



photo: Phil Grayson

KALWALL[®]

high performance translucent building systems

Introduction to Products + Features

Overview of the Kalwall Panel + System Technologies

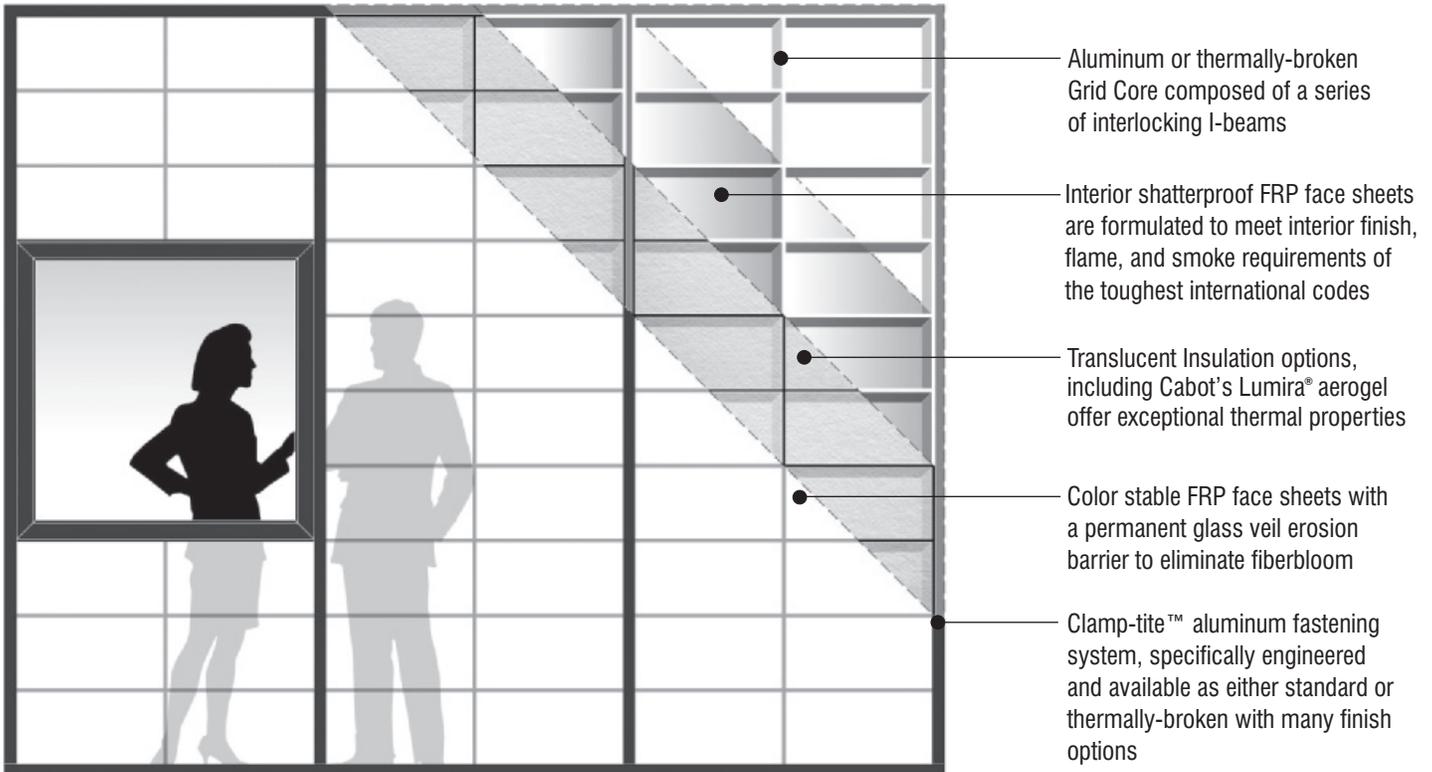
Facades | Skyroofs[®] | Skylights | Canopies + Walkways

Performance + Technical Summaries | Design Guide

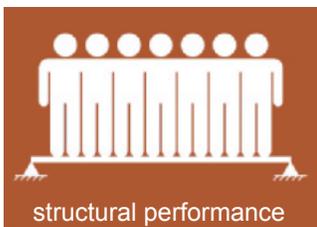
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Panel Technology

The building block for all Kalwall® systems is a flat Kalwall, or curved Kalcurve® panel, which is 2-3/4" (70 mm) thick. 4" (100 mm) is also available for some panel options. These structural sandwich panels are formed by permanently bonding two specially formulated translucent Fiberglass Reinforced Polymer (FRP) Faces to a Grid Core constructed of interlocking aluminum or thermally-broken composite I-beams. Utilizing either light-transmitting fiberglass 'batts' or aerogel as Translucent Insulation (TI), insulated panel U-factors range from 0.29 to 0.05 (1.65 to 0.28 W/m2K). Panels are installed with our proprietary structural and thermally efficient Clamp-tite™ fastening system.



Kalwall's Translucent Sandwich Panel Technology is backed by over 60 years of experience.



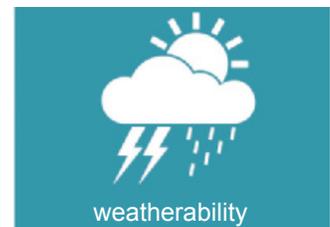
structural performance



lightweight materials



low maintenance



weatherability

Kalwall is not a glazing panel but rather a structural sandwich panel with outstanding load capacity and structural integrity that polycarbonate systems and insulated glass units (IGU) simply cannot match.

