Sustainable Curtain Walls

SEAN P. MURPHY
University of San Diego

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What do they do?

They Protect from...
The “Why?”

Carbon Footprint of a New Build

- Structural Work 24.5%
- Interior Construction 30.3%
- Installation/Finishing 36.7%
- Sitework 8%

US Curtain Wall Industry

- Net Zero Building: Technology Penetration
  - UFAD/Displmt
  - GSHP
  - Radiant
  - Cool Roof
  - Ht Recovery
  - HE HVAC
  - HE Envelope
  - HE Lighting
  - Daylighting

- LEED® 33 CREDITS

…Are Directly Affected by Curtain Wall Selections
“IN A GENERAL SENSE, THE TERM “CURTAIN WALL” REFERS TO AN EXTERIOR WALL THAT DOES NOT SUPPORT LOADS OTHER THAN ITS OWN WEIGHT. CURTAIN WALLS ARE THEREFORE NONSTRUCTURAL, AND SERVE SOLELY TO PROTECT THE BUILDING FROM THE ELEMENTS. SEISMIC AND WIND FORCES ON A CURTAIN WALL ARE TRANSFERRED TO THE SUPPORTING STRUCTURE AT ANCHORAGE POINTS, WHERE THE CURTAIN WALL FRAME IS ATTACHED TO THE BUILDING, GENERALLY AT FLOORS OR COLUMNS.”

-AMERICAN INSTITUTE OF ARCHITECTS
Oriel Chambers, 1864
Igloo: 1,000BC
Dover Castle: 1,160
Home Ins. Building, 1884
Halladie Building, 1917
Bauhaus, 1927
Types

- STOREFRONT
- I-BEAM WALL
- PRESSURE WALL
- WINDOW WALL
- STICK WALL
- UNITIZED WALL
PERFORMANCE PARAMETERS

• Wind Load Management
• Thermal Performance
  • Thermal Transmittance
  • Solar Heat Gain Coefficient
  • Condensation Resistance Factor
• Solar-Optical Performance
  • Sun Control
    • Exterior Sun Shades Reduce or Block Solar Gain
    • Interior Light Shelves Reflect Light Deeper into a Building (Southern Exposure)
  • Shadow Box Spandrels
• Acoustics
• Blast Mitigation
• Seismic Design
SUSTAINABLE PRODUCTS

• SMART WINDOWS
  • Reduce Energy Consumption as much as 43% Based on one Study
  • Contain a variable opacity filter which detects the amount of light passing through the window and automatically modifies opacity accordingly

Fig. 1: Double glazed smart window
**SUSTAINABLE PRODUCTS**

- **DOUBLE-SKIN SYSTEMS**
  - Utilizes two sets of curtain walls to create a buffer zone between interior and exterior temperatures.
  - More advanced versions include vents which allow thermal movement between the curtain wall layers resulting in normalized interior temperatures.

![Diagram of double-skin system](image.png)

- Water is shed away from glazing to Aerofoil sections and the location of the operable glazing
- Ventilation allows air intake at the bottom sill and exits at the head of the window
- Structural bracing provides lateral stability
- Glazing Panel Axon
Case Study #1

EPA Region 8 Headquarters | Denver, CO
Architect: Zimmer, Gunsul, Frasca LLP

Glazed curtain-wall system customized to each façade
75% of workstations receive sunlight
Wayne L. Morse Courthouse | Eugene, OR
Architect: DLR Group

70,000 sq. ft. of Type 304 Stainless Steel (recycled)

Energy Performance 38.4%
Better than LEED Requires
QUESTIONS?