



LIGHTLOUVER™
DAYLIGHTING SYSTEM

Daylighting and Solar Control in One Remarkable ProductSM

**LightLouver™ Daylighting System
Performance Specifications**

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**LightLouver, LLC
2540 Frontier Avenue, Suite 201
Boulder, Colorado 80301**

DIVISION 12491 OPTICAL LIGHT SHELF DAYLIGHTING SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Optical light shelf daylighting system

1.02 RELATED SECTIONS

[List related sections as appropriate, for example:

- A. Section 08920 – Glazed Aluminum Walls and Entrances
- B. Section 09020 – Finish Schedule: Locations of optical light shelves.]

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

- A. The optical light shelf daylighting system shall be placed inboard of the “daylight” glazing and intercept and redirect incident daylight uniformly onto the ceiling of the daylit space. All direct sunlight above 5° altitude angle shall be redirected onto the ceiling, and shall not pass through the optical light shelf unit causing visual discomfort (glare) to the daylit space occupants.
- B. The optical light shelf unit shall be of non-corroding, abrasion resistant, ultra-violet and temperature stable materials that will not delaminate, blister, peel; or crack, yellow, or darken.
- C. The optical light shelf reflecting slats shall have, at a minimum, the following optical properties:
 - Reflective Surfaces:
 - Total Reflectance (Nominal) -- 85%
 - Direct Image Reflectance, Specularity (Nominal) -- 84%
 - Non-Reflective Surfaces:
 - Total Reflectance (Nominal) -- Less than 20%
 - Direct Image Reflectance, Specularity (Nominal) -- Less than 5%
- D. The optical light shelf reflecting slats shall not have an offset from level of more than 0.0600 inch over the length (span) of the slat between the side frame supports.
- E. Optical light shelf unit shall attach to the vertical mullions in those windows receiving the optical light shelves in such a manner as to enable the unit to pivot away from the window to an open position with sufficient clearance to

allow for cleaning the window glass behind, and regular cleaning and maintenance of the optical light shelf unit.

- F. The optical light shelf unit shall securely attach to the vertical mullions so that seismic forces shall not dislodge the unit and cause it to fall.
- G. The optical light shelf unit shall be removable without excessive lateral movement. That is, the potential for unit twisting or torquing shall be held to a minimum to avoid damaging the slats.
- H. The optical light shelf slats shall be horizontal (level) with the ceiling plane and without twist, warp, bow or sagging between side-frame supports.
- I. It shall be possible to replace the optical light shelf slats. This may require the removal of the unit from “daylight” window, and disassembling of the optical light shelf unit.

1.04 PRODUCT SCHEDULE

- A. The optical light shelf units shall be fabricated in the following quantities:

Unit Type	No. of Units	Unit Dimensions
A		
B	[Indicate Unit Type]	
C		

- B. Location of optical light shelf units are designated on the architectural drawings.
- C. Manufacturer shall prepare a schedule of optical light shelf units by room number / name and unit type.

1.05 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating physical and dimensional characteristics and operating features, photometric properties of the reflective slats, and other data substantiating that the Design and Performance requirements of Section 1.03 have been met.
- C. Shop Drawings: Indicate opening sizes, tolerances required, methods of assembly and attachment, clearances, and operation.
- D. Manufacturer's Installation Instructions: Indicate special procedures. Include manufacturer's recommended maintenance and cleaning instructions.

1.06 QUALITY ASSURANCE

- A. The supplier of the optical light shelf daylighting system shall prepare fabrication drawings and specifications, and samples as required to substantiate that Design and Performance Requirements specified in Section 1.03 have been met, and assist the general contractor and the installing subcontractor with installation procedures.

1.07 PROJECT CONDITIONS

- A. Coordinate the work with window blind / shade installation.
- B. Field measurements of the “daylight” windows (window openings receiving the optical light shelf units) shall be made to determine sizes of optical light shelves required. Measurements from construction documents or shop drawings can be used to determine sizes of optical light shelves required if finished (installed) tolerances can be ensured.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Deliver optical light shelf units wrapped and crated in a manner to prevent damage to components or marring of surfaces.
- B. Store in a clean, dry area. Lay flat.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Architectural Energy Corporation

Architectural Energy Corporation is the only known source for the optical light shelf daylighting system. Their address and contact information are as follows: 2540 Frontier Avenue, Suite 201, Boulder, Colorado 80301, telephone (303) 444-4149, fax (303) 444-4304, and e-mail lightlouverinfo@lightlouver.com.

- B. Other manufacturers will be considered so long as their daylighting solution meets the minimum Design and Performance Requirements specified in Section 1.03.

2.02 OPTICAL LIGHT SHELF COMPONENTS

- A. Slats: Horizontal reflective slats, with the optical and physical properties

specified in Section 1.03 and formed into an optical geometric shape designed to achieve the daylighting functions specified in Section 1.03, supported within a rigid frame.

- B. Reflective Surfaces: Reflective surfaces of the optical light shelf slat shall consist of a metalized surface on an appropriate substrate or a reflective film with an appropriate pressure sensitive adhesive which meets the optical and physical performance properties specified in Section 1.03.
- C. Unit Frame: Extruded aluminum or other acceptable material meeting the Design and Performance Requirements of Section 1.03.
- D. Unit Side Supports (connects Unit Frame to the vertical mullions): Machined aluminum or metal, or other acceptable material meeting the Design and Performance Requirements of Section 1.03.
- E. Accessory Hardware: Type recommended by optical light shelf manufacturer, such as light blocking elements and mullion "stop" pads.

2.03 FABRICATION

- A. Fabricate optical light shelf units to fit within "daylight" window openings with uniform edge clearance of 1/4 inch +/- 1/8 inch.
- B. Fabricate optical light shelf units to easily install into the "daylight" window openings without damaging the optical light shelf unit or the surrounding window mullions.

2.04 REPLACEMENT PARTS

- A. Replacement optical light shelf units shall be fabricated in the following quantities:

Unit Type	No. of Units
Unit A	
Unit B	[Put number of replacement units as appropriate]
Unit C	
Unit D	
Unit E	

- B. All replacement optical light shelf units shall be properly protected, remain in their original packaging materials, and properly labeled by unit type.
- C. The packaged replacement optical light shelf units shall be delivered to the building O+M staff just prior to occupancy.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that “daylight” window openings are ready to receive the work.

3.02 INSTALLATION

- A. Install proper optical light shelf unit type in the “daylight” window.
- B. Install optical light shelf units on self-positioning Unit Side Supports in accordance with manufacturer’s instructions.
- C. As required, clean reflective surfaces of the slats to remove any dust or fingerprints, following manufacturers instructions for cleaning and handling.

3.03 INSTALLATION TOLERANCES

- A. Maximum Variation of Gap at Window Opening Perimeter: 1/4 (0.250) inch.
- B. Maximum Offset From Level: 0.0600 inch.

3.04 CLEANING

- A. As required, clean optical light shelf slat reflective surfaces just prior to occupancy, following manufacturers instructions for cleaning and handling.

END OF SPECIFICATION