With a high strength-to-weight ratio, Kalwall panels are both strong and lightweight. This makes the installation process easier and reduces extraneous structural support framing, saving both time and money.

All Kalwall systems are very low maintenance. The panel's FRP faces have self-cleaning properties, are resistant to dirt and particulate build-up, and can handle harsh chemical and environmental exposure.

As the inventor of the translucent structural sandwich panel, Kalwall manufactures the best in industry, Super-Weathering (SW) formulated FRP faces that are far superior to look-a-like products and commercial grade polymers.

Powerful Advantages

Kalwall has been a global leader for more than sixty years providing sustainable daylighting solutions to the AEC industry that balance performance, value, and aesthetics. Kalwall has continually raised the bar by offering the most highly insulating daylighting systems on the market that enhance indoor environmental quality, reduce a building's carbon footprint, and offer measurable energy savings to owners and tenants. While other building systems may claim to offer similar features, only Kalwall's high performance translucent building systems deliver all of these powerful advantages and so many more.



photo: Joseph Romeo

Dunbar High School | Washington, DC | Perkins Eastman + Moody Nolan | Custom Skyroof® and Clearspan™ System



museum-quality daylight™

Only Kalwall offers the power of diffused, balanced daylighting. Unlike other glazing products on the market, Kalwall provides predictable, beautiful, glare-free daylight that blocks harmful UV-A and UV-B rays while transmitting the full spectrum of visible light for perfect color rendition within interiors.



energy savings

As if museum-quality daylighting wasn't enough, Kalwall offers dramatic savings in energy consumption. With a wide range of translucent insulation options, Kalwall's exceptional thermal performance reduces HVAC heating + cooling loads while harvesting daylight to cut artificial lighting usage.



comfort + wellness

Study after study shows a high correlation between daylighting and increased human comfort. That is especially true when glare is eliminated, visual acuity is elevated, and eye fatigue is reduced. Combine all that with superior thermal performance and solar heat gain control for measurable benefits.



productivity

In order to be most productive, one needs to be comfortable first. Add superior light quality, views to the outdoors along with natural ventilation to enhance indoor environmental quality and people thrive. Daylighting done right has been proven to increase productivity, reduce absenteeism, and improve mood.

Facades

Wall Systems

Unitized Curtain Walls

Window Replacements



photo: David Sundburg | Esto

Hunter's Point High School | New York, NY | FXFowle | Wall System

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Wall Systems

Structural sandwich panels up to 5' x 20' (1500 mm x 6000 mm) are fastened to the building with the easy-to-install, Clamp-tite™ aluminum extrusions. System seals panel to panel and panel to building, allowing for expansion and contraction and provides proper weepage to channel any incidental moisture to the building exterior.

Balanced, natural daylight with superior thermal and solar control.

Panels may be either flat or curved. Arched heads as well as trapezoidal heads, sills and jambs are available for flat panels.



photo: Marc Sourbron

Unitized Curtain Walls

Structural sandwich panels, operating and/or fixed windows, louvers, even opaque panels, are factory unitized.

Provides rapid installation and a permanent weather seal, unlike most stick-built, "frame and glaze" components, that are all field assembled.

Delivered to the job site in large, pre-assembled units up to 5' x 35' (1500 mm x 10700 mm), Unitized Curtain Walls are the single-source solution.



photo: Chris Cunningham

Window Replacements

Kalwall provides glare-free, museum-quality daylighting™, as well as areas of ventilation and optional vision glazing.

Kalwall's heavy duty Window Replacement Systems, like our Unitized Curtain Walls, are all factory assembled into easy-to-install, manageable units.

Vandal, graffiti, and high impact resistance add up to minimal maintenance expenses.

Best in the industry thermal performance for energy upgrades.



Specialty Applications

Hurricane rated walls & windows for windborne debris resistance

High impact FRP face sheet options

Class A fire ratings

Blast resistant systems meet DOD UFC 4-010-01 Anti-Terrorism Force Protection (ATFP)

Factory Mutual certified systems: Class I Exterior Walls
FM 4881 & FM 4411

Explosion venting / pressure relief systems: Factory Mutual listed FM 4440



photo: Michael Spillers

Skylights | Skyroofs®

Skylights

Pre-engineered Skyroofs

Custom Skyroofs

Clearspan™ Systems



photo: Marc Sourbron

Luxembourg Freeport | Luxembourg Findel Airport | Atelier d'Architecture 3BM3 | Custom Skyroof

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Skylights

Standard Skylights are available prefabricated or knocked down.

S-Lines: 2-3/4" (70 mm) and 4" (100 mm) thick, flat skylights. 4' | 5' (1200 mm | 1500 mm) standard widths up to 5' x 20' (1500 mm x 6000 mm) in 1' (300 mm) long increments.

Pyramids: 2-3/4" (70 mm) from 4'x 4' (1200 mm x 1200 mm) to 20' x 20' (6000 mm x 6000 mm) in 1' (300 mm) increments.

Geo-Roofs[®]: 2-3/4" (70mm) in 17 standard sizes from 8' to 24' in diameter (2400 mm to 7300 mm).

