

CASE STUDY

LIGHTING THE LANDSCAPE: ENGINEERING UNIFORM BACKLIGHTING FOR CATALINA ISLAND



**CATALINA ISLAND CONSERVANCY
TRAILHEAD VISITOR CENTER**
AVALON, CA



A panoramic aerial image of Catalina Island spans the Trailhead retail environment, creating a luminous architectural focal point behind the transaction area.

LIGHTING THE LANDSCAPE: ENGINEERING UNIFORM BACKLIGHTING FOR CATALINA ISLAND

At the Catalina Island Conservancy Trailhead, a monumental panoramic attract wall called for a light engine that could disappear behind the image - delivering uniform illumination within a shallow cavity while remaining practical to install across more than 30 feet of wall.

At the Catalina Island Conservancy Trailhead Visitor Center in Avalon, the Island itself becomes part of the interior experience. A large aerial image of Catalina stretches across the primary attract wall, giving visitors an immediate visual connection to the landscape and conservation mission beyond the storefront.

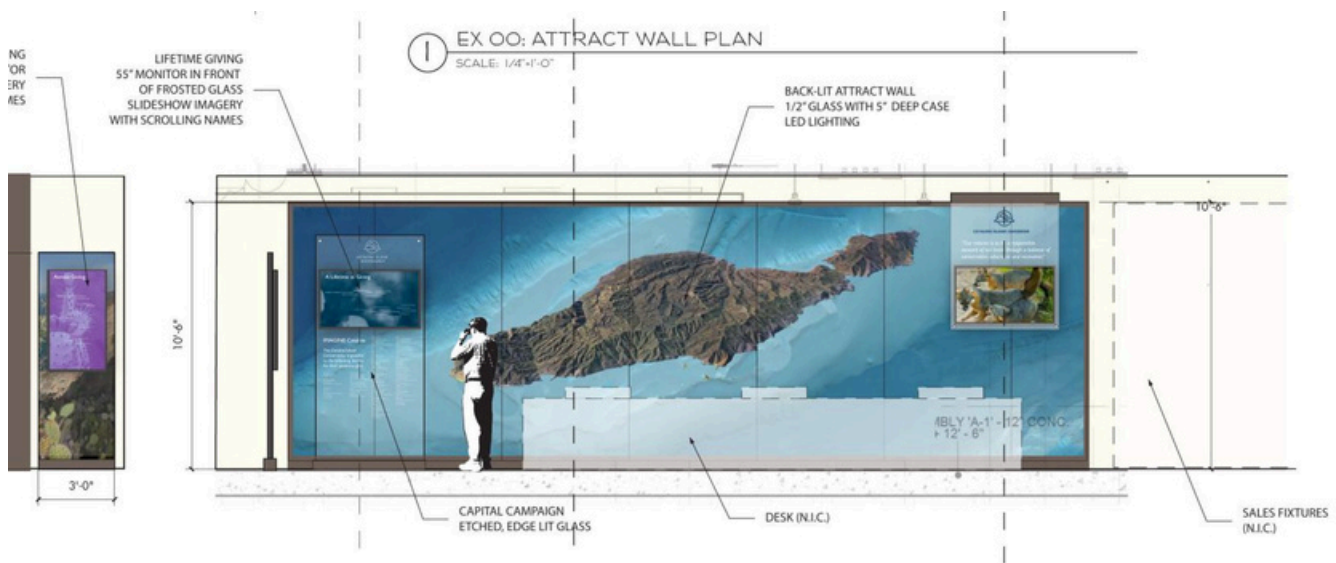
The exhibit design established a clear visual objective: a large, continuously illuminated graphic wall. What it did not prescribe was the specific light engine needed to achieve it. That distinction became the starting point for LEDCONN's role in the project.

"The lighting had to disappear so the landscape could take over."

A PERFORMANCE BRIEF, NOT A PRESCRIBED LIGHT ENGINE

The exhibit bid documents define EX 00 as a back-lit attract wall approximately 31'-6" wide and 10'-6" high. The assembly called for six equal glass panels carrying a second-surface transparency image, with the illuminated graphic housed in an approximately 5-inch-deep case. The lighting requirement itself was deliberately broad: simply LED lighting. In the section detail, the source is described as an LED light panel or mesh.

That left an important fabrication question unresolved: what type of LED system could illuminate a surface of this scale evenly, fit within the available depth, and still be efficient for the installer to lay out and connect?



Original exhibit bid drawing for the EX 00 Attract Wall. The design establishes the 5-inch-deep backlit case and visual intent, while leaving the LED light-engine configuration open for fabrication development.

