

## Project Report

Franklin Township Library

Somerset, NJ, USA



Architect: Arcari Iovino

### REVITALIZING A FAILED POLYCARBONATE DISASTER

#### KALWALL SPECIFICATION:

Panel: 2.75"   70 mm
Grid core: shoji
Exterior FRP: crystal
Interior FRP: white
System finish: aluminum #79
U-Value: .18   0.99 Wm <sup>2</sup> K
Solar Heat Gain Coefficient: .09
Visible Light Transmission: 7%

#### WHAT IS KALWALL?

A translucent, structural sandwich panel that provides:

- Glare-free, balanced daylighting
- Superior thermal performance
- Energy + electricity saving
- Low maintenance life cycle requirements
- Safety + security through visual privacy
- Durability + graffiti / vandal-resistance
- Hurricane, explosion venting + blast rated options



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For unparalleled thermal performance in translucent daylighting, consider specifying Kalwall with **CABOT's Lumira®** aerogel insulation. Available in 2.75" (70 mm) panel formats up to: 4' x 12' (1200 mm x 3600 mm) and 5' x 10' (1500 mm x 3000 mm) maximum.

This project has quite an interesting story. In 2005, the library decided to break the design specification and move forward with a manufacturer who produces polycarbonate roof panels instead of the originally designed and specified Kalwall translucent Fiberglass Reinforced Polymer (FRP) faces for its skyroof®. The decision to use polycarbonate was based on project budget savings, which would save the library \$90k to cover over 14,000sf of interior space as well as the adjacent butterfly garden skyroof, covering 600sf.

After installation, the occupants of the library noticed that the solar heat gain became unbearable, and the HVAC system could not cool enough in the warmer months nor warm enough in the colder months. As a result, and after years of discomfort, moisture leaks, panel yellowing and poor light quality, the library engaged a mechanical engineer to analyze the facility.

According to the mechanical engineers on the project, the HVAC drawings indicated that air conditioning for the library was provided by two 20-ton, 8,000 CFM rooftop air conditioning units with supply and return ductwork on the east and west side of the space. The cooling load calculations reveal that 40 tons is the proper capacity if the Kalwall system was installed. However, a polycarbonate system would require at least another 20 tons, for a total of 60 tons. Adding another 20 tons was estimated to cost around \$200k.

After almost 19 years of exorbitant operational costs, the library found it was losing upwards of \$50-\$60k annually in energy costs, thus nullifying the initial \$90k savings in just the first 18 months of the building's opening. Kalwall was once again asked to provide a solution, and the library finally received what was originally intended—perfectly diffuse, museum-quality daylighting™ that not only provides exceptional thermal performance but is virtually maintenance-free and will thrive in all climates for decades to come.

The new skyroof face sheets included:

- Exterior: 0.70 crystal type A
- Interior: 0.45 white type 25
- U-Factor: 0.18 custom Kalcurve® skyroof

Over the 19-year period with inefficient, failing polycarbonate and high HVAC costs, the library could have dramatically saved on these costs if they originally installed Kalwall's translucent FRP faces in its skyroof.

The energy savings, occupant comfort, visual acuity and longevity of Kalwall's products are superior to any other daylighting alternative. The library, in trying to save \$90k for an inferior solution—turns into a classic story of how sometimes "you get what you pay for."

Kalwall's Sr. Architectural Consultant, Steve Del Guercio, who oversaw the library's transformation said:

*"It's one of the most unique projects I think I've ever worked on. We were substituted for polycarbonate in 2005 and now the library came back to us and they got what was originally designed and they're now enjoying the benefits. There's a real and direct impact on the advantages of Kalwall versus polycarbonate."*