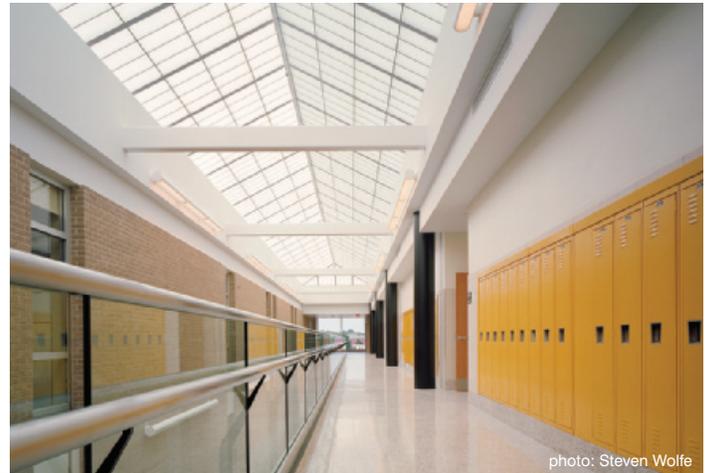


Pre-engineered Skyroofs[®]

Centerline Self-Supporting Ridge Roofs with 20°, 27°, 33°, 45° slope and spans up to 24' (7300 mm) utilizing 2-3/4" (70 mm) panels.

Kalcurve 180° vaults or 90° low-profile vaults are available in 1' (300 mm) increments up to 25' (7600 mm) max spans.

Pre-engineered Skyroofs are lightweight, under 3 lbs/ft² (14.65 kg/m²), allowing substructures to be minimized. Only thrust-bearing curb designs that accommodate local live, snow and wind load designs, provided by others, are required.



Custom Skyroofs[®]

2-3/4" (70mm) or 4" (100 mm) thick structural sandwich panel systems over substructures by others.

Flat, curved or a combination for design versatility, consistent with Kalwall system parameters.

Easy, fast installations, coupled with large-sized panel formats.

Exceptional thermal performance and solar control options, including Kalwall+Lumira[®] aerogel, help meet LEED, BREEAM, IgCC and other international green building standards.



Clearspan™ Systems

Custom turn-key solutions from the curb-up, including factory finished aluminum substructures from strategic partner, Structures Unlimited, Inc. take Kalwall Skyroofs to another dimension with Clearspans up to +/- 100' (30 m).

Design control, engineering, project management, fabrication, delivery and complete installation, all with unparalleled service. Installations are completed in days or weeks, not months, due to precision digital fabrication and less trade coordination.

Complete buildings, including Pool Enclosures, feature built-in, corrosion and moisture resistance.



Canopies + Walkways

Canopies

Walkways

Pre-engineered Structures



photo: Mark Herboth

Terminal 1 | Raleigh-Durham International Airport | Clark Nexsen | Supported Canopy

Canopies

Kalwall or Kalcurve structural sandwich panels are available over substructures by others or as part of a pre-engineered, canopy system, utilizing structural aluminum systems from Structures Unlimited, Inc.

Low maintenance, self-cleaning translucent panels significantly reduce maintenance requirements and mask debris from above.

Code-compliant, fire-rated FRP faces are standard.



Walkways

Kalwall or Kalcurve structural sandwich panels, available over substructures by others or as part of a pre-engineered, canopy system, utilizing structural aluminum systems from Structures Unlimited, Inc.

Wall Systems and Unitized Curtain Wall Systems are also available for enclosed walkways, connectors, link bridges and other zones of circulation that require balanced daylighting and protection from the elements. They provide privacy and reduce solar heat gain when compared to conventional glazing options.



Pre-engineered Structures

Turn-key solutions from the curb-up, including aluminum box beam substructures from strategic partner, Structures Unlimited, Inc. bring Kalwall Canopies + Walkways to another level.

Design control, engineering, project management, fabrication, delivery and complete installation, all with unparalleled service.

Rapid installations are completed in days or weeks, not months, due to digital fabrication technology.

Provide the footing and anchor bolt locations and Structures Unlimited, Inc. will do the rest. Having a single source solution minimizes coordination between trades and maintains installation schedule, which saves both time and money.

Custom cantilevered, butterfly, cable-and-mast, arched and curved configured structures, among others, are available.

Kalwall's Corrosion Resistant Finishes (KCRF) are available in both standard and custom colors for all structural aluminum elements.



Optimized Daylighting



Calder Foundation | New York, NY | Stephanie Goto | Custom Skyroof and Wall System

photo: Scott Frances/OTTO for *Architectural Digest*

Take the unpredictability out of your site-specific daylighting design with our complimentary Daylighting Analysis. Thanks to the power of diffusion, Kalwall provides unparalleled, museum-quality daylighting™ with much lower visible light transmission (VLT) percentages as compared to conventional vision glazing. Not convinced? Provide target light levels and our team of Daylight Modelers will help you during the design phase to optimize your design to ensure proper daylighting. Contact our sales department today for more information.

Enhance Retail Sales

Numerous studies have shown a high correlation between daylight spaces and increased retail sales. Patrons browse longer and are more likely to purchase products bathed in daylight. Kalwall's full spectrum, diffuse daylighting provides excellent visual clarity and true color rendition. By blocking the transmission of damaging UV-B wavelengths and dramatically reducing solar heat gain, interior finishes and contents are protected from fading and degradation.



Promote Plant Growth

Even though Kalwall blocks UV-A and UV-B wavelengths, it allows the transmission of visible light between 400 and 700 nm on the electromagnetic spectrum which are the required wavelengths for photosynthesis to occur in plants. As such, Kalwall has been specified in numerous projects including botanical gardens, zoos, aviaries, and other enclosed areas that feature flora and fauna.



