Scripps Ocean-Atmosphere Research Simulator (SOARS) Lab



Case Study





CLIENT

Scripps Ocean-Atmosphere Research Simulator (SOARS) Lab University of California San Diego, La Jolla, CA

CHALLENGE

In an effort to complete a sophisticated new ocean simulator, scientists at the historic Hydraulics Laboratory faced the challenge of controlling sunlight to precisely replicate real outdoor ocean conditions indoors.

RESULTS

Solatube Tubular Daylighting Devices (TDDs) allowed for natural daylight to be introduced into the lab to have controllable sunlight to measure algae growth critical for various testing and scientific studies.

PRODUCT

(6) Solatube M74 DS SkyVault Series with Amplifiers and Daylight Dimmers

SOLATUBE DISTRIBUTOR/INSTALLER Sun West Distributors, INC

ARCHITECT

CRB Architects & Engineers PC

BACKGROUND: Scripps Ocean-Atmosphere Research Simulator (SOARS) Lab at the University of California San Diego, has been at the forefront of climate change research, marking the beginning of the modern era in this field. Today, Scripps stands as a global leader in observing and comprehending the transformations occurring on our planet, assessing their impacts, seeking viable solutions and nurturing the next generation of scientific and environmental pioneers. Renowned as one of the oldest, largest and most influential centers for global earth science research and education worldwide, Scripps is dedicated to unraveling the mysteries of our oceans, earth and atmosphere, with a focus on addressing our most pressing environmental challenges.

To study the interconnected ocean and atmosphere, scientists at Scripps were awarded a National Science Foundation grant to build a first-of-itskind ocean simulator. The simulator is the only one in the world that allows for replication of ocean, atmosphere and biology in one instrument.









CHALLENGE: The pursuit of this groundbreaking innovation posed a formidable challenge for the scientists involved, as they needed to be able to control the sunlight that entered the laboratory to replicate the conditions of real oceans for the controlled growth of algae for various testing and scientific studies. Moreover, the laboratory's uniquely curved, copper fleece lined roof posed an additional challenge as they sought to find a daylighting system that could bring natural daylight into the space and integrate it efficiently. The design team needed a solution that would complement the curved roof's architecture while ensuring optimal solar capturing efficiency.



SOLUTION: To achieve optimal controlled daylighting to realistically replicate real ocean conditions, the architects at CRB Architects & Engineers PC turned to Solatube Tubular Daylighting Devices (TDDs). Leveraging the power of the proprietary Solatube Design Calculator, which uses photometry combined with weather data to accurately predict daylight distribution, and in close collaboration with the scientists, the architecture team carefully determined the precise physical parameters of daylight required for successful algae growth and other crucial scientific experiments.

Sun West Distributors installed the Solatube M74 DS SkyVault Series with Daylight Dimmers which granted the laboratory the ability to exercise precise control over the amount of natural daylight introduced into the experiment and space.

The design team crafted a custom curb that seamlessly integrated the Solatube TDDs into the facility's existing curvature. This custom curb not only supported the tubes but also ensured waterproofing for the existing copper roof.



The original copper fleece membrane was no longer available in a linear embossing, so a specially sourced cross-hatched embossed copper fleeced roof from Italy was used to match the historic materials. This careful selection ensured that the new roofing would patina to match the existing roof over time, making the modifications inconspicuous.

Additionally, the positioning of the Solatube TDDs and the wave simulator had to comply with California Coastal Commission regulations. The tubes were positioned strategically to avoid being above the tallest part of the curved roof, maintaining regulatory compliance.

RESULTS:

"Since the design intent and goal of the project was to penetrate the historic building skin in the most minimal way possible, it was rewarding to see the minimal impact the Solatube Tubular Daylighting Devices had on the building. This was especially true, and realized, when the new copper fleece roofing started its patina and blurred the line of what was new and existing. Similarly, from below, the tidy 2x4 ladder we created with the tubes centered in between looked as if it had been erected in the 1960s, when the building was constructed. Overall, the look and feel complimented the actual performance of the daylight for the science below in a way that we all felt was a success"

- Vasilies Beseau, AIA, Architect, CRB Architects & Engineers PC





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