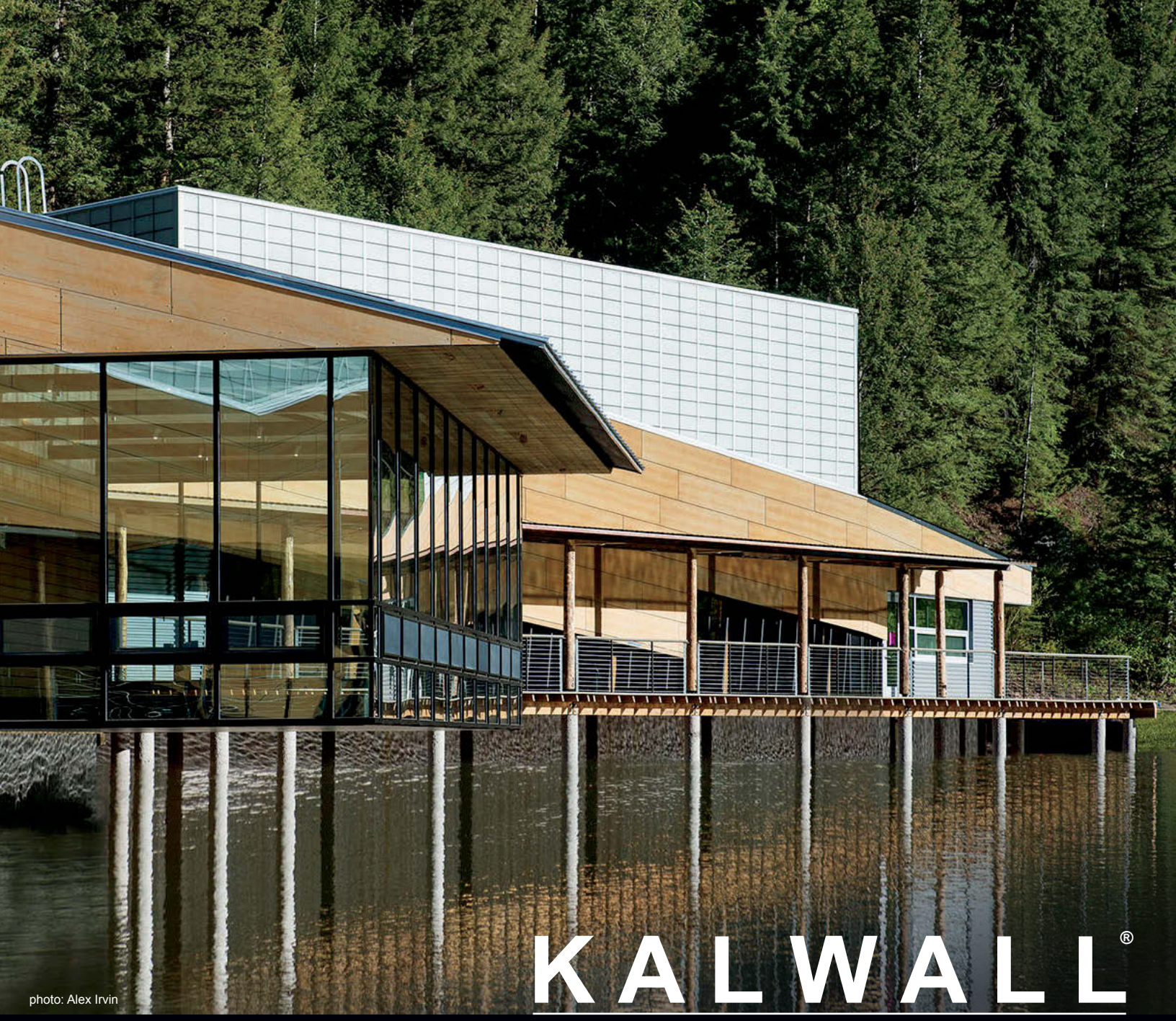

photo: Alex Irvin

KALWALL®

high performance translucent building systems

LEED® v3 2009 Reference Guide

For New Construction and Major Renovation

LEED v3 Available Credits

LEED v3 Checklist

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Available LEED v3 Credits

SUSTAINABLE SITES

CREDIT 7.2 | HEAT ISLAND EFFECT, ROOF (1 point)

"Use roofing materials with a solar reflectance index (SRI)... for a minimum of 75% of the roof's surface"

Steep-sloped roof > 2:12	29 SRI

Depending on design configurations, the Kalwall panel meets SRI requirements listed in ASTM E1980, ASTM E408 and ASTM E903 to reduce Heat Island Effect for roofs.

CREDIT 8 | LIGHT POLLUTION REDUCTION (1 point)

"All openings in the envelope with a direct line of sight to any nonemergency luminaires must have shielding (... for a resultant transmittance of less than 10% between 11 p.m. and 5 a.m.). Meeting... ANSI/ASHRAE/IESNA Standard 90.1-2007..."

Without the need for additional shielding, Kalwall's light transmittance to less than 10% preventing direct-beam illumination from leaving the building interior.