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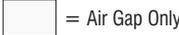
Performance Data: 2-3/4" (70mm) Panel

FRP Face Sheet Combinations		Visible Light Transmission (VLT) %					Solar Heat Gain Coefficient @ 0°				
Exterior FRP	Interior FRP	0.53 U	0.29 0.23 U	0.22 0.14 U	0.18 0.10 U	0.05 U	0.53 U	0.29 0.23 U	0.22 0.14 U	0.18 0.10 U	0.05 U
Crystal	White	35%	20%	12%	8%	20%	0.52	0.28	0.17	0.13	0.25
White	White	20%	15%	8%	5%	14%	0.38	0.23	0.15	0.11	0.18
Crystal	Crystal	50%	30%	15%	10%	N/A	0.65	0.33	0.18	0.13	N/A
Aqua	White	29%	17%	6%	4%	15%	0.45	0.24	0.14	0.10	0.21
Rose	White	30%	18%	6%	4%	16%	0.46	0.24	0.15	0.10	0.21
Ice Blue	White	35%	20%	8%	6%	21%	0.54	0.28	0.17	0.12	0.26
Greenish Blue	White	25%	14%	5%	3%	14%	0.50	0.23	0.14	0.10	0.19

Performance Data: 4" (100mm) Panel

FRP Face Sheet Combinations		Visible Light Transmission (VLT) %				Solar Heat Gain Coefficient @ 0°			
Exterior FRP	Interior FRP	0.55 U	0.15 U	0.08 U	0.05 U	0.55 U	0.15 U	0.08 U	0.05 U
Crystal	White	35%	14%	7%	N/A	0.52	0.09	0.04	N/A
White	White	20%	12%	5%	N/A	0.38	0.06	0.04	N/A
Crystal	Crystal	50%	17%	8%	N/A	0.65	0.10	0.07	N/A

U-value SI conversion: 1.0 W/m²K = 0.176 Btu/hr/ft²/°F

 = Air Gap Only  = Fiberglass 'Batts'  = Lumira® Aerogel

U-values shown in bold denote thermally-broken grid core panels.

Approximate Visible light transmission (VLT) values by ASTM E-972. VLT values over 30% are not recommended for most Kalwall applications.

Panel U-values include panel grid-core by NFRC 100 or 102. NFRC certified system U-values vary depending on framing.

Shading Coefficient (SC) is equal to 1.15 times the Solar Heat Gain Coefficient (SHGC).



Metea Valley High School | Aurora, IL | DLR Group | Wall System and Unitized Curtain Wall

NFRC Certified Systems

Kalwall provides the best overall system U-factors as low as 0.10 (0.57 W/m²K) with visible light transmission up to 20% including perimeter Clamp-tite™ fastening system. For more information, please visit KALWALL.COM or contact your local sales representative.

Design Overview

Kalwall Panel Dimensions

Standard Widths: 4' | 5' (1200 mm | 1500 mm) for Facades and Skyroofs.
Custom widths up to 5' (1500 mm) are optional

Standard Lengths: 3' - 20' (900 mm - 6100 mm) for Facades and up to 16'
(4900 mm) for Skyroofs and Canopies+Walkways

Standard Thickness: 2-3/4" (70 mm) Optional: 4" (100 mm) | 1-9/16" (40 mm)
1" (25 mm) panels available for translucent window glazing applications only

Standard + Optional Grid Cores

Shoji

Shoji Grid Cores are standard. Nominal grid sizes are 12" x 24" (300 mm x 600 mm) and 24" x 12" (600mm x 300 mm) for 4' and 5' (1200 mm and 1500 mm) wide panels for standard flat or optional Kalcurve panels. Panel spans will vary with different grid cores and spacings. Consult the factory for information based on project requirements. 8" x 20" | 20" x 8" (200 mm x 500 mm | 500 mm x 200 mm) are common options. Aerogel is available.

Tuckerman

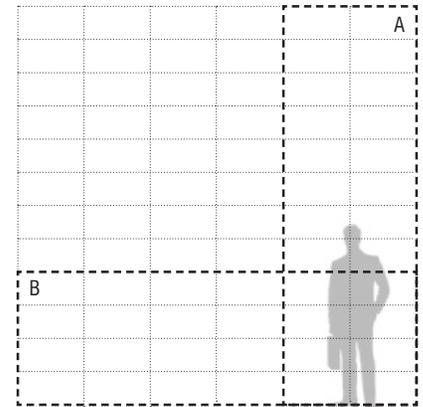
Tuckerman Grid Cores are optional. Nominal grid sizes are 12" x 12" (300 mm x 300 mm) for 4' and 5' (1200 mm and 1500 mm) wide panels for standard flat or optional Kalcurve panels. Panel spans will vary with different grid cores and spacings. Consult the factory for information based on project requirements. 8" x 8" | 10" x 10" (200 mm x 200 mm | 250 mm x 250 mm) are common options. Aerogel is available.

