Morgan Solar Daylight and Energy Solutions for Sustainable Buildings

Sustainability Challenge

Buildings have complex light management challenges due to shading from surrounding buildings, undesirable solar heat gain and glare, and competing demands for daylight including energy, illumination and view. Given these constraints, how can we use the entire building surface area to reduce carbon emissions, build beautiful and enjoyable buildings and further sustainability goals?

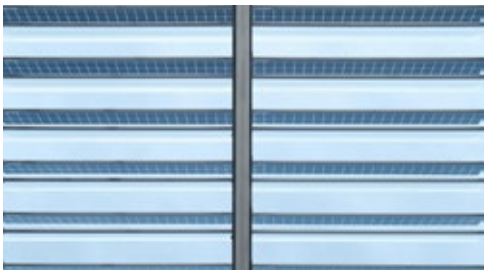
Morgan Solar Approach

1. **Understand what you want to achieve**
2. **Model the building**
3. **Assess the performance and financial return of various options**
4. **Optimize for the desired value(s)**
5. **Customize a solution proposal with our PV and optical fin platform**

SPOTlight Fins

SPOT - Simple Planar Optical Technology
- is an optical platform that enables light management in a thin cross section.
In buildings, SPOTlight is used to generate energy onsite, provide shade and improve occupant comfort, and transmit natural daylight without uncomfortable heat and glare.
A SPOTlight array is a functional and showcase aesthetic feature which demonstrates a commitment to sustainability. Integrated LEDs can be added for architectural detailing, signage and other illumination applications.

PV AND OPTICAL FINS



VIEW OF SKY THROUGH PV AND OPTICAL FINS

Case Study

The Ontario Association of Architects (OAA) renovated their Toronto headquarters to be Net Zero Energy. Despite installing conventional solar panels over almost the entire roof, the OAA needed more energy to satisfy the building energy requirement and did not want to cover the atrium and patio with opaque solar panels. To solve this problem, Morgan Solar designed a 200 m^2 customized SPOTlight Solar Pergola to generate 40,000 kWh annually, block 75% of the heat and glare throughout the year, and maintain a view of the sky. Integrated multicolor LEDs illuminate the array during events and completes the architectural design.




SPOTLIGHT SOLAR PERGOLA AT THE ONTARIO ASSOCIATION OF ARCHITECTS HEADQUARTERS

Other Applications

- PV and optical fins can be applied to the building exterior over atriums, curtain walls and skylights, and on vertical facades.
- Optical fins can be installed inside glazing to redirect solar heat gain and glare outside of the building more effectively than a traditional blind.

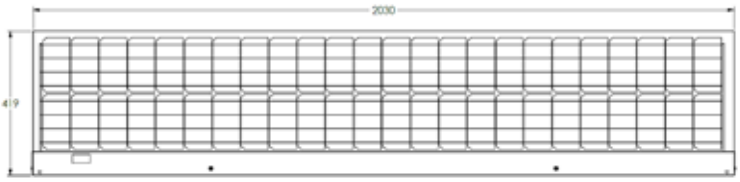
VIEW THROUGH SPOTLIGHT OPTICAL FINS INSIDE A WINDOW

Performance

- Generate up to 200 kWh/m2 annually in a horizontal application[1]
- Generate up to 125 kWh/m2 annually in a vertical application[2]
- Mitigate up to 75% of annual heat and glare

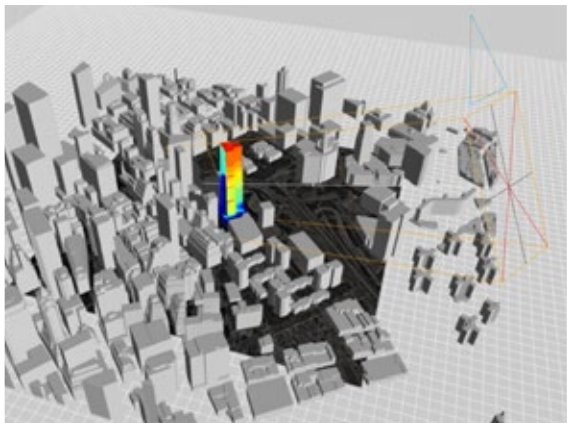
Specs

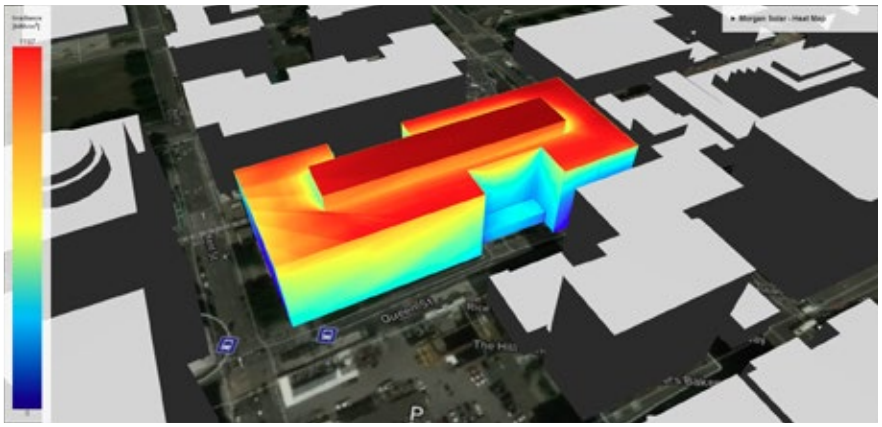
- The fins used at the Ontario Association of Architects headquarters are each approximately 2 m (6.5 ft) long x 0.4 m (1.3 ft) wide, and weigh 19.5 kg (43 lbs).
- Each PV fin has a maximum power of 115 W.
- The weight and power depends on the fins dimensions, other sizes are possible depending on building constraints.



Modeling Software and Design Tools

Morgan Solar uses design software to model the dynamic interaction of sunlight on buildings. The software tools are used to predict energy generation and operational savings for any existing or planned building, and allow owners, developers and architects to evaluate the full solar potential of the property. The software tools are used to customize SPOTlight for site-specific application and to achieve performance goals by adjusting fin tilt and density.





HEAT MAPS SHOWING THE AVAILABLE ANNUAL SOLAR RESOURCES ON THE ENTIRE SURFACE AREA OF A BUILDING

[1] *Measured in Toronto, ON*
[2] *Measured in Ottawa, ON*

Contact Information

For additional information on SPOTlight, to request a tour of an installation, or to discuss the viability of incorporating SPOTlight into your project, please address all inquiries to:

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