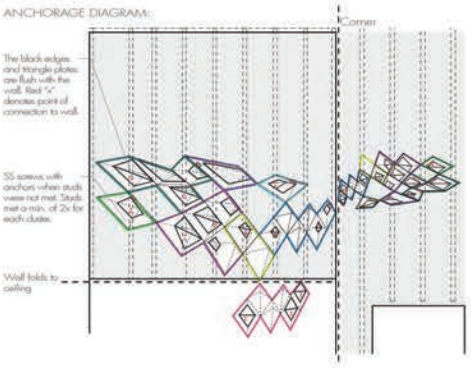


PREFABRICATION DIAGRAM:



ANCHORAGE DIAGRAM:



Above top: Laser cutting the aluminum, powder coating, riveting the modules and clustering them in easy-to-install assemblies.

Above and right: The four hour installation process was facilitated by the use of lightweight, preassembled parts.

Above and left: Embedded LEDs programmed with a microcontroller that senses daylighting to provide two different lighting programs for day and night. The sequence runs through blue, green and yellow during the day and pink, purple and blue during nighttime hours.