ENERGY & ATMOSPHERE

PREREQUISITE 2 | OPTIMIZE ENERGY PERFORMANCE (prerequisite)

"Demonstrate a 10% improvement in building performance rating for new buildings or a 5% improvement for major renovations. Calculate the baseline building performance... Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2007... using a computer simulation model..."

With insulation values up to R-20 (.05 U), conductive heat loss is kept to a minimum. Kalwall's low solar heat gain coefficients (SHGC), as low as .04, significantly reduce solar heat gain, greatly reducing tonnage requirements for AC systems, while lowering utility bills.

CREDIT 1 | OPTIMIZE ENERGY PERFORMANCE (up to 19 points)

"Demonstrate a percentage improvement in the proposed building performance rating compared to the baseline building performance rating... according to Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2007..."

Kalwall provides superior winter and summer energy efficiency while transmitting diffuse daylight.

CREDIT 2 | ON-SITE RENEWABLE ENERGY, 1% TO 13% (up to 7 points)

"Use on-site renewable energy systems to offset building energy costs. Calculate project performance... as a percentage of the building's annual energy cost (1%, 3%, 5%, 7%, 9%, 11% or 13%)..."

For over 60 years, Kalwall has been involved with both passive and active solar technologies. Kalwall's window systems and skylights from Structures Unlimited can accept BIPV panels.

MATERIALS & RESOURCES

CREDIT 1.1 | BUILDING REUSE-MAINTAIN EXISTING WALLS, FLOOR AND ROOF (up to 4 points)

"Maintain the existing building structure... and envelope (the exterior skin and framing, excluding window assemblies and non-structural roofing material)... upgrade components that would improve energy and water efficiencies such as windows..."

The thermal performance of Kalwall translucent window, skylight and curtain wall system replacements can result in over 500% more energy efficiency than insulated glass by reducing solar heat gain and saving HVAC costs.

CREDIT 3 | MATERIALS REUSE (up to 2 points)

"Use salvaged, refurbished or reused materials, the sum of which constitutes at least 5% or 10%, based on cost, of the total value of materials on the project"

Kalwall panels may be reused or refurbished. The design of the Kalwall Clamp-tite™ fastening system allows for removal of the entire window, curtain wall or skylight. These panel systems may then be installed in similar applications.

CREDIT 4 | RECYCLED CONTENT, 10% OR 20% (post consumer + 1/2 pre-consumer) (up to 2 points)

"Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% or 20%, based on cost, of the total value of the materials in the project"

Most Kalwall system contains +/-20% post-consumer/pre-consumer recycled content. Structures Unlimited's clearspan skylights and pool enclosures have recycled content, up to 25% or more.

INDOOR ENVIRONMENTAL QUALITY

CREDIT 6.2 | CONTROLLABILITY OF SYSTEMS (1 point)

"Provide individual comfort for 50% (minimum) of the building occupants to enable adjustments to meet individual needs and preferences. Operable windows in lieu of controls..."

Kalwall wall and window replacement systems can have project-in and project-out windows for fresh air ventilation.

CREDIT 7.1 | THERMAL COMFORT (1 point)

"Design... building envelope to meet the requirements of ASHRAE Standard 55-2004...Thermal Comfort Conditions for Human Occupancy"

Unlike traditional glazing, Kalwall's thermally broken technology all but eliminates undesirable thermal gain and loss. It also prevents condensation that builds up when exterior and interior temperatures vary.

CREDIT 8.1 | DAYLIGHT & VIEWS, DAYLIGHT (up to 2 points)

"Option 1: Demonstrate, through computer simulation, that 75% or more of all regularly occupied spaces achieve daylight illuminance levels of a minimum of 10 footcandles (fc) and a maximum of 500 fc in a clear sky condition on September 21 at 9 a.m. and 3 p.m."

Kalwall can perform a complimentary daylight modeling analysis to help achieve proper footcandle levels within a building. The daylight simulation (RADIANCE) shows compliance with LEED requirements. Annual Daylight Autonomy levels can also be shown, using real-world weather files for project locations. Both methods show the impact of daylight design on any building space.

"Option 2: Provide Sunlight redirection and/or glare control devices to ensure daylight effectiveness."

Kalwall's unique translucent systems diffuse sunlight and transmit controlled daylight into buildings without shadows, glare or hot spots and without the need for external solar controls or internal shelves, blinds and/or curtains.

CREDIT 8.2 | DAYLIGHT & VIEWS, VIEWS (up to 1 point)

"Achieve a direct line-of-sight to the outdoor environmental via vision glazing... for building occupants in 90% of all regularly occupied areas."

Kalwall wall panels, curtain wall and window replacement systems can easily and effectively integrate fixed and operable windows glazed with glass for connection to the outdoors. Skylights from Structures Unlimited, Inc. can integrate fixed-glass panels as well as operable roof systems for natural ventilation.

INNOVATION & DESIGN

CREDIT 1 | INNOVATION IN DESIGN (up to 5 points)

"To provide... projects the opportunity to achieve exceptional performance above the requirements set by the LEED Green Building rating System and/or innovative performance in green building categories not specifically addressed by the LEED green building rating system."