Verti-Kal™

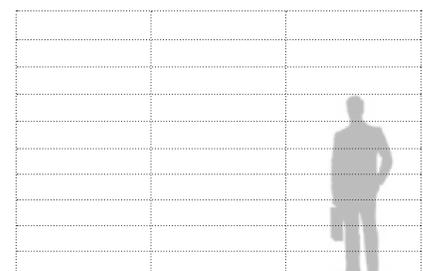
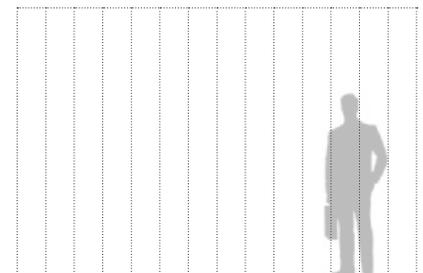
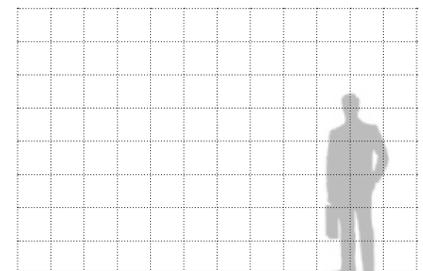
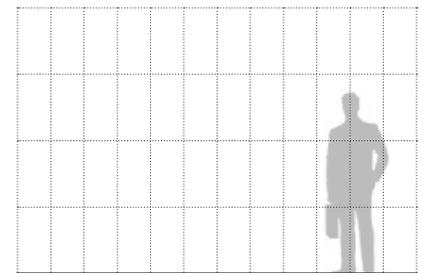
Verti-kal Grid Cores are optional for facades only. Nominal spacings of 8" and 10" (200 mm and 250 mm) are standard. Custom widths between 4" and 10" (100 mm and 250 mm) are also available. Depending on panel size, a cross mullion may be required. Panel spans will vary with different grid cores and spacings. Consult the factory for information based on project requirements. Kalcurve and Aerogel options are not available.

Ladder

Ladder Grid Cores are optional for facades only. Nominal spacings of 8" and 10" (200 mm and 250 mm) are standard. Custom widths between 4" and 10" (100 mm and 250 mm) are also available. Depending on panel size and orientation, a cross mullion may be required. Panel spans will vary with different grid cores and spacings. Consult the factory for information based on project requirements. Kalcurve and Aerogel options are not available.



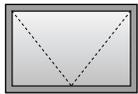
Panel Orientation Diagram: (A) Upright (B) On-Edge
Grid Cores shall be specified 'as viewed' in elevation.



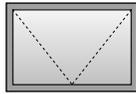
Unitized Curtain Wall

Factory-unitized panels up to 5' wide x 35' high (1500 mm x 10700 mm) depending on shipping and handling limitations. Our Unitized Curtain Walls are delivered to the site ready to install with no additional finishing. Eliminate superfluous structure required with most other systems. Unitize translucent panels with fixed and operable windows; drainable, fixed blade louvers; even opaque aluminum or FRP faced panels utilizing our Clamp-tite™ fastening system for a single source “kit of parts” to save time and money.

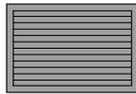
Choose between two window models: the Heavy Commercial HC-Series and the high performance, E-Series in both fixed and operable sash. Factory-installed glazing of all types are available. Performance options to AAMA/ANSI PI AW-90. Hurricane-resistant windows to TAS and ASTM standards.



E-Series



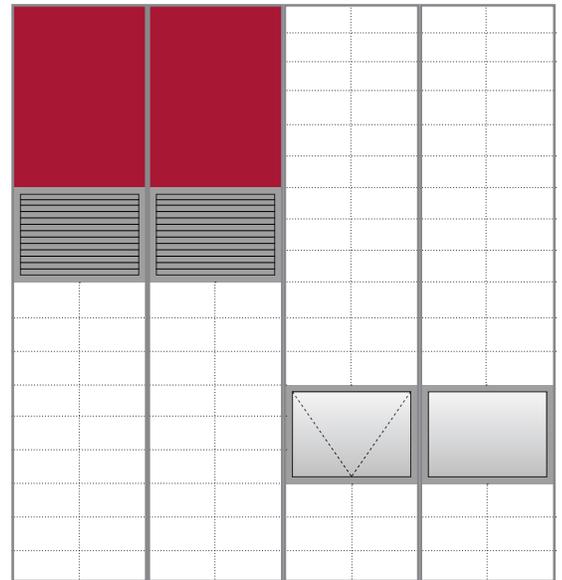
HC-2000



fixed louver



opaque panel



Factory Unitized Curtainwall Diagram: shipped as prefabricated units with windows (factory or field glazed), louvers, even opaque panels.

Fiberglass Reinforced Polymer (FRP) Faces

Kalwall has developed a full line of high performance FRP face sheets including the latest generation of Super Weathering (SW) formulations that are unrivaled in the industry. Along with a variety of high performance options, Kalwall offers both standard and optional colors and finishes in order to provide designers with more flexibility. Translucent White and Crystal FRP face sheets are standard. The four Kal-tints are optional. Optional FRP finishes are available for interior face sheets only.

Standard Translucent Colors



white



crystal

Optional Translucent Kal-tints



aqua



rose



ice blue



greenish blue

Standard Finish

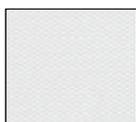


semi-gloss

Optional Finishes



matte



hexpin

Aluminum Finishes

The Clamp-tite™ fastening system is available in either mill finish or Kalwall Corrosion Resistant Finish (KCRF), a high performance, fluoropolymer-based coating that meets the performance requirements of AAMA 2604. (AAMA 2605 and anodized options are available with some product exceptions). KCRF is highly resistant to acids, alkalis, salt, industrial and moisture-laden atmospheres.