FROM DESIGN INTENT TO LIGHT-ENGINE SELECTION

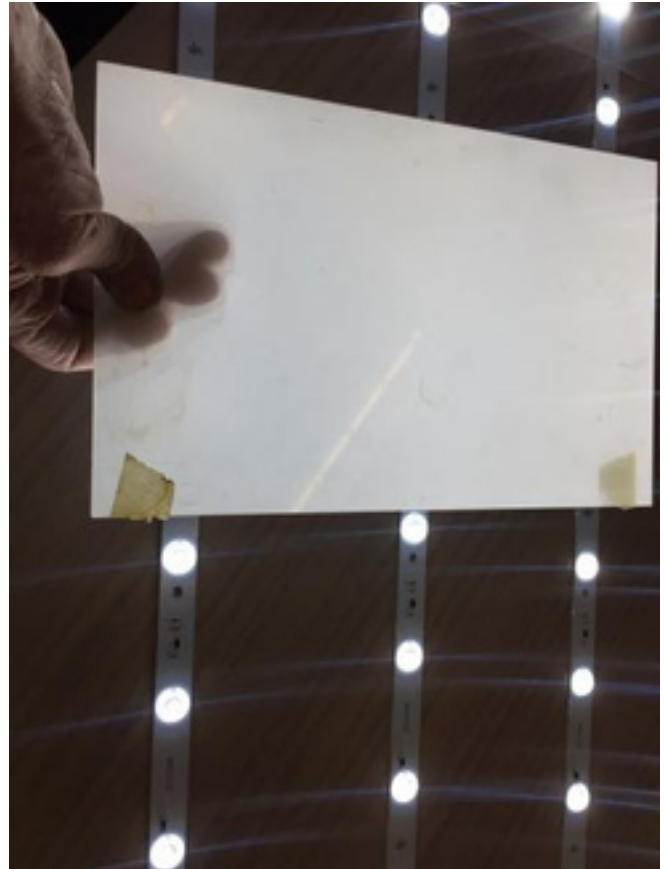
Ironwood, the exhibit fabricator, worked with LEDCONN to translate that open lighting requirement into a buildable system. Rather than selecting a product by name first, the team evaluated the application around the conditions that mattered most: broad-area uniformity, shallow installation depth, repeatable spacing, and installation efficiency across a very large surface.

LEDCONN recommended an early version of the lattice-based technology that would become LUXMESH™ LED Lattice. For this type of application, the advantage was not simply output. The interconnected lattice format made it practical to establish a consistent lighting grid over the wall without treating every row as an independent lighting assembly. That reduced layout complexity and gave the fabricator a repeatable installation method across the full field.

MOCK-UP FIRST: DESIGNING OUT HOT SPOTS

Uniformity could not be assumed from a drawing. Before the wall was populated, LEDCONN tested the relationship among LED optics, light-engine spacing, diffuser or graphic distance, and the available cavity depth. The goal was to eliminate visible LED hot spots before the system reached the finished graphic.

The wide 120° LED distribution allowed adjacent beams to overlap across the shallow cavity. By viewing the light through a sample panel during mock-up, the team could adjust spacing until the source points visually disappeared. With the enclosure depth already constrained by the exhibit design, this testing helped establish the spacing needed to achieve even illumination without unnecessarily increasing LED density.



Lighting mock-up used to evaluate diffusion and hotspot control. The wide 120° optical distribution, LED spacing and distance to the illuminated surface were considered together so individual LED images would blend into a continuous field of light.

ENGINEERING CONSISTENCY AT ARCHITECTURAL SCALE



Behind the finished graphic, the lattice-based LED system creates a repeatable field of light across the expansive wall, simplifying layout while supporting consistent illumination.

On a small lightbox, a slight change in spacing may go unnoticed. Across a wall more than 30 feet wide, the same variation can become a visible band, hot spot, or dark zone in the image. The lighting therefore had to behave as one continuous system rather than as a collection of individual LED rows.

The lattice approach helped preserve that consistency during installation. A repeatable grid reduced the amount of individual positioning required in the field, while the broad optical distribution provided the overlap needed to blend the LEDs before light reached the graphic surface. The result was a practical installation method that supported the visual uniformity established during mock-up.

THE RESULT: THE LIGHT SOURCE DISAPPEARS



The completed backlit landscape integrates with the retail environment, allowing the image - not the light source - to define the visitor experience.

Once the glass and panoramic Catalina image were installed, the lighting receded from view. Visitors see a luminous landscape rather than the individual components behind it. The wall reads as one continuous image and serves as an architectural backdrop to the retail environment.

The project illustrates an important part of custom backlighting that is easy to overlook: light-engine selection often happens after the design intent is established but before the visual result can be guaranteed. In that gap, mock-up testing and application engineering become as important as the LED product itself.

For LEDCONN, the solution was not about substituting one named product for another. It was about identifying the light-engine architecture that best fit the wall, validating the optical relationship in a mock-up, and giving the fabricator a system that could reproduce that performance across the full installation.



PROJECT INFORMATION

PROJECT SNAPSHOT

Client	Catalina Island Conservancy
Application	Large-format architectural graphic backlighting / EX 00 Attract Wall
Location	Trailhead Visitor Center, Avalon, California
Exhibit Fabricator	Ironwood
Exhibit Bid Drawings	Office of Kristen Olmon, Inc.
Lighting Solution	LUXMESH™ LED Lattice System
Approx. Wall Size	31' - 6" wide x 10' - 6" high
Graphic Assembly	Six equal 1/2-inch glass panels with transparency image mounted second surface (provided by others)
Lighting Cavity	Approximately 5 inches deep
Primary Lighting Criteria	Hotspot-free uniformity, repeatable spacing and installation efficiency
Development Method	Physical mock-up to validate optic spread, LED spacing and distance to illuminated surface