Kalwall's daylighting systems can contribute to sustainable innovations beyond those outlined by the LEED green building rating system.

LEED® v3 2009 Green Building Rating System Project Checklist for New Construction and Major Renovations

LEED v3 2009 point contributions available from Kalwall & Structures Unlimited, Inc. product lines

Sustainable Sites			26 Points
	Prereq 1	Construction Activity Pollution Prevention	Required
	Credit 1	Site Selection	1
	Credit 2	Development Density & Community Connectivity	5
	Credit 3	Brownfield Redevelopment	1
	Credit 4	Alternative Transportation	1 to 12
	Credit 5	Site Development	1 to 2
	Credit 6	Stormwater Design	1 to 2
	Credit 7.1	Heat Island Effect, Non-Roof	1
X	Credit 7.2	Heat Island Effect, Roof	1
X	Credit 8	Light Pollution Reduction	1

Water Efficiency			10 Points
	Prereq 1	Water Use Reduction	Required
	Credit 1	Water Efficient Landscaping	2 to 4
	Credit 2	Innovative Wastewater Technologies	2
	Credit 3	Water Use Reduction	2 to 4

Materials & Resources			14 Points
	Prereq 1	Storage and Collection of Recyclables	Required
X	Credit 1.1	Building Reuse-Maintain Existing Walls, Floors, and Roof	1 to 4
	Credit 2	Construction Waste Management	1 to 2
X	Credit 3	Materials Reuse	1 to 2
X	Credit 4	Recycled Content, 10% (post + 1/2 pre-consumer)	1
X		Recycled Content, 20% (post + 1/2 pre-consumer)	1
	Credit 5	Regional Materials, 10% E, P & M Regionally	1
		Regional Materials, 20% E, P & M Regionally	1
	Credit 6	Rapidly Renewable Materials	1
	Credit 7	Certified Wood	1

Indoor Environmental Quality			15 Points
	Prereq 1	Minimum Indoor Air Quality (IAQ) Performance	Required
	Prereq 2	Environmental Tobacco Smoke Control	Required
	Credit 1	Outdoor Air Delivery Monitoring	1
	Credit 2	Increased Ventilation	1
	Credit 3	Construction IAQ Management Plan	1 to 2
	Credit 4	Low-Emitting Materials	1 to 4
	Credit 5	Indoor Chemical & Pollution Source Control	1 to 1
	Credit 6.1	Controllability of Systems, Lighting	1
X	Credit 6.2	Controllability of Systems, Thermal Comfort	1
X	Credit 7.1	Thermal Comfort, Design	1
	Credit 7.2	Thermal Comfort, Verification	1
X	Credit 8.1	Daylight & Views, Daylight	2
X	Credit 8.2	Daylight & Views, Views	1

Energy & Atmosphere			35 Points
	Prereq 1	Fundamental Commissioning of Bldg Energy Systems	Required
X	Prereq 2	Minimum Energy Performance	Required
	Prereq 3	Fundamental Refrigerant Management	Required
	Credit 1	Optimize Energy Performance	1 to 19
X		12% New Building or 8% Existing Bldg Renovations	1
X		14% New Building or 10% Existing Bldg Renovations	1
X		16% New Building or 12% Existing Bldg Renovations	1
X		18% New Building or 14% Existing Bldg Renovations	1
X		20% New Building or 16% Existing Bldg Renovations	1
X		22% New Building or 18% Existing Bldg Renovations	1
X		24% New Building or 20% Existing Bldg Renovations	1
X		26% New Building or 22% Existing Bldg Renovations	1
X		28% New Building or 24% Existing Bldg Renovations	1
X		30% New Building or 26% Existing Bldg Renovations	1
X		32% New Building or 28% Existing Bldg Renovations	1
X		34% New Building or 30% Existing Bldg Renovations	1
X		36% New Building or 32% Existing Bldg Renovations	1
X		38% New Building or 34% Existing Bldg Renovations	1
X		40% New Building or 36% Existing Bldg Renovations	1
X		42% New Building or 38% Existing Bldg Renovations	1
X		44% New Building or 40% Existing Bldg Renovations	1
X		46% New Building or 42% Existing Bldg Renovations	1
X		48% New Building or 44% Existing Bldg Renovations	1
	Credit 2	On-site Renewable Energy	1 to 7
X		1% Renewable Energy	1
X		3% Renewable Energy	1
X		5% Renewable Energy	1
X		7% Renewable Energy	1
X		9% Renewable Energy	1
X		11% Renewable Energy	1
X		13% Renewable Energy	1
	Credit 3	Enhanced Commissioning	2
	Credit 4	Enhanced Refrigerant Management	2
	Credit 5	Measurement & Verification	3
	Credit 6	Green Power	2

Innovation & Design			6 Points
X	Credit 1	Innovation in Design: Provide Specific Title	1 to 5
	Credit 2	LEED® Accredited Professional	1

Regional Priority Credits			4 Points
	Credit 1	Regional Priority Credit	1 to 4

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