RESULTS

Challenged by the demands of providing daylight to a museum, the designers took a chance with an innovative skylight design. Direct sunlight was not to be allowed in the galleries. The resulting design using a 25-foot reflective light shaft to bring daylight to the lower gallery raised some concerns. Physical modeling demonstrated two things: direct sunlight would not penetrate into the galleries; and even in the worst case conditions under cloudy skies, the electric lights were not necessary during daytime hours.

Designed and built from 1983–1988, the designers were successful in demonstrating through physical models the functionality of a unique skylight design prior to being built. After ten years of operation, the automated daylight shading system continues to function as desired, protecting the galleries from direct sunlight while providing natural light in a way that greatly enhances the overall experience of visiting the museum.

RESOURCES

PG&E does not endorse particular products or services from any specific manufacturer or service provider. High efficiency products and services similar to those used in this project are available from multiple suppliers. For informational purposes, PG&E notes that the following companies provided equipment or services to the project:

**Architect:**
Moshe Safdie & Associates, Boston, Massachusetts
http://blackader.library.mcgill.ca/cac/safdie — 617-629-2100

**Lighting Designers:**
Fisher Marantz Stone, New York, New York
212-691-3020

**Automated Blinds:**
Solarfective, Toronto, Ontario
Tel: 416-421-3800 — Fax: 416-421-8424

**Photosensor Controls:**
Technical Blinds, Gloucestershire, UK
Tel: 01594 832010 — Fax: 01594 836674

**Photos:**
Courtesy of George Loisos

ADDITIONAL CONTACT INFORMATION

Pacific Energy Center, San Francisco, California
www.pge.com/pec/daylight — 415-973-7206

National Gallery of Canada, Ottawa, Ontario
http://national.gallery.ca
Where Art and Architecture Meet

Physical modeling proved this novel two-stor...
Architecture Meet

novel two-story daylighting design would work.

The lower-level rooms. This unusual device needed additional evaluation before curators would commit to the design.

Several small models were built, then larger (1:20) scale models were tested. Finally, a full-size mockup of one gallery was built to verify that such an unorthodox idea would work. It did.

PRISMATIC DIFFUSER LENS

Much like the lens common in fluorescent fixtures today, a prismatic acrylic lens at the ceiling level helps to diffuse the daylight across the room. This lens is installed only on the lower gallery and not on the upper floor galleries.

AUTOMATED BLINDS

In the side galleries, daylight is brought in through a vertical clerestory. To control the light levels in this space, automated blinds mounted on the interior of the clerestory are adjusted via a photosensor control to maintain the illuminance levels in the room (see photo). The photosensor is mounted below the windowsill.

FIXED LOUVERS

Wide aluminum louvers, installed at a fixed pitch to prevent direct sunlight from entering the gallery, are mounted inside the clerestory of the lower side galleries. The automated blinds, described above, are positioned between the louvers and the clerestory to control the quantity of light.

ELECTRIC LIGHTS

Most of the electric lights in the galleries are spotlights. The electric lights are linked to a building management system where curators can decide when to turn the lights on or off based on scheduling, the season, time of day, and curatorial specifications. Photosensor control is not used in this case.

Deep light shafts coated with highly reflective mirrored acetate conduct light to lower-level rooms.
RESULTS

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This program is funded by California utility customers and administered by Pacific Gas and Electric Company, under the auspices of the California Public Utilities Commission.

Additional Contact Information

Pacific Energy Center, San Francisco, California
www.pge.com/pec/daylight — 415-973-7296

National Gallery of Canada, Ottawa, Ontario
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Photos: Courtesy of George Loisos

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