Standard KCRF Colors



white 00



bone white 21B



gray 80



black 95



bronze 85



brick 88



blue 15



coro blue 48



minuette 03



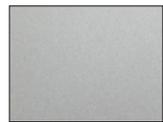
mountain green 70



hartford green 75



banner red 90



aluminum 79

Facade Details

For vertically oriented, flat panels

These are standard Clamp-tite™ details for 2-3/4" (70 mm) thick panels. Systems for other conditions, including panels on edge, concealed fastener options, Kalcurve®, Explosion Venting or Blast Resisting, are similar, but do contact Kalwall for specifics. Electronic CAD versions of these Facade details and many more are available at: KALWALL.COM

Blue indicates field installed items and may require trimming.

Red indicates thermal breaks. Optional sill flashing available.

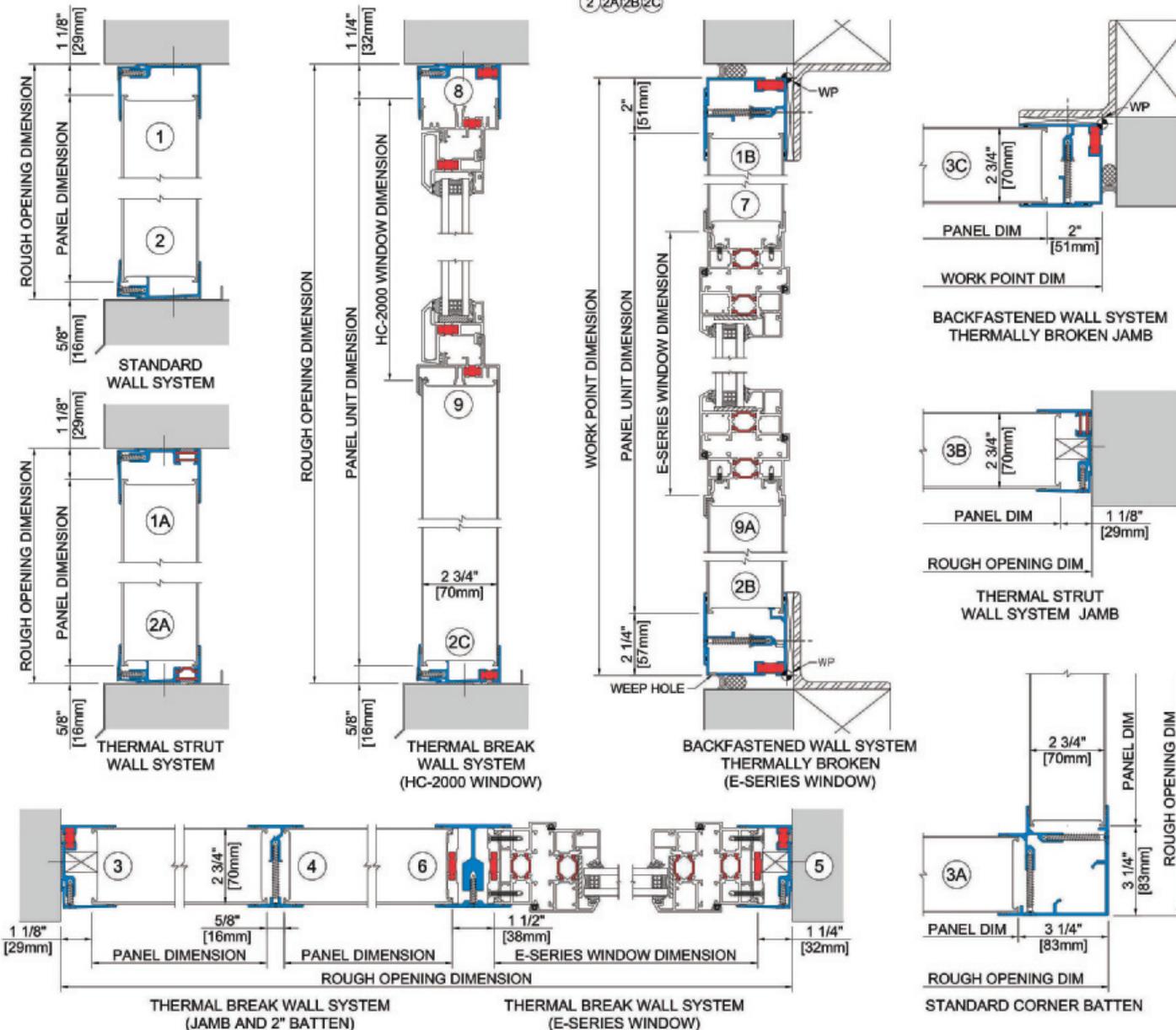
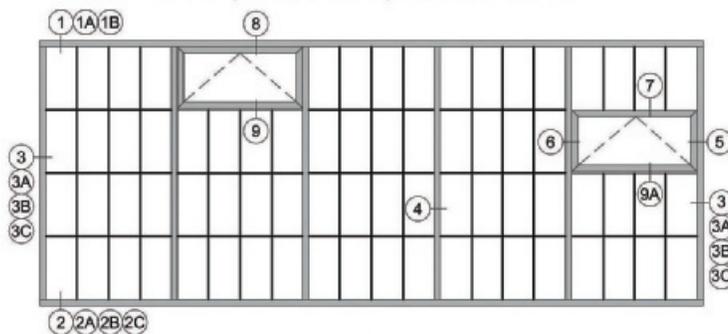
Kalwall Span Table: 4' (1200 mm) Wide Panel Module

Maximum Allowable Clearspan™ for Standard 2-3/4" (70 mm) Panels for Facades

Shoji 12" x 24" (300 mm x 600 mm)	Translucent Panel	Panel Unit (Mid-span Joint)
2" (51 mm) batten	12'-7" (3835 mm)	9'-2" (2794 mm)
2-3/4" (70 mm) ST + #12SSSE	16'-2" (4927 mm)	13'-1" (3987 mm)
3-1/4" (83 mm) IS-H	19'-8" (5995 mm)	17'-11" (5461 mm)

Clearspan at 25 PSF (1.2 kPa) wind pressure, L/60 minimum. Spans based on engineering data and tests. Others possible. CAUTION: Spans vary with panel grid core and orientation.

FAÇADE ELEVATION A
12" x 24" (300 mm x 600 mm) SHOJI GRID SHOWN



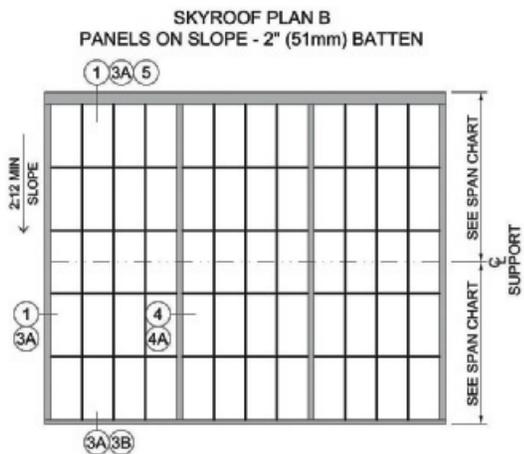
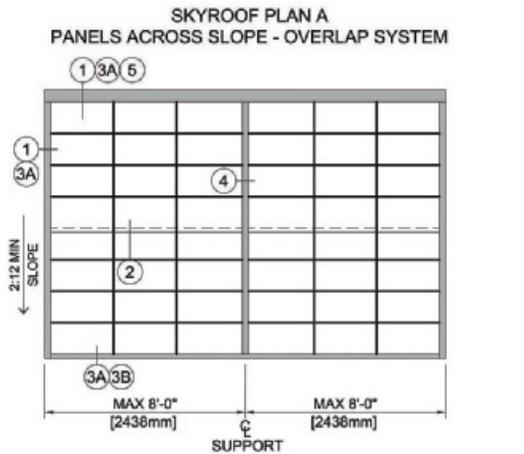
Kalwall Span Table: 4' (1200 mm) Wide Panel Module

Maximum Allowable Clearspan™ for Standard 2-3/4" (70 mm) Panels for Skyroofs®

Shoji 8" x 20" (200 mm x 500 mm)		
Live Load	30 PSF (1.44 kPa)	40 PSF (1.92 kPa)
Clearspan	11'-8" (3276 mm)	10'-8" (3251 mm)
Shoji 12" x 24" (300 mm x 600 mm)		
Live Load	30 PSF (1.44 kPa)	40 PSF (1.92 kPa)
Clearspan	10'-6" (3200 mm)	9'-4" (2845 mm)

Clearspan at 25 PSF (1.2 kPa) wind pressure, L/60 minimum at 2:12. Spans based on engineering data and tests. Longer clearspans are possible. Contact the factory.

Recommended minimum pitch for Skyroofs is 2:12.

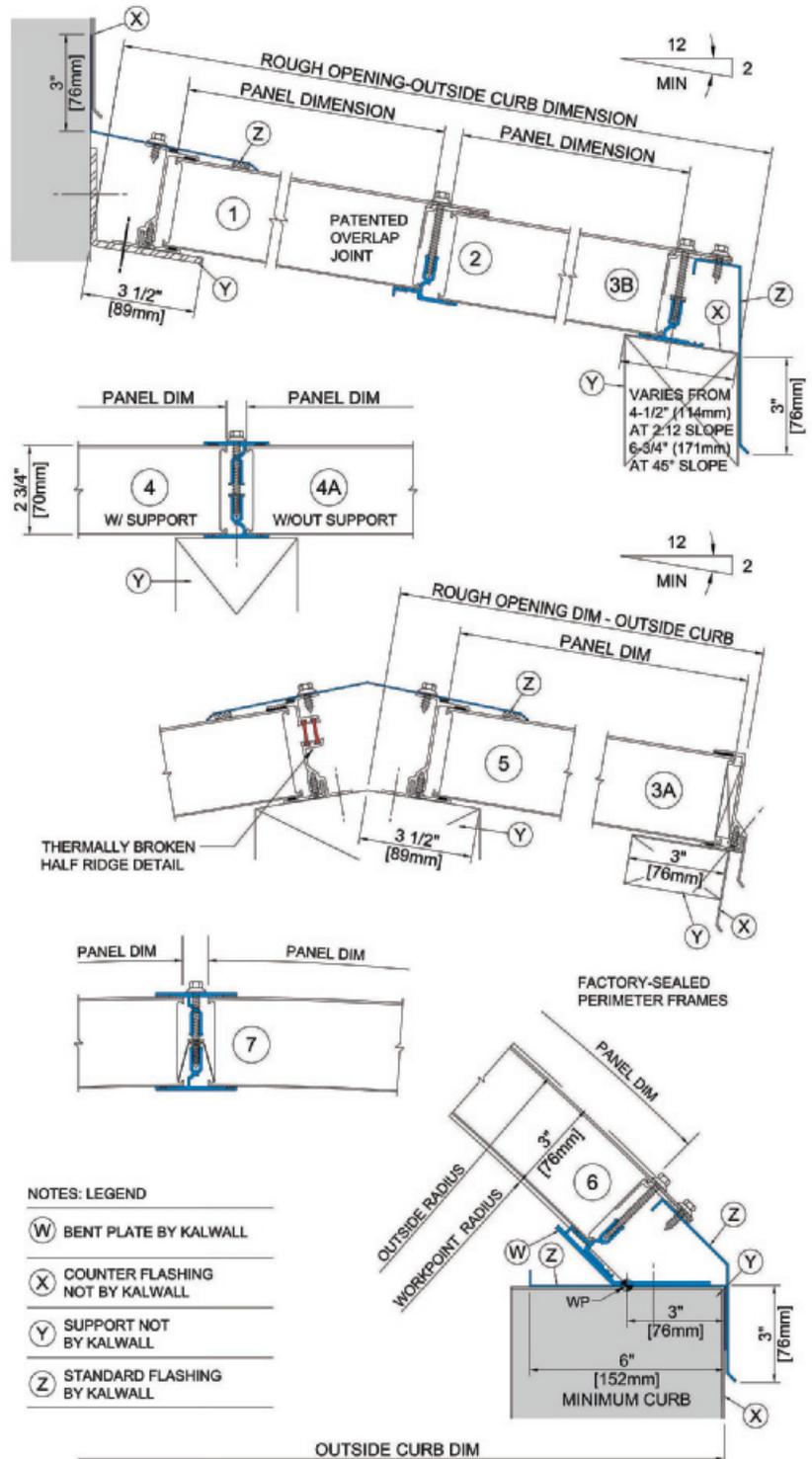


PLEASE CONTACT KALWALL FOR SPAN INFORMATION ON KALCURVE 180° AND LOW PROFILE BARREL VAULTS

Skyroof® Details

For on-slope, flat and curved panels

These are standard Clamp-tite™ details for 2-3/4" (70 mm) thick panels. Details for other conditions, including those for Self Supporting Ridge, Pyramid, Windborne Debris and Blast Resistant applications are similar, but not identical so please contact Kalwall for specifics. Electronic CAD versions of these Skyroof details and many more are available at: KALWALL.COM





fire performance

Kalwall panels are comprised of a thermoset FRP / aluminum composite that will not melt. Contact us for international code compliant specifications related to your project specific requirements including flame spread, time to ignition, and fuel contribution.



windborne debris protection

Known for handling the most extreme environments with ease, Kalwall is an obvious choice for daylighting applications where resiliency matters. Kalwall offers both Hurricane High Impact (HHI) translucent systems as well as fixed / operable windows rated up to large missile D.



blast protection

In an increasingly dangerous world, projects for the DoD and GSA, among others, demand building systems that can meet Anti-Terrorism Force Protection (ATFP). Kalwall is shatterproof and can be designed to meet the requirements of UFC 4-010-01 for many applications.



safety + security

Personal safety, especially in our schools and public places, is an important consideration during the design process. Translucent Kalwall blocks line of sight for visual privacy and is resistant to graffiti and vandalism. All of our Skyroofs and Skylights are OSHA fall through compliant.

Fall Through Compliance

Properly maintained Kalwall Skyroofs and Skylights can be walked on without risk of fall through. Tested to ASTM E661, Kalwall exceeds OSHA 1910.23 without the need for additional protection like external screens or fixed railings.

Impact Resistance

The shatterproof, super-weathering FRP face will withstand a 70 ft-lbs (95 J) impact. Optional high impact FRP faces will withstand 230 ft-lbs (312J) impact by UL 972; also rated for windborne debris protection up to large missile D.

Bond Strength

Panels and bonding adhesives are tested according to the stringent requirements of "Criteria for Sandwich Panels" issued by the ICC (International Code Council) ES-AC177. Before specifying alternates, insist on actual field proof of bond integrity over a 20 year period. Caution is urged in accepting look-alikes as equivalent.

Weight

Most panels and systems weigh under 3 lbs/ft² (14.65 kg/m²).

Fire Tests

Although some Kalwall panels contain combustible binder resins (ignition temperatures above 800°F), unlike thermoplastics including polycarbonates, they will withstand a 1200°F flame for one hour with no flame penetration; pass the Class A Burning Brand Test (ASTM E-108), or UL 790 listed Class A Roof System. All interior FRP Faces are CC-1 by ASTM D-635. Optional flame spread / smoke developed ratings by UL 723 tunnel tests, including class A. Kalwall is listed by: ICC ESR-2464 and ATI CCRR-0173; British Standard 476, Parts 3, 6, 7. NFPA 268 - Radiant Panel Test - Exterior Walls.

Special Approvals + Listings

- FM Explosion Venting Walls Standard 4440
- FM Wall and Roof Systems Standard 4881 and 4471
- Hurricane-Resistant Systems
- NFRC Certified Products Listing
- UL Listings for Class A Roof Systems and FRP Faces
- UFC 4-010-01 DoD Anti-Terrorism Specifications
- ETA-07/0244 Wall Systems

ICC-ES and ATI CCRR

Listed for quality assurance and compliance with IBC (AC-177).



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